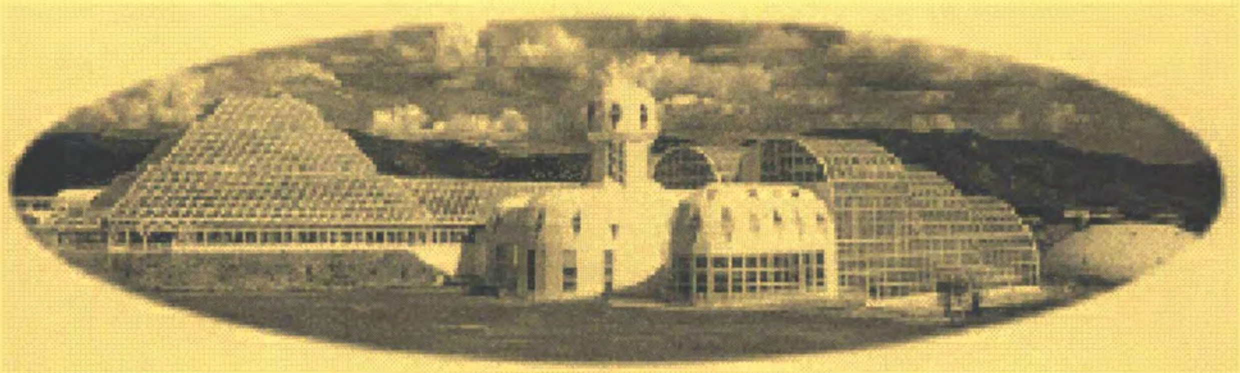
JOIDES PLANNING COMMITTEE
8-13 December, 1996, The Biosphere 2, Arizona

AGENDA BOOK



Joint Oceanographic Institutions for Deep Earth Sampling

University of California, Scripps Institution of Oceanography • Canada - Australia -Korea Consortium • Columbia University, Lamont-Doherty Earth Observatory • European Science Foundation: Belgium, Denmark, Finland, Iceland, Italy, The Netherlands, Norway, Spain, Sweden, Switzerland, Turkey • France: Institut Francais de Recherche pour l'Exploitation de la Mer • Germany: Bundesanstalt für Geowissenschaften und Rohstoffe • University of Hawaii, School of Ocean and Earth Science and Technology • Japan: Ocean Research Institute, University of Tokyo • University of Miami, Rosenstiel School of Marine and Atmospheric Science • Oregon State University, College of Oceanography • University of Rhode Island, Graduate School of Oceanography • Texas A&M University, College of Geosciences and Maritime Studies • University of Texas at Austin, Institute for Geophysics • United Kingdom: Natural Environment Research Council • University of Washington, College of Ocean and Fisheries Science • Woods Hole Oceanographic Institution

Prepared by the Woods Hole JOIDES Office

JOIDES Panel Chairs Annual Meeting Agenda Notes

Sunday, December 8th...8:30 AM

A. Welcome and Introduction (15 min.)

PANCH 1996 Attendees

- P. Fryer (IHP)
- T. Loutit (OHP)
- W. Hay (SGPP)
- S. Humphris (PCOM)
- A. Robertson (TECP)
- J. Ludden (LITHP)
- B. Malfait (NSF)
- K. Ellins (JOIDES Office)
- M. Ball (PPSP)
- J. M. Gieskes (SMP)
- S. Srivastava (SSP)
- R. Jarrard (DMP)
- A. Skinner (TEDCOM)
- D. Falvey (JOI)
- M. Mutti (JOIDES Office)

1. Introduction of PANCH Members, Liaisons and Guests
2. Logistics of the meeting

B. Review and Modification of the Agenda

PANCH is asked to approve the agenda for the meeting.

C. Approval of the Minutes of December 1995 PANCH Meeting

PANCH is asked to put forward any corrections in addition to those passed to the JOIDES Office before this meeting, and then vote on approving the Minutes of the San Diego meeting (Agenda Book - colored pages immediately following this PANCH Agenda). These contain all revisions received by the JOIDES Office before November 18, 1996.

D. Action on PANCH 1995 Recommendations

(Humphris)

PANCH recommends that the PCOM liaisons faithfully attend their designated panel meetings , function as accurate reporters of the sense of panel discussions, and be a clear channel of communication in both directions.

(Falvey)

PANCH recommends that the PCOM recommend to JOI that they allocate a larger amount of funding ($3500) for xeroxing and other functions of the panel chair. Individual institutions are currently heavily subsidizing the program.

(Ellins)

PANCH recommends that there be a change in the review criteria for proposals as suggested by Bill Hay and Sherm Bloomer.

1)Add a new category "A5. Could be relevant with major revisions" and renumber the present A5 to be "A".
2)Add a new category "D6. Possible safety problems, early review by PPSP recommended";
3)Add a new category "E0. No deficiencies";
4)Add F5 to read "of interdisciplinary interest."

(Srivastava)

PANCH recommends that each of the thematic panels designate one of their US panel members, with appropriate expertise, as ad hoc liaisons to SSP. They can then be called on by the SSP Chair to substitute for occasional US absentee SSP members. This substitution would take place no more than once a year for each individual.

(Srivastava)

PANCH recommends that the SSP workload be reduced by the following measures:

1. SSP will only consider the top 5 ranked proposals from each thematic panel during their meetings (rather than the previous 7 ranking).
2. Thematic panels will identify proposals ranked in the top 5 that lack adequate data and are thus unlikely to make it into the prospectus within two years time. SSP may exclude these proposals from consideration and may instead include, after consultation with the PCOM Chair, proposals ranked lower than 5.
3. PANCH recommends that each of the thematic panels designate one of their US panel members, with appropriate expertise, as ad hoc liaisons to SSP. They can then be called on by the SSP Chair to substitute for occasional US absentee SSP members. This substitution would take place no more than once a year for each individual.

D. New Science Advisory Structure **(Humphris)**

The New Science Advisory Structure has been approved in principle by EXCOM and JOI BoG, and adopted by JOI. An overview of the new structure and corresponding mandates and terms of reference can be found in section I of the Agenda Book. Two issues of concern are: How will thematic/country balance on panels and committees be addressed ? Has the matter of panel liaisons in the new structure been carefully considered? If not, what input can PANCH provide?

To assure that drilling innovations are considered in the context of downhole measurements, and vice versa, ***TEDCOM & Sci MP*** *need increased liaison and similar reporting paths (to both SCICOM and OPCOM). Inclusion of both scientific and technical expertise on SciMP is absolutely essential, because technological choices are inadequate unless they are made in the context of scientific and financial considerations.*

E. Proposal Pathway through the new Advisory Structure (Ellins/Humphris)

The description of the New Science Advisory Structure found in section I of the Agenda Book contains two flow diagrams showing how proposals will move through the advisory structure and an outline of the process. Has the matter of proposal flow and feed back to proponents been carefully considered and accurately depicted? Is clarification or modification warranted? What is the fate of highly ranked proposals currently in the JOIDES system?

F. Database Computerization

JANUS - sedimentary and tectonic structures; hard rock digital-image-based system (Falvey)

The ***IHP*** *recommends that JANUS Phase II be implemented as soon as possible. The IHP recognizes that implementation of Phase II will require that new moneys be identified to support this effort. There is an immediate need to ensure shipboard capture of data and to provide the shipboard party with a tool to describe the cores. The IHP recommends going to JANUS Phase II before completion of Phase I (once the SC priorities 1-4 are complete) and made suggestions to the Operator as to what tasks could be taken over by ODP/TAMU instead of having them completed by TRACOR (see minutes).*

OHP *supports the migration of existing data to the JANUS database system. The migration of biostratigraphic data should be a high priority task.*

TECP *recommends to PCOM that PCOM recommends to JOI Inc to direct ODP/TAMU to ensure that the integration of structural (and related sedimentary) data is fully completed within JANUS phase II, or equivalent.*

LITHP *has underlined the fact that they are are not satisfied with quality of the hard rock digital-image-based system that represents the "backbone" of the hard-rock community's requirements.*

CLIP (Core-Log Integration Platform) (Loutit)

*The panel **(OHP)** voted to further endorse and recommend continued support for the development of CLIP (Core-Log Integration Platform) software. The two products currently in development, Splicer (core-core data integration) and Sagan (core-log data integration) data integration software are viewed as essential shipboard and shorebased research tools for Ocean History drilling objectives. The panel supports the incorporation of Splicer and Sagan data products into the JANUS database and recommends that the programs be enhanced to access data directly from the database. The panel also recommends that ODP assume a proactive role in insuring that these CLIP software products are compatible with current and future modifications to the shipboard computing and network facilities.*

G. Core/Sample Curation (Fryer)

What was the outcome of the Curatorial Workshop held at JOI in October, 1996? How were some of the recent sampling request situations resolved?

H. Shipboard Collaboration Approval (Fryer/Loutit)

*The **IHP** recommends that in the future, any and all collaborative arrangements made among groups of scientists aboard the ship must be approved, monitored, and adjudicated by the Co-Chief scientists of the Leg.*

*The **OHP** does not endorse the IHP recommendation that any and all collaborations between shipboard scientists be approved, monitored, and adjudicated by the co-chief scientists of the leg. Such a practice would leave no mechanism for final appeal when conflicts arise between co-chief scientists and other shipboard scientists. Consequently, the OHP recommends that an independent body that can respond quickly to leg-based appeals have ultimate responsibility for adjudicating collaborative arrangements between shipboard scientists.*

I. 5-yr Program Plan (Humphris.)

The text of the draft of the science plan is in the Agenda Book, section L.

J. Other Business

K. Review of Motions and Action Items

Meeting Adjourns...5:00 PM

JOIDES ANNUAL PANEL CHAIR MEETING

SCRIPPS INSTITUTION OF OCEANOGRAPHY, SAN DIEGO

4 DECEMBER 1995

JOIDES Panel Chairs Annual Meeting 1995 Minutes

Monday 4th December 1995	09:00 am

A. Welcome and Introduction

PANCH 95 Attendees

P. Fryer (IHP) - CHAIR

T. Loutit (OHP)	**J. M. Gieskes (SMP)**
W. Hay (SGPP)	**S. Srivastava (SSP)**
R. Kidd (PCOM)	**P. Lysne (DMP)**
A. Robertson (TECP)	**H. Shatto (for E. Shanks, TEDCOM)**
S. Bloomer (LITHP)	**D. Falvey (JOI)**
B. Malfait (NSF)	**S. Humphris (PCOM Chair - Elect)**
K. Ellins (JOIDES Office)	**C. Jacobs (JOIDES Office)**

Apologies were received from M. Ball (PPSP).

B. Review and Modification of the Agenda

Some modifications will be made to the published agenda along with the order of presentations.

C. PANCH 94 Recommendations

Recommendation #1; Kidd reported that this was a matter for a report at PCOM. Not all the advice from the panels was put in place, but much had been done through the user groups. He said that these had been dealt with item by item at PCCOM and in general it was the most appropriate forum.

Recommendation #2: This was set up and has been done with a report from ODP-TAMU to PCOM.

Recommendation #3; The XRF has still not been replaced (Geiskes said the XRD was a greater need), the magnetometer has been replaced.

Recommendation #4; There was a request that each of these items was costed, he assured PANCH that as part of project management, each item was being costed as part of single projects and he asked PANCH to wait for the report of Falvey to PCOM. Kidd said there will be a major change in the management of ODP to become much more commercial.

Recommendation #5; This is now in place.

Recommendation #6; All panels are making an effort to fit in with this recommendation.

Recommendation #7; No action on this as it goes to JOI.

Recommendation #8; This is really up to individual panels and there has been no feedback to the PCOM Chair.

Recommendation #9; There have been moves to increase the publicity of the program, especially from JOI. Kidd commented that recent coverage of Leg 164 was good, though not exactly science-based, and Leg 165 coverage was also becoming high profile. He reported that port-calls have also generated a lot of interest. Fryer asked about input for the LRP, and Kidd reported that there was input from international global programs and national committees.

Bloomer said that he wished to renew the request for cost breakdowns as this may help panels when providing realistic advice. Kidd said that we are in a level budget situation. Falvey said that the costs will be published over the next few years as project management is implemented.

Falvey also said that Recommendation #1 from PANCH 94 still remains the mandate of the JOI steering committee, the logging database is the responsibility of ODP-LDEO, and ODP-TAMU will manage the database, but the management process will appear seamless to the user community.

D. JOIDES Office Business

1. Communications with the JOIDES Office

i) The Role of the JOIDES Office

Kidd outlined the role of the JOIDES Office and said that panels must communicate through the JOIDES Office, and not around it. He said that if panels do communicate direct with other parts of the program, they should always cc to the JOIDES OFFICE so that the information can be distributed. He also asked panel chairs to use the joides@cardiff.ac.uk e-mail address rather than personal addresses as frequently messages do get missed while staff are travelling. He offered easy telephone access for sensitive communications. Srivastava asked that the JOIDES Office look at their e-mail system and set their default addresses. Falvey added to Kidds' comment asking for copies of all minutes to be sent to the JOI Office, and if Panels communicate with ODP-LDEO or ODP-TAMU then JOI should be informed. The minutes of each panel meeting should be passed to all panel chairs by the respective panel chairs. This applies to the final minutes only and not draft minutes.

ii) Prompt submission of Rankings and Reviews to JOIDES Office

Kidd said that the panel rankings should get to the JOIDES Office ASAP, even the next day if possible, as the panel members often distribute rankings before they get to the JOIDES Office. Panel reviews are required for SSP more than anything and these also are urgently required. Srivastava said that SSP must have the panel rankings before they can even decide on the meeting agendas and therefore cannot get formal permission to hold the meeting. Ellins commented that rankings have gone direct to SSP, usually via thematic panel members and they really should go the JOIDES Office first.

iii) Length of notice period for approval of meetings

Kidd said that the approval requests are required as early as possible as the have budget implications for funding agencies. He asked that Panel Chairs stick to the 2-month notice, and that he requires a justification for the attendance of visitors. He said that USSAC have a limited budget and that they must approve the attendance of US guests, whereas it may not be so critical for non-US members. Kidd said that he can make the case to USSAC for the attendance of US guests to panel meetings.

In terms of US alternates, he said that most non-US members had alternates, but, and especially in terms of SSP which is a working panel, they really do need US alternates, but USSAC have said that this would be beyond their budget. He said that his advice is that there are areas, especially SSP it may become impossible for them to function. Geiskes said that he has one US panel member who now is in France, so what is the status. Kidd said that if the Institutional base is moved, then the member must change their allegiance (or leave the panel).

Kidd said that Ellins goes to all SSP meetings, whereas Jacobs rotates to all thematic panels. He said that they can provide support at the meeting, but they are not there to follow through with minutes etc. after the meeting, and this was also noted by the last two PEC reports.

iv) Role of PCOM Liaisons

These are there to communicate the actions of PCOM and are not to be considered as the panel watchdogs, and they can be panel 'heroes'. Lysne said that DMP were unsure what PCOM policy was as he felt the PCOM representation was weak. He said that it was impossible for panels to review items such as budgets and equipment if they were unaware exactly what PCOM wanted from the panel. Kidd said that liaisons are examined at every PCOM and the

PCOM Chair said the liaison should be available to the panel for the whole meeting. Lysne asked that PCOM Chair ensure consistent representation at DMP and the other panels. Kidd said that he would raise this item when PCOM looked again at their liaisons. Lysne said that often the panel recommendations were not acted upon and had minimal discussion that did not carry forth the feeling of the panel. He said that as the program evolves with more industry contacts etc. this will be crucial. Kidd said that this will be addressed as PCOM will be doing more long-range planning and therefore they will need a strategic view from the panels. Kidd said that it may be useful if PANCH suggested any changes for the Panel Chair guidelines.

iv) Panel Membership Rotation

Srivastava said that he thought that PCOM made a motion that panel members join for 4 years and not 3 for US members. This was confirmed by Kidd, who said that non-US members were usually 3 years, but it was up to individual national committees. Bloomer said that he was unaware of this, but Geiskes said he was aware of this. Bloomer said that some members have only accepted under the three-year term and some latitude must be given.

2. LRP update/planning for post-1998 panel structure.

Kidd said that this is a pre-publication version and ONLY MISTAKES would be changed. He said that the implementation section outlined how things would change after 1998. He said that PCOM will need to put out a call for post-1998 proposals that would involve multi-leg and multi-platform proposals, from the whole community including the global geoscience programs.

3. Input to JOIDES Thematic Panels from other global community programmes.

Kidd said that there would probably still be about 4 thematic panels although the areas of expertise would probably change. He said that joint ODP-community program workshops were already starting that would identify what the programs would like to achieve in the long term, and that multi-leg proposals would likely arise from these events. He said that the global programs may like representation or liaison to ODP panels, and for example, DPG's may arise from the various workshops. He said that NAD is already linked into JOI and it is likely to create a representation on the panels quite soon. He said that for example ANTOSTRAT may have a diffreent level of involvement as there is no sharing of resources as yet. He said that post 1998 the need for other platforms would require association with other programs to obtain additional resources for additional/alternate platforms. He said that post-98 the science planning structure will evolve. Robertson said that these points should be more formalised so that the panels can discuss them at their meetings. Though he thought that a call for proposals was a little optimistic and that maybe a call for LOIs was more realistic.

Srivastava asked about changes in the service panels. Kidd said that was a suggestion of the last PEC review and was still under debate and would probably be discussed at this PCOM. He said that he thought PCOM would ask panels to do specific things.

Coffee *10:15 - 10:35*

D. Drilling Proposals

1. Guidelines for Proposal Evaluation and Criteria for Proposal Review and Review Format

Bloomer said that the thematic panels had been asked to comment on the review forms that have been in use and suggested that there should be guidelines on length and content of proposals, including figures etc. Ellins said that the guidelines have been circulated to all panels and they had been printed in the JOIDES Journal. She said that OHP though colour figures would be useful. Loutit said that proponents should be responsible for making enough copies to all panels and watchdogs and they should send them to the thematic panel chairs who could them pass them to the appropriate watchdogs. That way it would solve the copying issues at the JOIDES Office. Hay said that for SGPP, all panel members want a copy of everything. Loutit said that the panel chair should make a decision as to who gets (colour) copies. Ellins said that proponents who have special needs (colour etc.) they should contact the JOIDES Office. Loutit said that 4 copies per thematic panel should be sufficient. Bloomer said that he sorted the proposals and sends out subsets, but copies everything to all panel members.

Loutit said that the 4 copies referred to colour or fold-out images only, and that all panel members can all have b/w copies.

Fryer asked about centralisation of proposal copying at the JOIDES Office rather than by the panel chairs. She asked if the service panel chairs actually needed the resources in the same way as thematic panel chairs. Hay said that his new panel members want not only new addenda, but require all previous versions, which amounts to a lot of paper. He said that by reducing page sizes and double-siding it reduced the volume significantly. He said that he thought that the extant proposals could be reproduced at a central office once and placed in a loose-leaf folder so that the entire proposal history could be looked up easily. He said the most time consuming part was taking the proposals apart for copying, we should look at the physical construction of proposals. He said that if it were done centrally then much of the money the panel chairs get would not be required, at present he spends almost double his allowance at present. Loutit said that each panel member is supposed to hand on material and this may be a way around this problem. Robertson said he thought that unrealistic, and it was important that new panel members get old versions of the proposals.

Srivastava said that SSP have watchdog books kept at the data bank and he didn't see why this couldn't be adopted by other panels. That way if the watchdogs change the new watchdog has a complete history to change. Geiskes said that he does use his $2500 and that he may be able to carry over some in some years. Humphris said that if proposal distribution is centralised it would increase the amount of copying and work as not all panel members copy all proposals to all members. Kidd asked if all the panels gave all the proposals to all members. Robertson said that he only sent out proposals that had a tectonic component, and Bloomer said that he did the same for LITHP. Srivastava said that if that happened then all SSP members would get 28 proposals each which was unrealistic, so he built lists of watchdogs based upon the thematic panel rankings. Bloomer asked if there were log sheets that tracked the arrival of addenda etc. Ellins said that there was and that it was included in the prospectus. Bloomer said that such a synopsis history of when the main proposal arrived would be of great help. Ellins said that time pressures make this very difficult.

Loutit said that a recommendation could to reduce the amount of copying could be for all panel chairs ask all panel members to pass on their material to their replacements. In terms of the $2500, Srivastava said that it is not only used for copying. Kidd asked if all panel chairs use their money. All except Fryer said that they did, and Bloomer said that he didn't use all his (US-only) administrative funds, but would like an increase in the copying funding. Lysne and said he used his and Hay said that he spent his allowance on the first mailing alone, and that he has to use institutional support. Geiskes said that he never requested his money, and he will not request more until his present allowance is used up. Robertson asked if the notional administrative allowance for US members could be transferred to the copying/mailing budgets, as this does not seem to be used up. Srivastava said the international partners should not be excluded from a recommendation. Loutit said that thematic panels and SSP should have an increase to $3500, with some movement of funds from the administrative budgets.

Bloomer asked about the proposal criteria forms. Ellins said that the current forms are about as small as she could make them, and the sheets go to the proponents along with a copy of the key sheet to the review criteria. Robertson said that TECP find the review criteria quite effective.

Hay said he had some specific changes;

1) add a new category "A5. Could be relevant with major revisions" and renumber the present A5 "A6";
2) add a new category "D6. Possible safety problems, early review by PPS recommended";
3) add a new category "E0. No deficiencies";

Loutit and Robertson said that D6 and E0 were good ideas. Srivastava said that a flag like D6 would be useful to SSP.

2. SSP Workload

Srivastava outlined the workload of SSP for PANCH95, and how SSP actually works. He said that they choose the top 7 ranked proposals to distribute to watchdogs, split into new proposals and those that had come up previously. He said that in the Spring meeting of 1995 13 of 24 proposals were previously ranked and 6 of those had new data. 9 of the 11 new proposals had data which was based on DSDP/ODP legs. He said the SSP recommendations go to PCOM, usually only 2-3 weeks after SSP. He sad that there is usually only one moth for SSP to get the JOIDES OFFICE to send the relevant proposals to the SSP members. He said that SSP flag target type, the kind of data and potential PPSP problems.

For the summer meeting PCOM has defined the geographic area, and this cut the proposals to 17, 10 of which had additional data sent to the data bank, and they also ask some proponents to give presentations to clarify points for SSP. SSP recommendations have to go to PCOM before their August meeting, again with a big time constraint, they have to advise what data is still required and that any new data has to be submitted to the SSDB by 1 November.

The last meeting in November looked at 11 proposals (again in Lamont to use the data bank), with 4 additions by the thematic panels. There was new data for 11 proposals and 5 had no data at all. They have to give PCOM advice as to the readiness to drill.

He said that it comes down to the mechanism of how SSP can look at the huge amount of data - they also have to look at the data readiness of planned legs as well as new proposals. He reviewed the workload of SSP from 1993-95 at each meeting

April	July	November
24	17	16
20	12	12
23	17	15

He said that SSP is overwhelmed with the amount of data and the number of proposals they have to look at, they only have 13 members. He said that as the area of operations decrease so the number of proposals to look at decreases, but this was still too much of a load. He looked at the global rankings of the proposals that SSP looked at. He said that if the area of operations should as closely defined as possible, and that the lowest rank proposal was 6. He said that in 1992 the lowest ranked proposal that was scheduled was 5 with an SSP rank of 2B, in 1993 the rank was 5, and in 1994, the lowest rank was 4. In 1995 the lowest rank in the prospectus was 5. He said that really a ranking of 7 never makes it to a leg, and can SSP use a ranking of 5 as a cut-off ? He suggested that a thematic panels made a new category of a proposal that they knew would not be ready for drilling in two years but was of high thematic interest, this would reduce SSP workload. This would the raise the "ranking " of lower ranked proposals that are nearer to b ready for drilling. Secondly he wants PCOM to constrain the area of operations as tightly as possible.

He said that SSP have to meet after November 1st due to submission deadline of data to the data bank. He asked if the data deadline could be moved to two weeks earlier ? He said that since SSP he has only had time to write the SSP minutes and prepare for this meeting.

Kidd said that the cut-off at 7 happened in his tenure of SSP, and that it was an arbitrary decision at that time. He said that in April all that PCOM does is extend the 4-year track, it does not decide an area of operations, but that can be revisited during PCOM. He said that there will be a recommendation coming from the operators and from JOI that PCOM schedules the ship in August and not in December, as there is not enough time to set up the science plan upon which the budget is based, and EXCOM and BCOM. He said that this will impact the panels most, though it will help on the management and budget side, but it could create a log-jam for one or maybe two years.

Srivastava asked if the thematic panels could flag proposals that they know would not be drilled and would not require SSP review. Bloomer said that they were asked to flag what would be ready in the next fiscal year. Srivastava said that two panels did this, but some would be ranked quite low. Robertson said that TECP would be very sympathetic to the problem, but they couldn't produce two separate lists, though they could flag "near-ready" proposals, with a ranking of 5 as a lower cut-off. Loutit said that with the review criteria in place (with the new ones proposed) it should not be a problem and that the review criteria should be passed to SSP along with the spring and fall rankings. Hay said that it was easier to identify things that would not be ready rather than those that would be, but these can be flagged.

3. Panel Alternates

Srivastava said absentees had unfortunately grown over the last 5 years such that sometimes only 7 members were looking at 17 proposals and 5 legs. He said that July was often a problem time, for both US and non-US members. Srivastava said that most of the time the foreign members do have alternates who do attend, but not always. He said that US members do not have alternates and this is where the problem lay. He said there are several choices, do they have one-for-one alternates, a general pool of alternates, or, and he thought the most appealing, that because they do not have thematic panel liaisons, that the SSP alternates are taken from thematic panel memberships, this would also improve inter-panel communication and would give four alternates, one from each thematic panel so that any absentee from SSP, the relevant thematic expertise could be replaced. Kidd said that he thought that USSAC would be happy with this solution and the alternates would all have to be US members who have data collection (survey) experience.

Fryer asked if the absentee problem was wider than SSP, and it was not. Fryer said that PANCH should make a recommendation on this.

E. Inter-Panel Communication

Fryer said that a listserver for panel chairs was recommended last year and never happened and it was a good idea and should be pushed again.

Robertson said that liaison with service panels has proved extremely useful and he would be loath to change this. Bloomer said that LITHP have come to the point where they cannot find volunteers to attend all the meetings, and so they do have corresponding liaisons who will attend if essential. Kidd said that if there is a specific case for attendance then it is fine, but otherwise there will simply be a very expensive network of liaisons. DMP said that they are really helped by thematic panel liaisons. Robertson said it was difficult to judge in advance the content of some service panel meetings. Kidd said that he would like to see that panel chairs communicate more in asking for attendees as JOI are continuing to ask for savings to be made. Lysne said that continuity is very important an that the extra cost of one person is small compared to the total cost of the meeting. Kidd said he recognised that each panel was unique and had it's own special relationships, though he asked PANCH to be conscious of costs.

Lunch *12:20 - 13:20*

F. Publications

Robertson said that TECP wanted the economies in publications to be monitored as maintenance of the IR is very important and that a reduction or abolition of the SR was preferable. They are concerned that the changes to the volumes should be carefully an continually monitored. A lot of work goes into the IR at sea and the effort at sea may be diluted if the volume is reduced or produced on CD only, resulting in a drop in quality of the IR material which could have an adverse affect on the credibility of the Program. ODP-TAMU have had to buy substantial items of equipment to make the changes so the value of such changes may be less than first thought.

Srivastava said that SSP felt that the shipboard data usually found in the IR volume should continue and that the volume should not be downgraded.

Fryer said the volume would be shortened to 100 pages with half-size core photos, and that site chapters will be preserved although it will be incumbent upon the scientists to make their contribution as succinct as possible. She said that IHP shares the concerns of TECP and SSP. She said the scanner was a $100K, one-time item. She said that IHP would be recommending a new approach to the SR volume, and that they wish to keep an SR volume, whilst recognising that individuals wish to publish in external literature. They propose to keep the 12-month arrangements the same, but that outside publication will be allowed after the second post-cruise meeting, and thereafter a scientist contribution to an outside journal will have to submit a reviewable manuscript to the ODP editorial board so that it can be distributed around the community, and it will count as a "performance" indicator. At least one paper must be in English, but further publications may be in other languages. She said that external publication targets would have to be met within the deadline of the SR volume.

Hay said that SGPP considered the submission of abstracts/reprint to the SR should be encouraged, and the addenda/data reports should also be published. Robertson said that it would be good if summaries of achievements of individual legs were published in the JOIDES Journal as soon as possible after the leg. Also a complete listing of the papers in the SR volume should be published elsewhere, possibly in the JOIDES Journal, or in the open literature. Srivastava said that GEOREF was a good forum for this. Geiskes said that 'data' would not be published in the open literature and we must address this problem. Fryer said that IHP is aware of this and they had discussed the problem and that maybe that data report CDs would be published, or in hard-bound volumes.

SSP also discussed the merits and demerits of publishing in the outside literature before the SR is published, and that there may be a problem with meeting all the guidelines. Bloomer said that LITHP had a very similar response, without a consensus on the SR, but an acknowledgement that the results of ODP must become more visible. LITHP recognised the SR as a valuable synthesis of each leg and it was not clear how this would be continued if publication was allowed outside the SR. Fryer said that an included abstract from an external journal included in the SR should address that problem. She said that IHP were alarmed at the EXCOM action as regards the SR in July 1995, and that was why they looked at revising the volume when originally they wanted it left more-or-less untouched. She said that synthesis volumes along thematic or regional lines may also be a way to ensure that synthesis are published. Kidd said that he wrote to all the national committees asking for support for such thematic volumes. Malfait said that JOI announced some time ago that they had money for such volumes, but that there were no takers at that time. Kidd said that the thematic panel could discuss this at their meetings and give direction, though such volumes usually arose out of workshops. Loutit drew PANCH attention to the OHP motion on publications.

Fryer asked PANCH what they thought about the scanner (at a cost of $100K) as a one-time cost. Will it impact the program unduly ? Falvey said that he thought it the best way out in the longer term and it would make the visual core description more readily available. Kidd said that the request has already been made to JOI.

G. Equipment Needs and Prioritisation

Kidd said that we have to look forward in terms of planning in terms of the operational items for the Resolution, and that we may have to look to ways of raising funds for shallow water rigs etc. Geiskes said that he has a list of what SMP will be asking for in the Fall. Kidd said that quite a few of the enhancements to be made to the ship could form part of the refit, which if done could result in the day-rate remaining unchanged. Kidd said that in the LRP there is a section on required technology development and these will also need addressing, including a decision as to how quickly they can come on-line. Loutit asked about the JANUS project, if the new software is on-board what about the networking and software issues. Falvey said that he envisions an evolution of the JANUS project will have to continue into FY97 and that there will be a need for existing data to be captured by the system. He said it is a new project after this year, with funding. Kidd asked how important the archive data was and if this will become a high priority for input to JANUS. Bloomer and Robertson said their prioritisation depended upon just what was accomplished in the first phase.

Shatto reported that there was a sub-committee meeting to look at progress with the DCS project, and they were impressed with the results they were obtaining. He said that Shanks had presented a new model using the seafloor as a reference for heave compensation. He said that in the event that DCS proves unfeasible, this new model could be developed with a great deal less effort than has already be expended so far on the present system. Essentially the heave compensator would be attached to the seafloor re-entry cone system with a chuck that could grab and release the DCS string, held by a passive compensator at the sea surface. He said there is the possibility that at the surface, on the ship, the place for adding pipe etc. could be moved to the derrick floor rather than in the derrick itself. He said that bit-weight would still need to be measured (with a computer) to enable accurate control. He said this model should be looked at as a back-up for the present system.

Lysne asked if MOBIL would be interested in a joint technology development project. Shatto said that he could ask. Falvey said that it simpler than having the secondary heave compensator on the ship. Shatto said that it was simpler in theory, but that accurate flow control of the compensation system was still essential from the surface. Falvey asked if a similar system had been tested. Shatto said it had been used in a shallow water application, and it exists on land. He commented that if this worked it would be much safer than having people working high in the derrick. TEDCOM are looking at this system with some estimates of the possible costs of building such a system. Falvey said it would be nice to see a listing of pros and cons of this system as opposed to the currently planned DCS system, including what it would do for the science objectives of ODP. Kidd said that a meeting of European ODP, the German members suggested that they too would like to investigate ways of putting DCS control at the seafloor.

Robertson said that if money has now run out for DCS, it would be sensible to examine a range of alternatives. Shatto said that TEDCOM felt the present DCS system was looking promising and that development should proceed, though this would be more fully explored in PCOM Fryer said that PANCH should make a recommendation to PCOM on this issue.

Geiskes then presented the SMP "wish-list".

New X-ray diffractometer (awaiting users community input)	($225,000)
Equipment for core/structure recording (still under discussion)	($125,000)
Transfer of old magnetometer to ODP-TAMU	needs to be estimated

Fryer said that the Brown report does impact the JANUS project, as there would be effort diverted to create the automatic data entry interfaces. She asked how much time and effort this diversion would require. Geiskes said that these questions are being addressed at the moment and that it would probably be March before any detailed plans are presented to TRACOR and they can comment properly, but the bottom line was that the time frame should not impact upon JANUS at all.

H. 1995 Panel Meetings and Schedule

Kidd said that the proposal to change the scheduling meeting from December to August is largely brought about by pressures from the sub-contractors. It would provide the community, PCOM and ODP management additional time to consider operational changes and their implications (e.g. leg add-ons). It will PCOM with a more realistic draft budget and plan in December for additional PCOM input before the program plan goes to NSF for review. Against this is that it will place extra burden on the thematic panels for at least one year, and the community will need to know about the change, and it will place a short term extra burden on SSP.

Loutit and Srivastava asked why change the system now when everything will change anyway in 1998. Falvey said that ODP-TAMU argue that they need more time to prepare better budgets. Falvey said that he just assumed moving everything by three months. Bloomer said that all the panel meetings would have to change too. Falvey said that the whole ODP schedule would change (for every panel). Robertson said that there would be problems getting panellists due to field season commitments. Falvey accepted that. Bloomer said that it may be easier to discuss with a 'mock-up' to discuss, he said that there is a problem now and that any shortening of the review process would probably not work.

Humphris and Kidd said that ODP-TAMU could actually use the prospectus and panel rankings as a basis for them to begin working out the budgets. Kidd said that the sub-contractors conference calls after the fall meetings could also be used to give ODP-TAMU and ODP-LDEO indications which proposals to budget for. These ideas will be the basis for a recommendation from PANCH.

Srivastava said that he wanted a data submission deadline of October 15th rather than 1 November. Ellins said that may prove too tight a timetable for many proponents to get data to the data bank. Bloomer said that panels could flag proposals that they expect to see in the prospectus at their spring meetings. Srivastava said the problem would be if the panels added new proposals to the prospectus and that they must bear in mind the responsibility of SSP. Bloomer said that he was in favour of an October 15th deadline. Ellins asked if the JOIDES Office should become strict with deadlines or not. Kidd said that if that deadline is moved then it will have to be adhered to, and this must be made clear to all proponents.

Bloomer said that many proponents are unaware of how important it is to submit data until they see their proposals get to the top of the rankings. Kidd said that the panel watchdogs from the panels must take this on and be more proactive in getting proponents to submit data as required. The thematic panel chairs were encouraged to meet and produce a template of a document that they wished to see distributed to all new panel members outlining their responsibilities. Bloomer volunteered to co-ordinate this (ACTION ITEM on Bloomer).

Coffee 15:00 - 15:30

I. Other Business

Bloomer asked that PANCH discuss LOI55 which was a multi-disciplinary proposal and did not fit easily to any one panel. It was to look at serpentine diapirs in the Bonin arc. Robertson said that interdisciplinary proposals could be flagged at the spring rankings, and Bloomer said that so far nothing had been done, and PANCH should address how this would be done. Kidd said that we could use the Red Sea proposal as this was highly ranked by two panels. Bloomer said that was highly ranked anyway and he was worried by those that individually ranked say 5 or 6. Kidd said that generally PCOM keep an eye on these to ensure they do not drop out altogether, and that the panels should make sure their PCOM liaison should be briefed on these types of proposals to bring them to the attention of PCOM. Hay said that in essence SGPP was the "interdisciplinary panel" and they ranked that LOI highly anyway. He said that a representative meeting with OHP was useful to identify cross-panel issues although they did not discuss individual proposals. He said that SGPP were still uncertain exactly what their role was vis-a-vis hydrothermal systems. He said that joint meetings were probably a good idea from time to time. Robertson said that they highlight those they thought interdisciplinary and hold e-mail discussions between the panel chairs and highlight such proposals to PCOM. He said this would avoid setting up formal structures. There was consensus to change one of the review criteria to indicate that it was of interdisciplinary interest.

K. PANCH 95 Recommendations to PCOM

RECOMMENDATIONS TO PCOM

1. PANCH recommends that the PCOM liaisons faithfully attend their designated panel meetings , function as accurate reporters of the sense of panel discussions, and be a clear channel of communication in both directions.

2. PANCH recommends that the PCOM recommend to JOI that they allocate a larger amount of funding ($3500) for xeroxing and other functions of the panel chair. Individual institutions are currently heavily subsidizing the program.

3. PANCH recommends that there be a change in the review criteria for proposals as suggested by Bill Hay and Sherm Bloomer:

1) add a new category "A5. Could be relevant with major revisions" and renumber the present A5 to be "A6";
2) add a new category "D6. Possible safety problems, early review by PPSP recommended";
3) add a new category "E0. No deficiencies";

4) add F5 to read "of interdisciplinary interest."

4. PANCH recommends that each of the thematic panels designate one of their US panel members, with appropriate expertise, as ad hoc liaisons to SSP. They can then be called on by the SSP Chair to substitute for occasional US absentee SSP members. This substitution would take place no more than once a year for each individual.

5. PANCH recommends that the SSP workload be reduced by the following measures:

1. SSP will only consider the top 5 ranked proposals from each thematic panel during their meetings (rather than the previous 7 ranking).

2. Thematic panels will identify proposals ranked in the top 5 that lack adequate data and are thus **unlikely** to make it into the prospectus within **two years** time. SSP may exclude these proposals from consideration and may instead include, after consultation with the PCOM Chair, proposals ranked lower than 5.

Comments

1. PANCH does not endorse changing the planning cycle and schedule, but suggests instead that the ODP TAMU budgeting process begin once the prospectus has been assembled. PANCH suggests that a tighter prospectus be designated so SSP need consider fewer proposals. PANCH recommends that the "Gang of 4" continue to maintain communications in order to maximize effective progress toward this end.

2. PANCH supports the TEDCOM subcommittee's recommendation regarding the acquisition of quotes for the evaluation of the alternative DCS system.

3. PANCH expresses concern regarding the changes in publications and in the implementation of these changes. It suggests that strict monitoring of the outcomes take place and that in a year's time the publications be reevaluated and recommendations for further changes be made, if necessary

Meeting Adjourn *16:10*

PCOM Meeting Agenda and Schedule

Tuesday, December 10th..8:30 AM

A. Welcome and Introduction (15 min.)

1. Introduction of PCOM Members, Liaisons and Guests
2. Logistics of the meeting (G. Mountain)
3. Approval of the Agenda
4. Approval of the Minutes of August 1996 PCOM Meeting

B. Reports of Liaisons

1. NSF (B. Malfait-15 min.)
2. JOI (D. Falvey- 15 min.)
3. ODP-TAMU (T. Francis- 45 min.)
4. ODP-LDEO (D. Goldberg- 20 min.)

Coffee Break..10:20-10:40

C. Review of FY '97 Schedule

1. Update on Hammer Drill-In Casing/Other Issues (T. Francis-10 min.)
2. PCOM Discussion (25 min.)

D. FY '98 Science Program

1. Thematic Panel Chairs Presentation of Prospectus
   - OHP (T. Loutit- 30 min.)
   - SGPP (B. Hay- 30 min.)

Lunch..12:15-1:15

1. Thematic Panel Chairs Presentation of Prospectus (continued)
   - TECP (A. Robertson- 30 min.)
   - LITHP (J. Ludden- 30 min.)
2. Site Survey Considerations
   - SSP (S. Srivastava- 30 min.)
3. Logging Prospectus (D. Goldberg- 20 min.)

Coffee Break..3: 05-3:25

4. Logistics and Budgetary Considerations
   - Proposal Logistics/Budget Implications (T. Francis/J. Fox - 30 min.)
5. FY' 98 Science Program Discussion

Adjourn..5:30

Wednesday, December11 th..8:30 AM

D. FY '98 Science Program (continued)

6. Final Discussion and Selection of Science Projects for Schedule

Coffee Break..10:00-1020

E. JOIDES Panel Reports and Action Items

1. Panel Chair Reports
   - PANCH (T. Loutit- 15 min.)
   - SGPP (W. Hay- 15 min.)

TECP (A. Robertson- 15 min.)
LITHP (J. Ludden- 15 min.)
OHP (T. Loutit- 15 min.)
SSP (S. Srivastava- 15 min.)
DMP (R. Jarrard- 15 min.)
SMP (J. Gieskes- 15 min.)

Lunch..12:20-1:30

E. JOIDES Panel Reports and Action Items (continued)

1. Panel Chair Reports (continues)
   IHP (P. Fryer- 15 min.)
   TEDCOM (A. Skinner- 15 min.)
   PPSP (M. Ball- 15 min.)
2. PCOM Responses to Action Items (45 min.)

Adjourn..3:00

TOUR OF THE BIOSPHERE 2.. 3:00-5:00

Thursday, December 12th..8:30 AM

F. Leg Reports

1. Leg 168 (E. Davis- 30 min.)
2. Leg 169 (R. Zierenberg- 30 min.)

G. Ongoing Computer and Publication Projects

1. JANUS (K. Moran- 20 min.)
2. Publications (D. Falvey- 10 min.)
3. PCOM Discussion (30 min.)

Coffee Break..10:30-10:50

H. JOI Workshops Reports

1. Curatorial Report (K. Moran- 15 min.)
2. Co-Chief Scientists' Workshop (D. Falvey- 15 min.)

I. Implementation of New JOIDES Advisory Structure

1. EXCOM Outstanding Issues
   Presentation of Issues (S. Humphris- 10 min.)
   PCOM Discussion (10 min.)
2. Scientific Measurements Panel
   Report from Subcommittee (W. Sager-15 min.)
   PCOM Discussion (15 min.)

Lunch..12:10-1:10

3. Mail Reviews
   Report from Subcommittee (J. Natland -15 min.)
   PCOM Discussion (15 min.)
4. Meeting and Proposal Schedule
   Proposal Annual Cycle (S. Humphris- 15 min.)
   PCOM Discussion (15 min.)

5. Procedures for Nominations to SCICOM and SSEPS
   (various- 30 min.)
6. Creation of PPGs (S. Humphris- 20 min.)

Coffee Break...3:00-3:20

J. FY '98 Schedule Revisited

1. The FY '98 Schedule
   Proposed Legs (T. Francis- 15 min.)
   PCOM Discussion and Final Approval (20 min.)
2. Co-Chief Scientist Nominations (30 min.)

K. FY '98 ODP Budget

1. FY '98 ODP Program Budget (D. Falvey- 20 min.)
2. PCOM Discussion and Prioritization of Budget Items (45 min.)

Adjourn...5:30

Friday, December 13th...8:30 AM

L. 5-yr Program Plan

1. Status of Science Program Plan (S. Humphris- 10 min.)
2. PCOM Discussion (30 min.)

M. Status of the Japanese OD-21 Program

1. International Workshop on Riser Technology (S. Takagawa- 15 min.)
2. CONCORD (K. Suyehiro- 15 min.)
3. PCOM Discussion (20 min.)

Coffee Break..10:00-10:30

N. Rock Drilling

1. Over-the-side rock drills (P. Johnson- 15 min.)
2. PCOM Discussion (15 min.)

O. PCOM Correspondence

1. Response to K. Miller (10 min.)
2. Response to Henry Dick (10 min.)

P. New Business

1. Future Meetings of SCICOM and OPCOM (20 min.)
2. Other Business

Q. Review of Motions and Action Items (20 min.)

Meeting Adjourn.. ....12:00

PARTICIPANT LIST

Members

K. Brown	Univ. of California, San Diego, Scripps Institution of Oceanography
R.M. Carter	James Cook University, Australia, Australia-Canada-Korea Consortium
H.P. Johnson	School of Ocean Sciences, University of Washington
S.E. Humphris (Chair)	Woods Hole Oceanographic Institution
H. Kudrass	Bundesanstalt für Geowissenschaften und Rohstoffe, Germany
R.L. Larson	University of Rhode Island, Graduate School of Oceanography
J.A. McKenzie	ETH, Zurich, ESF Consortium
C. Mevel	Laboratoire de Pétrologie, Université Pierre et Marie Curie, Paris
A. Mix	Oregon State University, College of Oceanography
G.F. Moore	University of Hawaii, School of Ocean and Earth Science and Technology
G. Mountain	Columbia University, Lamont-Doherty Earth Observatory
J. Natland	University of Miami, Rosenstiel School of Marine and Atmos. Sciences
J.A. Pearce	University of Durham, United Kingdom
W.W. Sager	Texas A&M University, College of Geosciences
T. Shipley	University of Texas at Austin, Institute for Geophysics
K. Suyehiro	Ocean Research Institute, Japan

Liaisons

D. Falvey	Joint Oceanographic Institutions, Inc.
T.J.G. Francis	Science Operator (ODP-TAMU)
D. Goldberg	Wireline Logging Services (ODP-LDEO)
B. Malfait	National Science Foundation

Guests & Observers

E. Davis	Pacific Geosciences Centre, Sidney
K.K. Ellins	JOIDES Office, Woods Hole Oceanographic Institution
P.J. Fox	ODP-TAMU
K. Moran	Geological Survey of Canada Atlantic, Dartmouth
M. Mutti	JOIDES Office, Woods Hole Oceanographic Institution
S.D. Scott	Canadian Secretariat for Ocean Drilling, Toronto
T. Tanaka	Japan Marine Science and Technology Center, Yokosuka
S. Takagawa	Japan Marine Science and Technology Center, Yokosuka
R. Zierenberg	University of California, Davis

Panel Chairs

M.M. Ball	US Geological Survey, Denver
P. Fryer	University of Hawaii at Manoa, Honolulu
J. M. Gieskes	Scripps Institution of Oceanography, San Diego
W.W. Hay	Geomar, Kiel
R. Jarrard	University of Utah, Salt Lake City
T. S. Loutit	Australian Geological Survey Organization, Canberra
J. Ludden	CRPG, Vandouvre-les-Nancy
A.H.P. Robertson	The Grant institute, Edinburgh
A. Skinner	British Geological Survey, Edinburgh
S. Srivastava	Geological Survey of Canada Atlantic, Dartmouth

JOIDES Meeting Schedule

Panel/Committee	Dates	Location
Panel Chairs	8 December, 1996	LDEO Biosphere 2, Arizona
PCOM	9-13 December, 1996	LDEO Biosphere 2, Arizona
Interim SSEP	20-22 January, 1997	WHOI, Woods Hole, Mass.
EXCOM	10-13 February, 1997	JOI, Washington, DC
PPSP	20-21 February, 1997	Scripps, San Diego
SciMP	March, 1997	College Station, Texas
SSP	1-4 April, 1997	Tokyo, Japan
OPCOM	11-12 April, 1997	College Station, Texas
SCICOM	14-17 April, 1997	College Station, Texas
PPSP	8-9 May, 1997	College Station, Texas
SSEPs	May, 1997	WHOI, Woods Hole, Mass.
EXCOM	June, 1997	Brest, France
TEDCOM	July, 1997	College Station, Texas
SCICOM	18-22 August, 1997	Davos, Switzerland

JOIDES Resolution Operations Schedule

Leg	Destination	Cruise dates	Port of Origin	Total Days	Tran-sit	On Site
170	Costa Rica Margin	22 Oct-17 Dec 96	San Diego 17-21 Oct '96	56	11	45
171A	Barbados LWD	21 Dec'96-8 Jan '97	Panama 17-20 Dec '96	18	7	11
171B	Blake Nose	9 Jan-14 Feb '97	Barbados 8 Jan '97	36	6	30
172	NW Atlantic Sed. Drifts	19 Feb-16 Apr '97	Charleston 14-18 Feb 97	56	15	41
173	Iberia II	21 Apr- 16 Jun '97	Lisbon 16-20 Apr '97	56	10	46
174A	New Jersey Shelf	19 Jun-17 Jul '97	Halifax 16-18 Jun '97	28	3	25
174B	CORK/Engineering	20 Jul-18 Aug '97	New York 17-19 Jul '97	29	14	15
175	Benguela	23 Aug- 18 Oct '97	Las Palmas 18-22 Aug '97	56	19	37
176	Return to Hole 735B	23 Oct-18 Dec '97	Cape Town 18-22 Oct '97	56	16	40

PCOM Meeting Agenda Notes

Tuesday, December 10th...8:30 AM

A. Welcome and Introduction (15 min.)

1. Introduction of PCOM Members, Liaisons and Guests
2. Logistics of the meeting (G. Mountain)
3. Approval of the Agenda

PCOM is asked to approve the agenda for the meeting.

4. Approval of the Minutes of August 1996 PCOM Meeting

PCOM is asked to put forward any corrections in addition to those passed to the JOIDES Office before this meeting, and then vote on approving the Minutes of the Townsville meeting, in the Agenda Book (section A). These contain all revisions received by the JOIDES Office before November 18, 1996.

B. Reports of Liaisons

1. NSF (B. Malfait-15 min.)
2. JOI (D. Falvey- 15 min.)
3. ODP-TAMU (T. Francis- 45 min.)
4. ODP-LDEO (D. Goldberg- 20 min.)

Coffee Break..10:20-10:40

C. Review of FY '97 Schedule

1. Update on Hammer Drill-In Casing/Other Issues (T. Francis-10 min.)

PCOM will receive a report on the status of the hammer drill-in casing and the likelihood of its readiness for testing in FY '97. In addition, issues related to scheduling of high latitidue drilling that might impact the FY '97 Schedule will be raised (see letter from T. Francis in section C of the Agenda book).

2. PCOM Discussion (25 min.)

PCOM will determine the allocation of any time that may be available in the FY '97 schedule. PCOM should bear in mind the ***PCOM Motion 96-1-9*** *which states :*
Any potential time that may be available on Leg 174B as a result of not being able to do engineering tests, be re-allocated on a 50-50 basis to Leg174A and LOI69 for the CORKing work, with the provision that if there are required port changes, it does not impact the science time on other Legs.
In addition, DMP has made the following Recommendation:
DMP recommends that PCOM move forward with the LOI 72 proposal for Leg 174B, to be used if hammer-drill is not available, contingent on favorable answers to questions of insurance, sufficient resistivity contrast, sonic reliability, and ability to start a hole and achieve a 4-5 day time frame. These types of LWD measurement will be needed within the near future of ODP. Although DMP has insufficient information to recommend these measurements for Leg 174B, there is probably time to answer the questions before the decision deadline.

D. FY '98 Science Program

1. Thematic Panel Chairs Presentation of Prospectus

Panel Chairs will each make a 30-minute presentation of their highly-ranked proposals with emphasis on how the objectives of each proposal address high priority *scientific goals of the ODP Long Range Plan. PCOM watchdogs should be ready to provide additional comments. The 1996 Global Rankings are illustrated in the Agenda Book, section D.*

OHP (T. Loutit- 30 min.)
SGPP (B. Hay- 30 min.)

Lunch..12:15-1:15

1. Thematic Panel Chairs Presentation of Prospectus (continued)
   TECP (A. Robertson- 30 min.)
   LITHP (J. Ludden- 30 min.)
2. Site Survey Considerations
   SSP (S. Srivastava- 30 min.)

Panel Chair will provide comments on the site survey readiness of the high-ranked proposals.

3. Logging Prospectus (D. Goldberg- 20 min.)

The Logging Prospectus can be found in section D of the Agenda Book.

Coffee Break..3: 05-3:25

4. Logistics and Budgetary Considerations
   Proposal Logistics/Budget Implications (T. Francis/J. Fox - 30 min.)

The FY'98 drilling schedule is likely to have a number of operationa and logistical constraints (for example, see letter from Tim Francis in section C of this Agenda Book). ODP-TAMU will present logistical considerations for each of the highly-ranked proposals. The budgetary implications of distant and/or high latitude operations will be presented by ODP-TAMU.

5. FY' 98 Science Program Discussion

PCOM will discuss the individual proposals and vote on the list of proposals to be included in the drilling program for FY'98. PCOM watchdogs (listed below) will be expected to stand ready to critically comment on the top-ranked proposals.

451 Tonga Forearc	*Julian Pearce*
431 W Pacific Seismic Network	*Paul Johnson*
457 Kerguelen	*Will Sager*
472 Izu-Mariana Mass Balance	*Jim Natland*
367 Cenozoic Carbonates	*Judy McKenzie*
464 Southern Ocean Paleoceanography	*Alan Mix*
441 S W Pacific Gateways	*Hermann Kudrass*
485 Southern Gateways	*Greg Mountain*
445 Nankai Trough	*Kevin Brown*
450 Taiwan	*Tom Shipley*
447 Woodlark	*Tom Shipley*
79 Somali Basin	*Jim Natland*
Antarctic DPG	*Hermann Kudrass, Greg Mountain, Alan Mix*
~~*509 DCS Engineering Test*~~	~~*Paul Johnson*~~
508 NERO/ION	*Catherine Mevel*

Adjourn..5:30

Wednesday, December11 th...8:30 AM

D. FY '98 Science Program (continued)

6. Final Discussion and Selection of Science Projects for Schedule

Coffee Break...10:00-1020

E. JOIDES Panel Reports and Action Items

PCOM members are expected to have read the minutes in this Agenda Book. Each Panel Chair should therefore focus on presenting their action items. A compilation of these, extracted from the panel minutes, can be found listed both by panel and by topic in this Agenda Book , section E.

1. Panel Chair Reports

PANCH (T. Loutit- 15 min.)

The minutes of the latest meeting can be found at the beginning of this Agenda Book, together with the Agenda for the 1996 PANCH Meeting.

SGPP (B. Hay- 15 min.)

The minutes of the latest meeting can be found in section E of this Agenda Book.

TECP (A. Robertson- 15 min.)

The minutes of the latest meeting can be found in section E of this Agenda Book.

LITHP (J. Ludden- 15 min.)

The minutes of the latest meeting can be found in section E of this Agenda Book.

OHP (T. Loutit- 15 min.)

The minutes of the latest meeting can be found in section E of this Agenda Book.

SSP (S. Srivastava- 15 min.)

The minutes of the latest meeting will be tabled.

DMP (R. Jarrard- 15 min.)

The minutes of the latest meeting can be found in section E of this Agenda Book.

SMP (J. Gieskes- 15 min.)

The minutes of the latest meeting will be tabled.

Lunch..12:20-1:30

E. JOIDES Panel Reports and Action Items (continued)

1. Panel Chair Reports (continues)

IHP (P. Fryer- 15 min.)

The minutes of the latest meeting can be found in section E of this Agenda Book

~~TEDCOM (A. Skinner- 15 min.)~~

The minutes of the latest meeting can be found in section E of this Agenda Book

PPSP (M. Ball- 15 min.)

The minutes of the latest meeting can be found in section E of this Agenda Book

2. PCOM Responses to Action Items (45 min.)

Prior to this item the PCOM Chair will, where possible, delegate drafting of responses to Panel recommendations for PCOM discussion based on the PCOM liaisons to panels.

Adjourn...*3:00*

TOUR OF THE BIOSPHERE 2... 3:00-5:00

Thursday, December 12th...8:30 AM

F. Leg Reports

PCOM will receive science reports on the two legs detailed below

1. Leg 168 (E. Davis- 30 min.)
2. Leg 169 (R. Zierenberg- 30 min.)

G. Ongoing Computer and Publication Projects

1. JANUS (K. Moran- 20 min.)

PCOM will receive a report on the status of the JANUS project, including an update on how the project is adhering to both the time-line and costs, and what resources will be required to complete the project.

2. Publications (D. Falvey- 10 min.)

This is a short report on the current status of the Publications project and the creation of a Publication Steering Committee.

3. PCOM Discussion (30 min.)

Coffee Break...*10:30-10:50*

H. JOI Workshops Reports

1. Curatorial Report (K. Moran- 15 min.)

This is a short report on the outcome of the Curatorial Workshop held at JOI on November 18-19.

2. Co-Chief Scientists' Workshop (D. Falvey- 15 min.)

This is a short report on the major recommendations resulting from the Co-Chief Scientists' Workshop helf at JOI on November 20-21.

I. Implementation of New JOIDES Advisory Structure

The latest version of the Science Advisory Structure is in this Agenda Book,section I.

1. EXCOM Outstanding Issues

Presentation of Issues (S. Humphris- 10 min.)

EXCOM Motion:
"EXCOM advises JOI to adopt in outline the attached revised JOIDES Advisory Structure with immediate effect, subject to determination of the following specified aspects which will be the subject of further EXCOM advice following its February 1997 meeting:
- Operations Committee membership (PCOM should reconsider whether ad hoc membership is appropriate, and bring advice and rationale to EXCOM);
- Scientific Measurements Panel mandate and membership (PCOM has a mechanism in place for resolving this; it should address the question whether Publications should be within the mandate of SMP);
- Working Groups (whether WGs are needed; or could be set up as ad hoc committees if needed by SCICOM under normal rules of committee; or could be established as DPGs).

Until these matters are resolved, responsibilities allocated to these entities should continue to be carried out by the current JOI/JOIDES mode of operation (e.g.

service panels). The purpose of this advice is to permit JOIDES to establish its Science Committee and SSEPs, and to call for the nomination of persons to serve as members on those committees/panels in order that the 1997 planning cycle can proceed in timely fashion. The advice is also to maintain or create PPGs, DPS, and TEDCOM for the further development of the longer term program.

Nominations for membership of the new committees and panels should be sought ab initio. It is open to any JOIDES member to nominate their current PCOM member to serve on SCICOM for a period equal to the unexpired period of their service on PCOM."

PCOM Discussion (10 min.)

2. Scientific Measurements Panel

PCOM Motion 96-2-3: PCOM recommends to EXCOM the proposed new advisory structure with wording modified from the version of July 24, 1996 (attached). Under JOIDES Service Panels, the mandate for the new Scientific Measurements Panel will be refined by a sub-committee formed of the present chairs of IHP, DMP, and SMP, plus the following PCOM members: Brown (SMP liaison), Moore (DMP liaison), Suyehiro (Japan), Humphris (PCOM chair-elect) and Sager (IHP liaison and chair of sub-committee). This group shall meet at College Station in November 1996. Any revisions to the mandate will be approved by PCOM through e-mail review.

PCOM will discuss and recommend to EXCOM a plan for the structure, membership, and mandate of the new Scientific Measurement Panel that will ensure the continuation of expert advice on issues related to shipboard and downhole measurements, information handling and publications.

Report from Subcommitee (W. Sager-15 min.)

PCOM Discussion (15 min.)

Lunch...12:10-1:10

3. Mail Reviews

PCOM needs to determine selection criteria to assess which proposals are ready to be sent out for external mail reviews well as recommending review procedures

Report from Subcommitee (J. Natland -15 min.)

PCOM Discussion (15 min.)

4. Meeting and Proposal Schedule

PCOM Motion 96-2-5: PCOM recommends that EXCOM approve the attached implementation timetable for the new JOIDES advisory structure, modified slightly from the version of July 24, 1996. The principal revision is that an interim joint SSEP, comprised of two members each from the current thematic panels, shall meet in January, 1997 to initiate proposal mail review.

PCOM Motion 96-2-6: PCOM directs each thematic panel to recommend four of its members to serve on an interim Scientific Steering and Evaluation Committee to meet once, in January, 1997. The panel is to specify which of the proposals received and current as of January 1, 1997, should be sent out for mail reviews, based on guidelines which PCOM will establish at its meeting in December, 1996. The reviews need to be completed in time for the initial meeting of the new Interior and Environment SSEPs in May 1997.

Proposal Annual Cycle (S. Humphris- 15 min.)

PCOM will review a slightly revised version of the meeting and proposal schedule. See section I in this Agenda Book.

PCOM Discussion (15 min.)

5. Procedures for Nominations to SCICOM and SSEPS (30 MIN.)

PCOM will receive information on how the national committees in each member country is handling the selection of members for SCICOM and SSEPs. Appropriate PCOM members from each member country should stand ready to provide this information.

6. Creation of PPGs (S. Humphris- 20 min.)

PCOM will consider what PPGs and/or DPGs need to be created at this meeting in order to begin the planning process for Phase III. PCOM will limit its deliberations to those PPGs and/or DPGs needed to initiate planning for drilling in the 1999-2000 time frame.

Coffee Break..........3:00-3:20

J. FY '98 Schedule Revisited

1. The FY '98 Schedule

Proposed Legs (T. Francis- 15 min.)

T. Francis will present the drilling schedule for FY'98 , discussing the logistical and budgetary implications

PCOM discussion and Final Approval (20 min.)

PCOM will vote on the final drilling schedule for FY'98.

2. Co-Chief Scientist Nominations (30 min.)

These will be tabled at the meeting

K. FY '98 ODP Budget

1. FY '98 ODP Program Budget (D. Falvey- 20 min.)

PCOM will receive a report on the proposed FY '98 Program Budget that will include the costs associated with the approved FY '98 Drilling Schedule.

2. PCOM Discussion and Prioritization of Budget Items (45 min.)

PCOM will prioritize items in the ODP X-base budget.

Adjourn..........5:30

Friday, December 13th..........8:30 AM

L. 5-yr Program Plan

The text of the draft of the science plan is in the Agenda Book, section L.

1. Status of Science Program Plan (S. Humphris- 10 min.)
2. PCOM Discussion (30 min.)

M. Status of the Japanese OD-21 Program

1. International Workshop on Riser Technology (S. Takagawa- 15 min.)
2. CONCORD (K. Suyehiro- 15 min.)
3. PCOM Discussion (20 min.)

Coffee Break..........10:00-10:30

N. Rock Drilling

1. Over-the-side rock drills (P. Johnson- 15 min)

PCOM will receive a report describing the drills and their present status

2. PCOM Discussion

PCOM will discuss whether or not there should be any relationship with ODP.

O. PCOM Correspondence

See section O in this agenda book for letter from K. Miller, regarding onshore drilling on the New Jersey Coastal Plain, and letter from H. Dick, regarding the effort to secure a VSP program and scientists for Leg 176.

1. Response to K. Miller (10 min.)
2. Response to Henry Dick (10 min.)

P. New Business

1. Future Meetings of SCICOM and OPCOM (20 min.)
2. Other Business

Q. Review of Motions and Action Items (20 min.)

Meeting Adjourn.. ....12:00

DRAFT PCOM MINUTES

TOWNSVILLE, AUSTRALIA

AUGUST 19 - 22 1996

PCOM AUGUST 1996 - PARTICIPANT LIST

Planning Committee - PCOM

K Brown	University of California, San Diego, Scripps Institution of Oceanography
R M Carter	James Cook University, Australia, Australia- Canada Consortium
S Humphris	Woods Hole Oceanographic Institution
H P Johnson	School of Ocean Sciences, University of Washington
H Kudrass	Bundesanstalt für Geowissenschaften und Rohstoffe, Germany
R Larson	University of Rhode Island, Graduate School of Oceanography
J McKenzie	ETH, Zurich, ESF Consortium
C Mével	Laboratoire de Pétrologie, Université Pierre et Marie Curie, Paris
A Mix	Oregon State University, College of Oceanography
G Moore	University of Hawaii, School of Ocean and Earth Science and Technology
G Mountain	Columbia University, Lamont-Doherty Earth Observatory
J Natland	University of Miami, Rosenstiel School of Marine and Atmospheric Sciences
J Pearce (Chairman)	University of Durham, United Kingdom
W W Sager	Texas A&M University, College of Geosciences
T Shipley	University of Texas at Austin, Institute for Geophysics
K Suyehiro	Ocean Research Institute, Japan

Liaisons

D Falvey	Joint Oceanographic Institutions, Inc.
T Francis	Science Operator (ODP-TAMU)
D Goldberg	Wireline Logging Services (ODP-LDEO)
B Malfait	National Science Foundation

Guests and Observers

P Barrett	Victoria University of Wellington, New Zealand
A Dziewonski	Harvard University
G Eberli	Co-Chief Scientist Leg 166, University of Miami
M Lyle	Co-Chief Scientist Leg 167, Boise State University
K Fujioka	JAMSTEC
M Mutti	ETH Zurich
T Tanaka	JAMSTEC

JOIDES Office

K Ellins	Executive Assistant and US Liaison
C Jacobs	Executive Assistant and Science Co-ordinator

JOIDES Planning Committee, August 1996 Motions

PCOM Consensus 96-2-1

PCOM approves the agenda for the meeting.

Unanimous (1 Absent)

PCOM Motion 96-2-2

Subject to the changes outlined above, PCOM approves the minutes of the last meeting at Aix-en-Provence as a true record.

Unanimous (1 Absent)

PCOM Motion 96-2-3

PCOM recommends to EXCOM the proposed new advisory structure with wording modified from the version of July 24, 1996 (attached). Under JOIDES Service Panels, the mandate for the new Scientific Measurements Panel will be refined by a sub-committee formed of the present chairs of IHP, DMP, and SMP, plus the following PCOM members: Brown (SMP liaison), Moore (DMP liaison), Suyehiro (Japan), Humphris (PCOM chair-elect) and Sager (IHP liaison and chair of sub-committee). This group shall meet at College Station in November 1996. Any revisions to the mandate will be approved by PCOM through e-mail review.

Proposed: Natland, Seconded: Brown — *16 For, 0 Against*

PCOM Motion 96-2-4

PCOM requests that EXCOM approve the proposed new JOIDES advisory structure before the December PCOM meeting.

Proposed: Natland, Seconded: Larson — *14 For, 2 Absent*

PCOM Motion 96-2-5

PCOM recommends that EXCOM approve the attached implementation timetable for the new JOIDES advisory structure, modified slightly from the version of July 24, 1996. The principal revision is that an interim joint SSEP, comprised of two members each from the current thematic panels, shall meet in January, 1997 to initiate proposal mail review.

Proposed: Natland, Seconded: Moore — *14 For, 2 Absent*

PCOM Motion 96-2-6

PCOM directs each thematic panel to recommend four of its members to serve on an interim Scientific Steering and Evaluation Committee to meet once, in January, 1997. The panel is to specify which of the proposals received and current as of January 1, 1997, should be sent out for mail reviews, based on guidelines which PCOM will establish at its meeting in December, 1996. The reviews need to be completed in time for the initial meeting of the new Interior and Environment SSEPs in May 1997.

Proposed: Natland, Seconded: Sager — *16 For, 0 Against*

PCOM Consensus 96-2-7

PCOM expresses its enthusiasm for industrial company consortium plans to design and build a deep "riserless" drilling system that could provide pressure control and return flow for a deep hole drilled below at least 4 km water depth. PCOM asks JOI to continue to seek ways and means by which ODP interests could join at least the feasibility phase of this consortium, so that we might consider incorporating such a system into future ODP drilling plans.

PCOM Motion 96-2-8

The contents of the FY98 Prospectus and initial long-term Planning Prospectus to be considered for Thematic Panel ranking shall include the following proposals and programs:

79 Somali Basin

431 W Pacific Seismic Network

445 Nankai Trough

450 Taiwan Arc

457 Kerguelen LIP

472 Izu-Mariana

367 GAB Cenozoic Carbonates

441 SW Pacific Gateway

447 Woodlark Basin

451 Tonga Forearc

464 Southern Ocean Paleoceanography

485 Australia-Antarctic Southern Gateway

Antarctic DPG 1, 2, 3

Additional programs may be considered by the panels at their discretion. A DCS/LWD Engineering Leg is also to be considered by PCOM for scheduling. The panels and TEDCOM are asked to comment on this proposal, which is included for information in the prospectus.

Proposed: Natland, Seconded: Sager *12 For, 0 Against, 4 Abstentions*

PCOM Motion 96-2-9

PCOM reaffirms its intent in PCOM motion 96-1-13 to continue for the immediate future to publish the basic information of ODP in both text (hard copy) and electronic formats in order to archive and display this information in the most certain and visible manners available to us at present. However, PCOM also agrees with the general philosophy that publication technology is moving towards universally compatible electronic formats.

Publication of the basic information in this format in an *Initial Reports* volume will consist of the site summaries, operations reports, site chapters, one scientific overview authored by the co-chiefs, and a guide to electronic usage. Other items specified in 96-1-13 for electronic publication, section 3 B (e.g. core descriptions, VCDs, etc.) will remain in electronic-only format and will be published 12 to 18 months post-cruise.

PCOM acknowledges the need for additional cost savings over the original form of motion 96-1-13 and therefore propose that the *Scientific Results* volume consisting of scientific papers, texts of data reports, and abstracts of papers published outside of ODP, be published in electronic format only, starting with Leg 169.

Electronic publication of the *Scientific Results* volume should be 48 months post-cruise. The publication of the *Initial Reports* volume, 12 to 18 months post-cruise, in text form will alleviate the need for an initial core description volume as described in 96-1-13, section 5, and this will achieve further cost savings.

ODP must continue to re-evaluate its publication options as technology and scientific community attitudes evolve, but should continue to publish the *Initial Reports* volume in both text and electronic formats for the immediate future. The issue of moving to electronic-only publication of the *Initial Reports* volumes should be continuously reviewed by the JOI Publications Steering Committee and SCICOM.

Proposed: Larson, Seconded: McKenzie *8 For, 1 Against, 7 Abstentions*

PCOM Motion by Acclamation

PCOM expresses its thanks to Bob Carter, Susan Cook and Rachel Grieve for hosting PCOM in Townsville and the field trips in Cairns. The Townsville venue was comfortable and efficient for the conduct of the meeting. The field trip before and during the meeting allowed us intimate familiarity with things uniquely Australian, ranging from the Great Barrier Reef to Koala bears.

We return home across the equator with fond memories of friendly Australians, and in our best Australian accents, say "good bye" and "good on yer, mates".

PCOM Motion by Acclamation

PCOM thanks Henry Dick for his years of service on PCOM, and especially notes his contributions to long-term planning, his efforts to refine ODP publications, and his attempts to convince us that the answer to all important scientific problems is "735B". We wish him luck on upcoming Leg 176 and anticipate his continued contributions to ODP in the future.

PCOM Motion by Acclamation

PCOM, on behalf of the JOIDES Office and the entire ODP community, thanks Julian Pearce for stepping in as interim PCOM Chair, handling a difficult transition at a time of unprecedented change with skill and grace. We wish him luck, and grant him a return to normal. We look forward to his future contributions to ODP.

PCOM Motion by Acclamation

PCOM thanks Kathy Ellins, Colin Jacobs, and Julie Harris of the JOIDES office for their service to the JOIDES community over the past two years. The skill with which they have carried out their responsibilities under Rob Kidd for the first time from a base outside the US and variously under trying, complicated, and even tragic circumstances cannot be understated. Rob always praised the insight and intuition of his staff, and we can only add to that our appreciation of their devotion to him and the JOIDES Planning process and their consistent helpfulness and hard work during all the meetings and in between. Sadly, we cannot direct this appreciation to Rob in person, but we can note that during the past two years, the cause of scientific ocean drilling has been greatly advanced, and its future more nearly secured, under his skilful leadership. To those ends, the staff of the JOIDES Office has contributed immeasurably. To Kathy, Colin, and Julie, our sincere thanks. Godspeed and all the best in the years ahead.

Monday 19th August 1996 **10:00 am**

A. WELCOME AND INTRODUCTION

1) INTRODUCTION OF PCOM MEMBERS, LIAISONS, AND GUESTS.

Pearce welcomed all attendees to the meeting. Suyehiro had sent apologies and would be joining the meeting on Tuesday 20th.

Pearce was chairing the meeting following the death of Rob Kidd. Jim Natland will give a tribute to Rob Kidd and Tim Francis will giving a tribute to Lou Garrison.

Natland presented the tribute to Rob Kidd, showing some slides of Rob and past colleagues.

Tribute to Rob Kidd

James H Natland

On June 9th, or a day or so later, we were each reminded of the contingency of life. We are all used to vaulting across continents and oceans to deal with "Long-Range Plans" and "Implementation Strategies", preparing for a future that each of us expects to see. But the truth is, we are but bubbles, and life can end, as bubbles burst, in an instant.

Our friend Rob Kidd, the friend of each one of us, knew this well. I want to give you a few impressions of how I think he dealt with it.

The first impression, one we all saw, was the presence of his family in his travels to our meetings. He made light of this, calling them his "minders". They made sure he got his rest and took his pills. But what was really going on was that he delighted in their company, and he knew that if his time might be limited, that time needed to be shared with them, no matter how busy he was, or how far he travelled. So they came, to Makuhari, to La Jolla, and the last time I saw Rob, in May, to Woods Hole. With him then was his son Tomos, and we happened to meet at the bus terminal in Boston after they had spent the day sightseeing. Although we talked - for almost two hours on the bus - about the workshop we were going to attend, and the reaction to all the doings at the meeting in Aix - Rob also wanted to know what might be possible for him to do with Tomos - to go to Nantucket, to see Plymouth Plantation - while they were together in this place. Rob loved his family, and they were "one".

My next impression is from the meeting in La Jolla. Rob spent a post-doctoral appointment at the Deep Sea Drilling Project in 1972, and participated on Leg 23 in the Indian Ocean. He and I were old DSDP hands - we never quite sorted out which was the older - and at each of our meetings we usually found some time to reminisce about those days. He once recalled to me being in a group with the staff scientists being called together by Terry Edgar, then chief scientist. They gathered in a restaurant in La Jolla Shores called Rhinelander. This is now the upscale Italian restaurant where many of us dined, in walking distance from Sea Lodge, where we had our December meeting. At the meeting then, Terry Edgar asked the group to help him decide where precisely Glomar Challenger, then at sea, should drill next. Amid steins of beer, profiler records were rolled out on the small tables, and sites or alternate sites selected, which information then would be 'telexed' to the ship the following day. Rob never ceased to be amazed that so major a Program could be managed so successfully in such a way, and that he, a post-doc, should ever have been consulted about those sorts of decisions.

As I mentioned, Rob participated on Leg 23 in the Indian Ocean. At the end of our meeting in December, he and Rosalie asked me to tag along for a dinner party organized by some people from DSDP, and from Leg 23, whom we both knew. Some of them I hadn't seen in years. Rob and Rosalie obviously made a point of keeping up with these very old friends even as they moved in very different directions. When someone at the party asked what brought him to La Jolla, he almost sheepishly admitted to being chair of the PCOM, a confession which I'd say elicited something between amusement and mock horror in his audience. In any case, Rob had a very genuine touch with everyone he knew; he was able to slip into the terms of old friendships in a totally fresh spirit, as if the time apart had been only days or weeks rather than years. On this evening, he divested himself completely of all the activity of our meeting over five intense days, and simply immersed himself in the pleasure of seeing old friends. The ability to do that speaks eloquently of the priorities, and the worth, of this gentle man.

My final impression of Rob for these remarks is of the special meeting we had in Cardiff to deal with resuscitating the Long-Range Plan. This is a scientific impression, but it also bears on the qualities of leadership which now seem to be of at least some theoretical concern in this Program. Trying to pull together a polyglot document like the Long-Range Plan, which deals with so many aspects of our science, is not a job to be managed by a specialist. We all knew that the language of the document had to be at some not-simplistic, but still very straightforward level that more than just an inside group could understand. But since we were all scientists, it still had to be precise. So virtually each and every science issue had to be discussed and honed to the point where we as a group, at least, could agree that the basic ideas were understandable. For what it's worth, in my opinion, the group that met at Cardiff was very good at doing this. With no obvious fanfare at the Makuhari meeting just a month earlier, Rob pulled together the group of people he wanted for this meeting in Cardiff. Some topics, of course, could only be dealt with by one or two of us. But in watching Rob lead this exercise, it gradually began to dawn on me that his scientific breadth was really quite extraordinary. Over a broad range of sedimentological, paleoceanographic, environmental and even lithospheric concerns, he was extremely knowledgeable.

A couple of weeks ago I took a look at Rob's publications using GEOREF. He was all over the sedimentological map - Indian Ocean, Mediterranean, North Atlantic margins, sediment drifts, even ice rafting. He wrote papers which emphasised regional tectonic processes, and papers on volcanogenic sedimentation. He bragged about papers he wrote concerning a hole in the ocean crust called King's Trough, partly explored during DSDP Leg 94, in which Rob served, with Bill Ruddiman, as co-chief. He dedicated a chunk of his career to developing and promoting near-bottom, high resolution survey equipment for sea floor study. I thus think that as a scientist, he was extremely well placed to take a strong leadership role in scientific ocean drilling, and it certainly helped him to be a major balancing factor in the development of our Long-Range Plan.

Rob was at the task of selling this type of science for a long time, longer by far than his tenure as PCOM chair. From that experience, he knew how to phrase things. He also clearly understood that by letting us all thrash things out, he would achieve something akin to a PCOM consensus, and thus he would be assured of our support for the contents of the document when he and others would have to sell it to anyone else. From where we started a few months earlier, I'm not sure any of us would have agreed that a consensus was possible. Rob knew that it was essential. Rob tried to summon up the best in all of us. I <u>know</u> that he was very pleased with, and proud of, the way we *finally* pulled together on this.

At this point I'd like to acknowledge those who worked closely with Rob in the JOIDES Office. The last two years have in some respects been the most extraordinary in the history of the institution - the first time outside the U.S., big changes in the wind, and all that has happened. If in the end the way we measure someone is in nothing more than the intensity of the devotion of his staff, marked in this instance only in part by their dedication of long hours to learn, and learn well, while doing, then Rob Kidd was truly exceptional in both his ability to select young collaborators, and to inspire them. This is the last meeting for Colin and Kathy, and for Julie back in Cardiff. I doubt they will ever have an employment experience quite like this ever again. But they have helped Rob in more ways than any of us can know, and thus they helped us. We owe them, in Rob's memory, joyous thanks and praise.

In conclusion, and sadly we must conclude, I remember our friend Rob as a <u>complete</u> man, who carried forward his life and its various enterprises - including this one - with grace and balance, and an even-handed, good-humoured <u>optimism</u>, that paid no attention to the occasional fatalism that he must have felt as a consequence of the vicissitudes of his own health. That optimism comes through in the words he asked to have read at what his family called the "celebration of his life", last June in Wales. These are presented in the frontispiece to our agenda book. Kathy suggested that it is better to hear them read, than to read them, so I shall now do this.

What is dying?

A ship sails and I stand watching till she fades on the horizon and someone at my side says, "She is gone." Gone where? Gone from my sight, that is all; she is just as large as when I saw her. The diminished size, and total loss of sight is in me, not in her, and just at the moment when someone at my side says "She is gone," there are others who are watching her coming, and other voices take up a glad shout, "There she comes!" and that is dying.

Bishop Brent.

Let's take a moment to collect our thoughts, and remember our friend Rob, before we get on with the task at hand.

Francis presented a tribute to Lou Garrison. Lou was the only the fourth person recruited to ODP, in August 1983, and worked for ODP for 7 years. He did a great job working for the Program and invited some around this table to be co-chiefs in the 1980's. He worked with USGS before ODP and had a long association with marine geology and ocean drilling. His main contribution to scientific ocean drilling before ODP was in the foundation of the Pollution Prevention and Safety Panel, and he served for many years as the chair of that panel. The foresight he showed in setting up such a panel was one reason why he was asked to serve the ODP.

2) LOGISTICS OF THE MEETING.

Pearce thanked Carter for the field trip prior to the meeting and asked him to outline the logistics of the meeting.

3) APPROVAL OF THE AGENDA.

Pearce asked PCOM for any comments.

PCOM Consensus 96-2-1

PCOM approves the agenda for the meeting.

Unanimous (1 Absent)

4) APPROVAL OF THE MINUTES OF THE APRIL 1996 PCOM MEETING, AIX-EN-PROVENCE.

Pearce asked for comments and amendments. Sager referred to p.29, "core-tensor stress measurements" and asked for clarification. It should read "tensile stress measurements". Francis, p.25 said that "Columbia" should be changed to "Venezuela", and the word "cores" should be deleted and "coring assemblies" inserted, also that "7 days drilling would cost $7M", should be "60 days/7 sites would cost $7M, and 31 days/4 sites would be about $4M". On p.40, remove the "$1M" figure from station keeping, and the figure for "Power management and living quarters /lab stacks" should be $900K. Sager would pass other minor changes to the JOIDES Office.

PCOM Motion 96-2-2

Subject to the changes outlined above, PCOM approves the minutes of the last meeting at Aix-en-Provence as a true record.

Unanimous (1 Absent)

Pearce then outlined the structure of the meeting (the main business of each day) for the benefit of observers.

B. REPORTS OF LIAISONS

1) NSF

Malfait reported. The ODP Council has interjected a new step in the planning process in that it wants to see further definition of the long-term plans of the Program in February 1997, based on the following items: a) a final JOIDES Science Management Plan; ii) a 5-year science implementation plan, through 2003, that addresses the Program's focus and priorities and a first order articulation of how the goals in the LRP will be addressed; c) 5-year budget plans including science implementation at different budget levels, with the maximum being that identified in the LRP, and the impacts of lower budget levels; d) the EXCOM/JOI resource strategy will need to identify the source of resources to support the budget plans and the actions and approaches the Program has to achieve the budget plans. There is also a requirement to rapidly communicate these plans to member science committees.

In terms of the change to the timeline diagram (Appendix 1), the international partners have been formally invited to continue membership through 2003, with final decisions required by the June 1997 ODP Council meeting.

NSF has requested a 5-year Program Plan from JOI containing the following elements: a) it will run from 1998-2002; b) it will be reviewed as the basis for funding authority; c) the base program should assume level funding through 1998; d) it should assume a modest yearly increase to the base budget for the period 1999-2002; e) there will be a supplement above the base budget for 1998/1999 for the mid-life refit of *JOIDES Resolution*; f) this plan should be consistent with the science implementation plan; g) the report should be presented to NSF in March/April 1997.

Other details of NSF activities and information were that : a) US Department of State is currently considering a membership MOU for the terms of Chinese membership; b) the 1997 Program Plan has been received from JOI and is in good order; c) Antarctic planning has some implications for long lead time planning, and there are a number of environmental issues that NSF have to be sensitive to in terms of ODP activities; d) the FY97 NSF budget is still not finalised; e) Sandy Shor has left the ODP Program.

2) JOI

Falvey reviewed the X-base budget following the Aix-en-Provence meeting. ODP-LDEO has identified extra funds that could be used for the LEG 171B GHMT shortfall that was apparent at that time.

The Korean Institute of Geology, Mining and Materials (KIGAM) has now joined the Aus-Can consortia (at a level of 1/12 for the first year). Other member issues were: Taiwan - the situation still remains ill defined; China - A delegation from the State Science and Technology Commission visited Washington DC in April, and discussions with JOI and NSF on joining the Program as an Associate Member at a level of 1/6 partner are ongoing (see NSF report above).

The JANUS status is summarised as follows:

	User Group	Data Model Concepts	Data Model Definition	Software Dev't	Onboard/Lab Testing
Operations	1	complete	complete	complete	complete
Core Data	1	complete	complete	complete	complete
Sample & Curation	1	complete	complete	complete	complete
Paleontology	2b	complete	complete	complete	
MST & Logging	2a	complete	complete		
Paleomagnetics	2a	complete			
Physical Properties	3	complete	complete		
Chemistry	4a	complete	complete		
Core Description	4b	complete			
Hard Rock	5	complete			
Underway	6				

In terms of RFP's, the basic Wireline Logging Services RFP is now ready to go to NSF, following EXCOM's request for a change in the wording to maximise innovation. The SSDB RFP will have no major changes in the technical scope of work, but the RFP will encourage innovative use of electronic data storage and access. The JOIDES Office RFP for October 1998 to September 2000, at a non-US location, will be issued after the February 1997 EXCOM and responses will be accepted from each non-US JOIDES member. An assessment panel consisting of up to 5 non-conflicted EXCOM members will be appointed by JOI, and the following selection criteria will be used: a) scientific leadership and management qualities of the proposed PCOM chair; b) infrastructure available at the proposed host institution; c) estimated cost of operating the office at the proposed location; d) independent support, if any, that may be offered by the relevant National Committee or funding agency. The issuing of the RFP will have to wait until the new JOIDES advisory structure is in place.

JOI will manage a Co-Chief Scientists review on 20-22 November 1996, and a review of curation policy, adjacent to the Co-Chiefs review. This second ad hoc advisory group will consist of some IHP members, ODP-TAMU staff and recent ODP participants. The primary objective is to explore how ODP can more effectively maximise the scientific return from ODP materials while maintaining the high quality of core curation and repository activities. Discussion will focus upon: a) general policy of sample and data distribution; b) dedicated holes and composite depth sections; c) "re-curation"; d) curatorial practices vis-a-vis 1996 LRP; e) capacity of core repositories; f) integration of samples from other drilling platforms; g) sampling/curation and new publication policy; and h) sampling/curation and JANUS database management. The group's recommendations will be put to SCICOM/PCOM before implementation.

JOI has appointed Pamela Baker-Masson as Director of Public Affairs and is currently re-defining a public communications strategy. Short term objectives include: Interacting with Program participants to identify available resources and conduct assessment of public affairs priorities;

establish a communication system linking all member country public affairs individuals/offices; update and prepare ODP public information materials for international audiences and review US public information materials; develop story ideas and target US and international media; use port-call events to target public figures and funding entities; develop Program-wide draft of media crisis communication plan.

Options for the Joint Management of ODP and OD21 in Phase IV have the following basic assumptions and criteria:

(a) Basic Assumption

The Long Range Plan (1996) identifies scientific ocean drilling problems that require two drilling platforms beyond 2003:

1. A *JOIDES Resolution*-type vessel, *without* a riser system - for relatively *shallow* drilling (mainly "Dynamics of Earth's Environment")
2. A vessel of the type described in the OD-21 initiative, *with* a riser system - for *deep* drilling (mainly "Dynamics of Earth's Interior")

(b) Basic Criteria

The management and organisation of ODP and OD-21 beyond 2003 should satisfy the following criteria:

1. ODP (Phase IV) and OD-21 should have integrated management, science co-ordination and science advisory functions
2. The drilling platform provided to the international ocean drilling community by the United States should be an identifiably US facility
3. The drilling platform provided to the international ocean drilling community by Japan should be an identifiably Japanese facility

Integrated ODP-OD21 management hinges on a single JOIDES Advisory and Program Management structure (Appendix 2). This model has been accepted by JAMSTEC in principle, subject to a detailed paper being produced.

Natland asked about the co-chief scientist review. Falvey replied that it was brought up by PEC IV. It was more appropriate to be managed by JOI rather than ODP-TAMU as it involved all the elements of the Program (WLS, JOIDES) and not just Science Operations.

Coffee .... *10:55 - 11:15*

3) ODP-TAMU

Francis reported. Leg 167: off-loaded 1500 m of core during the leg in San Diego (total 7501 m of core was recovered). The San Francisco port-call had a lot of PR activities associated with it, and the new 2G magnetometer was installed on the ship. Leg 168: 4 re-entry sites had just ended, an ambitious project during which all objectives were achieved. Some additional sites were drilled at the end of the Leg as time was available. CORK sites were established at Sites 1026 and 1027, though there were some problems with cementing the casing at Site 1027. There are a lot of public relations activities at the Victoria port-call, which have been organised by the Canadians. The Saanich Inlet drilling will begin today, the *JOIDES Resolution* will be accompanied by a Canadian Coast Guard vessel to keep the public away. There will be journalists, and a film crew will be aboard for part of the Leg. Negotiations with ODL have included an amendment to the contract to allow the drilling in both Saanich Inlet and on Leg 174A. This amendment requires ODP-TAMU to acquire extra insurance for the vessel (50 days of coverage). Shallow water guidelines have been revised (see last December meeting notes) and additional training for stuck pipe procedures will be undertaken by the crew.

The schedule was changed in May (see agenda book) with Leg 171 being split into two legs rather than three, and Leg 174A has been given an extra four days at sea.

Project management training has begun, and three categories of project have been determined for drilling legs, a) development of operational parameters and costs of legs BEFORE scheduling, b) one per scheduled leg, from scheduling to completion of operations, c) Leg publications. Leg 176 will be the first "b" project undertaken.

The ODP-TAMU schedules for its project types were outlined (Appendix 3). Project "a" has been started and will be applicable for this meeting. Project management is giving ODP-TAMU a better idea of where its money is going and what the actual costs of individual elements of the Program really are.

Engineering and Drilling Operations at ODP-TAMU has a new manager and new name; it is now called the Drilling Services Department. Two key members of the engineering department have left ODP-TAMU (Reudelhuber and Stahl).

Publications in the outside literature at >1 year post-cruise has been allowed beginning with Leg 160. The *Scientific Results* publication date has been moved to 4 years post-cruise in a transition period through Legs 161-163. A market analysis of electronic publications is being carried out to determine the hardware/software available in the community, feedback on the use of CD-ROMs, and with the use of electronic publication, what will users want to print out? Leg 169 staff are affected by publications uncertainties, and a definitive decision on publications is urgently needed. The uncertainties over publications are leading to a very large staff turnover in the publications department (almost 50% in the past year). The coring time estimator is now available on the WWW, the URL address is http://www-odp.tamu.edu/eng/drillest.html

There have been announcements of the building of two new deep water drillships - Discoverer Enterprise and Glomar Explorer. This may put pressure of ODP-TAMU's ability to hold onto and attract engineers. The SEDCO/BP 471 will be officially renamed the *JOIDES Resolution* during Leg 170.

A request for an ODP-TAMU engineer to go on an Arctic leg was declined as the Science Operator did not have the manpower, a decision which was made before the loss of the two engineers announced above. The NAD, who made the request, were unhappy that the engineer couldn't go especially after the PCOM resolutions from August 1995.

Moving to proposals, the E Asian Monsoon has 6 sites in the South China Sea, with 4 sites in Chinese waters and 2 others, but there are no international agreements to territorial claims in that region. The US State Department suggested seeking clearance from all parties, but indicated that it believed permission would not be granted. ODP-TAMU have contacted CCOP on this matter and that organisation do not want to be involved. ODP-TAMU believes that this is not a viable drilling leg to appear in any long range schedule.

Falvey said that PCOM are asked, at this meeting, to be a little more rigorous about the contents of the FY98 Prospectus as JOI have to meet NSF's schedule for the 5-year plan. This means making a shorter prospectus, actually as short as possible, but it will be possible for PCOM to refine this in December. Larson said that in effect that would pre-empt the thematic panel discussion in the fall. Francis said that ODP-TAMU have been asked to provide a budget in October this year for FY98 drilling. Sager commented that ODP-TAMU have provided a model for a standard leg, and that PCOM could use this to identify non-standard legs. Francis said that ODP-TAMU have done this in a preliminary fashion already.

4) ODP-LDEO

Goldberg reported on recent logging results. Leg 167: 7 holes logged using the triple combo suite with IPL, FMS and GHMT. Results were exceptional, and data was transmitted to and from the ship via satellite allowing the scientists to leave the vessel with processed data. The CLIP "Splicer" module was used extensively and the output was successfully integrated into the JANUS database. The "Sagan" module was installed and tested. Leg 168: had one hole logged using the triple combo IPL, FMS and GEOCHEM tools, the SLIP "seismic" module was installed and tested, and a Downhole Measurements laboratory upgrade was completed in port.

Examples of data from Site 1014 (gamma and resistivity data) were reviewed, along with the results of processing of the FMS dynamically normalized conductivity which illustrated that a resolution of sub-orbital scales is now achievable (Appendices 4 and 5).

Magnetic susceptibility, density and natural gamma logs at Site 1020 show that the downhole resolution is now approaching that of shipboard measurements (Appendix 6).

Upcoming logging operations. Leg 169: standard tool sand Becker T-tool (hi-T) scheduled, Lamont/French T-tools (hi-T) deployed. Leg 170: LWD standard tools planned for 3 holes, triple combo with IPL, and FMS scheduled for 1-2 holes, shear sonic tool (LDEO) deployed for 1-2 holes. Leg 171A: LWD standard tools planed for 4 holes, standard sonic log scheduled for 1 hole, replacement of Wireline Heave Compensator pump. Leg 171B: triple combo with IPL, FMS/sonic, and GHMT scheduled. Logging planned in 4 holes. Replacement of Wireline Heave Compensator pump (continued).

Log database. Data model for raw geophysical and geochemical log data completed; model for processed data under development by Tracor and BRG. Database WWW page; log data catalogue on-line with geographical search by tool and Leg capabilities; data plotting tool available in September. Historic log data migration project initiated and on schedule (Appendix 7).

The Leg 174B GHMT funding has now been found due to non-deployment on a previous leg.

C. PCOM LIAISON REPORTS

1) EXCOM

Mix reported. Thanks were expressed to the recent and future co-chiefs and JOIDES Office for all assistance in preparation for his presentation. Three major issues were raised at EXCOM and the joint EXCOM-ODP Council session: a) the JOIDES advisory structure re-organisation plan, b) the FY97 schedule presentation (with much praise from EXCOM for the X-base budgeting system), c) presentation to ODP Council of the previous year Program accomplishments.

ODP Council presentation and joint session comments. Mix presented a 20 minute talk on the last 6 legs of drilling. This was the first time that a scientist had presented the results to ODP Council. It was a very important innovation as the Council members never before had a real sense of what they actually paid for. Council members were filled with questions and were very excited both during and after the presentation. The talk was presented in terms of the LRP, how ODP is re-orienting its science into the themes of the LRP, and how each leg fits into a long-term strategy. It is the only forum where the whole of the Program is explained and why it has to be done as an international partnership. Concerns expressed included whether ODP was becoming more efficient. Falvey, for JOI, gave the response in terms of dollars, and Mix gave a response in terms of science. Another concern was whether there is a significant level of innovation and new technology, and third, if the products were being used by the outside community. Finally, ODP Council asked how accountable the Program will be to the LRP. Council were concerned that the "BEST SCIENCE" was linked to the LRP. The 5-year plan requested by Council should be viewed as an opportunity to send the message that the Program has exciting projects planned, but they will cost more, and the ODP community has to convince the Council to spend more and not cut pieces from the Program. ODP Council want to see different budget scenarios as to how the Program will accomplish its goals, though overall it (ODP Council) was reasonably happy with the overall direction of the Program.

Falvey continued. He referred to the budget scenario in the LRP, saying that ODP Council asked for the budgets to be presented in more detail than in the LRP. He reviewed the single Phase III budget scenario that was presented to ODP Council in Oslo (Appendix 8). He said that EXCOM and Council then asked for other scenarios, such as losing a member in FY99. Francis asked if additional platforms were included as contributions in kind? Falvey said that this will require detailed discussion before it is finalised.

Malfait said that the message about the exciting science of the Program can be sent through the national offices.

Pearce said that many items alluded to here would be returned to later in the meeting.

2) SSP

Kudrass said that many items discussed at SSP will also be dealt with later in this meeting. SSP set up a sub-committee to look at how the new advisory structure might effect the work of SSP, and referred PCOM to the tabled SSP minutes. Ellins said that many of the SSP concerns are addressed already in the implementation document in the PCOM agenda books. Another SSP recommendation was that the panel wanted the same database in the SSDB and the JOIDES Office.

D. REPORTS ON GLOBAL GEOSCIENCE PROGRAM WORKSHOPS

1) ODP - IAVCEI - INTERRIDGE

Mével reported. She said the meeting discussed LIPs, Ridges, and Arc systems. There were presentations over 1.5 days, and included technological aspects of drilling. The meeting then split into 5 working groups which produced the following (summary) goals. Site survey requirements were not discussed by the working groups as time was not available. The most important consensus arising from the workshop was

"Drilling legs should be part of integrated studies, involving other types of experiments, organised in the frame of other global initiatives" (InterRidge, ION, Margins...).

An overview of the outcome of the work of the various working groups was presented:

Fast Spreading Ridges

Priority: total crustal penetration - relationships between the seismically defined melt lens, dyke injection and the building of the upper crust; depth of hydrothermal circulation; freezing of melt in the lower crust; nature of the MOHO (reference hole).

Strategy: (deep hole - three stages) 1) exploratory leg to select a place for a deep hole (possible sites discussed : H2O site, cable between Hawaii and California; Mohole site, near Guadeloupe Island, Mexico; super-fast crust, east of the East Pacific Rise south of the Garrett Fracture Zone; Site 504B, although intermediate spreading rate. 2) start the deep hole during Phase III (2-3 km), using the *JOIDES Resolution*. 3) continue to 6 km using a new vessel post 2003. (Offset drilling strategy) because the deep hole is a long-term goal, pursue the offset drilling strategy at Hess Deep to sample the lower crust and upper mantle.

Slow Spreading Ridges

Priority: heterogeneity of lithosphere architecture - significance of the variation in MBA between the centre and the end of a segment, focus/non-focused mantle upwelling, significance of MOHO when residual peridotites crop out (at the end of segments).

Strategy: 2 experiments. A) Crustal drilling - three stages. Characterise the crustal structure in the centre and at the end of a well-defined segment. 1) drill two arrays of shallow, single bit holes along two flow lines at the centre and the end of a segment, 2) select two of the holes, one at the centre, one at the end, for deepening to 1-3 km, using the *JOIDES Resolution*, 3) continue to deepen the two holes. B) Mantle drilling - drill a serpentine belt at 15°N on the mid-Atlantic Ridge, to characterise upper mantle and melt geochemistry, melting and melt migration mechanisms, deformation structures (in the lithosphere and asthenosphere), hydrothermal alteration, and the variation of these properties along axis.

Active Processes

Priority: ridge axis observatory experiment - temporal variability of accretionary processes at mid-ocean ridge. The ridge axis environment is the most important, however other environments should be investigated also: ridge flanks, intraplate volcano, convergent margin. Biology.

Strategy: Phase III - drilling and instrumenting 5 boreholes in conjunction with a ridge axis experiment: L-shaped array of 5 holes, ideally to 500 M, CORKs, develop physical and chemical sensors, DCS? Phase IV - deepen a hole to 2 km, initiate new observatories at alternative sites (ridge flanks, intraplate volcano, other spreading rates ?).

LIPs

Priority: understand the timing, genesis and environmental impact of the Cretaceous LIPs - LIPs are not clearly explained in the plate tectonic model; energy transfer from the Earth interior has occurred in a mode substantially different from present day. Constrain the timing, the volume, the chemistry of a LIP magmatic event; establish temporal relationships among different Cretaceous LIPs; quantify the LIPs contribution to the global magmatic flux throughout the Cretaceous period.

Strategy: 1) drill the Kerguelen LIP (Phase II), 2) drill a giant LIP (Ontong Java) and possibly two others (one older, one younger) (Phase III), drill one deep hole and two intermediate holes in a giant LIP (Phase IV).

Convergent Margins

Note: The working group felt that they represented only a small portion of the community working at convergent margins.

Priorities: testing the ophiolite model, the formation of ore deposits. Most ophiolites were not formed at a mid-oceanic ridge but likely in a suprasubduction zone. Drilling in a forearc would test this ophiolite model and provide a reference hole to the ophiolite community. Metallic ore deposits of economic importance were not formed at mid-ocean ridges but in arc environments. Drilling in an active hydrothermal system in that type of setting would help understanding of formation of large ore bodies.

Strategy: 1) drill a 2-3 km deep hole in a forearc, Site 786 in the Bonin forearc could be deepened, 2) drill an active hydrothermal system in the western Pacific, PacManus (andesite-dacite hosted deposit) is a good candidate.

Technological requirements

The capability of the *JOIDES Resolution* has not been fully exploited, drill holes to 2-3 km during Phase III should be feasible with present technology.

Improve penetration and recovery: hammer-in casing system; DCS - important for drilling holes in young crust (active processes).

Develop a new generation of borehole instrumentation and logging tools (slim holes produced by DCS).

Strong interest for deep holes (6 km) ship equipped with a riser (Phase IV). *However, most of the holes discussed will be beyond the reach of a riser with a 2500 m water depth capability.* Explore other directions such as riserless drilling or slimline riser.

Strong interest in the biomass: develop tools to sample the biota without contamination, develop a biology laboratory on the *JOIDES Resolution.*

Working Groups

The workshop participants recommend to ODP to create 5 working groups which will address the scientific questions discussed at the meeting. Only two address lithospheric problems exclusively.

Ridges: will address all the questions related to accretionary processes at mid-oceanic ridges (fast and slow). *InterRidge.*

LIPs: *LIPs*

Borehole Instrumentation working group: should cover the different environments, including ridges. *InterRidge, ION, Margins (?)*

Biology: to discuss all the aspects of sampling and studying the biological specimens in boreholes. *InterRidge, others (?).*

Active convergent margins: to cover all the aspects of the arc environment, and not only the lithospheric aspects. *InterRidge (for the back arcs), MARGINS, (?), ION ?*

Mével reviewed a matrix of proposed legs for Phases II, III, and IV (Appendix 9).

Mountain commented that he was disappointed the workshop did not provide SSP with a list of criteria that were required prior to drilling a deep hole. Mével said that it was simply due to lack of time. Sager commented that there was no convincing argument of the absolute need for a deep riser drilling vessel. Mével replied that it would be required, but plans had yet to be defined. Natland said that he was astonished at the interest in LIPs at the meeting, and that the biology laboratory recommendation was aimed at getting it set up in the FY98 *JOIDES Resolution* refit.

Lunch.. 12:50 - 13:50

2) ANTARCTIC DPG REPORT.

Barrett presented referring PCOM to the full report and his tabled summary. He reviewed the background to the DPG and its membership. It was a very successful meeting with group consensus on the recommendations at the end of the meeting. The justification for drilling around Antarctica was reviewed. Most ice was contained in the East Antarctica ice sheet, but the West Antarctic ice sheet was thought to be the most unstable, although glaciologists were divided on this issue. It can be addressed by looking at the historical record. There are two main ice-volume proxies available, firstly the oxygen isotope curve and secondly the onlap/offlap curve determined by Haq et al. At the Eocene - Oligocene boundary there is no correspondence between the Haq onlap/offlap curve and the oxygen isotope curve, and further back in time the oxygen curve suggests that no ice sheets were present in Antarctica, whereas the onlap/offlap curve suggests that some short-lived ice-sheets may have been present. One of the current best determinants of ice sheet size is temperature. The ice-sheet would actually increase in size with a 5°C temp rise, but above 9°C the West Antarctic ice sheet begins to shrink rapidly. Should there be a 19-20°C rise, the entire Antarctic ice-sheet would disappear, resulting in a 60 m rise in sea level.

The regions selected for study are the Antarctic Peninsular, Weddell Sea, Wilkes Land, Ross Sea and Prydz Bay. The physiographic environments to be examined include both shelf and slope sites, paired with drift sites on the continental rise that will give more continuous records. Problems are weather and sea-ice, which realistically means that only one leg could be drilled each year. Previous experience in this region indicates that the legs close to the Antarctic actually have better weather than those further out in the Southern Ocean. Other drilling programs include the Cape Roberts project (tabled leaflet), and the Norwegian program.

The order for drilling proposed is 1) Antarctic peninsular (as this could easily attach to a cruise planned from Cape Town, and it is the most mature proposal), 2) Weddell Sea, 3) Prydz Bay, 4) Ross Sea.

Sager asked about the need for five areas rather than two or three. Barrett said that the objective is to link the advance and retreat of the ice with the sediment drifts, there is no one place where the whole story can be obtained. A number of different sites will also ensure that results will not reflect local conditions. Ellins said that not all the proposals are in the same state in terms of site survey readiness and that was why the drilling plans did not reflect the science priorities of the DPG. She said that each drilling plan was in fact a combination of a number of proposals.

3) ION

Dziewonski reported. The benefit of seismic networks would allow, for example, determination of the differential rotation of the Earth's core, but stations have to be placed in critical places. It will also allow detailed examination of the seismic velocity anomalies below mid-ocean ridges, which is fundamental for the understanding of ridge processes, the examination of seismic anomalies (super-plumes) at global scales, and which plumes are connected to surficial expressions such as rifts and ridges. ION was proposed in 1993 as a series of permanent observatories in the ocean, its objectives were reviewed as was the workshop held in Marseille in January 1995 (reports already published). There are many common elements in the studies of active processes and larger (continental/global) scale processes. There is a natural division between deep earth structure and dynamics and the recommendations for active process studies, and these were reviewed as were the summary recommendations:

<u>Scientific Objectives - Global Studies</u>

I - Seismology. Fill in gaps in global station distribution to address issues such as: role of tectonic plates in the global deep circulation; style of mantle convection; core-mantle boundary structure.

II - Geomagnetism. Core processes; flow at the core-mantle boundary; core-mantle topography and coupling to mantle; electrical conductivity of deep mantle.

III - Geodesy. Global plate kinematics; strain monitoring at plate boundaries.

<u>Scientific Objectives - Active processes</u>

I - Mid Ocean Ridges. Scale of flow in upper mantle; volcanic and tectonic processes; vent field processes.

II - Convergent and Passive Margins. Fluid flow and biogeochemical fluxes; seismology from the ocean side; hotspots; mid-plate processes.

<u>Summary Recommendations</u>

Long-term observations on the ocean floor of a variety of phenomena are required to address a range of important problems in Earth system science.

One group of experiments must be framed to study deep Earth structure and dynamics, involving the disciplines of global seismology, geomagnetism and global geodesy.

Another group of experiments must be developed to focus on observation of active processes in a variety of geotectonic environments.

Observatories must be sites where scientists can deploy diverse instruments and share infrastructure, in which observations of several different phenomena are combined and are continued for periods of a year or more.

More than ten observatories are required over the next five years to address the necessary science of both groups of experiments.

Data collected at the observatories must be made freely available to the global community of scientists.

ION must function as a clearing house for scientific opportunities and for data exchange, and will undertake long-term planning of observatory work.

In terms of technical issues, real-time data recovery, supply of power to observatories, modularity of design and ability for expansion of observatories were the main considerations.

Another Program, Borehole, was formed with its own plans for the use of sea-floor sites. There is a lot of commonality between Borehole and ION.

The current ION proposal submitted to ODP has 9 sites, and it is hoped that this proposal would be discussed in the 5-year plan. Maps of planned sites in the Pacific, Atlantic and Indian

Oceans were reviewed and it was announced that ships had been scheduled for some preparatory work.

Larson asked about survey requirements for these holes? Ellins said that SSP require three-dimensional data for the proposed ION sites. Dziewonski said that the Hawaii site had the same requirements as for ordinary drilling sites. Ellins then reviewed the SSP requirements (from the tabled SSP minutes). Kudrass asked about the number and amount of basement penetration sites that would be required. Dziewonski replied that there are about 30 sites required overall. Tests on the instruments will be undertaken at the Hawaii site next year, including borehole and surface instrumentation. There is significant expectation that borehole emplacement will produce better results than surface data.

4) IMAGES

Mix reported. IMAGES was beginning to take shape and the US membership was becoming organised (MESH would be the US member). He referred to the tabled letters and said that IMAGES now has a draft agreement circulating amongst potential members, and draft implementation plans were being put together, including potential field programs. Near-term plans include a (funded) coring program around the Taiwan region, and possibly around New Zealand.

The IMAGES newsletter discusses relationships with ODP. The IMAGES steering committee has realised that longer cores are part of the IMAGES mission, and it wants to initiate formal links and work closely with ODP.

The MESH meeting, in July, prioritised studies and tasked individuals with pursuing drilling proposals, focusing on Pliocene and Eocene warm periods, and oceanic anoxic events. Key process are the history of ice in the southern hemisphere, and especially looking at Paleogene objectives within the Antarctic programs. Stability of the tropical thermostat (W Pacific) is also another key process that will be studied by using transects across the paleo-equator. The Bering Sea is another area of interest. A detailed workshop report will be available in the near future.

Natland asked if the meeting represented the overall scope of IMAGES work. Mix said that it did not address some themes that IMAGES are interested in and so there will be more to come. There was a request that ODP form a Working Group on warm climates.

Carter said that IMAGES is still unsure of how to define its membership. The fees have increased significantly, and in some countries it is giving supporters of both ODP and IMAGES problems as there is competition for funds with ODP.

5) NOTIFICATION OF UPCOMING WORKSHOPS.

Johnson said that there will be a meeting from 22-24 October 1996, at Orcus Island, Washington, on The Magnetisation of Ocean Crust. He did not think that specific drilling proposals would result from this workshop, but the attendees would probably like to look at, and suggest modifications to, existing proposals to accommodate their requirements. Kudrass said there would be a workshop on technological aspects of deep drilling in the oceans, with attendees from industry, to look at future European strategies for ocean drilling. It would be held on 14 - 15 October 1996, in Strasbourg.

E. LEG REPORTS

LEG 166 (BAHAMA TRANSECT).

Eberli reported on the results of the leg. A full description can be found in the Leg 166 Preliminary Report available from ODP-TAMU and on the WWW.

Scientific Recommendations: a need for transect legs in other oceans to assess global synchronicity of sea-level changes.

Operational Recommendations: more time for transect legs; WST necessary for precise core/log/seismic correlation; LWD for deeper holes; improve barrel sheets to improve resolution of sedimentary record.

Carter asked about dating. Eberli said that almost all of Neogene marker species were present in all the sites which allowed a precise dating of all seismic sequence boundaries.

LEG 167 (CALIFORNIA MARGIN).

Lyle reported on the results on the leg. A full description can be found in the Leg 167 Preliminary Report available from ODP-TAMU and on the WWW.

Scientific Recommendations:

Operational Recommendations: MDCB was very good for taking samples of both basement and cherts. It did take time to ensure good recovery, but the time investment could be very worthwhile and was better than the XCB. Concerned about the possible change for the Initial Reports, and that the publications issue must be cleared up very soon. Recovery of 7500 m of core led toward bottlenecks, specifically - core flow (descriptions and paleomagnetics), reefer space, the amount that the shipboard party can write.

Mix asked about sub-Milankovitch variability. Lyle said that there is such variability, but the dating has yet to be refined to produce detailed results.

Pearce thanked Lyle and Eberli for their reports.

Coffee .... *16:10 - 16:40*

F. ODP PHASE III IMPLEMENTATION PLAN

1. AS PRESENTED TO EXCOM AND ODP COUNCIL AND EXCOM ACTIONS.

Mix presented this report. The approach at EXCOM was to identify the goals, to inform EXCOM that PCOM intended to keep what worked in the advisory structure, and had identified what it believed could be improved. EXCOM were asked for specific actions : i) endorse the basic framework, ii) endorse the concept of thematic balance on SCICOM, iii) task PCOM with additional mandate development, iv) determine the timing required, v) consider the resource implications. Each level of the proposed structure was outlined as were any remaining discussion items. EXCOM endorsed the framework, the concept of thematic balance, tasked PCOM with mandate development, and will consider a start date of 1997. The number of working groups (resources) is still under discussion.

The workload for the SCICOM chair was discussed, but no solution was forthcoming, although a deputy was suggested; this was discussed later by the joint sub-committee. Membership was a big issue for EXCOM, especially on SSEPs and OPCOM. If it was a voting body it would have to have full proportional representation. The solution for EXCOM was that OPCOM would be a sub-committee of SCICOM with overlapping membership. As regards PPGs, EXCOM decided that members retained the right of representation, and therefore if there are many PPGs then the whole structure would grow. They would be financially self-limiting in that if a country wanted to send a member then they would pay for them. As regards the SSEPs, the PCOM consensus in the last meeting was to have them with limited power, dealing mainly with mail reviews. EXCOM wanted them to be active in advising SCICOM on the development of themes, and to help individual proponents who were not in PPGs in nurturing proposals. EXCOM wanted more thought put into the calendars, information flow, and the transition phase. The EXCOM suggestion for the transition was to form proto-SSEPs from the present thematic panel membership, with tuning as needed for representation and thematic balance. The SSEPs should be unconflicted groups with, initially, a one-year mandate.

In terms of leadership, EXCOM received a report from Otis Brown, and it accepted that SCICOM and the SCICOM chair represent the scientific leadership, though an individual, as an advocate, may still be required at a high level. One idea was to bid the EXCOM chair, but this did not seem to advance.

2. PCOM/EXCOM SUB-COMMITTEE REPORT.

Shipley reported. In the document in the agenda book, the changes from the PCOM model developed in Aix-en-Provence were at EXCOM insistence. Shipley reviewed the membership of OPCOM, and said that he thought that it would be only doing slightly more than Drillopts. He said that as a six-person committee he did not believe that there was a lot it could do. He said that the SCICOM/OPCOM chair would need to be relied upon to ensure that the wishes of SCICOM were implemented by OPCOM. The idea of a deputy was discussed, but the discussion indicated that a deputy would need to be co-located.

Science Steering and Evaluation Panels (SSEPs) would grade proposals rather than rank them, and they would have an interaction with the Program Planning Groups (PPGs). Membership would require that the individuals would be unconflicted. Mix interjected that was not what he heard at EXCOM. Pearce said that was an item for further discussion. Shipley continued. There may be problems in getting individuals to serve on such committees, and there may be continuity issues to address.

PPGs had the name change as there will be other kinds of working groups within JOIDES and they should not be confused. PPGs would be used to address areas where proposals for goals in the

LRP are under-represented. The right of representation may also be an adverse issue for the Program. Care will have to be taken in which PPGs are set-up.

Pearce asked Humphris how she felt about the workload arising from OPCOM? She said that if it was totally separate from SCICOM it may need its own chair, but because of the logistics issues and the information flow through the JOIDES Office, it was important that OPCOM be a sub-committee of SCICOM, and that the SCICOM chair should chair OPCOM. Larson commented that the SCICOM chair would stay at the top of the structure and may not be able to become closely involved with the PPGs and lower levels of the structure. Pearce asked Falvey to comment on the rights of representation. Falvey said the right of membership would exist on all PPGs, but the expectation was that this right would not always be taken up. McKenzie said that her consortia is keen to send individuals to the PPGs. Mével asked for further discussion of the PPG mandates and was supported by Humphris. Falvey said that the JOIDES part of the membership will be decided by SCICOM, and that if ION or another program wanted to send members then that program would have to find the funds. Dziewonski commented that with his program, the data belongs to the community, and that conflict of interest should be considered when membership is discussed. Pearce said that links to other programs can also be discussed further.

Sager commented that the service panels will need to be discussed. Pearce reminded PCOM that this was raised in the agenda notes. Larson said that the question of SSEPs not being proponents needs to be discussed, and Pearce said that conflict of interest will also need to be addressed. Mével said if SSEPs are to interact with SCICOM, then it would remove the scientific leadership from SCICOM. Humphris said that SCICOM would simply be taking advice and using the experience of the SSEPs.

Sager said that he sees no work moving from SCICOM. Mountain asked that there be a presentation of how a proposal would go through the proposed system, including the calendar. PCOM agreed that this was desirable. Mix asked that the liaison paths be clearly defined. Natland asked for clarification on how the X-based budgets would be dealt with, and which committee would deal with them. Falvey said that the structure would evolve, and that the objective is to provide the best targeted advice so that the Wireline Logging Service and Science Operator can fulfil the goals it is set. In terms of the X-base, JOI, ODP-TAMU and ODP-LDEO hear the discussions and interact with BCOM. This process will continue, and it is likely that next year OPCOM may take some of this responsibility away from BCOM. The proposed new calendar should allow OPCOM to take over this function entirely.

Pearce said that in terms of the gross structure, PCOM is in general agreement, only the details need refinement; PPG membership and mandate; the mandate and other aspects of the Scientific Measurements panel; the SSEP membership and mandate; the precise membership of OPCOM.

Adjourn *17:50*

Tuesday 20th August 1996	***09:00 am***

4. PCOM DISCUSSION.
SCICOM

Falvey presented an update on how the US members of SCICOM would be chosen in the future. The JOI BoG agreed to remove the connection between JOI institutions an US members of PCOM (SCICOM). A nominating committee will be set up by the USSAC chair and the JOI BoG chair, and the nominees will be selected by that committee. It will be implemented this year and will give the board the freedom to achieve thematic balance on SCICOM. Larson said that the nomination list will be prioritised. Falvey confirmed that there will be an advert for nominations to PCOM, Larson said that it is already published in the USSAC newsletter. Falvey said that the majority of the current US members on PCOM will probably see out their terms. Larson said thematic balance would be achieved in a similar manner to the way that thematic balance was maintained on the drill ship at present.

Larson said that at present the rotation is four years and he asked why there was a change to three years. Falvey replied that the shorter term was to embrace a larger community, but really it would be up to national committees, and that the document in the agenda books reflected the new US position. Ellins said that the term length of the SCICOM/OPCOM chair may also be extended to three years, which could in reality mean a five year membership for certain individuals. Natland said that for USSAC, four years was the preferred option. Larson and Falvey said that this could always be changed.

OPCOM

Pearce commented that one way to deal with this would be to let it run and to deal with problems if any arise. Humphris said that she is happy with the concept of chairing it initially. In terms of membership, there may be a requirement for different expertise as and when required.

SSEPs

One main concern was how scientific balance would be achieved, and another was that members must not be in PPGs or be proponents. Larson suggested that SSEP members not be allowed to be members of PPGs but should be allowed to be proponents. Mountain commented that there is a mechanism to deal with conflict of interest and so being a proponent should not be a problem. Larson said that it was inconsistent to have conflicted SCICOM members and unconflicted SSEP members. Kudrass said that he too wanted members to be able to write proposals. There was PCOM consensus that members of SSEPs be able to write proposals.

Mix asked about inter-panel liaisons and suggested that they be explicitly determined. Carter suggested that the Chairs of SSEPs will be liaisons to SCICOM. Humphris said that the chairs actually report to SCICOM and not liaise. McKenzie asked about SCICOM liaisons to the SSEPs. PCOM consensus was that there should be SCICOM liaisons to SSEPs.

PPGs

The key item was that membership be determined by SCICOM. It could be re-written as "To be determined by SCICOM, though consultation with SSEPs and community programs". McKenzie asked about the mechanism for setting up PPGs. Mix said that the formulation would not implicitly include or exclude proponents. In terms of representation, each member must be given the right of membership. Mix asked if members could send whomever they wished? Pearce said that national committees would have that ultimate right. Membership wording would be changed to "Chosen by JOIDES member committees with SCICOM advice through consultation with SSEPs and community programs". Malfait said that even at present, each representative at PCOM has the right to demand representation for his or her institution on each DPG or WG.

Humphris asked about the last bullet on the mandate. She suggested removal of "rather than the Program Planning Group". Ellins reminded PCOM that SCICOM can still form DPGs that can write drilling plans, such as the recent Antarctic DPG (which essentially is a drilling proposal or plan).

Service Panels

There was no overwhelming opposition to the sentiment that IHP would be disbanded, though certain parts may reform for specialist requirements. Also there was no significant opposition to the idea that DMP and SMP be merged. A letter from the chairs of the above committees have asked that PCOM reconsider this issue. Pearce said that this has been through EXCOM and it is unlikely to be varied a great deal. Sager suggested that the rationale for this, to save money, was the first that he had heard about this. He quoted some of the objections from the panel chair's letter in the agenda book, including the suggestion that to save money the panels could meet only once per year. The biggest concern is that the mandates of the present panels such as curation, publications, database etc. will not be covered by a combined panel. Sager volunteered to host a sub-committee meeting to determine exactly what will areas of science advice will need to be covered by a combined panel. Natland said that initially he understood that all three panels would be combined, but now it appears that one is to be disbanded. Larson said that this issue must be addressed in detail. He supported Sager's suggestion of having a partial moratorium on the combination of these panels until the mandates have been determined. Falvey said that IHP advice has been weak for some time. In each of the database, publications, and curation fields there are (or will be) JOI sub-committees to take these issues forward and provide strong, definitive advice to the operators. Falvey said that, for example, he wants to avoid the present system of ad-hoc advice on curation on a leg-by-leg basis.

Pearce said that he spoke to the IHP chair and she was happy with things as proposed. The new system will provide a degree of flexibility that presently does not exist, as the panel would be able to "import" expert, focused groups as and when required. Brown said that for some issues there was a great deal of overlap of work between panels. Falvey said that ultimately the science advice forms the annual Program Plan, and if that advice is inadequate then he will call for a further strengthening. Natland suggested that the wording be modified to "A new Scientific Measurement Panel will be formed from elements of the existing DMP, SMP and IHP". There was PCOM consensus on this new wording. Larson suggested that Sager's sub-committee meeting be allowed to go ahead and that it produce a mandate for PCOM to consider. The sub-committee, will consist of the chairs of the three relevant panels, plus Sager, Brown, Moore, Suyehiro. Pearce said that a mandate developed in this manner could be approved by an e-mail consultation of PCOM.

Carter asked about implementation on 1 January 1997, and whether the service panel advice could continue in its present structure through the initial implementation phase. Pearce said the implementation can be phased, but that EXCOM will need a specific mandate for approval. Mountain and Carter asked why PCOM cannot debate this further in December. Larson said that it is apparent that there is consensus that there will be one service panel, but the question of timing still has to be addressed.

Coffee .... *10:10 - 10:40*

> PCOM Motion 96-2-3
>
> PCOM recommends to EXCOM the proposed new advisory structure with wording modified from the version of July 24, 1996 (attached). Under JOIDES Service Panels, the mandate for the new Scientific Measurements Panel will be refined by a sub-committee formed of the present chairs of IHP, DMP, and SMP, plus the following PCOM members: Brown (SMP liaison), Moore (DMP liaison), Suyehiro (Japan), Humphris (PCOM chair-elect) and Sager (IHP liaison and chair of sub-committee). This group shall meet at College Station in November 1996. Any revisions to the mandate will be approved by PCOM through e-mail review.

Proposed: Natland, Seconded: Brown *16 For, 0 Against*

Humphris asked about the timing. If EXCOM approve this in November/December, then there are only six weeks for nominations for members of the new committees. Larson said that it was reasonable to ask EXCOM to meet early to approve the new structure, but he didn't understand why they couldn't approve a part of the structure with the service panel details to be approved later. Pearce said that PCOM have to give EXCOM a complete package of mandates for the new advisory structure, but the actual phasing in of the new panels is a separate issue. Humphris said that in February 1997 EXCOM would select SCICOM members, so that SCICOM could meet in the following April, and therefore EXCOM will need nominations at its February meeting. Falvey suggested that PCOM write a draft mandate for the new panel, and then a revision will be presented to EXCOM at a later date for formal approval.

There was PCOM consensus on modifying the existing mandate of the Scientific Measurement panel to read "To monitor and recommend development and/or acquisition and/or dissemination of scientific measurements".

Pearce then moved to the timetable and reviewed the agenda papers (starting with p.243). Mével asked if SCICOM had an e-mail vote on the ship schedule. This was confirmed. Discussion moved to the "normal" yearly timetable. Mountain asked about the return of mail reviews back to proponents. He said there should be a filter to oversee the mail review comments, and that it could be addressed by using SSEP watchdogs. Falvey said that the step of clearly articulating selection criteria for what goes out for external mail review will be essential. The timetable on p.242 was then discussed. Natland suggested that a sub-set of the thematic panels be used to decide which proposals should be sent out to mail review, possibly by having meetings in late January 1997. Humphris said that the re-constituted panels will need to see what proposals in the system are mature enough to be sent out. Pearce said that PCOM would have to consider this issue in December 1996. Brown suggested some changes to the calendar on p.241, so that the Scientific Measurements Panel always meets the month before OPCOM. Falvey reminded PCOM that before the mail review occurs, PCOM will have to determine selection criteria. Pearce said that it would be done in the December meeting.

Natland suggested that a sub-committee look at the review process before the December meeting and Mountain said that the reviewers will also require guidance. PCOM accepted this. Sager suggested that the thematic panels be charged with the development of guidelines for mail review of proposals, and of reviewers, that can be presented in PANCH96. Natland said that PCOM can write a document at this meeting to give to the thematic panels for consideration at their meetings later in the year.

Shipley raised the issue of the role of the PPGs. He said that his belief was that mature proposals would all go to the SSEPs and then to mail review, whereas another path was for immature proposals to go through the SSEPs to the PPG's. He commented that where a theme is under-represented by proposals, SCICOM could form a PPG. There will probably only be a small number of these. He asked if PPGs could be formed to help groups that are not familiar with ODP? Pearce confirmed this. Mével said that PPGs will be the link between ODP and other programs, but this didn't require further discussion here.

G. FY96 AND FY97 X-BASE UPDATES

1. ENGINEERING AT ODP -TAMU.

a) Hammer drill-in casing update (Leg 174B).

Francis reviewed the purpose of the hammer drill-in system and the timetable. Overall the system is progressing well in tests to date. There are some disadvantages with the current ring-bit systems used on land, but these may be overcome by the use of eccentricor retractable bits. Although these will only work for the first 50 m or so, they allow better control of weight on bit and do not stress the casing. The latest decisions were reviewed: SDS will develop the large diameter water hammer; eccentric and/or retractable bits will be used, supplied by Holte manufacturing Co.; SDS and Holte are in contact with each other; cuttings will be brought up inside the casing.

The financial aspects of the project were summarised as follows:

	FY96	FY97	FY98	Totals
Project Mgt				10,400
Hammer				740,760
- SDS Phase I	92,000 (est 83% spent)			
- SDS Phase II	<------508,000 ----->			
- Holte Bits		85,000		
Re-entry cones/hangers				90,132
Running tool				80,806
Sea trial prep				13,520
Totals	230,484	300,814	4,400	$ 935,618
	400,000			

Phase II was more expensive than originally thought and has been funded through savings in the present budget, largely on fuel ($400K). The total cost for Leg 174B will be ca. $925K.

The project is going well and should be on track for deployment on Leg 174B. Sager asked if there was a significant cost over-run? Francis said that he originally estimated $200-300K for Phase II.

b) Other Technology Development Updates.

DCS

The development schedule was reviewed (Appendix 10), and Francis referred to the status report in the agenda books and reported on the DCS design and operation review. The report is currently in draft and will be circulated before the December PCOM. The low-friction seals on the primary heave compensator will be installed at the San Diego port call, so long as the surface finish of the cylinders are still in good shape. The ship is currently being instrumented with the sensors required for the secondary heave compensator and the heave data will be recorded again after the installation of the new friction seals. Francis referred PCOM to the tabled paper on a proposed DCS Engineering Leg in 1998. This will help maintain continuity of the project and staff morale, using Site 735B as a test area. It will also precede the major dry-dock of FY99, which will allow the ship to be modified to bring the drive system to the rig floor for operational and safety reasons. The extra funds required for a DCS Engineering Leg may preclude the use of an ice-boat for Antarctic work. However, such a Leg could not be undertaken before Leg 180 due to the current development schedule.

Sager said that a FY98 cruise would need scheduling in December 1996, which will be prior to any land tests. Francis said that the cost (above that for a standard leg) would be approximately $1.3M. Natland asked if moving of the drive to the rig floor was essential? Francis said that the current system would be very slow, and that the refit of the drive system is considered essential for both operational and safety issues. Francis confirmed that the only site that will be considered in the Indian Ocean is the wavecut platform at Site 735B. Moore questioned the fact that the proposals from ODP-TAMU requires that the ship stay in the Indian Ocean for 4 Legs (175-180) at least. Mountain questioned the use of Site 735B? Was it a challenging environment or one where the system would be thought to work? Francis said that an "easy" environment was best for a test of the system.

JANUS

Deployment has been postponed to Leg 171B at the request of the steering committee. Testing and acceptance will done on Leg 172, and warranty support would be available though May- July

1997. It was reported that not all the components of Phase I would be completed within budget, those that would not be were reviewed (Appendix 11).

2. TECHNOLOGY AT ODP-LDEO

Goldberg reviewed the FY96 (BoreHole TeleViewer Data, Well Seismic Tool Data, Satellite Data Transmission) and FY97 (LUBR/LDEO Diamage project, Core Log Integration Platform) projects.

The digitisation of ODP BoreHole TeleViewer (BHTV) data into standard format is now complete. The BHTViewer program is also complete, it will allow users to view the data, adjust scaling and colour palette, print, and edit the header information. In terms of the Well Seismic Tool (WST) data, the translation of all WST data collected by ODP from LIS into SEG-Y format has now been completed. All future WST data collected will be translated into SEG-Y format. Moving to Satellite data transmission, VSAT (256 kbaud) was used for Legs 166-168. The geophysical data can now be processed and returned to the ship within seven days logging in most cases. Inmarsat B (64 kbaud) installation will be undertaken during the Leg 170 port call, and negotiations are underway between ODP-TAMU and ODL.

The Diamage project goal is to integrate core and log image data in FY97/98, and currently the arrangements are being made for software installation at LUBR and LDEO. Also there is an exploration of the hardware options for both ship and shore-based testing using data from Legs 118, 149, 173, and 176. In reporting on the Core Log Integration Platform (CLIP), the updated CLIP software has been installed on the *JOIDES Resolution*, *Splicer* was used extensively on Leg 167 and the *Sagan* prototype was tested on that Leg also. *Splicer* was also integrated into the shipboard JANUS database. The FY97 *Sagan* enhancements include a non-linear alignment of core and depth scales and a mapping function for interrelating core and log data.

McKenzie asked if the satellite system had implications for ship-shore communications? Goldberg said the new system will be data limited, and reminded PCOM that negotiations were underway between ODP-TAMU and ODL.

H. OTHER MATTERS FOR CONSIDERATION BEFORE THE FY98 PROSPECTUS

1) INDUSTRY-FINANCED MINI-LEG IN THE GULF OF MEXICO AND ELSEWHERE.

Francis referred to the agenda book report and reviewed the conclusions of that report: a) transferring APC technology to industry was not straightforward, b) industry participants had specific regional interests (e.g., deep water Gulf of Mexico), c) ODP's planning cycle was much too long for industry, which operates on 6-month timelines. If ODP wished to become involved with industry, these time scales will need to be accommodated within the Program.

The CONOCO-Hydril Riserless Drilling Project is likely to go ahead, and ODP-TAMU are considering getting involved in Phase I (at a cost of $50K). The design and construction in Phase II would cost ca. $20M. There will be a requirement for a deep water test ship in about 1998, and the *JOIDES Resolution* is probably the most suitable vessel. Larson asked about the funds for involvement. Francis said that it was not finalised whether commingled funds would be used.

Mével said that there was support for this type of project at the Woods Hole workshop. McKenzie commented that the contribution of $50K was a small amount of money, and that ODP could make such a contribution to the feasibility workshop. Francis said that he would like PCOM to make a statement on this project. Carter said that ODP should be cautious about putting expertise into the project if there is no guarantee of IPR. Falvey said that ODP would be bringing experience to the feasibility study, and the study group report would be confidential to the contributors for a period of three years. Pearce suggested that it would be an ideal issue for TEDCOM to discuss at their next meeting. Falvey said that it was unlikely that commingled funds could be used if the resulting report is to be confidential.

Mountain said that he believed that ODP had engineering expertise to sell to this group. McKenzie said that initially this discussion was brought about as there was a suggestion of a mini-leg to be inserted into the program, she wanted to know the outcome of that issue. Francis said that JOI and NSF would not allow ODP-TAMU to "sell" periods of time on the drilling vessel.

Larson said that only one part of the LITHP community was ready to use riser drilling technology, there was no guarantee that the OD21 would provide a 4 km riser in the first years of that project, and so this should be followed up. Kudrass said that a European group is being established to look into the whole question of riserless drilling.

Lunch .... *12:47 - 13:55*

PCOM Motion 96-2-4

PCOM requests that EXCOM approve the proposed new JOIDES advisory structure before the December PCOM meeting.

Proposed: Natland, Seconded: Larson *14 For, 2 Absent*

PCOM Motion 96-2-5

PCOM recommends that EXCOM approve the attached implementation timetable for the new JOIDES advisory structure, modified slightly from the version of July 24, 1996. The principal revision is that an interim joint SSEP, comprised of two members each from the current thematic panels, shall meet in January, 1997 to initiate proposal mail review.

Proposed: Natland, Seconded: Moore *14 For, 2 Absent*

Humphris raised the issue of representation if sub-groups of the thematic panels are used, and suggested that there should be four people from each panel. Falvey asked for confirmation that there is no voting? This was confirmed. PCOM discussion led to the suggestion of 8 members in total. Larson said that there could be a large number of proposals to be sent out. Moore agreed that the proposals will be quite mature and so this could be the case. Humphris said that she thought that the total number sent out for external review should be culled to 10-20 at most. Ellins said that there are already the global rankings and there will soon be the fall rankings for the groups to base their findings on. Twenty would be a reasonable number. Larson said that the issue of representation will become important if there are a low number of proposals sent out for review. Pearce said that here PCOM is simply trying to get the panels to get a sub-set of their membership alerted to this. Brown suggested that PCOM ask the panels to suggest four names and then PCOM could choose the actual individuals in December.

PCOM Motion 96-2-6

PCOM directs each thematic panel to recommend four of its members to serve on an interim Scientific Steering and Evaluation Committee to meet once, in January, 1997. The panel is to specify which of the proposals received and current as of January 1, 1997, should be sent out for mail reviews, based on guidelines which PCOM will establish at its meeting in December, 1996. The reviews need to be completed in time for the initial meeting of the new Interior and Environment SSEPs in May 1997.

Proposed: Natland, Seconded: Sager *16 For, 0 Against*

PCOM Consensus 96-2-7

PCOM expresses its enthusiasm for industrial company consortium plans to design and build a deep "riserless" drilling system that could provide pressure control and return flow for a deep hole drilled below at least 4 km water depth. PCOM asks JOI to continue to seek ways and means by which ODP interests could join at least the feasibility phase of this consortium, so that we might consider incorporating such a system into future ODP drilling plans.

2) PROPOSAL 79.

Ellins said that PCOM was asked to consider this proposal as it was inadvertently left off the active proposal list. She wanted PCOM to make a clear statement to the proponents of its level of interest.

Larson asked if SSP would rank it highly. She replied that she could not answer. Larson said that at present the proposal is not ready, but it is an interesting proposal looking at paleoceanography of the Mesozoic. It is potentially the only site for looking at the boundary conditions of how East Tethys fits to the Pacific. Francis commented that ODP-TAMU has been looking for the opportunity to drill a 3 km hole for some time, and this is one location where it would be possible. McKenzie reminded PCOM that it has in the past asked the panels to look for deep holes, and that at one time this proposal did have strong interest from SGPP. Kudrass said that a site survey in this region has been withdraw because the proposal was not highly ranked, and therefore the site survey proposal was not highly ranked within Germany. Natland said that there is information on the site summary page, and so there must be data somewhere. Shipley replied that he did not think that there was good velocity data. Mountain responded that there are 50 sonobouys in the area and there is abundant velocity data in the region. McKenzie reminded PCOM that this was a revised proposal. Sager reminded PCOM that there was no support from the thematic panels. Pearce said that PCOM should see how it fits into the LRP. There are several potential deep drilling sites in the W Pacific. Francis replied that the first deep drilling capability test of the *JOIDES Resolution* should not be on an active margin. Pearce said that the discussion is now beginning to sound more like an Engineering Leg. Francis replied that it would be firstly a science leg, then a *de facto* engineering test. Pearce asked PCOM to indicate if this proposal should remain under consideration for the prospectus. Mountain said that SSP should be tasked to look at this at their fall meeting. McKenzie said that just because the panels have not ranked it highly does not mean that PCOM should not consider it.

Pearce called for a show of hands: nine PCOM members were in favour of considering it in the prospectus discussions, with six abstentions.

3) LOI 72.

Pearce opened the discussion by saying that this was a legitimate way to put forward a proposal. Malfait asked if the proposal was submitted as a scientific proposal or as a subcontractor proposal. Goldberg said that it was submitted as a development proposal. Pearce said that this is a contingency in case the hammer-drill casing did not go forward. McKenzie said that PCOM already passed a motion dealing with any time that comes available in case the hammer system did not work.

Mountain asked if the hammer test was passed through TEDCOM? Pearce said that it was considered by all panels. Mountain said that PCOM are being asked to re-consider motion 96-1-9. PCOM agreed that there was already a contingency, but also agreed that DMP and LITHP be asked to review the proposal in the fall. Natland asked for clarification of what was to be done during the Engineering Leg?

Goldberg responded. He referred PCOM to the agenda papers. The proposal is a test of 2nd generation LWD tools, that require no modification from the standard industry specifications. As the tools are off the shelf, the lead time is now brought down to only three months.

Ellins said that the proponents of Proposal 476 are aware of the possible selection of alternate sites for the New Jersey leg and they have suggested that the Proposal 476 sites should be considered as alternates. Also that proposal now involves measuring while drilling whereas the original was logging while drilling. PCOM did not support this idea.

4) SOUTHERN HEMISPHERE OPERATIONS

Pearce said that this was put in to consider "latitudinal" readiness. In the prospectus there will be high latitude proposals and low latitude proposals and PCOM should return to this item after the discussion of site survey readiness.

I. FY98 PROSPECTUS

Larson raised a conflict of interest issue and referred PCOM to p.174-175. Under item (c), the last sentence was not present after the discussion in Aix-en-Provence. The following items of discussion may mean that some members are required to leave the room.

1. 1996 GLOBAL RANKINGS.

Conflicted members are:

Roger Larson 472 Izu-Mariana

Kiyoshi Suyehiro 431 Generic Seismic

Alan Mix 465 S E Pacific

Greg Moore 445 Nankai, 450 Taiwan, 447 Woodlark

LITHP

448 Ontong Java - not ready

480 Caribbean - wrong area

481 Red Sea - clearance initiatives ongoing - Francis said that these are unlikely in his opinion. - Humphris presented. Hydrothermal aspects, to look at formation of mineral deposits and also to look

at incipient rifting. The sediments of the region are also very unusual and would give exciting results. Also basement and stockwork are drilling targets.

451 Tonga Forearc - Pearce - to look at evolution of the forearc through the sediment sequence, and look at the ophiolite model that forearcs are more representative in ophiolites than deep ocean crust.

Seismic Boreholes Generic - not discussed. Mével said that this involves emplacement of a seismometer in the Indian Ocean and only involves about 10 days of drilling.

457 Kerguelan LIP - Sager - has been highly ranked by LITHP and large LIP community interest. Little is known about LIPs and they can be drilled very easily with the *JOIDES Resolution*. Larson - 3 sites on oceanic crust, from Leg 120 drilling, some of the south Kerguelan Plateau may have continental affinities and one hole is dedicated to test this. It would be a one leg, six-site reconnaissance drilling program. Sites tend to the southern part of the plateau.

472 Izu-Mariana - Pearce - to get an idea of the budget of what is going down the subduction zone, especially at the base of the sediment section. Aim is to deepen Site 801C to penetrate basement and to drill complementary sites.

426 Australia - Antarctic Discordance - Humphris - in an area with a distinct boundary between mantle of Indian/Pacific sources. The boundary may migrate and the idea is to drill off-axis to try and understand this major structure.

OHP

464 S Ocean Palaeoceanography - Mix - site survey cruise was successful. Belongs in the prospectus.

441 SW Pacific Gateway - looking at deep water flow into the Pacific. SSP package is submitted with an additional cruise in Feb. 1997. It is viable for the prospectus.

465 - Mix conflicted - location is off Chile.

367 - Cenozoic Carbonates in the Gt Australian Bight - off south Australia, interest in sea level and Cenozoic paleoceanography, some shallow water sites. Good site survey data, should be viable for prospectus. McKenzie - interesting environment not well studied, temperate water carbonates.

E Asian Monsoon - immature.

485 - Depth transect across Tasman Rise, similar to Cenozoic Carbonate in palaeoceanographic objectives. Some deep penetration holes for this type of study.

449+488 - Mesozoic Weddell Sea - not an ANTOSTRAT proposal. Mesozoic black shale focus and Neogene history of water masses. Has weather and ice constraints associated with the proposal. Not ranked near top of Antarctic DPG list.

452 - W Antarctica - ultra high sedimentation rate, quadruple HPC for rapid climate change studies. Could be done after sub-Antarctic transect leg (March - April).

SGPP

481 - see above

445 - McKenzie - two legs, not back to back, would complement Barbados studies.

ANTARCTIC DPG - see DPG report.

367 -

476 - Hudson Apron - out of area.

TECP

450 - Shipley -

447 - in previous prospectus, should be in this too.

431 - W Pacific Seismic Network - First of eight areas ready to go. Some problems with Site Survey requirements.

445 - Nankai - either one or two legs, a follow-on from previous legs. Comparison between decollement and deformation of the section.

442 - N Mariana Rift - rift to drift in an opening back-arc. Not ready for FY98.

484 - E Asia Monsoon - very immature proposal.

451 - Tonga forearc - see above.

2. SITE SURVEY READINESS.

Ellins reported and reviewed the SSP readiness ratings which were in the tabled SSP minutes.

Regarding Proposal 426, Mix reported that the site survey cruise was not successful, and the seismic reflection data is not clear in terms of defining sediment thicknesses. Sidescan data is available and shows sediment ponds, however there is a question of whether the sediment ponds are deep enough to enable spudding-in. The *JOIDES Resolution* could be used to define the sediment thickness as it approaches the sites.

Humphris asked about the proposals that were in last years' prospectus that are now ranked 2C by SSP. Kudrass said that for Proposal 481, the cruise has not actually been scheduled, so it moved back from 2A to 2C. Ellins said that in fact it means that the data submitted to the SSDB is not actually as good as SSP thought it would be. Also it depends upon the information fed to SSP by proponents, which can be inadvertently misleading.

Pearce suggested that categories 1A and B, and 2A should be considered ready, and the rest will be discussed if required. It was then decided that those proposals that are clearly not ready should be removed from consideration rather than take up time on discussion.

PCOM took advice from the Science Operator, based on information from the US State Department, and an e-mail from John Ludden, and removed Red Sea Deeps from consideration for the FY98 prospectus. Francis asked, and PCOM agreed, that a DCS Engineering Leg be considered for the Prospectus.

Coffee .... *15:58 - 16:27*

Mével announced an Australian cruise scheduled for Kerguelan in February 1997, and said that this proposal should move up in SSP rank to 2B.

3. CONTENTS OF THE FY98 PROSPECTUS.

Natland outlined for PCOM the proposals that remain in consideration for inclusion in the FY98 drilling prospectus. Pearce reminded PCOM that conflicted proponents will be expected to leave the room. Carter, Moore, Larson and Suyehiro left the room.

Humphris asked why the Antarctic Peninsula was being considered when it was out of the area defined in the four-year track. Pearce and Mix reminded PCOM that the Antarctic DPG, which PCOM set up in the first place, requested that PCOM consider the Antarctic Peninsula proposal despite it not being along the outline four-year plan Pearce asked if PCOM was happy with the remaining 13 proposals as a starting point. Mix said that proposals 426 and 485 should also be considered. Mével said that the generic Seismic Borehole proposal includes a hole in the Indian Ocean and that as this only requires 10 days of drilling it should be considered. Ellins reminded PCOM that it could be inserted by the thematic panels

The proposals were then evaluated for their relevance to the LRP themes (I=Climate change, II=Sea level change, III=Fluids etc, IV=Transfer of heat and materials, V=Deformatoin, Initiative 1= Rapid climate change, Initiative 2= Observatories, Initiative 3= Deep drilling, P=Biosphere).

79 Somali Basin - I, III, Initiative 3

367 Cen Carb Gt Aust Bight - I, II, III

431 W Pacific Seismic Network - IV, V, Initiative 2

441 SW Pacific Gateway - I

445 Nankai - III, V, Initiative 2

447 Woodlark - V

450 Taiwan - III, V

451 Tonga Forearc - IV, V

452 ANT Plan 1 - I, II, Initiative 1

457 Kerguelen - IV

464 Sth Ocean Paleoceanography - I, Initiative 1

472 Izu-Mariana - III, IV

485 Australia - Antarctic Southern Gateway - I

490 ANT Plan 3 - I, II, Initiative 1

DCS Engineering - Technology

Pearce summarised by saying that all the proposals are drill-able and relevant to the LRP. One possibility to prioritise is to look at which ones the ship can realistically pick up in FY98. Falvey commented that PCOM should bear in mind that the 5-year plan is to be constructed and that PCOM could use all 15 of the proposals in that plan.

Pearce asked if 464 and 503 could both be drilled in the Austral summer? Mix reported that the DPG said that the Antarctic Peninsula is drill-able between early January to late April, and Prydz Bay from mid-January to mid-March. ODP-TAMU reserved judgement on the need for an ice-boat on the

Antarctic Peninsula, but noted that it will be essential for Prydz Bay. The Kerguelan weather window is February - March, and will not stretch to late April.

Mével suggested cutting off the most distant proposals as they are logistically unreasonable. Natland said that the Antarctic legs should not be included due to logistics. Barrett said that ANT Plan 1 was the most mature and was the most sensitive to climate, but in scientific terms, the Prydz Bay was the most important, despite the site survey cruise yet to be run (February 1997). The weather window is mid-January to mid-March.

After a brief and inconclusive discussion, Pearce suggested that PCOM break and discuss this outside the meeting and come to a decision tomorrow.

Adjourn *17:48*

Wednesday 21st August 1996 **08:45 am**

Pearce said there are two models to consider, Natland will present. Option 1 was to produce a southern hemisphere prospectus, which allowed two Antarctic legs to be undertaken over two years. Concerns were raised about the presumption that the prospectus would be built upon the basis of the DPG reports when the thematic panels have not ranked those reports against the other proposals. Option 2 is to include the proposals above the equator, and ask for TEDCOM comment on DCS , and use an Antarctic drilling plan instead of the Prydz Bay proposal. Pearce said that the proposals above the equator are high priority and are very likely to be drilled at some point. He reminded PCOM that SSP finds looking at more than 12 proposals excessive in terms of that panel's workload. He said the northern hemisphere proposals could then be scheduled in FY99. Natland said that SSP would only have to spend minimal time on the 1A and 1B ranked proposals. The panel would have to look in detail at Prydz Bay and the Antarctic Peninsula. Mountain commented that SSP can bring in additional help should they need it for particular meetings. Also if the northern hemisphere proposals are excluded, after the panel rankings then there may not be enough highly ranked proposals to schedule. Shipley said that PCOM must be aware that the panels could give only one Antarctic proposal a high ranking and so all the proposals should be left in. Pearce asked if there was support for the equatorial cut-off? PCOM were not supportive of this. The Antarctic DPG drilling plans will be looked at by SSP and the thematic panels.

Shipley wanted to address the issue of where else the DCS leg could be drilled apart from Site 735B. Pearce said that ODP-LDEO wanted to test some tools and therefore he proposed that this be a Generic Engineering Leg. Pearce told the subcontractors that a Generic Engineering leg proposal should be submitted to the JOIDES Office by 20 September. Mountain said that was essential to outline site survey requirements for the SSP review. McKenzie said that originally, it was suggested that the DCS test be done near to the US to avoid large shipping costs. Francis said that the system must be tested to maintain the momentum of the project. Natland said that Site 735B was the only place in the Indian Ocean where the site survey data exists, but there are areas in the W Pacific. Pearce said that PCOM required options for testing. Mountain said that this should have been presented in the agenda book, it is far too large an item to be presented following a number of tabled papers. Mountain said that PCOM are committed to get the system on-line. Pearce said that PCOM must have something to balance against the scheduling of the DCS test leg.

PCOM Motion 96-2-8

The contents of the FY98 Prospectus and initial long-term Planning Prospectus to be considered for Thematic Panel ranking shall include the following proposals and programs:

79	Somali Basin	367	GAB Cenozoic Carbonates
431	W Pacific Seismic Network	441	SW Pacific Gateway
445	Nankai Trough	447	Woodlark Basin
450	Taiwan Arc	451	Tonga Forearc
457	Kerguelen LIP	464	S Southern Ocean Paleoceanography
472	Izu-Mariana	485	Australia-Antarctic Southern Gateway

Antarctic DPG 1, 2, 3

Additional programs may be considered by the panels at their discretion. A DCS/LWD Engineering Leg is also to be considered by PCOM for scheduling. The panels and TEDCOM are asked to comment on this proposal, which is included for information in the prospectus.

Proposed: Natland, Seconded: Sager — *12 For, 0 Against, 4 Abstentions*

4. PCOM WATCHDOG ASSIGNMENTS.

451 Tonga Forearc	Julian Pearce
431 W Pacific Seismic Network	Paul Johnson
457 Kerguelen	Will Sager
472 Izu-Mariana mass balance	Jim Natland
367 Cenozoic Carbonates	Judy McKenzie
464 Southern Ocean paleoceanography	Alan Mix
441 S W Pacific gateways	Hermann Kudrass
485 Southern Gateways	Greg Mountain
445 Nankai Trough	Kevin Brown
450 Taiwan	Tom Shipley
447 Woodlark	Tom Shipley
79 Somali Basin	Jim Natland
Antarctic DPG	Hermann Kudrass, Greg Mountain, Alan Mix
Generic Engineering	Paul Johnson

Humphris said that as incoming PCOM chair, she expected the watchdogs to communicate with proponents and understand the proposals so that they can present their opinion and answer questions. Panel Chairs would present proposals in the context of their rankings, and the PCOM members will be expected to justify how the proposal fits into the LRP. It would essentially be an evaluation that is required from the watchdogs. Francis said that ODP-TAMU would submit a technological justification of the need for deep drilling.

J. 5 -YEAR SCIENCE PLAN

1. EXCOM AND NSF REQUIREMENTS.

Falvey presented the JOI view of this exercise. The 5-year plan is required by NSF by March-April 97, slightly ahead of the normal submission of the annual Program Plan. It will have the same contents as a draft Program Plan with extended out-years to show where the science is going, in less and less detail, through the end of Phase III, and it will include engineering requirements. The first year's science plan can be determined in December, although the budgets will need to be examined by the operators, and provisions for an ice-boat (ca. $1M) may have to be built in for the next two years. This will have a large impact in the X-base, which, at the same time will have to ensure continuity in projects such as JANUS and DCS.

For the moment PCOM needs to produce a plan along the lines of the LITHP model (p.351 in agenda book). The 1-page descriptions are rationales for the plan and the outcome of each type of science. It should include the engineering requirements and links to global programs. Mével asked how the results of workshops can be included in this plan. Falvey said that this is the Planning Committee, it must produce a forward plan, the LRP already includes input from the outside community. Part of he plan will form the FY98 Program Plan that will go to EXCOM in February 1997 for approval, and then on to NSF.

Pearce then asked PCOM to break into working groups to produce their initial 5-year planning matrix.

2. PCOM DISCUSSION OF SCIENCE PRIORITIES.

PCOM re-convened and the lead individuals of the sub-groups outlined the aims and rationale of the initial 5-year planning matrices of each group.

Climate Change - Alan Mix

Sea Level Change - Greg Mountain

Sediments, Fluids and Bacteria - Judy McKenzie

Transfer of Heat and Materials - Jim Natland

Deformation - Kiyoshi Suyehiro

Adjourn *12:40*

Thursday 22nd August 1996 **09:00 am**

J. 5 -YEAR SCIENCE PLAN (CONTINUED)

2. PCOM DISCUSSION OF SCIENCE PRIORITIES (CONTINUED).

Pearce presented an outline of his perception, after talking to all the groups, of what the final matrix might look like. He said that the details will be discussed later, this is a first look for discussion. In this proposed plan, a number of the sub-themes will be addressed on the same legs, so that although initially it looks as though there are far too many legs, in fact that will not be so. At present there are 43 legs, with only 30 slots. He asked if PCOM was happy with the format as outlined.

McKenzie was concerned that there were no sedimentary processes objectives in the matrix as outlined. Mountain said that the sedimentary processes community is very large and it must be included. Carter commented that it may be because sedimentary processes were not specified in the LRP. Mével said that monitoring of active ridge processes is also absent. McKenzie commented that this document looks to be very specific rather than the working document that she thought it would be. Falvey said that the document must set out what ODP thinks it will do; It will not be a completely fixed plan, but it must try to identify what will be required and drilled over the next 5 years; SCICOM can revise the plan later, but an initial plan must be forthcoming now.

Mountain asked if this is open for discussion and can be modified? Pearce said that he wants the sub-groups to re-cast their documents into the form that he has outlined, and then there will be a discussion leading to approval. Larson asked how locked PCOM will be in outlining such a plan? He commented that probably over 50% of the plan, as it is presented here, will be drilled. Falvey confirmed that this was probably true. He reminded PCOM that ODP was asking for the commitment of one-quarter of a billion dollars, and therefore such a forward plan is essential. The plan will not be rigid, certainly for the end of Phase III. PCOM must also, in the same document, outline where the state of knowledge will be when this plan has been achieved. Natland commented that there seems to be a lot of themes, and he asked if ODP will be at the point where we will have fundamental answers for some themes, or if the Program will have only partial answers. Pearce suggested that each theme will require a statement of objectives, a mechanism for implementation and the likely outcomes by 2003.

Francis commented that ODP has to produce a costed 5-year plan, and said that if the 5-year plan is not well-defined it will be impossible. Falvey said that by December the FY98 program will be defined, and, moving to the later years, by looking at that program ODP can say that it must finish DCS and test and use it, and therefore JOI can add the necessary additional X-base budget, even though the ambiguity may be ±50% in 2002. Malfait reminded PCOM that several plans have been requested, at different budget levels. Sager said that conceptually the standard leg model can be used to help the budgetary planning for this process; a minimum will be standard legs and a maximum will include X-base and inflation. Pearce said that he wanted PCOM to focus on the science. Francis said that the science depended upon the affordability and he did not understand where that consideration would be made. Pearce said that once PCOM have outlined the plan, JOI can look at the budget requirements and report back to PCOM in December. Malfait said that the budget scenarios will be required prior to the February 1997 ODP Council meeting. Francis said that he wanted it recorded that ODP-TAMU are a very stretched organisation and he believes that it may be asked to do things that it does not have the manpower to achieve. Falvey and Pearce reminded PCOM that the sub-groups should also include the links to other programs and technology requirements.

PCOM again broke into sub-groups to refine their initial outlines.

Coffee .... *10:15 - 10:30*

3. CONSENSUS ON 5-YEAR PLAN AND PRODUCTION OF PHASE III PLANNING MATRIX.

Pearce said that as a group PCOM should approve the matrix and the JOIDES Office would produce a neat and coherent document for forwarding to JOI after PCOM circulation and comment.

Climate Change (Mix) : slight name changes to those presented earlier, some experiments would use sites of opportunity. Other programs would overlap. McKenzie asked about where the high resolution studies would be concentrated? Mix said that these would be general high sedimentation rate areas. McKenzie said that carbon cycle could be added to these programs. Mountain commented that global circulation studies of ancient times could be included and that these studies may require technological development. Pearce asked if PCOM took this presentation as approved? There was no dissent.

Sea Level (Mountain) : testing global sea-level and sequence stratigraphic models. Shallow water drilling will be needed to achieve the goals of the sequence stratigraphic models. Core recovery and dating techniques will need to be refined. Mével asked about the involvement of DCS? It may be required for atoll and guyot studies. Pearce asked if PCOM took this presentation as approved? There was no dissent.

Fluids and Bacteria (McKenzie) : modest program that may use results from other legs. Deep biosphere will be exploratory up to 2000, using holes from other programs for initial studies and development of techniques. Direct link with fluid flow. Technological requirements would include a geomicrobiology laboratory on the ship. A biological observatory would be required around a drill hole by 2003. Gas Hydrates will be examined on convergent margins with other programs. Continued development of sampling techniques (PCS etc). Proposing a global fluid initiative to work alongside other programs. Some dedicated fluid flux legs may be required. Observatories and long-term sampling systems will require further technological developments. Five dedicated legs required and attachments to ca. 20 others. A number of connections to global programs. Pearce asked if PCOM took this presentation as approved? There was no dissent.

Heat Mass transfer (Natland) : ION global network added (global sites), additional LIP leg has been added to allow more than one to be examined and one to be examined in detail. Offset drilling has also been added (deep drilling). At least five legs will be required for a significant advance of knowledge. DCS has great relevance for hydrological process and zero-age drilling, but the system is not just for lithosphere objectives. Fluxes could be addressed in conjunction with other programs. Pearce said that the added leg could be a multi-objectives program. Casing and re-entry installations will need development (for up to a couple of hundred re-entry's for very deep holes). Pearce asked if PCOM took this presentation as approved? There was no dissent.

Deformation and earthquakes (Suyehiro) : for orogeny studies there was a slight change from the original matrix. The total number of legs has not changed, technology requirements include deep drilling. Active studies require LWD, CORKing and observatories. Drilling may not require five years but observatories will. Deep deformation objectives would be in the latter part of Phase III, and could be regarded as part of OD21 site characterisation. There are many links to other programs. Existing proposals have been identified. Brown said that in-situ long term stress measurements could be a required development. Mountain asked if earthquake process included effects such as tsunamis? This was confirmed. Mountain replied that this was linked to sedimentology studies. Pearce said that links to ocean crustal studies would occur in the deformation project (ridge structure). Francis asked about deep holes. Suyehiro said there would be two (two legs each). Pearce asked if PCOM took this presentation as approved? There was no dissent.

Pearce reported that these originals will be combined by the JOIDES Office in early September. It will be sent to PCOM and JOI simultaneously and substantive comments would lead to revision. Ellins said that it has to be at JOI by 15 September. Pearce said that PCOM comments should be sent to Woods Hole. Humphris asked what JOI would do with the plan. Falvey said that JOI would produce a draft 5-year plan for PCOM to review in December. EXCOM and ODP Council want to look at the implementation plan with details of budgets and alternates budgets, thus it has to be finalised by mid-January 1997.

Mix asked how the necessary reduction in legs will take place. Falvey said that he will work with the PCOM chair for an outline that can be reviewed by PCOM. Some projects may have to be postponed to Phase IV.

K. OLD BUSINESS

1. PUBLICATIONS POLICY.

Falvey said that publications policy must be tightened and that has now been done with PCOM input from a sub-committee. The EXCOM have asked for clear indications as to how cost savings may be achieved to put into innovation, and there was also the NSF Inspector General's Report as background to this issue. The policy was reviewed for PCOM (papers were supplied in the agenda book). The broad framework has been approved by EXCOM.

The target implementation schedule is what should be considered by PCOM. The *Initial Reports* volume is the contentious issue. The reason for the proposed transition point was that it would give the maximum cost savings. Falvey presented an alternate plan with the same net savings, but said that this alternate would involve an additional expenditure of ca. $2M as the changes in policy will not be implemented at the optimum time. He re-iterated that milestone checks and balances will ensure that implementation would be delayed to ensure that ODP is just behind what is acceptable practice in the outside world. A steering committee would be appointed to advise on the implementation of the policy; it would not necessarily have to be proportionally representative, it should be a mix, of users and people within the electronic publication industry.

Pearce said that the context was that USSAC were not happy with the proposition, and a straw poll showed that this would be a unanimous view. Larson has discussed the situation with Falvey and hence the suggested compromise outlined by Falvey. He wanted comments on approval of the implementation.

Sager said that PCOM has a year to decide about the *Initial Reports* and two years to decide about the *Scientific Results*, and whether this could be an ongoing window? Falvey said that he simply reports the issues to PCOM and policy to EXCOM and sees what the recommendations from the steering committee will be in the context of outside common practice. Natland said the Inspector General's Report projected a substantial saving, and he asked about the DSDP-type option discussed at Aix-en-Provence. Falvey said that option worked out to be slightly more expensive. Falvey reviewed the projected costs savings for changing or eliminating ODP Publications (Appendix 12).

Pearce said that EXCOM have approved the strategy, and PCOM should use its time to influence the implementation.

Sager commented that the sub-committee was presented with the scenario that there is a constant fine tuning that does actually save small amounts of money. To make significant savings in publications there has to be a switch to electronic versions. The original implementation plan was slightly different from that presented, but ultimately money will need to be found to retain publications as they are. Carter said that PCOM should be asked where it would save $0.75M in the Program, as that is the amount that will be saved by this proposed change. Francis said that publications will only drop in cost once the publications actually cease, and that will not be this or next year.

Natland said that it seemed as though EXCOM had told ODP to take $750K from publications. Falvey said that was not so. EXCOM have approved the publication strategy, and that has the effect of saving $2/3M. Falvey said that this was recommended to EXCOM by the PCOM sub-committee and JOI. Pearce reminded PCOM that it can change the implementation strategy. Humphris asked how PCOM could influence the strategy? All that seems possible is that savings could be moved forward or backward in time. Falvey said that if Larson had not begun the debate, JOI would already have formed a steering committee and they would likely have made the recommendation already alluded to by Larson's model. Humphris commented that it would be a mistake to shorten the time the *Scientific Results* are in hard copy, as this was where most data from shore-based studies will go. The community may not be ready for this. She wanted to go with the original (JOI) proposal. Pearce said that one approach was to go with the original proposal and another was Larson's model.

Larson felt it was more important to retain a hard copy of the *Initial Reports*. He was willing to give up the *Scientific Results* as the rubicund has already been crossed when PCOM agreed that papers can now be published outside literature after 12 months. He referred PCOM to the text on P.52-53 in the agenda books. Humphris said that another concern of hers was that both of the Publications Subcommittee reports indicated that there was a lot of value in the *Scientific Results*. McKenzie said that ODP publishes paired volumes and that they should both end at the same time. Sager said that it was simply that continuing the *Scientific Results* was a commitment for another four years.

Natland said that he did not think he would be able to sway people to contribute articles to an electronic publication, and the consequence would be the total destruction of the *Scientific Results* volume. Mével agreed that the decision was actually made when PCOM agreed to the one-year post cruise publication, and she said that the data would still exist. Pearce said that it does seem as if an electronic publication format would allow and encourage people to put their data into electronic format, but there must be a way to ensure that the data is published.

Carter said that Natland's point was key, and that it would be a management problem in ensuring that the key archival data gets published. Pearce said that PCOM has to decide on the implementation schedule first and then it can take care of the worries expressed by Natland and Carter.

Sager commented that this issue must be closed as it affects the current cruise and the staff at ODP-TAMU. He would not have a problem in writing an extended abstract with all his data in electronic version, outside papers are prepared in electronic format anyway and would be easy to send in for inclusion in an electronic version. Mix commented that in the policy as stated, it will require a new development of JANUS, therefore it is really a cost-shift of money moving from publications to innovation. Therefore the issue is really how ODP wants to deliver information. Mountain asked if JOI and ODP-TAMU were certain that there would be no copyright problems with electronic publications? Falvey said that there are protocols for this currently being developed. Humphris said that with the *Initial Reports*, it may be better on a CD, and it will be less "painful" than transition to the *Scientific Results* on CD. ODP should give itself as long as possible to get the community aware of the transition.

Lunch .... 12:47 - 13:38

Pearce said the first issue is a straight choice between the implementation as per the agenda book papers, or the amendment suggested by Larson. McKenzie said that ECOD wanted to keep the volumes, but she believes that in this transition phase the *Initial Reports* is the one to keep. Pearce called for a vote on which strategy would be followed. 5 members wish to have the implementation strategy as proposed with immediate cessation of the *Initial Reports,* 6 wish to use the Larson modification of continuing publication of the *Initial Reports* instead of the *Scientific Results,* and there were 5 abstentions. PCOM then considered the following motion:

PCOM Motion 96-2-9

PCOM reaffirms its intent in PCOM motion 96-1-13 to continue for the immediate future to publish the basic information of ODP in both text (hard copy) and electronic formats in order to archive and display this information in the most certain and visible manners available to us at present. However, PCOM also agrees with the general philosophy that publication technology is moving towards universally compatible electronic formats.

Publication of the basic information in this format in an *Initial Reports* volume will consist of the site summaries, operations reports, site chapters, one scientific overview authored by the co-chiefs, and a guide to electronic usage. Other items specified in 96-1-13 for electronic publication, section 3 B (e.g. core descriptions, VCDs, etc.) will remain in electronic-only format and will be published 12 to 18 months post cruise.

PCOM acknowledges the need for additional cost savings over the original form of motion 96-1-13 and therefore propose that the *Scientific Results* volume consisting of scientific papers, texts of data reports, and abstracts of papers published outside of ODP, be published in electronic format only, starting with Leg 169.

Electronic publication of the *Scientific Results* volume should be 48 months post-cruise. The publication of the *Initial Reports* volume, 12 to 18 months post-cruise, in text form will alleviate the need for an initial core description volume as described in 96-1-13, section 5, and this will achieve further cost savings.

ODP must continue to re-evaluate its publication options as technology and scientific community attitudes evolve, but should continue to publish the *Initial Reports* volume in both text and electronic formats for the immediate future. The issue of moving to electronic-only publication of the *Initial Reports* volumes should be continuously reviewed by the JOI Publications Steering Committee and SCICOM.

Proposed: Larson, Seconded: McKenzie — *8 For, 1 Against, 7 Abstentions*

Natland asked about ERB's, Mével said that it could be addressed by the Publications Steering Committee. Falvey said that he wanted suggestions for names for members of the steering committee. Warner Bruckmann was suggested by Kudrass (seconded by Shipley and Sager). Names would also go from national committees.

PCOM Motion by Acclamation

PCOM expresses its thanks to Bob Carter, Susan Cook and Rachel Grieve for hosting PCOM in Townsville and the field trips in Cairns. The Townsville venue was comfortable and efficient for the conduct of the meeting. The field trip before and during the meeting allowed us intimate familiarity with things uniquely Australian, ranging from the Great Barrier Reef to Koala bears.

We return home across the equator with fond memories of friendly Australians, and in our best Australian accents, say "good bye" and "good on yer, mates".

2. CONFLICT OF INTEREST.

Falvey referred PCOM to the report in the agenda book. Larson commented that the wording was essentially the same apart from section 11.04 (C).

3. DIFFERENTIAL GPS ON JOIDES RESOLUTION

Francis referred PCOM to the tabled paper: 'Precise Positioning Options for Use Onboard JOIDES Resolution'. No truly global dPGPS system is available, hence acoustic beacons are still required for the DP system. A regional dPGS system is available on the ship at present, was used on Leg 168 and will be agian on Leg 174A. ODP-TAMU believes that the present selective availability GPS is more than adequate for most legs, especially considering that the ship-seafloor offset is not taken into account. A systemcombining S/AGPS with the Russian GLONASS satellites will be available soon for ca. $10-20K, giving substantial improvements over S/A GPS alone.

Mountain questioned the number of legs that require such high precision. Francis said that Leg 174A is one, but in general high accuracy is not required. In industry, satellite DP is used in combination with acoustic beacons, satellite systems are never used alone. Larson asked about using systems that can avoid the dither on GPS. Francis said that as *JOIDES Resolution* was not US-flagged, it was a problem. Falvey said that Admiral Watkins has this as a priority.

Francis said that this perceived problem may be resolved by better liaison between ODP-TAMU and SSP, and PCOM should urge that dialogue be improved between the two bodies.

L. NEW BUSINESS

1. WORKSHOP ON RISER DRILLING SCIENCE, JAPAN. STEERING COMMITTEE NOMINATIONS.

Falvey reported on the engineering workshop, and announced that Takagawa has generated a second circular for the meeting.

There are "Model Holes" required to define the boundary conditions for engineers to begin their detailed designs. Details required are lithostratigraphy (fractures, faults) interstitial fluids, pressures, water depths, temperature. Humphris said that the thematic panels developed a set of holes for a similar purpose about four or five years ago, and that maybe these could be built upon. Falvey said that these were not adequate as they did not contain all the parameters required.

Nominations are: Passive margins (Joel Watkins), Deep Ocean Basin sediments (Yves Lancelot), Convergent Margins (Tim Byrne), LIP (Hans Christian-Larsen), New Ocean Crust (Rody Batiza), Older Ocean Crust (Roger Larson).

The ODP aim should be to widen the discussion from a fixed 2500 m riser system, so that the engineering is based upon the science rather than vice-versa.

Suyehiro then reviewed the timetable for COSOD-R, which is to be co-hosted by STA and JOIDES. He said that an international steering committee must be set up very soon and it should meet in October of this year. He would like to have names of nominees today if at all possible; 7 or 8 Japanese and the same number of non-Japanese. Each member can have one representative and the US could have more. Pearce said that there could be continuity with the engineering meeting. Mével said that maybe the steering committee members should be a mixture from inside and outside the ODP community. Suyehiro said the steering committee would write a position paper as well as being a steering committee. The present thematic panel chairs could go for ODP. Pearce said that the UK was considering Alister Skinner. Kudrass said that he could not contact his funding agency so he could not make a nomination. McKenzie said that perhaps PCOM should be considering names for a steering committee co-chair who could then look for other members, possibly with a list of three or four. Joe Cann (1), Jamie Austin (2), Mark Zoback (3) were proposed. Pearce said that national committee representatives should pass names to Suyehiro once they return to their own countries.

2. **PCOM CORRESPONDENCE.**

Pearce referred PCOM to the letter on p.367 of the agenda book. Mix reminded PCOM that there was a request for IMAGES to address JOIDES. Humphris agreed to deal with this.

3. **FUTURE MEETINGS.**

Time	Place	Host
8 December (PANCH96)	Biosphere, Arizona	Mountain
10 - 13 December 1996	Biosphere, Arizona	Mountain
14 - 17 April 1997	College Station, Texas	Francis
18 - 22 August 1997	Davos, Switzerland	McKenzie
February 1998	Seattle, Washington	Johnson
August 1998	Durham, UK	Pearce

4. **NEW PANEL MEMBERSHIP AND CHAIRS.**

Mével said that this should be the responsibility of SCICOM. Pearce said that national committees and the thematic panels could also be consulted. Mix said that PCOM should ask the thematic panels to suggest names for the membership of the SSEPs. Pearce agreed to write to the panels with this request.

5. **PCOM LIAISONS.**

PCOM will retain its current panel liaisons for this last round of thematic panel meetings.

6. **PCOM CHAIR TERM OF OFFICE.**

Humphris said that three years would be better than two, but that there would have to be a mechanism to ensure that the SCICOM chair would have an easy way back into science. Pearce suggested that PCOM members discuss this with their EXCOM members and it can be re-visited in December.

M. ANY OTHER BUSINESS

Natland said that there will be an e-mail discussion regarding the external proposal review criteria, and it will be returned to in detail in December.

PCOM Motion by Acclamation

PCOM thanks Henry Dick for his years of service on PCOM, and especially notes his contributions to long-term planning, his efforts to refine ODP publications, and his attempts to convince us that the answer to all important scientific problems is "735B". We wish him luck on upcoming Leg 176 and anticipate his continued contributions to ODP in the future.

PCOM Motion by Acclamation

PCOM, on behalf of the JOIDES Office and the entire ODP community, thanks Julian Pearce for stepping in as interim PCOM Chair, handling a difficult transition at a time of unprecedented change with skill and grace. We wish him luck, and grant him a return to normal. We look forward to his future contributions to ODP.

PCOM Motion by Acclamation

PCOM thanks Kathy Ellins, Colin Jacobs, and Julie Harris of the JOIDES office for their service to the JOIDES community over the past two years. The skill with which they have carried out their responsibilities under Rob Kidd for the first time from a base outside the US and variously under trying, complicated, and even tragic circumstances cannot be understated. Rob always praised the insight and intuition of his staff, and we can only add to that our appreciation of their devotion to him and the JOIDES Planning process and their consistent helpfulness and hard work during all the meetings and in between. Sadly, we cannot direct this appreciation to Rob in person, but we can note that during the past two years, the cause of scientific ocean drilling has been greatly advanced, and its future more nearly secured, under his skilful leadership. To those ends, the staff of the JOIDES Office has contributed immeasurably. To Kathy, Colin, and Julie, our sincere thanks. Godspeed and all the best in the years ahead.

Adjourn *15:22*

APPENDICES

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October 24, 1996

Dr. Susan Humphris
Chair JOIDES PCOM
JOIDES Office
Woods Hole Oceanographic Institution
Woods Hole, MA 02543

RE: Operations Schedule and Antarctic/Sub-Antarctic Drilling

Dear Susan,

I want to draw your attention to the importance of scheduling upcoming Antarctic/Sub-Antarctic Legs, many of which are proposed over the next few years, only at the optimum time of the year for weather and ice conditions. For most years this will mean that there will be only one high southern latitude leg per year.

1. I have been reviewing previous ODP operations in the Antarctic/Sub-Antarctic:

Leg 113 (Weddell Sea)	5 January-11 March 1987
Leg 114 (Sub-Antarctic South Atlantic)	14 March-13 May 1987
Leg 119 (Prydz Bay & S. Kerguelen Plateau)	18 December-21 February 1988
Leg 120 (Central Kerguelen Plateau)	26 February-30 April 1988

It is quite clear that whilst Legs 113 and 119 were scheduled in the right weather and ice window, Legs 114 and 120 were scheduled too late in the year and encountered appalling weather. See attached excerpts from the Leg 114 and 120 Preliminary Reports. The conclusion is that optimizing the timing of the first high latitude leg for ice/weather can result in the second leg being badly timed. I reached the same conclusion with respect to the high latitude North Atlantic legs in my report on the Leg 163 storm: "The experience of Legs 151/152 and Legs 162/163 suggests that scheduling two high latitude legs per year is risky. The season is too short to allow ice/weather conditions to be optimized for two legs. In both 1993 and 1995 the window was optimum for the first leg. Both legs 152 and 163 had to be curtailed because of weather conditions."

Ocean Drilling Program
Office of the Director
Texas A&M University Research Park
'Discovery Drive
Station, Texas 77845-9547 USA
(409) 845-8480
Telex Number: 62760290
FAX Number: (409) 845-1026

2. As you know, we have produced a straw schedule at ODP-TAMU for budgeting purposes. This is not being circulated to the community, because we do not wish to impinge on PCOM's prerogative for determining the schedule. It is simply a planning document. However, one thing that the straw schedule makes clear is that if we continue with the present cycle, the timing is not ideal for scheduling high southern latitude legs in 1998 and 1999.

For example, the schedule might include the following:

Leg 177	Southern Ocean Paleoceanography		
	Capetown	dep 22 December	1997
	Punta Arenas	arr 16 February	1998
Leg 178	West Antarctic Peninsula		
	Punta Arenas	dep 21 February	1998
	Capetown	arr 18 April	1998
Leg 183	Prydz Bay		
	Fremantle	dep 14 January	1999
	Fremantle	arr 20 March	1999.

It happens that Southern Ocean Paleoceanography and West Antarctic Peninsula can be scheduled in the same year as the optimum ice conditions for the latter occur a couple of months later than the optimum weather conditions for the former. All three of the above legs would benefit from being scheduled a couple of weeks earlier in order to enjoy the best chance of favorable weather/ice conditions.

3. Following the experience of Leg 163, you should know that both the ship's captains and Sedco Forex management are extremely wary of future operations in high latitudes. As Science Operator we are under an obligation to schedule the ship to these areas only at the optimum time of the year. The following paragraph, written in 1984, still exists in our contract with ODL (Sedco Forex):

> "A high priority has been assigned to high latitude operation areas such as the Weddell Sea and the Labrador Sea, however, there is no intention to operate in dangerous proximity to ice. Operations will be scheduled at the benign time of year for those areas, with plans to depart from the area should ice become a threat."

4. The bottom line of all this is that if PCOM decides to schedule Legs 177 and 178 as indicated above, we will want to save 8 days from drilling legs already scheduled in 1997 in order to move these two operations into their optimum weather/ice windows. Ideally we would bring Legs 177 and 178

forward by two weeks, but I don't think that's practicable.

Since we will not know until the December PCOM exactly what Legs 177 and 178 will be, it will be too late to make any schedule changes before the end of Leg 171B. My recommendation at the moment would be to cut 2 days off Legs 172, 173, 175 and 176 to meet the requirements of timing Legs 177 and 178 properly.

Best regards,

Tim

Timothy J.G. Francis
Deputy Director

TJGF:rcs

cc: David Falvey (JOI)
Jeff Fox (ODP)
ODP Managers

Attachments: 2

Louis, Mauritius. During this period, seven sites (698 to 704) were drilled in the subantarctic South Atlantic (Figure 1; Table 1). The severe weather conditions encountered during this cruise tested the drilling capabilities of JOIDES Resolution and her crew. Strong gale force winds (greater than 41 kts) were encountered during 29 days of the cruise (Figure 2). Maximum wind speeds of 86 kts and combined seas of 40-50 ft were experienced during the transit from Site 702 to Site 703. A wind of 71 kts occurred while on location at Site 703, which together with the seas, required 7.2 megawatts of power to keep the ship on station. For roughly one third (28%) of the cruise the combined seas exceeded 18 ft. The maximum roll taken by the vessel was 26°.

Despite these extreme operating conditions the vessel remained remarkably stable and drilling operations were suspended for only 1.5 days total during the cruise because of weather. Although the heave of the ship affected coring operations, recovery for the leg averaged 63.4% and the advanced piston corer (APC) and the extended core barrel (XCB) corer recovered relatively undisturbed cores that are suitable for high-resolution paleoceanographic studies.

One of the greatest successes of Leg 114 was to recover a virtually complete stratigraphic representation of the Upper Cretaceous-Holocene (Figure 3) with rich assemblages of calcareous and siliceous microfossils. Calibration of the biostratigraphy and magnetostratigraphy of these sequences provides a nearly complete geochronologic framework which will be the basis for further paleoenvironmental and tectonic interpretations. The presence of carbonate sequences spanning a period of 90 m.y. (Figure 3) will provide stable isotopic documentation of subantarctic climatic and oceanographic history.

DRILLING RESULTS

SITE 698

Site 698 lies near the eastern edge of the shallowest portion of the Northeast Georgia Rise (NEGR) ($51^{\circ}27.51'$ S, $33^{\circ}05.96'$ W) and at a water depth of 2128 m. The primary objectives of the site were largely tectonic in nature: to determine the age, nature, and subsidence history of basement; to establish the possible role of the NEGR as a Late Cretaceous-early Tertiary convergent boundary between the Malvinas Plate and the South American Plate; and to determine the temporal relationship between subduction at the NEGR and southern Andean orogeny. These objectives are also important for evaluating the influence of the NEGR and other regional plateaus and ridges as Late Cretaceous-Paleogene obstructions to deep water interchange between the Weddell and South Atlantic basins.

Early departure from port and rapid transit resulted in the gain of 2.3 days of operational time used to drill this lower priority site. A single hole was rotary drilled (to ensure basement penetration in the time allotted) in 2 days and 9 hours, from 17 to 19 March 1987. Hole 698A consists of 27 rotary core barrel (RCB) cores to a depth of 237 meters below seafloor (mbsf) with 22% recovery. Drilling conditions were excellent. Drilling terminated 27.6 m into basement.

Weather

The weather during Leg 120 was probably the most severe experienced to date. Sleet and snow were common, as were waves in excess of 20 m, winds over 65 kt and rolls over 20°. The ship spent 1.8 days waiting on weather, and the weather was responsible for bit failure in two holes. Weather forecasting by the Captain and mates was aided by satellite photos and maps from NOAA, Australia, and a Russian Antarctic weather station.

Safety

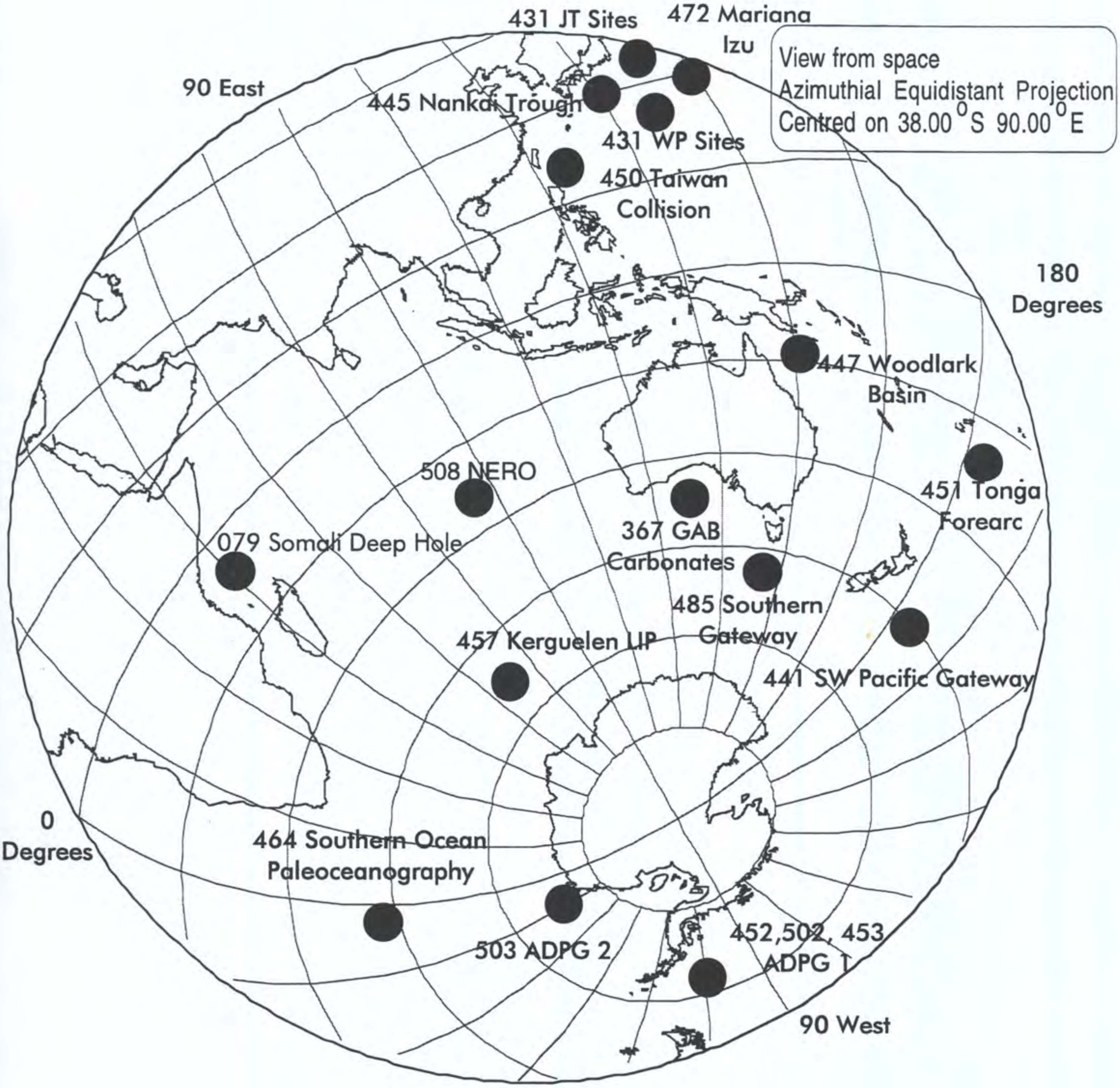
The ship had weekly fire and boat drills, and the METS practiced weekly with the SEDCO fire fighting crew. The ship's physician held medical seminars on selected topics and also conducted CPR classes. New fiberglass lockers arrived for firefighting turnouts and survival equipment.

Personnel

The extremely rough sea conditions strained everyone during the leg. Lack of sunlight and the freezing, blowing weather made for a long, difficult trip. Lamar's passing away was a crushing blow that weighed heavily on all of us. But throughout all of this the crew persevered and spirits remained high. The entire team is to be congratulated for their professionalism and a job well done.

FALL 1996 THEMATIC PANEL RANKINGS

RANK	LITHP	OHP	SGPP	TECP
0	**D C S Test**			
1	457 - Kerguelen	464 - Southern Ocean Paleo	ADPG -1	447-Woodlark
2	ION (431W.Pac. Sites & NERO)	441 - S. Pac. Gateway	445- Nankai Trough	431- W.Pac. Seismic Network
3	451 - Tonga Forearc	367 GAB Carbonates	367 - GAB Carbonates	451- Tonga Forearc
4	472 - Mariana-Izu	465 SE Pacific Paleo.	LOI 69 - Barbados Cork Refurbishment	450- Taiwan Collision
5	431 - Japan Trench sites	503 - Weddell Sea (ADPG 2)	472 - Mariana-Izu	445- Nankai Trough
6	447 - Woodlark	452/502 Antarctic Pen.	447 - Woodlark	472 - Mariana-Izu
7	450- Taiwan Collision	482 Ross Sea/Wilkes Land (ADPG 4)	464 - Southern Ocean Paleo	457 - Kerguelen
8	079 - Somali Basin	485 - S. Gateway: Australia-Antarctica	451- Tonga Forearc	D C S Test
9		472 - Mariana-Izu	450- Taiwan Collision	485 - S. Gateway: Australia-Antarctica
10			441 - S. Pac. Gateway	441 - S. Pac. Gateway
11			079 - Somali Basin	079 - Somali Basin
12			LOI- 72 LWD Eng.	
13			D C S Test	



LOCATIONS OF PROPOSALS UNDER CONSIDERATION FOR INCLUSION IN THE FY 1998 ODP DRILLING SCHEDULE

FY 1998

ODP Logging Prospectus

This Logging Prospectus was prepared by the ODP Logging Services Operator. It was reviewed by the Downhole Measurements Panel and the thematic panels. Based on a compilation of the panels' input, the prospectus was revised and a final review was conducted by the proponents of each proposal.

November 1996

(079) The Mesozoic Somali Basin

This proposal will core a single deep site in the Somali Basin, into some of the world's oldest oceanic crust. A single hole is planned to 3000 m depth, coring 2500 m of sediment and 500 m of basement. The scientific aims of the leg are to obtain Mesozoic sediment and basalt associated with the waning Tethyan Ocean and the nascent Indian Ocean, specifically: 1) Mesozoic global change, including paleoceanography and paleoclimate; 2) geochemistry, petrology, and hydrothermal alteration of Jurassic oceanic crust; 3) Gondwanan plate kinematics; 4) Mesozoic bio-magnetostratigraphy and chemostratigraphy; 5) sedimentary mass balance; and 6) state of stress of the Somalian plate.

Downhole logging will be critical to these scientific objectives, providing continuous measurements where core recovery is (inevitably, in a single hole) incomplete, and complementary to in-situ measurements where recovery is good.

For paleoceanography, the geophysical tools will be able to detect cycles and long term changes in the sediment properties. Natural gamma measurements and GLT (geochemical) logging will be able to distinguish between claystones, siltstones, and calcareous and organic-rich sediment. The susceptibility measurement of the GHMT tool should be useful as a tracer for detrital sediment input. FMS will record sub-cm-scale changes in porosity and grain-size, and provide detailed images of fractures, turbidites and other sedimentological features, from which dip and strike directions can be determined.

In the basaltic basement, the logs are especially important, as core recovery is often more difficult than in sediments. The FMS will give detailed images of pillow lavas, sheeted dikes, breccias, and also the distribution of vesicles and direction of veins and fractures. The geophysical and geochemical logs will also distinguish different basalt types, useful in determining the true proportions and distribution where core recovery may be biased to one type or the other. The GLT will give major-element abundances.

For magnetostratigraphy, the GHMT should give an essential continuous magnetic reversal record through the sediment column. The GHMT is unlikely to provide directional information that is useful to plate kinematics, as the sensor measures only scalar intensity of the magnetic field in the borehole.

The BHTV could be used to determine the in-situ stress in the hole, if break-outs of the borehole wall occur; these breakouts will be aligned according to the present stress field.

A VSP would help correlate depth to lithological horizons with seismic reflectors, and hence aid seismic stratigraphic interpretations, and also sedimentary mass balance calculations.

The proposed hole would be the deepest yet drilled by the ODP, and therefore there are large uncertainties surrounding the drilling time, and consequently the hole conditions. The drilling strategy will hinge on how many sections of the hole will be logged separately. Leaving all logging until hole completion is not possible, as borehole deterioration for such a deep hole will be severe. Logging is recommended to be carried out in two sections in the sediment (at bit changes), and once in the basement.

Site	Water depth	Penetration sediment	Penetration basement	Logging Operations

WSB-1	4000	2500	500	Triple, FMS-Sonic, GHMT, GLT, BHTV, VSP

(367) Great Australian Bight Cool-Water Carbonates

The program is to drill a transect of 10 holes across the western Great Australian Bight margin, from shelf edge to the continental rise, with the following main objectives:

1) To evaluate the evolution of a high- to mid-latitude carbonate margin in response to oceanographic and biotic changes through the Cenozoic;

2) To extract the records of: sea level fluctuations, paleo-ocean chemical and physical dynamics, biotic evolution, fluid flow and diagenesis contained in these cool-water carbonate sediments.

Given that many of the objectives of this proposal rely heavily on a detailed sequence stratigraphic interpretation, one of the basic tasks to be accomplished will be a detailed correlation between cores and logs to the seismic reflection data. Presently, the proponents have amassed a great deal of stacking velocities from the multi-channel seismic data. It is highly recommended that seismic calibration experiments be performed at several of the sites along the transect, in order to minimize the uncertainties regarding core-seismic correlation. In addition to providing good ties to the seismic reflection data at individual sites, the wireline logs will be of key importance for detailed inter-site correlations, helping to refine the seismic interpretation.

Geophysical logs also should be helpful in evaluating the lithostratigraphic response of the carbonates to sea level and climatic change. The fine-scale characteristics of the bedding, including pore spaces, bioturbation, fractures and stylolites may be imaged with the FMS. Integrated interpretation of FMS and geophysical logs should provide a good complement to cores in describing the lithostratigraphy.

Diagenesis in carbonates usually is well expressed through changes in porosity and chemical precipitation of soluble elements (such as uranium). All of these lead to large changes in log properties seen through sonic, resistivity, density and neutron logs, as well as gamma-ray. Thus the diagenetic changes in the carbonate sediments, another key objective of the leg, may be evaluated through the petrophysical response measured in the wireline logs.

With respect to the fluid flow objectives, logging data may be of secondary importance to interstitial fluid characterization from core. However, the assessment of fracture networks and basic fluid properties using sonic and resistivity logs, together with FMS images, may provide an important contribution to this leg objective.

The two standard suite of logs, Triple combo and FMS/Sonic should be deployed at all sites. In addition, check-shot surveys with the WST for seismic-log calibration should be performed in as many sites as possible along the transect to ensure an accurate time-to-depth conversion. The proponents have also requested the deployment of the GHMT and the GLT at several sites. Some of the sites where penetration is beyond 1000 meters will require logging in two sections (in two separate holes) to ensure better quality holes (and data). We also note that some sites are too shallow for useful deployment of the CSES, and thus it is recommended that detailed attention be paid to drilling and hole stabilization procedures.

Site	Water Depth	Penetration Depth	Logging Operations
GAB-1B	3887	740	Triple, FMS/Sonic, WST, GHMT
GAB-2B	1043	1575	Triple, FMS/Sonic, WST, GHMT, GLT
GAB-3A	682	545	Triple, FMS/Sonic, WST
GAB-4A	753	680	Triple, FMS/Sonic, WST
GAB-5B	488	620	Triple, FMS/Sonic, WST
GAB-6B	220	725	Triple, FMS/Sonic, WST, GHMT, GLT
GAB-7A	480	615	Triple, FMS/Sonic, WST
GAB-8A	332	670	Triple, FMS/Sonic, GHMT
GAB-9A	200	630	Triple, FMS/Sonic, WST
GAB-13B	4465	1570	Triple, FMS/Sonic, WST, GHMT, GLT

(431) W. Pacific Geophysical Network

The proposal for the W. Pacific Geophysical Network is endorsed by the International Ocean Network (ION) and outlined as an initiative in the ODP Long range plan (LRP) as part of its long-term observatories for the Global Seismic Network. The GSN has been successful is resolving the earth's interior from land and island based seismic installations, but lacks significant coverage over large areas of the oceans. Four specific sites are identified in this proposal to study the dynamics of the subducting plates, formation of island arcs, earthquake dynamics, and their relationship with mantle convection in and near the Japan Trench in the W. Pacific. Long-term seismic observatories will be installed at all four sites which are located in proximity to existing telecommunications cables and in ION-objective areas. Quiet and stable boreholes are required for these installations. Volumetric strain gauges will also be grouted in the two deep (1300 m) Japan Trench holes; Cretaceous basement must be reached in order to match the instrument with the rock rigidity. The *JOIDES Resolution* is required for these installations to assure clean boreholes and for grouting. A secondary objective at the northern site is to study MORB chemistry.

A significant amount of technological development is needed for the success of this leg. Both the strain sensors and the broad-band borehole seismometers are under development and will be tested during 1997. The 4" diameter strain sensors, however, are too large for deployment through the ODP drillpipe and will require development of a *'top hat'* latching system to lower the instruments at the bottom of the drill string. The *'top hat'* system is proposed be designed by the proponents, but has previously been suggested by ODP for other large-diameter downhole tool deployments. Joint development and/or monitoring is recommended.

The logging program for the four holes is designed to measure physical properties, anisotropy, and hole shape, objectives that are quite similar to the objectives at the pilot site OSN-1 during Leg 136. An azimuthal resistivity tool (ARI) could be used in place of the laterolog to measure resistivity anisotropy at approximately 1-m resolution, complementing the high-resolution FMS images. Standard geophysical logs can be used to measure physical properties; hole volume can be estimated with high accuracy using a BHTV log in the basement intervals. This will significantly improve grouting procedures for the strain sensors and emplacement for the seismometers. High-resolution temperature logs should be emphasized to identify permeable zones and in-flow/out-flow from both drilling-induced and natural fractures in the holes.

The recommended tool strings at all four sites are: 1) standard triple-combo with ARI; 2) FMS/Sonic, and 3) BHTV. Note that the BHTV logging speed is approx. 1m/min which will is likely to exceed the total five days of logging time estimated by the proponents for this leg. A geochemical logging tool (GLT) run to estimate the MORB chemistry and litho-stratigraphy at Site WP-2A is recommended if core recovery is poor.

Site	Water Depth	Penetration Depth	Logging Operations
WP-1A	5715	470	Triple w/ARI, FMS/Sonic, BHTV
WP-2A	5700	400	Triple w/ARI, FMS/Sonic, BHTV, GLT
JT-1A	2700	1300	Triple w/ARI, FMS/Sonic, BHTV
JT-2A	2025	1350	Triple w/ARI, FMS/Sonic, BHTV

(441-Rev) Southwest Pacific Gateway

A depth and latitudinal transect of nine sites are proposed to reconstruct past changes in deep ocean circulation since the early Miocene (ca. 20 Ma). The sites span a broad range in water depths in a region which is presently poorly represented by extant ODP/DSDP drill sites, making the proposed science objectives both timely and relevant. They propose to address four primary Ocean History objectives: 1) Neogene fluctuations in Deep Southern Pacific thermohaline ocean circulation; 2) Reconstruction of glacial-interglacial fluctuations in Circumpolar Deep Water flux rates, the zonal position of the Subantarctic Front, and Subantarctic surface productivity; 3) Paleoceanographic linkages between Southern and Northern Hemispheres throughout the Neogene; and 4) Timing and origin of millennial-scale Antarctic climate change events.

Sediments encountered during this leg will vary widely, including coarser sediment drift deposits, turbidites, pelagic carbonate sediments and red clays, and interbedded siliceous-terrigenous clastic sediments. The drilling strategy is to recover complete and continuous sediment records spanning the Neogene for a total of nine drill sites. Sediments encountered at these sites will consist of periodically alternating layers of biosiliceous and carbonate sediments, with variable amounts of fine (clays) and coarse (ice-rafted debris) terrigenous clastics. Because of the strong density and porosity variations associated with this lithologic variability, core and log physical property indices will very likely be extremely valuable proxy measurements for reconstructing sediment composition timeseries. Some sites evidently have very high sediment accumulation rates so there will be a great potential for generating very high-resolution records of regional paleoclimatic and paleoceanographic variability. All proposed sites have penetration depths exceeding 300m and should be logged with the Triple Combination, FMS, and GHMT logging tools.

Site	Water Depth	Penetration Depth	Logging Operations
SWPAC 1A	310m	600m	Triple, FMS/Sonic, GHMT
SWPAC 2A	585m	520m	Triple, FMS/Sonic, GHMT
SWPAC 3A	1320m	625m	Triple, FMS,/Sonic GHMT
SWPAC 4A	2880m	750m	Triple, FMS/Sonic, GHMT
SWPAC 5A	3325m	700m	Triple, FMS,/Sonic GHMT
SWPAC 6A	960m	500m	Triple, FMS/Sonic, GHMT
SWPAC 7A	390m	450m	Triple, FMS/Sonic, GHMT
SWPAC 8A	4460m	600m	Triple, FMS/Sonic, GHMT
SWPAC 9A	4170m	800m	Triple, FMS/Sonic, GHMT

(445) Nankai Trough

Sediments in the Nankai Trough offer the ideal record to investigate the evolution of an accretionary prism. The proposed two transects will define the interrelationship of the dynamics of deformation and fluid flow processes in an accretionary prism characterized by thick terrigenous sediments.

LWD:
The Logging-While-Drilling that was implemented on Leg 156 (Barbados prism) allows estimates of physical properties to be measured through the prism minutes after cutting the hole, closely approximating in situ conditions. CDR and CDN tools are directly measuring in situ resistivity, porosity, density, and natural gamma ray. The ISONIC tool is currently available from Anadrill for velocities >2,000 m/s. The wireline sonic should also be run as conditions permit to insure a velocity-depth transform for accurate log-scale seismic stratigraphy. The wireline sonic tool will also provide data from sediments with slower velocities than can be handled by the ISONIC tool. Running this tool in CBT mode in the cased holes will also assist in cement evaluation. The RAB tool will allow "near real-time" imaging of the ephemeral microstructures in the décollement and thrust faults.

Downhole Measurements:
The emplacement of casing to the décollement would allow for pore pressure and permeability measurements using the ODP packer system. VSP should be run in cased hole using Schlumberger's 5-element, 3-component Array Seismic Imager (ASI) tool to yield velocity/depth measurements.

Site	Water Depth	Sediment Thickness	Penetration Depth	Logging Operations
ENT-01A	4780	750	800	*LWD, ASI, sonic
ENT-02A	4790	900	900	*LWD, ASI, sonic
ENT-03A	4710	1000	1000	*LWD, ASI, sonic
WNT-01A	4850	1250	1300	*LWD, ASI, sonic
WNT-02A	4490	1700	1700	*LWD, ASI, sonic
WNT-03B	4850	1150	1150	*LWD, ASI, sonic

*LWD tools:
CDR - resistivity, gamma-ray
CDN - neutron, density
ISONIC - sonic velocity
RAB - resistivity-at-bit (imaging)

(447) Western Woodlark Basin

The western Woodlark Basin offers the possibility to investigate the mechanics of lithospheric extension, from active continental rifting to seafloor spreading, in a small geographical area. Low-angle normal faulting appears to be an important mechanism of extension in this basin. The drilling of a transect of sites across this asymmetric conjugate margin and the study of the nature of active low-angle faulting are the main objectives of this proposal.

The scientific objectives of the project might be expressed in terms of structure, stratigraphy, physical properties, and stress history. For structure and stress, FMS electrical images should provide high resolution images to detect, identify, and map bedding, fractures, and faults. In order to determine present tectonic stress orientation and deviations from borehole breakouts in the vicinity of active zones, BHTV images should be recorded whenever basement penetration is proposed.

The determination of physical properties changes in the vicinity of the fault requires acoustic characterization of the fault structure and good core-log integration. Standard logs should be used in each of the holes, either in the sedimentary deposits or in basement. To measure resistivity (and resistivity anisotropy) in igneous environments, the Azimuthal Resistivity Imager (ARI) is recommended. Geochemical logs will contribute to complete basement identification. Standard logs also provide a means to compute synthetic seismograms, hence linking borehole data to large-scale MCS profiles. The Array Seismic Imager (ASI) is recommended in the deepest cased hole to accurately tie the well to regional MCS data. The GHMT, with the identification of paleomagnetic field reversals from the total field measurement, can provide continuous dating of sedimentary sequences, and hence, constraints on basin development and extension. The magnetic susceptibility log can also aid core-log integration via shipboard magnetic susceptibility data.

Site	Water Depth	Sediment Thickness	Penetr. Depth	Logging Operations
ACE-1A	2350	950	1000	Triple, FMS/Sonic, BHTV, GHMT, ARI,
ACE-3C	386	300	500	Triple, FMS/Sonic, BHTV, GHMT, ARI,
ACE-7A	2160	700	700	Triple, FMS/Sonic, GHMT
ACE-8A	3189	900	1200	Triple, FMS/Sonic, BHTV, ARI, GHMT, ASI

(450) Taiwan Arc-Continent Collision

The primary objectives of this proposal are investigating the suture of an active collision and its evolution. More specifically, the proposed drilling will establish the structural geometry and kinematics in the closure of a forearc basin during active collision; investigate tectonic and surface processes operating during early phases of this collision; and detail the stratigraphic record of the active arc-continent collision. In short, it seeks a thorough quantitative knowledge on structure, stratigraphy, spatial distribution and history of the strain-stress field and chronological relationship with the developing collision. Paleomagnetic determination of the history of motion in the northern part of Philippine Sea plate is also sought. Along the developing collision, active flow exists, and fluid production together with abnormally high pore-fluid pressure may control, in part, the collision processes.

As the proponents requested, the standard suite of logging tools, Triple Combo and FMS/Sonic, should be run at all the sites. The Triple Combo provides high-resolution formation density, velocity, deep/intermediate/shallow resistivity, and natural gamma ray profiles for detailed lithologic and petrophysical information. The high-resolution FMS images can be used to detect, identify, and map bedding, fractures, faults, and other possibly fine structures associated with developing collision. Sonic velocity data can be used with the density log to generate synthetic seismograms to provide ground truth for interpretation of large-scale MCS profiles and provide high-resolution velocity control which is lacking in the proposed drilling area. Full waveform sonic data in regions of active fluid flow and abnormal pore-fluid pressure, can be used to study the permeability structure of the collision zones. Present-day tectonic stress orientation in the basement zones can be investigated with BHTV images. The Azimuthal Resistivity Imager (ARI) should be used to measure resistivity and resistivity anisotropy in low-porosity igneous environments. The GHMT allows identification of paleomagnetic field reversals from total field measurement which can provide a continuous dating of sedimentary sequences and constrain the development and extension of the collision region. A Shear Sonic Tool (SST) is highly recommended for Site TC-4 to identify abnormal pore-fluid pressure zones.

In summary, the geophysical and FMS/Sonic toolstrings should be run in each of the proposed holes. VSPs are highly recommended in the deeper holes to establish the depth/seismic tie and to resolve subsurface structure and faulting, critical for modeling of this arc-continent collision processes.

Site	Water Depth	Sediment Thickness	Penetr. Depth	Logging Operations
TC-1	1927	900	1000	Triple, FMS/Sonic, BHTV, GHMT, ARI, VSP
TC-2	1252	750	750	Triple, FMS/Sonic, VSP
TC-3	4470	1250	1300	Triple, FMS/Sonic, BHTV, GHMT, ARI, VSP
TC-4	2490	700	750	Triple, FMS/Sonic, BHTV, GHMT, ARI, VSP, SST, LWD
TC-5	3360	900	950	Triple, FMS/Sonic, BHTV
TC-6	1335	400	400	Triple, FMS/Sonic, BHTV, GHMT, VSP
TC-7	2438	400	450	Triple, FMS/Sonic, BHTV, GHMT, ARI

(451) Ocean Drilling in the Tonga Forearc

This proposal is aimed at a number of fundamental questions about the processes involved in subduction and associated magmatism, and focuses on the Tonga subduction zone in the southwestern Pacific which is the world's most active plate boundary and the type example of an extension-dominated convergent margin system. Six or seven drill sites are proposed in the Tonga forearc which together will form three transects at different latitudes, and into each of the main structural sub-divisions of the forearc. Drilling data from Leg 135 in the adjacent Lau Basin provide additional and appropriate spatial constraints.

The primary objectives of the proposal are, in summary:

1. to assess the broad-scale plate dynamics and their controls on subduction geometry and marginal basin formation
2. to constrain the deformation history of the Tonga forearc
3. to determine the role of subduction in arc rifting and marginal basin formation
4 to document and constrain the spatial and temporal variations in arc volcanism and associated igneous activity

These objectives are to be addressed by drilling either six or seven holes, the final choice yet to be determined from three suggested options, two involving 6 holes, and one 7 holes. Five holes (TONG01A, 02A, 03A, 04B and 10A) are common to all options. All holes are planned to penetrate at least 100m into basement, with 400 to 500 m of overlying sediment.

Achievement of all the scientific objectives requires a maximum amount of information about the lithological sequence and the spatial relationships between lithological units, as well as the nature and orientation of the structural elements (faults, fractures, shears, folded/tilted bedding, etc.), and the magnitudes and orientations of the *in situ* stresses. A full program of downhole measurements is proposed for all holes drilled, with: a) lithological characterization from standard geophysical and geochemical logs, b) measurement of the orientation and frequency of occurrence of all structural features from FMS electrical images, and c) measurement of the stress magnitudes and orientations from borehole televiewer (BHTV) measurements. While stress orientations can be made using the FMS calipers alone, the latter can often give erroneous results; the FMS is not a substitute for the BHTV if stress analysis is important . The Azimuthal Resistivity Imager (ARI) should be used to measure resistivity and resistivity anisotropy, with deep penetration into the formation, complimenting the FMS and BHTV borehole wall images.

Site	Water Depth	Penetration Sediment	Penetration Basement	Logging Operations
TONG01A	1950	400	100	Triple, FMS/Sonic, ARI, GLT, BHTV
TONG02A	3227	412	100	Triple, FMS/Sonic, ARI, GLT, BHTV
TONG03A	315	504	100	Triple, FMS/Sonic, ARI, GLT, BHTV
TONG04B	1109	400	100	Triple, FMS/Sonic, ARI, GLT, BHTV
TONG06B	1354	540	200	Triple, FMS/Sonic, ARI, GLT, BHTV
TONG08A	3555	430	100	Triple, FMS/Sonic, ARI, GLT, BHTV
TONG10A	4868	390	100	Triple, FMS/Sonic, ARI, GLT, BHTV

(452) Antarctic Peninsula Pacific Margin: Antarctic Glacial History and Sea-Level Change

This proposal is part of the broader objectives of the SCAR-ANTOSTRAT plan to document the Cenozoic history of Antarctic glaciation and contribution to sea level change, focusing on the Pacific margin of Antarctica. The main objectives are to:

1) Extract and compare high-resolution records of continental glaciation in the last 10 Ma from the glacio-marine sequences deposited on the shelf, slope and rise (drift deposits) on the Pacific Margin of Antarctica;
2) Compile a history of grounded-ice volume fluctuations and compare to low-latitude records of sea level change
3) Assess the controls on sediment dispersal on Antarctic margins
4) Determine timing of extensional tectonics in Bransfield Strait
5) Extract record of climate on Antarctic Peninsula prior to ridge collision against margin and constrain vertical tectonics history along the margin.

Prior ODP/DSDP experience in Antarctic margins (Legs 28, 113 and 119) showed core recovery, particularly in diamictons can be poor. Only limited logging was attempted during Legs 113 and 119 but with good quality results (sonic-resistivity, lithoporosity).

The main potential contributions of wireline logging to this proposal are:

- Characterizing the stratigraphic response of the margin to sea-level and ice volume changes, using FMS and geophysical logs. The integration of logs with core data has the potential to offset the anticipated low core recovery, particularly on the shelf sections.

- Characterizing the fine scale bedding on the slope and drift deposits using FMS images. This may be of particular significance to assess cyclicity in the sedimentary section and help evaluate the climatic forcing functions and to refine timing by tuning the downhole log records.
- Site to site correlation, both on the shelf and from shelf to rise. These correlations can be facilitated if a magnetic reversal sequence is obtained with the GHMT. Previous dating in the Antarctic has relied on diatom biostratigraphy and magnetostratigraphy from core samples. Given that recovery is likely to be low at some sites (particularly in the shelf-slope), the GHMT could be an important tool to help date the sedimentary record.
- Seismic calibration with check-shot surveys.

We recommend the deployment of the two standard suites: the IPLT-DIT combination for lithoporosity-resistivity data and the FMS-sonic combination. In addition, we suggest that the GHMT be deployed at all sites for magnetostratigraphy and correlation purposes, and the seismic calibration tool (WST) be deployed at selected sites.

As noted above, the GHMT data will allow improved correlation across the transect sites using magneto-stratigraphy derived from the logs, as well as complement the chronostratigraphy. On the drift sites, magnetic susceptibility records, together with other geophysical logs, will help decipher the climatic signals recorded through changes in the proportion of pelagic vs. margin derived sediments, as well as to provide excellent records for detailed core-log integration (e.g., Leg 162 results).

Proponents have indicated the need for a VSP for seismic calibration at proposed sites in the Bransfield Strait (ABRST-1 and 2). Given the importance of seismic reflection data and correlations based on seismics in this proposal, we highly recommend that check-shot surveys be performed at the Branfield Strait site, on at least one of the rise sites, and on 3 of the 5 sites of the shelf transect. Lateral variability in sound velocity is probably significant across the transect, justifying the deployment on multiple sites.

LWD may be a good strategy to obtain logs where core recovery is anticipated to be poor and where hole conditions are likely to be unstable. We also note that if bad hole conditions are encountered, only limited use of the CSES will be permitted on the shelf sites in view of the shallow water depth compared to the planned penetration. Deploying LWD tools on the shelf sites could provide a basic set of good quality geophysical logs.

Site	Water Depth	Penetration Depth	Logging Operations
APRISE-1A	3200	[700]	IPL, FMS-SDT, GHMT, WST
		1450	IPL, FMS-SDT, GHMT, WST
APRISE-2A	3850	550	IPL, FMS-SDT, GHMT
APSHEL-1A	450	505	IPL, FMS-SDT, GHMT, WST, LWD
APSHEL-2A	440	560	IPL, FMS-SDT, GHMT, LWD
APSHEL-3A	440	505	IPL, FMS-SDT, GHMT, WST, LWD
APSHEL-4A	490	785	IPL, FMS-SDT, GHMT, WST, LWD
APSHEL-13A	1040	60	no logging
APRISE-5A	2850	[200]	no logging
		1000	IPL, FMS-SDT, GHMT, WST
APSHEL-5A	600	785	IPL, FMS-SDT, GHMT, WST
APBRST-1A	1420	925	IPL, FMS-SDT, GHMT, WST

(457) Kerguelen Plateau

The primary objectives of drilling on the Kerguelen Plateau and Broken Ridge are to investigate the origin, growth, compositional variation, and subsidence history of this large igneous province (LIP). LIPs represent voluminous fluxes of magma emplaced over relatively short time periods and are important for understanding the earth's evolution as well as mantle plume dynamics. LIP's provide information about mantle composition and dynamics that are not reflected by volcanism at spreading ridges and the intense episodic nature of their formation has an impact on past global environmental change.

Downhole measurements will primarily contribute to the scientific objectives of this leg through studies of volcanic stratigraphy, the geochemical evolution of the Kerguelen plume, and the analysis of tectonic stresses. The standard geophysical and FMS logs should be run at each of the proposed sites. The recording of physical property information from the geophysical string is essential to core-log integration studies. A key point in this project is determining the degree of continental involvement in the mantle source for the Kerguelen Plateau. The geochemical logs, successfully used in a similar environment in the Ontong-Java Plateau, will address the geochemical evolution of lavas enabling a chemical stratigraphy to be established at each site and the possible correlation between sites across the plateau. The standard geophysical suite will provide a detailed volcanic stratigraphy and log-based synthetic seismograms can be integrated with regional seismic data for accurate time-depth conversions. To measure resistivity in igneous environments, deployment of the Azimuthal Resistivity Imager (ARI) is recommended.

The BHTV should be deployed to image stress-induced borehole features. High-resolution FMS images will allow accurate description of the volcanic stratigraphy including bed dips, evidence of weathering, the style of volcanic emplacement, and the presence and orientation of fractures, as was successfully shown on Leg 152. Structural information from the FMS is particularly important for assessing the degree of the syn- and post-emplacement tectonism. The WST should be used for check shot surveys and a shear wave sonic tool (SST) is recommended to measure shear wave velocity anomalies associated with the tops of flows.

Site	Water Depth	Sediment Thickness	Penetr. Depth	Logging Operations
KIP-2A	3150	250	450	Triple, ARI, DSI/SST, GLT, FMS, BHTV, WST
KIP-3A	600	600	800	Triple, ARI, DSI/SST, GLT, FMS, BHTV, WST
KIP-6B	1000	300	500	Triple, ARI, DSI/SST, GLT, FMS, BHTV, WST
KIP-7A	1200	650	850	Triple, ARI, DSI/SST, GLT, FMS, BHTV, WST
KIP-9A	1325	100	300	Triple, ARI, DSI/SST, GLT, FMS, BHTV, WST
KIP-12A	1800	550	750	Triple, ARI, DSI/SST, GLT, FMS, BHTV, WST

(464) Southern Ocean Paleoceanography

A series of sites are proposed in the Atlantic sector of the Southern Ocean to reconstruct the Cenozoic paleoceanographic and paleoclimatic history of this region. The main objectives addressed by this drilling proposal are: 1) evolution of the Antarctic Circumpolar Current and sea-ice margin, 2) evolution and stability of the Antarctic ice sheets, 3) changes in Southern Ocean surface productivity, 4) changes in deep water circulation, 5) defining the phase relationships between northern and southern hemisphere climate change signatures, and 6) correlation of Southern Ocean paleoclimate records with Antarctic ice core records.

Sediments encountered at these sites will consist of periodically alternating layers of biosiliceous and carbonate sediments, with variable amounts of fine (clays) and coarse (ice-rafted debris) terrigenous clastics. Because of the strong density and porosity variations associated with this lithologic variability, core and log physical property indices will very likely be extremely valuable proxy measurements for reconstructing sediment composition time series. Some sites evidently have very high sediment accumulation rates so there will be a great potential for generating very high-resolution records of regional paleoclimatic and paleoceanographic variability.

This leg offers one of the best opportunities to date for reconstructing continuous records of Southern Ocean paleoclimate variability using core and log data. Previous ODP logging at some of the sites described in this proposal indicates that these sites have strong physical property variability related to the paleoclimatic opal-carbonate-terrigenous bedding cycles. The deployment of the FMS and the GHMT at each site is strongly recommended based on their critical contribution toward developing continuous high-resolution paleoclimate records.

Site	Water Depth	Sediment Thickness	Penetration Depth	Logging Operations
TSO-2A	2090m	800	800m	Triple, FMS/Sonic, GHMT
TSO-4A	4630m	600	600m	Triple, FMS/Sonic, GHMT
TSO-6A	3680m	700	700m	Triple, FMS/Sonic, GHMT

(472-Rev) Crustal Fluxes and Mass Balances at the Mariana-Izu Convergent Margin

The main objective of this proposal is to determine the crustal fluxes being recycled into the deep mantle by mass-balance of the inputs (sediment and basaltic portions of the incoming plate) and outputs (sediment and crustal components recycled to the volcanic arc and back-arc) at the Mariana-Izu subduction zone. The two proposed sites are located seaward of the Mariana and Izu trenches, respectively.

The volcanic arc output is well constrained for both the Mariana and Izu arcs. Important geochemical differences have been observed between Mariana and Izu output basalts, so drilling and logging the subducting crust seaward of each zone could test whether these variations derive from regional differences in the subducted crustal inputs. Recording downhole geochemical and physical properties data in both holes is essential to core-log integration studies. These conventional logs will also provide a continuous lithological characterization and will strongly contribute to site-to-site comparisons of the chemical signature of the logged sequence.

The proposed site to the east of Mariana trench (801C) has already been logged during Leg 144 where the top of the oldest oceanic crust has been reached. Another objective of this proposal is to deepen this hole to provide a more complete sampling of the upper alteration zones of this old oceanic crust. To fully characterize the petrology, hydrogeology, structure, and physical properties of this old oceanic crust, this hole needs to be logged using the Triple combo, geochemical, and the FMS/Sonic toolstrings. The Azimuthal Resistivity Tool (ARI) should be used to measure deep resistivity and image resistivity anisotropy in basement sections.

The oceanic crust subducted in the Izu-Bonin trench has never been sampled and logged. To satisfy the objectives of this proposal and to compare the sedimentary sequence and the upper oceanic crust with the ones of Site 801C, the geochemical and geophysical tools as well as the FMS should be used at that site (BON-8A). Moreover, to satisfy the time-scale objective, that is to determine the age of the basement, the GHMT (magnetic susceptibility and total magnetic field measurements) could provide a paleomagnetic reversal sequence of the overlying sediment. As in the previous site, the ARI should be used to image the basement section.

Site	Water Depth	Sediment Thickness	Penetration Depth	Logging Operations
BON-8A	6000	600	900	Triple, GLT, FMS/Sonic, GHMT, ARI
801C	5674	460	960	Triple, GLT, FMS/Sonic, ARI

(485-Rev) Southern Gateway - Australia and Antarctica

Drilling the area between Tasmania and Antarctica allows the study of the tectonic study of the Southern Gateway opening and its consequences in terms of paleocirculation and paleoclimate. The main objectives of the drilling proposal are (1) to detail the global Cenozoic change in climate and current patterns, and (2) to address basic questions related to the nature of transform margins.

Tectonic Sites
The scientific objectives might be expressed for the transform margin can be expressed in terms of stratigraphy, structure, stress and thermal history. As a consequence, standard geophysical logs should be run in each of the proposed holes. Whilst the recording of in-situ physical properties data is essential to core-log integration studies, these logs are also useful to provide a continuous lithological characterization and an identification of seismic reflectors using synthetic seismic profiles generated from velocity and density logs. Natural radioactivity should provide a means for detecting the presence and the nature of the magmatic intrusions. The temperature probe included in the geophysical tools string is important to identify zones of active fluid flow in this transform margin. The FMS will provide high-resolution images for accurate description of present orientation, frequency of occurrence, and possibly the nature of the infill of brittle deformational features, and foliation/bedding orientations. In order to determine the present tectonic stress orientation and deviations from borehole break-outs and fractures in the vicinity of active zones, BHTV images should be recorded whenever basement penetration is proposed.

Paleoceanographic Sites
The main objectives of the paleoclimatic approach can be addressed by establishing a detailed high-resolution lithostratigraphy which can be obtained from a combination of standard geophysical (sonic, density, porosity, resistivity, and gamma ray) data with the FMS records. Logging will contribute to the effort by identifying both cyclical lithologic variations and lithological responses to climatic transitions, and by providing important inter-site correlation. Ice rafted debris deposits can be delineated by their physical properties (e.g., gamma ray and magnetic susceptibility) and by the FMS imagery. The

GHMT is strongly recommended in this high-latitude environment in order to lead to the construction of a depth/time tie through the detection of paleomagnetic reversals. This is the only means to provide continuous dating of the cored interval and thus a precise determination of the sedimentation rates. The establishment of synthetic seismograms from the WST, density, and acoustic data is useful to the lateral extrapolation of results derived from drilling. The correlation of sediment core properties to log data can provide depth ties to resolve the undistorted depth of sedimentary layers from individual cores.

Site	Water Depth	Sediment Thickness	Penetration Depth	Logging Operations
WT-1A	2500	1225	1245	Triple, FMS/Sonic, GHMT, WST
WT-2A	2920	855	855	Triple, FMS/Sonic, GHMT
WSTR-1A	3570	1035	1035	Triple, FMS/Sonic, GHMT, WST
TFZ-1A	3100	500	500	Triple, FMS/Sonic
TFZ-2A	3200	150	200	Triple, FMS/Sonic, BHTV
WSTR-2A	2730	580	580	Triple, FMS/Sonic, GHMT
STR-1A	1460	1160	1160	Triple, FMS/Sonic, GHMT, WST
SET-1A	4055	500	500	Triple, FMS/Sonic, GHMT
ETP-1A	2800	615	615	Triple, FMS/Sonic, GHMT

(490) Glacial History and Paleoceanography: Prydz Bay-Cooperation Sea, Antarctica

This proposal combines drilling of glacial fan deposits on the continental slope and of sediment drifts on the continental rise. This two-pronged objective might allow the comparison of the paleoceanographic evolution (sea surface temperature, bottom water formation in the southern ocean, sea ice extent) with Antarctica ice sheet fluctuations.

These regional and global objectives can be addressed by establishing a detailed high-resolution lithostratigraphy which can be obtained from a combination of standard geophysical (sonic, density, porosity, resistivity and gamma ray) data with the FMS records. Logging will contribute to the effort by identifying both cyclical lithologic variations and lithological responses to climatic transitions, and by providing important inter-site correlation. Ice rafted debris and turbiditic deposits can be delineated by their physical properties, notably gamma ray and magnetic susceptibility, and by the FMS imagery. The GHMT (magnetic susceptibility and total magnetic field) is strongly recommended in this high latitude environment in order to allow for the construction of a depth/time tie through the detection of reversals of the paleomagnetic field, especially for sites located on the continental rise. This is the only means to provide a continuous dating of the cored interval and thus a precise determination of the sedimentation rates. The establishment of synthetic seismograms from WST as well as density and acoustic data is useful to the lateral extrapolation of results derived from drilling. The correlation of sediment core properties to log data can provide depth ties to resolve the undistorted depth of sedimentary layers from individual cores.

Site	Water Depth	Sediment Thickness	Penetration Depth	Logging Operations
PBF2	1312	550	550	Triple, FMS/Sonic, GHMT
PBF1	2010	720	720	Triple, FMS/Sonic, GHMT, (WST)
PBF1A	1890	730	730	Triple, FMS/Sonic, GHMT
PBD4	2745	934	934	Triple, FMS/Sonic, GHMT, WST

PBD2	3075	1100	1100	Triple, FMS/Sonic, GHMT, WST
PBD2A	3262	1500	1500	Triple, FMS/Sonic, GHMT, WST

(503) Cenozoic Glacial History; East Antarctic Ice Shield

This proposal is a combination of two independent projects, one concerned with the Cenozoic glacial history of the East Antarctic Ice Shield, and the second with the evolution of the Mesozoic Weddell Basin, combined to provide a joint drilling program appropriate for a single leg. The Cenozoic project is part of the ANTOSTRAT initiative.

The proposal is to drill five sites in the southern Weddell Sea. Three of these sites (WS01A (Alternate: WS02A), WS03A, WS04A), to be drilled close to the primary source area of the Weddell Sea Bottom Water (WSBW), are concerned with the ANTOSTRAT work. These are to address the following objectives:

1.1. to extend the Leg 113 depth transect to encompass true WSBW generation,
1.2. to obtain a high resolution sediment record to reflect the evolution and variability of the Easy Antarctic ice shield as it drains into the Weddell Sea, and
1.3. to investigate relationships between bottom water production and glacial events recorded from ice cores in East Antarctica.

For the second part of the proposal two sites (WS05A, WS06A) would be drilled off Dronning Maud Land in the vicinity of the Wegener Canyon. These would investigate the evolution of the Mesozoic Weddell Sea through three specific objectives:

2.1. to extend the Leg 113 sites close to the Wegener Canyon to obtain temporal constraints on the breakup of Gondwana,
2.2. to study black shale sequences with respect to the early development of the restricted Weddell Sea, and
2.3. to recover Albian diatomite with respect to the evolution and taxonomy of that microfossil group.

Several of these objectives can be aided considerably by logging. Sites WS01A, WS03A, and WS04A address the themes of paleoclimate and paleoceanographic development of the southern oceans; there is the obvious need, even with high sedimentation rates (>20 cm per 10^3 yr.) at two of the sites, for high resolution information particularly to satisfy objectives 1.2 and 1.3. In addition to the standard geophysical suite of logs both FMS and high resolution magnetic susceptibility (GHMT) logs should also be run. These will be invaluable for core-log integration studies in addition to providing continuous and specific information about the chronology of the lithological sequence.

For the second part of the proposal, suggested holes at sites WS05A and WS06A are located so that the upper and lower portions of the Lower Cretaceous black shale sequence can be recovered, with sufficient penetration planned that correlation between sites can be achieved and the complete record of Mesozoic strata in the region obtained. Logging with the standard geophysical tool string will thus enable a continuous record of the physical properties of the Mesozoic sequence in the region to be obtained, and will provide an additional check on the cross-correlation between holes; both aspects support specific objective 2.2. In addition, if good synthetic seismograms can be obtained correlation with the major seismic reflection horizons in the Mesozoic could be possible (objective 2.1). Check shot data from the WST are recommended for this correlation.

Site	Water Depth	Penetration Depth	Logging Operations

WS01A	3456	500	Triple, FMS/Sonic, GHMT
WS03A	3337	700	Triple, FMS/Sonic, GHMT
WS04A	3707	1200	Triple, FMS/Sonic, GHMT
WS05A	2550	800	Triple, FMS/Sonic, WST
WS06A	3020	1350	Triple, FMS/Sonic, WST
WS02A (Alt)	3582	500	Triple, FMS/Sonic, GHMT

(LOI 72) Engineering Test of Logging-While-Drilling Tools in Difficult Drilling Environments

Penetrating young crustal sections and hydrothermal environments have proved to be a difficult task throughout the history of ocean drilling. Low core recovery (avg. 20-30%) and hole instabilities have been the major reasons for the poor logging success the recent past. The objective is to drill a 150 to 200 m test hole in a difficult drilling environment using a combination of new LWD tools, potentially including the Resistivity-at-the-Bit (RAB), Sonic (ISONIC), and Azimuthal Density Neutron (ADN). As these tools and requisite drilling equipment are available commercially 'off-the-shelf', a future ODP deployment can be scheduled with approximately 3 months lead time. The proposed deployment involves a 5-day drilling operation during FY 98 in a shallow crustal environment. Previous drilling experiences suggest that a 200 m hole is well within the life span of a single bit in crustal rocks. Costs will depend largely on transit time requirements, so a mini-leg departing from and returning to a major port with the *JOIDES Resolution* would minimize leasing expenses. The previous estimate was $300,000 for a 20-day deployment (15 day transit) at the MARK area. *Such a mini-leg deployment could be operated back-to-back with or independently of the currently proposed DCS engineering leg.* Possible site locations include MARK and TAG areas, SW Indian ridge (Site 735), Pacific guyots, Hess Deep, and the East Pacific rise. The target site will be selected in close consultation with the scientific community and with TAMU on engineering and logistical concerns to optimize both cost and data recovery (penetration) for successful testing of these tools. At any location, the specific hole and alternates will be selected where there is ample site survey data and the drilling characteristics are known.

Acquisition of LWD data in unstable boreholes where high-quality wireline data cannot be acquired offers at least two other operational advantages: (1) data are acquired over the entire drilled interval, particularly in the critical shallow section from seafloor to the base of pipe, and (2) data is acquired immediately after the borehole is opened, not allowing time for downhole conditions, such as porosity, permeability, and fluid movement, to degrade significantly. In shallow crustal environments, the LWD results may be used to create 3-dimensional maps of the variations of in situ properties, such as failure surfaces or fractured basalts, or to correct sampling bias in lithological or structural interpretations that result from less than 100% core recovery.

Site	**Water Depth**	**Penetration**	**Logging Operations**
TBD	<3000	200	LWD*

*LWD tools:
ADN - azimuthal neutron, density
ISONIC - sonic velocity
RAB - resistivity-at-bit (imaging)

JOIDES Panel Action Items listed by panel

Ocean History Panel (OHP) Fall 1996

A. CLIP software development

The panel voted to further endorse and recommend continued support for the development of CLIP (Core-Log Integration Platform) software. The two products currently in development, Splicer (core-core data integration) and Sagan (core-log data integration) data integration software are viewed as essential shipboard and shorebased research tools for Ocean History drilling objectives. The panel supports the incorporation of Splicer and Sagan data products into the JANUS database and recommends that the programs be enhanced to access data directly from the database. The panel also recommends that ODP assume a proactive role in insuring that these CLIP software products are compatible with current and future modifications to the shipboard computing and network facilities.

B. Recommendations to PCOM

The OHP endorses the 2 October 1996 recommendations to PCOM on (1) the new ODP advisory structure, (2) JANUS, (3) new publications, and (4) printing and distribution of ODP IR and SR volumes for archival purposes.

C. Approval of shipboard collaborations

The OHP does not endorse the IHP recommendation that any and all collaborations between shipboard scientists be approved, monitored, and adjudicated by the co-chief scientists of the leg. Such a practice would leave no mechanism for final appeal when conflicts arise between co-chief scientists and other shipboard scientists. Consequently, the OHP recommends that an independent body that can respond quickly to leg-based appeals have ultimate responsibility for adjudicating collaborative arrangements between shipboard scientists.

D. Subsidize publication costs

ODP SR volumes constitute a primary resource for much earth historical research. Resources of particular importance include (1) microfossil studies that document taxonomic concepts of stratigraphic significance, and (2) site-specific stratigraphic studies. Consequently, given the pending phasing-out of SR volumes, the OHP recommends that PCOM consider subsidizing costs of publishing such studies in the open peer-reviewed literature (i.e., by payment of page charges for taxonomic and stratigraphic studies).

E. JANUS

OHP supports the migration of existing data to the JANUS database system. The migration of biostratigraphic data should be a high priority task.

F. Leg 175

OHP is aware that coring depth restrictions imposed due to safety considerations in the North Angola Basin may limit the scope of Sites in this area to Quaternary/upper Pliocene. This will nevertheless provide important new information and the southern transects retain a sufficiently broad coverage to provide a robust reconstruction of the evolution of the Benguela current system. This leg remains a top priority for ocean history. It has been considerably strengthened by the addition of high resolution sites in Walvis Bay and has the full support of the panel.

Tectonics Panel (TECP) Fall 1996

A. JANUS 175

TECP recommends to PCOM that PCOM recommends to JOI Inc direct ODP/TAMU to ensure that the integration of structural (and related sedimentary) data is fully completed within JANUS phase II, or equivalent.

Note: TECP believes that it is essential that PCOM and JOI allocate the resources to complete the image-based core description portion of the JANUS project in the most timely and efficient manner, with completion in a year as the goal.

The sedimentary, hard rock, and structural geology community is agreed upon the type of core description software and hardware needed for shipboard description. We desperately await the implementation of the system that will make the job of the majority of shipboard scientists easier and more efficient. It will greatly improve the description, archiving, and distribution of core description data, and deserves the highest priority, bar none.

B. Deep hole175

TECP recommends to PCOM that PCOM recommends to JOI Inc direct ODP/TAMU to exclude Somali Basin as a candidate for a deep hole, as it has no scientific merit. Alternate of scientific interest to TECP are Nankai upslope site and Woodlark basin.

Notes:TECP believes ODP/TAMU engineers are being overly concervative in seeking to drill a simple, stable, passive margin setting such as Somali Basin. This environment is not an effective test of high priority drilling sites over the next few years. Other sites are well characterized and fulfill realistic needs for future deep drilling. These include

a. Nankai; upslope site in sediments at 2-3 km water depth in seismically well imaged area where active faults could be avoided. This site could serve as a future reference hole for seismogenic related drilling (OD 21 priority).

b. Woodlark; deep hole at 2-3 km water depth in rift basin sediments, a priority for present Woodlark proposal but not included owing to time contraints. Well imaged: a relistic drilling test.

Other possibilities could include Iberia Margin (S` reflector), Venezuela basin, Angola basin.

C. DCS 175

While supporting the concept of a DCS engineering leg, TECP believes that alternate to 735B may well fit the science drilling plan better, i.e., Nankai slope; Woodlark basin.

Notes: TECP recognizes 735B has merits but JR may leave this area previously. TECP recognizes the drill site should be very well characterized and therefore suggests the following alternates in previously drilled areas.

a. Bonin ridge Site 809; Data include good seismics and swath mapping (former engineering test site).

b. Vanuatu Leg 134 Oba basin flank near previously drilled sites includes volcanics and volcanoclastics (good weather avoiding site clearancies).

Downhole Measurements Panel (DMP) Fall 1996

A. VSP Tool

A Schlumberger 3-component VSP tool for Hole 735B should be funded by the BRG-WLS budget for FY98.

B. LOI 72 proposal

DMP recommends that PCOM move forward with the LOI 72 proposal for Leg 174B, to be used if hammer-drill is not available, contingent on favorable answers to questions of insurance, sufficient resistivity contrast, sonic reliability, and ability to start a hole and achieve a 4-5 day time frame. These types of LWD measurement will be needed within the near future of ODP. Although DMP has insufficient information to recommend these measurements for Leg 174B, there is probably time to answer the questions before the decision deadline.

C. third-party (tool guidelines)

Realizing that downhole measurements problems cause inappropriate or inefficient ship use, DMP recommends that SciMP, the WLS contractor, and ODP-TAMU monitor and enforce third-party (non-commingled) tool guidelines. SciMP could use an individual on honorarium or a separate 1-day subcommittee meeting to accomplish this.

D. DMP responsibility shifted to proponents

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E. TEDCOM & SciMP need increased liaison

To assure that drilling innovations are considered in the context of downhole measurements, and vice versa, TEDCOM & SciMP need increased liaison and similar reporting paths (to both SCICOM and OPCOM). Inclusion of both scientific and technical expertise on SciMP is absolutely essential, because technological choices are inadequate unless they are made in the context of scientific and financial considerations.

F. New SciMP

The DMP recognizes that not all of its current functions can be subsumed into a new SciMP. Therefore, it recommends that some of its current responsibilities be moved to specialgroups:

(a) The procedures for the evolution of third-party tools have been codified and tested. DMP recommends that the primary responsibility for monitoring third-party tools now be assigned to an individual, whose necessary expenses are reimbursed by JOI and who reports to SciMP.

(b) DMP recognizes the need for temporary working groups, with resulting white papers, to address issues that would previously have been considered by DMP, but are beyond the likely scope of SciMP expertise and time availability. We recommend that the following two downhole measurement topics be considered for 1997 working groups: (1) vertical seismic profiles, and (2) log quality.

G. Proposed partial mandate for the Scientific Measurements Panel (SciMP)

Proposed partial mandate for the Scientific Measurements Panel:

* investigate and evaluate new measurement technologies, analysis techniques, and third-party equipment developments, and recommend future measurement directions;

* identify ways in which existing ODP measurement capabilities and core-log-integration can be refined to increase scientific benefits; and
* advise on the scientific relevance and technical feasibility of proposal measurement plans.

Proposed liaisons for SciMP:
* from WLS, ODP-TAMU, JOI, TEDCOM, and OPCOM to SciMP;
* from SciMP to TEDCOM, OPCOM, and SCICOM.

SGPP Fall 1996

A. Publications

SGPP is very concerned with the plan to drop any printed version of the Initial Reportvolumes. Therefore we strongly request that some kind of printed copy be retained even if some of the traditional data needs to be left out.

B. Antartic DPG

SGPP endorses the study of Antartic glacial histiry and sea level change. We support a first leg to be drilled at the Antartic Peninsula as a test of the concept. the results of this leg should then be eveluated to detrrmine whether the drilling strategy will answer the questions posed. We do not necessarily agree with the proposed order and schedule of subsequent legs as given in the DPG report. We recommend that the future panel structure consider this issue when the results of the Antarctic Peninsula Leg are known.

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SGPP has always viewed CORK experiments as a high priority,and the new Long Range Plan places added emphasis on this type of technology. By supporting this program, ODP makes an implicit committment to mantian the equipment. Failure to follow through with such committments will eliminate the long term aspect of the in situ monitoring and thus greatly reduce the values of the experiment. The only reasons for abandoning CORK's is if the science is weak or it becomes apparent that the CORK site is not adequate to achieve the desired objectives. Thus, SGPP urges PCOM to facilitating this aspect of the program.

LITHP Fall 1992

A. Digital imaging of core

Following the presentation of the status of the JANUS data base by the TAMU representative, the panel underlined the fact that they are are not satisfied with quality of the hard rock digital-image-based system that represents the "backbone" of the hard-rock community's requirements. The need for this system seems to have "slipped through the net" in the JANUS programe and should not be forgotten.

B. DCS system

The TAMU representative presented an update of the status of the DCS system, and in particular the safety tests. Despite the fact that a significant proportion of LithPanel's objectives can be achieved with conventional drilling, the panel strongly supports the development and testing of DCS for future hard-rock legs and for use in areas of hard-rock (cherty sequences, hydrothermal sytems). The panel ranked a test of the system as zero (the top priority, but not ranked with the other prospectus proposals). The most reasonable site for such a test is probably at site 735. However, the panel stressed that such testing should be on a bare rock, low angle site, with reasonable access to a port.

C. Comments on transition in review process

Considerable concern was stated about how the new proposal review will be handled. In particular, how soon will proponents be advised that their proposal is going for mail review, and how much time will a proponent be given to rewrite the proposal before review?

Most of the proposals in the system are written with the current review process in mind, and given the possibility of stringent reviews, JOI or JOIDES should inform proponents as soon as possible of the changes in the review procedure. In doing so they should provide proponents and reviewers clear guidelines on the new review procedures.

IHP — Fall 1996

A. MRC report and plans for the Stratigraphic Database Center

1) Huber would like to send remaining samples to complete the diatom and foram collections at Moscow MRC. The IHP recommended to Brian that he send the Diatoms but hold the Forams until some agreement is reached for providing the necessary vials etc. to process the samples. The panel suggested that the Moscow Curator (Basov) be invited to attend the next curatorial meeting.

2) Huber would like to advise the community regarding availability of these nannofossil, radiolarian, and lithologic smear slide collections in hopes of establishing new subloan institutions. The IHP agrees.

3) Huber would like the Bremen core repository to take over production of 4 sets of lithologic smear slides. IHP agrees.

B. Publication Steering Committee

The IHP recommends that the Publications Steering Committee that JOI intends to convene ensure that once some final decision is reached with regard to the future publications of the ODP, a set period of trial implementation is provided for so that the effects of the changes can be evaluated in a deliberate manner. Further, the IHP hopes that the Program will provide for a long-term group to provide oversight of the ODP publications operations and policies and to ensure the necessary continual feedback regarding evaluation, special requests for exceptions, keeping up-to-date on technological up-grading.

C. Publications

1) The IHP recommends that with regard to the matter of the Inspector General's investigation of ODP publications, the ODP community be aware of the potential negative effects of such investigations on the Program. The IHP endorses fully the integrity of the publications staff of the ODP/TAMU.

2) IHP supports the suggestion of the ODP operator that a printer be identified who would agree to print on demand a small number of hard copies (10-50, the final number to be decided by PCOM/SCICOM) of ODP SR and IR volumes be printed, to fulfill the archival obligations of the Program. and that copies be distributed to selected localities (libraries, ODP offices, etc.).

D. New Advisory Structure

1) IHP recommends that the long-term functions of the ODP be overseen by long-term standing committees of some sort. IHP further recommends that care be taken to avoid convening multiple ad hoc advisory bodies simultaneously to advise different levels of the ODP structure on the same functions.

2) The IHP recommends that any JOI-coordinated ad hoc committees have liaisons from the PCOM/SCICOM and the new SciMP and that any reports from the JOI-coordinated committees go jointly to PCOM/SCICOM, SciMP, and JOI.

3)The IHP recommends that the scope of the mandate to the SciMP be broadened to encompass most of the mandates of the IHP (as well as the SMP and DMP), but that the activities of these mandates be performed via some mechanism that distributes responsibility within the SciMP with outside help on an as-needed basis.

E. Ethic Issues and Nonperformers

The IHP recommends that in the future, any and all collaborative arrangements made among groups of scientist aboard the ship must be approved, monitored, and adjudicated by the Co-Chief scientists of the Leg.

F. Janus

The IHP recommends that JANUS Phase II be implemented as soon as possible. The IHP recognizes that implementation of Phase II will require that new moneys be identified to support this effort. There is an immediate need to ensure shipboard capture of data and to provide the shipboard party with a tool to describe the cores. The IHP recommends going to JANUS Phase II before completion of Phase I (once the SC priorities 1-4 are complete) and made suggestions to the Operator as to what tasks could be taken over by ODP/TAMU instead of having them completed by TRACOR (see minutes).

G. Legacy data

The IHP recommends that the migration of the legacy data remain a high priority.

TEDCOM — Fall 1996

A. OD21 Workshop and TEDCOM

TEDCOM will support the OD21 Project as fully as possible. The "Joides Resolution" is likely to remain the sole option for ocean drilling for ODP to at least 2008. This will have implications on any refurbishment/refit options to that vessel which may be influenced by ODP.

B. TEDCOM Interactions

TEDCOM request PCOM to consider agreeing to a single TEDCOM meeting per year, together with sub-committee meetings for progressing selected projects.

C. Active heat Compensation

TEDCOM will advise PCOM, by the December '96 meeting regarding Active Heave Compensation (AHC) which could be fitted to the "Joides Resolution" to improve coring.

D. Hammer drill

TEDCOM recommend that the hammer drill project be closely monitored and be slowed down if good information and favorable results for a Joides Resolution operation are not forthcoming from SDS, even if this precludes a product for an engineering tests in 1997.

E. Drydocking

TEDCOM will assist ODP TAMU in building up a priority list for drydocking requirements. Implementation will be dependent on finally agreed funding.

F. Engineering Legs

1997- Leg 175B- will test the Hammer-in Casing if available

1998- Projected DCS Leg. This will not be required.

JOIDES Panel Action Items by topic

JANUS and software developments

1. CLIP software development/OHP

The panel voted to further endorse and recommend continued support for the development of CLIP (Core-Log Integration Platform) software. The two products currently in development, Splicer (core-core data integration) and Sagan (core-log data integration) data integration software are viewed as essential shipboard and shorebased research tools for Ocean History drilling objectives. The panel supports the incorporation of Splicer and Sagan data products into the JANUS database and recommends that the programs be enhanced to access data directly from the database. The panel also recommends that ODP assume a proactive role in insuring that these CLIP software products are compatible with current and future modifications to the shipboard computing and network facilities.

2. JANUS/OHP

OHP supports the migration of existing data to the JANUS database system. The migration of biostratigraphic data should be a high priority task.

3. JANUS /TECP

TECP recommends to PCOM that PCOM recommends to JOI Inc direct ODP/TAMU to ensure that the integration of structural (and related sedimentary) data is fully completed within JANUS phase II, or equivalent.

Note: TECP believes that it is essential that PCOM and JOI allocate the resources to complete the image-based core description portion of the JANUS project in the most timely and efficient manner, with completion in a year as the goal.

The sedimentary, hard rock, and structural geology community is agreed upon the type of core description software and hardware needed for shipboard description. We desperately await the implementation of the system that will make the job of the majority of shipboard scientists easier and more efficient. It will greatly improve the description, archiving, and distribution of core description data, and deserves the highest priority, bar none.

4. Digital imaging of core/LITHP

Following the presentation of the status of the JANUS data base by the TAMU representative, the panel underlined the fact that they are are not satisfied with quality of the hard rock digital-image-based system that represents the "backbone" of the hard-rock community's requirements. The need for this system seems to have "slipped through the net" in the JANUS programe and should not be forgotten.

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Publications

1. Subsidize publication costs/OHP

ODP SR volumes constitute a primary resource for much earth historical research. Resources of particular importance include (1) microfossil studies that document taxonomic concepts of stratigraphic significance, and (2) site-specific stratigraphic studies. Consequently, given the pending phasing-out of SR volumes, the OHP recommends that PCOM consider subsidizing costs of publishing such studies in the open peer-reviewed literature (i.e., by payment of page charges for taxonomic and stratigraphic studies).

2. Publications/SGPP

SGPP is very concerned with the plan to drop any printed version of the Initial Reportvolumes. Therefore we strongly request that some kind of printed copy be retained even if some of the traditional data needs to be left out.

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DCS

1. DCS 175/TECP

While supporting the concept of a DCS engineering leg, TECP believes that alternate to 735B may well fit the science drilling plan better, i.e., Nankai slope; Woodlark basin.

Notes: TECP recognizes 735B has merits but JR may leave this area previously. TECP recognizes the drill site should be very well characterized and therefore suggests the following alternates in previously drilled areas.

a. Bonin ridge Site 809; Data include good seismics and swath mapping (former engineering test site).

b. Vanuatu Leg 134 Oba basin flank near previously drilled sites includes volcanics and volcanoclastics (good weather avoiding site clearancies).

2.DCS system/LITHP

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Approval of shipboard collaborations

1. Ethic Issues and Nonperformers/IHP

The IHP recommends that in the future, any and all collaborative arrangements made among groups of scientist aboard the ship must be approved, monitored, and adjudicated by the Co-Chief scientists of the Leg.

2. Approval of shipboard collaborations

The OHP does not endorse the IHP recommendation that any and all collaborations between shipboard scientists be approved, monitored, and adjudicated by the co-chief scientists of the leg. Such a practice would leave no mechanism for final appeal when conflicts arise between co-chief scientists and other shipboard scientists. Consequently, the OHP recommends that an independent body that can respond quickly to leg-based appeals have ultimate responsibility for adjudicating collaborative arrangements between shipboard scientists.

varia

1. LOI 72 proposal for Leg 174B /DMP

DMP recommends that PCOM move forward with the LOI 72 proposal for Leg 174B, to be used if hammer-drill is not available, contingent on favorable answers to questions of insurance, sufficient resistivity contrast, sonic reliability, and ability to start a hole and achieve a 4-5 day time frame. These types of LWD measurement will be needed within the near future of ODP. Although DMP has insufficient information to recommend these measurements for Leg 174B, there is probably time to answer the questions before the decision deadline.

2. Leg 175/OHP

OHP is aware that coring depth restrictions imposed due to safety considerations in the North Angola Basin may limit the scope of Sites in this area to Quaternary/upper Pliocene. This will nevertheless provide important new information and the southern transects retain a sufficiently broad coverage to provide a robust reconstruction of the evolution of the Benguela current system. This leg remains a top priority for ocean history. It has been considerably strengthened by the addition of high resolution sites in Walvis Bay and has the full support of the panel.

3. Deep hole/TECP

TECP recommends to PCOM that PCOM recommends to JOI Inc direct ODP/TAMU to exclude Somali Basin as a candidate for a deep hole, as it has no scientific merit. Alternate of scientific interest to TECP are Nankai upslope site and Woodlark basin.

Notes:TECP believes ODP/TAMU engineers are being overly concervative in seeking to drill a simple, stable, passive margin setting such as Somali Basin. This environment is not an effective test of high priority drilling sites over the next few years. Other sites are well characterized and fulfill realistic needs for future deep drilling. These include

a. Nankai; upslope site in sediments at 2-3 km water depth in seismically well imaged area where active faults could be avoided. This site could serve as a future reference hole for seismogenic related drilling (OD 21 priority).

b. Woodlark; deep hole at 2-3 km water depth in rift basin sediments, a priority for present Woodlark proposal but not included owing to time contraints. Well imaged: a relistic drilling test.

Other possibilities could include Iberia Margin (S` reflector), Venezuela basin, Angola basin.

4. Cork/SGPP

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SEDIMENTARY AND GEOCHEMICAL PROCESSES PANEL MEETING

October 3-5 , 1996

CRPG-CNRS Nancy, France

EXECUTIVE SUMMARY

1. Reviews of Proposals: The Panel reviewed 12 revised proposals, 19 addenda, 1 update, and 14 new proposals, rating them as follows: .

PRP. NO.	ABBREVIATED TITLE							
079-Add	Western Somali	A3	B1.3	B2.1	C3/C4	D2	E0	F4/F5
354-update	Benguela Upwelling		No ratings needed .					
355-Add2	Peruvian Margin	A2	B1.2	B2.1	C2	D3	E0	F2
367-Add3	Cool Water Carb.	A1	B1.1	B2.1	C1	D1	E0	F1
426-Rev2	Aus-Ant Rifting	A5						F4
431-Add3	W. Pacific Geophys.	A5						F4
432-Add	Galicia	A5						F4
441-Add1	Deep Pacific Source	A5						F4
445-Add2	Nankai Prism	A1	B1.1	B2.1	C1	D1	E0/E8	F1/F
447.Rev3	Western Woodlark	A2	B1.2	B2.1	C3	D1	E8	F2
448-Rev2	Ontong Java Plateau	A5						F4
450-Add2	Taiwan Collision	A3	B1.2	B2.1	C1	D1	E8	F2
451-Add2	Tonga Forearc	A3	B1.2	B2.1	C2	D1	E0	F5
452-Add2	Antarctic Peninsula	A1	B1.1	B2.1	C2	D1	E8	F2
457-Rev4	Kerguelen Plateau	A5						F4
463-Add2	Shatsky Rise	A5						F4
464-Add2	Southern Ocean	A3	B1.2	B2.1	C1	D1	E0	F3
466-Rev	Great Austr. Bight	A5						F4
467-Rev	Turbidite Systems	A1	B1.1	B2.1	C1	D1	E0	F1
469-Add	Argo Abyssal Plain	A5						F4
472-Add	Mariana-Izu Margin	A1	B1.1	B2.1	C2	D1	E0	F2
476-Add2	Hudson Apron	A1	B1.2	B2.1	C1	D1	E0	F1
477-Rev	Okhotsk/Bering Seas	A4	B1.2	B2.1	C1	D3	E0	F3
479-Rev	E. ManuBasin	A1	B1.2	B2.1	C3	D1	E0	F5
481-Add	Red Sea Deeps	A1	B1.1	B2.1	C1	D1	E0	F1
482-Add	Wilkes L/Ross S	A1	B1.2	B2.1	C3	D1	E8	F2
485-Rev	Aus-Ant Gateway	A5						F4
486-Rev	Paleogene Eq. Pacific	A5						F4
489-Add	Wilkes L/ Ross S	A1	B1.2	B2.1	C2	D1	E8	F2
491-Add	Crustal Accretion	A5						F4
494-Rev	South China Sea	A5						F4
495-Rev	Seychelles	A5						F4
496	Cuvier/Wallaby	A5						F4
497	Ryukyu Forearc	A5						F4

498	Barents Sea	A5						F4
499	Eq. Pacific Geophys.	A5						F4
500	H2O Observatory	A5						F4
501	LIP Ontong Java	A5						F4
502	Palmer Deep	A3	B1.2	B2.1	C1	D1	E0	F3
503	Weddell Sea	A2	B1.1	B2.1	C3	D1	E0	F3
504	Newfoundland Basin	A5						F4
505	Mariana Margin	A1	B1.2	B2.1	C2	D1	E3*	F2
506	Global Geophys. Plan	A5						F4
507	TAG II	A2	B1.2	B2.1	C4	D3	E0	F5
X	Okinawa Trough	A3	B1.2	B2.1	C2	D3	E0	F5
XX	DCS Engineering	A5						F4

* = for southern transect.

October 5, 1996

2. Reviews of Letters of Intent (LOIs): The Panel reviewed 5 Letters of Intent. They were rated only in terms of thematic relevance.

LOI No.	ABBREVIATED TITLE	RATING
69	Refurbishment of Barbados Cork Experiments	A1
70	Hydraulic Piston Coring	A5
71	Southeast Indian Ocean Hotspots	A5
72	RAB and ISONIC LWD tool engineering test	A3
X	South China Sea - Evolution of Back-Arc Basin	A5

3. Ranking of Proposals in the FY98 Prospectus: LOI 69 (CORKs) was added to Prospectus, and Proposals 431, 457, 485, and ADPG 2 and ADPG 3 were deleted from consideration. The Panel then ranked the remaining programs in the FY98 Prospectus and the LOI it had added from 1 (highest priority) to 13 (lowest priority amng those ranked) as follows:

PROP NO.	ABBREVIATED TITLE	SCORE	STD. DEV.	RANK
X	Antarctic DPG 1	11.9	1.5	1
445	Nankai trough	11.4	1.7	2
367	Cool Water Carbonates	10.8	1.8	3
LOI 69	Barbados CORKs	10.4	1.3	4
472	Mariana-Izu	8.5	2.5	5
447	Woodlark Basin	7.1	2.8	6
464	S Atlantic Paleocean	6.7	1.9	7
451	Tonga Forearc	6.4	2	8
450	Taiwan Collision	5.4	1.3	9
441	SW Pacific Gateway	5.2	2.6	10
79	Somali Basin	4.6	2.7	11
LOI 72	LWD Engineering	2.4	1.1	12
X	DCS Engineering	1.6	0.8	13

		Not ranked
431	W Pacific Network	Not ranked
457	Kerguelen	Not ranked
485	Australian Antarctic Gateway	Not ranked
X	Antarctic DPG 2	Not ranked
X	Antarctic DPG 3	

4. Responses to PCOM and JOIDES Requests

4.1. Suggestions for Attendees at the SSEP Meeting in January:

Gregor Eberli and Michael Underwood
Michael Whiticar and Paul Baker

SGPP urges PCOM to find a fluid flow person to serve on the panel. Current SGPP members Kastner and Beakins both have conflicts of interest. Former SGPP member Jean Barr would be suitable.

SGPP notes that a number of the topics with which it has been concerned overlap the new Endogene and Exogene SSEPs. SGPP recommends that SCICOM take into account the need for continuity and familiarity with proposals "in the system" in its initial selection of members for the SSEPs.

4.2. Publications

4.2.1. Suggestions for membership on the Publications Steering Committee: SGPP understands that Bjorn Buchardt will be a member of the new Committee, representing ESF.

4.2.2. Motion regarding the new publications policy

It was moved by Bekins and seconded by Buchardt that

SGPP is very concerned with the plan to drop any printed version of the Initial Reports volumes. Therefore we strongly request that some kind of printed copy be retained even if some of the traditional data needs to be left out.

The motion was passed unanimously

4.3. Suggestions for SCICOM regarding possible PPG's: After discussion, SGPP recommends that SCICOM consider the following as possible PPGs:

*Fluid mass balances
*Microbial processes (Deep Biosphere Pilot Project).
*Marine carbon cycle and oxygenation histories
*Sea Level
*Metal concentration processes

5. SGPP motions regarding the Antartctic program:

Macko moved and Whiticar seconded that

SGPP endorses the study of Antarctic glacial history and sea level change. We support a first leg to be drilled at the Antarctic Peninsula as a test of the concept. The results of this leg should then be evaluated to determine whether the drilling strategy will answer the questions posed. We do not necessarily agree with the proposed order and schedule of subsequent legs as given in the DPG report. We recommend that the future panel structure consider this issue when the results of the Antarctic Peninsula leg are known.

Passed unanimously (one absent).

It was moved by Bekins and seconded by Macko that

From the materials provided, it is not clear to SGPP that 452-Add2 in its entirety is consistent with the main objectives of the Antarctic Program. to study glacial history and sea level change. Therefore, SGPP requests that the DPG submit a drilling plan for the Antarctic Peninsula that has site summary forms and a description of the goals for all of the sites. In addition, we would like a clear statement that this plan represents a consensus among the participants.

Passed unanimously (one absent).

6.. SGPP Motion regarding CORKs

It was moved by Underwood and seconded by Macko that

SGPP has always viewed CORK experiments as a high priority, and the new Long Range Plan places added emphasis on this type of technology. By supporting this program, ODP makes an implicit commitment to maintain the equipment. Failure to follow through with such commitments will eliminate the long term aspect of the in situ monitoring and thus greatly reduce the value of the experiments. The only reasons for abandoning CORK's is if the science is weak or it becomes apparent that the CORK site is not adequate to achieve the desired objectives. Thus, SGPP urges PCOM to facilitating this aspect of the program.

Passed unanimously

7. Suggestions for Co-Chief Scientists:

Antarctic Peninsula: Peter Barker, A. Camerlenghi, D. Fütterer, Luis Gamboa, John Anderson, Jim Kennett

Nankai Trough: Greg Moore, Miriam Kastner, Kate Moran, A. Taira, H. Tokuyama

Great Australian Bight: David Fearey, Noel James, David Osleger, Isabella Montanez

(LOI 69 CORKS; Kier Becker)

Mariana-Izu:: T. Plank, P. A. Floyd

Woodlark Basin: B. Taylor, John Mutter, A. Le Pichon, J.-C. Sibuet

SEDIMENTARY AND GEOCHEMICAL PROCESSES PANEL MEETING

DRAFT MINUTES

Date: Thursday-Saturday, October 3-5 , 1996
Place: CRPG-CNRS Nancy, France
Host: Christian France-Lanord, Panel Member

Attendees:
Hans Brumsack (F.R.G.)
Mike Underwood (USA)
Barbara Bekins (USA)
Christian France-Lanord (F)
Steve Macko (USA)
Ryuji Tada (J)
Gregor Eberli (USA)
Michael Whiticar (CAN-AUS-KOR)
Bjorn Buchardt (ESF)

Liaisons:
Judith McKenzie (PCOM)
Peter Blum (ODP)
Brian Popp (OHP)
Maria Mutti (JOIDES Office)
Tim Byrne (TECP)
Dominique Weis (LITHP)

Members unable to attend:
Paul Baker (USA)
Miriam Kastner (USA)
John Parkes (UK)
Henry Posamentier (USA)
Wayne Shanks (USA)

3 October

1. Welcome, Introductions, and Logistics: Christian France-Lanord welcomed the participants to Nancy and to the CRPG/CNRS. He explained the logistical arrangements for the meeting. Hay welcomed panel members, liaisons and guests to the meeting. He noted that he had received messages from Peter Harvey and Miriam Kastner regretting that because of last minute emergencies they were unable to attend. The attendees introduced themselves and gave their affiliations.

2. Agenda: The agenda was discussed and revised. I was noted that the Panel is to select four members whose names will be proposed to PCOM as possible members for the an initial meeting of the new Advisory Structure's Science Steering and Evaluation Panels to be held in January. It was noted that several proposal revisions and an LOI had been received late and that these would be included in the discussions. The JOIDES Office has also informed us of the establishment of a new Publications Steering Committee, and requested that we suggest the names of individuals who could make a significant contribution.

3. Approval of the Minutes of the last Meeting: Hay had distributed the final minutes of the last meeting. Corrections hade been suggested by Bekins and Kästner. The minutes were then approved.

4. Reports: The PCOM liaison, representative of ODP, liaisons from other Panels, and participants on recent Legs were asked to present reports on activities since the last meeting of the SGPP.

4.1. PCOM: Judith McKenzie reported on the meeting of PCOM in Townsville, Australia, August 19-22, 1996.

4.1.1. New Advisory Structure: PCOM is now planning for the program after 1998. A major change is required and this is reflected in a dramatic change of the advisory structure. A new advisory structure was suggested at the PCOM meeting in April, modified by EXCOM, and approved by PCOM in August.

A Science Committee, SCICOM, will replace PCOM as the new group responsible for long term science and technology planning. It will do the ranking of proposals.

An Operations Committee, OPCOM, will be concerned with short-term planning, and will consist of 3 SCICOM and 3 non-SCICOM members.

There will be two Science Steering and Evaluation Committees, SSEPs, each with 16 members. The two panels will be concerned with interior and surficial (exogene and endogene) earth processes. They will evaluate proposals and determiine which are mature enough for external mail review, which will be crucial to this new structure.

Program Planning Groups (PPGs) will develop drilling strategies for major scientific initiatives that SCICOM believes are not adequately represented by proposals in the system. PPGs would typically be formed for one year, at the maximum for 3 years.

The five year plan is reflected in the following initiatives:

climate
sea level
bacteria and fluids
lithosphere-oriented studies
tectonics-oriented studies

These initiatives will be reflected in PPGs, e.g. there might be a gas hydrate PPG, a deep biosphere PPG etc.

There will also be Scientific Measurements Panel which will combine the dutires of the present SMP, DMP, and IHP. It will report to OPCOM (Operational Committee).

4.1.2. 1998 Prospectus: McKenzie continued the report from PCOM, discussing the Prospectus for 1998. The Southern Oceans Transect had been suggested and has support for scheduling in Jan-Feb 1998, leaving from Cape Town. From there it would be possible to go to the Antarctic Peninsula. After that the ship will go to Australia and east Asian waters. This can not be accomplished in one year, therefore the prospectus actually is for 1999 as well. In response to a question, McKenzie noted that the Somali Basin proposal was included in the Prospectus because it is a deep hole with potential for significant scientific return.

4.1.3. Five Year Program: PCOM considered a five year program at its meeting. Sediments and geochemistry are underrepresented in the membership of PCOM, so McKenzie herself was largely responsible for this part of the plan. The major points of this 5 year plan are:

1. Understanding the history and effects of sea level change
2. Understanding Earths changing climate (ANTOSTRAT comes up very strongly in the 5 year planning, WH will give a report later).
3. Sediments, fluids and bacteria as agents for change. Gas hydrates, mass balance, biological transects. Global sub–surface biosphere, fluids, gas hydrates. here may be one dedicated gas hydrate leg in the 5-years plan. Global fluid initiative is a new idea/group coming up. A PPG on deep biosphere should be established, and a biolab put on the ship in 99 during the drydocking.
4. Exploring the transfer of heat and materials to and from the Earth's interior. ION: International seismic network.
5. Deformation of the lithosphere and earthquake processes. A fluid component is to be integrated into this program.

4.1.4. COSOD-R: COSOD-R is a conference being organized by the Japanese for September of next year to discuss ideas for a drillship with riser use beyond 2003. (The OD-21 conference is concerning a riser drill ship is being held later this month in Yokohama).

4.1.5. Future of the Program: McKenzie is optimistic about the future funding of ODP, the Portugese will join the European Consortium. Korea intends to join with Canada and Australia. Germany is on board, the British are positive, and the French are probably on as well. Negotiations with Taiwan and China continue. The program seems to survive.

4.2. ODP Report: Peter Blum reported on developments in ODP at TAMU.

4.2.1. ODP Reorganization: The ODP Director has initiated organizational changes in order to: 1) address budgetary constraints of a continuing flat budget, and 2) accommodate JOI-mandated project management of legs. The changes should furthermore streamline ODP activities, eliminate redundancies, and improve services to the community. An independent management consultant was hired and reported to the Director in August.

The Director has appointed Jack Baldauf as his special assistant to implement organizational changes. During this time, Jamie Allan is interim manager of Science Operations. Some of the proposed organizational changes are subject to approval by the Texas A&M University (TAMU). It may therefore take until the end of the year to implement the recently specified, and still confidential changes.

4.2.2. ODP/TAMU Budget: ODP has responded the EXCOM/JOI request to present for FY97 a bare-bone base budget, along with special operation expense items (SOEs), as approved by BCOM/PCOM. Compare the total, flat budget with FY95 actual expenditures and FY96 Program Plan budget.

FY95	$36,494,984	(Total)
FY96	$37,717,503	(Total)
FY97	$34,832,449	(Base)
	$ 2,823.223	(SOE)

$37,655,672 (Total)

FY97 budgeted SOEs are:

Leg 173 reentry hardware	148,267
Leg 174B: CORK Hole 395A	66,074
DCS Phase III and initial Phase IV	$551,590
Hammer drill system	301,086
Janus I: complete	661,702
Janus II projects	150,000
Data migration	300,000
WWW publication	100,358
Split-core MST	190,373
Procure core image capture system	111,233
Sampling parties	29,400
Semiannual report	8,000
Solaris operations system upgrades	8,100
XRF crystals	6,000

4.2.3. ODP Publications: Major new decisions have been taken regarding publications.

4.2.3.1. Background: The re-design of ODP publications has taken another twist in its 1.5-year long history. Changes were primarily required by budget constraints, but also by the need to make increasingly use of electronic media for a more useful and cost-effective way of publishing the growing amount of data. In December 1994, PCOM formed a Publications Subcommittee to review cost and scope of ODP publication. In spring 1995, the subcommittee recommended changes that essentially retained the initial reports (IR) and scientific results (SR) volumes in their present form. The changes were not fully implemented by JOI because of the lack of significant cost savings and lack of unanimous support by the community.

At its January 1996 meeting, EXCOM asked PCOM and BCOM to advise JOI on what existing program components, foremost mentioning publications, could be dropped or reduced to accommodate new initiatives. On 12 April, 1996, a report was received from the Inspector General (IG) of NSF's Ocean Sciences Division, recommending that ODP cease publication of the SR volume, cease printing of the IR volume, and expand and publish an electronic version of the IR volume. The IG estimated a net savings of $1.1 million per year out of a $2 million publications budget.

In April 1996, PCOM accepted a second plan by its Publications Subcommittee which essentially proposed a return to DSDP-style publication in order to print one instead of two books per leg. This proposed change was not implemented, however, again because of a lack of apparent cost savings (all material still needed to be printed) and the impracticality of delaying publication of initial report material by three years.

In view of two unfeasible models proposed by the PCOM subcommittee, EXCOM's recommendation, and the IG's report, ODP/TAMU drafted a detailed publications plan during the Month of May. According to this plan, the concept of an IR volume would be fully retained but electronic media would be used, while printing of the SR volume would be phased out in conjunction with publication in the open literature and an electronic journal for ODP-specific reports and notes. At the same time, JOI put forward a more generic plan to move towards electronic publication as soon as possible.

4.2.3.2. Re-designing ODP Publications: The first decisive policy change of major implication was implemented by JOI in May 1996: in order to fulfill the publication requirement, shipboard participants must publish in a recognized international journal OR in the SR volume (starting with leg 160). At the end of May, JOI, PCOM and ODP/TAMU representatives met in College Station to devise the final publication plan. The plan proposed to publish the IR on CD-ROM, packaged with a booklet containing basic description of the leg and a guide to the CD, as well as on the WWW. The one-year moratorium for non-participants would be retained. In addition, an electronic SR volume would focus on synthesis papers and data reports. The plan also envisioned various links between the electronic publications and a future, expanded version of the Janus database.

This latest plan was endorsed by EXCOM in June. In July, ODP/TAMU drafted a corresponding, detailed publications policy (see ODP WWW page) and an implementation plan. According to this plan, all IR data will be electronically published starting with Leg 169, and printing of the IR will cease with Leg 175. For the SR, the printed volume will be limited to 500 pages for legs 152 to 168 and CD viewable versions will be available which may include data sets if provided by the author. Starting with Leg 169, no more SR hard copy will be printed and the CD material will be viewable, downloadable and printable.

JOI is now forming a Publications Steering Committee (PSC) to provide advisory input to the Publications Department during the shift to electronic publication. The activities of the PSC and publications developments at ODP/TAMU will be reported to all SCICOM and EXCOM meetings. The shift to all-electronic publishing (176IR; 169SR) will proceed only if JOI receives recommendations from the PSC and endorsement by the JOIDES scientific community.

4.2.4. JANUS Project: The JANUS Project is nearing completion of its first phase.

4.2.4.1. Phase I: Phase I development is through the present contract with Tracor, ending in April 1997, with a warranty support until July 1997. Deployment of the final delivery version is scheduled for Leg 171B (January/February, 1997). Testing and acceptance is scheduled for Leg 172 (February/March, 1997). Warranty support is from mid April to mid July 1997.

Components to be completed within Phase I:
- Corelog, Operations, Curation, Sampling (UG1)
- MST, Logging (UG2a)
- Paleontology, paleomag, color reflectance (UG2b)
- Physical Properties (UG3)
- Chemistry (UG4a)

Components that will probably not be completed within Phase I:
- Core description (replacement of VCD, HARVI)
- Core photos
- Thin sections and smear slides
- Underway geophysics, tensor tool

The Steering Committee's priority list for outstanding work is as follows:

1. Age-depth function (UG2b)
2. Color reflectance (UG2a)

3. Thin section, smear slides (UG4b, 5)
4. Paleomag (UG2a)
5. HARVI replacement
6. Chemistry quality control
7. Tensor tool (UG6)
8. Adara tool
9. Core display application
10. Torvane and penetrometer (UG3)

Janus-related work being performed by ODP/TAMU:

Moisture and density application, completed and installed on Leg 169
Coulometer application, completed and installed on Leg 169
Curation, to be completed by November 1996
Repository sampling, to be completed in October 1996
Janus WWW, Internet access to ODP data
Update video display of Corelog information on ship, Leg 171B

4.2.4.2. Phase II: Phase II refers to proposed developments which cannot be accomplished within Phase I, and for which two SOE items are scheduled within FY97 budget.

Two project proposals exist at present:

4.2.4.2.1. Core description: To refine user requirements for the core description application to replace the current VCD program. $150,000 are projected for FY98.

4.2.4.2.2. Core image capture system: To develop an imaging system capable of producing color digital images of a complete section of core. $136,233 projected as SOE in FY98.

4.2.5. Drilling Services Department

4.2.5.1. Personnel: The department was restructured under the new manager Brian Jonasson. Three team leaders are:

Ron Grout, Drilling Operations Team
Pat Thompson, Material Services Team
Charles Bollfrass (new hire), Development Engineering Team

Other staff (engineers and technicians) are assigned to project as needed.

Dan Reudelhuber (DCS project leader) and Bill Rhinehard left ODP recently. Michael Fredericks was hired as an engineering advisor.

4.2.5.2. DCS: Internal review concluded that enormous progress was made. The principal recommendations were to carry out a safety assessment on the DCS platform, plan the next DC test at a stable site such as Site 735B, and implement a number of minor equipment and operational changes. A final report is in preparation.

Phase IIIA development progressed as planned and the heave compensator controller was installed successfully during the Leg 169 port call. Phase IIIB will focus on converting the controllers developed in phase II into actual operating software and the creation of the operator interface structure.

New primary heave compensator seal designs, require the cylinder inner diameter and surfaces to be within tolerance and in good condition. The condition of the cylinders is unknown, and an examination is being prepared. Based on the results it will be decided whether installation of low-friction seals is possible. Major cylinder repairs would have to wait until the FY99 dry dock.

4.2.5.3. Hammer Drill System

4.2.5.3.1. Phase I: Feasibility: Recent tests in Australia of a 4.8" water hammer drill system successfully spudded holes into granite at angle ranging from 15 to 45, and hammer-drilled a total of 21 m of 7" casing into the formation with penetration rates of up to 7m/hr. Despite some bit problems, overall the tests were deemed successful so that Phase II could be initiated in order to keep the project on schedule for Leg 174B. A visit was also made to Iceland Drilling Company to observe techniques in drilling in casing using a pneumatic hammer drill equipment. 72 m of 11-3/4" casing was drilled in with a penetration of 6m/hr.

4.2.5.3.2. Phase II: PCOM reviewed the priority of the HDS project within the program and recommended JOI's approval of a FY96 Program Plan change to add $400,000 to the project to meet hydraulic hammer development costs. Phase II is to develop a 16" hydraulic system for deep-sea use. Ultimately the system is required to be capable of setting all existing casing string. Multiple bit-type options are being evaluated. Modified casing running tools, hanger, and reentry cone will designed by ODP/TAMU starting early FY97.

4.2.5. Other News

4.2.5.1. ODP Memberships: South Korea has officially joined the Canadian-Australia consortium on Sept. 24. ODP/TAMU and JOI/NSF are working with the consortium to define sailing privileges, etc.

Taiwan is about to join the consortium but papers are not signed yet. The issue of how to refer to the Taiwanese member is being addressed by JOI/NSF and the consortium

4.3.1. Wireline Logging Services: Peter Harvey is unable to attend and there is no report.

4.4.1. Ocean History Panel: Brian Popp noted that the OHP meets next week in Strasbourg. There is nothing to report at this time.

4.5.1. Tectonics Panel: Tim Byrne noted that TECP will `meet later, there is nothing to report at this time.

4.6.1. Lithosphere Panel: Dominique Weis noted that LITHP meets next week in Japan. There is nothing to report at this time.

4.7. Reports of Recent Drilling Legs

4.7.1. Leg 166: Gregor Eberli reported that Leg 166 completed a transect from the shallow top of the Great Bahama Bank into the Straits of Florida. The main objectives were 1) to establish the sedimentary record of Neogene-Holocene sea level changes, 2) to assess fluid flow through the platform margin, and 3) to study paleoceanographic changes in the Straits of Florida.

The Leg successfully completed the transect and drilled a short two hole transect further south. Seventeen holes were drilled at 17 Sites and five deep holes were logged. The recovered cores and logs provided the data necessary to answer the questions posed by the objectives. Facies successions in the cores gave the sedimentary record of sea-level changes throughout the Neogene. These changes are recorded in the sediments by variations in the amounts and kinds of platform-derived material. High-frequency fluctuations are displayed in cyclic alternations of more pelagic and more neritic sediments. Longer-term sea level fluctuations caused major margin erosion and coeval deposition of mass gravity flows at the toe-of-slope and in the adjacent basin. The sedimentary packages recording the longer term fluctuations are imaged on seismic data as seismic sequences.

The abundance of biostratigraphic markers in all transect sites allowed dating of the seismic sequence boundaries and, thus, the times of major sea-level falls. Sixteen seismic sequence boundaries were dated. The correlation between the sites documented the age consistency of seismic reflection horizons.

Active fluid flow was documented by geochemical profiles of the interstitial waters. The profiles showed a near vertical gradient of both the conservative and non-conservative elements in the top 50 m of the sediment, indicating flushing by sea-water. Deviations in the profiles further indicated flow into the platform. This finding documented for the first time geothermal-driven flow into the margins of an isolated carbonate platform.

4.7.2. Leg 167: Ryuji Tada presented a brief summary of Leg 167 drilling on the California Margin. The main objective of the cruise was to obtain continuous high-resolution paleoceanographic and paleoclimatic records of the late Neogene at 13 Sites arranged to form depth as well as latitudinal transects along the California Margin. The cruise was very successful and could have recovered over 7 km of sediments. Preliminary shipboard MST, logging, reflectance, and chemical analyses suggest that the sedimentary record clearly shows orbital signals which will allow establishment of a high-resolution cyclostratigraphy during the last 5 Ma or so. This will allow calculation of MAR's of biogenic as well as terrigenous materials with the highest resolution ever attained in this region. Tada also mentioned ultra-high-resolution analysis to reconstruct surface versus intermediate water characteristics, with variations possibly related to Dansgaard-Oeschger cycles.

4.7.3. Leg 168: Mike Underwood reported on the results of Leg 168, the Juan de Fuca Hydrothermal Transect at Middle Valley. There were three transects drilled to study the hydrothermal circulation and permeability. These included at total of 10 sites. Upflow of pore fluids was observed, and there was an upward flow of formation fluids at 60 degrees in one of the drill strings. Four CORKs were installed, water was sampled after a few days.

4.7.4. Leg 169: Michael Whiticar reported on the drilling at Saanich Inlet. The JOIDES RESOLUTION cored two sites in Saanich Inlet, each to a depth of about 120 m. Visual examination of the cores indicates that they contain a complete record of annual, seasonal, and even higher resolution environmental conditions, both terrestrial and marine, through the Holocene and latest Pleistocene. Lamina pair thicknesses (i.e. annual accumulations) vary from an average of about 6 mm to more than 1.5 cm. Fish remains were found at several depths, and wood debris and charcoal were also recovered. There appears to be a cyclicity in lamina thickness and composition on a decadal to century time scale. The Mazama Ah (from the eruption of Mount Mazama (Crater Lake, Oregon), 6,800 years ago, is present as a white layer about 1 cm thick. Massive intervals several tens of centimeters thick are evident throughout the cores, and are probably related to both earthquake-triggered underwater landslides and to periods of re-oxygenation of the bottom waters. A well developed bivalve fauna indicates that bottom waters were well-oxygenated immediately following the disappearance of the glaciers.

5. Responses to PCOM and JOIDES Requests

5.1. Suggestions for Attendees at the SSEP Meeting in January:

Eberli and Underwood
Whiticar and Baker

SGPP urges PCOM to find a fluid flow person to serve on the panel. Current SGPP members Kastner and Beakins both have conflicts of interest. Former SGPP member Jean Barr would be suitable. .

SGPP notes that a number of the topics with which it has been concerned overlap the new Endogene and Exogene SSEPs. SGPP recommends that SCICOM take into account the need for continuity and familiarity with proposals "in the system" in its initial selection of members for the SSEPs.

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The motion was passed unanimously

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*Fluid mass balances
*Microbial processes (Deep Biosphere Pilot Project).
*Marine carbon cycle and oxygenation histories
*Sea Level
*Metal concentration processes

October 4, 1996

6. Report on Antarctic DPG: Hay reported that PCOM had authorized establishment of an Antarctic Detailed Planning Group, as recommended by SGPP. He was appointed Chair by the PCOM, and the JOIDES Office selected and invited members. The DPG met at the end of May in College Station. On this short notice, it was not possible to get another member of SGPP to serve, but Ted Moore, Rainer Gersonde, and Tom Crowley from OHP, John Diebold from SSP, and Peter Blum of ODP were able to attend. The proponents present were Peter Barker (Proponent on Proposals 452 and 483), Peter Barrett (Proponent on Proposal 489), Angelo Camerlenghi (Proponent on Proposal 452), Carlota Escutia (Proponent on Proposal 482), and Anders Solheim (Proponent on Proposal 488).

The Report of the Antarctic DPG was to have been in the 1998 Prospectus, but only a few pages of the report were included. Hay had not noticed this before leaving for Nancy, so the entire report was printed out and distributed at the SGPP meeting.

The Charge to the DPG was to: 1) develop viable drilling plans to constrain the timing and extent of regional glaciation, 2) guide the proponent groups as they assemble relevant site survey information and submit it to the Site Survey Data Bank, 3) prioritize the proposals based on scientific quality and consistency with the ODP Long Range Plan, 4) consider operational constraints, recognizing that weather will likely limit the extent of drilling operations in the region, 5) submit a drilling plan for possible inclusion in the 1998 drilling prospectus for the August 1996 PCOM meeting, and further reports if needed for Fall 1996 thematic panel meetings and the December 1996 PCOM meeting.

The members of the DPG concluded that the principal theme of Antarctic lay in determining the timing, extent, and variability of glaciation of the Antarctic continent, its effect on global sea level, and its influence on the surrounding ocean.

The DPG considered multi-year drilling plans based on the assumptions that

1) The Southern Ocean (Austral) Transect (Proposal 464) is already on the schedule pending 1996 site surveys.

2) the paleoclimate goals of the Bransfield Strait sites and the Palmer Deep site would be included in an Antarctic Peninsula Leg.

3) the Mesozoic site in the Weddell Sea would be combined with the Polarstern Bank and Crary Fan sites into a single leg.

4) the Ross Sea and Wilkes Land areas, being contiguous, could be a two leg program with crew change in McMurdo or by helicopter from McMurdo.

The DPG's preferred drilling plan was as follows

1997/1998 Antarctic Peninsula after the Austral transect (464)
Scotia Sea picked up in transit in 1997/1998 or 1998/1999
1998/1999 Weddell Sea
1999/2000 Prydz Bay
2001 Ross Sea and Wilkes Land (as a two leg combination with crew change in McMurdo).

After making the report, it was noted that Hay could now be considered a proponent, and so he left the room during the discussion to avoid conflict of interest. After considerable discussion, the following motions were made:

6.1 SGPP motions regarding the Antartctic program:

Macko moved and Whiticar seconded that

SGPP endorses the study of Antarctic glacial history and sea level change. We support a first leg to be drilled at the Antarctic Peninsula as a test of the concept. The results of this leg should then be evaluated to determine whether the drilling strategy will answer the questions posed. We do not necessarily agree with the proposed order and schedule of subsequent legs as given in the DPG report. We recommend that the future panel structure consider this issue when the results of the Antarctic Peninsula leg are known.

Passed unanimously (one absent).

It was moved by Bekins and seconded by Macko that

From the materials provided, it is not clear to SGPP that 452-Add2 in its entirety is consistent with the main objectives of the Antarctic Program: to study glacial history and sea level change. Therefore, SGPP requests that the DPG submit a drilling plan for the Antarctic Peninsula that has site summary forms and a description of the goals for all of the sites. In addition, we would like a clear statement that this plan represents a consensus among the participants.

Passed unanimously (one absent).

7. Reviews of Proposals: The Panel reviewed 12 revised proposals, 19 addenda, 1 update, and 14 new proposals. As in the past, proponents were requested to leave the room during discussion of their proposals. It was also noted if Panel members belonged to the same institution as the proponents, in which case the Panel members abstained from participation in the discussion to avoid any appearance of conflict of interest. The "Review Criteria for ODP Thematic Panels Review (Jan. 1, 1996)" were used for the ratings. Proposals rated A5 were given no further rating except F4. Reviews of the proposals are in Appendix A.

PRP. NO.	ABBREVIATED TITLE							
079-Add	Western Somali	A3	B1.3	B2.1	C3/C4	D2	E0	F4/F5
354-update	Benguela Upwelling		No ratings needed					
355-Add2	Peruvian Margin	A2	B1.2	B2.1	C2	D3	E0	F2
367-Add3	Cool Water Carb.	A1	B1.1	B2.1	C1	D1	E0	F1
426-Rev2	Aus-Ant Rifting	A5						F4
431-Add3	W. Pacific Geophys.	A5						F4
432-Add	Galicia	A5						F4
441-Add1	Deep Pacific Source	A5						F4
445-Add2	Nankai Prism	A1	B1.1	B2.1	C1	D1	E0/E8	F1/F
447.Rev3	Western Woodlark	A2	B1.2	B2.1	C3	D1	E8	F2
448-Rev2	Ontong Java Plateau	A5						F4
450-Add2	Taiwan Collision	A3	B1.2	B2.1	C1	D1	E8	F2
451-Add2	Tonga Forearc	A3	B1.2	B2.1	C2	D1	E0	F5
452-Add2	Antarctic Peninsula	A1	B1.1	B2.1	C2	D1	E8	F2
457-Rev4	Kerguelen Plateau	A5						F4
463-Add2	Shatsky Rise	A5						F4
464-Add2	Southern Ocean	A3	B1.2	B2.1	C1	D1	E0	F3
466-Rev	Great Austr. Bight	A5						F4

467-Rev	Turbidite Systems	A1	B1.1	B2.1	C1	D1	E0	F1
469-Add	Argo Abyssal Plain	A5						F4
472-Add	Mariana-Izu Margin	A1	B1.1	B2.1	C2	D1	E0	F2
476-Add2	Hudson Apron	A1	B1.2	B2.1	C1	D1	E0	F1
477-Rev	Okhotsk/Bering Seas	A4	B1.2	B2.1	C1	D3	E0	F3
479-Rev	E. ManuBasin	A1	B1.2	B2.1	C3	D1	E0	F5
481-Add	Red Sea Deeps	A1	B1.1	B2.1	C1	D1	E0	F1
482-Add	Wilkes L/Ross S	A1	B1.2	B2.1	C3	D1	E8	F2
485-Rev	Aus-Ant Gateway	A5						F4
486-Rev	Paleogene Eq. Pacific	A5						F4
489-Add	Wilkes L/ Ross S	A1	B1.2	B2.1	C2	D1	E8	F2
491-Add	Crustal Accretion	A5						F4
494-Rev	South China Sea	A5						F4
495-Rev	Seychelles	A5						F4
496	Cuvier/Wallaby	A5						F4
497	Ryukyu Forearc	A5						F4
498	Barents Sea	A5						F4
499	Eq. Pacific Geophys.	A5						F4
500	H2O Observatory	A5						F4
501	LIP Ontong Java	A5						F4
502	Palmer Deep	A3	B1.2	B2.1	C1	D1	E0	F3
503	Weddell Sea	A2	B1.1	B2.1	C3	D1	E0	F3
504	Newfoundland Basin	A5						F4
505	Mariana Margin	A1	B1.2	B2.1	C2	D1	E3*	F2
506	Global Geophys. Plan	A5						F4
507	TAG II	A2	B1.2	B2.1	C4	D3	E0	F5
X	Okinawa Trough	A3	B1.2	B2.1	C2	D3	E0	F5
XX	DCS Engineering	A5						F4

* = for southern transect.

October 5, 1996

8. Reviews of Letters of Intent (LOIs): The Panel reviewed 5 Letters of Intent. They were rated only in terms of thematic relevance. The Panels comments on each are given in Appendix A.

8.1 Summary of Ratings of LOIs: The following table presents a summary of the ratings of the LOIs.

LOI No.	ABBREVIATED TITLE	RATING
69	Refurbishment of Barbados Cork Experiments	A1
70	Hydraulic Piston Coring	A5
71	Southeast Indian Ocean Hotspots	A5
72	RAB and ISONIC LWD tool engineering test	A3
X	South China Sea - Evolution of Back-Arc Basin	A5

9. Ranking of Proposals in the FY98 Prospectus: After discussion of the proposals in the Prospectus, Macko moved and Whiticar seconded that

LOI 69 (CORKs) be added to Prospectus

Unanimous (10)

Macko moved and Brumsack seconded that Proposals 431, 457, 485, and ADPG 2 and ADPG 3 be deleted from consideration.

Unanimous (10).

The Panel then ranked the remaining programs in the FY98 Prospectus, including the LOI it had voted to add to it. The results of voting were tabulated independently by Blum and Hay. The program with the highest average is ranked 1, as the Panel's highest priority. The ranking is as follows:

PROP NO.	ABBREVIATED TITLE	SCORE	STD. DEV.	RANK
X	Antarctic DPG 1	11.9	1.5	1
445	Nankai trough	11.4	1.7	2
367	Cool Water Carbonates	10.8	1.8	3
LOI 69	Barbados CORKs	10.4	1.3	4
472	Mariana-Izu	8.5	2.5	5
447	Woodlark Basin	7.1	2.8	6
464	S Atlantic Paleocean	6.7	1.9	7
451	Tonga Forearc	6.4	2	8
450	Taiwan Collision	5.4	1.3	9
441	SW Pacific Gateway	5.2	2.6	10
79	Somali Basin	4.6	2.7	11
LOI 72	LWD Engineering	2.4	1.1	12
X	DCS Engineering	1.6	0.8	13
431	W Pacific Network			Not ranked
457	Kerguelen			Not ranked
485	Australian Antarctic Gateway			Not ranked
X	Antarctic DPG 2			Not ranked
X	Antarctic DPG 3			Not ranked

10. SGPP Motion regarding CORKs

It was moved by Underwood and seconded by Macko that

SGPP has always viewed CORK experiments as a high priority, and the new Long Range Plan places added emphasis on this type of technology. By supporting this program, ODP makes an implicit commitment to maintain the equipment. Failure to

follow through with such commitments will eliminate the long term aspect of the in situ monitoring and thus greatly reduce the value of the experiments. The only reasons for abandoning CORK's is if the science is weak or it becomes apparent that the CORK site is not adequate to achieve the desired objectives. Thus, SGPP urges PCOM to facilitating this aspect of the program.

Passed unanimously

11. Suggestions for Co-Chief Scientists:

Antarctic Peninsula: Peter Barker, A. Camerlenghi, D. Futterer, Luis Gamboa, John Anderson, Jim Kennett

Nankai Trough: Greg Moore, Miriam Kastner, Kate Moran, A. Taira, H. Tokuyama

Great Australian Bight: David Fearcy, Noel James, David Osleger, Isabella Montanez

(LOI 69 CORKS; Kier Becker)

Mariana-Izu:: T. Plank, P. A. Floyd

Woodlark Basin: B. Taylor, John Mutter, A. Le Pichon, J.-C. Sibuet

12. SCICOM: It was noted that U.S. SCICOM members will be chosen from applicants. It was urged that SGPP members apply to serve on SCICOM

13. Thanks for Service: Hay and McKenzie thanked the members of the Panel for their service over the years. Hay also conveyed the thanks for the JOIDES Office.

14. Adjournment: The meeting adjourned at 12:45 PM.

APPENDIX A

Comments on Proposals and Letters of Intent
Reviewed at the Meeting of the
JOIDES Sedimentary Geochemistry and Processes Panel
3-5 October, 1996
Nancy, France

Proposal 079-Add
Title: Geophysical site survey work for a deep ODP hole in the western Somali Basin
Proponents: K. Hinz, H. A. Rosser, and M. F. Coffin
Rankings: A3, B1.3, B2.1, C3/C4, D2, E0, F4/F5

This addendum provides a summary for a proposed site survey of the Somali Basin. Because it is written in German, it is somewhat difficult to evaluate. However, based on the English summary, it appears as though no significant changes in scientific objectives have been made since proposal 079-Rev2 was submitted in 1993. SGPP has never considered this proposal to be of high thematic priority. SGPP has never included the proposal in any of its global rankings. In the years since 079-Rev2 was submitted, SGPP rewrote its White Paper, and JOI/ODP formulated a new Five-Year Plan. Unfortunately, nothing has been added to clarify or improve the aspects of interest to SGPP. The thematic goal of "sedimentary mass balance" dates back to an earlier SGPP White Paper. The proponents fail to provide the details necessary for us to give this vague objective a fair evaluation, but even if they had, the theme is no longer of high priority to SGPP. The role of eustatic sea-level is mentioned briefly, as a potential control on rates and processes of sediment accumulation. This potential exists within virtually every sedimentary succession. Why should ODP focus its efforts on the Somali Basin example? Evidently, the proponents merely hope to match non-eustatic pulses in turbidite deposition with phases of local tectonic activity. SGPP remains quite interested in the effects of sea-level fluctuations (in general), but to be meaningful and definitive, studies of this type need to follow the guidelines of the Sea-Level Working Group. The drilling sites must be located along transects that are tied closely to changes in seismic-reflection geometry. Drilling a single very deep hole through flat-lying reflectors will tell us very little (nothing?) about how sea-level affects three-dimensional facies architecture. Presumably, the proponents plan to hang their borehole stratigraphy on the eustatic template of Haq and others. They fail to provide convincing justification, however, as to why this should be done in the Somali Basin as opposed to any other continental margin. The real purposes of this study are: (1) to determine the timing and nature of continental break-up; (2) to study magnetic anomaly characteristics of Mesozoic-aged oceanic crust, and (3) to compare the stratigraphic characteristics of Mesozoic sequences to both sides of the SW Indian Ridge. As such, the study remains marginally relevant to SGPP objectives, at best. There is little chance of success with respect to SGPP thematic priorities, and the proposal is unlikely to become a high priority.

Proposal 354-Revised Site Location Table
Title: Neogene history of the Benguela Current and Angola/Namibia Upwelling System
Proponents: G. Wefer, V. Spiess, U. Bleil, M. Breitzke, K. Gohl, R. Schneider, and G. Uenzelmann-Neben

SGPP acknowledges the information provided by the proponents concerning the new locations of some of the proposed and alternative drill sites. he cancellation of the shallow site NCB 1 for safety reasons is accepted by SGPP.

Proposal 355-Add2
Title: Peruvian Margin
Proponents: N. Kukowski
Rankings: A2, B1.2, B2.1, C2, D3, E0, F2

This addendum argues that the Peru Margin represents an end member accretionary complex with little sedimentary input, strong vertical tectonism, and a complex tectonic history. Although the complex tectonics would normally be a disadvantage, the proponents argue that this represents an opportunity to address several different questions. These are the relationship between tectonic uplift and gas hydrate stability, the fluid flow system with a possible continental backstop, and the tectonic signature of a subducting ridge. This seems a reasonable position but none of the specific goals are of compelling interest at this particular margin. For each goal there seems to be a better location. For example gas hydrates and tectonics might be better pursued on a second Cascadia leg. Similarly, the fluid flow picture is complicated by a lateral component that may make a fluid mass balance difficult to achieve for this area. Finally, the proponents have not really addressed the comments of SGPP from Spring, 1995. In these comments we asked for a conceptual model of the fluid flow system and a detailed geochemical sampling plan to address the questions about the origins of the fluid anomalies and the gas hydrates.

Proposal 367-Add3
Title: Cenozoic cool-water carbonates of the Great Australian Bight
Proponents: D. A. Feary
Rankings: A1, B1.1, B2.1, C1, D1, E0, F1

In this revision the proponent addressed the question of SGPP. In particular, the questions in regards to fluid flow and diagenesis, and dating are clearly answered. The inclusion of a hydrogeologist as a proponent helped formulate fluid flow models which can be tested with the proposed drilling. SGPP encourages the proponents to perform a more detailed sequence analysis to refine the sequence stratigraphic framework. Within this framework an attempt should be made to date several third-order sequence boundaries in addition to the proposed second order unconformities. This refinement will allow a better comparison with the ages of the sequence boundaries of the New Jersey and Bahamas transects.

Proposal 426-Rev2
Title: Mantle reservoirs and mantle migration associated with Australian-Antarctic rifting
Proponents: D. Christie, D. G. G. Pyle, and A. J. Crawford
Rankings: A5, F4

SGPP does not consider this proposal relevant to its objectives.

Proposal 431-Add3
Title: Western Pacific Geophysical network: Subducting plates into mantle
Proponents: K. Suyehiro, H. Fujimoto, T. Kanazawa, J. Kashahara, Y. Fukao, H. Momma, K. Fujioka, T. Matsumoto, H. Kinoshita, S. Sacks, A. Linde, R. Hino, A. Hasegawa, M. Shinohara, and I. Kawasaki
Rankings: A5, F4

This addendum is a status report, with new information about upcoming site surveys, development of borehole strain meters and broadband seismometers, and installation of a new fibre optic cable system. This program is consistent with one of the new initiatives identified by the Long Range Plan: in situ monitoring of geological processes. However, the objectives are not within the mandate of SGPP.

Proposal 432-Add
Title: A deep hole off Galicia to study the mechanism of continental breakup: Sedimentary and subsidence history and the nature of the S Reflector
Proponents: T. J. Reston, G. Boillot, M.-O. Beslier, C. M. Krawczyk, and J.-C. Sibuet
Rankings: A5, F4

This brief addendum provides information about an upcoming MCS survey to image the S reflector west of the Galicia Bank. In theory, the S reflector is a detachment fault associated with continental breakup, and the proponents want to sample above and below the reflector. This would require drilling through approximately 3000 m of sedimentary and basement rocks. The seismic survey will help determine whether or not the S reflector is shallow enough anywhere within the study area to be classified as a feasible drilling target using the JOIDES Resolution. This program lies entirely within the thematic realm of TECP.

Proposal 445-Add2
Title: Deformation and fluid flow processes - Nankai Prism
Proponents: G. F. Moore, J. Morgan, B. Bekins, T. Byrne, M. Kastner, A. Taira, H. Tokuyama, W. Br™ckman, D. E. Karig, K. Moran, and H. Tobin
Rankings: A1, B1.1, B2.1, C1, D1, E0 (Leg I)/E8 (Leg II), F1 (Leg I)/F2 (Leg II)

The thematic objectives of this proposal are clearly within the category of high priority as established by the most recent SGPP White Paper and the Long Range Plan. SGPP has forwarded to the proponents many detailed comments during its reviews of earlier revisions and addenda. This addendum provides the proponents' responses to the Spring 1996 review, as well as their most recent results of iterative modeling of fluid flow. These preliminary models help establish a very sound predictive framework for additional drilling, by demonstrating exactly how changes in clay mineralogy and consolidation behavior might affect fluid chemistry. The proponents have clarified how they will use new drilling results (from both cores and logs) to improve the values of input parameters in their numerical models. Smectite content appears to be too low to account for the chlorinity profile at Site 808. The proponents have outlined several possible scenarios to account for increases in the total volume of smectite within the accretionary prism and within the underthrust domain. Most of these possibilities remain speculative given the existing database, but they can be tested definitively by additional drilling and lab analyses. The proponents have explained why packer tests and CORK experiments should be deferred until the second proposed leg; they have explained the scientific value of such data, and they have established valid guidelines for both single-leg and two-leg drilling programs. The Panel recognizes the value of CORKs, but to CORK all of the holes is expensive in time and equipment. . SGPP commends the proponents for responding so effectively to the panel's input. The first Leg of the program is well justified and ready to schedule.

Proposal 447-Rev3
Title: Active continental extension in the Western Woodlark Basin
Proponents: B. Taylor, J. Mutter, F. Martinez, A. Goodliffe, R. Binns, S. Scott, G. Abers, C. Mutter, and H. Davies
Rankings: A2, B1.2, B2.1, C3, D1, E8, F2

This revision establishes a modified drilling strategy and presents the most up-to-date interpretations of seismic data and dredge recoveries from a recent site survey of the Woodlark Basin. For the most part, the Woodlark Basin program addresses themes that are of great interest to TECP. The subject of fluid flow along active faults and other types of high-permeability pathways, however, is definitely within the mandate of SGPP. This theme is also a high priority articulated by the Long Range Plan, without restriction to any specific type of tectonic environment.

Our reviews of earlier versions of this proposal (especially Spring 1996) provided the proponents with what have become routine expectations for the implementation of CORK experiments. Little has been added to the proposal to provide these requested details. The real problem, in this case, is that the experiments would have to be designed in the total absence of previous coring data. Accordingly, any predictive models of fluid flow and fluid-rock interaction would involve pure speculation. The proponents have decided not to follow this pathway of speculative modeling, and that decision is perfectly valid. To be fair, however, SGPP must maintain consistent standards in its evaluation of fluid-flow objectives, be they associated with low-angle reverse faults in accretionary prisms, low-angle normal faults in extensional margins, hydrothermal cells near the flanks of mid-ocean ridges, or carbonate platforms. At present, we have no reason to conclude that long-term monitoring would be worthwhile in the Woodlark Basin, or that any type of anomaly exists within or near the fault zone at Moresby Seamount. Accordingly, SGPP suggests that it would premature to plan for the installation of a CORK at Site ACE-8a.

Rather than devoting all of the time (and money) for a triple-cased re-entry hole and CORK, we suggest that the first drilling leg in the Woodlark Basin should concentrate on comprehensive shipboard and shore based characterization of the physical stratigraphy, mineralogy, physical properties, and fluid chemistry. An aggressive program of packer tests and in situ temperature measurements (using WSTP, DVTP, and Adara tools) also could be completed during a single drilling leg. Perhaps these data would provide the proponents with a reasonable understanding of the fluid system. Perhaps interesting anomalies and evidence of transient phenomena would be discovered. Collectively, the conventional data would help them establish the parameter values required for predictive numerical models of fluid flow and their associated hydro-geochemical responses. After all of that work is completed, then the proponents would be in a position to formulate an effective CORK program, with the assistance of topical experts in physical hydrology and fluid geochemistry. Experts in those fields really need to be added to the group of proponents. The CORK program (plus osmotic fluid samplers?) then could be merged with the proponents' other long-term objective of drilling a very deep hole through the active fault during a second leg.

Proposal 448-Rev2
Title: Assessing the origins, age and post-emplacement history of the Ontong Java Plateau through basement drilling
Proponents: L. W. Kroenke, J. J. Mahoney, A. D. Saunders, P. Wessel, and D. Bercovici
Rankings: A5, F4

SGPP does not consider this proposal relevant to its objectives.

Proposal 450-Add2
Title: Taiwan arc-continent collision: An actively developing suture
Proponents: N. Lundberg, D. L. Reed, T. Byrne, J. Crespi, J. Gieskes, and G. F. Moore
Rankings: A3, B1.2, B2.1, C1, D1, E0, F2

This addendum an update based on the results of processing the seismic data acquired by the Ewing in Aug-Sept, 1995. SGPP has always been primarily interested in the fluid flow aspects of this proposal. Last time this proposal was reviewed in Fall, 1995, SGPP requested that the fluid flow objectives be better developed. The proponents have not addressed these concerns in this latest addendum. Thus the rating remains the same except that D3 has been upgraded to D1 because the pore water sampler has now been tested. To reiterate, SGPP feels that the hydrological/hydrogeochemical aspects are still immature. Thus, we would still like to see an explanation of how the hydrogeochemical questions will be addressed. The proponents need to formulate a configuration of drilling sites and methods to systematically address these questions in the drilling plan.

Proposal 451-Add2
Title: Ocean drilling in the Tonga Forearc: Subduction geodynamics, arc evolution and deformation processes at non-accretionary convergent margins
Proponents: C. J. MacLeod, D. R. Tappin, S. H. Bloomer, P. D. Kempton, and P. D. Clift
Rankings: A3, B1.2, B2.1, C2, D1, E0, F5

This well-organized addendum provides a summary of results from recent site surveys, together with a revised strategy for drilling three transects across the Tonga forearc. All of the primary objectives remain within the thematic territory of TECP and LITHP. Ancillary objectives of interest to SGPP include: (1) determining the nature and extent of fluid circulation in the Tonga forearc; and (2) studying the mechanisms of sediment dispersal and redeposition on trench slopes. The proponents make a brief, but valid, case for pursuing these ancillary objectives. In essence, even if the drilling strategy is designed to achieve only TECP and LITHP objectives, interesting results almost certainly will fall out of the normal shipboard measurements programs in sedimentology and fluid geochemistry. As stated in earlier reviews, this will be by default rather than by design. Nevertheless, characteristics of fluid chemistry in regions of tectonic erosion, ridge collision, and arc rifting remain very poorly documented, and this drilling program should provide a much-improved global database that could push forward a focused program to study fluid flow in greater detail. Similarly, our understanding of the balance between eustatic and tectonic influences on forearc sedimentation remains vague, especially within intraoceanic settings. Comparisons of subsidence history and sediment-accumulation patterns among the three proposed transects should be very interesting, especially if the results are superimposed on the eustatic reference frame. SGPP is unlikely to shift this proposal into its category of high priority, but the Tonga drilling program will provide an excellent opportunity for true interdisciplinary cooperation.

Proposal 457-Rev4
Title: Future ODP drilling on the Kerguelen Plateau and Broken Ridge: Determining the origin, growth and evolution of a very large igneous province in the Southern Indian Ocean
Proponents: F. A. Frey, M. Coffin, D. Weis, M. Chaming, M. Munschy, R. Schlich, L. Konnecke, M. Storey, R. Duncan, M. S. Pringle, and S. L. Goldstein
Rankings: A5, F4

This proposal does not address topics within the SGPP mandate.

Proposal 463-Add2
Title: Testing hypotheses of giant LIP formation at Shatsky Rise
Proponents: W. W. Sager, Y. Tatsumi, M. Nakanishi, L. M. Khankishieva, A.

Klaus, J. J. Mahoney, G. R. Brown, and W. V. Sliter
Rankings: A5, F4

SGPP does not consider this proposal relevant to its objectives.

Proposal 464-Add2
Title: Paleoceanographic transect across the Southern Ocean - Atlantic Sector
Proponents: R. Gersonde, D. Hodell, G. Bohrmann, C. D. Charles, P. N. Froelich, D. F™tterer, K. Gohl, J. P. Kennett, G. Kuhn, H. Miller, and D. A. Warnke
Rankings: A3, B1.2, B2.1, C2, D1, E0, F3

This is still an exciting proposal with prospects of study of burial and diagenesis of silica. This topic is barely addressed in the proposal, but could be developed with appropriate collaboration.

Proposal 466-Rev
Title: Investigation of linearly magnetised rifted crust and the evolution of high-extension/slow spreading continental margins: A proposal for drilling in the Great Australian Bight region by the Ocean Drilling Program
Proponents: H. M. J. Stagg, J. B. Wilcox, J.-Y. Royer, J. B. Colwell, A. J. Crawford and S. Shafik
Rankings: A5, F4

SGPP does not consider this proposal relevant to its objectives.

Proposal 467-Rev
Title: Sand-rich vs. mud-rich turbidite systems at intermediate latitudes: Stratigraphic response to sea-level changes
Proponents: L. Droz, C. Ravenne, B. Savoye, S. Bern≠, and G. Bellaiche
Rankings: A1, B1.1, B2.1, C1, D1, E0, F1

This proposal is to do a comparative study of the response of two submarine fans to changes of sea level. The fans are close to each other, but have very different source areas and shelf slope configurations. The Var fan off the Ligurian margin has a mountainous source area, a narrow shelf, steep continental slope, and is sand-rich. The Rhone fan is fed by a major river draining lowland areas, a wide shelf and gentle continental slope, and is mud-rich. The Panel concluded that this is an excellent opportunity to study the difference in development of these two fan types in response to sea level change.

Proposal 469-Add
Title: The Argo Abyssal Plain: A proposal to drill reflecting interfaces within oceanic crust
Proponents: H. M. J. Stagg and P. A. Symonds
Rankings: A5, F4

This is a modification to report on site survey information. The proposal is directed toward LITHP objectives and is not relevant to SGPP interests.

Proposal 472-Add
Title: Crustal Fluxes and Mass Balances at the Mariana-Izu Convergent Margin

Proponents: T. Plank, R. L. Larson, P.A. Floyd, J. Alt, T. Elliott, L. Abrams,
J. Morris, R. J. Stern, & J. B. Gill,
Rankings: A1, B1.1, B2.2, C2, D1, E0, F2

This addition addresses some of the comments from the spring 1996 meetings. SGPP appreciates the clarification regarding the choice of 801C as the Mariana reference site. The use of existing sites to characterize the sediment input seems reasonable. However, the point was briefly made that if the EMB crust is from Cretaceous seafloor spreading then the existing Nauru hole can be used as a reference site. How will this be determined? If this is the case, will the deepening of 801C then be exchanged for another site? The response to SGPP's request for description of the relationship between this proposal and that of Freyer was treated somewhat superficially. The panel feels that the coordination between the proponents on the two proposals should be much closer. Finally, as mentioned before, there is nothing in the plan to address the fluid output budget for the Izu forearc. Even though active vents have not been observed, a significant fluid flow component could be still be present either as diffuse, slow, or intermittent flow. This aspect of the proposal needs to be more carefully constrained.

Proposal 476-Add2
Title: Hudson Apron Submarine Slope Stability Transect
Proponents: L. Pratson, C. Pirmez & D. Goldberg
Rankings: A1, B1.2, B2.1, C1, D1, E0, F1

This proposal seeks to test the hypothesis that slope failure is most frequent during lowstands of sea level. The current addendum restructures the proposal as a pilot study - essentially a contingency plan for Leg 174 if time should become available. The present plan is to drill four sites in 375 to 975 m water depth to 340 to 550 mbsf. The issue of resolving timing with respect to pre-failure and post-failure conditions needs to be viewed within the framework of geologic rather than human time. The goal of documenting physical properties `"just prior to failure" does not mean hours or days before failure. It means contrasting geologic zones within a larger geographic area that is known to have experienced slope failure - one zone has failed, one zone has not. Are the obvious differences in physical properties between these zones, or is failure triggered entirely by transient phenomena that operate on human time scales? The proposed study should help answer these questions.

Proposal 477-Rev
Title: The Okhotsk and Bering Seas: High resolution Plio-Pleistocene evolution of the Glacial/Interglacial changes in the marginal seas
Proponents: K. Takahashi, I. Koizumi, A. SV. Svarichevsky, S. A. Gorbarenko, R. Thiedemann, D. W. Scholl, and A. Taira
Ratings: A4, B1.2, B2.1, C1, D3, E0, F3

This proposal continues to be one of interest to SGPP, with great potential for studies on silica and carbon diagenesis. SGPP encourages the proponents to seek collaboration with geochemists to address their wishes. With aspects of sedimentary geochemistry more extensively developed, SGPP would rate the proposal more favorably.

Proposal 479-Rev
Title: Massive sulfide mineralization in felsic volcanics of the Eastern Manus Back-Arc Basin, Western Pacific
Proponents: R. A. Binns and S. D. Scott
Ratings: A1, B1.2, B2.1, C3, D1, E0, F5

This proposal is to drill a hydrothermal system hosted in a felsic volcanic environment (Eastern Manus Basin). The main justification of the proposal is the contrasted environment with regard to other hydrothermal areas investigated by ODP. Compared to the former proposal, site to drill massive sulphide deposits have been withdrawn and new survey, including Sinkai dives, strengthen the choice of the sites to be drilled.

The proposed strategy includes :

-one deep hole (700m) in the modern active system to understand the volcanic architecture, characterize the mineralization and the hydrothermal system. Ultimately this deep hole is hoped to reach the source zone of metal.

- one site in the potential fluid influx zone;
- one site in sediment nearby the hydrothermal site to document the history of the hydrothermal activity.

The proposal includes CORK and eventually long term fluid sampling experiments.

The ODP LRP mentions as an objective the study of analogues of economic deposits; this corresponds well with this proposal. At this stage of knowledge of the system, the proposal is essentially directed toward the characterization of the system and does not allow testing of sophisticated models of fluid circulation. This is an exploratory project and it seems tentative to plan CORKs in the system. The proposal remain vague on the type of investigation proposed. For instance it is difficult to estimate how well the structure of the hydrothermal deposit will be known if massive sulfides will be avoided for safety reason. It would also be necessary to develop the type of information which will be extracted from the sediment to reconstruct the historical evolution of the system.

Proposal 481-Add
Title: Red-Sea Deeps
Proponents: J. Ludden and R. Rihm
Ratings: A1, B1.1, B2.1, C1, D1, E0, F1

This addendum to the Red Sea proposal essentially presents better OH objectives and gives information on the clearance situation. A two Leg program is likely to be necessary to achieve the objectives. The proposal remain a top priority for the SGP panel. However, given the political problem in the region there is no reason to ask that this proposal be included in the FY98 list.

Proposal 482-Add
Title: Addendum to the Wilkes Land and Ross Sea Ocean drilling Program Proposals (482-Add and 489-Add)
Proponents: C. Escutia and Wilkes Land ODP Proposal Working Group
Ratings: A1, B1.2, B2.1, C2, D1, E8, F2

This addendum provides a new logistical framework for an 82-day "superleg" that would combine drilling transects of the Wilkes Land margin and the Ross Sea. Potentially, this type of study is relevant to high-priority SGPP thematic objectives, specifically with respect to sea-level and facies architecture. As written, however, the proponents actually offer an interdisciplinary approach that straddles OHP and SGPP priorities, and the SGPP component remains poorly formulated and weakly supported. During its previous evaluations of these proposals, SGPP stated that the Wilkes Land study was the weakest of the ANTOSTRAT proposals. SGPP also forwarded numerous suggestions and critical comments to proponents of the Ross Sea transect. We are disappointed that the proponents did not responded to any of this input, and they have not improved their treatment of scientific objectives or drilling strategies in any meaningful way. Instead, they merely combined two proposals into one drilling schedule. The proponents need to realize that SGPP's interest in a generic sea-level study of an ice-contact margin does not translate into carte blanche support for each proposal within the ANTOSTRAT program. This particular combination of Wilkes Land and Ross Sea transects is not ready to be taken seriously by SGPP.

Proposal 485-Rev
Title: The southern gateway between Australia and Antarctica: A proposal for ODP Paleoclimatic, Paleoceanographic and Transform Margin Drilling
Proponents: N. F. Exon, J. P. Kennett, J. Mascle, P. J. Hill, J.-Y. Royer, G.
C. H. Chaproniere, and S. Shafik
Rankings: A5, F4

This proposal is concerned with Ocean History and does not address SGPP objectives.

Proposal 486-Rev
Title: Paleogene Equatorial Pacific APC Transect
Proponents: M. Lyle, D. K. Rea, T. C. Moore, and L. D. Stott
Ratings: A5, F4

This proposal is concerned with Ocean History and does not address SGPP objectives. The panel could become interested if it were more clear how global sediment mass balance and CCD changes will be addressed.

Proposal 489-Add
Title: Addendum to the Wilkes Land and Ross Sea Ocean drilling Program Proposals (482-Add and 489-Add)
Proponents: F. J. Davey and Ross Sea ODP Proposal Working Group
Ratings: A1, B1.2, B2.1, C2, D1, E8, F2

This addendum provides a new logistical framework for an 82-day "superleg" that would combine drilling transects of the Wilkes Land margin and the Ross Sea. Potentially, this type of study is relevant to high-priority SGPP thematic objectives, specifically with respect to sea-level and facies architecture. As written, however, the proponents actually offer an interdisciplinary approach that straddles OHP and SGPP priorities, and the SGPP component remains poorly formulated and weakly supported. During its previous evaluations of these proposals, SGPP stated that the Wilkes Land study was the weakest of the ANTOSTRAT proposals. SGPP also forwarded numerous suggestions and critical comments to proponents of the Ross Sea transect. We are disappointed that the proponents did not responded to any of this input, and they have not improved their treatment of scientific objectives or drilling strategies in any meaningful way. Instead, they merely combined two proposals into one drilling schedule. The proponents need to realize that SGPP's interest in a generic sea-level study of an ice-contact margin does not translate into carte blanche support for each proposal within the ANTOSTRAT program. This particular combination of Wilkes Land and Ross Sea transects is not ready to be taken seriously by SGPP.

Proposal 491-Add
Title: Drilling of defined oceanic crustal categories to a better understanding of cyclic crustal accretion
Proponents: K. Hinz, M. Block, H. Meyer, S. Neben, and C. Reichert
Ratings: A5, F4

This brief addendum to proposal 491 is merely a letter that explains why revisions have not been finished. The purpose of the study is to determine the causes of changes in the seismic response of Cretaceous-aged oceanic basement within South Atlantic basins. SGPP's assessment remains unchanged. The proposal, as written, is entirely within the mandate of LITHP.

Proposal 494-Rev
Title: Rifting processes of the passive continental margin and tectonic evolution of the South China Sea
Proponents: B. Yao, K. Xia, Z. Zhou, D. E. Hayes, N. Wu, C. Huang, W. Lei,
P. Li, and Y. Luo
Ratings: A5, F4

This proposal is concerned with tectonics and does not address topics within the mandate of SGPP.

Proposal 495-Rev
Title: Rifting and isolation of microcontinents: Tectono-magmatic evolution of Seychelles and associated continental fragments in the western Indian Ocean
Proponents: W. E. Stephens, P. S. Plummer, P. R. Joseph, M. F. Coffin, J.
A. Dunbar, and V. W. Devey
Ratings: A5, F4

This proposal is concerned with tectonics and does not address topics within the mandate of SGPP.

Proposal 496
Title: Formation of volcanic rifted margins and oceanic plateaus: A proposal to test mantle plume versus non-mantle plume hypotheses by drilling the Cuvier Margin and Wallaby Plateau off Western Australia
Proponents: S. Planke, P. A. Symonds, D. M™ller, A. J. Crawford, D. Mihut,
J. R. Hopper, J. B. Colwell, and M. F. Coffin
Ratings: A5, F4

This proposal does not address topics within the mandate of SGPP.

Proposal 497
Title: Ryukyu forearc tectonics and paleoceanography
Proponents: U. Ujii≠
Ratings: A5, F4

This proposal has TECP and OHP goals but nothing for SGPP.

Proposal 498
Title: Barents Sea
Proponent: G. G. Gamsakhourdia
Ratings:A5, F4
The science is of minor interest, both to this panel and to ODP as such, but the possibility of getting access to a second drilling vessel from Russia should be considered. The proposal should be sent back to JOIDES.

Proposal 499

Title: Equatorial Pacific site for the International Ocean Network
Proponents: J. A. Orcutt, A. Dziewonski, B. Romanowicz, and F. Vernon
Ratings: A5, F4

This addendum addressed questions of TectP and LithP regarding depth of hole, location, and CORK possibilities. The proponents explained that these boreholes must be packed off at the base to prevent any fluid circulation. Thus, although the possibility of monitoring fluid processes has often been mentioned in this and related proposals, this requirement precludes using any of them for fluid monitoring. Thus the Ocean Network proposals are of no interest to SGPP.

Proposal 500
Title: Drilling fast spread Pacific crust at the H2O long term seafloor observatory
Proponents: R. A. Stephen, J. H. Natland, R. Butler, A. D. Chave, and F. K.
Duennebier
Ratings: A5, F4

This proposal expands upon a previous Letter of Intent and provides some new information about a proposed site survey. The primary purpose of the study is to establish a long-term borehole observatory in the Eastern Pacific, somewhere along an abandoned cable between California and Hawaii. Principal scientific themes include generation and evolution of oceanic crust at a fast-spreading ridge, hydrothermal alteration of the oceanic crust, and monitoring of seismic events as part of the Ocean Seismic Network. The proponents mention several topics of interest to SGPP: hydrothermal circulation in oceanic crust, mineralization, porosity/permeability structure, porosity history, patterns and rates of fluid flux, and relations between hydrothermal systems and melt lenses. None of these topics, however, is fully developed.

SGPP regards this proposal as immature but encourages the proponents to work toward a meaningful CORK experiment. The proposal requires much better justification and explanation of its fluid-flow objectives. The proponents need to construct a predictive model of heat flow and fluid flow. They should be more rigorous in presenting an organized set of testable hypotheses, and they should predict what the profiles of temperature and fluid chemistry might look like, given different assumed patterns of hydrothermal circulation. As written, it seems as though the proponents merely want to CORK a borehole "because it's there." What specific hypotheses do they intend to test? How will a relatively short-term record of CORK data provide definitive tests of those hypotheses, especially for a portion of the crust that is 40 million years old? How will the proposed study differ from or compliment the forthcoming CORK installation at Hole 395A? Will any type of fluid sampling program be attempted?

Technological issues also need to be addressed. The proponents discuss the possibility of developing a lighter "wireline" version of the Becker/Davis CORK that can be installed and maintained by submersibles or ROVs. If this new design is not finished, will the proponents then use the Becker/Davis CORK? What impact will such a decision have on the potential for success? Another likely problem with the plan is that the borehole should penetrate at least 400 m into basement, and the proponents imply that DCS will be required to reach the desired target. Given the longstanding problems with DCS development, the proponents need to assess their chances for success, at least with respect to the hydrothermal component of this interdisciplinary program, both with DCS and without DCS.

Proposal 501
Title: Tectonic, geochemical and environmental consequences of Cretaceous LIP formation in the western Pacific: The mid-Cretaceous igneous complex

and Ontong Java Plateau
Proponents: P. R. Castillo, R. L. Larson, P. E. Janney, L. J. Abrams, T. H. Shipley, W. W. Sager, and Y. P. Lancelot
Ratings: A5, F4

This proposal does not address topics within the mandate of SGPP.

Proposal 502
Title: Holocene paleoproductivity signal of the Antarctic coastal ocean: Linkages among sun, atmosphere, ocean, sea ice, and biota
Proponents: E. Domack, R. W. Murray, T. Janacek, S. Ishman, A. Leventer, J. Kennett, S. Brachfeld
Ratings: A3, B1.1, B2.1, C1, D1, E0, F3

This is a well formulated proposal to perform a high-resolution study of paleoproductivity and Holocene climate fluctuations. The proposed sites are very attractive as they allow for a comparison with the study in the Saanich Inlet. The objectives in regards to sedimentary system and particle flux are of special interest to SGPP

Proposal 503
Title: Cenozoic glacial history of the East Antarctic Ice Shield and the evolution of the restricted Mesozoic Weddell Basin
Proponents: W. Jokat, G. Kuhn, H. Miller, L. Oszoko, Y. Kristoffersen, B. Kuvaas, A. Solheim, M. de Batist, S. W. Wise, S. O'Connell, and W. Sliter
Ratings: A2, B1.1, B2.1, C3, D1, E0, F3

This proposal is a combination pf two previously ranked proposals, 449 and 488. It contains aspects of OHP and SGPP interests. Previously this panel awaited results of preliminary work to be carried out in early 1996 for evaluation of the potential of this study for success. Those data are still lacking. There is interest by the Panel in development of the understanding of the black shales and expansion of the organic geochemical aspects of the study.

Proposal 504
Title: Understanding the processes that shape passive margins during the transition from continental extension to seafloor spreading: The Newfoundland Basin
Proponents: N. W. Driscoll, B. E. Tucholke, J. A. Austin, J.-C. Sibuet, and S. P. Srivastava
Ratings: A5, F4

This proposal does not address topics within the mandate of SGPP.

Proposal 505
Title: Slab-derived fluids and geochemical mass balance in the Mariana convergent margin
Proponents: P. Fryer, M. Mottl, G. Wheat, and A. Fisher
Ratings: A2, B1.2, B2.1, C2, D3, E3, F2

This proposal is presented in the continuation of other Mass balance proposal already in the system. The aim is here to drill a series of holes on a transect to determine the chemical variability of pore fluids in sediments and determine the dehydration processes undergoing in the subducting slab. The originality of this proposal is to be strongly directed toward fluids genesis which is accessible throughout expelled fluid chemistry.

This proposal is highly relevant to SGPP and the LRP. While the proposed strategy is consistent, it should be better demonstrated how it will be possible to decipher the processes that produces fluids at depth from pore fluids which integer complex interactions during their flow. This might be a real problem in site where highly reactive volcaniclastic sediments are present.

The proponents are proposing to drill two transects of three holes each. One transect is at a known location of venting near the Pacman and Conical seamounts. The other is at the southern end of the margin and is not known to be actively venting. They will conduct sidescan and geophysical surveys in the southern area to find possible seeps. They will also conduct heat flow surveys and collect cores in the north. There are some problems with the hypotheses. Each hypothesis is given followed by a discussion of the problems. 1) They expect that the fluid composition will vary normal to the trench. However he drill sites are closely spaced and they present no evidence from the existing sites that the fluids vary systematically with arcward distance. 2) The composition of fluids is useful for defining reactions that generated them. Although this is true in principle, it appears that the composition of the vent fluid reflects a mixture of reactions that occur in several temperature regimes. This is not a good sign for the goal of determining which fluids come from which reactions. 3) The composition differs between transects. While this may be true, currently the second transect has no solid evidence of fluid flow. This remains to be determined with the upcoming survey. If there is no active venting then how will this hypothesis be tested. 4) The fluids are often channelized along faults. Fluids are also channeled along active diapirs. This alternative should also be tested. 5) The diagenetic minerals can be used as fluid chemistry indicators. In using minerals as tracers, the same problem is encountered as with the pore water chemistry. Is there really a unique signature that goes with one pore water origin or are pore waters originating from several reactions mixed together? I suggest that a model of the transport be constructed which incorporates that effects of hydrodynamic dispersion. Considering the long distance traveled and that dispersion increases with distance, considerable mixing may be expected. Also the complexity of the flow system is probably greatly increased by the diapirism.. 6) The same comment about assuming that the flow paths are located along faults still holds. 7) Finally, the idea that a budget for the oceanic crust is best done at a margin with no sediments is very promising. However, this margin is not very wide and the subduction angle is steep. It may be better to space the boreholes farther apart perpendicular to the trench to get a more distinct chemical signature from each hole. Consider adding another hole along the trench strike at the location of the middle hole to get at the local scale variability along strike

Proposal 506
Title: Global siting plan of borehole geophysical observatories by International Ocean Network
Proponents: R. A. Stephen and J. Orcutt
Ratings: A5, F4

This proposal does not address topics within the mandate of SGPP.

Proposal 507
Title: TAG II: Evolution of a volcanic-hosted hydrothermal system on a slow-spreading ocean ridge
Proponents: P. A. Rona, D. S. Cronan, J. B. Gemmell, M. D. Hannington, P.

M. Herzig, and N. G. Holm
Ratings: A2, B1.2, B2.1, C4, D3, E0, F5

This proposal follows the LOI that SGPP examined in Copenhagen. The return to the TAG hydrothermal field is proposed for (1) completing the unrealized objectives of Leg 158 to determine the architecture of the massive sulphide mound, and (2) add new sites to examine the temporal evolution of the system at the time scale of ca; 150 kyr.

The major problem encountered during Leg 158 was the recovery which varied between 1.7 and 30%. Here it is proposed to enhance this recovery with systematic casing of the upper 50 m of anhydrite and sulfide. This might be even more problematic in the altered material of the second objective.

The objective to reconstruct history of hydrothermal activity is very interesting and effort should be done in the proposal to define how this can be achieved. Is the focus limited to the duration of the hydrothermal activity or will there be other goals? For example will there be goals as of the spatial extent of alteration, the variability and the magnitude of the flow. The proposal mention that this site could be the place for deep biosphere experiment but nothing is proposed. Major concern on this proposal remain on the technical feasibility of the second phase of drilling. A clear table presenting the drilling program with sites, objectives and time estimates should be included. The proponents should also explain how the mass balance will be achieved. The microbiological aspects should be better developed, and a microbiologist might possibly be added as a proponent.

Proposal X
Okinawa Trough
Proponents:
Ratings: A3, B1.2, B2.1, C2, D3, E0, F5

This is a proposal to drill six sites in the Okinawa Trough to investigate back-arc rifting and associated hydrothermal circulation. The hydrothermal aspects of the proposal fall within the mandate of SGPP. The sites described are well surveyed and show evidence of vigorous outflow. The methods of the hydrothermal investigation need to be better described. For example, the proponents hope to investigate horizontal circulation. This suggests that another borehole should be added that is located at a potential influx area. In addition, perhaps a CORK would be useful for monitoring the fluid flow over time. The drilling plan also needs to be revised to lower the total amount of drilling in the basement. The total distance proposed is not feasible in the time of one drilling leg.

LOI 69
Subject: Refurbishment of Barbados Cork experiments on 174B
Authors: K. Becker, J.-P. Foucher, M. Kastner, A. Fisher, E. Davis, and P. Henry
Ratings: A1, B1.1, B2.1, C1, D1, E0, F1

This Letter of Intent outlines the rationale for refurbishment of CORKs at Holes 948D and 949C in the northern Barbados accretionary prism. Because of operational difficulties during Leg 156, the CORK in Hole 948D did not latch in properly, and the experiment was compromised because a bridge plug was never installed in the bottom of the borehole. At Site 949, where the CORK has been working effectively since installation, the thermistor string needs to be replaced.

SGPP has always viewed these CORK experiments as a high priority, and the new Long Range Plan places added emphasis on this type of technology. By supporting this program, ODP makes an implicit commitment to maintain the equipment. Failure do follow through with such commitments will eliminate the "long-term" aspect of the in situ monitoring and greatly reduce the value of the experiments. The only reasons for abandoning CORKs would be if it could be shown that the science is weak or that the characteristics of the CORK site are inherently inappropriate to achieve the desired objectives. Neither argument applies in the case of Barbados Ridge. In fact, adding to the timeframe of CORK data will compliment the forthcoming LWD program. Similarly, additional data from packer tests would be worthwhile, and the proposal offers an effective strategy for recovering the osmotic fluid sampler from Hole 949C. SGPP should endorse this LOI with vigor.

If time becomes available in the Leg 174B schedule then SGPP very strongly recommends that it be allocated to perform work proposed in LOI 69 according to the priorities listed. This is the best point in the schedule because the necessary CORK engineering expertise will already be on the ship. In addition, this work logically belongs on an engineering leg because understanding what went wrong with the 948D CORK is an important engineering development problem. SGPP has always viewed CORK experiments as a high priority, and the new Long Range Plan places added emphasis on this type of technology. By supporting this program, ODP makes an implicit commitment to maintain the equipment. The only reasons for abandoning CORK's is if the science is weak or it becomes apparent that the CORK site is not adequate to achieve the desired objectives. Neither argument applies to Barbados Ridge. Adding to the timeframe of the CORK data will compliment the forthcoming LWD program. The proposal also offers an effective strategy for recovering the osmotic fluid sampler from Hole 949C. Finally, conducting new packer tests that incorporate what has been learned from previous tests would be worthwhile. In particular, consideration should be given to allowing the pressure longer to stabilize after setting the packer and before starting the tests. Also, conducting fewer tests but of longer duration would allow sampling of greater radius around the borehole.

LOI 70
Subject: Hydraulic piston coring to deepwater site investigation
Author: W. A. Dunlap
Rating: A5

This is for a demonstration of ODP technology to industry. It should be handled by JOI in the context of industry-academic relations.

LOI 71
Subject: Southeast Indian Ocean hotspots
Authors: K. T. M. Johnson, F. A. Frey, D. Forsyth, and D. Scheirer
Rating: A5

This LOI does not address topics within the SGPP mandate.

LOI 72
Subject: RAB and ISONIC LWD tool engineering test
Authors: D. Goldberg and G. Iturrino
Rating: A3

The proposal seems to be more of a science than an engineering proposal since it is using existing technology. In addition, SGPP feels that determining the problem with the CORK and plugging the bottom of the hole at 948D are engineering problems that are more critical to its mandate. Thus we would rate this LOI as lower priority than refurbishing the CORK's at Barbados Ridge as proposed in LOI 69.

LOI X
Subject: Geologic evolution of a back-arc basin: Drilling in the South China Sea and the Bashi Strait
Authors: Chen, J.-C., Chen, M.-P., and Hsu, K. J.

Rating: A3

This LOI is notice of intent to submit a proposal to study back-arc basin geology by drilling 12-15 holes to a depth of 1000 m or more in the South China Sea and Bashi Strait. This is a very ambitious drilling program, and it is not clear whether it will be developed into one or more proposals. There are many aspects to the scientific program and it is difficult to judge the probability of scientific success of the program until more specific information is available.

JOIDES TECTONICS PANEL
FALL 1996 MEETING
Sultan Quaboos University, Oman,
19-21st October, 1996
Executive Summary

Attendees:
TECP Members: Juichiro Ashi: Uni. Tokyo, Ulrich Bleil: Uni. Bremen, Kevin Brown: Scripps Institution, Tim Byrne: Uni. Connecticut, Steve Hurst: Duke Uni., Garry Karner: Lamont Doherty, Juan Lorenzo: Louisiana State Uni., Alain Mauffret: Villefrance-sur-Mer, Dieter Mueller: Uni. Sydney, Alastair Robertson: Uni. Edinburgh, Jacob Skogseid: Uni. Oslo, Joann Stock: CalTech

Liasons: Tom Shipley: PCOM, Carl Richter: TAMU, Phillipe Pezard: WLS, Dave Falvey: JOI

Host: Samir Hanna

1. Ranking of proposals

Rank	Proposal	points	Stdv
1	447 Woodlark	2.67	1.87
2	431 WPac Seism	2.75	1.76
3	451 Tonga	3.42	1.68
4	450 Taiwan	3.64	2.25
5	445 Nankai	5.27	2.61
6	472 Izu	6.17	1.80
7	457 Kerguelen	6.33	2.19
8	DCS	7.67	2.50
9	485 Aus-Ant Gateway	7.92	2.23
10	441 SW Pac Gateway	9.08	1.56
11	79 Somali	10.08	1.24

2. Recommendations
After discussion TECP adopted the following recommendations. Further details of the number of the issues are given in the minutes below.

2.1. Janus "structure" initiative
TECP recommends to PCOM that PCOM recommends to JOI Inc. direct ODP/TAMU to ensure that the integration of structural (and related sedimentary) data is fully completed within JANUS phase II, or equivalent.
Note: TECP believes that it is essential that PCOM and JOI allocate the resources to complete the image-based core description portion of the JANUS project in the most timely and efficient manner, with completion in a year as the goal.

The sedimentary, hard rock, and structural geology community is agreed upon the type of core description software and hardware needed for shipboard description. We desperately await the implementation of the system that will make the job of the majority of shipboard scientists easier and more efficient. It will greatly improve the description, archiving, and distribution of core description data, and deserves the highest priority, bar none.

2.2. Proposed engineering legs

2.2.1 Deep hole
TECP recommends to PCOM that PCOM recommends to JOI Inc. direct ODP/TAMU to exclude Somali Basin as a candidate for a deep hole, as it has no scientific merit. Alternate of scientific interest to TECP are Nankai upslope site and Woodlark basin.

Notes:
TECP believes ODP/TAMU engineers are being overly conservative in seeking to drill a simple, stable, passive margin setting such as Somali Basin. This environment is not an effective test of high priority drilling sites over the next few years. Other sites are well characterized and fulfill realistic needs for future deep drilling. These include
a. Nankai; upslope site in sediments at 2-3 km water depth in seismically well imaged area where active faults could be avoided. This site could serve as a future reference hole for seismogenic related drilling (OD 21 priority).
b. Woodlark; deep hole at 2-3 km water depth in rift basin sediments, a priority for present Woodlark proposal but not included owing to time constraints. Well imaged: a realistic drilling test.
Other possibilities could include Iberia Margin (S` reflector), Venezuela basin, Angola basin.

2.2.2. DCS
While supporting the concept of a DCS engineering leg, TECP believes that alternate to 735B may well fit the science drilling plan better, i.e., Bonin Ridge and Vanuatu.

Notes: TECP recognizes 735B has merits but JR may leave this area previously. TECP recognizes the drill site should be very well characterized and therefore suggests the following alternates in previously drilled areas.
a. Bonin Ridge Site 809; Data include good seismics and swath mapping (former engineering test site).
b. Vanuatu Leg 134 Oba basin flank near previously drilled sites includes volcanics and volcanoclastics (good weather avoiding site clearances).

3. Interim Panel planning membership

TECP members selected for corporate memory and scientific balance:
Kevin Brown, Garry Karner, Dietmar Mueller, An Yin
Alternate: Alain Mauffret

4. Drilling plan

TECP proposes the following drilling plan for next 3 or more year that gels high thematic objectives with PCOMs theme objectives, as follows:

<u>4.1. Deformation partitioning within the lithosphere due to extension</u>

- active low angle, e.g., Woodlark
- conjugate margins, e.g., Newfoundland/Iberia, Great Australia Bight/Antarctic, NE Atlantic (volcanic rifted margins), Gulf of Aden
- Transforms, e.g., Tasman fracture zone, Vema/Romanche

- Ocean crust, e.g., W Atlantic, Angola basin, Angola abyssal plain

4.2. Deformation partitioning, fluid flow, and exhumation during lithosphere convergence

- deformation and fluid flow, e.g., Nankai, Barbados, Cascadia, Costa Rica
- Collisional processes, e.g., Taiwan, Timor, E Mediterranean
- arc evolution, e.g., Tonga, Okinawa trough, S China Sea
- fluid flow/mass balance, e.g., Izu-Mariana, Costa Rica
- Tectonic erosion, e.g., Peru-Chile, Tonga, Japan Trench

4.3. Earthquake mechanisms

- monitoring seismicity using global seismic network and downhole geophysical observatories, e.g., west Pacific seismic network and related downhole measurements

5. Program planning groups

TECP proposes the following program planning groups, aimed to progress new initiatives:

- downhole measurements and observatories
- conjugate margins
- seismogenic segmentation (convergent margins)

6. Thanks

Alastair Robertson concluded the meeting by thanking all TECP members for their wonderful input and commitments to the panel's activities. On behalf of the panel members, Garry Karner expressed their gratitude to Alastair Robertson for his work as a very effective TECP chairman and his contribution in directing the meetings and organizing and executing related field trips.

JOIDES TECTONICS PANEL
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Liasons: Tom Shipley: PCOM, Carl Richter: TAMU, Phillipe Pezard: WLS, Dave Falvey: JOI

Host: Samir Hanna

1. Introduction

Alastair Robertson began by welcoming the panel to this, the last TECP meeting, as presently constituted. On behalf of TECP he thanked profusely Dr. Samir Hanna for all his assistance with organizing the meeting and related activities at Sultan Quaboos University, and with helping to lead the very successful field excursion.

2. Minutes

The prior minutes were endorsed without further discussion.

It was noted that the agenda was very full largely owing to the very large number of new and revised tectonics related drilling proposals and letters of intend.

3. Liaison reports

3.1. JOI

Dave Falvey outlined the organizational changes at ODP that would soon be introduced. TECP and LITHP would essentially be combined within a new panel, with a Science Committee above and a limited number of short life planning groups below. U.S. members of the Science Committee would no longer be drawn exclusively from JOI Institutions. The new cycle of planning meetings would facilitate operations. The overall objective is to make the program more accountable and responsive to the funding agencies through the ODP counsel.
During a brief discussion it was noted that the revised panel structure did not differ greatly from that suggested by TECP at its spring meeting. The changes were largely driven by the funding agencies; the present 4 panel structure was not necessarily flawed, but needed streamlining to be more accountable.

3.2. PCOM

Tom Shipley (PCOM) expanded on the reorganization. Accountability was a prerequisite for requests for greatly increased expenditure (i.e., OD21) in the new Science Committee. Detailed planning groups would be multidisciplinary, specific, short-lived and few in number to cut costs. Mail reviews would play an important role. An interim panel would meet once in the new year to select mature proposals for mail review. TECP was asked to select 4 members to form this committee.

TECP should clearly state its priorities in the form of an outline drilling plan for the next 3 years. In the discussion concern was expressed that tectonic-related science should be well represented in the new panel structure, considering the strong and growing grass roots interest in tectonics drilling.
Concern was expressed that the mail review system be carefully set up and returns sensibly interpreted.
A rogue review could potentially destroy an excellent drilling program resulting from years of work and major expenditure.

3.3.LITHP report
Alastair Robertson, in the absence of LITHP liaison Jian Lin, who was at sea, presented the LITHP ranking of proposals. LITHP had ranked DCS engineering leg ahead of all normal proposals. They had ranked ION to include Seismic networks in the W Pacific and 90 deg E Ridge. The latter was therefore added to the prospectus.

3.4. TAMU report
3.4.1. ODP REORGANIZATION

The ODP Director, Jeff Fox, has initiated organizational changes in order to address budgetary constraints of a continuing flat budget, and accommodate JOI-mandated project management of legs and other activities. The changes should furthermore streamline ODP activities, eliminate redundancies, and improve services to the community.

3.4.2. ODP/TAMU BUDGET

ODP has responded to the EXCOM/JOI request to present for FY97 a bare-bone base budget, along with special operation expense items (SOEs), as approved by BCOM/PCOM.

FY95	$36,494,984	(Total)
FY96	$37,717,503	(Total)
FY97	$34,832,449	(Base)
	$ 2,823.223	(SOE)
	$37,655,672	(Total)

FY97 budgeted SOEs are: Leg 173 reentry hardware, Leg 174B: CORK Hole 395A, DCS Phase III and initial Phase IV, hammer drill system, Janus I: complete, Janus II projects, data migration, WWW publication, split-core MST, procure core image capture system, sampling parties, semiannual report, Solaris operations system upgrades, XRF crystals.

3.4.3. ODP PUBLICATIONS

The first decisive policy change of major implication was implemented by JOI in May 1996: in order to fulfill the publication requirement, shipboard participants must publish in a recognized international journal OR in the SR volume (starting with leg 160). All IR data will be electronically published starting with Leg 169, and printing of the IR will cease with Leg 175. For the SR, the printed volume will be limited to 500 pages for legs 152 to 168 and CD viewable versions will be available which may include data sets if provided by the author. Starting with Leg 169, no more SR hard copy will be printed and the CD material will be viewable, downloadable and printable. JOI is now forming a Publications Steering Committee (PSC) to provide advisory input to the Publications Department during the shift to electronic publication. The shift to all-electronic publishing (176IR; 169SR) will proceed only if JOI receives recommendations from the PSC and endorsement by the JOIDES scientific community.

3.4.4. ORACLE DATABASE PROJECT (JANUS)

Deployment of the final delivery version of the Oracle database is scheduled for Leg 171B (January/February, 1997). Testing and acceptance is scheduled for Leg 172 (February/March, 1997). Warranty support is from mid April to mid July 1997.
Components to be completed within Phase I: Corelog, Operations, Curation, Sampling (UG1) MST, Logging (UG2a), Paleontology, paleomag, color reflectance (UG2b), Physical Properties (UG3), Chemistry (UG4a)
Components probably not completed within Phase I: Core description (replacement of VCD, HARVI), Core photos, Thin sections and smear slides, Underway geophysics, tensor tool

Phase II refers to proposed developments which cannot be accomplished within Phase I, and for which two SOE items are scheduled within FY97 budget.

3.5. SGPP

Tim Bryne summarized the results of the Fall1996 meeting that was held in Nancy, October 3-5.

3.6. WLS report

Philippe Pezard reported on recent results and developments from the logging program.

4. Recent Scientific results

Leg 167 (California Margin) investigated the evolution of oceanogaphic conditions in the north Pacific Ocean to document changes in flow of the California Current system and associated changes in coastal upwelling. The 13 sites are organized into three transects across the California Current and one coastal transect extending from northern Baja California to the California/Oregon border. Observed high sedimentation rates (30-200 m/m.y.) make it possible to study climate variability at submillenial scales at most sites. High organic carbon burial helps to preserve paleoproductivity indices. The productivity events that were observe along the California margin are different in timing than those in either the subarctic or equatorial Pacific. Regional oceanographic circulation patterns seem to last for millions of years, suggesting that stable climate patterns exist or that climate responds strongly to tectonic changes in boundary conditions.

Leg 168 (Juan de Fuca hydrothermal) drilled a transect on the eastern flank of the Juan de Fuca Ridge, extending from about 20 km east of the ridge crest, where turbidite sediments begin to continuously blanket the 0.8 Ma igneous crust, to about 100 km from the crest, where the crust is 3.6 Ma in age. The main objective was to determine the thermophysical characteristics of hydrothermal circulation in the upper oceanic crust in off-axis settings as influenced by crustal topography, sediment cover, and permeability; The hydrothermal transition transect documented changes in basement fluid temperature and compositions, the physics of fluid flow, and the alteration of the crustal rocks. Two corks were successfully installed at Sites 1024 and 1025. Basalts illustrate progressive changes in alteration intensity related to increasing basement temperature from Site 1023 to 1024 to 1025. Higher basement temperatures and coarser grain sizes produce larger degrees of hydrothermal alteration. No alteration effects were observed that have occurred at temperatures much higher than those prevailing today. Composition of pore water shows clear indications of reaction and diffusion in the sediment section.
Outermost site (1025) shows advection.

Leg169S (Saanich Inlet) was a 2-day, 2-site leg to obtain an ultra-high-resolution record of Holocene climate, oceanography, marine productivity, ecology, and terrestrial vegetation. Upper

15 m at both sites were dark gray, gassy, highly disturbed sediment. The laminated sequence extends below that to 55 mbsf (1033) and 80 mbsf (1034). Varve thicknesses up to 1.5 cm and long intervals of uninterrupted laminations will enable very detailed investigations.

Leg169 (Sedimented ridges) investigated the mechanism of formation of massive sulfide deposits at sedimented ridges, the tectonics of sedimented rifts and controls on fluid flow, and the sedimentation history and diagenesis at sedimented rifts. Two CORKs were successfully replaced. Site 1035 (8 holes with <225 mbsf penetration) in the Bent Hill area was drilled to obtain a 3-dimensional image of a massive sulfide deposit. Drilling has created at least two new vigorous hydrothermal vents at Holes 1035F and 1035H. Site 1036 in the Dead Dog hydrothermal mound drilled three shallow holes (<50 mbsf) 9 m west of an active anhydrite chimney.

5. Reviews of New and Revised Proposals and Letters of Intent

The chair summarized the normal procedure for review and noted that the JOIDES office had asked that several "late" proposals, LOI's and technical requests also be considered.
As in the past care was taken to ensure that proponents left the meeting room during discussion of their individual proposal(s).

79-Add: W Somali Basin

Tectonic objectives need to be placed into the proper scientific framework. Currently there is insufficient seismic data coverage over the proposed drilling region and the drilling sites remain undefined. It is unconvincing that only one hole can uniquely constrain the proposed kinematic models. Clarification is needed as to why stress measurements in addition to those available on land are needed and whether it is essential to drill into oceanic crust in order to obtain reliable values of stress. If the kinematic history is solved with new magnetic, gravity and seismic data collected by a pre-site survey then the need to drill to basement for the purpose of discerning between existing kinematic models can be removed.

Ratings: A6, B1.2, B2.1, C3, D2, E2, E3, E6, E8, F4

355: Add2 Peru Gas Hydrates

TECP thanks the proponents for their letter remind us of the proposals possible contributions to the drilling program. The basic tectonic questions in the proposal remain of considerable interest to us. TECP note, however, that no further data are presented and encourages the proponents to consider how to best study the along strike variations in the unconformities and facies architecture in this margin as these will best address questions surrounding the effect of the ridge impingent and associated forearc erosional processes. Along strike seismic data should be presented with interpretations of the evolving unconformities that are placed in the context of the local tectonic and global eustatic impacts on the associated sequence boundaries.

426-Rev 2 Mantle reservoirs and mantle migration associated with Australian-Antarctic rifting

TECP considers this proposal to be very clear and straightforward, well designed to constrain the location of the isotopic boundary between Pacific MORB and Indian MORB going back in time. The drilling plan is well thought out, but the proposal does not sufficiently discuss what the proponents will do with the data, once they are collected, in order to answer the tectonic questions they have posed. We can envision that the data might be used in modeling of large-scale mantle flow patterns, etc., but the proposal does not describe the details of what the proponents expect to do in this regard. We consider this to be a very important aspect of the tectonic outcome of the proposed work and we feel that this proposal would benefit greatly from a more detailed mention of the planned follow-up in terms of modeling. Perhaps the proponents could contact someone who can help them with such modeling (e.g., Geoff Davies, Michael Gurnis, Jason Phipps-Morgan).

Any revision of this proposal should contain the following information:
1) The final geochemical results of the dredged samples from 1996 (those listed as "ND", or "not determined" in the present version of the proposal. These are essential in order to completely support the model that the proponents wish to test.
2) The proponents need to demonstrate that they will be able to do sufficient geochemical analyses on board ship, within a few hours, in order to make decisions on where to drill next. They recognize in their proposal that such capability needs to be demonstrated before the proposal can be approved.
3) The proponents should prepare a detailed magnetic anomaly map of the study region. This is because smaller scale ridge jumps, if present, could affect the distance between the ridge and the anomaly boundary at fracture zones. This would lead to problems with the interpretation scheme proposed for the geometry of the isotopic boundary (Figure 10 of the proposal).
4) The proponents should consider whether the isotopic characteristics of either Indian MORB or Pacific MORB might have evolved with time, over the timescale being considered here (tens of Ma) and if so, how this will affect their drilling strategy and/or their interpretations. For example, is it possible that the present strong difference between Indian Ocean MORB and Pacific MORB is less obvious going back in time?
If so, this would have very interesting implications for the cause of the anomaly and its tectonic evolution through time, and it would also affect our ability to locate it on older seafloor.

Ratings: A3, B1.1, B2.1, C1, D1-2, E4, F3

431 Rev Add3: W. Pacific Geophysical Network

This proposal meets the scientific objectives of ION and is highly relevant to TECP objectives. We ask the proponents to present to TECP all processed data as soon as they become available. This includes the results of on-land testing of their instruments as well as their site-survey results.

Ratings: A1, B1.1, B2.1, C1, D3, E0, F2

441-Add1: Southwest Pacific Gateway: Palaeohydrography of the deep Pacific source

This proposal is highly directed toward OHP and SGPP themes. A part of the objectives, however, concerns about TECP interests. The site SWPAC-8A deepened by 50 m is placed for obtaining the accurate age of the regional unconformity, which provides the post-Late Miocene sedimentary and deformation history. TECP has encouraged the proponents to discuss about tectonic aspects in this region. For example, the Spring 1995 TECP comment addressed the collaboration with tectonic geologists. Tectonic aspects, however, are still unclear in this proposal. A distribution map of unconformity and models showing plate kinematics should be presented.

445-Add 4: Nankai

TECP considers this proposal highly relevant to both the long range plan and the TECP interests of TECP. The results of the modeling provide both interesting additional constraints and further questions that can only be addressed by drilling. The proposal is now at the stage where it is fully mature and ready for drilling. TECP is particularly keen on the concept of testing the hypothesis that the along strike variation in the taper of the wedge, general internal wedge architecture and decollement reflective character etc, are linked to differences in the fluid pressure and stress conditions on the basal decollement. It is considerably beneficial that such variations occur in the same wedge so that many extraneous factors can be avoided and the underlying principals studied in a relatively simple environment. Naturally, prospects for the second leg involving the emplacement of corks etc, will be necessarily predicated on the success and results of the first leg. We expect the geochemical aspects of the study would then have to be addressed quantitatively and in more detail when further data are available. We expect the successor panel to TECP will be most interested in any future result from drilling Nankai.

Ratings: A1 B1.1 B2.1 C1 D1 E0 F1

447-Rev 3: Active continental extension in the western Woodlark basin

This is a mature proposal that deals with a major theme of both the LRP & TECP, that of defining and constraining the deformational history of a low-angle, active, normal fault. It remains one of the highest ranked TECP proposals. The panel was interested to learn of the local seismic network proposal in lieu of its recommendations from the Spring '96 panel. Further, the panel was happy to see progress on the MCS processing and noted the 1A classification from SSP. Despite its high ranking, the panel remains concerned about the activeness of the low-angle normal fault even though the Moresby Seamount region may be in an area of general continental extension. The main concern of the Spring panel was the demonstration that the normal fault was indeed active. While arguments presented in the proposal generally supported this issue (e.g., increasing dip of deeper syn-rift packages across the hangingwall block), the panel is requesting:

1) a structure contour map of the fault surface,
2) 3.5kHz records over the bathymetric escarpments,
3) reprocessing of the critical seismic sections to optimize imaging of the fault surface and the sediment packages,
4) a seismic stratigraphic study of the region to help identify alternate/higher priority drill sites,
5) depth conversion of critical seismic sections.

It is the panel's view that the imaged low-angle fault has been periodically active and it is not clear what part of the cycle the fault is presently in. Further, since the degree of rotation of the syn-rift sediments is a proxy for the amount of extension, then maximum basin development has occurred further to the west (EW9510-1371) and is possibly a better drilling target. This assessment can only be made with the cooperation of the proponents in finalizing the processing and interpretation of the seismic data. The panel will look forward to the eventual results of the NSF proposal.

Ratings: A1, B1.1, B2.1, C1, D1, E0, F1

448-Rev2: Ontong Java

This proposal seeks to address several tectonic aspects of LIP formation including emplacement deformation, vertical tectonics, post-emplacement collision and rifting, and paleomagnetic aspects such as the dating of M0. To accomplish these objectives the proponents need additional survey data to determine appropriate sites that fulfill the tectonic aspects as well as petrologic aspects of the program. Until more survey data is collected the Ontong Java plateau project is primarily in exploration mode and will have difficulty defining exact sites that can address testable tectonic hypotheses. We recommend continued consideration of tectonic aspects of LIP emplacement and evolution in the refinement of drilling site selection based on new information, both site survey and onshore mapping and analyses

Ratings: A3, B1.2, B2.1, C2, D1, E0, F5

450 Add-2: Taiwan

TECP considers this to be a highly relevant proposal. The three dimensional transgressive nature of the Taiwan collision belt offers considerable opportunities for studying the evolving kinematic and sedimentological changes that occur during an arc continent collision. The sites dealing with the sedimentological, structural and hydrogeologic processes occurring along the back thrust of the system should be adequately constrained by the present drilling strategy and will greatly add to our understanding of the arc continental collision process. TECP strongly encourages the proponents to present and make use of the additional constraints that should be provided by the newly acquired MCS data.

Although most of the legs objective would be met even without drilling TECP-3, TECP is also very interested in the hypothesis of the offshore extension of the active syn-collisional "normal fault systems" that have been identified onland. The GPS and field based studies suggest that these are currently unroofing the metamorphic interior of the accreting material to the west of the longitudinal trough. Mechanisms of syncollisional tectonic extension and unroofing of deep material (up to blueschist in some collisional systems) in collisional provinces are still the object of considerable debate in the scientific community. We appear to have the opportunity to test this hypothesis and to study the structural and hydrogeologic processes associated with the possible southward propagation of the external fault system into the developing wedge. The aqueous geochemical signature of any fluids escaping along such faults should have deep seated origins and be closer to their pristine state in this submerged region of the wedge which is away from the topographical generated ground water flow of the emergent mountain belt. TECP would like the proponents to present all the relevant gravity, seabeam, side scan and magnetic data, that we believe does exist, to support the contention that the extensional zone extends through TC-3. If necessary, the proponents should also consider moving TC-3 further north to improve the chances that they encounter the extensional system, as this represents a fundamentally new type of tectonic processes for ODP drilling.

Ratings: A1, B1.1, B2.1, C1, D1, E0, F1

451-Add2: Ocean drilling in the Tonga forearc: subduction geodynamics, arc evolution and deformation processes at non-accretion

This is mature proposal well formulated and documented. The new site survey data go a long way to address TECP's concerns about the tectonic objectives, especially the role of the Louisville Ridge. TECP noted that the revised proposal is simplified and focuses more on testable hypotheses. However, the objectives are clearly intermingled and the whole drill results will need to be taken together when addressing individual hypotheses. TECP feels that although it is still not clear how each and every hypothesis will be effectively tested by drilling, this is a very exciting drill program that is bound to lead to very interesting results. The land-based community will also be interested, even if the actual drilling of the ophiolitic forearc is not possible (barerock).. However, the proponents can hope to obtain a complete section of the Tonga margin from the forearc and upper slope by drilling and by the dredged samples already obtained in the lower slope between 4.5 km and 9 km.

Ratings: A 3, B 1.1, B 2. 1, C 1, D 1 E 0, F 3.

452- Add2: Antarctic Peninsula

Ratings: A5- Not relevant to thematic objectives.

457-Rev4: Kerguelen Plateau

As written, this proposal has few tectonic objectives. The proponents should clearly delineate the possible results from each drilling site that may shed light on the complicated tectonics of the Kerguelen plateau. From emplacement deformation, syn and post emplacement vertical tectonics, post-emplacement rifting and possible collisional events, the tectonic history of Kerguelen is complex and will directly affect the interpretation and analysis of petrologic and other data from drilling. We strongly recommend that the proponents continue to consider these tectonic aspects in the selection of drill sites and clarify the expected structural and tectonic hypotheses to be tested at each drilling site.

Ratings: A3, B1.1, B2.1, D1, E0, F4

463-Add2: Shatsky Rise

The main aspect of this proposal of interest to the Tectonics Panel is the relationship of the volcanic activity to plate reconstruction and/or ridge jumping. We strongly support the efforts of the proponents to address these questions and recommend continued consideration of these aspects in the selection and refinement of the positions and targets of the proposed drilling sites.

Ratings: A3, B1.1, B2.1, C1, D2, E0, F5

Proposal 466-Rev: "Investigation of linearly magnetized rifted crust and the evolution of high extension/slow spreading continental margins: A proposal for drilling in the Great Australian Bight region by the Ocean Drilling Program"

The problem of investigating the behavior of highly extended continental crust/and or young oceanic crust during the transition from rifting to drifting is of high relevance to both TECP and the LRP (conjugate margin studies). Consequently, the panel welcomed this revised proposal dealing with the zone of enigmatic crust in the Great Australian Bight that is characterized by linear magnetic anomalies and related tilt-blocks.

The panel felt that this revised proposal, without the unnecessary distractions associated with metamorphic core complexes, represented an effective and straightforward statement about studying the nature of faulted, linearly magnetized, crust. However, in the data presented and "Reconstructions and spreading history" discussions, it is not clear that the continent-ocean boundary (COB) has been adequately defined spatially.
That is, what is the nature of the crust to the north of the presumed COB? What is the origin of the gravity highs that bound the various crustal zones (given that they are as persistent as the magnetic anomalies along strike)?
The panel agrees with the proponents that the crustal fabric (as defined from GEOSAT gravity and ASGO seismic mapping) parallels the opening direction of the Perth basin. Thus, is the crust to the north of the presumed COB oceanic crust produced by ultra-slow spreading from M10 onwards? If so, then it is hardly surprising that the differences between the shiptrack azimuth and the spreading direction would result in magnetic anomalies that are difficult to correlate. The panel believes that the proposal is immature in its present form and ecommends the following revisions:

1) The issue of linear magnetic anomalies and continental crust.
Given the observed distribution of tilted blocks, how much of the magnetic anomaly is topographically imparted?

2) The issue of possible oceanic crust to the north of the proposed
COB. Is the existence of this oceanic crust consistent with the plate tectonic reconstructions for the Indo-Australian, Antarctica, and Pacific plates for the appropriate time interval?

3) Augmenting drilling locations/targets. It would seem imperative
that the crustal type to the north of the presumed COB be tested. Thus the complete drilling transect needs to define the crustal type and timing of deformation/formation in each zone.

4) Fundamental importance of the proposal. As presented, the proposal does not portray the project in anything more than solving a local problem. That is, what is the advance in our knowledge of lithospheric processes if drilling does in fact determine whether these enigmatic crustal zones south of Australia are oceanic or continental? Clearly it will help define the rifting events affecting the southern Australia and this plate reconstructions between Australia and Antarctica, but is this truly fundamental? The proponents need to give careful consideration as to why this crustal type issue is truly a fundamental problem that can only be addressed by ODP drilling. Perhaps it might be useful to recast this problem along the lines of the mechanical behavior of highly extended continental crust and/or young oceanic crust during the transition from extension to spreading.

Ratings: A1, B1.2, B2.1, C2, E8, F2

467-Rev: Sand rich versus mud rich turbidite systems at intermediate latitude

The main target of this proposal is to compare a mud rich turbidite system (i. e. Rhone deep sea fan) and a sand rich system (i. e., Var fan). At the difference of the Mississippi and Amazon fans the Mediterranean fans have been affected by the glacio-eustatism. These fans were supplied by the rivers (Rhone and Var.) draining the Alps massif. The Mediterranean Sea is a closed system and a balance between the erosion of the Alps and the sedimentation in the basin can be established. The ODP drilling in the Indus fan gave several information on the Himalayas mountain building and in this way some tectonic information on the Alps could be obtained. The Mediterranean basin was opened by a rotation of the Corsica-Sardinia block during the early Miocene. During the extension two types of margin have been identified: one in the Gulf of Lion where the present Rhone fan is located is large whereas an abrupt and narrow margin bounds the Côte d'Azur area. These two types of margin are separated by a major transfer fault The tectonic architecture has a large influence on the construction of the Mediterranean fans during the Pliocene and Quaternary times. The Rhone deep sea fan is distributed in several lobes on a large area whereas the Var fan is vertically stacked close to the slope off Nice. Moreover, the steepness of the slope allow the formation of turbiditic currents in the abyssal plain although the present time is characterized by a high stand level. In addition the steepness of the slope is accentuated by a reactivation by compression. The relationship between the formation of fans and the previous extension is interesting for a tectonic point of view.
However, this proposal is mainly OHP oriented and the tectonic aspects cannot be developed because the eventual tectonic targets are too deep to be reached with the present capabilities of drilling of the Joides Resolution.

Ratings: A3, F4

469-Add: The Argo Abyssal Plain: A Proposal to Drill Reflecting Interfaces within Oceanic Crust

TECP is encouraged that the proponents have collected more geophysical data for their proposed study area. We will be interested in seeing the revised proposal that appears to be forthcoming for Jan. 1997.

Ratings: no new ratings because the proposal is the same one as last time.

472-Add: Crustal Fluxes and Mass Balances at the Mariana-Izu Margin

This addendum addresses comments made by the panels in the spring of 1996; primarily concerns raised by SGPP with some overlap with TECP. Specific questions raised by TECP related to the heterogeneity of oceanic crust and the likelihood that just one hole in the crust 100s of kilometers from the trench will better constrain the mass balance equation. The proponents have done an excellent job of simplifying what is known and not known about the mass balance equation (e. g., Table 1) and provide a clear explanation of the rationale for deepening ODP 801.

In essence, an ODP workshop in May, 1996, concluded that: (1) there has been no penetration of Pacific crust anywhere beyond about 100 m and (2) approximately 300-400 m of crust needs to be drilled in order to document the alternation zone. Deeping of 801 is most logical because: (1) the crust has already been penetrated and they know that it is normal crust (2) it's the most direct route; Site 452 requires drilling through 100's m (>500) of Cret. flows and sills already sampled (Leg 129) before reaching oceanic crust. In addition, Site 452 appears to be very similar to all other PB sites so it's not clear that anything new will be obtained with this extra drilling.

TECP is still concerned, however, with the problem of how representative the results from 801 will be and, therefore, with the ultimate goal of "balancing" the fluid budget across the margin.

Ratings: A1, B11, B21, C1, D1, E0, F1

476-Add2: The Hudson Apron Submarine Slope Stability Transport

The proponents have made an excellent effort at addressing questions raised by TECP and the panel is, overall, more supportive of the proposed pilot study than the previous proposals. In any future revisions or addendums, however, the panel would also like to ask that the proponents include the results any side-scan surveys of their proposed sites.

At the same time, the panel is still concerned that objectives outlined in the addendum will not address the fundamental mechanic or dynamic aspects of slope failure. As the Panel expressed in their last review, the difficulty of locating a site that will fail in the near future is almost impossible to overcome.

479-Rev: Massive sulfide mineralization in felsic volcanics of the eastern Manus back-arc basin, Western Pacific

The tectonic framework of the Manus back-arc basin interests the Tectonic Panel. This basin formed by small spreading centers separated by large transform faults. The eastern Manus basin is a pull apart basin formed in a felsic volcanic environment whereas the crust presents Morb affinity in the small basins opened by oceanic crust accretion. The evolution from pull part basin to oceanic accretion can be applied to others areas (i. e. California Gulf). however, the tectonic aspect of the Manus basin is not the main topics of this proposal that is focused on the mineralization in felsic volcanic environment. If the proponents will expand the tectonic aspects the TecP will be interested. As others panels we recommend to form a working group to build an integrated proposal that will include the tectonic framework. The Japanese results from a diving submersible survey should be also included in the final proposal.

Ratings: A 3, B 1.1, B 2. 1, C 1, D 1 E 0, F 3.

481-Add: Red Sea Deeps

Tectonic process during the early stages of oceanization after continental break-up has been considered as an important theme of TECP interests. The proponents planed a transect drilling including four sites oblique to the rift axis in the original proposal, and TECP claimed the obliquity of the transect. This addendum addresses the re-oriented the transect perpendicular to the rift axis and additional site survey plan of high resolution MCS. The proposal should be well presented by using of these new MCS and/or reprocessed MCS profiles, especially for crustal structures. The proponents also show a structural lineament map around the proposed sites (RS-1B, RS-2 and RS 3B) for understanding the formation of the pull apart basin, although a lineament map of the northern Red Sea is shown in Figure 14 in the original proposal.

Ratings: A3, B1.2, B2.1, C2, D1, E8, F5

485-Rev: Southern Gateway-Australia/Antarctic

Two tectonic sites are proposed to drill the west South Tasman Rise marginal ridge. Transforms are of great interest to the panel. However, the transform history is probably more complex than so far presented and if would be better served with a separate proposal. Therefore we do not recommend a major alteration to the current proposal in order to include the transform tectonics component.

This drilling proposal already contains a highly interesting tectonic component, namely the influence of plate kinematics on palaeoceanography. For this reason we suggest that the proponents consider whether drill a site on oceanic crust (perhaps off the SE corner of the South Tasman Rise), could further kinematic movements in the region. The latest available magnetic anomaly map should be included in this new assessment. A future version of this proposal should contain a more refined plate kinematic reconstruction and its relation to climate.

Certain local aspects of the complexity of this transform remain to be addressed in any future proposal. It is unclear from the data shown whether there is sufficient sedimentary cover to conduct a useful subsidence analysis. The possible degree of flexural coupling with oceanic crust across the transform is not noted. The western South Tasman Rise terrain experienced shearing both on its western and eastern edges. Therefore, the intracontinental transform stage may consist of two episodes directed from two directions. Gabbro along the transform margin could derive not only from the transform margin but also from underplating from the rifted direction or even from early intracontinental shearing. The significance of underplating should be incorporated into testable geodynamic models. As in the previous Leg 159 to a continental transform margin, a series of drilling sites along the length of the margin will be necessary.

We encourage communication with the South Australian Bight drilling proponents (Stagg et al., AGSO) to address common tectonic objectives.

Ratings: A6, B1.2 (too brief), B.2.1 (for tectonics although the transform component is questionable), C3, D1, E4 (refined kinematic evolutionary sequence based on new published marine magnetic anomaly interpretations of Exxon, Royer and Hill Mar. Geophys. Res. (1996), F5, but could become F3 were this proposal substantially revised.

491-Add: Drilling of Defined Oceanic Crustal Categories to a Better Understanding of Cyclic Crustal Accretion

We will look forward to seeing the revised proposal which the proponents indicate they will submit at the end of the year. The general problem being addressed is of interest to TECP, but the specifics of this study need to be more clearly formulated. TECP requests the proponents to take into account our comments from Spring 1996, which are not repeated here. We remind the proponents that the revised proposal must clearly lay out the hypotheses being tested and must specify how the measurements they will make, in-situ or on the cores, will then allow them to resolve among these hypotheses. This proposal definitely has the potential to be of strong interest to TECP but the approach to the problem may need to be multidisciplinary in nature. We recommend that the proponents consider including a discussion of any petrological or geochemical tests which will aid them in resolving their hypotheses, as well as of possible unwanted effects of proximity to the influence of the Tristan da Cunha hotspot. TECP also suggests that the proponents clearly explain why this is the best area to address this question. Can any constraints be obtained from existing drilling results and seismic data elsewhere on earth?

Because of ODP's increased interest and possibility in deep drilling, the proponents may also wish to consider some scenarios involving deeper penetration of basement at their proposed sites.

Ratings: No new ratings as this is the same proposal as last time.

494-Rev: "Rifting processes of the passive continental margin and tectonic evolution of the south China Sea"

The panel was happy to see the marked improvement of this revised proposal, both in terms of the presentation of corroborating evidence to support arguments and the overall structure and philosophy of the proposal compared with the earlier submission. However, it is the panel's view that the proponents remain overly ambitious in their suite of objectives. Perhaps more problematic is that many of the objectives tend to be only of local significance. At the heart of the proposal is the need to use the drill ship to define the type and age of crust across the south China Sea. The onus is on the proponents to develop and defend the fundamental nature of this work. For example, how will knowing the details of the age of formation of the south China Sea really help us understand better rift processes? Why do we need to know in detail the sedimentation processes operative across passive continental margins? Further, how can the proponents "test the validity of existing thermo-mechanical models of rifting"? No quantitative predictions were presented in the proposal that highlight the differences between the many models proposed in the literature for margin development nor was it clear how drilling could be used to unambiguously test between these models. It was equally unclear if the proponents had access to lithospheric deformation computer codes. The proponents also need to place their proposed drilling sites into a regional seismic and geologic framework. In particular, it is difficult to assess the regional importance of the various unconformities mentioned in the proposal from the reflection seismics presented.

The panel recognizes, however, that first-order geological problems do exist in the south China Sea region. For example and as actually mentioned by the proponents on page 3, a particularly interesting problem deals with the tectonic mechanisms responsible for the initiation of the south China Sea - plate rollback along the Palawan trench or continental escape of Indo-China along the Red River fault in response to the Indian sub-continent collision with Asia. The panel recommends that the proponents seriously consider this theme in collaboration with, for example, French researchers who have been working actively on aspects of this same problem (e.g., Anne Briais, Observatoire midi-Pyrenees GRGS, Toulouse; Paul Tapponnier, Institut de Physique du Globe, Paris). During the proposal revision, the proponents should keep in mind that they need to test a hypothesis that itself has a number of first-order predictions that can be compared with observations/results obtained by ODP drilling.

Ratings: A6, B1.2, C3, F4.

495-Rev: Rifting and the isolation of microcontinents: Tectono-magmatic evolution of Seychelles and associated continental fragments in the Western Indian Ocean.

Since last version this revision has taken onboard several of the comments made by TECP in the sense that the objectives are rewritten to be more model testing. However, 1) the drilling strategy and major drilling targets are not changed and do not tell how the revised objectives are to be addressed; 2) based on the relatively large amount of seismic data available the proponents have not been able to identify even the generalized structure of the microcontinent, including identifying the grabens that are suggested to be filled with either sediments or volcanics, and thus would allow the ultimate test according to proposal; 3) the suggested tectono-magmatic models are as such not evaluated, and it is TECP's view that none of these models have to apply. Several panel members noticed that there are other microcontinents around the world that are characterized by rift propagation in clear non-plume settings (not mentioned by the proponents); 4) the plate tectonic consequences of a large microcontinent are not properly discussed. TECP think it is unrealistic to spend two drilling legs only to define the extent of the microcontinent, and cannot see how the prime tectonic component of the proposal can be achieved with the proposed drilling. The fact that aeromagnetic data apparently worked well for the definition of the Farquhar group may indicate that such data could be used also to limit Greater Seychelles. TECP thinks more work needs to be carried out. However, before embarking on this the proponents need to realise that they have not yet convinced TECP that they are actually tackling a problem of global importance (i.e. rifting of microcontinents as opposed to large continents) and that even if this is a global problem how they would actually solve it by drilling in the Seychelles. The study of a regional problem in the Indian ocean is not in itself an adequate reason for drilling.

Ratings: A6; B1.2; B2.1; C3; D1; E8; F3

496: "Formation of volcanic rifted margins and oceanic plateaus: A proposal to test mantle plume versus non-mantle plume hypotheses by drilling the Cuvier Margin and Wallaby Plateau off Western Australia"

This new proposal intends to test between a plume and non-plume hypothesis for the formation of large volcanic constructs on newly formed oceanic crust along the northwest Australian margin. With the evidence presented, the panel was not convinced that: 1) A plume model was particularly convincing for reasons outlined below, and 2) drilling could really help to resolve between the models presented. First, while the Zenith Seamount and Wallaby Plateau may well parallel the proposed hotspot trend, a hotspot hypothesis completely ignores the equally important Joey Rise adjacent to the northwest edge of the Exmouth Plateau and the areally extensive Roo Rise. Second and as reported by the proponents, "there are no convincing plume related . . . basalts sampled in dredges from the Western Australian rifted margin, either from the 155 Ma Argo margin or from the 130 Ma Cuvier and Gascoyne margins". Third, the reported regional uplift of the Bernier Platform, in the absence of any supporting reflection seismic lines, is better explained as the footwall (i.e., rift flank) uplift in response to Tithonian-Valanginian extension along the margin. These points, coupled with the fact that the Cuvier ocean crust immediately after breakup is of standard thickness, suggested to the panel that the plume hypothesis is not tenable without significantly more corroborating evidence.

In contrast, the panel felt that studying the processes that lead to large volcanic constructions on oceanic crust, especially those adjacent to major fracture zones, is important. However, without the plume hypothesis, this proposal does not present a testable hypothesis using the drilling tool to investigate what these processes might be. Even though the

Wallaby Plateau showed evidence for continental contamination, this was not a characteristic of the Joey Rise suggesting that the continental component within these northwestern Australian oceanic plateaus is, in general, minimal. The panel would welcome a revised drilling proposal to test between various non-plume hypotheses for the development of oceanic plateaus.

Ratings: A2, B1.2, B2.1, C1, D1, F3

497: Ryukyu Forearc Tectonics and Paleoceanography

This proposal is relevant to TECP's thematic objectives. There has been a long-standing interest in the question what causes bends in volcabic arcs. However, the proposal requires major improvement with respect to:

1) Defining a problem of global interest
2) Clearly outlining hypotheses to be tested by drilling
3) Relevance to the Long Range Plan
4) Broadening of the proposal by involving the international community (e.g. French, US scientists)
5) Is the location of the Ryukyu arc the most appropriate one to test the particular hypotheses to be tested?

The proponents will be sent an example of a successful proposal (e.g. Nankai) to aid improving the structure of theirs.

Ratings: A2, B1.3, B2.1, C3, D1, E8, F4

499: Equatorial Pacific Site for the International Ocean Network

This proposal meets the scientific objectives of ION. The site selected in the equatorial Pacific ocean fills a critical gap in the global seismic network. The proponents should report on further progress in testing the equipment and installation of instrument packages in deep sea boreholes. TECP would like to see the location of the selected site in the context of regional geological and tectonic framework, i.e. plate boundaries, magnetic lineations, and gravity anomalies. We suggest the proponents may consider carrying out an OBS survey of the selected area to demonstrate the suitability of the site mainly in order to characterize the site in terms of noise level. We ask the proponents to outline their strategy for long term power supply and data retrieval at their station.

Ratings: A2, B1.1, B2.1, C1, D3, E?, F1

501: Geochemical and Environmental Consequences of Cretaceous LIP Formation in the Western Pacific

The study of the Cretaceous LIP is very fundamental for the dynamics of the Earth's mantle and environmental impact regarded as the theme addressed in the Long Range Plan (LRP). This proposal focuses on both the mid-Cretaceous igneous complex and the Ontong Java Plateau. The former has two conflicting models for explaining the emplacement. TECP recognizes that the emplacement of the igneous complex and the drilling of the Jurassic basement is important for understanding of the Pacific Plate evolution. The latter is the target to know the uplift and subsidence of the plateau and the timing of the volcanic activity. It is also partly relevant to the TECP theme. However, the tectonic objectives remain unclear. TECP encourages the proponents to discuss about tectonic aspects for the formation of the igneous complex.

Questions:

1. According to the magnetic anomaly map (Fig. 2), SNB-1A is located in or south of the M17. The schematic illustrations, however, show that the Jurassic oceanic crust exists in the SNB-1A. A detail map for the magnetic anomalies is needed.
2. Where is the EMB-3 in Fig. 2?

Ratings: A3, B1.1, B2.1, C2, D1, F4

504: Understanding the processes that shape passive margins during the transition from continental rifting to seafloor spreading: the Newfoundland Basin.

This proposal is considered of high thematic relevance to TECP and the planned drilling seem to be ideally located with respect to ODP's stated interest of conjugate margin drilling. TECP looks, however, forwards to see the new data that is mentioned in the proposal or a reprocessing of existing data, which hopefully will allow a better definition of "basement" across the margin. From the existing data it seems that fairly thick units of apparent sedimentary strata exists in the half-graben terrain beneath the "U" reflector, which theoretically indicates substantially more upper crustal extensional deformation than can be inferred from the presented interpretation (e.g. fig. 6). Although it is realized that drill-hole information from the syn-rift sequence may require even deeper holes than presently proposed, it is clear that such information will enable a better assessment of the temporal rift development and the strain partitioning or focusing on the margin.
In terms of ODP's general aim on hypothesis-testing drilling TECP would like to see data constrained quantitative models for the basin uplift/subsidence history related to the one or the other suggested alternative for the origin of basement across the margin. It is difficult to envisage that "U" is a near sealevel erosional surface formed during an episode of ultra-slow seafloor spreading and associated formation of thin oceanic crust. It is, on the other hand, also questionable whether a simple shear model may manage to keep an almost 300 km wide rift zone near sealevel during most of the rifting episode. If so there has to be a close correlation between the amount of predictable mantle lithosphere thinning and the amount of post-rift tectonic subsidence observed. It is requested that such calculations are included in the proposal, as it is believed that this will enable a more precise drilling strategy and maybe aid a redefinition of "U" as a diachroneous feature, which as such not is directly related to breakup. The Iberian Margin Leg 173 will in part address the same questions that are outlined in this proposal, and TECP encourage the proponents to include in a revised version of the proposal the new results from the Iberian Margin.

Rankings: A1; B1.2; B2.1; C2; D2; E8; F2

505: Mariana convergent margin mass balance

While still at an early stage of development the studies along the Mariana system should provide substantial benefits with regards isolating hydrogeologic and chemical input from the oceanic basement during accretion and are in tune with the long range plan. This basement fluid component is a fundamental part of all convergent margins and this proposal will address very important processes in an end member system. TECP encourages the proponent to make full use of the data from the upcoming cruises to isolate the coupling between forearc structure, heat flow and hydrogeologic systems along this margin. Concern was expressed, however, over the apparent misconception of the proponents that this system will not be dominated by both heterogeneous and transient flow patterns. The proponents make an issue of the contention that these are not important, but are probably incorrect in doing so. Shore based hydrogeologic studies have always shown that heterogeneity is a fundamental component of fracture flow systems and must be treated with respect (particularly given the mix of mantle diapirs and fracture systems in the Mariana forearc). Why do the proponents think the Marina forearc system would be any different to those previously studied fractured systems? Transient fault

valving mechanisms were also first developed for hardrock fracture flow environments (ie. the various Sibson models) similar to those in this forearc. TECP would be greatly surprised if such mechanisms were not operating particularly given the likelihood for chemical precipitates in fractures at depth. Why do the proponents think there will be little significant transience? Even the eruptions and rate of fluid flow through the diapirs will probably be linked to earthquake related stress/strain pulses in the forearc region.
TECP would also expect the geochemical signature of fluids moving up the faults in the forearc will be different to those moving up the mantle diapirs given the different chemical environments they will encounter along the way. How will the proponent separate the effects of the different flow paths? The proponents also need to make it clear that it will be possible to extract fluids from fault rocks in regions outside of the serpentinite diapirs. Why the alteration products can be studies, it would be difficult to squeeze pristine water from fractured basalt.

Ratings: A1, B1.2, B2.1, C2, D1, E8, F2

506: Global siting plan of borehole geophysical observatories by International Ocean Network

This proposal presents the scientific goals, the global siting plan and the implementation plan for in situ geophysical observatories in the world oceans. It is highly relevant to TECP thematic objectives and to the Long Range Plan. TECP is highly supportive of the general concepts as well as of the two prime objectives of this proposal: 1) Global seismic tomography and 2) monitoring processes in tectonically active areas, including hazards originating the oceanic environment.

506 Add: Ninety East Ridge Observatory (NERO)

NERO meets the scientific objectives of ION. The site selected in the south central Indian ocean fills a critical gap in the global seismic network. It will also enable the investigation of specific geodynamic problems of the Idian plate. This proposal is relevant to TECP thematic objectives. All necessary technology including broadband seismometers, their installation and retrieval from boreholes have been successfully tested, and should not cause any future problems.

Ratings: A2, B1.1, B2.1, C1, D1, E0, F1

507: TAG II: Evolution of a Volcanic-hosted Hydrothermal System on a Slow spreading Ocean Ridge

This proposal addresses the temporal and spatial development of an entire hydrothermal system by drilling the active zone, where ODP Leg 158 failed to drill the center, and the relict zone in the TAG hydrothermal field. The drilling of the TAG field will provide the example for the evolution of the hydrothermal system hosted in mafic volcanic rocks at the slow-spreading ridge. The proponents address the interplay with magmatic and tectonic processes through time. Tectonic aspects, however, are unclear in this proposal. TECP would like the proponents to explain what the relationship between magmatic and tectonic processes is.

Ratings: A5, F4

Okinawa Trough

This proposal, while very preliminary, would address several themes of interest to TECP. The Okinawa Trough may be an excellent place to study the initiation of a back-arc basin and to constrain various aspects of the evolution of such a system in terms of heat flow, crustal composition and structure. We encourage the proponents to outline specific hypotheses regarding tectonic processes relevant to this area, and clearly indicate how these hypotheses will be constrained by the measurements to be done in the drill holes and/or on the cores recovered from drilling. For instance, it is unclear how drilling will be able to identify the existence of spreading-related magnetic anomalies given the lack of such identified anomalies on the numerous ship tracks in the area.

The international composition of the proponent group is a very positive aspect of this proposal. The proponents may also wish to review the details of a proposal which has been submitted for study of the Ryuku forearc (#497) to see to what extent the two proposals might be able to be coordinated in terms of processes linking the two regions.

Ratings: A6, B1.2, B2.1, C2, D1, E3, E4, E8, F3

Letters of Intent

LOI 69: CORK 174B

As presented, fully approved by Tectonics Panel.

Ratings: A1, F1, B1.1, B2, C1, D1, E0, F1

LOI 70: Hydraulic piston coring to deepwater site investigation

TECP encourages the proposed collaboration with industry. However it is essential that a scientific rationale is developed for the proposed leg. We encourage the proponent to submit a full proposal, including clearly outlined scientific objectives.

LOI 71: Southeast Indian Ocean hotspots

Drilling a previously unknown linear chain of seamounts may contribute deciphering the history and relationships between various hotspots in the central Indian Ocean and to improve on the regional plate tectonics. The extremely limited data base available is as yet inadequate, however, to address these objectives and substantial site survey (including dredging) is needed before submitting a proposal.

Ratings: A3, F4

LOI 72: RAB and ISONIC LWD tool engineering test

This proposal is of high relevance to TECP. The RAB/ISONIC tool would be instrumental to better image structures both in MOR basalts as well as in accretionary prisms. We encourage the proponents to submit a complete proposal. However, there was doubt as to how useful the ISONIC tool would be for unconsolidated sediments. Which are the lowest sonic velocities for which the tool would work?

LOI (no number): Geologic evolution of a back-arc basin by drilling the South China Sea and the Bashi Strait

Many of the objectives of this letter of intent are clearly related to the mandates of the Ocean History Panel (e.g., the paleoceanographic problems listed on page 6) and it is therefore not appropriate for TECP to comment on these aspects. With respect to the TECP objectives, the panel understands the archipelago model and recognizes the desire by the proponents to test the model in an active or "actualistic" setting. If the archipelago model applies universally, however, the panel is not convinced that it can be tested with the program outlined in the Letter of Intent.

12. Drilling plan

TECP proposes the following drilling plan for next 3 or more year that gels high thematic objectives with PCOMs theme objectives, as follows:

12.1. Deformation partitioning within the lithosphere due to extension

- active low angle, e.g., Woodlark
- conjugate margins, e.g., Newfoundland/Iberia, Great Australia Bight/Antarctic, NE Atlantic (volcanic rifted margins), Gulf of Aden
- Transforms, e.g., Tasman fracture zone, Vema/Romanche
- Ocean crust, e.g., W Atlantic, Angola basin, Angola abyssal plain

12.2. Deformation partitioning, fluid flow, and exhumation during lithosphere convergence

- deformation and fluid flow, e.g., Nankai, Barbados, Cascadia, Costa Rica
- Collisional processes, e.g., Taiwan, Timor, E Mediterranean
- arc evolution, e.g., Tonga, Okinawa trough, S China Sea
- fluid flow/mass balance, e.g., Izu-Mariana, Costa Rica
- Tectonic erosion, e.g., Peru-Chile, Tonga, Japan Trench

12.3. Earthquake mechanisms

- monitoring seismicity using global seismic network and downhole geophysical observatories, e.g., west Pacific seismic network and related downhole measurements

13. Program planning groups

TECP proposes the following program planning groups, aimed to progress new initiatives:

- downhole measurements and observatories
- conjugate margins
- seismogenic segmentation (convergent margins)

14. Thanks

Alastair Robertson concluded the meeting by thanking all TECP members for their wonderful input and commitments to the panel's activities. On behalf of the panel members, Gary Karner expressed their gratitude to Alastair Robertson for his work as a very effective TECP chairman and his contribution in directing the meetings and organizing and executing related field trips.

Lithosphere panel meeting,

October 7 - 9, Kanazawa, Japan, hosted by Shoji Arai

Members attending the meeting:

Dave Caress	LDEO
Pat Castillo	Scripps (UCSD)
John Mahoney	Hawaii
Kathy Gillis	U.Victoria (Canada)
Roland Rihm	Geomar (Germany)
Anne Sheehan	Univ Colorado
Jeff Gee	Scripps (UCSD)
Dominiqie Weis	UL Brussels (ESF)
Godfrey Fitton	Edinburgh (UK)
Shoji Arai	Kanazawa (Japan)
John Ludden	Nancy (France)

Members absent for the meeting:

Andy Fisher	UCSC
Jim Moore	USGS
Suzanne Carbotte	LDGO
Randy Koski	USGS

Liasons and Guests

Paul Wallace	TAMU
Catherine Mevel	PCOM
J-P Montagner	ION
Kathy Ellins	JOIDES
Takeshi Matsumoto	JAMSTEC

Introduction:

The chairman thanked Shoji Arai for inviting the Lithosphere panel to Kanazawa

The panel was informed of the loss of both Rob Kidd and Lou Garrison, men who dedicated a considerable amount of energy towards the success of ocean drilling.

1. MEETING SUMMARY:

Monday 7th October:

The panel convened at 09:00 and spent the morning reviewing presentations from the various liasons. In particular Paul Wallace of TAMU provided an overview of the results of drilling the Juan de Fuca hydrothermal systems (leg 168).

At the request of the panel chair, part of the afternoon session was dedicated to a report from Jean-Paul Montagner on the ION project. Montagner provided a clear summary of the requirements for ION sites, for both deep mantle convection studies, and for earthquake source studies on seismogenic zones. Given that the panel was confronted with evaluation of a series of ION projects this presentation provided important technical information. In addition to the ION presentation, Takeshi Matsumoto from JAMSTEC provided the panel with an overview of the OD-21 project and a variety of sea-floor and borehole instrumentation projects with which the organisation is involved.

Part of the afternoon was spent reviewing new proposals submitted to for the July 1 deadline.

Tuesday 8th October:

Dedicated to evaluation of new proposals and LOI's, revisions and additions to old proposals.

A summary of each of the proposals evaluated in the prospectus was completed and some preliminary discussion was undertaken on how the panel would rank these proposals.

Wednesday 9th October:

Most of the morning was spent revisiting some of the proposals in the prospectus and deciding on how to divide certain proposals for ranking (in particular the ION projects).

After the ranking process had been completed, given that this was the last time the full panel would meet, the chairman asked the panel members to provide general reflections on the ODP system and also on the revised panel structure.

Nominations were made for the interim committee for proposal evaluation, co-chief sceintists for upcoming legs, suggestions for the publications committee and for the Fall SSP.

The meeting was adjourned at 14:00

2. RECOMMENDATIONS AND COMMENTS FOR PCOM:

Digital imaging of core: Following the presentation of the status of the JANUS data base by the TAMU representative, the panel underlined the fact that they are are not satisfied with quality of the hard rock digital-image-based system that represents the "backbone" of the hard-rock community's requirements. The need for this system seems to have "slipped through the net" in the JANUS programe and should not be forgotten.

DCS system: The TAMU representative presented an update of the status of the DCS system, and in particular the safety tests. Despite the fact that a significant proportion of LithPanel's objectives can be achieved with conventional drilling, the panel strongly supports the development and testing of DCS for future hard-rock legs and for use in areas of hard-rock (cherty sequences, hydrothermal sytems). The panel ranked a test of the system as zero (the top priority, but not ranked with the other prospectus proposals). The most reasonable site for such a test is probably at site 735. However, the panel stressed that such testing should be on a bare rock, low angle site, with reasonable access to a port.

Comments on transition in review process: Considerable concern was stated about how the new proposal review will be handled. In particular, how soon will proponents be advised that their proposal is going for mail review, and how much time will a proponent be given to rewrite the proposal before review?

Most of the proposals in the system are written with the current review process in mind, and given the possibility of stringent reviews, JOI or JOIDES should inform proponents as soon as possible of the changes in the review procedure. In doing so they should provide proponents and reviewers clear guidelines on the new review procedures.

3. RANKINGS

DCS	**zero**	
457 Rev-Kerguelen	**7,1**	**±1,0**
"ION - mantle holes (NERO + 431 Add3 sites WP1 and WP2)"	**6,7**	**±1,3**
451 Add2 - Tonga	**6,2**	**±1,4**
472 Add - Marianas Isu	**5.2**	**±1.5**
431 Add3 - W Pac Seis net - sites JT1 and JT2 (Japan Trench)"	**4.5**	**±1.4**
447 Rev3 - Woodlark basin	**3.2**	**±1.3**
450 Add2 - Taiwan	**2.3**	**±0.8**
79 Add - Somali basin	**1.8**	**±1.3**

Comments on rankings:

474 DCS/LWD engineering leg (Pettigrew)
RANKED AS ZERO, with the argument that LithP does not wish to rank DCS testing directly with science proposals in the prospectusi as there are no propsals in the prospectus that depend on DCS, but nonetheless agrees that this tool will be essential to the lithP objectives in the future. Furthermore, DCS will probably be used in non LithP proposals - ie., SGPP in ridge axes, chert horizons on seamounts, feslic large ore systems etc.

457 Rev Kerguelen plateau and Broken ridge (Frey et al)
Part of LIP strategy. Heterogeneity, chemistry, unique chance in terms of available site surveys.

431 & 506 NERO Deep mantle ION sites (Montagner et al and Suyehiro et al)
(NERO + 431 Add3 sites WP1 and WP2)
The panel chose to separate the deep mantle ION sites (Pacific and Indian Ocean) from the trench-seismic related sites. Drilling of ION holes is considered to be a high priority by LITHP. We feel that mini-legs to drill ION holes should be coordinated by PCOM when the ship schedule takes it near high-priority ION sites.

472 Add Marian-Izu mass balance (Plank et al)
Some questions about cretaceous overprint, part of a programme of experiments on fluxes in subduction systems: Tonga, serpentine diapirs, Costa Rica, Nicaragua etc......

451 Add2 Tonga Forearc: subduction geodynamics (MacLoed et al)
Sme questions about difficulties in orientation of cores in reconstructing the tectonic history. Interesting use of use sediments to record compositional change in arc magmatism. May be able to track mantle reservoirs using influx of IO asthenosphere Very successful site survey sediments pre-Louisville ridge - viable proposal flowing mantle is Samoan

431 Add3 West Pacific Seismic network (Suyehiro et al), sites JT1 and JT2 (Japan Trench)
The panel ranked the Subduction-zone objectives of the ION programme separately to the deep-mantle objectives. Drilling of ION holes is considered to be a high priority by LITHP. We feel that mini-legs to drill ION holes should be coordinated by PCOM when the ship schedule takes it near high-priority ION sites.

447 Rev3 Active extension in the Western Woodlark basin (Taylor et al)

450 Add2 Taiwan Arc-Cont collsion (Lundberg et al)

79 add Deep hole in the Somali basin (Hinz et al)
Has been poorly ranked by the panel in the past. Have not included LithP objectives inproposal. Why was this site chosen as a selected deep hole despite being poorly ranked in teh past?

Antarctic DPG 3 - BRANSFIELD STRAIT site
Lith objectives poorly ranked do not support this sites as the ideal regiuon to address back arc rifting problems

Proposals not ranked

WW367	Great Australia Bight Cenozoic cool-water carbonates; James /Feary
WW464	Southern Ocean Plaeoceanography; Gersonde et al
WW441	SW Pacific gateway; Carter et al
WW485	Australia-Antarctic southern gateway; Exon et al.
WW###	Antarctic DPG 1, 2, 3
445	Nankai trough

4. PCOM's 5 YEAR PLAN:

We much appreciate the fact that Pcom used our plan (from the Spring 1996 meeting) as a template for defining their long term goals. ***In particular we suggest to Pcom that a summary of the plan should be disseminated in a format such as that made available by EOS. as soon as possible***

Suggestion for working groups: Given that these working groups will be critical in defining the science programe of the future ODP, the panel spent some time discussing possible groups. In general our recomendations fell into long-lived groups (3-4 years) and short-lived groups (1 year).

Long-Lived groups:

Mantle dynamic experiments: Discussion on LIPS, which have sometimes been considered as "non-ocean crust experiments" by some members of the grilling community, resulted in the suggestion that these projects should be incorporated into one or two global projects looking at mantle dynamics in general. For example, a West Pacific mantle dynamics experiment would look into mantle convection regimes and petrochemistry, before, during, and after a large igneous event. These events must be considered as an integral part of the mantle convection and ocean-crust formation process.

Areas of interest - West Pacific Ocean; Eastern Indian Ocean; AAD etc..

These experiments should include ION type imaging and would ultimately serve to include a broader community in the planning process (i.e. mantle convection modellers) and would have strong links to programes such as, IAVCEI, ION, CSEDI and Margins (continental breakup)

RIDGES: Working group with links to Inter-ridge accretionary processes, melting regimes below fast and slow ridges - fluxes and crustal ageing.

This should include plans for deep hole (e.g. H2O site).

Active convergent margins: Should include fluxes through arcs and have
links to inter-ridge all aspects of arc magmatism, tectonics and fluid fluxes - links to Inter-ridge

Bore hole Instrumentation working group: Links to Inter-ridge ION, Margins.

Biology group: All environments

Short-lived groups (not DPG's!)

Large ore-deposits: Recommendation for a ***short-lived*** group which would include representatives from the mining industry and would define one or more drilling programes dedicated to understanding major hydrothermal fluxes leading to the formation of a large ore deposit : VMS and/or sedEX

Fluxes: A **short-lived** group to get with a mission to obtain a consensus on what needs to be measured and how to measure it. Arcs, ridges old crust - links to GERM

5. NOMINATIONS

Nominees for transition meeting:

Ludden (Petrology/geochem., Chair LithP);
Gillis (Canada, hydrothermal metamorphic);
Rihm (Germany, Seismics);
Gee (USA, paleo magnetics);

Nominee for publications committee:

Pat Castillo (Scrips)

Representative at Fall SSP meeting:

Suzanne Carbotte (Lamont) expecting a newborn
Dave Caress (Lamont) probably at sea
Anne Sheehan (Boulder) could make it if pushed

6. END OF MEETING:

The chairman thanked the panel for their efforts of the past few years and encouraged the panel members to remain active within ODP.

C. Mevel (Pcom) added her thanks for our work in supporting ODP.

The panel greatly appreciates the efforts that Shoji Arai put into hosting the meeting in and associated field-trip in Kanazawa

John Ludden
Nancy, France
4 November 1996

REVIEWS OF NEW PROPOSALS, ADDITIONS AND REVISIONS SUBMITTED FOR THE JULY 1 1996 DEADLINE.

Note that three additional proposals were reviewed:

506	NERO Ninety East Ridge (Montagner et al.,)
xxx	Back-arc rifting and crustal fluid circulation in the Okinawa through (Li et al.)
xxx	Geologic evolution of a back-arc basin by drilling the South China Sea and the Bashi Strait (Ju-Chin Chen,)

Proposals not evaluated

498	Barents sea drilling program Gamsakhourdia et al (penetration into sedimentary "basement")
502	Paleoproductivity in the Antarctic coastal ocean
503	East Artic ice shield and Weddell basin (Penetration into basement age of unconformity)
485	Southern Gateways sedimenatry basement

496 VRM'S and Oceanic Plateaux - Western Australia (Planke et al.)

This is a well written proposal with objectives relevant to LITHP. The principal objective, to test the hypothesis that the volcanic rifted NW margin of Australia had a non-plume origin, is highly pertinent. The secondary objectives are more relevant to TECP. Although sympathetic to the objectives of the proposal, panel members felt that the evidence provided by dredge samples pointed towards a plume origin for the volcanic activity. This reduced the priority the panel was prepared to give to the proposal since it seems highly likely that drilling will confirm this origin. Geochemical data on dredge samples were not provided in the proposal and it was not possible, therefore for the panel to judge the strength of the evidence against the non-plume hypothesis. In view of the limited number of drilling legs available to achieve LITHP objectives over the next five years, the panel are unlikely to support this proposal in the foreseeable future. The panel feels that significant advances towards resolving this problem could be achieved through a comprehensive dredging programe.

494 Rev: Rifting Processes of the Passive Continental Margin and Tectonic Evolution of the South China Sea

This proposal seeks to discriminate among various models (pure shear, simple shear, layered shear) for rifting and extension of the northern continental margin of the South China Sea, as well as to test models of multiple spreading episodes in this marginal sea. The panel noted the significant improvement in this revised version of the proposal although the role of drilling in answering the proposed questions still needs to be better developed. While the panel is generally interested in processes of extension in continental margins, these questions do not fall within our mandate.

Recommended action: A5, F4

501 - Western Pacific Cretaceous LIP formation (Castillo et al.)

Several different interesting issues are addressed in this proposal.The introduction and aims of the proposal are well defined. The formulation of the proposal is a little awkward - the summary of the objectives deals only with the OJP part and the effect of the emplacement of this LIP on the sediments and seawater - it doesn't address the Cretaceous igneous complex. The links between the objectives for each hole are not clearly defined.

For both models the explanation for the formation of the igneous Cretaceous complex is a little awkward and LITHP would like to see a more detailed discussion concerning the preservation of the magnetic anomalies. Also the 2nd model is not very clear - what is the origin of the material? In some ways the presentation is too regional, despite the fact that the problem being adressed is global.

There are also quite a few technical issues. For instance, in the study of the old MORB samples, the issue of age correction has to be addressed - this is a major point which is not considered at all here as it can change the distribution of the data quite significantly.

Another question that is very interesting and should be addressed: when does the role of the OJ plateau influence in the Pacific MORB end? Where do we drill to test the mixing of the OJ plume source and the MORB source?

The main recommendation of LITH is that this proposal is integrated into the Ontong-Java Plateau proposal - especially for the reference hole, thus defining a global west Pacific magmatic experiment, looking at plume inputs, residence times, mixing of sources etc.. The objectives of this part of the proposal are entirely within the main goals of LIP studies.

Recommended action: A2-B1.2-B2.1-C2-D1-E8-F3

Proposal 504 - Newfoundland Basin (Driscoll et al.)

This proposal involves an interesting area of continental break-up and early oceanisation, with an ambitious drilling plan. LithP does not, however, recognize major objectives of the panel being adressed in this proposal. It is suggested that the proponents assess the results of drilling the Iberian margin, before defining a program for its conjugate margin, and to prioritize the suggested sites in such a way, that a single leg of drilling can be defined.

Recommended action: A5, F4

505 - Slab-derived fluids and geochemical mass balance in the Mariana convergent margin (Fryer et al.)

Although geochemical mass balance experiments are of great interest to LithP, the panel felt that the present proposal was not well presented and somewhat premature. The two upcoming cruises (heat flow/sediment coring and a side scan/geophysical survey) may answer several of the questions raised in the proposal. It is unclear how other objectives (e.g., quantification of diffuse versus focussed flow) will be addressed, even if both drilling and survey results were available. A more cogent discussion of the necessity of drilling is required, outlining what unique results the drillcore samples could provide and how these would be merged with additional data to meet the objectives outlined. It was also noted that other nonaccretionary convergent margins do not have active fluid egress sites. In view of this, some effort should be made to place the Mariana convergent margin in a more global context. Are the fluid egress sites representative of nonacretionary margins in general? Finally, we note that 2 of the 3 sites (at 7,000 to 8,000 m water depth) in the southern transect lie beyond the reach of the present drilling technology.

Recommended action: A1, B1.3, B2.1, C3, D1, E2, F3

497 - Ryukyu Forearc, Ujiie

This proposal is not of high priority to LITHP, as it addresses mainly TECP and OHP objectives. We feel that the proposal would benefit from the addition of more proponents with various backgrounds and viewpoints. The proponent may wish to contact the proponents of "Back arc rifting and crustal fluid circulation in the Okinawa trough" (Li et al).

Recommended action: A5, F4.

507 - TAG II (Rona et al.)

Proposal 507 outlines a second phase of drilling at the TAG hydrothermal field to 1) further characterize the nature of the subsurface in the active mound and, in particular, the expected Cu-rich and stockwork zone and 2) investigate the maturation processes in this type of deposit. LITH P found the proposal lacking sufficient detail to evaluate the proposed drilling strategy and site selection. For example, what site survey data is available for the inactive mounds? An additional goal of the proposal is to investigate the linkages between magmatic and hydrothermal processes. The proponents suggest that this may be achieved by drilling the SE corner of the active and MIR zones. The proponents do not specifically state how further drilling will address this goal and what was learned from the sites that penetrated volcanic basement through the sulfide cover.

Although this proposal addresses high priority themes stated in the long range plan, it is unlikely that further drilling of this type of deposit will be a high prioirity within the next 5 years. LITHP expects to focus on large ore deposits associated with arcs and felsic magmatism.

Recommended action: A1; B1.3; B2.1; C2; D"; E6,8; F4

499 - Equatorial Pacific (Orcutt et al.)

Drilling of ION holes is considered to be a high priority by LITHP. We feel that mini-legs to drill ION holes should be coordinated by PCOM when the ship schedule takes it near high-priority ION sites. Clarification is needed regarding drill-string versus submersible deployment of borehole seismometers.

The proponents need to talk with Wilson and Alt (LOI 64) to assess common interests in 10-12 Ma reference hole. Clarification is needed on whether the drill-string is needed for the deployment. Little detail is given on the exact instruments to be deployed at this site. JOIDES informs us that more site survey information is needed (eg 3D seismics) for ION holes. Of the eastern Pacific sites we find the H2O site to be more interesting in terms of evolution of the ocean crust, and has the distinct advantage of cable vs ship access.

Recommended action: A1,F2.

506 - ION Siting Plan, (Ion Steering committe, Stephen and Orcutt)
(To be distributed to proponents of all ION sites)
Drilling of ION holes is considered to be a high priority by LITHP. We feel that mini-legs to drill ION holes should be coordinated by PCOM when the ship schedule takes it near high-priority ION sites. Clarification is needed regarding drill-string versus submersible deployment of borehole seismometers.

LITHP agrees with the general siting plan outlined in Proposal 506, with the understanding that the exact order that the holes are drilled will be dictated to some degree by the ship schedule. We feel that mini-legs to drill ION holes should be a high priority, coordinated by PCOM.

A short document including a full discussion of the technical aspects of a mini-leg to drill and ION-hole should be developed : depth, casing requirements, logging, time on site, means of reading data, means of occupying the hole etc..

Recommended action: A1,F2.

506 - NERO Ninety East Ridge (Montagner et al.)

Drilling of ION holes is considered to be a high priority by LITHP. We feel that mini-legs to drill ION holes should be coordinated by PCOM when the ship schedule takes it near high-priority ION sites. Clarification is needed regarding drill-string versus submersible deployment of borehole seismometers.

We request that the proponents obtain drilling time estimates from TAMU. In particular, it is likely that time will need to be added for logging. The proponents should contact the co-chiefs of Leg 121 in order to get information on drilling conditions of site 756 vs 757. Clarification is needed on drill-string versus submersible deployment of the seismometer.

Included are estimates of drilling times obtained from TAMU

PROPOSED ION SITE AT 756:
It will require 7.4 days to perform the following:
1. Set a reentry cone with 70 m of 16-inch casing and 140 m of 10 3/4-inch casing. This is what would be required to case the sediment section of this site.
2. Core 200 m into basaltic basement. The total depth is 340 mbsf.
I based coring time upon data obtained from the Core Tech sheets on Hole 756D. During Leg 121, deteriorating hole conditions were experienced after penetrating only 30 m into basalt. They gave up after penetrating 81 m into basement because of the rough going. This suggests that two hundred meters of basement penetration may be too optimistic.

PROPOSED ION SITE AT 757:
It will require 5.1 days to perform the following:
1. Set a reentry cone with 70 m of 16-inch casing and 370 m of 10 3/4-inch casing. This is what would be needed to case the sediment section of this site.
2. Core 100 m into basaltic basement. The total depth is 470 mbsf.
I based coring time upon data from Hole 757C. Operations were terminated after 48 m of basement penetration due to a medical evacuation. No hole problems were noted while coring basement at this site. Based upon the lack of hole problems while coring basement in Hole 757C, 757-ION would appear to be more feasible than 756-ION.
The cost estimate for hardware and cement to accomplish 756-ION is $63.7K.
The cost estimate for hardware and cement to accomplish 757-ION is $77.6K.

Recommended action: A1, B1.2, B2.1, C1, D1, E0, F1.5.

500 - Drilling fast spread Pacific crust at the H2O long term seafloor observatory (Stephen et al.)

LITHP is strongly supportive of drilling the ION borehole seismometer sites outlined in the ION siting plan (Proposal 500) (including this site) as logistical opportunities arise.

LITHP is particularly interested in the H2O location as the possible site of a reference hole for fast spread Pacific crust. We advocate the devotion of a complete leg to the H2O ION installation. This leg should involve drilling to the greatest depth that circumstances allow and a full suite of downhole logging and permeability experiments prior to the installation of the seismometer. This approach would address crustal evolution as well as providing the first significant sampling of layer 2 in old Pacific crust. Should the drilling results prove encouraging, the OSN location could later become the site of a second hole which would sample deep into the crust.

Note - This is a potential legacy site for the program

Recommended action: A1, B.1,2, B2.1, C2, D1, E0, F2

LOI 71 SE Indian Ocean hotspots (Johnson et al.)

LITHP appreciates the efforts by the proponents in presenting the scientific significance of the newly discovered seamount chain. The chain is very important particularly with regard to testing whether the Ninetyeast Ridge was produced by 2 hotspots (ASP + Kerguelen) or by only one (Kerguelen). The Panel, however, does not think that in the current situation, a drilling proposal will be likely to be ranked highly in the next few years. The Panel wishes the proponents well in pursuing other means (e.g., dredging, surveying) to investigate this fascinating, newly discovered structure.

LOI 70 Hydraulic piston coring deepwater site study (Dunlap et al)

This propsal aims to test the ODP piston coring technique and aid in a sifgnificant transfer of technology to the industry. We fully encourage ODP to undertake whatever is required to interest the petroleum Industry.

LOI 69 - Refurbishment of Barbados Cork experiments on 174B (Becker et al.)

Given the investment already made to these experiments during leg 156, LITHP considers the CORK refurbishment to be very high priority. The packer work should be done if time is available, but is of lesser priority than the CORK refurbishment. Recommendation strongly that ODP makes time available to complete this cork experiment

Recommended action: A1, F1

LOI 72 - RAB and ISONIC LWD tool engineering test (Goldberg + Iturrino)

This LOI is mainly based on inside information not available to the panel members involved in the evaluation. Having been informed about the background by PCom and JOI office during the meeting, LithP members are fully supportive of testing this sort of tool, and a trial run is recommended for the next opportunity avalable, which probably will be the DCS engineering leg. Some concerns remain, whether reorientation of the cores can be done in some types of environment with significantly magnetized rocks - serpentinised-peridotites, gabbros.

xxx - Back-arc rifting and crustal fluid circulation in the Okinawa through (Li et al.)

One of our main goals, in our long range plan, is to drill a hydrothermal system in a felsic context in a a back-arc system. The proponents have to come back to ODP/LITHP with more focused objectives. The proposal still needs to be rewritten and to be more specific as too many issues are raised in the present proposal. LITHP suggests that the proponents contact the Joides office for information similar proposals in the system (for example the Manus basin drilling by Binns et al.). Given the changes in the structure of the ODP proposal system, we recommend that the authors contact JOIDES and find the best way to have their proposal evaluated in the new system. The authors may well want to participate in a working group on hydrothermal systems or back-arcs, if such a group is proposed.

Recommended action: A3-B1.3-B2.1-C3-D? (DCS)-E8-F3.

XXX - Geologic evolution of a back-arc basin by drilling the South China Sea and the Bashi Strait (Ju-Chin Chen, Taiwan)

This proposal is of marginal interest to LithP, although some of the objectives of back arc rifting, and hydrothermal alteration, if developed, could be of significant interest to the lithospheric community. We draw the proponents attention to the fact that a proposal (494-Rev) with very similar target and objectives by B. Yao et al (Guangzhou, China) is already in the ODP propsal system.

448-Rev - Ontong Java Plateau (Kroenke et al)

LITHP strongly endorses the revised drilling program for Ontong Java Plateau and appreciates the response of the proponents to our previous concerns. Site survey data is essential for this highly ranked proposal to become mature. The panel hopes that the funding agencies will respond to this need.

The proponents are encouraged to formally contact the proponents of Proposal 501 (Castillo et al.) in order to develop a 2-3 leg drilling strategy that addresses the broad question of Pacific magmatism related to the emplacement of large igneous provinces. LITHP envisions that such a "Pacific magmatic experiment" would be designed to characterize the geochemical evolution of the western Pacific, pre-, during, and post-LIP emplacement. The proponents should refer to the Dick and Mével document (Woods Hole, May 1996) that presents a possible strategy for this problem.

Recommended action: A1; B1.1; B2.1; C2 (pending site survey); D1 (pending site survey); E8 (pending site survey); F2 (pending site survey).

463 - Shatsky Rise (Sager et al.)

The proponents have provided convincing evidence for the suitability of Shatsky Rise as a site for testing some aspects of current LIP hypotheses. Good tectonic control provided by magnetic anomalies, and the evidence for age progression are useful features lacking in the larger oceanic LIPS. However, panel members felt that comparing the size of Shatsky Rise with Hawaii was not a convincing argument. The origin of Shatsky Rise through the effects of a mantle plume on a spreading center makes the area more analogous with Iceland, which is of a comparable size. If the Hawaiian plume were superimposed on a fast spreading center, it is likely that an oceanic plateau much larger than Shatsky Rise would be produced. Consequently the panel were unconvinced that Shatsky Rise is a suitable site for the testing of hypotheses for *giant* LIP formation. The age of Shatsky Rise would still make it an interesting site for drilling, but ODP is unlikely to schedule more than three LIPs Legs over the next five years. LITHP feels that these Legs should be devoted to drilling the larger LIPSs, for which there is no modern analogue. Drilling Shatsky Rise is unlikely to become a high-priority objective.

Recommended action: A2 F4

426 Rev 2 - Mantle Reservoirs and Mantle Migration associated with Australian-Antarctic Rifting (Christie et al.)

Establishing the long term relationship between the AAD and the Pacific/Indian mantle boundary will address a fundamental aspect of mantle dynamics and hence is of great interest to LithP. The panel continues to be highly supportive of this well-defined test of a first order geologic problem. This revision presents results from the site survey cruise conducted in February, 1996. Results from this cruise demonstrate the difficulty in obtaining suitable (or any) material from dredging crust > 7 Ma. Preliminary geochemical data from newly acquired dredges nearer the ridge (< 7 Ma) corroborate the migration of the isotopic boundary across spreading segment B5, but these new data do not preclude any of the three possible relationships between the AAD and the isotopic boundary. Together with the difficulty in dredging older crust, there is little remaining doubt that drilling will be required to accomplish the objectives of this proposal.

The panel noted that the rapid (few hours) acquisition of geochemical data will likely require revision of the shipboard analytical procedures. Finally, the panel was disappointed that the site survey geophysical data (3.5 kHz, single channel seismics) were deemed unusable by SSP. We would strongly support additional funding to acquire site survey dataa necessary to make this program ready for drilling.

Recommended action: A1, B1.1, B2.1, C1, D1, E8, F2 (site survey data)

491 Add Defining Ocean Crustal Categories (Hinz)

The panel acknowledges the receipt of this letter stating that they are going ahead with preparation of a revision of this propsal. Understanding the evolution of oceanic crust remains a first order priority of the panel

481 Add - Red Sea Deeps (Ludden and Rihm)

This proposal addresses important LITHP objectives, particularly with regard to penetration of the hydrothermal system in the Atlantis II deep. We encourage the proponents to continue to develop the proposal and to seek funding for site surveys.

This interdisciplinary proposal remains immature.The proponents need to discuss fully how the three sites in the new tectonic transect address their objectives. Also, at present the site survey forms are not filled out correctly (e.g. locations do not agree with the maps). The Atlantis II deep site will likely require DCS or hammer-in-core technology, both of which are under development. The proponents need to provide more complete estimates of drilling times and logging procedures.

Recommended action: A1, B.1.2, B.2.1, C2, E3, E6, F2/F5

479 rev Felsic Backarc Hydrothermal systeme in teh Manus basin (Binns and Scott)

The proposal is of considerable thematic interest to the Panel and is maturing, thanks to the rapid and continuing growth of knowledge of the Pacmanus area. We feel that additional sampling via shallow DCS, dredging, etc.) is vital to move the proposal forward, in order to confirm the proponents' present conception of the hydrothermal system and to refine selection of proposed sites and drilling goals. Although deep DCS is probably strictly unnecessary, the capability (now under development) would very probably enhance the project significantly. An apparent weakness of the proposal is that although the hydrothermal system is clearly very active, no ore deposits of significant size seem (as yet) to be present; hence, only a part of the problem of ore-deposit formation can be studied in this location. One Panel member criticized proposed site EMB-5C, arguing that the record of the hydrothermal system as preserved in sediments is likely to be compromised by water-current variation in time. Several members advised inclusion of more biological aspects, with possible inclusion of an expert in the field as a co-proponent. A general consensus was that addition of a short background discussion of felsic-rock-hosted hydrothermal ore deposits would be very helpful for nonspecialists.

Recommended action: A1, B1.2, B2.1, C2, D1 and D3M E8, F2

495 Rev: Seychelles microcontinent (Stephens et al.)

The proposal adresses an interesting regional problem, namely the disassembly of the continental fragments of the western Indian Ocean. The geophysical data are fairly convincing in supporting the overall ideas expressed in the proposal. It is thus unclear, taht a significant increase in understanding can be gained from drilling, that is not already known from existing samples and geophysical data. Furthermore, despite the fact that microcontinent fragments are part of the general accretionary scenario for many accreting margins, LithP does not regard the problem posed for the Seychelles microcontinent as being of global interest.

Recommended action: A5, F4

432-ADD, Deep Hole off Galicia (Reston et al.)

This proposal is not considered to be a high priority by LITHP.

Recommended action: A5, F4.

466-Rev Investigation of linearly magnetised, Great Australian Bight region by the Ocean (Stagg et al.)

The proposal is devoted to investigation of origin of non-volcanic rifted margin, especially of its linearly magnetised rifted crust. The drilling data on the non-volcanic rifted margin around Australia-Antarctica are poor and may be important to more thoroughly understand the processes of continental break-up and sea-floor spreading. The objectives are interesting but are not relevant to LITHP in the present form. The proposal should be revised, and the following are the points for further consideration.

1. There are some drilling data on other non-volcanic rifted margins (e.g., Iberian Margin). To highlight the necessity of drilling GAB evaluation of the data from other rifted margins should be added. Petrological examinations are necessary both for GAB and ever drilled non-volcanic
rifted margins.
2. The proponents proposed only one site (SAAP02A) for investigation of pseudo sea-floor spreading magnetic lineations. We think that the crustal structure due to the magnetic lineations is possibly too complex to understand through one site which has only 100 m basement penetration.
3. please state more clearly the difference between the pseudo ocean-floor spreading magnetic lineations and the ordinary ones.
4. Figures are of such low quality and the captions are insufficient
5. Please provide estimate the drilling times.

Recommended action: A-5 , F-4

469 Add: Argo abyssal plain (Stagg/Symonds)

Proposal 469 has been of moderate interest to LithP in the past (see reviews spring 1995, ...). Following our last recommendations, we are awaiting the announced seismic results to be in the position of better assess the scientific feasibility of the program. We underline the fact that the water depths and the basement penetration required are outside the present limits of the Joides Resolution

Recommended action: A3, F3

494 Rev: Rifting Processes of the Passive Continental Margin and Tectonic Evolution of the South China Sea (Yao et al)

This proposal seeks to discriminate among various models (pure shear, simple shear, layered shear) for rifting and extension of the northern continental margin of the South China Sea as well as to test models of multiple spreading episodes in this marginal sea. The panel noted the significant improvement in this revised version of the proposal although the role of drilling in answering the proposed questions still needs to be better developed. While the panel is generally interested in processes of extension in continental margins, these questions do not fall within our mandate.

Recommended action: A5, F4

Review of the prospectus - proposals considered by LithP

457 Rev	Kerguelen plateau and Broken ridge (Frey et al)
472 Add	Mariana-Izu mass balance (Plank et al)
451 Add2	Tonga Forearc: subduction geodynamics (MacLoed et al)
431 Add3	West Pacific Seismic network (Suyehiro et al)
450 Add2	Taiwan Arc-Cont collsion (Lundberg et al)
447 Rev3	Active extension in the Western Woodlark basin (Taylor et al)
79 Add	Deep hole in the Somali basin (Hinz et al)
474	DCS/LWD engineering leg (Pettigrew)

Other propsals in the prospectus:

367	Great Australia Bight Cenozoic cool-water carbonates (James /Feary)
464	Southern Ocean Plaeoceanography (Gersonde et al.)
441	SW Pacific gateway (Carter et al)
485	Australia-Antarctic southern gateway (Exon et al.)
###	Antarctic DPG 1, 2, 3
445	Nankai trough

OHP Meeting October 7-9, 1996
Strasbourg, France

Attendees

Panel members
John Armentrout
Bradford Clement
Tom Crowley
Steve D'Hondt
Elisabetta Erba
Rainer Gersonde
David Hodell
Anne Marie Karpoff - host
Alan Kemp
Tom Loutit - Chair
Ted Moore
Delia Oppo
Brian Popp
Warren Prell
Christina Ravelo
Kozo Takahashi
Liaisons
Bob Carter (PCOM)
Brian Huber (IHP)
Guests
Maria Mutti (JOIDES Office)
Apologies
John Firth ODP/TAMU

Prospectus Ranking

1 - **464** S. Atlantic Transect	7.5 (0.6)
2 - **441** S. Pacific Gateway	6.0 (1.4)
3 - **367** Great Austral. Bight	5.4 (1.7)
4 - **465** SE Pacific Transect*	4.6 (2.1)
5 - **503** Weddell Sea	4.2 (1.8)
6 - **452/502** Antarctic Penn	3.1 (2.0)
7 - **482** Ross Sea/Wilkes Land	2.3 (1.6)
8 - **485** South Tasman Rise	2.0 (1.3)
9 - **472** Mariana Trench	0.9 (2.0)

* added to ranking

Recommendations/Motions

CLIP software development
The panel voted to further endorse and recommend continued support for the development of CLIP (Core-Log Integration Platform) software. The two products currently in development, Splicer (core-core data integration) and Sagan (core-log data integration) data integration software are viewed as essential shipboard and shorebased research tools for Ocean History drilling objectives. The panel supports the incorporation of Splicer and Sagan data products into the JANUS database and recommends that the programs be enhanced to access data directly from the database. The panel also recommends that ODP assume a proactive role in insuring that these CLIP software products

are compatible with current and future modifications to the shipboard computing and network facilities.

Information Management
A. The OHP endorses the 2 October 1996 recommendations to PCOM on (1) the new ODP advisory structure, (2) JANUS, (3) new publications, and (4) printing and distribution of ODP IR and SR volumes for archival purposes.

B. The OHP does not endorse the IHP recommendation that any and all collaborations between shipboard scientists be approved, monitored, and adjudicated by the co-chief scientists of the leg. Such a practice would leave no mechanism for final appeal when conflicts arise between co-chief scientists and other shipboard scientists. Consequently, the OHP recommends that an independent body that can respond quickly to leg-based appeals have ultimate responsibility for adjudicating collaborative arrangements between shipboard scientists.

C. ODP SR volumes constitute a primary resource for much earth historical research. Resources of particular importance include (1) microfossil studies that document taxonomic concepts of stratigraphic significance, and (2) site-specific stratigraphic studies. Consequently, given the pending phasing-out of SR volumes, the OHP recommends that PCOM consider subsidizing costs of publishing such studies in the open peer-reviewed literature (i.e., by payment of page charges for taxonomic and stratigraphic studies).

D. OHP supports the migration of existing data to the JANUS database system. The migration of biostratigraphic data should be a high priority task.

Leg 175
OHP is aware that coring depth restrictions imposed due to safety considerations in the North Angola Basin may limit the scope of Sites in this area to Quaternary/upper Pliocene. This will nevertheless provide important new information and the southern transects retain a sufficiently broad coverage to provide a robust reconstruction of the evolution of the Benguela current system. This leg remains a top priority for ocean history. It has been considerably strengthened by the addition of high resolution sites in Walvis Bay and has the full support of the panel.

SSEC nominations
Steve D'Hondt
Christine Ravelo
Tom Crowley
Anne-Marie Karpof

SSEP nominations
The following current OHP members are suggested as potential members of the Environments SSEP. They are not proponents and have at least 1 year to serve on the current panel. They are also *willing* to serve on the new panel.
Popp - 2 years
Armentrout - 3 years
Crowley - 2 years
D'Hondt - 3 years
Karpoff - ?
Kemp - 2 years
Erba - 2 years
Ravelo - 2 years
Oppo - 1 year

PPG suggestions and nominations

PPG's
Rapid Climate Change
Extreme Climates
Orbital-Scale Climate Change
Sea Level
Ice Origin/Dynamics

Nominations for PPG's and liaisons with international/national groups
Gersonde - GLOCHANT
Oppo - IMAGES
Moore - ANTOSTRAT
Erba - CRER
Prell - MESH/PAGES
Armentrout - PEP/MARGINS

ANTOSTRAT Detailed Planning Group
OHP recommends that the ADPG meets again in 1997 to refine the drilling proposals and proposed schedules as a result of the 1998 prospectus ranking and drilling schedule.

JOIDES Advisory Structure
see attachment on proposal flow and issues that needto be addressed with the transition to the new panels.

New Proposals Reviews
079 Somali Basin
For several reasons the proposed leg is highly risky from an OHP perspective. These include: (1) the present lack of detailed seismic control on site location, and (2) the single-hole nature of the proposed drilling. Hence, from an OHP perspective, the proposed leg is presently best considered as primarily of engineering interest.

367-Add2 Great Australian Bight
A1, B1.1, B2.1, C1, D1, E0, F1
The goals of this proposal remain highly relevant to programmatic themes and to the objectives of the Long Range Plan. The panel acknowledged the receipt of the new site survey information and note that two drill sites have been eliminated because of site safety concerns. We agree with the proponents that the removal of these sites will not compromise the goals of the proposed leg and note that alternative platforms are being considered for these holes. OHP applauds and supports these efforts. The panel encouraged the proponents to interpret the new seismic data beyond the sequence level prior to drilling and recommend that the proponents investigate the cost/benefit of the use of VSP.

452-Add2 Antarctic Peninsula
A1, B1.1, B2.1, C1, D1, E8, F1
The OHP recommends that the proponents raise the priority of the Palmer Deep site from 2 to 1. We would like to have the Palmer Deep site carefully evaluated so that the thickest possible section having a good stratigraphic record is cored. We also strongly recommend that all first priority sites be **triple** cored with the APC. Double coring does NOT assure complete recovery of the section. This will require a recalculation of drilling times.

457 Rev3 Kerguelen
A5
OHP was disappointed that the paleoceanographic objectives that were incorporated into 457 are no longer included in the revised, two-leg drill plan. Paleoceanographic sites KIP15-17A were

dropped from the schedule and Zachos has been removed from the list of proponents. Consequently, this proposal is no longer relevant to OHP objectives, although we acknowledge that there may be some limited opportunities to address some ocean history questions with sediments recovered while drilling to basement.

463-add2 Shatsky Rise
A6 - possible area/topic for working group?
The objectives of this proposal are primarily Lithospheric in nature. OHP notes, however that sediments recovered at the reference sites would address several OHP objectives. This is particularly true if the motor driven core barrel can be used effectively. The ocurrence of shallow water sediments on Shatsky is also of interest and is important for understanding paleo-circulation and migrqtions of benthic community in the Pacific. The subsidence history of the rise will also provide an opportunity to examine the changes in both benthic and planktonic communities related to paleo-water depth.

464 - Add2 SW Atlantic Transect
A1, B1.1, B2.1, C1, D1, E0, F1
The panel continues to be highly supportive of this proposal and commends the proponents for the excellent job they have done in coming up with a plan that meets both longer-term Cenozoic objectives and high-resolution Plio-Pleistocene objectives. This addendum provides results of the site survey to refine site selection. The panel recommends some additional refinement of the drilling plan, however. In particular, it suggested looking more carefully at the possibility of extending the record at one of the high deposition rate sites to 3-4 myr. If, for example, seismics acquired on the recent site survey cruise suggest that sediments underlying the 300 m mark at SUBSAT-1B appear promising, then we recommend deeper drilling here. Acquisition of longer high-resolution records for comparison to records from Leg 162, 167, and scheduled leg 172 sediments should yield a better understanding of processes driving rapid climate changes on suborbital time scales (and northern/southern hemisphere linkages). Do the drill times include logging?

467-Rev W. Med sea level
A3, B1.1, B2.1, C1, D1, E0, F3
This is a well presented proposal focusing on sea level changes versus tectonic control on depositional history. It contrasts depositional architecture in a sand-rich system(Var, narrow shelf, active fan deposition during high stands)and mud-rich systems (Rhone, broader shelf, fan deposition primarily during lowstands)
The proposal would be strengthened by contrasting the history of the Var and Rhone fan deposition with age-equivalent systems of the Mississippi and Amazon fans. In this way the impacts of differences in tectonic setting, drainage basins, sediment flux, physiography, and responses to climatic variation could be explored. The likelihood of success of this effort would be increased by showing that the stratigraphy in the Mediterranean depositional systems could be accurately compared with the Amazon and Mississippi fan systems through the use of high-resolution chronostratigraphic techniques.

472-add Mariana-Izu Region
A6 (the reference hole could have relevance to OHP)
The Addendum does not contain response to the Spring 1966 OHP comments and therefore it is not relevant to the panel.
Proponents are strongly encouraged to revise the proposal in order to better formulate the OHP-related objectives and strengthen the thematic relevance according to previous comments.

477-Rev
A1, B1.3, B2.1, C2, D1, E8, F2

This proposal is highly relevant to OHP themes as defined in the long range plan in that drilling in this area could provide information on the formation of deep and intermediate water, its impact on the circulation in the Pacific Ocean, and its relationship to Arctic Ocean processes affecting climate dynamics on orbital time scales. Although improved from the earlier version, the panel felt that the main objectives of the drilling leg were poorly developed. This proposal would benefit from a comprehensive review of previous drilling in the North Pacific (Leg 145 and Sea of Japan results) and integration of that knowledge with the goals of the proposed drilling. Site selection should be based on a strategy to achieve those specific, well formulated goals. Better site survey information is needed to identify continuous undisturbed sedimentary sequences with more confidence (without hiatuses and turbidites). In addition, the panel felt that it would also be valuable to recover high resolution sections at least through the Pliocene at the expense of a few of the sites dedicated to only Pleistocene sections.

481-Add Red Sea Deeps
A3, B1.2, B2.1, C3, D1, E8, F3
The Addendum provides response to previous OHP comments: objectives are better discussed and some documentation of existing data are included. However, there are still concerns about a better formulation of OHP-relqted objectives as well as insufficient data to achieve them.
Location of proposed sites must be added.
The panel advises the proponents to consider existing sites in the Indian Ocean in order to evaluate potential additional sites outside the Red Sea.

485-Rev
A1, B1.2, B2.1, C2, D1, E8, F2
Addition of fracture zone sites does not contribute to OHP objectives.
Although a listing of core is given, no real information about piston cores is included. What do piston cores and previous DSDP cores tell us about probable accumulation rates, actual measures of carbonate preservation (not just water or burial depth, and the continuity of the section.
Where are actual ocean fronts and their known glacial-interglacial variability compared to sites? For longer term climate-ocean evolution questions, how have the sites changed their latitude with time? Plots of these relations would be useful in anticipating what the site might record. The latitude separation of the sites is only 4^{o}, so getting the full Polar Front-STC story is unlikely.
None of the Milankovitch type can be done if accumulation rates are not high enough (minimum is ~2 cm/ky 20m/my) but should be higher. As I read the Site 281 discussion, the rates are likely to be less than 1 cm/ky (36m Plio-Pleistocene/5 my = 7m/my)
Need better clarification on what lithology and carbonate preservation is actually anticipated. Much discussion is of "pelagic carbonates", but text and DSDP holes talks of mudstones and shallow water sediments (282) Can these sites really give continuous sections with high enough resolution to accomplish the questions raised under the banner of the Earth's Dynamic Environment. The proposal is not convincing on this point.
What are actual differences between Indian and Pacific and exactly how are the proposed cores anticipated to cover the time range of the evolving advection? Idea is clear but not the details.
The big picture marine geology and seismic interpretation are great but the paleoceanography-climate questions need more attention to what is actually possible

486-Rev Equatorial Pacific APC
A1, B1.2, B2.2, C3, D3, E8, F2
This proposal remains highly relevant to OHP top thematic objectives in potential to deliver key-data for reconstructing long-term changes and evolution of the tropical central Pacific during the Paleogene.
Although proponents were very responsive to panel's previous comments and considerably revised the proposal, OHP still expressed concerns as follows:

The main goal of the proposal is the recovery of a complete and high-resolution record of the Paleogene tropical Pacific. Results from previous sites located very close to proposed sites strongly suggest that the recovery of a high-resolution transect will be extremely difficult mainly due to widespread occurrence of Oligocene-Eocene cherts and hiatuses. In addition, Paleogene sections are rather thin and calcareous intervals are rare. Proponents should discuss the feasibility of objectives taking into account the probable recovery of thin, incomplete and calcareous-poor sections.

Proponents should explain how a high-resolution stratigraphy can be achieved.

Magnetostratigraphy will be very difficult (if not impossible) at equatorial paleolatitudes and biostratigraphy of mainly siliceous oozes with minor carbonate component is not very detailed.

The rare occurrence of calcareous interval will also hamper isotopic studies

One of the main objectives is the reconstruction of the Paleogene ITCZ history. Only one proposed site (PAT 16) is located at appropiate latitude, whereas all others will address only the Neogene history of ITCZ. Proponents should consider additional sites at present latidude between 30° and 40°N.

CHERT. The panel was particularly pleased to see that proponents consider chert an "opportunity"rather than a "problem". Proponents should question the link between chert and paleoproductivity at the equator.

Establishment of nature and stratigraphy of chert (page6) does not require new drilling,because such a record already exists and can be analyzed.

Site location should be revised after site survey (late 1997) not only to minimize the chert recovery, but to better address the Neogene history of ITCZ.

Proponents are advised to re-estimate drilling times for MDCB according to updated coring-speed.

497 Ryukyu Forearc and Paleoceano

A6

As currently formulated this proposal appears to have a primarily tectonic focus although if suitably adapted it could appeal to Ocean History/ Environment objectives.

This proposal needs much improved structure prior to proper consideration by OHP. A clear statement is required for both tectonic and paleoceanographic objectives. This revised proposal should specify scientific hypotheses and over what stratigraphic intervals these will be tested. Proper justification should be included for each proposed site.with reference to which of the objectives/ hypotheses the site is relevant to. With respect to the paleoceanographic objectives a clear distinction should be drawn between local and regional/ global questions.

498 Barent Sea

A5

This proposal is directed toward the Nansen Arctic Drilling Program and seeks to use another existing ship to recover shallow sections in the Barents Sea. Reviewed as an ODP proposal, but level is more like a letter of intent.

The proposal contains no well developed science questions of interest to OHP. Most of proposal is directed to sampling and the associated studies needed to analyze the sediments. Given the objectives of acquiring Quaternary and Paleogene sediments, the sites seem in poor locations and apparently duplicate already existing drill cores. Both sections seem thin and the proposal is not clear why these locations were selected.

The proposal does not address what the new cores would accomplish. Better recovery? Longer sections?

501 Tectonic, geochemical and Environmental; Ontong Java Plateau

A3, B1.2, B2.1, C1, D2, E8, F2

The panel recognizes the importance of recovering Cretaceous sedimentary sections in the Pacific for documenting and understanding processes that produce and mantain extreme warmth in the

Earth's climate. The proponents are strongly encouraged to better formulate OHP-related objectives as follows:
Deep reference holes in the Nauru and Pigafetta Basins will provide crucial biostratigraphic and radiometric ages for the mid-Cretaceous volcaniclastic sediments and constrain the number and duration of volcanic events involved in the formation of the OJP-LIP.
The sedimentary record can be used to address the role of greenhouse gases in climate change and determine how natural variations in atmospheric CO2 are linked to changes in oceanographic conditions.
The stratigraphy of the Cretaceous volcanic episode will be crucial for correlqtion of LIP's formation to global paleobiological and chemical events.
Paleontological studies of the section will address the questions of how the biosphere responds to major volcanic/tectonic episodes and related climate change as well as advance our understanding of biological extinctions and natural changes in biodiversity.
Geochemical studies will provide insights for understanding causql links between massive eruptions and changes in alkqlinity and isotopic composition of the oceans, nutrient cycling and black shale deposition.
Sedimentological studies will better constrain the CCD history during the Cretaceous Pacific Ocean and the uplift and subsidence of OJP.

502 Palmer Deep
A1, B1.1, B2.1, C1, D1, E8, F1
This proposal is highly relevant to OHP themes as defined in the long range plan in that drilling in this area could provide information on rapid climate change. Scientific objectives and rationale for Holocene paleoclimatic studies in this region are well formulated. However, OHP has several suggestions to make this a better drilling proposal. The proposal should be significantly shortened by removing detailed explanations of planned measurements and methods. It should include a short background section on the physical setting to demonstrate the climatically sensitive location of the site. Seismic data with site survey map, and site summary form should be included. In addition, OHP was curious as to whether the site could either be moved to a location within basin I where a thicker section could be recovered. OHP also suggests that deeper drilling be considered to recover older sediments if possible

503 (combination of 488 and 449) S. Weddel Sea
Older and Deeper A1, B1.1, B2.1, C1, D1, E8, F2 (drilling estimate + add seismic)
ANTOSTRAT A1, B1.1, B2.1, C1, D1, E8, F2
This proposal is a combination of two prior proposals -- 488 (Jokat) and 449 (Wise); the combination was based on a recommendation by the Antarctic Detailed Planning Group in June 1996. Five sites are proposed -- one on the Polarstern Bank to track Weddell Sea Bottom Water Flow near its source; two cores on the levees of the Crary Trough/Fan system; and two to the northeast off Dronning Maud Land into Mesozoic sediments to recover black shales (southernmost occurrence), a very well preserved diatomite (important for taxonomy and evolution), and information relevant to the breakup of Gondwana.
The panel expressed considerable interest in the proposal but were more enthusiastic about the Mesozoic component and the drilling on the Polarstern Bank. There is a lower guarantee of success drilling on the levee but that is the nature of such deposits and the increased risk should not be held against the proposed sites. As it now stands there are several problems:
- need for alternate siting in case of sea ice problems (levee sites);
- concerns about underestimates of drilling time (Mesozoic);
- concerns about the fact that the total leg length is too long (63 days) - new drilling estimates should include the standard 56 days and rechecked drilling times
- need for more seismic information for some of the sites??

The committee recommends that the proponents take these concerns under advisement and that, if necessary resplit the proposal into two efforts. Suggest that these issues be addressed by a second meeting of the ANTOSTRAT DPG.

504 Newfoundland Basin
A6

508 Okinawa Trough
A5, F4

DCS
A6, E8
OHP had suggested that if the DCS was not ready by the beginning of Phase III then it would not support the development. It appears that the development program will not be complete until 1999 and will not be available for some key OHP objectives. If this is the case the panel withdraws its support for the DCS development program.

LOI 72 LWD
A5

LOI 73
It is not clear from the LOI that the proposed program will achieve any of the OHP objectives because of the dominant interest in tectonics. If the proponents can demonstrate that the drilling targets will resolve some major climatic questions then this proposal couldbecome of significant interest to the Environments SSEP.

Suggestions for Proposal Pathways through new Advisory Structure

In order to understand the management processes within the new advisory structure OHP has developed a set of instructions/guidelines/observations concerning the path of a proposal into the new advisory structure. Maybe the document will help to focus thinking onto developing guidelines for potential proponents.

I. Sources of Drilling Proposals

A. Individual Scientists
B. Scientific international/national groups (independent of ODP)
C. Program Planning Groups (within ODP)
D. Working Groups (within ODP)

II. Proposal Submittal: JOIDES Office: SCICOM designee immediately passes proposal to one of two SSEPs in time for panel meeting

III. SSEP Evaluates each proposal.

A. Proposal is scientifically mature
1. Send out proposal for mail review: SSEP recommends a pool of reviewers to JOIDES office; SSEP Chair assigns reviewers; JOIDES Office checks reviewer availability, sends and receives reviews, forwards reviews to SSEP.
2. SSEP evaluates mail reviews and reviews proposal relative to other scientifically mature proposals that have been received.
3. Check with SSP on maturity for drilling.
4. Pass evaluation (recommendation) to SCICOM

B. Proposal is not scientifically mature:
1. Proposal has low scientific interest or does not address goals of long range plan; recommend rejection (?to SCICOM).
2. Proposal has scientific interest; does address goals of Long Range Plan, but is not scientifically mature:
a. Stage 1:
i. Evaluate proposal and advise proponents of recommended changes or additional information needed to evaluate proposal adequately. (assign watchdogs) AND/OR
ii. Recommend need for additional site survey data AND/OR
iii. Recommend to SCICOM that the proposal be referred to a DPG or Working Group in order to be integrated with existing or new proposals.

b. Stage 2:
i. Proponent representative (SSEP watchdog, or WG, DPG representative) presents proposed drilling plan to the SSEP.
ii. Evaluate proposal(s) and pass evaluation to SCICOM.
iii. Advise SSP of SSEP action.

NEED TO ESTABLISH:

1. Means for wide community knowledge of and participation in the proposal process (EOS, Geotimes, GSA News, AAPG Explorer, as well as JOIDES journal; editorials in professional journals):

Widely advertise themes
Advertise proposal guidelines
Advertise proposal review procedure

2. What are the guidelines for submitted proposals?

Organization
Contents
Length
Appendices

3. What instructions do we give the mail reviewers regarding the criteria for judgment and evaluation? Is the reviewer's evaluation based solely on potential usefulness of the recovered section, or is it based on what the proponents say they plan to do on the recovered section?

Instruct reviewers to evaluate:

a) The importance of the scientific problem addressed by the proposed drilling effort.
b) The appropriateness of the proposed drilling and the likelihood that the sections drilled will contribute significantly to the solution of the stated scientific problem.

4. NEED TO REDUCE SSEP WORKLOAD.

It is unrealistic to expect the SSEPs to undertake all of the responsibilities listed under 5.2.2 of the Mandate and actually contribute significantly in most of these areas (particularly 5.2.2a)

JOIDES Downhole Measurements Panel

30 September - 2 October 1996 meeting, Salt Lake City, Utah

draft minutes

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

DMP consensus: The recent replacement of the CNT-G neutron tool with the IPLT appears to substantially improve the reliability of porosity determination, and DMP looks forward to further tests of IPLT accuracy.

DMP consensus: DMP is encouraged by the initial results of BRG trials of satellite ship-to-shore communications: both logging operations and the shipboard usefulness of logs were enhanced.

DMP consensus: DMP applauds the BRG initiatives in on-line browsing and access to logging data. Coupled with the current program of rapidly adding older data to the database, this initiative is a significant step toward the long-standing DMP goal of making ODP downhole measurements a truly effective legacy.

DMP consensus: BRG has satisfied the need for improved sonic-log quality by changing from the long-spaced sonic to the SDT (sonic digital tool).

DMP consensus: DMP strongly endorses the proposal for a 3-component VSP at Hole 735B. DMP also endorses the concept of an oblique seismic experiment at this site.

DMP Recommendation 96-2-2 to PCOM: A Schlumberger 3-component VSP tool for Hole 735B should be funded by the BRG-WLS budget for FY98. [motion passed with 12 yes, 0 opposed, 1 abstain]

DMP consensus: The Leg 164 deployment of the BRG shear-sonic tool obtained reasonably accurate P-wave velocities. The logged formations were too slow, however, to provide an adequate test of this tool's S-wave capabilities. DMP looks forward to seeing the tool deployed in higher-velocity sediments (such as on Leg 170), as a critical step toward eventual third party certification.

DMP consensus: The performance of the Davis-Villinger temperature tool in abundant Leg 168 runs satisfies the third-party tool requirement for a successful ODP test. DMP commends the developers and encourages them to initiate steps to apply for certified status for this tool.

DMP Recommendation 96-2-3 to PCOM: DMP recommends that PCOM move forward with the LOI 72 proposal for Leg 174B, to be used if hammer-drill is not available, contingent on favorable answers to questions of insurance, sufficient resistivity contrast, sonic reliability, and ability to start a hole and achieve a 4-5 day time frame. These types of LWD measurement will be needed within the near future of ODP. Although DMP has insufficient information to recommend these measurements for Leg 174B, there is probably time to answer the questions before the decision deadline.

DMP consensus: DMP endorses the concept of running the next shipboard DCS engineering test in a known, benign environment. DCS development will be of intense interest to the SciMP, but DMP lacks the information needed to evaluate the specifics of proposed DCS use on a DCS/LWD engineering leg.

In addition to normal agenda items, the Fall 1996 DMP meeting made the following recommendations concerning new panel structure and mandates:

DMP consensus: DMP recommends that each SSEP include a member with downhole measurement expertise.

DMP consensus: If WLS changes substantially as a result of the WLS RFP, a working group should be established to assure a relatively seamless transition.

DMP Recommendation 96-2-1 to PCOM: Realizing that downhole measurements problems cause inappropriate or inefficient ship use, DMP recommends that SciMP, the WLS contractor, and ODP-TAMU monitor and enforce third-party (non-commingled) tool guidelines. SciMP could use an individual on honorarium or a separate 1-day subcommittee meeting to accomplish this.

DMP Recommendation 96-2-4 to PCOM: Recognizing that SciMP cannot duplicate the DMP depth of analysis of downhole measurement programs for upcoming legs, DMP recommends that some of the traditional DMP responsibility be shifted to proponents. To improve efficiency of early considerations of downhole measurements, DMP proposes that the wording of the site summary form be slightly changed to add considerations of downhole measurements, as shown in Appendix 1. DMP further recommends that SSEPs judge a proposal as immature if it neglects to respond to these new sections of the form. [motion passed 13 yes, 0 opposed]

DMP Recommendation 96-2-5 to PCOM: To assure that drilling innovations are considered in the context of downhole measurements, and vice versa, TEDCOM & SciMP need increased liaison and similar reporting paths (to both SCICOM and OPCOM). Inclusion of both scientific and technical expertise on SciMP is absolutely essential, because technological choices are inadequate unless they are made in the context of scientific and financial considerations. [motion passed 11 yes, 0 opposed, 2 abstain]

DMP Recommendation 96-2-6 to PCOM: The DMP recognizes that not all of its current functions can be subsumed into a new SciMP. Therefore, it recommends that some of its current responsibilities be moved to special groups:

(a) The procedures for the evolution of third-party tools have been codified and tested. DMP recommends that the primary responsibility for monitoring third-party tools now be assigned to an individual, whose necessary expenses are reimbursed by JOI and who reports to SciMP.

(b) DMP recognizes the need for temporary working groups, with resulting white papers, to address issues that would previously have been considered by DMP, but are beyond the likely scope of SciMP expertise and time availability. We recommend that the following two downhole measurement topics be considered for 1997 working groups: (1) vertical seismic profiles, and (2) log quality.

DMP Recommendation 96-2-7 to PCOM:

Proposed partial mandate for the Scientific Measurements Panel:
- investigate and evaluate new measurement technologies, analysis techniques, and third-party equipment developments, and recommend future measurement directions;
- identify ways in which existing ODP measurement capabilities and core-log-integration can be refined to increase scientific benefits; and
- advise on the scientific relevance and technical feasibility of proposal measurement plans.

Proposed liaisons for SciMP:
- from WLS, ODP-TAMU, JOI, TEDCOM, and OPCOM to SciMP;
- from SciMP to TEDCOM, OPCOM, and SCICOM.

JOIDES Downhole Measurements Panel

30 September - 2 October 1996 meeting, Salt Lake City, Utah

draft minutes

Chair:	Richard Jarrard	US
Panel Members:	Dan Arnold	US
	Arthur Cheng	US
	Gilles Dubuisson	France
	Andrew Green	UK
	David Herrick	US
	Peter Lysne	US
	Daniel Moos	US
	Philip Nelson	US
	Karen Romine	Australia-Canada
	Richard Wendlandt	US
	Jurgen Wohlenberg	Germany
	John Woodside	ESF
	Makoto Yamano	Japan
Liaisons:	Carlos Pirmez	LDEO-BRG
	Adam Klaus	ODP-TAMU
	Gregory Moore	PCOM liaison
Apologies:	Bobb Carson	US

1. WELCOME AND INTRODUCTION

The second meeting of the JOIDES Downhole Measurements Panel (DMP) for 1996 was called to order at 0900, Monday, 30 September at the University of Utah, Salt Lake City, Utah.

Chair and host Richard Jarrard welcomed panel members and liaisons to Salt Lake City, and he commented on the local geologic setting. He announced that there had been no recent changes in panel membership, and nearly all panel members were present. Bobb Carson was unable to attend this meeting, due to a simultaneous meeting in Washington DC on borehole observatories. Neither JOI nor NSF liaisons were attending this DMP meeting. Jarrard reviewed meeting logistics.

Jarrard reviewed agenda plans. He noted that PCOM's top priority for this meeting is consideration of the role of downhole measurements within the proposed new ODP panel structure. Accordingly, DMP would take up that item later in the morning for thorough discussions and tentative recommendations, then return to this topic briefly on the third day, for possible final revisions. A review of the status of all third-party tools had been planned for this meeting but was cancelled, because of uncertainty concerning the future of third-party tool monitoring within the new panel structure. Downhole measurements planning for the FY98 Prospectus might be reduced in time and depth, depending on how much time is needed for panel reorganization. A call for proposed agenda changes elicited no changes.

A call for changes to the draft minutes of the Spring 1996 DMP meeting elicited no changes, so those minutes were accepted as a fair representation of proceedings at the Tsukuba meeting.

2. PCOM/EXCOM/JOI DEVELOPMENTS

PCOM liaison Greg Moore summarized resolutions and consensus items by both PCOM and EXCOM that were of potential interest to the panel. Korea has joined ODP, as part of the Can/Aus membership. LWD now is planned for Leg 170; this recommendation of DMP, LITHP, and TECP was funded partly by lowering priority for some other specialty tool deployments.

Progress had occurred on a major agenda item from the previous DMP meeting: Phase III (1998-2003) planning. The last DMP meeting had provided recommendations for the Wireline Logging Services (WLS) Request for Proposals (RFP). April PCOM passed a motion saying that PCOM sees no way to reduce items for inclusion in the WLS Scope of Work, except for the modest redefinition of the geochemical string as a specialty tool. June EXCOM responded by emphasizing maximized innovation, along with a minimum core service. The RFP is expected to be released soon. The previous DMP has also developed technological priorities for Phase III downhole measurements, and Moore reported that JOI is now working on a 5-year Program Plan that includes engineering needs. ODP national member commitments on continuing to 2003 are expected by next June.

3. PANEL REORGANIZATION (PART 1)

PCOM liaison Greg Moore provided an overview of the planned panel reorganization. He said that the reorganization was intended to increase innovation and efficiency, reduce overlaps between panels, and save money. The new structure has fewer panels and therefore reduced travel costs and reduced liaison reports, and it is expected to streamline decision-making. Working groups are perceived as more innovative than panels.

Moore pointed out three major changes: (1) PCOM's role will be undertaken by new SCICOM and OPCOM; (2) the four thematic panels will be replaced by two new SSEPs (Environment and Interior), which will send proposals out for mail review rather than ranking proposals; and (3) DMP, SMP, and IHP will be replaced by a new Scientific Measurements Panel (called SciMP in these minutes). In addition to these "permanent" panels, three kinds of groups could be formed occasionally to fulfill temporary needs: (1) Detailed Planning Groups will continue to be used to blend multiple drilling proposals for an area into a prioritized drilling plan; (2) Program Planning Groups will generate proposals for portions of the Long Range Plan not addressed by unsolicited proposals; and (3) Working Groups can be formed to investigate individual scientific or technical topics in depth and produce white papers.

Jarrard added that ODP has a long-standing tradition of occasional reorganizations. Usually, panels are added, and some consolidation therefore is not surprising. The Chairs of DMP, SMP, and IHP were very concerned, however, that combining these three panels would inevitably decrease ODP attention to subjects formerly covered by their mandates, and they had expressed these reservations in a joint letter to PCOM. The most recent PCOM committed to the change, asked the three panels to provide recommendations concerning the SciMP mandate, and called for a November meeting of panel chairs and PCOM liaisons to merge and reconcile these recommendations.

Jarrard suggested that the working assumption of panel deliberations be that the advisory structure boundary conditions are non-negotiable (e.g., no increases in panel size, length of meetings, or frequency of meetings). Panel discussions began with questions to Moore, particularly on how downhole measurements were intended to fit into this new structure, then evolved into brainstorming on these and alternative approaches. For clarity, the Item 3 minutes that follow are not in strictly chronological order.

A) Increased Responsibilities for Proponents

The panel recognized that a small amount of very early attention and/or influence can accomplish as much as a huge amount of last-minute panic reaction. The panel felt that proponents could assume more of the responsibility for early consideration of downhole measurements. One suggestion was that proponents could be actively encouraged to add comments on what downhole measurements are needed for a proposed program. A means of accomplishing this is to add a section to the site summary form for comments on downhole measurements. A line already exists on the form for listing expected downhole measurements, but several watchdogs of programs in the FY98 Prospectus commented that this line is often left blank. Leaving other lines blank on the site summary form can be grounds for judging a proposal as immature, and DMP members felt that the same could be said for ignoring downhole measurements. Jarrard asked four of the advocates of amending site summary forms (Romine, Moos, Nelson, and Wendlandt) to meet as a subcommittee outside of normal meeting times, draft a proposed addition to site summary forms, and present the results to DMP on Wednesday.

SSEPs will be the judges of proposal maturity, so it is most efficient to have the SSEPs examine the downhole measurements portion of the site summary form to decide whether proponents had made a sincere and realistic assessment of this subject. This may require that some downhole measurements expertise be present within each SSEP. This additional SSEP responsibility would consume very little panel time, so it may not be necessary to change SSEP mandates to add it specifically.

DMP consensus: DMP recommends that each SSEP include a member with downhole measurement expertise.

B) Scope and Panel Location for Technical Responsibilities

The panel was particularly concerned with assuring that technical development and innovation are retained within the new structure. Dubuisson suggested that the current scientific and technical roles of DMP might need to be split into different panels in the new structure, and Jarrard responded that working groups could temporarily accomplish aspects of this split, by taking on either scientific or technical topics. The panel considered the possibility that TEDCOM could assume some of the current technical responsibilities of DMP. Alternatively, SciMP might evolve into a panel much more like TEDCOM than SMP and DMP had been. Moos argued that it is now critical for downhole measurements technology to be considered by TEDCOM, but Lysne responded that TEDCOM is already so busy that this additional responsibility would dilute TEDCOM's existing efforts. Certainly, very good liaison between SciMP and TEDCOM will be needed, but DMP achieved no consensus on whether liaisons alone would be sufficient. Rather than suggesting a move of the downhole measurements technology mandate to TEDCOM, the panel emphasized that drilling technology needs to be considered in the context of downhole measurements. For example, any planning of logging-while-coring should involve both TEDCOM and SciMP. The panel concluded that TEDCOM and SciMP needed to be at similar levels within the new panel structure. Recognizing that the current plan for TEDCOM to report to both OPCOM and SCICOM was appropriate, the panel agreed that this dual-reporting path is equally appropriate for SciMP. The panel considered, but rejected, the possibility of specifying which portions of the SciMP mandate should report to which panel. Panel conclusions on these issues are summarized in DMP Recommendation 96-2-5.

C) Increased Responsibilities for Groups other than SciMP

Some downhole measurements responsibilities are clearly far beyond the capabilities (either in time or expertise) of SciMP, and the panel hoped that working groups could be formed to accomplish them. For example, if bidding for Phase III of WLS results in either a new WLS Operator or a major change in WLS operations, then a transition committee might be needed. The expertise gap will be particularly marked for new technologies (e.g., downhole observatories), and evaluation of such technologies may be done best via working groups, consisting of specialists and reporting to both SciMP and the SSEPs. Increased use of working groups may be the only viable way to overcome the expected SciMP problems of decreased expertise and time available per task. Disadvantages of working groups are that they reduce the financial advantages of panel consolidation, increase reaction time, lack continuity of attention to a subject, and complicate the quest for balanced national representation.

DMP consensus: If WLS changes substantially as a result of the WLS RFP, a working group should be established to assure a relatively seamless transition.

D) SciMP Mandate and Organization

To foster discussion of a mandate for SciMP, Jarrard handed out copies of the current mandate of DMP and of the EXCOM/PCOM subcommittee recommendation for a SciMP mandate. He then displayed an overhead of his draft recommendations for a new mandate, incorporating elements of both the DMP and EXCOM/PCOM versions. Panel members agreed on numerous revisions to wording of individual mandate items. For example, Wohlenberg emphasized that the SciMP mandate must include interpretation techniques, not merely equipment, and Pirmez noted that the core/log integration initiative would fit within the SciMP mandate.

Traditionally, DMP has provided an impartial evaluation of downhole measurements operations and science, asking: How can success rate be improved? How can scientific return per hour and per investment dollar be improved? Should a different tool be used? Is more precruise testing and calibration needed? Is a new interpretation technique fruitful (e.g., electrofacies, hydrate detection, anisotropy)?

Nelson suggested that a brief look at the recommendations from the last DMP meeting showed that DMP has a strong operations emphasis; some recommendations involved scientific leadership, but most were operational, concerning either tools or techniques. This observation led to panel expression of a broader concern: technological decisions generally must include financial and scientific considerations, and ODP cannot expect OPCOM to do all of this. Financial impacts are not limited to direct technological investments; Klaus reminded the panel that downhole tool failures resulted in inappropriate or inefficient ship use.

Jarrard highlighted two aspects of current DMP responsibilities -- downhole measurement science and third-party tools -- asking the panel to carefully evaluate whether these roles could be retained in the new panel structure, in view of the necessary reductions in time and downhole measurements expertise. Both topics required very detailed discussions.

The panel discussed several possible ways of dealing with the anticipated increase in workload of SciMP, compared to DMP. In theory, much can be done with email, rather than having members focussing on ODP only twice per year. In practice, however, many panel members experience so many daily work demands that only the imminence of an ODP meeting forces their attention to ODP concerns.

Will SciMP be able to devote sufficient attention to downhole measurements planning for upcoming legs? Already, DMP cannot take the time to examine all proposals and communicate with proponents. Instead, DMP briefly reviews proposals in the out-year prospectus, with particular attention to two concerns: (1) technical feasibility of downhole measurement plans critical to leg objectives, and (2) specialty tool needs that would affect either ship time or the WLS-BRG budget. After PCOM selects legs from the prospectus programs, DMP is able to focus its deliberations, concentrating more on changes in readiness of special tools.

One option is for SciMP not to consider most proposals, but instead to flag only problem areas (e.g., high-temperature legs) for special attention. Generic white papers, such as one on high-T tools, were seen as a valuable broader approach for these special topics. Alternatively, SciMP or non-SciMP people with downhole-measurements expertise could be asked to provide mail reviews of downhole measurements options for individual legs, but attaining balanced and adequate responses for all legs might be challenging. Perhaps a superior approach would be to implement a formal flow of logging information to the proponents at some stage, earlier than the current BRG attendance at precruise meetings.

Now that DMP has established third-party guidelines, can their implementation be turned over to WLS-BRG and ODP-TAMU? The panel consensus was that continuation of third-party policies is essential. The current DMP procedure is to assign a watchdog for each third-party tool, assuring personal interaction with proponents and monitoring of tool-development progress. For SciMP to do the same, however, would mean a doubling or tripling of the number of tools per watchdog, as well as decreased likelihood of matching panelist expertise to each tool. Already, watchdogs are put in a particularly awkward situation whenever they feel obliged to say no concerning deployment of an individual's funded tool development, and that situation would be aggravated if the watchdogs were more susceptible to the criticism that they lack technical or scientific expertise on the tool. Another concern is the need to avoid any possibility of conflict of interest, whenever the WLS Operator is also a developer of tools using non-commingled funds. Perhaps both concerns can be dealt with by leaving routine implementation of third-party policies to the Operators, while assigning oversight of the overall process, and of potential conflicts of interest in particular, to SciMP.

Recognizing the problems implicit in expecting SciMP watchdogs and BRG to monitor third-party tool developments and enforce guidelines, Nelson suggested an alternative: assign the task to an individual (not necessarily one on SciMP), providing an honorarium of perhaps $10K. This procedure would give visibility to the task, avoid the risk that increased time pressures of the new system will mean decreased priority for third-party tools, and assure continued and relatively evenhanded activity on all tool developments. This individual would consult with other experts, possibly travel to some tool development sites, and report to a SciMP subcommittee. The proposal was endorsed by many panel members (although the mechanism for implementing such a system was unclear) as the method most likely to maximize shipboard performance of third-party tools. The cost of the honorarium is minor in comparison to the expected savings in ship time.

> *DMP Recommendation 96-2-1 to PCOM:* Realizing that downhole measurements problems cause inappropriate or inefficient ship use, DMP recommends that SciMP, the WLS contractor, and ODP-TAMU monitor and enforce third-party (non-commingled) tool guidelines. SciMP could use an individual on honorarium or a separate 1-day subcommittee meeting to accomplish this.

Specialty tool needs are not confined to third-party tools, and DMP members agreed that the new panel structure must deal with all specialty tools. Much of this task is inappropriate for SciMP as a whole; probably a subcommittee, in conjunction with email, would be more efficient.

Regardless of the details of mandate transfer, the panel felt that a reevaluation after about one year would be very useful, to identify what has worked well and what problem areas remain, and then to suggest further refinements.

4. ODP-TAMU REPORT

Adam Klaus summarized ODP-TAMU downhole measurements for recent legs. He noted in particular the very large number of temperature measurements made on Legs 166, 167, and 168. On Leg 168, the new Davis-Villinger temperature tool was used extensively and successfully [Spring 1996 DMP had endorsed its use for Leg 169], four packer runs were undertaken, and four CORKs were emplaced; planned logging, however, was severely cut to accommodate these and other activities.

Leg 169, underway now, encountered more high temperatures than had been anticipated. The T/P memory tool [recommended by Fall 1993 DMP as the top priority for addition to ODP high-T capabilities] failed, as did the Los Alamos fluid sampler [not recommended by DMP for further use, after its failures on Leg 139]. The BRGM temperature tool was also unsuccessful: it set down on a bridge and kinked the cable. CORK deployments were aimed in part to remedy previous failures and leaks in previous CORKs. Lysne was concerned that this program had not received more DMP attention, despite its high temperatures. The Fisseler water sampler is on board for the first time since the Spring 1996 DMP recommendation to test it further, but it has not been used yet because of the high temperatures.

Concerning ODP-TAMU downhole-measurement plans for upcoming legs, Klaus highlighted Leg 174B, a return to Hole 395A with newer downhole technologies such as a CORK, FMS, array sonic, and other logging tools.

Klaus also provided an update on tool developments for the WSTP, Adara, pressure-core barrel, and Davis-Villinger tools. A European proposal seeks funding for combining MDCB and PCS techniques, aimed at improving core recovery in hard formations. A second Davis-Villinger tool has been built and calibrated, the original is on board for Legs 169 and 170, and the tool's developers are willing to turn the tool over to ODP.

Klaus concluded by briefly commenting on some relevant but non-measurement topics: recent changes in publication policy, status of the ODP diamond coring system, plans for drydock, the possibility of an industry consortium on riserless drilling, a new core repository being built at TAMU, status of JANUS, and ODP-TAMU personnel changes.

5. WIRELINE LOGGING SERVICES REPORT

A) Results and Implications of Recent Logging Operations

Carlos Pirmez began his WLS report with recent logging operations. Leg 166 had three innovations:

(1) the first ODP use of the Integrated Porosity Logging Tool (IPLT), an improved neutron porosity logging tool. Unlike the older neutron tool, which usually overestimated porosity because of unknown standoff (separation between borehole wall and the tool), the IPLT uses a centralizer and provides a standoff estimate. Pirmez reported that IPLT porosities for Leg 166 agreed excellently with density porosities, and Jarrard asked him to provide SciMP with an update on the tool's accuracy in other types of sediments.

(2) the well seismic tool (WST) was used for check shots at every site, a substantial increase over WST use on other legs. The check-shot surveys gave transit times 5% slower than the sonic logs.

(3) the first use of satellite ship/shore data exchange permitted processed data to be returned to the ship within a couple of days. Whether this real-time processing will become routine is still being evaluated. Pirmez reported that geochemical data could be processed during a leg either at Leicester or at BRG, but this was not done during Leg 166.

> *DMP consensus:* The recent replacement of the CNT-G neutron tool with the IPLT appears to substantially improve the reliability of porosity determination, and DMP looks forward to further tests of IPLT accuracy.

> *DMP consensus:* DMP is encouraged by the initial results of BRG trials of satellite ship-to-shore communications: both logging operations and the shipboard usefulness of logs were enhanced.

Leg 167 combined, for the first time, FMS and sonic tools on the same string. Although logging speed is reduced, compared to FMS alone, data quality is expected to improve because both tools work best when centralized. The companion change in tool combinations, the triple combo, could not be tried on Leg 167 because the HLDS density tool was not through-wired. Nine sites were logged on this leg, and BRG logger Peter DeMenocal used the Core-Log Integration Package for extensive splicing of core records and then comparison to log data.

Leg 168 had only one log (as reported above), near the end of the leg. Leg 169 had an FMS failure, caused by logging at higher temperatures than the specified tool limit.

Pirmez briefly showed examples of log-based scientific results from some of these legs.

B) Upcoming Operations

Pirmez then summarized downhole measurement plans for upcoming legs. Leg 170 will use logging-while-drilling (LWD), and it may include the second ODP use of the BRG shear sonic tool. Leg 171A is almost entirely an LWD leg, but standard sonic logging is planned for one hole, because the LWD suite does not include sonic logging. Legs 171B and 172 will use standard logging. BRG is proposing that Leg 173 be the first leg to use the software package DIAMAGE for comparison of FMS images with circumferential core images. This technique has the potential of orienting core. However, acquisition of a core scanner and planned incorporation of its use into core-handling flow are just beginning. Leg 174A planning is also in flux; the leg may include LWD.

C) Logging Database

The meeting then relocated temporarily to a Sun computer classroom, for a demonstration by Pirmez of the recent rapid progress for the WLS database and data distribution. Pirmez showed how to use internet to access the BRG web page, find out what log data exist for regions or legs, browse data files, and obtain data (either by saving data files to one's local computer or by submitting an on-line data request). He also gave brief previews of some future options that are being developed. DMP members and liaisons then spent a few minutes individually connected to the BRG web site and trying the various options themselves.

After returning to the meeting room, DMP was shown viewgraphs of future enhancements to the BRG web site, including geographic selection of data and on-line plots and crossplots for browsing data prior to importing them. A spreadsheet for estimating logging times is also available on the web.

Pirmez provided updates on other database developments. Colleen Barton of Stanford has been hired to provide part of her Macintosh-based borehole-televiewer software to WLS. BRG expects to put borehole-televiewer data onto CD-ROM. All WST data have been translated to SEG-Y format, and this translation will be done on-board in the future. For shipboard data, BRG has developed loaders for transforming log data into Oracle format for addition to the shipboard database, and BRG is working on establishing a routine procedure for handling processed data sent to the ship from shore. For the web site, additional data-search paths are being added, and data migration to the web is proceeding at the target pace. The current plan is for the BRG web site to have and maintain all logging data, with a duplicate copy kept on the JANUS site at TAMU [this plan contrasts with the Spring 1996 DMP recommendation that complete mirror databases, not just mirror logging databases, be kept at both sites]. The Bremen core repository will have a complete mirror database, permitting more rapid data access by European scientists than would be possible if the only complete database were at TAMU.

Jarrard asked whether BRG is still fully committed to the current three-node organization (BRG-LDEO, Leicester, and Marseille). Pirmez responded "yes"; Leicester now does less geochemical processing but more data migration, and they were involved in the Leg 166 trial of real-time processing. Jarrard commented that BRG had proved the feasibility of real-time processing, but he asked whether it was likely to become the usual mode, given the huge variations in quantity of logging from leg to leg. Pirmez answered that this processing was able to keep up with data inflow during Leg 168 when nine sites were logged, and the tentative plan for the future is to do real-time processing as much as possible, but data cannot be transmitted in some geographic regions. Pirmez was asked whether an audit trail is kept for processing, in case a user has a question about possible log problems; Pirmez confirmed that this is standard.

DMP consensus: DMP applauds the BRG initiatives in on-line browsing and access to logging data. Coupled with the current program of rapidly adding older data to the database, this initiative is a significant step toward the long-standing DMP goal of making ODP downhole measurements a truly effective legacy.

Pirmez concluded by reporting that WLS is considering reorganizing, in response to the change to project management.

6. RELIABILITY OF ODP LOGS

A) Log Replicability Tests

Jurgen Wohlenberg reported the results of a survey of ODP log reliability that he and his students had undertaken. They examined replicability by comparing repeat logs from the same instrument on different legs or from different instruments on the same leg. This procedure meant that most comparisons were for data from Hole 504B, which has been repeatedly logged throughout ODP.

Hole 504B dual laterologs from Legs 111 and 148 showed excellent agreement. Sonic velocities based on the BRG multichannel-sonic tool (Leg 111) and Schlumberger digital sonic tool (SDT) agreed surprisingly well, except for the expected lower vertical resolution of the former. In contrast, gamma-ray logs from Legs 111, 140, and 148 were often poorly correlated, and this discrepancy was particularly large for estimated concentrations of K, Th, and U. DMP members felt that this difference was partly due to differences in processing (particularly smoothing), and Wohlenberg and DMP agreed that 504B provides a worst-case example of gamma-ray replicability because counts are extremely low at this site. On Leg 148, both BGR and Schlumberger (GPIT) magnetometers were run in 504B, giving a good character correlation but a 2000 gamma offset for the GPIT. Dubuisson noted that this GPIT offset had previously been observed at other sites. Hole 504B geochemical logs obtained on Legs 111 and 140 showed virtually no correlation, with the more recent log showing much less geochemical variation than the huge geochemical swings implied by the earlier log. This difference is attributed to the improvement in geochemical log quality that resulted from adding a boron sleeve to the geochemical tool several years ago.

Some comparisons from other sites confirmed the patterns seen at Hole 504B. Basalt logging at 896A showed poor replicability for gamma-ray logs; like 504B, this site had extremely low gamma-ray counts. At all sites, replicate logging of approximately a 50-m interval is standard procedure, and replicate logs for Site 952 sediments showed generally very good agreement. An exception was neutron porosity; the low quality of neutron-porosity logs was the driving force behind the recent change to a more accurate neutron-porosity tool, the IPLT. Wohlenberg also showed comparisons of porosities calculated from different types of tools (sonic, neutron, density, and resistivity) for basement Holes 504B and 735B. In general, log character was similar but amplitudes and average values differed between tools, probably because of differences in the transforms from log response to porosity.

Lysne suggested that Wohlenberg publish these reliability results. Nelson added that publishing the porosity transforms could be lower priority than publishing the repeatability tests, as the transform methods are interpretations for which much has been published. Moos commented that log repeatability appears to be less of an issue than DMP had thought. An SPWLA special topics meeting next year will focus on log quality.

Wohlenberg provided an update concerning his proposal to provide a real-time litholog (electrofacies log) to shipboard scientific parties. The previous DMP meeting had recommended that he contact cochiefs for upcoming legs and ask whether he could provide the litholog as a shorebased investigator. Cochiefs for the upcoming Iberia leg responded with the suggestion that he first apply the technique to previous Iberia logs. Wohlenberg did so, although that analysis was challenging because of the combination of low core recovery and few logs. His analysis appears to have distinguished brecciated from unbrecciated serpentinite at Site 899, and he identified fining-upward sequences of turbidites at Site 900.

B) Reliability of Sonic Tools

The previous DMP meeting had expressed concern that the Schlumberger long-spaced sonic (LSS), the tool used for nearly all prior ODP sonic logging, was not reliable enough for routine ODP use. Pirmez began this agenda item by reporting that the LSS is now used on the ship only as a backup. The primary sonic tool is now the digital sonic tool (SDT), which has one source plus eight receivers at half-foot spacing, in contrast to the two sources and two receivers used by the LSS. Arthur Cheng reviewed the advantages of the SDT over the LSS: the SDT provides higher resolution (half foot vs. two feet), longer spacing, and twice as many measurements. Cheng suggested, and the panel agreed, that the SDT is fine for routine sonic logging. The SDT cannot determine compressional velocity when that velocity is almost as slow as fluid velocity, but its wider spacing means that it does better than the LSS.

Pirmez reported that the SDT has a wide selection of possible data-acquisition modes. Schlumberger claims that the tool can also determine shear and Stoneley velocities, but measuring these is inherently difficult for the slow velocities of most ODP sediments. Cheng commented that the Schlumberger Dipole Shear Imager (DSI) is better at determining shear velocity, but the reliability of all shear-velocity estimates decreases with slower velocities and becomes difficult to judge.

At DMP request, Pirmez had investigated the cost implications of making the DSI available on the ship. Having a DSI plus SDT backup would cost an extra $137K/year, and having a DSI plus LSS backup would cost an extra $81K/year. The DSI can be used for more than just compressional and shear velocities; it is designed to permit determination of horizontal anisotropy by using shear-wave splitting. Moos reported that many sonic specialists have concluded that the DSI capabilities have been oversold.

Cheng recommended that the DSI or its equivalent should be a specialty tool that is available for legs on which it is specifically needed. Cheng suggested that the panel should consider how to handle funding of this tool. He commented that it is difficult to request: in theory, BRG can budget it if lead time is long enough, or individual scientists can seek USSSP or other funding for BRG. Its cost for a single leg was not known.

Pirmez announced that David Goldberg proposes an alternative method, instead of the DSI, for determining anisotropy: the Schlumberger azimuthal resistivity tool. This tool has 12 electrodes around its circumference, using the laterolog method of resistivity measurement. It sees much deeper into the formation than does the FMS and is less sensitive to hole washouts than the FMS. It is combinable with most tools. DMP was intrigued with this possibility but was unwilling to endorse the proposal without any knowledge of its costs.

DMP consensus: BRG has satisfied the need for improved sonic-log quality by changing from the long-spaced sonic to the SDT (sonic digital tool).

7. SPECIALTY TOOL DEVELOPMENTS

A) Vertical Seismic Profiles

Watchdog Andy Green led a discussion of VSP tool options, beginning with an update of Leg 164 VSP discussions held at the last DMP meeting. Leg 164 used the WHOI VSP tool at three sites and found major velocity reductions at the bottom-simulating reflector, establishing presence of free gas. Technical difficulties included cable twists, clamping problems, a failure of the clamping arm to close, electrical problems due to ambient noise on the ship, and tool resonance problems. No tool electrical failures occurred, clamping problems were caused by enlarged hole rather than any tool deficiency, and cable twists are not unusual when using the side entry sub. The abundance of problems led to very slow operations, so these VSPs were quite expensive from the standpoint of ship time. Two oblique seismic experiments, or walkaway VSPs, were also undertaken, but Green had not seen their results.

Green reported that Ralph Stephen has proposed a VSP for Leg 176 (SW Indian Ridge). Jarrard added that JOI has asked DMP to make recommendations concerning the scientific usefulness of a SWIR VSP and particularly what VSP tool should be used on this leg. At present, petrologic and seismic refraction evidences disagree on how deep Moho is at this site; VSP can look ahead of the bit, seeing deeper reflectors. An offset seismic experiment would be needed, however, to measure interval velocities below the bottom of the hole. Previous studies have shown that SWIR Site 735 provides a good opportunity to compare different-frequency (VSP, log, and core-plug) measurements of both attenuation and P-wave velocity. Green noted that Stephen is investigating availability of a second ship, because an oblique seismic experiment could examine lateral heterogeneity.

DMP consensus: DMP strongly endorses the proposal for a 3-component VSP at Hole 735B. DMP also endorses the concept of an oblique seismic experiment at this site.

To lead discussions of tool options, Green showed a transparency listing various available VSP tools. Some of these could be eliminated for Leg 176: (a) the Schlumberger WST could be used but is only 1-component, whereas a 3-component tool would be superior; (b) the Schlumberger array tool, which worked excellently on Leg 156, requires casing for clamping and is therefore inappropriate for Site 735; (c) several tools would require an engineer to run them and therefore pose both financial and staffing problems; and (d) some tools are too large to fit down the pipe, necessitating the time-consuming and expensive use of TOPHAT (a method of dangling the tool below the base of pipe during reentry) in ODP.

Subsequent panel discussions concentrated on the need to select between two tools -- the WHOI and Prakla-Seismos (Schlumberger) 3-component tools. Two advantages of the P-S tool are that it is digital (the WHOI tool is analog) and it has a much higher reliability record. Two advantages of the WHOI tool are that its responses are better known than P-S tool responses and it has a complete backup. The P-S tool, in contrast, would be backed up only by the 1-component WST tool, and use of this WST could reduce VSP scientific results slightly and oblique seismic experiment (if any) results substantially. The WHOI tool usually is run by a WHOI engineer but would be run by scientist Stephen on this leg. The P-S tool would be run by the Schlumberger engineer.

Pirmez reported that the BRG now has a Schlumberger crossover head, which would require minor modification of the WHOI tool and solve the Leg 164 VSP tool-connection problems. A swivel is also available and reported to be reliable. Stephen prefers to use a hydrophone to obtain a far-field source signature; this previously was a problem when the WST was used on the Schlumberger CYBER data-acquisition unit, but it was not a problem using MAXIS on Leg 156.

Costs of the two options were considered, but DMP did not judge them to be the decisive factor. The P-S tool would be funded out of the BRG-WLS FY98 special-tools budget, whereas the WHOI tool would be funded by the US Science Support Program. Pirmez reported that the P-S tool would cost $32K/leg; total costs for using the WHOI tool were not available but are usually similar to or more expensive than this. Pirmez added that two WST tools are already on the ship, and their cost is $15K/leg for those legs on which one is used. DMP concluded that, all other factors being equal, using commingled funds for VSPs is more appropriate than funding them from USSSP, because benefits accrue to the entire scientific program rather than to an individual scientist, and leg planning is less dependent on whether the VSP scientist owns a VSP tool.

Additional funding options were also considered. For example, Stephen had suggested the possibility of funding non-Schlumberger VSPs such as the WHOI tool through commingled funds by having BRG-WLS subcontract to WHOI. More generally, a Center of Excellence for VSPs could be supported by commingled funds. Moore reminded the panel that this idea had been considered earlier in ODP, but there may not be enough VSPs to support such a facility. Moos said that long-standing ODP policy has been to look first to the logging contractor to provide a needed tool.

DMP was less concerned with the direct VSP costs (e.g., tool plus personnel) than with the possible costs in ship time and lost science of tool breakdowns. The SWIR VSP discussions concluded with the following motion by Lysne, seconded by Green:

DMP Recommendation 96-2-2 to PCOM: A Schlumberger 3-component VSP tool for Hole 735B should be funded by the BRG-WLS budget for FY98. [motion passed with 12 yes, 0 opposed, 1 abstain]

DMP recognized that this motion set a precedent concerning future VSP deployments at other locations. However, the panel chose not to recommend a broader VSP policy, in order to permit maximum flexibility for bidders on the Phase III WLS contract to address the VSP issue. At its previous meeting, DMP had recommended that the WLS RFP include operation of specialty tools, and DMP included VSPs among those specialty tools that could be -- but were not required to be -- provided.

B) BRG Shear Sonic Tool

This new tool has been used only once in ODP, on Leg 164, and the previous DMP meeting had asked Goldberg and Cheng to report back on the results of the Leg 164 trial. Watchdog Cheng led discussion of this tool. The BRG tool provided estimates of Leg 164 compressional velocity that agreed fairly well with those of the Schlumberger sonic tool. Cheng stated that shear velocities were so slow in the Leg 164 sediments that determining them would be a challenge for any shear tool. The tool's estimated shear velocities were 600-700 m/s, but Moos and Cheng said that these results cannot be evaluated without seeing waveforms. Watchdog Cheng had not seen these waveforms, except in the form of a briefly displayed transparency at the previous DMP, but he will do so. The tool had been used on Leg 164 in the hope that it could detect the effects of gas hydrates on Vp/Vs, but apparently the hydrate concentrations were too low to affect Vp/Vs significantly.

Cheng reported that the tool's development progress was generally in accord with DMP guidelines. It was tested last month at the BRG test site, and software is being improved. The development plan has been completed, so the tool is now a development tool, awaiting demonstrated ODP success before moving to the next step of ODP certification.

The cochiefs for Leg 170 have requested this tool. Cheng recommended that the tool be given another chance, in a formation with higher velocities, and panelists expressed the hope that the cementation known to be present in Costa Rica may provide these needed higher velocities. Moos commented that ideally this tool's performance should be compared to a tool known to work, in an environment similar to ODP. A DSI for Leg 170 is neither funded nor planned, but at least one hole is scheduled to have the full standard Schlumberger suite.

> *DMP consensus:* The Leg 164 deployment of the BRG shear-sonic tool obtained reasonably accurate P-wave velocities. The logged formations were too slow, however, to provide an adequate test of this tool's S-wave capabilities. DMP looks forward to seeing the tool deployed in higher-velocity sediments (such as on Leg 170), as a critical step toward eventual third party certification.

C) Davis-Villinger Tool

Watchdog Makoto Yamano said that he had examined both initial documentation and a recent report of tool performance. He concluded that the tool is apparently robust and reliable, and that it imparts minimum temperature disturbance to the formation. He judged that the tool's performance on Leg 168 constituted a very good and successful ODP test. Klaus noted that the appropriate next stage for the tool would be for TAMU and the proponents together to compare it with other tools, evaluate maintenance, and consider changes from a prototype to a routinely operational version. Lysne commented that this tool can serve as a flagship for the role of third-party tools within the new project management structure.

> *DMP consensus:* The performance of the Davis-Villinger temperature tool in abundant Leg 168 runs satisfies the third-party tool requirement for a successful ODP test. DMP commends the developers and encourages them to initiate steps to apply for certified status for this tool.

D) BRG Gamma-ray Tool

Pirmez announced that the official start of funding for this tool was in May of 1996, and that design is currently underway. Initial plans for a total gamma-ray tool have been changed to a spectral gamma-ray tool. The tool will use a NaI crystal, have ratings of 90°C and 100G, and be about 10' long. The designers hope that the tool can be attached to the Schlumberger string, via a new telemetry module that will also be usable with other tools. Plans are for bench tests in March and July 1997 and initial deployment in 1998.

E) LOI 72 Proposal for Leg 174B

Jarrard stated that PCOM wants DMP to comment on LOI 72 concerning LWD tests at MARK.

Pirmez summarized LWD plans for upcoming Leg 174B. BRG is proposing to test resistivity-at-bit and sonic LWD tools in a 150-200 m hole in the difficult-drilling environment at MARK. The proposal, which calls for 4-5 days of drilling at an estimated total cost (excluding ship time) of $300K, is driven by the desire to overcome the very low logging rate for near-ridge environments. DMP, which is accustomed to seeing Schlumberger surpass third-party guidelines, was uncomfortable with depending on a sonic tool which is "planned to be released by the end of 1996" (according to the proposal) and was cautious about recommending equipment on the basis of two introductory SPWLA papers.

Klaus stated that the present schedule is for this LWD to be a backup if hammer-drill casing is not available for Leg 174B. Pirmez added that the $300K commitment could be made as late as three months before the leg, if hammer-drill is cancelled by that point.

Several panel questions did not have ready answers. Pirmez did not know whether insurance of LWD was available. Near-ridge drilling has had a high casualty rate for drill strings, but Moos noted that MARK is away from the ridge and that its serpentinized rocks appear to be a much easier drilling environment than TAG and zero-aged crust. The planning appears to call for bare-rock spud-in rather than use of a guidebase, because a guidebase would be expensive and much more time-consuming than the planned 4-5 day total. Is a guidebase needed, or can one spud in? Regardless, in this type of environment one must be prepared for the risk that the time and LWD expense will be lost because of inability to obtain a hole. Panelists also wondered whether a resistivity tool designed for medium-to-high resistivities is compatible with the low resistivities expected at MARK.

In spite of these reservations, DMP recognized the opportunity to do science on an engineering leg, the high scientific value of determining fracture patterns and their orientations, and the likelihood that the resistivity tool would be able to detect open fractures.

> *DMP Recommendation 96-2-3 to PCOM:* DMP recommends that PCOM move forward with the LOI 72 proposal for Leg 174B, to be used if hammer-drill is not available, contingent on favorable answers to questions of insurance, sufficient resistivity contrast, sonic reliability, and ability to start a hole and achieve a 4-5 day time frame. These types of LWD measurement will be needed within the near future of ODP. Although DMP has insufficient information to recommend these measurements for Leg 174B, there is probably time to answer the questions before the decision deadline.

Moos was assigned watchdog responsibilities for these issues, with the hope that he can pass answers to PCOM liaison Moore prior to December PCOM.

F) DCS/LWD Engineering Leg in FY98

PCOM had asked all panels for comments on a DCS/LWD engineering leg in FY98. Jarrard had assigned Dan Arnold, David Herrick, and Peter Lysne to watchdog this FY98 proposal.

Lysne reviewed the background for this proposal. The preferred site is Site 735, a much easier drilling environment than previous DCS tests. Watchdogs endorsed the general concept of testing DCS in a known, benign environment. They were, however, uncomfortable with being asked to accept assertions about the expected capabilities and strengths of planned developments (e.g., the controller), without detailed documentation. It was not clear, however, that DMP is asked to comment on both DCS and LWD tests. Concerning the DCS portion, the panel concluded:

> *DMP consensus:* DMP endorses the concept of running the next shipboard DCS engineering test in a known, benign environment. DCS development will be of intense interest to the SciMP, but DMP lacks the information needed to evaluate the specifics of proposed DCS use on a DCS/LWD engineering leg.

The LWD portion of this proposal is currently just LOI 72, so DMP did not elaborate on their LOI 72 recommendation above. The ability to run borehole televiewer, FMS, and standard sonic tools in the excellent hole conditions at Site 735 indicates that an LWD test here will have minimal direct scientific value. Nor will the test determine ability to collect LWD in unstable hard-rock environments. The test would provide a valuable comparison to standard logging results, if such a comparison is not already available from non-ODP wells.

8. PANEL REORGANIZATION AND MANDATE (PART 2)

Having had more than a day to think about the tentative conclusions and outstanding issues of initial DMP discussions on panel reorganization and mandates, DMP returned to these topics Wednesday morning. Jarrard handed out a draft of tentative conclusions on this subject based on the first day's deliberations.

A) Increased Responsibilities for Proponents

Moos began by providing a summary from the subcommittee charged with suggesting changes to the proposal site summary form, to expand considerations of downhole measurements. He showed a transparency of the subcommittee's recommended additions: a table listing program objectives and what downhole measurements are proposed to contribute to those objectives, and several brief questions. The panel discussed this form, strongly agreeing with its overall framework and suggesting only minor modifications. Proponents would be given the opportunity to say that a specific standard tool is not needed, not merely to say which tools beyond standard ones should be added.

Several methods of minimizing the burden on proponents were considered; the most popular was putting examples of thematically filled-out forms on the BRG web pages or in the packets mailed to proponents. Panel members debated the wisdom of requiring proponents to contact BRG, or asking whether the proponent had contacted BRG. DMP concluded, however, that neither was necessary, because a few proponents already have extensive logging experience and others know people with such experience.

Panel members agreed that downhole measurement issues should be addressed by proponents early in the proposal process, and that proposals should not be judged as mature unless these issues have been addressed on the site summary form. Romine summarized the benefits of shifting more of this responsibility to the proponents:

To the proponents: As the proponents become better informed about downhole measurements, they will develop a broader understanding of how these measurements can help them to achieve their program objectives. In addition, early consideration of these subjects avoids surprises at the pre-cruise meeting and gives co-chiefs more flexibility in designing the optimal drilling program to accomplish scientific objectives within the given time frame.

To the WLS Operator: Putting the onus on the proponents to contact BRG early will give BRG more lead time for planning and preparation for each cruise, particularly where there are special requirements, environmental issues, or third-party developments to assess.

To the new SciMP: As the DMP scientific and technical representation will decrease by half on the new SciMP, it is essential to find ways to streamline the evaluation of proposal needs for downhole measurements for future ODP legs. By requiring earlier and more "proactive" input by the proponents, the evaluation of mature proposals will be a simpler and more efficient process.

To SCICOM: Evaluation of the scientific merits of proposed downhole measurements will be easier, because the proponents will already have evaluated and justified their needs.

The following motion was made by Moos and seconded by Romine:

DMP Recommendation 96-2-4 to PCOM: Recognizing that SciMP cannot duplicate the DMP depth of analysis of downhole measurement programs for upcoming legs, DMP recommends that some of the traditional DMP responsibility be shifted to proponents. To improve efficiency of early considerations of downhole measurements, DMP proposes that the wording of the site summary form be slightly changed to add considerations of downhole measurements, as shown in Appendix 1. DMP further recommends that SSEPs judge a proposal as immature if it neglects to respond to these new sections of the form. [motion passed 13 yes, 0 opposed]

B) Scope and Panel Location for Technical Responsibilities

Dubuisson made the following motion, seconded by Romine:

DMP Recommendation 96-2-5 to PCOM: To assure that drilling innovations are considered in the context of downhole measurements, and vice versa, TEDCOM & SciMP need increased liaison and similar reporting paths (to both SCICOM and OPCOM). Inclusion of both scientific and technical expertise on SciMP is absolutely essential, because technological choices are inadequate unless they are made in the context of scientific and financial considerations. [motion passed 11 yes, 0 opposed, 2 abstain]

C) Increased Responsibilities for Groups other than SciMP

Nelson began by suggesting that the panel needed a more cohesive approach to its recommendations on reorganization than the many individual recommendations of Jarrard's draft. He said that DMP needed to be clearer that offloading some tasks is essential, but listing too many specific proposals could dilute PCOM attention to individual ones. Recognizing that SciMP cannot take on all previous DMP responsibilities, he proposed that special groups be assigned for the following four responsibilities: (1) an individual on honorarium for monitoring third-party tools, (2) a working group for VSPs, (3) a working group (if needed) for transition of WLS into Phase III, and (4) a working group on log quality. Subsequent panel discussions further separated third-party tools from potential working groups:

DMP Recommendation 96-2-6 to PCOM: The DMP recognizes that not all of its current functions can be subsumed into a new SciMP. Therefore, it recommends that some of its current responsibilities be moved to special groups:

(a) The procedures for the evolution of third-party tools have been codified and tested. DMP recommends that the primary responsibility for monitoring third-party tools now be assigned to an individual, whose necessary expenses are reimbursed by JOI and who reports to SciMP.

(b) DMP recognizes the need for temporary working groups, with resulting white papers, to address issues that would previously have been considered by DMP, but are beyond the likely scope of SciMP expertise and time availability. We recommend that the following two downhole measurement topics be considered for 1997 working groups: (1) vertical seismic profiles, and (2) log quality.

Both log quality and VSPs are issues that cannot be adequately addressed in a single DMP or SciMP meeting and that are best discussed by a wider group of experienced people than is available within a panel. More detailed consideration of both topics offers the promise that ODP will obtain better, more useful data with less investment of ship time.The panel agreed that both log quality and VSP needs and technology will continue to evolve and to require ODP time and expertise in upcoming years.

The rationale for assigning third-party tool monitoring to an individual, as discussed earlier in the meeting, includes standardizing record keeping, making tool evaluations more even-handed, and assuring continued communications with tool developers. TAMU and BRG are partners in this effort, but -- as in the past -- cannot be expected to bear the main responsibility because of their budget limitations. The panel consensus was that attention by both this individual and a subcommittee of SciMP is needed to emphasize the importance of continuing the quest for third-party innovation without undue loss of ship time. [Two DMP members who have retired have expressed a willingness to take on this responsibility if their expenses (phone, etc., but not labor) are covered.]

D) SciMP Mandate and Organization

The panel reexamined Jarrard's 30 September draft revision of the proposed mandate for SciMP, and members suggested further changes. In drafting the proposed mandate, DMP attempted to respond to both downhole and shipboard measurement needs of ODP. Panel members recognized that they were omitting topics currently covered by IHP, because of insufficient time and DMP expertise on those subjects, and DMP expected that the upcoming DMP/SMP/IHP subcommittee meeting would add IHP-related items to the SciMP mandate.

DMP Recommendation 96-2-7 to PCOM:

Proposed partial mandate for the Scientific Measurements Panel:

- investigate and evaluate new measurement technologies, analysis techniques, and third-party equipment developments, and recommend future measurement directions;
- identify ways in which existing ODP measurement capabilities and core-log-integration can be refined to increase scientific benefits; and
- advise on the scientific relevance and technical feasibility of proposal measurement plans.

Proposed liaisons for SciMP:

- from WLS, ODP-TAMU, JOI, TEDCOM, and OPCOM to SciMP;
- from SciMP to TEDCOM, OPCOM, and SCICOM.

This proposed mandate is generally similar to that suggested by the EXCOM/PCOM subcommittee, but - like the DMP/SMP/IHP Chairs' letter to PCOM - it emphasizes that purchases of new technology are merely one of the available paths to measurement-based innovation within ODP. Despite prolonged discussion, DMP could identify no current DMP role that can be reduced or abandoned.

DMP strongly endorsed abundant use of subcommittees by SciMP. Subcommittees are an essential path to coping with the increased workload; they also avoid wasting the time of panel members who do not share an enthusiasm for a particular subcommittee topic. DMP thought that the use of subcommittees during the joint DMP/OD-21 meeting (Spring 1996) had been very efficient: that meeting had included two periods of three concurrent subcommittee meetings, with different memberships and topics for each period. DMP assumed that each subcommittee would do most of its work during the regular SciMP meeting, perhaps supplemented by email deliberations between meetings.

Jarrard commented that the time frame for staffing SciMP was short, and it could be useful for PCOM to know which members of DMP, IHP, and SMP might be interested in the possibility of serving on SciMP. He passed around a sheet for members to specify whether or not they might be willing to serve; no commitment by either PCOM or members was implied.

9. LOGGING PLANS FOR FY98 PROSPECTUS

Pirmez led an examination of logging plans for all programs in the FY98 prospectus. For each program, he first provided a synopsis of drilling plans and objectives, then followed by presenting BRG recommendations for the logging plan. Each program had a DMP watchdog, who was asked to comment on the BRG recommendations and provide additional insights into appropriate logging plans. The panel as a whole was then asked to comment.

Pirmez incorporated the DMP conclusions into a revised logging plan for each program, so it is not necessary for these minutes to mention the details of initial and revised plans for every program. Three broader concerns should be noted, however: dependence of leg objectives on unproved (e.g., DCS) or expensive (LWD) downhole technology, lack of BRG consideration of TAMU downhole measurements, and use of the array resistivity tool.

Of all the programs in the FY98 prospectus, only the DCS/LWD engineering leg -- as discussed above -- clearly poses the problem of being dependent on downhole technology that is still being tested. The panel noted that LAST is proposed for Nankai, and DMP felt strongly that LAST should not be considered for this leg because it is unreliable and its developer had ignored third-party tool guidelines. LAST is not essential to the Nankai objectives, however, and it can be omitted without significantly affecting the leg's viability.

BRG, a strong advocate of greatly increased use of LWD, recommended LWD for every leg where hole stability problems are likely. This approach should not be confused with the more conservative one of using LWD only for programs in which it is essential for scientific success of the leg. DMP regrets that neither its watchdogs nor BRG distinguished between these two, although the distinction would be valuable for PCOM deliberations concerning which programs to schedule.

Unlike many previous BRG projections of downhole measurements for out-year legs, this one neglected non-BRG tools such as those provided by TAMU. DMP understood this reluctance to recommend non-BRG downhole measurements, but the panel thought that the most efficient means of initially evaluating prospectus downhole measurements would be for BRG to consider all available downhole measurements.

BRG recommended use of the array resistivity tool in a variety of sites. DMP was enthusiastic about the basic concept of seeing the array resistivity tool used in appropriate sites, and the panel looks forward to seeing results of a first ODP trial. DMP was unwilling to recommend multiple deployments of the tool, however, without seeing the financial implications of those deployments for other parts of WLS and ODP.

10. WRAPUP

A) DMP Consensus Items and Recommendations to PCOM

At the start of 2 October, Jarrard had distributed his interpretations of what the panel had agreed to during the first two days of the meeting. This agenda item permitted panel members to make corrections and potentially to change "consensus" to "majority view". Corrections were few but significant. Consensus items and recommendations above and in the executive summary reflect these changes.

B) Adjournment

Panel members thanked their host, and the formal proceedings of the JOIDES Downhole Measurements Panel were concluded at 1:06 PM on Wednesday, 2 October 1996.

SCIENTIFIC OBJECTIVE	MEASUREMENT**	TOOL**	R*
Seismic time-depth tie	VSP (vertical seismic profile)	WST (well-seismic tool)	E
NOTE: Sites with > 400m penetration or significant basement penetration require these measurements and logs:	gamma, neutron density, resistivity, sonic, formation microscanner, magnetic inclination	Triple combo, FMS/sonic	

R* = relevance to your objective: Essential, Useful, No Impact

Y **N**

__ __ Have you determined logging duration?** _______ hours

__ __ Are there any special requirements to optimize downhole measurements data recovery (e.g. run wellbore imaging devices before VSP to prevent damage to the wellbore during the VSP run from degrading the image)? (If yes, attach sheet explaining)

__ __ Are you aware of any environmental problems associated with site (e.g. high temperatures)? (If yes, attach sheet explaining)

**For further information contact the Borehole Research Group:

URL: http://www.ldeo.columbia.edu/BRG/brg_home.html
Email: borehole@ldeo.columbia.edu
Ph/Fax: (914) 365-8674 / (914) 365-3182

SCIENTIFIC OBJECTIVE	MEASUREMENT**	TOOL**	R*
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Final IHP Meeting - September 11-13, 1996
Kiel, Germany

MINUTES

Attending:
IHP Members:

Yoshiaka Aita, Warner Bruckmann (Host), Patrick Diver, Patricia Fryer (Chair), Graham Glenn, Brian Huber, Michael Loughridge, Chris MacLeod, Gilbert Maudire, Carla Moore, Henry Spall, Lynn Watney, Roy Wilkens

IHP Liaisons:

William Sager (PCOM), Lucy Edwards (SMP), Ann Klaus (ODP Pubs), Russ Merrill (ODP CS), Mary Reagan (BRG), Steve Hurst (TECP), William Hay (SGPP)

Day 1 - Wednesday, Sept. 11, 1996

Introductions: The panel members introduced themselves and stated their affiliations.

Announcements: Transportation arrangements for getting to GEOMAR were reviewed. The ferry schedule was provided.

The minutes of the last IHP meeting were approved.

Action items: A discussion of disposition of a matter involving a breach of publications policy and potential misconduct on the part of a former shipboard scientist was conducted and an update on related matters was presented by Fryer. A group was requested to review these materials and to draft recommendations to be forwarded to PCOM for full panel review on Thursday.

The panel also charged a small subcommittee to review the files of potential non-performers and to report to the panel on Thursday.

Report of the Paleo/Strat Subcommittee meeting was presented (see Appendix 1).

The report highlighted the activities of this standing subcommittee of IHP, which encompass, but are not limited to the following:

* Recommendations regarding policy on the long-term access to prime biostratigraphic data,
  Acquisition and integration of DSDP/ODP data
  Maintenance of data
  Migration of data
* Review of standards in biostratigraphy and making recommendations regarding the preservation of data,
  - data capture
  - Monitor and further development of the JANUS data model
  - Promote standardization of biostratigraphic database to ensure usability throughout the scientific community (including fields other than biostratigraphy)
  - Help define data extraction capabilities from the database
*Making recommendations regarding oversight of age models and their use (ensuring that the necessary tools are available on the ship)
* Making recommendations as to ways to maintain quality and standards for presentation of biostratigraphic data in publications
*Establishing and maintaining alliances with other taxonomic/stratigraphic efforts
  taxonomic databases (e.g., IUBS/TDWG)
  foster development of taxonomic catalogs

develop links with other related scientific programs (PAGES, IGCP, IMAGES)

*Making decisions regarding policy of and monitoring of the Micropaleontology Reference Centers for which the lead Curator (an IHP member) has direct responsibility.

*Recommending policy on issues related to recording and archiving biostratigraphic data on the JOIDES Resolution.

This report included the MRC report and an update on plans for the Stratigraphic Database Center and the following recommendations for actions:

An MRC foram collection move to Rio de Janeiro:

1) Wolf Berger's objections were noted

2) News that a new position was filled at Rio with a paleo person.

IHP again supports its decision to permit the move of the foram collection to Rio.

B. Moscow MRC activity:

1) Diatoms and Forams both are partial collections in Moscow. Remaining collections are stored at the Smithsonian Institution.

Recommendation - Huber would like to send remaining samples to complete the diatom and foram collections at Moscow MRC. **The IHP recommended to Brian that he send the Diatoms but hold the Forams until some agreement is reached for providing the necessary vials etc. to process the samples. The panel suggested that the Moscow Curator (Basov) be invited to attend the next curatorial meeting.**

2) The Radiolarians, Nannofossils, and lithologic smear slides were never sent to Moscow, These are stored at Scripps.

Recommendations - Huber would like to advise the community regarding availability of these nannofossil, radiolarian, and lithologic smear slide collections in hopes of establishing new subloan institutions. **The IHP agrees.**

C. Production of smear slides

Recommendations - Huber would like the Bremen core repository to take over production of 4 sets of lithologic smear slides. **IHP agrees.**

Proposed New JOIDES panel structure: Fryer presented a short summary of the proposed new JOIDES advisory structure as defined in the PCOM Agenda book (PP 237-250, see Appendix 2) highlighting the rationale for change of panel structure. The PCOM asked EXCOM to reorganize the JOIDES structure in order to mirror the Long Range Plan. The Long Range Plan embodies a change from a purely individual science driven program to one in which themes are identified at the highest levels of the program and proposals responsive to these themes are encouraged. The suggested reorganization of the science and operations advisory structure reflects this "top-down" philosophy. Fryer summarized her recommendations to PCOM regarding the possible distribution of IHP mandates, as contained in her email to the JOIDES office of July 24, 1996 (see Appendix 3) and summarized Will Sager's comments on those recommendations (see Appendix 4). Sager provided additional information that the OPCOM is intended to be a small subcommittee of the Scientific Measurements Panel. Thus, this may change some of the recommendations made in July. Fryer encouraged the panel to keep this new structure in mind, because the primary task of this IHP meeting is to try to find niches for the IHP mandates and functions within the proposed new structure. Fryer listed the proposed new panels and requested the IHP members to suggest names of individuals who might serve on these panels. She asked the panel members to think about these panels over the next two days and consider additional names that could be added to the list as the meeting proceeds. Fryer explained to the panel that PCOM has appointed a subcommittee, chaired by Will Sager and consisting of the chairs of the former service panels, PCOM liaisons to those panels, a representative from the non-US partners, Dave Falvey (JOI), Tim Francis (TAMU), and Dave Goldberg (BRG-LDEO), to be involved in discussions of the formulation of the new ODP Scientific Measurements Panel, its mandate and membership.

PCOM report: Will Sager presented a summary of actions taken at the most recent PCOM meeting in Australia, August, 1996:

Prospectus: Area of operations to be Southern Atlantic, Indian Ocean, Antarctic margin, and far-west Pacific.

New partner: Korea takes 1/12 trial membership in Can-Aus consortium

Budget still flat: A portion of every meeting is discussion of cost priorities. Now "X-based budget." JANUS, DCS, and other engineering usually get go-ahead.

LRP: finished December 1995 and published March 1996.

PCOM asked by EXCOM to **reorganize JOIDES advisory structure to reflect LRP**. Done April 1996; approved by EXCOM in July 1996; revisited August, 1996.

PCOM makes **5-year plan**. To be used for budgeting and selling program at renewal

PCOM responses to IHP recommendations:

Publications: IHP made statements supporting publications
Recommendation: Continue Publications Subcommittee
Action JOI will form Publications Steering Committee

JANUS
Recommendation: Find resources to complete JANUS
Action: Funds have been approved to complete JANUS-1
Recommendation: Proceed with migration of historical data to JANUS
Action: RFP has been circulated for data migration

Curation
Recommendation:: do not cut summer student helper curatorial funds
Action:: none

Will Sager presented a summary of other actions taken by PCOM at its meeting and described a dilemma set before the PCOM regarding the move to electronic publications (see Appendix 5).

Sager also provided a summary of actions related to publications

Publications: Recent History

December 1994:

PCOM asked to consider ways to improve publications and reduce annual cost by $600K by FY 98.

PCOM subcommittee formed; H. Dick polls JOIDES panels; finds diversity of opinion.

January 1995:

Subcommittee meets. Recommends smaller IR, SR plus move to electronic publication. Publication moratorium examined. Recommends extension of SR article deadlines.

April 1995:

PCOM endorses Subcommittee plan. Recommends deadline extension, reductions in scope, etc. Reaffirms support for SR volume.

December 1995: PCOM accepts IHP recommendations on Publications plan; accepts recommendation to purchase scanning equipment.

January 1996:

EXCOM requests input from PCOM about which services to reduce of curtail to make funds available for LRP innovation

April 1996:

PCOM recommends publication of DSDP style volume (IR+SR) with 48 month post-cruise deadline

Inspector General makes "unsolicited" review of ODP publications; recommendations (1) cease publishing SR volume ASAP and (2) make electronic version of IR and cease printed publication. Savings of $1.1M projected.

May 1996:

PCOM subcommittee meets at ODP. Ceasing of Printed publications seen as only method of saving significant funds. Subcommittee reluctantly agrees to electronic-only publication, but only with transition period for SR volume

July 1996:

EXCOM accepts PCOM subcommittee recommendation for transition to electronic only publication. Recommendations never formally approved by PCOM.

August 1996:

PCOM informed of April motion must be revisited because DSDP style volume will cost same as present publications.

Subgroup of PCOM rewrites subcommittee recommendations: SR volume to go electronic with next Leg (169) while retaining printed IR volume until about Leg 175 (with evaluation later) (see Appendix 5)

Nearly half of PCOM abstains from vote.

IHP notes that the on-going changes in the plans to reformat the ODP publications during the last year and a half have wasted ODP funds. This is because there has been insufficient time to evaluate the effects of any of the implementation plans and insufficient input from the community. The ODP/TAMU publications representative reported to IHP that the on-going changes in the publication plan during this time period have consumed a significant portion of the staffs' time (in creating multiple budgets and implementation plans in response to inconsistent Panel/JOI instructions) and have made it nearly impossible for ODP to provide advance notice (prior to sailing) to the scientific community with regard to the product they can expect for each leg. In addition, the department has begun to see high staff turnover rates, as trained employees become concerned about the insecurity or uncertainty of their jobs in the near future because of indecisiveness and inconsistency from the JOIDES advisory bodies.

This seemingly rudderless activity has distracted Publications from their jobs and has diverted publications funds from the functions they are meant to support. For example, Ann Klaus noted that in May of 1996 (in preparation for the May JOI/PCOM Publications Steering Committee meeting at ODP) the ODP/TAMU staff invested the equivalent of $18,000 in payroll to the preparation of requested new publication scenarios and related budgets.

Such activities waste valuable time and assets (both financial and personnel). They are self-defeating if scenarios continue to change on such short notice and if cost estimates are used in a manner other than that for which they were intended.

The IHP recommends that the Publications Steering Committee that JOI intends to convene ensure that once some final decision is reached with regard to the future publications of the ODP, a set period of trial implementation is provided for so that the effects of the changes can be evaluated in a deliberate manner. Further, the IHP hopes that the Program will provide for a long-term group to provide oversight of the ODP publications operations and policies and to ensure the necessary continual feedback regarding evaluation, special requests for exceptions, keeping up-to-date on technological up-grading.

Question from IHP members: Panel members were concerned as regards why the Inspector General became involved in the evaluation of ODP publications. The IG office is meant to deal with matters of fraud, deliberate mismanagement of funds, malfeasance, etc. John Falvey informed the panel that the NSF managers of the ODP funds (Malfait and Heinrichs) had stated that they had not requested the IG review and did not know who had. No one on the IHP could remember the ODP ever having been investigated by the IG office in the past. The IHP is concerned that such investigations reflect poorly on the Publications office and on the Program in general. As presented to the panel, the actions concerning this investigation seem unusual. The IHP strongly supports the Publications staff of the ODP and hopes the PCOM will do so also. If this investigation came at the instigation of an individual in the community it may be necessary to remind the community that such actions can have serious adverse effects. Thus, the IHP offers the following recommendation:

The IHP recommends that with regard to the matter of the Inspector General's investigation of ODP publications, the ODP community be aware of the potential negative effects of such investigations on the Program. The IHP endorses fully the integrity of the publications staff of the ODP/TAMU. Although the IHP recognizes that the IG's office may investigate any aspect of operations under its purview for any reason, if such actions are prompted by a desire on the part of disgruntled individuals, such individuals should be reminded that by doing so they do harm to the reputation of the Program at a time when it will be facing particularly critical deliberations regarding renewal.

The IHP discussed the issue of migration of the legacy data: John Farrell explained that Dave Falvey intends to send out an RFP, or request for letters of interest, asking Institutions and various groups to see if people are interested in migrating data into the database (an expression of interest is to come in by November 1 for a meeting in January). Falvey intends appointing a Working Group to oversee implementation of the data migration. A concern was offered by Mike Loughridge who noted that new Federal Standards regarding archiving of data are to be implemented soon. He emphasized that this kind of issue requires a long-term management oversight so that the database will remain up-to-date. The IHP hopes that the Legacy Data Migration Working Group and the JANUS Steering committee will provide for the creation of a subgroup of the new Scientific Measurements Panel (herein called SciMP, to distinguish it from the existing SMP) to remain active and be given a charge to oversee the continuing need for database issues and data migration efforts. It was thought that this could be part of a mandate, at the SciMP level, to oversee database issues and publications, as the two are intimately linked. The individuals involved might easily be the same as those needed to oversee and provide continual evaluation of publications, as described above. The question was asked as to how much of the

$300K designated for the migration of the legacy data would be required in order to evaluate the proposals submitted in response to this RFP. It was reported that Rakesh Mithal estimated that evaluation would require approximately $100K, although estimates vary The IHP is concerned that this is a large figure!!

The panel returned to a discussion of the proposed new ODP advisory structure. As the panel understands it, the rationale for the structure was to break up the current PCOM (which is overloaded with work) into a SCICOM, to deal with science planning, and an OPCOM, to deal with operations. The OPCOM is to be a small (3 to 5 members) subcommittee of SCICOM, the chair of which is to be the SCICOM chair. It is not clear whether OPCOM will meet on a regular basis, or be convened only when need arises. If the latter, there will be no established mechanism by which operations groups in ODP can obtain advice regarding policy and long-term functions. Operational advice is to be provided to the OPCOM through the efforts of working groups that may be convened on an ad hoc basis to deal with issues as they arise. The IHP is concerned that unless careful instructions are provided to these working groups by the SCICOM/OPCOM this method of operation has the potential for repeating the type of short-term, short-notice activities characteristic of the recent publications history. The IHP is sympathetic to the pleas of the publications group that they not be subjected to any more of what they consider to be "jerking around." If ad hoc advisory committees are also convened at other levels in the ODP advisory structure, the potential for inconsistent advice and a lack of clear guidance is increased.

IHP noted that in the new advisory structure there will also be several JOI-coordinated ad hoc working groups formed to deal with functions such as JANUS, Publications, Migration of legacy data, Curation, and "others as the need arises." If there are to be two bodies (JOI and the SCICOM/OPCOM) who can convene ad hoc committees for advice, the "Gang of Four" will have to arrange for a greater degree of interaction than that in which they currently engage. This will be necessary because they will have to address greater levels of detail regarding the functions of the operational aspects of the Program if they are to avoid having simultaneous committees providing advice at different levels of the advisory structure. This is going to create inefficiency at the highest level in the Program. The IHP does strongly agree there is need for subcommittees to deal with the functions of the various operations groups, and it agrees that in some instances executive decisions are the most effective way of making changes, but only with regard to thematic issues. The IHP sees several potential problems with the creation of high-level ad hoc advisory committees. The first is obvious, that if simultaneous ad hoc advisory committees are at work, there are likely to be conflicts in the nature of the advice given to the Program on a given matter. The IHP sees two problems with the proposed scenario of several JOI-coordinated ad hoc committees; a short-term problem and a long-term problem:

1. Short term: If such ad hoc committees are coordinated by the JOI office they do not benefit from interaction with the community and panels (i.e., they represent top-down functionality not community-/science-driven functionality). At best this decreases the efficiency of the advisory structure of ODP. No large management scheme known works effectively with all the detailed decisions being made at the top (JOI) and with little delegation of responsibility to lower management levels (panels) (see comments below). It also places the ODP in danger of receiving inconsistent advice because steering committee members may be influenced by special interests. In the old advisory structure such interests could be damped out by passage through the hierarchy of panels. The result of the proposed scheme may be more short-term, short-notice decision making. With multiple advisory

bodies the potential for conflicting advice and unwarranted expense in responding to the conflicting recommendations.

2. Long term: The appointment of ad hoc steering committees or working groups fails to provide for the long-term oversight. Once the Publications Steering Committee is disbanded, for instance, who will provide for oversight, evaluation of the effectiveness of publications produced, advice on requests for exceptions to the deadlines and policies, and who will advise the Program regarding possible modifications of policies that may need reconsideration, etc.? The IHP sees a need for establishing long-term mechanisms for providing these sorts of advice. All functions of the ODP that maintain a long-term activity require an advisory body to assist with the day-to-day, year-to-year running of that operation. It would be grossly unfair to the members of the newly forming Scientific Measurement Panel to require them to perform all these functions, as well as those that may be recommended by the current SMP and DMP. The IHP sees the new SciMP as potentially overburdened if some auxiliary body is not designed that can provide for the long-term panel-driven advice that best reflects the community's needs.

IHP recommends that the long-term functions of the ODP be overseen by long-term standing committees of some sort. IHP further recommends that care be taken to avoid convening multiple ad hoc advisory bodies simultaneously to advise different levels of the ODP structure on the same functions.

Mike Loughridge noted that the IHP had not heard in detail the views of the non-US partners regarding the new advisory structure. He asked that the non-US partners present give a brief summary of how their constituencies viewed the plan:

Gilbert Maudire reported that for France the money is the issue of principal concern and thus it is good to get rid of a panel.

Yoshi Aita reported that at the Japan ODP meeting the Japanese were concerned regarding the fact that to combine the IHP, SMP and DMP there will be too much to do for that panel. He agreed that it would depend on the structure ultimately decided upon. He reported that Japan has suggested a person to serve on the new SciMP.

Warner Brueckmann reported that 90% of the German constituents have a lot of questions about the publication changes. There is little concern over the "over-all structure" of the new advisory structure, but there is worry about the fact that there appears that there will be no control over what's going on "on top," at the JOI level.

There was some general discussion of these reactions including the following:

Lynn Watney provided some comments, expanding on this matter. He noted that this represents a change in management style that eliminates a major function of the advisory structure. This "top-down" mechanism can provide quick reaction at the executive level, but provides little room for recommendations through "channels." He recommended that a mechanism be preserved for recommendations through channels. He commented that "long-range planning" has been impossible lately (especially in the last 6 months).

Fryer displayed the flow chart of the "Flow of Science Advice" (p 244 of the August PCOM agenda book (see Appendix 2)). She added, at the top of the chart, the JOI coordinated advisory bodies that are known to be envisioned (JANUS Steering Committee, Publications Steering Committee, Migration of Legacy Data, Curation Workshop) as bubbles with reporting lines only to JOI, as was the plan as of the IHP meeting. Some members of the IHP immediately labeled this concept as the "bubble idea."

Pat Diver noted that in Industry the model is that big thematic issues are decided at the executive management level. Decisions regarding details of implementation are sent down to the lower management levels, otherwise it bogs down the process. The "bubble idea" with advice on details of operations going only to the executive level is never enacted in industry.

Will sager noted that some sort of a "bottom-up" advisory mechanism must be preserved. He suggested that the reports of the "bubble chairs" go to SciMP.

John Farrell provided the IHP with the agenda for the Curation workshop:

He noted that the primary objective of the meeting is to explore how ODP can more effectively maximize the scientific return from ODP materials while maintaining the high quality of core curation and repository activities

He noted that recommendations will be put before PCOM/SCICOM before implementation. Discussion will focus on a variety of topics, including:

(1) the general sample request policy (including forms) and associated procedures,
(2) sampling from "dedicated holes" and "composite depth sections;"
(3) "re-curation", the effort to alleviate core degradation and ameliorate existing collections;
(4) curatorial practices in light of the 1996 LRP initiatives;
(5) capacity of core repositories;
(6) integration of samples from other drilling platforms into the curatorial system;
(7) integration of sampling/curation policy and the new publication policy;
(8) the connection between sampling/curation and the JANUS database management system; and
(9) the philosophical debate over sampling vs. archiving core material.

Some IHP members expressed concern over whether a 2-day working group can accomplish a full evaluation of all of the issues outlined. Such issues involve policies that have taken years to establish, that require maintenance in the form of evaluation of effectiveness, and that require an adequate mechanism for responses to requests for exceptions. The agenda as presented lacks provision for long-term debate of the sort that has created the policies that this workshop is meant to discuss. The statement that recommendations be put before PCOM/SCICOM before implementation, suggests that PCOM/SCICOM may **not** be given sufficient time to request advice from the new SciMP, the body that will most likely take over the functions of the service panels, before it is required to respond. Because a 2-day workshop will not be able to accomplish detailed examination of the issues outlined, the most positive possible outcome is that it will provide some innovative suggestions as to how to improve policies regarding the issues. If contrary suggestions come from the "trenches" (the PCOM and SciMP level), as has already been the case with the recent publications situation, who will make the final decision? The IHP strongly feels that the Curation Workshop has great potential for benefit to the system, but only so long as it is used as a vehicle for stimulation, and not as a means for rationalizing a preordained agenda of executive directives.

The IHP fully supports the need of the JOI office to obtain rapid responses for thematic aspects of the program. However, the most effective means of implementation is to delegate authority for detail to lower-level management. If the JOI office intends to establish and maintain implementation committees it must permit these to interact directly with the panel structure. The JANUS SC is a **good** example, its reports go directly to JOI, but also directly to the IHP and SMP. Both the IHP and SMP have liaisons who are members of the SC. The two service panels have spent considerable time involved with selection of User Group members, prioritization issues, and definitions of various aspects of the data to be included. If the JOI office issues directives on the advice of the JOI steering committees without permitting the panels direct access to the deliberations of that steering committees, the panels will be forced to establish their own advisory subcommittees to assist it in implementation. Establishment of one Steering Committee at the JOI level and coeval advisory subcommittees at the lower (panel) levels to deal with the same programmatic issues will be counter-productive. The IHP strongly opposes the notion that reports from the chairs of the JOI-coordinated subcommittees go exclusively to JOI.

The IHP recommends that any JOI-coordinated ad hoc committees have liaisons from the PCOM/SCICOM and the new SciMP and that any reports from the JOI-coordinated committees go jointly to PCOM/SCICOM, SciMP, and JOI.

After reviewing the description of the currently proposed new advisory structure the IHP is concerned that the structure may be a difficult one in which to find niches for the mandates of the IHP. The IHP recognizes that to try to expand the mandate of the SciMP to encompass all of those mandates would be too burdensome. It suggests instead that a standing subcommittee of SciMP be created to deal with the long-term oversight of certain aspects of the ODP that have previously been the purview of the IHP. Suggestions were made that this subcommittee could possibly do some of its business via email, could tap specialists from the user community or outside advisors on occasion, as required, to respond to specific needs.

The IHP recommends that the scope of the mandate to the SciMP be broadened to encompass most of the mandates of the IHP (as well as the SMP and DMP), but that the activities of these mandates be performed via some mechanism that distributes responsibility within the SciMP with outside help on an as-needed basis.

Publications Report (see Appendix 6 for report from ODP/TAMU Publications)

The publications report was updated with a few corrections and Ann Klaus requested the panel look over the current Publications Policy (see attached sheet at the end of Appendix 6). The panel endorsed the policy with the exception that it recommended that the policy should contain a statement that non-performers will be precluded from receiving any further samples until such time as they have removed themselves from the status of non-performers.

Ann Klaus presented the IHP with a short summary of the recent changes in directives to the publications group as a consequence of the rapid shifts in EXCOM vs PCOM recommendations regarding publications (as described in the Publications history presented by Will sager (see PCOM report above - p. 2-3). The panel expressed its concern over who would eventually resolve the problem, PCOM or EXCOM. Subsequent to its Kiel meeting (i.e.., on Oct. 1), the IHP was informed that a directive from JOI was issued, dated Sept. 13 1996, to move to electronic publication with the following schedule.

NEW VOLUME FORMAT

Initial Reports:
Volumes 169-175:
Book:
* site summaries
* site chapters
* operations reports
* scientific overview authored by co-chiefs

* guide to usage of material on CD
CD:
* prime data (core-description forms and core photographs,
* thin-section descriptions, smear-slide descriptions) large data sets
* viewable volume of book material

Volumes 176 and beyond:
CD:
* site summaries
* site chapters
* operations reports
* scientific overview authored by co-chiefs
* prime data (core-description forms and core photographs,
* thin-section descriptions, smear-slide descriptions) large data sets
* viewable volume of book material WWW version of CD material

Scientific Results
Volumes 152-168:
Book: Contains peer-reviewed papers
Note-- Beginning with 160:
* publication permitted in outside literature at 12 months post-cruise
* SR volumes limited to 500 pages; reprints no longer published in book.
CD: Viewable volume and data sets

Volumes 169 and beyond:
CD: Entire publication published on CD (no book) WWW version of CD material

(In the directive it was noted that the shift to CD-only publishing will only proceed if JOI receives a recommendation to do so from the Publications Steering Committee and endorsement by the JOIDES Scientific Community.)

The panel discussed its concern over the archivability of the electronic publications. Dave Lazarus suggested that libraries would probably make hard copies from CDs. Lucy Edwards asked if authors would receive reprints. Ann Klaus answered no, that under the new scenario there would be no provision for any type of hard copy. Russ Merrill suggested that a small number of SR and IR volumes be printed as archival copies and be distributed to the ODP offices and to a small number of other selected sites. The IHP supports this suggestion as follows:

IHP supports the suggestion of the ODP operator that a printer be identified who would agree to print on demand a small number of hard copies (10-50, the final number to be decided by PCOM/SCICOM) of ODP SR and IR volumes be printed, to fulfill the archival obligations of the Program. and that copies be distributed to selected localities (libraries, ODP offices, etc.).

The panel discussed a letter forwarded from Jim Natland to Bob Dietrich via email dated 9/5/96 regarding publications issues that were to be voted on by the PCOM. The letter expresses concern over the circumventing of normal procedures with regard to issues of ODP Publications. The IHP is sympathetic to the complaints voiced by Natland. Because of the recent rapid changes of policy regarding publications damage is being done to the morale, functionality, and budget of the ODP

Publications group. The panel was asked by John Farrell as to which scenario for moving to electronic publications the IHP would favor (that proposed by PCOM or that by EXCOM (See Appendix 5). The panel unanimously stated that both the scenarios are ill-considered and would prefer not to choose either. If it had to, however the panel members' straw vote was 7 for PCOM, 6 for EXCOM, and one abstention.

Day 2 - Thursday, Sept. 12, 1996

Announcements: The panel decided to meet at 7:00 PM for the "Last Supper."

Ethics issues and Nonperformers:
The chair presented a summary of the decisions regarding a case involving issues of a breach of publication policy and of potential unethical behavior. A letter of censure for the breach of publications policy was to be drafted along with a recommendation to PCOM as to how to proceed. As the panel is to be disbanded it was decided that further issues involving the unethical behavior should be forwarded to the PCOM level for adjudication. The IHP recommended that a small group familiar with the field involved be chosen (to be agreed to by both accused and complainants) and to render a judgement on the matter as rapidly as possible. Fryer suggested the following recommendation for a new policy to minimize recurrence of the type of behavior under discussion.

The IHP recommends that in the future, any and all collaborative arrangements made among groups of scientist aboard the ship must be approved, monitored, and adjudicated by the Co-Chief scientists of the Leg.

The panel finalized decisions regarding non-performers. Seven letters of censure were drafted for PCOM review. These will be forwarded to Susan Humphris, the new PCOM Chair, for action.

BRG Report (see Appendix 7): Mary Regan notes that the legacy data migration is on-going. IHP asks what BRG database issues will require long-term advice. Answer: what data are to go in, migration of BRG legacy data, consideration of data distribution issues regarding moratorium related to data. Question: are the data in Oracle format yet? Answer: no. A suggestion made was to put the data on-line then they can be converted. Problem is there is too much data. For instance, companies don't store log data on databases because of the amount of data involved. The suggestion is to use processed data only, not FMS, etc. One IHP member asked who determines policy and makes decisions regarding what data is placed into and what data is released from the, site survey data bank under the new advisory structure. In the past this was the purview of the SSP. Will this remain so in the new advisory structure? Data must be uniform in order to be translatable into the new database.

TECP Report: Steve Hurst noted that with regard to the reorganization of the ODP advisory structure, the TECP had felt the service panels were doing their job and so felt neutral with regard to the reorganization. They had no suggestions to change the service panels. The TECP is interested in getting structural data into the prime data and into the database. JANUS Phase II is necessary for acquiring hard rock and structural data. As the situation stands with the recommendations of the SC, there will be **no data captured** between the installation of JANUS (171b) and installation of JANUS II. Steve notes that Leg 176 (return to 735B) is likely to be inundated with core as was leg 153. The lack of capture of hard-rock and structural data will be particularly problematic for such Legs.

OHP Liaison Report: Brian Huber had nothing to report. John Farrell noted that the OHP has concerns over high resolution sampling. The Curatorial Workshop will address some aspects of this problem, but for a long-term solution and oversight this problem must have a permanent home in the new advisory structure. The IHP has frequent requests for exceptions to the policy on sampling. The IHP recommends that these matters are properly considered at the SciMP level.

SMP report: Lucy Edwards reported that the SMP has a concern regarding the oversight of new instruments. This is a matter that will require long-term oversight. The IHP recommends that as new instruments become available for use onboard there must be someone to determine that the new instruments have a JANUS/Oracle interface capability. Developers of potential shipboard instruments must be alerted to the necessity of providing for this capability. This is likely to require a $20-30K additional expense for development. TAMU should define what specifications must be met so data will interface. NSF must be informed that instrument proposals will have this requirement. A certification procedure, similar to the DMP third party tool procedure, should be established. This matter has so far not been a consideration of the JANUS SC, but must become one if the IHP is to be disbanded.

Summary of the most recent SMP meeting:

Request to ODP/TAMU to provide information for detailed discussion of all major equipment (life expectancy, future changes, spares, software requirements, and laboratory flow-charts).

JANUS - the SMP endorses continuing the JANUS project. It endorses the concept of generic utility laboratory "cookbooks" and "generic Explanatory Notes". The Teka thermal conductivity system is ready for Leg 167. Further development towards multiprobe system, integrate Teka in Phys Props and JANUS.

Natural Gamma Ray Spectral Data: 256 channel and standards comparative testing or calibration rods.

Bulk volume sampling for density be eliminated

Require all new equipment to have JANUS/Oracle interface

Thin section preparation - polished on 1 side, 2 if possible

CHNS apparatus is set for C/N only unless advance request

Color Measurements

Electrical resistivity measurements - apparatus not ready yet

Transfer of old cryogenic magnetometer

Visual Core Descriptions endorse workshop

SMP wish list (in priority order):

1. Core description Project
2. XRD replacement
3. Tumbling Demagnetizer

SMP agenda for its Tokyo Oct. 30- Nov. 1 meeting:

1. Opening remarks and discussion of March 1996 SMP meeting
2. Remarks from PCOM rep
3. Remarks from NSF rep
4. Review of recommendations of Mar 1996
5. Report of ODP/TAMU on status of shipboard Measurements
6. Future of SMP under new advisory structure
7. Joint meeting with JAMSTEC on future of Shipboard measurements on the Godzilla Maru
8. Report on "future of Shipboard Measurements" for all major equipment:

* life expectancy,
* future changes,
* spares,
* software requirements, and
* laboratory flow-charts

The IHP discussed the fact that the OD21 (Godzilla Maru) plans to retrieve principally core cuttings rather than core. This will require a new curatorial policy. Will data from such a platform be appropriate for inclusion into the database? Who will decide? Lots of questions. The OD21 will have a 2,500 - 3,000 m capability. The work will therefore be limited to shallow shelf efforts. How will this fit in with the ODP's LRP?

Information Services and Curatorial report (see Appendix 8): Russ Merrill reported for Chris Mato. Merrill provided an update on sample requests. Sampling policies have been modified as of March regarding composite sections and core/core integration. A general problem that needs to be addressed Want to sample the best section and take whole rounds, etc. The Policy says that one needs to define a second composite section before being free to sample excessively. The problem is that with the error (+ 50 cm) the archive half of the composite section is saved. (people want to sample the rest of the archives). The major issue is archiving vs sampling or non archiving. Whole round requests can't be processed on the ship (can't be done) so they require a permanent body to make decisions.

IHP received a special request for general permission to sample excessively on Leg 170. Russ Merrill brought to the meeting the individual sample requests and additional information from John Miller. The Chair requested a subcommittee (Brueckmann, Watney, Wilkens and Huber) to review the matter over lunch and render an opinion to the panel. in the afternoon. The subcommittee made its report and after a discussion of the wording of the response, the IHP approved the following response to the request from Leg 170 to be sent to Dr. Eli Silver:

"A subcommittee of IHP including Warner Brueckmann, Roy Wilkens, Brian Huber and Lynn Watney evaluated your request for sampling that exceeds present policy on ODP Leg 170 at our semi-annual meeting in Kiel, Germany. In their deliberation they had access to e-mail correspondence of August 6th from you to Patty Fryer, Prospectus of Leg 170, latest sample distribution policy, Sept. 11 fax from John Miller to Russ Merrill containing details of Leg 170 sampling plan, and a note from Michael Mottl to Chris Mato regarding recommendations of acceptable aliquot sizes for interstitial water.

Existing core sampling policy does provide for sampling that exceeds approved limits. Whole round samples were specifically mentioned in the Leg 170 Prospectus. However, destructive whole round sampling as proposed by Miriam Kastner (Sample Request #15671) minimally exceeds 8% of the anticipated planned core recovery (2150 meters of core recovery). This is not acceptable. We believe that a mistake was made in the coring strategy designed for this leg. Consideration should have been given to extensive sampling that exceeds previous similar legs by an order of magnitude. Whole round sampling typically has been limited to every third core. Calculations of time commitments suggest that the logistics of the existing proposed sampling would either not be possible or would create time conflicts for the technical staff in serving all scientists and lead to degradation in the quality of sample analyses. At least dual APC-cored holes should have been scheduled to accomplish the proposed sampling for these science objectives.

To achieve the goals of the research as described in the Prospectus of Leg 170 and the proposal, the IHP is willing to approve sampling in excess of policy. We propose a compromise that initially involves decisions of the co-chiefs and Miriam Kastner. The decision needs to be made before the Port Call October 221, 1996 (San Diego).

We suggest for sample request #15671 of Miriam Kastner that (1) fluid volumes requested be reduced to 10 cc, (2) that whole rounds not exceed 25 cm or 10% of any individual recovered core whichever is smaller, (3) all except 40cc of each squeezed sediment cake be returned to ODP for curation, (4) the co-chiefs inform the entire scientific party immediately after decision is made as to the extent of the sample request and its impact on the availability of samples for other participants, and (5) obtain consensus of shipboard party. Finally, we request that cores are run through the MST prior to destructive sampling.

Please contact us via e-mail regarding receipt and whether you feel our suggested program is an acceptable compromise. If not, we request a more elaborate rationale be prepared to support an alternative sampling strategy."

(Subsequent to the meeting the above letter was sent to Eli Silver and he forwarded it to all shipboard participants. He explained that he intends to hold a sampling meeting during the port call and asked whether the IHP could respond if the meeting took place at that time. Fryer sent email messages to the subcommittee members asking if they would be available for consultation and all agreed they would be. Silver was informed of this and that the IHP will await his further communications. when the response from Silver arrives after the shipboard sampling meeting it will be sent to the subcommittee members for comment then their recommendation will be sent to the full IHP via email for approval. Response from the IHP will be sent to Silver aboard the ship.)

Russ Merrill noted that aspects of the policy on sampling are described in several different places (Whole Round Policy, Technical Notes, IW policy statements from Mike Mottl) and suggested that all these should be assembled and printed in a single place. The IHP agrees and suggests that review of these statements and draft of a new composite policy could be performed at the proposed JOI Curatorial Workshop. Oversight of the policy should probably be turned over to the SciMP for the long-term. The SciMP could possibly designate a set of people in the drilling community, not actually members of the SciMP, but who have expertise in the fields for which special exceptions for sampling often come (sedimentology, pore-water geochem, petrology, etc.) to review special requests and recommend decisions. These subcommittees could be polled via email. A concern regarding this is that there may not be sufficient international representation on such groups and that there may not be sufficient response in a given instance. The suggestion was made that a requirement for a sufficient international representation be maintained and a quorum of responses be required.

JANUS report, including SC report and (see Appendix 9): Russ Merrill reported.

The report included the following

* A JANUS update
* Expenditures through July 1996
* Report of User Group 4A April 1996 meeting,
* Minutes of TRACOR meeting at TAMU June 1996
* Minutes of the JANUS SC March 1996 meeting
* Report of the User group 4b meeting July 1996
* Overview of test report for TRACOR JANUS build 0.7.1 (5/3/96)

The deployment was delayed, at the SC request, from Leg 170 to Leg 171B (9 Jan. - 14 Feb., 1997) TRACOR personnel will be onboard that Leg.

Testing and acceptance :Leg 172 (19 Feb. - 16 Apr., 1997)Warranty Support: Mid April to Mid July, 1997.

The impression is that the system that will be installed on the ship on Leg 171B will work, but will be less of it because TRACOR is having trouble with higher priority items. This will cause them to stop work on low priority elements

In-line documentation has defects.

A list of what is completed vs what is not were presented by Merrill:

Complete (substantially)
- Corelog, Operations, Sampling (UG1)
- MST, Logging (UG2a)
- Paleontology (UG2b)

To be completed by Leg 171B
- Phys props (UG3)
- VSR, Sonic Velocity, Thermal conductivity, ADARA, WST
- Chemistry (UG4a)
- Apple Core (as a stop-gap HARVI)

May not be completed in Phase I
- Sediments/Structure (UG4b)
  Smear slides, text-based VCD
- Hardrocks, thin sections (UG5)
- Tensor, Underway Geophys (UG6)
- Others: seismic, core photos

SC Priorities:

1. Age/Depth function (UG2 requirement)
2. Color Reflectance (UG3)
3. Thin section/HR thin, Smear Slides (UG4b and 5)
4. Paleomag (Cryo, Spinner) (UG2a)
5. HARVI (UG5)
6. Chemistry, quality control (Exception is IW) (UG4a)
7. Tensor (UG2a)
8. ADARA (UG3)
9. Core Display application (UG1)
10 TORVANE (UG3)

It was stated that the JANUS SC expects that it may continue through legacy data migration, therefore it wants to receive a recommendation from IHP for what data to migrate first. The IHP understands that a JOI-coordinated Data Migration Committee, different from the SC is to be convened. If so, the IHP feels the SC must be kept informed of the details of the work of this committee, or the two may be at cross-purposes. Therefore a liaison of each committee should attend meetings of the other and each should send meeting reports to the other simultaneously as they send report to JOI. The IHP recommends that in order to determine how data should be prioritized for migration it would be useful to have an assessment of mow many requests come in for each of the different data types. The community will help determine priorities.

As a strawman, the panel suggests the following general groupings of priorities for data migration (individual data sets are not listed in priority order):

High profile	**Low Profile**	**Limbo**
Age Profile	P-wave (bad data)	VCD
XRF	Mag field (bad data)	core log
Carbonate/carbon	Thermal conductivity	sampling (requests)

Velocity	XRD	Bibliography (what's been published)
Index	Strength (very low!)	
Things related to sampling (e.g., slides, HARVI, HRthin)		
Rock eval		
Gas chron		
IW		
Natural Gamma (if fixed)		

The IHP suggests that the way to proceed with data migration is to do one whole leg first to see how data interrelate. The choice of the Leg should be one from which there are numerous requests for data (a popular Leg).

Steve Hurst reminded the IHP that barrel sheets of hard rock description on the CD's won't be useful so there is a need to request higher resolution barrel sheets. He also noted that between the installation of JANUS (171b) and installation of JANUS II there will be NO hard rock data in the data base. The IHP reexamined the issue of the SC priorities for items to be completed under JANUS I. It suggested that of the items on the SC list of priorities those down to item 4 must indeed be accomplished by TRACOR. It suggested that items 5 - 10 could be accomplished by TAMU personnel, although it recognizes that this could not be on an ASAP basis. The work of JANUS Phase II has already been acknowledged as important but was ranked low previously in order to ensure that work on prime data types be completed. The prime data types could have been completed up front if funds had been allotted to tasks assigned to Phase II at the outset. Therefore:

The IHP recommends that JANUS Phase II be implemented as soon as possible. The IHP recognizes that implementation of Phase II will require that new moneys be identified to support this effort. There is an immediate need to ensure shipboard capture of data and to provide the shipboard party with a tool to describe the cores. The IHP recommends going to JANUS Phase II before completion of Phase I (once the SC priorities 1-4 are complete) and made suggestions to the Operator as to what tasks could be taken over by ODP/TAMU instead of having them completed by TRACOR (see minutes).

The IHP recommends that the migration of the legacy data remain a high priority.

Day 3 - Friday, Sept. 13, 1995

Finalizing non-performers: Fryer collected final drafts of 7 non-performer letters.

Responses to PCOM directive: The IHP finalized its response to the directive from PCOM to provide recommendations regarding the future of the IHP mandates within the newly proposed ODP advisory structure. The panel first defined its mandates in light of what actions it customarily performs at its meetings, identified those areas where the proposed advisory structure may be inadequate to cope with the IHP mandates. Fryer stressed that the panel should try to find innovative ways to distribute the load so that the SciMP (the most obvious vehicle for carrying out the IHP mandates) would not be overburdened.

Existing IHP Mandates: The panel reduced the 7 mandates listed in the JOIDES Journal to essential four general categories.

1. Publications,
2. Databases,

3. Curation,

4. Computers and software.

Historically, for the most part, activities related to the last have been initiated at TAMU and only been actively pursued by the IHP since Ian Gibson prompted the computer/database upgrade. The shipboard aspects of this mandate have been largely the purview of the SMP, although the IHP has provided significant input regarding biostratigraphy aspects of software development. The requirement that has fallen under IHP purview, with regard to computers and software, has been the need to maintain oversight of the appropriateness and consistency (thus the archivability) of data generated. Publications, database issues, and various aspects of curation occupy most of the time at IHP meetings. These meetings typically last 3-4 days (including the meetings of the Paleo/Strat subcommittee). During the last 8 years, in a typical meeting the IHP will deal with all of these issues. Someone has to respond to and make decisions about the issues that continually arise relative to publications, data, and curation and in the past that has been IHP. Without the IHP filter, the details regarding these questions will have to be dealt with by JOI or one of the subcontractors.

JOI-coordinated Steering Committees: JOI representatives have said JOI will constitute a Publications Steering Committee, to oversee the transition to electronic publication, and will host a workshop on curatorial issues. In addition, the JANUS data base contract is overseen by the JANUS Steering Committee. The JANUS SC has the focused objective of oversight of the JANUS Phase I contract and therefore in its current incarnation does not address broader and long-term data base issues. The Curatorial Workshop has a broad scope, but a limited lifetime. Likewise, although the mandates of the Pubs Implementation SC and the Proposed Data Migration Implementation SC have not yet been made public, their titles imply limited scope and duration.

Outside Advisory Groups: Because PCOM has indicated that SciMP will take up the mandates of the three existing service panels, IHP envisions these mandates as being maintained by SciMP with assistance from outside advisory groups. Simply combining the mandates of IHP with those of SMP and DMP seems to be an unworkable solution. This would give SciMP too much to do without giving it the depth of expertise to handle various areas of its mandates. Therefore IHP feels that the usual mode of SciMP operation will be oversight of these mandates with the help of focused advisory committees. The advisory groups could be constituted from non panel members and should maintain a sufficiently international representation so as to uphold the spirit of international cooperation in the ODP. The advisory groups could be polled by email and would not have to meet in person. A quorum of responses would be required in order to assure sufficient input before recommendations for action could be accepted by the SciMP.

Publications and Databases: All of the three main IHP mandates (publications, databases, and curation) have long-term components, i.e., they are issues on a recurring basis. IHP believes that there will be a necessity to address these mandates on a regular basis as long as ODP is active. For example, the JANUS SC does not now address broader and long-term database issues, so if it is to relieve SciMP of having to address database issues, then its mandate and membership must be broadened. Likewise, the Curatorial Workshop will not stop requests for exceptions to sampling and curation policies, so SciMP will have to address these on a recurring basis. SciMP will be stretched for time and expertise. Database and Publications issues will become increasingly intertwined with electronic publication. IHP recommends that the publications and database mandates be combined and handled by a single, formal standing subcommittee to deal with Database/Publications. The IHP recognizes that this subcommittee might be regarded as more like a second service committee, and had tried to avoid making such a suggestion. But it could see no other solution. It may be advantageous to have this group report directly to JOI with its recommendations, but if SciMP is to be the repository of these mandates, then the advice will have to be reported simultaneously also to SciMP and OPCOM/SCICOM. If there are objections to having a single committee on publications and databases, perhaps because it seems too much like an "IHP", then two separate committees could be formed. One could be formed from the JANUS SC and the other could be the proposed Publications SC. In this scenario, IHP expects that these groups would probably meet in proximity for cross pollination.

Curation: Curation issues could be addressed by the SciMP. The main problem with this scenario is that it is different from the usual DMP and SMP issues, so it requires expanding the expertise base of SciMP to include biostratigraphers and sedimentologists. Such individuals will also be needed in order to oversee the Micropaleontology Reference Centers and the Paleontology/Stratigraphy subcommittee work.

Membership: IHP has been populated by scientists with various interests and experience with DSDP and ODP in addition to others with special expertise. In the latter category, IHP has had co-chief scientists, for the purpose of monitoring the effects of publications policy changes on publications and the scientists, and people with experience in scientific publishing or data bases for the knowledge they bring in those areas. In addition, IHP has maintained a liaison with the National Geophysical Data Center because all ODP data must eventually be archived there and because this person brings much experience in databases and archives. IHP has also formed a subcommittee, the Paleontology/Stratigraphy subcommittee, to review standards in biostratigraphy, to monitor the Micropaleontology Reference Centers, and to work on issues related to recording and archiving biostratigraphic data on the JOIDES Resolution (see page 2). Biostratigraphic data is one of the greatest gaps in the existing ODP data base and the assistance of such a group of individuals will be essential if and when the chore of transferring old data into JANUS is undertaken. the IHP is concerned that on the SciMP there may be only 1 person with this sort of expertise. On IHP currently there are 5. There may be need for additional advisors to SciMP on these issues.

Database/Publications committee: IHP has recommended a Database/Publications committee. If this recommendation is accepted, the panel should be populated mainly with persons having experience with databases (particularly individuals in Industry) and/or electronic publication. This panel should also have a liaison with the NGDC,. one might not be required on the SciMP if the Database/Publications committee is accepted. In addition, the committee should contain some scientists with ODP experience, particularly people who have sailed on the JOIDES Resolution recently (co-Chiefs would give the most up-to-date information necessary for evaluation of effectiveness of these aspects of the Program). If Database and Publications steering committees are formed, they will have the same personnel requirements. A potential problem here is the NGDC liaison. Perhaps this liaison would best be with the Database group, because the publications would be part of the database.

Assuming publications and database people are elsewhere in the system, SciMP will need people with micropaleontology experience to deal with husbanding the MRCs and with the Paleontology/Stratigraphy subcommittee chores. Curation issues can be handled by having on the panel scientists with experience in ODP science. Once again, it would be useful to have members who have recently sailed on the JOIDES Resolution.

The Panel charged Fryer with the task of producing a series of flow charts to show the following:

The flow of reports that IHP oversees (see page 21 following)

The flow of advice and information that are related to IHP mandates (see page 22 following)

The recommendations as to where the IHP mandates should live once IHP is disbanded. (Will Sager actually produced these, distilling the thoughts of the IHP. Many thanks Will!) (see pages 23 and 24).

A list of recommendations and comments to PCOM were finalized for inclusion in the executive summary of the meeting.

Fryer thanked the panel members for their service on the IHP, but asked them to please consider their obligations not to be discharged until at least the December PCOM meeting. She especially thanks Will Sager for help with the summary of Friday's activities for the minutes.

Various members of the IHP graciously thanked Fryer for chairing the panel.

The panel thanks Warner Brueckmann for making the arrangements for the meeting and for the effort he has expended to make the facility available to the panel, to set up email connections under very adverse conditions, to shepherd us away from the construction noise, and to assist with a phenomenal amount of Xeroxing and faxing. The weather was wonderful and those giant chocolate things were fantastic! A great job!!

The final act of the IHP was to pose for a couple dozen class pictures. Who **was** that guy with all the cameras??

Adjournment was at 11:30, Friday, Sept. 13.

(Subsequent to the Kiel meeting, Fryer forwarded this suggestion to Will Sager (head of the SciMP advisory subcommittee of PCOM) in hopes of helping to solve the problem of overburden of the SciMP with service panel mandates:

Subdivision of responsibility in SciMP:

The workload of the new SciMP could be delegated to a subset of certain individuals within the panel who maintain a long-term responsibility for certain aspects of the mandate of the panel. This might be accomplished if the panel were to subdivide itself into several standing subcommittees (to deal with functions that IHP, SMP, and DMP currently cover). Clearly there would have to be somewhat more members on the full panel than there are an any one current service panel, so that sufficient expertise would exist to take care of the subcommittees' business. In order to assure breadth of expertise the chairs of the subcommittees should be given a list of specialists who do not formally serve on the SciMP but who are willing to be tapped from time to time (via email or phone) for advice on matters of concern to the panel. These individuals should be approved by the entire SciMP so that full US and non-US partner agreement is assured regarding the input of advice to the subcommittees. a balance of specialists from the US and non-US partner nations should be maintained on these lists of specialists as far as possible.

Functioning between formal meetings:

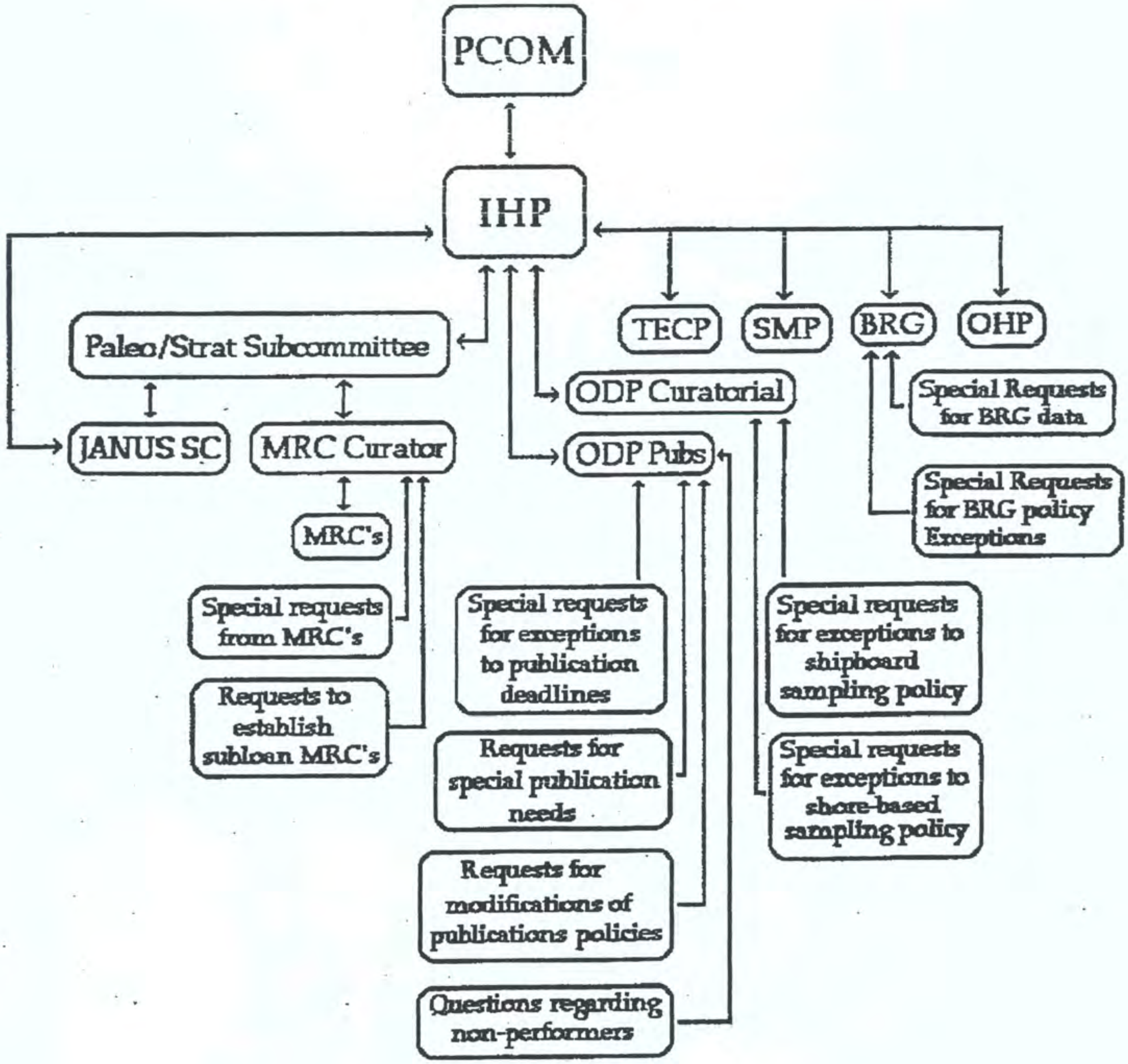
Prior to attending the formal meeting the subcommittees will have to conduct business via email. During the interim periods (between formal meetings) they can obtained input from any specialists as required. Any reports that ordinarily come from the various ODP operations groups under the purview of a given subcommittee should be forwarded to the subcommittee members well in advance of the formal meeting. The subcommittee should solicit input regularly from the operator. Thus, they can remain up-to-date on concerns from the operator. This will require that the chairs of the subcommittees be particularly responsible individuals who agree to commit the time and effort that performing this task will require.

Functioning during formal meetings:

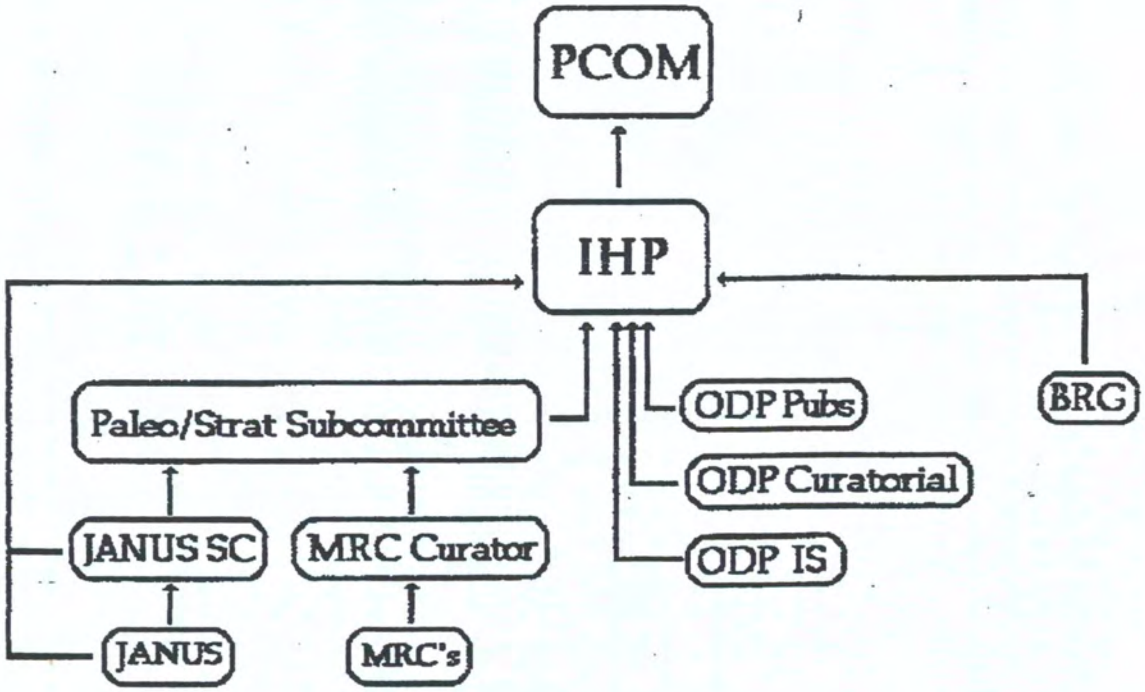
The SciMP will probably have to meet for a longer period than the 2.5-3 days that the current service panels require. The meeting should be split into two parts, a 1-2-day pre-meeting "workshop" for subcommittees and a 1-2-day plenary session that is a formal meeting of the full SciMP. During the "workshop" portion of the meeting the subcommittees should devote time exclusively to the business of their particular purviews. They should come to the meeting with a draft summary of the all business conducted up to the time of the meeting and with any suggestions, in the form of draft recommendations, that they feel should be forwarded by the SciMP as a whole to SCICOM. At the time of the workshops, the subcommittees could obtain input from liaisons from other panels and from the operator with regard to updates on current problems, etc. At the time of the meeting any updates or additional advice needed by the operator can be discussed and the subcommittees can spend time in the workshop finalizing their reports and recommendations. Clearly a lot of work will have to be done prior to the meeting in order for this scenario to work smoothly. Most of the work of the panel would have been done in the interim period between formal meetings.

At the plenary session the chairs of the subcommittees would walk the full panel through their respective reports and recommendations. The purpose of the plenary sessions is several-fold. The full panel must participate in any vote called on any matters requiring special consideration. The full panel should send only those recommendations to SCICOM that are agreed to by consensus or formal vote. These sessions help to maintain full partner input to the establishment of policies and to the operational decisions of the SciMP. They will permit the subcommittees to garner additional insight from points of view outside their fields of specialization. Potential operational conflicts arising from recommendations can be discussed and resolved. The plenary sessions will minimize the potential for influence on the program from special interests. Involving the entire panel in decisions regarding recommendations will help to provide for a sense of corporate memory and will thus will help to prevent inconsistent advice from the panel.

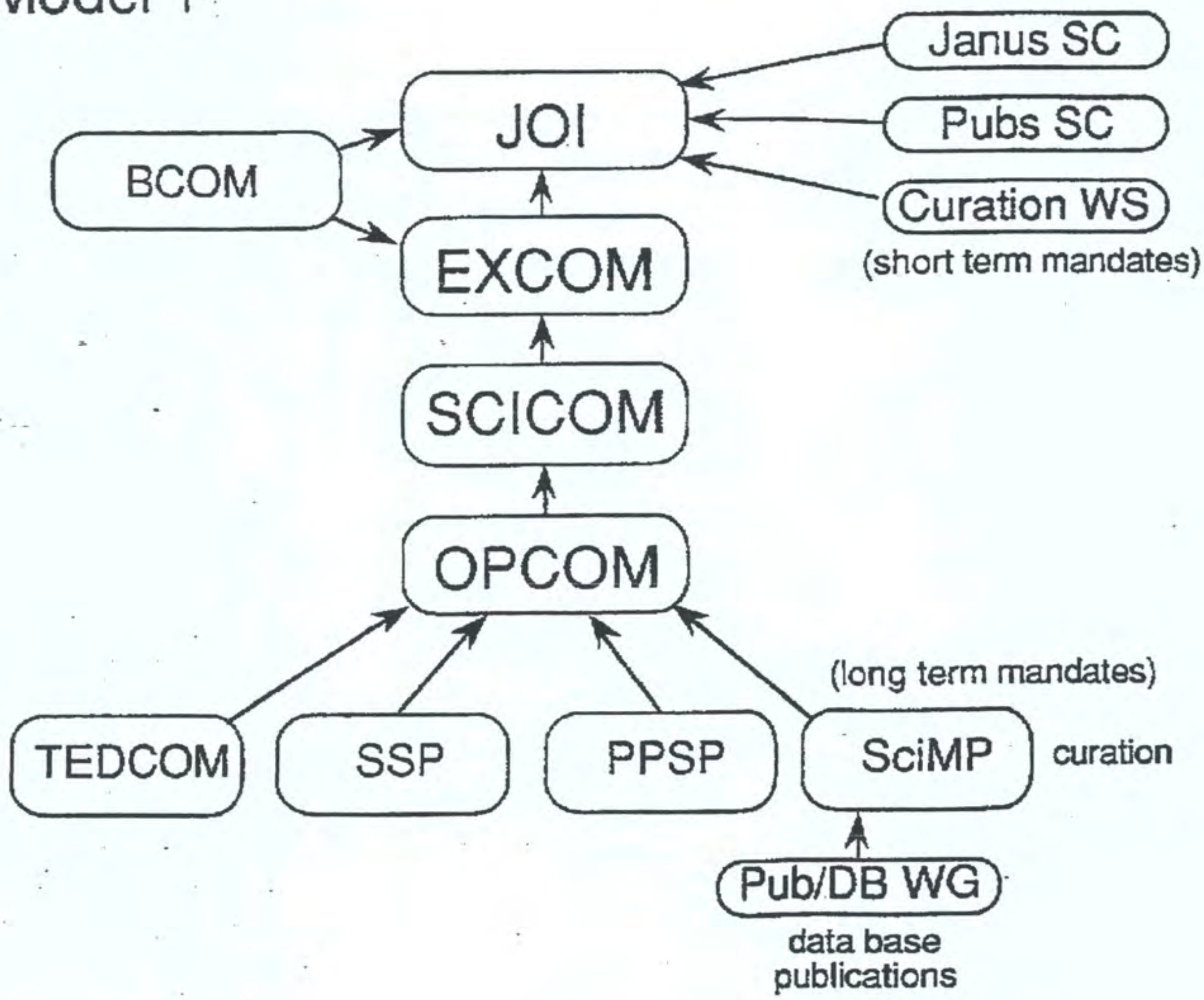
Flow Chart for Advice/Info



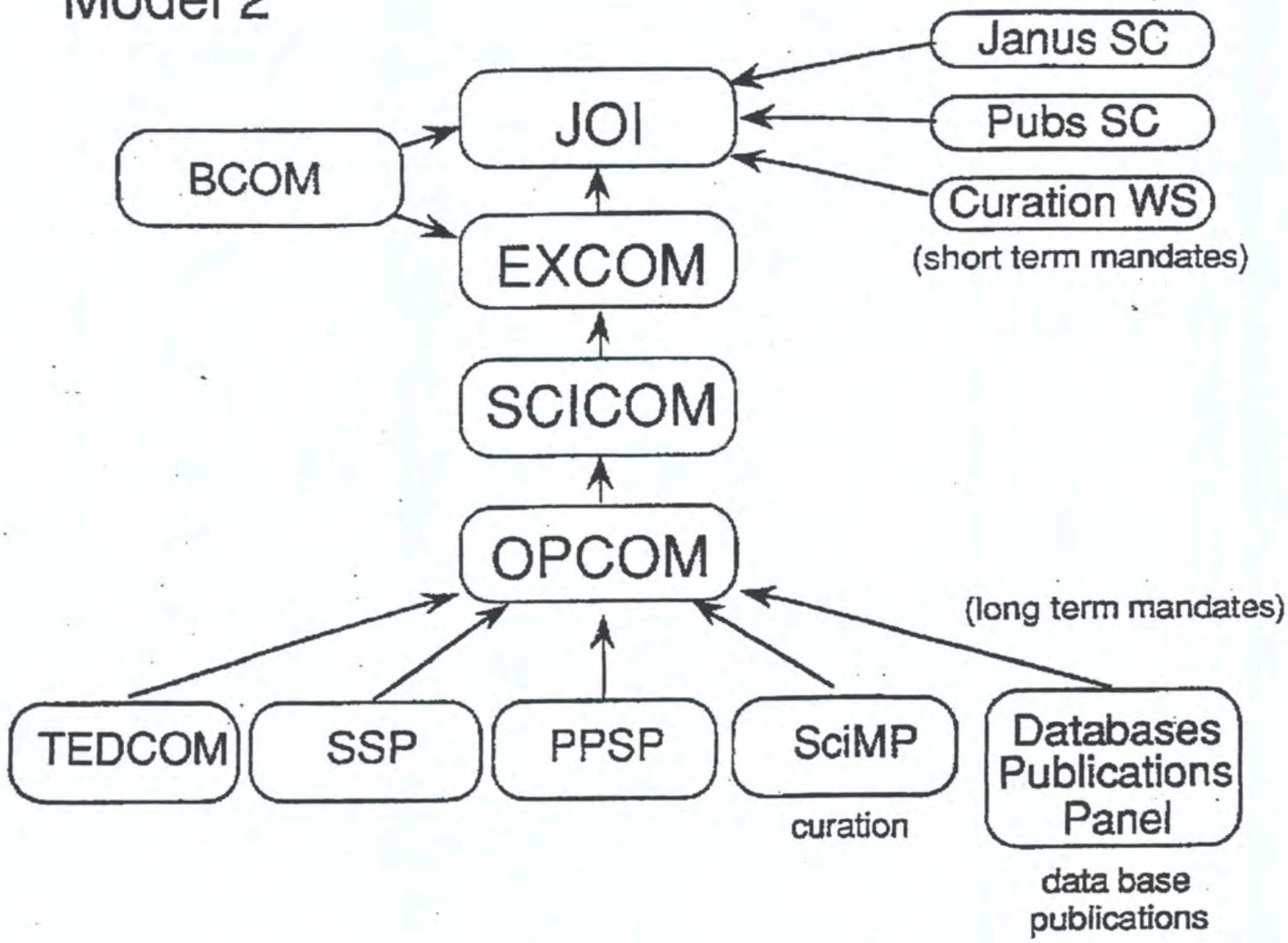
Flow Chart for Written Reports



IHP Mandate Distribution
Model 1



IHP Mandate Distribution
Model 2



Appendix 1

Report of the Paleontology/Stratigraphy Subcommittee Meeting

Overview: The Paleontology/stratigraphy subcommittee along with IHP has fostered numerous efforts to organize, preserve, migrate, standardize, and utilize databases. These activities will remain critical to the future viability of information generated by ODP. These important tasks remain for the Janus DB. Janus DB will need to be monitored and modified to reflect the evolving body of knowledge in order for it to remain viable and useful. Paleontology/stratigraphy expertise is needed to address these essential tasks.

1. Provide advice on the long-term access to paleontologic and stratigraphic data
   a. *Acquisition* and *integration* of DSDP/ODP data
      (i) Development of tools and templates to make information from the ODP database accessible to the user.
      (ii) Acquisition and integration into the ODP archive of data generated from ODP samples that are published in the outside literature.
   b. *Maintenance* of data
      -Given the inevitable changes in technology and science, determine how to keep data alive and accessible for years.
   c. *Migration* of data
      (i) Oversee migration of existing data into the ORACLE database.
      (ii) Make policy recommendations and priority assignments regarding migration; should this include ODP data only, ODP and DSDP data, DSDP/ODP data from outside publications?

2. Oversee the paleontological portion of Janus
   a. Data capture
      (i) Monitor and provide guidance for system changes to the Janus FossiList equivalent for fast, accurate, and complete paleo data capture to the Janus database. This should include on-shore as well as ship-based studies.
      (ii) Post-cruise capture of the paleontology data promote ease of entry to the Janus database, including entry of all data types in the paleo portion of the model - remarks as well as fossil occurrence and abundance.
   b. Monitor and further development of the Janus data model
      - A proactive approach is needed to identify changes to the paleo portion of Janus to facilitate integration with other disciplines. This includes capture of types of information not previously identified to achieve the paleoenvironmental and paleoclimatological long range goals of ODP.
   c. Promote standardization of paleo database to ensure usability.
      Paleo data are an essential component to studies in chronology, paleogeography, and paleoclimate. An important future goal is to allow transparent access of paleontologic data to *all* ODP participants. To be accomplished by:
      (i) Improved tracking of taxonomic concepts through enhancements in database design,
      (ii) Ensure, via continuously updated synonymy lists, that key biostratigraphic marker data can be retrieved in the future.
      (iii) Internal database tables to explicitly define abundance and

preservation codes applied to fossils

(iv) Improved interface to serve varied needs of users (e.g., facilitate queries both paleontologists and non paleontologists, and at both world scale and local, fine scale chronostratigraphy).

(v) Provide database infrastructure for consistent application of paleontological interpretation.

d. Help define data extraction capabilities from the database. Cross disciplinary studies will be important motives for future searches of the Janus database. Queries, reports, and graphics need to be designed to anticipate different background of users. Routine/common retrievals need to be organized. Advise on the level of user assistence.

3. Oversee age models and their use.

-Ensure that the necessary tools (literature, software, templates) are available on the ship.

4. Establish and maintain alliances with other taxonomic/stratigraphic efforts

a. Taxonomic databases

(i) Link ODP taxonomic data structures and concepts with other international organizations (IUBS/TDWG).

-The design and sharing of information between taxonomic database systems is a major goal of international programs such as the International Union of Biological Sciences' Taxonomic Database Working Group (IUBS/TDWG), and links scientifically to ODP via biodiversity/global change studies of modern ocean biotas.

(ii) Foster development of taxonomic catalogs.

b. Develop links with other related scientific programs (PAGES, IGCP, IMAGES).

As scientific questions become more global and integrative, the need increases to link ODPs data with those of other international science organizations. ODP data provide a long-term historical complement to high resolution global paleoclimate programs (PAGES, IMAGES). ODP stratigraphic interpretations need to be strengthened by stronger linkages to other relevant geological programs (e.g., the International Geological Correlation Program, IGCP).

5. Oversee Micropaleontological Reference Centers (MRCs)

-all policy decisions and the appointment of a Lead Curator must be approved through the JOIDES structure

a. Provide scientific management of MRCs

(i) annually review MRC activities by having Lead Curator gather and present reports from each MRC institution

(ii) Make policy recommendations

•move MRC collections from inactive institutions to institutions that will use MRC samples

-requires advertisement of collection availability and review of proposals that result

•update guidelines for MRC establishment, sampling strategies, and sample curation

- resolve issues of non-compliance to JOIDES approved guidelines and policy changes
- determine ways to improve MRC sample information accessibility and increase visitation to MRCs
    - -add biostratigraphic databases, core depth information, etc.

b. Coordinate sampling of recently drilled ODP legs for each microfossil group and for lithostratigraphic smear slides.

- Review reports/select samples
- Coordinate sample preparation
- Distribute samples to MRCs

c. Update and improve MRC home page

6. Maintain quality and standards for paleontology manuscripts

e.g., issues involving plate number limitations, plate backgrounds, image quality and resolution, range charts, and stratigraphic nomenclature. Reduce plate reproduction costs.

United States Department of the Interior

U. S. GEOLOGICAL SURVEY
Box 25046 M.S. 939
Denver Federal Center
Denver, Colorado 80225

IN REPLY REFER TO:

November 7, 1996

To: Susan Humphris, Chairman, JOI-PCOM

From: Mahlon M. Ball, Chairman, JOI-PPSP MMB

Subject: PPSP meeting of September 19-20, 1996

This meeting was held in the conference room of ODP-TAMU, College Station, Texas.

Attendance:

Mahlon Ball
George Claypool
Dietrich Horn
Art Green
Hans Juvkam-Wold
Barry Katz
David MacKenzie
Rinaldo Nicolich
Joel Watkins

ODP-TAMU-SP
Kevin Burke
Martin Hovland
Thomas Thompson
Henk Wories

ODP-TAMU
Tim Francis
James Allen
Adam Klaus
Mitch Malone
Brian Jonasson
Mike Storm

JOI-PCOM
Susan Humphris

JOI-ODP-Data Bank
Dan Quoidbach

Chief Scientists
Leg 174A-Jamie Austin
Leg 175-Wolf Berger
Leg 175-Volkhard Spiess
Leg 176-Jim Natland

Proponents
174A-Greg Mountain
S. Austral. Bight: David Feary

Mahlon Ball opened the meeting requesting self introductions and circulating a signature list. Memorials for Lou Garrison and Rob Kidd were given by Ball and Tim Francis.

Francis made housekeeping announcements. Minutes of the last meeting were approved.

Francis then reported on drilling status. The Bahamas Transect, Leg 166 was completed with 5 holes. Correlation between holes is good and sequence stratigraphy is well established to the late Oligocene-Early Miocene interval. The California Margin, Leg 167 resulted in recovery of 7501 m of core. Gas was encountreed, as expected. One core linear exploded. No injuries occurred. The Jaun de Fuca Hydrothermal leg resulted in establishment of 4 re-entry sites and additional sites as time permitted. All objectives were achieved. Leg 168 S, Saaniche Inlet, went smoothly and Leg 169, Sedimented Ridges II, is underway.

Susan Humphris reported on subjects discussed by PCOM at its August meeting: Pending EXCOM approval, the new organization structure of JOIDES should be operational within a year. PPSP may be called upon for input to the Operation Committee (OPCOM) that will be responsible for program logistics. The 1998 drilling schedule will be finalized at the December 96 PCOM meeting. Proposals under consideration are in southern oceans: the Indian Ocean, Western Pacific and Antarctic waters. A 5-year science plan is required by NSF, for submission by March-April 1997.

James Austin and Greg Mountain described the regional geology, geophysics and scientific objectives for Leg 174A, New Jersey Margin II. They then led the site-by-site discussion connected with the safety review. Sites were approved as follows:

Site	Latitude	Longitude	Depth (m)	Penetration (m)
7B-1	39°28.119'N	72°54.9438'W	66	1239
7B-2	39°28.0866'N	72°54.5478'W	67	1241
7B-3	39°28.2846'N	72°55.299'W	65	1238
8B-1	39°22.965'N	72°43.5498'W	88	1178
8B-2	39°23.0124'N	72°43.635'W	87	1166
8B-3	39°28.9488'N	72°43.6988'W	88	1165
9B-1	39°21.9348'N	72°41.6712'W	98	1096
9B-2	39°22.8066'N	72°41.4024'W	98	1199
9B-3	39°21.9582'N	72°41.5206'W	98	1206
AT13A	39°12.50'N	72°26.60'W	315	1049

13B This site was moved to CDP 1650 on line 32 to avoid an anticlined crest with an associated flat spot that may result from a gas-water contact. Water depth of this site is around 600 m. Approved penetration is 750 m.

Site	Latitude	Longitude	Depth (m)	Penetration (m)
13C	39°13.3315'N	72°16.9594'W	652	625
13D	39°16.7249'N	72°18.9547'W	285	429

All the Leg 174A shallow-water sites have been approved to penetration depths exceeding the 1 km depth cited in "Guidelines for Shallow Water Drilling Hazards" (maximum approved penetration: 1241 m at site 7B-2). PPSP approved deeper penetration depths because data on which these safety reviews were based are of very high quality and the extensive drilling results in this area indicate deeper penetrations are reasonably safe. It goes without saying that the drilling operations must be constantly and carefully monitored for hydrocarbons and that drilling must be stopped if dangerously high concentrations of gas are encountered.

Logging while drilling is planned for all Leg 174A sites. It follows that twinned holes must be drilled. PPSP assumes that each logged hole will be located within 20 m of the initially drilled and continuously cored hole. Following a discussion led by Mike Storm, it was decided that LWD holes will always be terminated above levels at which gas occurrences necessitate termination of the initially drilled and cored twin holes. This level will be determined by the ODP Operations Manager. The LWD holes will be plugged with appropriately weighted drilling mud because plugging with cement could damage the LWD gear, according to the operators of this equipment.

No review was necessary for the previously approved Leg 174B Cork/Engineering sites.

Wolf Berger and Volkhard Spiess described the regional geology, geophysics, and scientific objectives for Leg 175, Benguela Current. They then led the site-by-site discussion connected with the safety review.

It became apparent that Angola Basin sites, north of the Walvis Ridge, overlap areas of active hydrocarbon exploration. Art Green and Dietrich Horn emphasized the prevalence of oil shows and production on and offshore in and adjacent to this region. Little progress was made toward approval of specific sites. David MacKenzie suggested that the order of presentation be reversed starting in the south with sites in the Cape Basin. This procedure was adopted following what amounted to a preview of the Angola Basin sites. These southern sites were approved.

Southern Cape Basin

Site	Latitude	Longitude	Depth (m)	Penetration (m)
SCB-1	31°25.0'S	15°17.0'E	1350	400
SCB-A	31°54.4'S	15°14.1'E	2234	600
SCB-B	31°47.1'S	15°30.0'E	1507	600
SCB-C	This site was moved to SP650 on line 6 to avoid possible sandy channel deposits and pinch outs. Water depth at this site is about 900 m and penetration is approved to 600m.			

Site	Latitude	Longitude	Depth (m)	Penetration (m)
SCB-D	31°21.3'S	15°36.5'E	778	600

Mid Cape Basin

Site	Latitude	Longitude	Depth (m)	Penetration (m)
MCB-A	29°22.5'S	13°59.4'E	1726	600

North Cape Basin

NCB-2B This site was moved to S.P. 3700 on line 12 and approved to a penetration of 600 m. Depth is about 1800 m.

Walvis Basin

WB-A This site was moved to SP 2300 on line 18 to avoid an anticlinal closure. Depth at this site is around 2700 m. Approved penetration is 600 m.

Site	Latitude	Longitude	Depth (m)	Penetration (m)
WB-B	21°05.6'S	11°49.2'E	1290	600

WB-C This site was moved to S.P. 1200 on line 21 to avoid faulting. Depth at this site is around 2200 m. Approved penetration is 600 m.

Walvis Ridge

WR-1A This site was moved to SP 3800 on line 24 to avoid possible pinch outs and closure. Water depth at this site is around 750 m. Approved penetration is 600 m.

An extended discussion was devoted to appraising Berger and Spiess of additional information the Safety Panel would like to have available for a subsequent safety review of the Angola Basin sites. There was general agreement that maps showing hydrocarbon occurrences in relation to proposed sites are necessary. Included in this class of data are offshore and onshore wells, fields, tar sands, seeps, cores, consessions, DSDP and ODP sites, etc. Horn agreed to assist Spiess in obtaining some of these data. If commercial well data are available, information on gas kick and mud weights would be helpful. Joel Watkins emphasized the necessity of true amplitude processing of available seismic data. The aim here is to eliminate any programmed gain control other than that normalizing spherical divergence so that gain control will not interfere with bright-spot analysis. Spiess said this would be done. Several possibilities of additional seismic and exploration studies in this area were mentioned: Rosendahl, RSMAS; Korner, LDEO; and Robertson Research, Houston. Geochemical sampling results may be available from TAMU working and satellite photos revealing oil slicks may be available from Texaco. Watkins compiled a list of the above lines of additional investigation that would be desirable. This list was supplied to the chief scientists together with names of contacts where available.

Ball summarized the situation regarding Angola Basin sites: if no additional information is forthcoming, a show of hands of Safety Panel members indicated that shallow sites, with penetrations of a 100 m or so, can still be selected for reasonably safe coring. With additional information, deeper penetrations may be deemed safe. Ball indicated that he would be in contact with the chief scientists.

James Natland described the regional geology, geophysics and scientific objectives for Leg 176, return to 735-B. Atlantis Fracture Zone, eastern Indian Ocean. Natland provided an interesting video illustrating the thin sedimentary section in the vicinity of drill sites and local flat spots that have been chosen as optimal positions for location of the guide base necesssary for drilling. A split core was also displayed for perusal by meeting attendees. The only conceivable hazard that could be involved in this venture is that serpentinization might occur in drilling into fresh periodotites with temperatures high enough to cause reaction between seawater in the hole and hot rock. This could result in formation of hydrogen gas. No new sites have been proposed since previous safety reviews and the Safety Panel didn't ask for a repetition of site-by-site discussions for this leg.

David Feary described the regional geology, geophysics and scientific objectives of the proposed for drilling the Western Great Australian Bight. He then led a discussion in connection with a safety preview of this project. Available data include a net of high quality MCS seismic lines tied to the only exploration test in the study area. This well, although favorably located structurally, was dry and lacked shows of oil or gas. Three onshore wells updip from the study area are also dry and lacking shows. It seems likely that reasonably safe drill sites can be chosen within this study area.

Martin Hovland presented work of his Statoil colleagues, demonstrating use of 3-D seismic data in shallow hazards detection. Time slices and cross sections available from 3-D measurements have to be very helpful in revealing sand-filled ice-scour marks 50-100 m wide and 10 m thick.

PPSP's next meeting was tentatively scheduled for Scripps Institution of Oceanography, Feb. 20-21, 1997, with Wolf Berger as host. The primary purpose of this meeting will be safety review of Angola Basin sites of Log 175, Benguala Current. Humphris and Francis made the point that previews and reviews of additional legs should, as much as possible, be included on the agenda for this meeting. Ball agreed.

Old and new business were considered and the meeting was adjourned.

TEDCOM Meeting Agenda

Yokohama Prince Hotel, Yokohama, Japan, 30-31st October 1996

1. Introduction to Meeting
- a) thanks to Host
- b) background to new Chairman

2. Apologies for absence

3. Discussion of OD21 Workshop - Interaction with TEDCOM
- a) items of immediate relevance for ODP
- b) items for future co-operation/consideration with ODP

4. Continuation of Links - OD21 and TEDCOM

5. TEDCOM Interactions with the JOIDES Advisory Structure and ODP TAMU
- a) Changes in ODP advisory structure
- b) Effectiveness of TEDCOM/TAMU interaction
- c) Effectiveness of TEDCOM/PCOM/SCICOMinteraction

6. ODP Leg Summaries and Future Proposals
- a) Activity on Legs since last meeting
- b) Forthcoming Legs - equipment to be used etc.

7. Engineering Development, Position Papers
- a) New structure overview
- b) Position Papers on technological requirements

8. TEDCOM Subcommittees

9. Engineering Legs

10 Items of Interest to TEDCOM-ODP
- a) HYACE - proposal to EU for pressure corer development
- b) VPC - ODP vibra percussive corer
- c) Initiative by European Members of ODP to try and obtain funding for technology applicable to ODP and other programmes concerned with deepwater working.
- d) Any others items?

11. AOB

12. Date of next meeting

Minutes of the 20th ODP TEDCOM Meeting held at the Yokohama Prince Hotel, Yokohama, Japan on the 30th and 31st October 1996

The meeting followed the OD21 Riser Technology Meeting held at the same venue over the period 28th-30th October 1996. Those present were as follows:

TEDCOM Members

Gary Marsh (USA)	Frank Schuh (USA)	Earl Shanks (USA)
Howard Shatto (USA)	Alister Skinner (UK) [chairman]	Charles Sparks (FRA)
Alex Summerour (USA)	Shinichi Takagawa (Japan) [Host for the meeting]	

TEDCOM Liaisons

Dave Falvey, JOI, USA	Brian Jonasson, ODP TAMU, DSD Manager
Gene Pollard, ODP TAMU	Jim Natland, PCOM Liaison

Guests/Observers

Kazuhiro Kitazawa, JAMSTEC (Japan)	Masanori Kyo, JAMSTEC (Japan)
Hiroshi Matsuoka, JAMSTEC (Japan)	Brent Shoemaker, ODL (USA)
Kazuyasa Wada, JAMSTEC (Japan)	

Dr Shinichi Takagawa, JAMSTEC, who was the organizer of the OD21 Workshop hosted the meeting.

Extracts from Minutes

Agenda Item 3 - OD21 Workshop and TEDCOM.
TEDCOM will support the OD21 Project as fully as possible.
The "Joides Resolution" is likely to remain the sole option for ocean drilling for ODP to at least 2008. This will have implications on any refurbishment/refit options to that vessel which may be influenced by ODP.

Agenda Item 5 - TEDCOM Interactions.
TEDCOM request PCOM to consider agreeing to a single TEDCOM meeting per year, together with sub-committee meetings for progressing selected projects.

Agenda Item 7 - Active heave Compensation.
TEDCOM will advise PCOM, by the December '96 meeting regarding Active Heave Compensation (AHC) which could be fitted to the "Joides Resolution" to improve coring.

Agenda Item 7 - Hammer drill.
TEDCOM recommend that the hammer drill project be closely monitored and be slowed down if good information and favourable results for a Joides Resolution operation are not forthcoming from SDS, even if this precludes a product for an engineering test leg in 1997.

Agenda Item 7 - Drydocking.
TEDCOM will assist ODP TAMU in building up a priority list for drydocking requirements. Implementation will be dependent on finally agreed funding.

Agenda Item 9 - Engineering Legs.
1997 - Leg 175B - will test the Hammer Drill-in Casing if available.
1998 - Projected DCS Leg. This will not be required.

AGENDA

A draft agenda had been circulated. In order to maximise the time available and ensure that the meeting was able to be completed before some members had to leave due to other commitments the order and grouping of items was revised. The revised agenda is attached and the following numbering refers to it.

1. (a) Meeting Host

Skinner opened the meeting by thanking Dr Takagawa for agreeing to host the meeting and arranging the venue. Dr Takagawa said that he was pleased to be able to do this on behalf of JAMSTEC.

1. (b) Chairmanship

Shanks explained the position with regard to the Chairmanship of TEDCOM. He had been chairman of TEDCOM but his work commitments were becoming so great that he wished to stand down as chairman and this had been put forward to PCOM. Skinner was mentioned as a successor and Shanks had agreed to canvas TEDCOM Members. Events overtook this and it was promulgated that Skinner was the new Chairman of TEDCOM without the members of that committee having a say. While recognising that the event had taken place and that there did not appear to be any dissent from members, Shanks formally proposed that Skinner take over as Chairman. This was seconded by Schuh and Shatto.

2. Apologies

Apologies had been received from Luy (Germany), Maidla (Australia) and Svendsen (USA).

3. The OD21 Workshop and interaction with TEDCOM

A workshop entitled the OD21 Riser Technology Workshop had taken place immediately prior to the TEDCOM meeting. This had engaged an international group of scientists and engineers involved with ODP together with JAMSTEC, the proponents of OD21. Although JAMSTEC organised the workshop it was set up with the agreement of EXCOM and TEDCOM.

TEDCOM Members wished a clear timetable of events which would allow a new drilling vessel, equipped with riser capability, to be built for scientific ocean drilling under the OD21 project. In particular TEDCOM wished to try and put a date to the earliest availability of such a vessel to undertake ODP-type international programmes. The discussion is summarised below:

JAMSTEC explained the steps which they are going through in order to progress the OD21 Project as follows:

* The workshop on riser drilling technology which had just taken place and which defined the outline requirements for deep water, deep penetration boreholes in a variety of situations.
* A similar scientific workshop, CONCORD, scheduled for July 1997, will combine the assessment of scientific group meetings into a comprehensive document identifying the science requiring a new type of drilling vessel which could be provided within the objectives of the OD21 project. A steering committee for CONCORD was meeting in Tokyo on the 31st October 1996.
* After both of those events have taken place and been assessed JAMSTEC will prepare a draft budget proposal for the implementation of the OD21 programme which includes the building of a new scientific drilling vessel. Application for funding will be made through the appropriate channels.
* Assuming all went favourably this would allow completion of the vessel by 2002 and commencement of scientific operations around Japan by end 2003. There is a learning curve and a work programme of several boreholes around Japan and the programme would then gradually be extended as experience and operational capability was obtained.
* International co-operation will be required even within the period of operation around Japan.

* After this period of one/two years it was envisaged that the vessel would become available for world-wide operations.

Natland commented that the timing of the new vessel for international operations may cause changes to be made to the ODP Long Range Plan (LRP) but this is not clear at this stage.

What is clear to TEDCOM is that the "Joides Resolution" is likely to remain the sole option for ocean drilling for ODP to at least 2008. This will have implications on any refurbishment/refit options to that vessel which may be influenced by ODP.

Of benefit to TEDCOM from the OD21 meeting was the set of "Model Holes" which are now available. This allows the ODP technology programme to be evaluated for future scientific programmes by consideration of generic sets of conditions.

TEDCOM also benefitted from the specific details given for the OD21 vessel. Summerour pointed out that the technology required for OD21 is similar to that being developed in the offshore oilfield at the present time and therefore a closer technology link will make it easier to reach a common goal

With certain reservations (eg the viability of a 16" riser in most severe storms) TEDCOM members endorsed the feasibility of the generic concepts for a new scientific drilling vessel for OD21 and the recommendations which were agreed at the end of the Riser Technology Workshop.

In order for JAMSTEC to continue to benefit from TEDCOM they should be specific in requirements and maintain informal links as well as the formal ones mentioned in 4. below.

On questions regarding the ODP LRP Natland confirmed that the LRP, after 2003, calls for a two ship operation with two separate contractors but one overall advisory structure and that it will not be called the Ocean Drilling Programme.

Sparks questioned the availability of funding for a two-ship operation and Natland advised that this was being addressed. The US scientific community was being focused to provide information on all relevant requirements which will support the case for the requirement for more than one ship within the new era of ocean drilling.

4. Continuation of Links with OD21

The Joides advisory structure will continue to assist the efforts being made by JAMSTEC to make the technical and scientific packages necessary to support and build up the OD21 Project. TEDCOM will assist JAMSTEC in obtaining information on the necessary technologies for such a vessel, whenever possible, and will maintain the link with JAMSTEC through Dr Takagawa who will also make a formal report on the progress of OD21 at each TEDCOM Meeting. Dr Takagawa was also encouraged to make contact with individual members of TEDCOM as and when he needs information with which they could possibly assist.

5. TEDCOM Interactions with the JOIDES Advisory Structure and ODP TAMU

Natland outlined the new JOIDES Advisory Structure and the background to the changes. It comes into effect on January 1st 1997. Essentially TEDCOM remains unchanged and, after December 1996, when it reports to PCOM, it will report to the SCICOM and OPCOM committees. As both of these committees have the same chairperson there is one clear line of communication for TEDCOM reporting. The SCICOM committee deals with the ranking and long term planning matters while the OPCOM committee deals with immediate operational and tactical matters. TEDCOM will, after December 1996, require to meet in JULY in order to report to the SCICOM/OPCOM meeting in August and should then meet mid year in Jan/Feb - however a proposal has been put forward which may change this format of mid-year meeting, as discussed below.

Jonasson, the new ODP TAMU Drilling Services Manager outlined how he has structured his department and how he saw TEDCOM assisting his efforts. He cited the mandate and illustrated past successes when TEDCOM was allowed to interact with the engineers at TAMU. He presented his project based development strategy which has regard to both the science requirement and the funding available. He expects TEDCOM to respond to the position papers presented to them, which have a five year forward look, updated yearly. It is his suggestion that the TEDCOM time may be better utilised if there was one main meeting a year at College Station and a set of TEDCOM subcommittees which met on an "as required" basis having regard to current projects and objectives. Discussion on this topic was taken at this stage.

Schuh endorsed the feeling of all members that this approach to TEDCOM/TAMU interaction was a most refreshing offer and was most welcome.

Sparks had a concern about the length of time there would be between meetings of the full TEDCOM, this had allowed for poor communication in the past when meetings were cancelled or delayed.
Skinner suggested that one meeting per year may allow us to recruit more experts into TEDCOM. Shatto pointed out that while he was not against two meetings per year he had only signed up for one per year!
Summerour said, and it was acknowledged by all, that there would be a huge saving in the expenditure of companies who volunteer their staff for TEDCOM, irrespective of the air fare savings if only one main meeting per year was instigated.
With good communications of e-mail, fax and phone even sub-committees need not have a requirement to meet too often. Video-conferencing was suggested but could prove difficult with international sub-committees and the different time zones!.
Natland wondered if one meeting a year would allow sufficient reaction time for SCICOM requests to be met? - This would have to be checked out but correspondence was an obvious possibility here.
On balance it was felt that the suggestion has merit and will be taken forward to PCOM by Skinner as they will have to approve any changes. In view of the new panel structure TEDCOM will have to meet again in JULY '97 when this subject can be discussed again.

Jonasson then continued with his strategy for development of the Drilling Services Department at ODP TAMU, following the requirements of the ODP Long Range Plan. The strategy is project based, closely focused to the science requirement of the ODP Long Range Plan and the available budgets.

Details of newly recruited staff were supplied, anyone in his group can lead a project and there is integration of the operations requirements from the outset.

Natland stated that the Scientists need to be kept closely linked to TEDCOM and the whole technology process in order that they are aware both of the limits and opportunities of any technology. He will explore how best this could be done once the new panel structure is in place.

6. Leg Summaries and Future Proposals
Pollard summarised the past legs 164-169 and outlined the activities proposed for the future legs 170-176. All past legs had been extremely successful and core collection records were broken. A drillstring was lost by accident on the last pipe trip of Leg 169 although, fortunately, no-one

was hurt during the incident.
Sparks suggested that it would be a good idea to include a sketch map of the location of the legs summarised as TEDCOM members were not so familiar with the locations as were the scientific community. This was agreed.

7. Engineering Development, Position Papers
Jonasson presented the committee with his perspective of the way forward. He gave an overview which included a mission statement and how he saw the Drilling Services Department interfacing with the aims and objectives of the ODP Long Range Plan. His review of a set of Position Papers supplied to TEDCOM illustrated the engineering work which required to be done on a Project by Project basis. This review of prepared position papers was in line with the EDRC and the new funding basis being imposed from JOI.
The three mission objectives of the ODP LRP were perhaps not issued to TEDCOM Members and it would be useful if they were - A. Skinner will check.

Of the Position papers presented some are ongoing technological requirements. All are now formalised into project status.
* Diamond Coring system (DCS)
* Hammer Drill
* Deep Drilling
* Legacy Holes
* Upgrading of Tools
* Drydocking

All show work to a defined plan, costed for budgetary purposes and with interaction points inter department, with TEDCOM and with other interested parties.

Such an approach determined priorities. A method of execution from the outset, for each project, was also given and could comprise up to five further phases commencing with evaluation of existing techniques through design and prototype development, land and sea tests as appropriate and finally reaching operational status with manuals being written and any upgrades being noted as time and operational use progressed.
Dedicated engineering legs were not seen as being a necessary part of this development and Jonasson thought that it would be more prudent to try and reserve some time on specific legs which could be used, by mutual agreement, if the situation allowed. This was planned for Leg 169 although the engineering time was returned to science due to various circumstances which suggested that the engineering trials would not have been a success.

DCS
The discussion on aspects of the DCS went beyond that in the position paper but all aspects are taken here. In particular heave compensations aspects were discussed.

ODP TAMU carried out an in-house (but non-associated) review of the present in derrick platform DCS (DCS Phase 2) and commissioned an independent safety assessment in the use of the DCS. Both reports gave it a fundamentally clean bill of health although there are obvious reservations about working on a platform up in the derrick.

In continuation of the TEDCOM recommended phasing of DCS work the Joides Resolution Top Drive and Compensation System has been instrumented for collection of data during the range of coring and drilling operations. Data is being collected at present. Initial teething problems have been ironed out and Leg 170 will attempt full data gathering. This data collection is to check out the controller system and simulation studies already completed and proceed the DCS to a land test using the new controller. Some of the data collected may be unreliable due to sensor specification - this is being checked out at present - hopefully it will be valid to test the model designed by Stress/Parvis.

Primary Heave Compensator improvements.
The Primary Heave Compensator seals have been reviewed and options to change are now available. Measurements will be made on the condition of the cylinders during the February 1997 Charleston Port Call (Leg 172) and two replacement options, plus re-packing with original type materials will be available. If at all possible the sensors presently fitted will remain in order that the performance of the compensator, with new seals, can be evaluated. The most favoured seals can only be used if the cylinders are in good condition and this cannot be determined until inspection which will take place at the same time as the replacement. An operational schedule for this has been determined.

Active Heave Compensation input to Primary Compensator.
The ultimate aim with the DCS is to operate it at the rig floor (DCS Phase 3). Jonasson put forward a proposal to stop work on DCS in its present form and consider using the immediate savings to purchase a RETSCO Active Heave Compensation (AHC) system to act on the primary heave compensator. AHC had already been identified by TEDCOM as being useful to assist (together with low friction seals) in bringing the residual heave with which the secondary compensator has to deal with, down to acceptable levels.
There was much discussion on this topic.

With regard to the heave compensation improvements there was universal agreement that an AHC system would improve the performance of the primary heave compensator and make the whole unit much more favourable towards all types of ODP coring. This, coupled with low friction seals in the Primary Compensation System should make a significant improvement to weight on bit stability.

There was not agreement that such a compensation system, when fitted, would allow operation of the DCS system, at deck level, without further secondary compensation being required. Additionally other matters of riser tensioners and making connections of DCS hydril pipe on a moving deck as opposed to on a steady platform would have to be resolved and thus the translation to deck level (the envisaged DCS phase 3) could not simply happen due to any improvements in the sensitivity of AHC systems.

All TEDCOM members present felt that the RETSCO AHC in its STANDARD form will be insufficiently effective to allow the DCS to be used without a secondary heave compensator as it is not designed for this work or for low hook loads.
Undoubtedly such a system would improve the chances of the DCS secondary heave compensation system, as presently configured, to work successfully. This had already been identified by TEDCOM when they supported the recommendation from Stress Engineering that low friction seals be installed in the main compensator.

In view of the doubts on the sensitivity of the primary heave compensator, even with the proposed AHC addition, the following is proposed by TEDCOM as the best way forward.

DCS Subcommittee members Marsh, Schuh, Shanks, Shatto and Summerour to liaise with Jonasson (Shatto to arrange) and all interested parties to obtain as much information as possible on the following:

* RETSCO performance figures and claims in relation to the provision of a coring AHC for ODP. If possible check this against operators with an existing system who may be able to provide figures. ODL will assist with this.
* Review the existing simulations of Stress/Parvis in relation to suggested deficiencies in their

modelling and possibly the data already retrieved from the ODP vessel.
* Assess the applicability of the RETSCO AHC for ODP coring improvements and make a recommendation to TEDCOM in time for the December PCOM meeting.

Almost certainly the introduction of an Active Heave Compensation System will improve the coring performance of ODP, especially in relation to RCB/XCB operations. PCOM should therefore be prepared to consider approving the funding for implementation, at their December meeting, if a favourable recommendation is received from TEDCOM following their review of the available system. The DSD proposal suggested the Capetown Portcall (Leg 176) in October 1998 as a possible date for AHC installation.

Any further development of DCS compensation systems can be held in abeyance until this recommendation is made. If AHC is selected as a way forward for ODP coring then an "on-ship" assessment of performance will help decide what is necessary for DCS compensation.

Natland expressed concern that, in 1998, there was no good survey in an area for an engineering leg for DCS. DCS will not be a candidate for an engineering Leg in 1998 whatever the recommendation of the DCS subcommittee on AHC as funding restraints will limit the speed of development so the requirement can fall.

Skinner to arrange with PCOM that US member travel for subcommittee meeting(s) on the AHC be authorised, this to include Natland (PCOM Liaison). PCOM will require the sub-committee recommendations by early DECEMBER.

Hammer Drill
This is a new system under development to set casing in fractured and rubbly rock at seafloor which is difficult, if not impossible, to drill and keep open for a second stage casing emplacement. A modified hammer drill sets a casing while drilling thereby allowing a one stage process to pass the difficult area at the top of the hole. Various sets of casing can be emplaced.

The concept uses a modification from conventional air hammers to water (hydraulic) hammers and is pioneered by Digger Tools of Australia (SDS)
A 4 1/8" demonstration hammer worked well in tests despite field problems. STATOIL has also used the system and is developing a larger (12 1/4") hammer with them. The geothermal programme in Iceland uses air hammers and Holte Bits. ODP would like to develop and use a 16" water hammer to drill in a casing and set it, possibly using two hammers, one at the top and one at the base of the casing. The lower hammer would be fitted with a Holte type bit rather than an SDS one.
Although the prospects are good and ODP wish to pursue the possibility of manufacture of a larger hammer the information from SDS is poor or non-existent to date. Some of the operating parameters which have been received would make the tool inoperable on the Joides Resolution, in the mode envisaged for ODP operations so design changes are required.

Costs are also escalating (65%) in relation to original estimates quoted by SDS only six months ago when the study began. Unfortunately they are the only company who has shown an interest in the development. ODP TAMU would like to trial a system on the 1997 Engineering Leg so time is short. A meeting is planned with SDS to resolve parameters and plan a land test.

Schuh pointed out that problems have been encountered in the past with pressure pulses when using hydraulic hammers in long strings. In addition he felt the company could possibly be over-stretched in modifying their existing product to a different type - a sentiment echoed by other members. He also said that John Rowley at Los Alamos has been involved in mud hammers and may be able to assist.

Summerour felt that Shell, Holland may have relevant experience.

Skinner pointed out that the Russians also have hydraulic hammers for drilling and coring - details exist at ODP TAMU. Clausthall, Germany are also developing down the hole hammers for the oil industry.

Marsh suggested that the smaller 12 1/4 hammer already being developed by SDC for STATOIL could work even if it did not have optimum performance characteristics and thus there may have to be a compromise. Quite a few thought it advisable to wait and see if the STATOIL development materialised as it is by no means certain that a scale-up will work.

Is there such an urgent need? Casing could be set with an under reamer or a retractable bit so be careful about leaping ahead with this company unless more information and definite guarantees can be obtained. The upcoming engineering leg can be used as a lever for trying to obtain more timely information from SDS but they must be made aware of the ODP requirements and provide to an ODP specification, or say that they cannot meet this.

The TEDCOM recommendation to PCOM on the hammer drill project is that it be closely monitored and be slowed down if good information and favourable results for a Joides Resolution operation are not forthcoming from SDS, rather than trying to attain a product for an engineering test leg in 1997.

Vessel capability possibly needs to be upgraded in respect of high pressure lines for fluid supply for hammer operations even although it is presently within contract specification.

First test of the 12 1/4" hammer drill is likely to be at Rogaland in Norway by STATOIL.

Marsh and Takagawa volunteered to monitor progress of this project. [Skinner will also contact Maidla, who is the Australia TEDCOM Member, with regard to this and with Luy who works at Clausthall.].

Deep Drilling

Jonasson felt that the Operation, Technology and Equipment need to be reviewed in relation to boreholes greater than 2km deep. He proposes a workshop with scientists to find out if the technology proposed for the LRP actually meets the requirements and to inform them of the full capability of the Joides Resolution.

One of the items listed was Measurement while Coring (MWC) and Shanks pointed out that even industry consortia have shied away from this due to the high cost of development and the ultimate cost of a tool which is very vulnerable (more so in ODP type boreholes).

It is necessary that science continues to drive the technology and TAMU and the logging operator need to be involved with SCICOM to set this up. Timing would have to be later than Feb. 98 according to Natland. Additionally interchange with scientists is essential, if nothing else to set priorities.

Legacy Holes

Only around 30 out of over 1000 holes are available for re-entry and further measurements.

A BOREHOLE (BORE Hole Observations Laboratories and Experiments) group want to change this by integrating post-drilling sub-seafloor science into the programme.

A Workshop is proposed in 1999 to deal with Legacy Holes and define how to proceed both in technology and requirements.

Natland pointed out that some of this is already in hand and has to be budgeted for at time of first drilling (casing strings etc). SSP could also have a bigger say in this.

There also needs to be improvements to tools for downhole (corks etc.) and new methods of recording and returning to holes.

Better focus is required in order to provide better engineering and less ad-hoc solutions. Natland will organise the scientific side and liaise with TAMU.

Upgrading of Tools
Despite a limited budget Jonasson wishes to continue to develop existing tools by observing their performance in the field and noting where improvements, often minor, could significantly improve the scientific return. There was no dissention to this.

Drydocking
A document was prepared for consultation. Jonasson wishes TEDCOM to put their individual priorities on the items shown with the most important for improving the scientific capability of the vessel, in their opinion, ranked at No. 1. He will collate and use as part of his "wish list" for the drydocking.
TEDCOM agreed the necessity of keeping the "Joides Resolution" in the best shape possible to beyond 2003.

In answer to a question from Sparks Natland responded that "Beyond the major drydocking in 1999 there are studies ongoing to assess the scientific requirement for a "stretched" Joides Resolution and USSAC are actively involved in the scientific data gathering for this assessment".

8. TEDCOM Subcommittees
The DCS subcommittee was the only active one and last met in January 1996 when the controller for the DCS secondary heave compensation was chosen. Data gathering for the next step of DCS is only now happening.

Marsh, Takagawa and possibly Maidla will monitor the progress of the Hammer Drill Casing system - Jonasson to keep them informed of requirements/liaise on milestones.

Luy and Skinner, together possibly with Svendsen will monitor the progress of the HYACE project, if EU funding is forthcoming. Jonasson will be kept informed of progress on a regular basis, again if funding is approved. His engineers will be involved if the tool is to have eventual operational status in the ODP suite.

9. Enginering Leg
1997 - Leg 174B will be primarily to test the hammer in casing system if it is available. Other items may be added in but are not considered at this stage. DCS will require further evaluation in due course but this is unlikely to be before FY99 so does not have to be a concern when the vessel is in the Indian Ocean. Installation of any AHC system can be done at a routine port call (possibly extended) and can run thereafter. If it becomes inoperable or does not perform it can be switched out and operations would revert to the existing procedures.

10. Items of interest to TEDCOM-ODP
HYACE - Hydrate autoclave Coring Equipment.
This is a joint EU proposal from several European Countries to improve and expand the ODP PCS system to include different methods of core collection and on-board but "in-situ" examination facility for core. JAMSTEC pressure laboratory for biological samples could have applicable technology to this especially as ODP are considering building a microbiology lab on board "Joides Resolution".

VPC - ODP Vibra Percussive Corer.

Presently held at BGS UK, this will be returned to ODP TAMU untouched. It arrived 18 months after the project on which it could have been used had started. The funding which could have been used for development was diverted to meet the project requirement by different means and further funding for technology improvement rather than technology invention has not been forthcoming. BGS have evaluated the commercially available tools and it seems better to consider purchase and modification of a Russian or German system to allow downhole vibrocoring. If this progresses the ODP requirement will be borne in mind also.

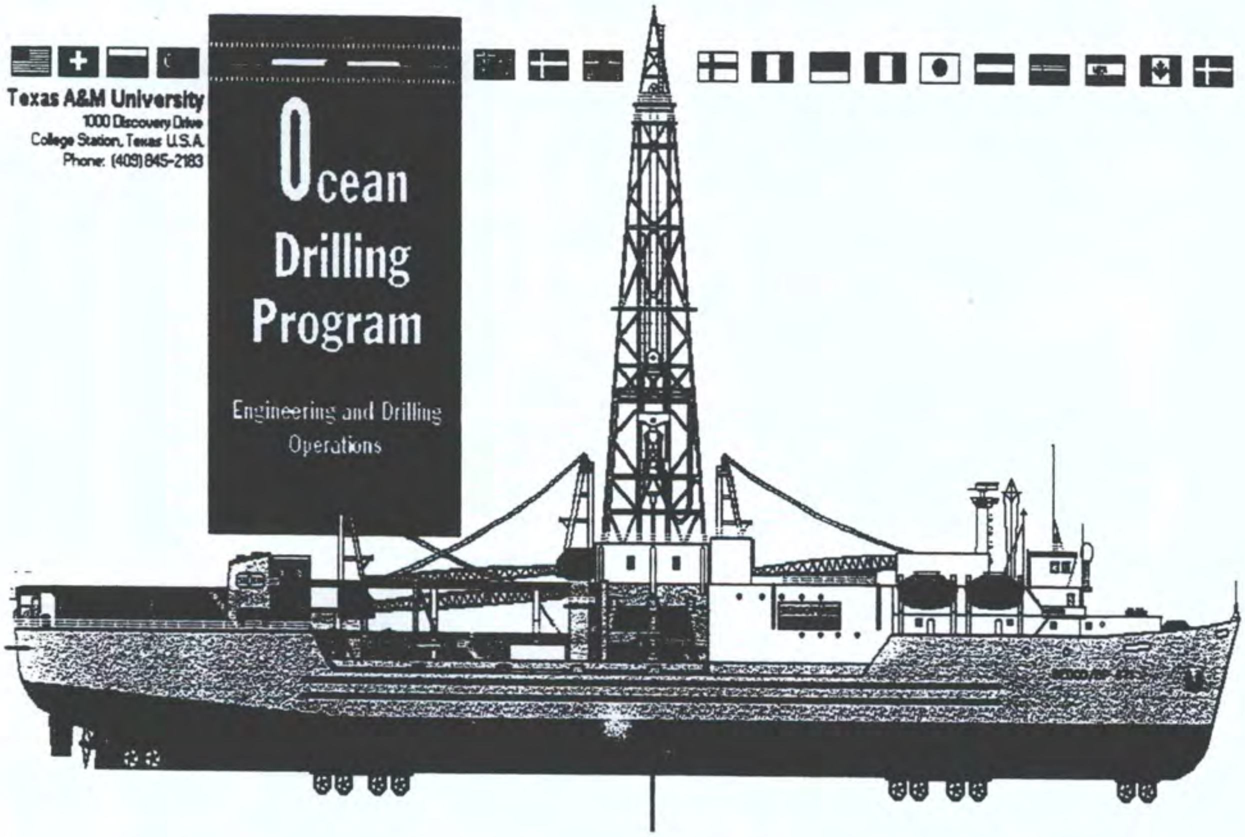
ESF co-ordinated European technology for deep water drilling.
Industry and research institutes Europe wide are getting together to progress this. There are definite advantages for ODP also and TEDCOM will monitor via Sparks, Skinner and possibly Luy.

Change of DP system in Joides Resolution. Howard Shatto is one of the most experienced persons available in this field and is willing to assist TAMU and ODL in this matter, especially with regard to the integration of different positioning systems. He will take the opportunity to make contact when addressing the DCS subcommittee matters on AHC in College Station in November.

11. AOB
Recruitment of new members - we are presently under strength and there is a possibility that Sparks will also be rotated off.
Skinner to ask for any US nominations when circulating the draft minutes. He will also find out from PCOM what the total membership should constitute then formulate a request to PCOM for consideration.
Skinner also to request PCOM permission to change to one full meeting a year, in JULY plus other subcommittee meetings, as required. It is possible that the change to one full meeting per year would encourage a wider industry participation.
If Sparks is rotated off France will provide a replacement.

12. Date of Next Meeting
Following circulation of the draft minutes and having regard to member commitments and other ODP related meetings it is proposed to hold the next TEDCOM meeting at College Station over two days during the week of 24-28 JUNE 1997.

The meeting closed with a re-iteration of our thanks to Dr Shinichi Takagawa of JAMSTEC for his hosting of the meeting and a request that he convey our appreciation to JAMSTEC for allowing him to do this.



20th Tedcom Meeting
Yokosuka, Japan
Oct 31 - Nov 1, 1996

TEDCOM and ODP/TAMU Interaction

History

The mandate of TEDCOM, as approved by the Executive Committee (EXCOM) in January 1994, is:

> **The Technology and Engineering Development Committee (TEDCOM) is responsible for recommending to PCOM drilling tools and techniques to meet the objectives of the scientific plan and for monitoring the progress of their development through liaison with the ODP/TAMU Engineering development department.**

This role for TEDCOM was reviewed in 1994 by the Engineering Development Review Committee (EDRC). The EDRC recommended the following regarding TEDCOM and ODP/TAMU interaction:

> The EDRC endorsed the mandate for TEDCOM and the recommendations that TEDCOM be a more proactive committee.
>
> TEDCOM's primary role in interacting with ODP/TAMU should be in project feasibility analysis and ensuing planning of development effort, not in the day-to-day details of the development engineering.

The EDRC also recommended a standard procedure for engineering development.

Observations

TEDCOM, like the other JOIDES panels, is made up of volunteers. However, unlike the other panels, the majority of TEDCOM members do not have a vested interest in the scientific objectives of ODP. The TEDCOM members "are doing the program a favor" in offering their expertise. This crucial difference means SCICOM/OPSCOM can only reasonably expect a few days time, in small, well-spaced increments, of any one TEDCOM member in a given year.

Two recent successes by TEDCOM highlight the group's potential effectiveness. When presented with the problems ODP/TAMU has experienced in starting holes on bare rock, it was a TEDCOM member that suggested the casing hammer concept. This same TEDCOM member provided contacts for follow-up by ODP/TAMU. TEDCOM's support of the hammer drill project helped succeed in scheduling testing time on the ship in FY97.

Another effective use of TEDCOM's time has been the DCS Subcommittee. This subgroup has provided a great deal of guidance to ODP/TAMU in the DCS development. Another side benefit to the Subcommittee approach has been avoiding the impossible task of bringing everyone on

TEDCOM up to speed on a complicated matter with a short presentation every six months. Instead the highlights and the decisions reached by ODP/TAMU and the Subcommittee can be discussed. Normally TEDCOM as a whole has been comfortable with this efficient and effective subcommittee approach.

These two success stories suggest the following course of action to optimize the TEDCOM interaction with the program.

Course of Action

1. ODP/TAMU reviews with TEDCOM a **Strategy for Development Projects** based on a five year cycle. The strategy will address development objectives of DSD, associated areas for development projects based on the long range scientific objectives of ODP, and a technology development methodology, including a format for position papers in each area. This will allow DSD to present a manpower loading and expenditure profile for development projects over the five year period, and allow TEDCOM to make recommendations on priorities to PCOM.

2. **Position papers** will be developed by DSD on each development area for review with TEDCOM. Each position paper will address critical areas for development engineering to achieve the science objectives of the ODP Long Range Plan. The following position papers have been developed for the FY 1998 to 2002 five year period:

- Hammer Drill System
- Diamond Coring System
- Deep Drilling
- Legacy Holes/Monitoring and Instrumentation
- Drydock/Ship Improvements

3. The DSD **Strategy for Development Projects** and associated **position papers** will be **reviewed yearly with TEDCOM** prior to the

- December 1996 PCOM or
- August 1997 SCICOM

This is an critical yearly TEDCOM meeting and review with respect to the overall direction of ODP development engineering projects as it will result in a recommendation by TEDCOM to PCOM/SCICOM on the priorities to be assigned to each project and the manpower/expenditure profile for DSD in its upcoming fiscal program plan which is reviewed and approved at PCOM/SCICOM.

4. Based on the successes noted above with respect to the hammer drill and diamond coring system subcommittee approach it is also suggested that **TEDCOM appoint a subcommittee chair for each of the position papers** referenced in item 2. The subcommittee would meet as appropriate over the year with the Project Manager and Development Engineering staff in College Station to

interchange technical ideas. The mandate of each subcommittee can be defined by the subcommittee chair, subject to the approval of the TEDCOM chair. The TEDCOM subcommittee chair would have the responsibility of supplying the TEDCOM chair a brief progress report prior to SCICOM/OPSCOM meetings.

5. DSD ODP/TAMU's **development engineering direction and budget** for the upcoming fiscal year will then be **determined by the priorities established by SCICOM/OPSCOM** (August meetings with new structure) with technical input to OPSCOM from TEDCOM.

6. This **recommended format for future TEDCOM meetings** will result in

- A **yearly general meeting of TEDCOM** in College Station to review the 5 year development engineering strategy with brief progress reports by TEDCOM subcommittee chairs and ODP Project Managers.

- **TEDCOM project subcommittee meetings** as appropriate over the year with appropriate DSD staff to review and exchange technical information relevant to the project.

Drilling Services Department
Ocean Drilling Program
Strategy for Development Projects
5-Year Plan 1998-2002

Mission Statement

The Drilling Services Department functions as a team oriented project group to support the drilling/coring goals and objectives of the scientific community. The Drilling Services Department will provide and improve drilling/coring, engineering and material services in an administratively efficient, cost effective and timely manner.

Development Objectives

Inherent in this task is the continued development and refinement of tools and techniques required to meet the scientific objectives outlined in the following documents:

- Ocean Drilling Program Long Range Plan "Understanding Our Dynamic Earth" March 1996.
- Borehole "A plan to advance post-drilling, sub-seafloor science" December 1994.
- ODP Five Year Science Plan (1998-2003).

Position Papers

The Drilling Services Department has identified the following areas which require position papers to address ODP's vision on the tools and milestones needed to meet the objectives identified for Phase II, III and IV of the science plans:

Position Paper I	Diamond Coring System
II	Hammer Drilling System
III	Deep Drilling
IV	Legacy Holes
V	Improved Drilling/Coring Tools
VI	1998/99 Drydock of ***Joides Resolution***

The inclusion of position papers in key areas of engineering and scientific development in ODP's Program Plan, with five year forecasts, will initiate an effective and consistent means of maintaining communications with the science community and the JOIDES committees. This strategic ODP development plan can also be reviewed yearly with TEDCOM prior to the key JOIDES SCICOM/OPSCOM committee meeting to ensure that an independent technical opinion on the strategic ODP development plan is presented to the JOIDES committees. TEDCOM can also create technical subcommittees to work in each area (position paper) with ODP's staff, supplying independent engineering audit reports to the TEDCOM chair for review with the JOIDES committees.

Technology Development Methodology

ODP will approach technology development needed to meet the scientific objectives of the Long Range Plan using the following project management phases:

Phase 1 - Scientific/Conceptual Requirements

Based on the scientific objectives defined in the above planning documents, ODP will develop a work breakdown structure (WBS) identifying existing technology and potential new technology for each position paper. Each element of the WBS will describe the current operational status of specific equipment, potential new technology (equipment/tools) with a description of the tool, development risk (probability of engineering success), development time frame and estimated costs.

A key step in this development methodology, using the initial documentation prepared by ODP for the Program Plan and five year forecasts, will be the establishment of a WORKSHOP to review the scientific objective, technical objectives, technical solutions and development time frame with those scientific participants having the appropriate expertise. TEDCOM subcommittee and other technical/scientific representatives will participate to ensure ODP's development program meets the needs of the science community. Project work, scopes and schedules will then be modified by ODP to meet the scientific objectives and recommendations identified by the workshop.

Phase 2 - Preliminary Engineering/Commercial Evaluation

ODP staff will carry out preliminary evaluation of the equipment/tools, including the availability of existing technology to meet the needs of the program plan. This preliminary evaluation will be documented in a preliminary engineering report on specific WBS tasks for discussion and consensus at appropriate workshops and for TEDCOM subcommittee review.

Phase 3 - Engineering Design/Prototype Fabrication

Detailed engineering design/prototype fabrication of the equipment/tool based on the preliminary engineering reports and recommendations by the science community and TEDCOM will commence following successful completion of Phase 2 and SCICOM/OPSCOM approval of this phase in the Program Plan.

Phase 4 - Land Testing

Land testing will be required. if feasible and as appropriate. to validate the readiness of new technology to meet the operational performance requests of offshore deployment.

Land testing will be the primary method for testing new in-situ measurements and downhole sampling tools prior to deployment on the JR. This includes Measurement While Coring (MWC) technology. Test results shall be compared to design parameters to resolve differences.

DSD staff members will interface with oil company representatives to obtain access to operational wells to maximize the testing opportunities for tools prior to operational deployment on the JR. Performance parameters and tool/equipment specifications are a final Phase 4 effort.

Phase 5 - Engineering Leg

It is recommended that consideration be given to a dedicated engineering leg to test major new systems prior to turning the equipment/tool over to ODP as an operational/community approval tool.

Dedicated Engineering legs in the 5 yr Plan are forseen as requirements **only for the DCS and HDS.**

For **testing new tools**, it is recommended that **2 days discretionary testing be available** to the Operations Superintendent **on each leg**. This would ensure that new or modified tools and coring equipment are properly field tested for operational use. This testing would occur only if appropriate conditions are avilable for testing the tool at a hole, after discussion with the staff scientist and co-chief scientists, and would be available to achieve the science objectives of the leg as additional days near the end of the leg if it was not used for testing tools. Ideally, testing requirements would be integrated into the Leg Prospectus as a result of discussions with the Co-Chiefs.

Phase 6 - Operational Upgrades

Follow-up work to finalize procedures, technical manuals and modify equipment/tools prior to releasing the equipment/tool for use by the scientific community on an ODP Leg.

This **phased approach to technology development** will ensure that a consistent project management methodology is used by ODP on all projects for review, comment by TEDCOM, and approval by SCICOM.

Format of Position Paper

Position Papers for technology development will be formatted using the following headings:

- TITLE
- PURPOSE/OBJECTIVE
  - Scientific
  - Operational

  With cross-references to the objectives of the science plans.

- BACKGROUND

  The background will address current ODP equipment/tool technology, its application and limitations, its use on previous legs and whether it addresses and meets Phase II or III requirements of the LRP.

- TECHNOLOGY WORK BREAKDOWN STRUCTURE

  Equipment/tool requirements for each position paper will be identified in a work breakdown structure (WBS) which will identify existing and new tool requirements. Tool Development milestones will follow the technology development methodology discussed above, with an appropriate Gantt chart.

DRILLING SERVICES DEPARTMENT
PROGRAM PLAN BUDGET SHEET
DEVELOPMENT PROJECTS SUMMARY

	FY96	FY97	FY98	FY99	FY00	FY01	FY02		
HAMMER DRILL SYSTEM									
MANHOURS	750	1,840		1,600	200				
SUBTOTAL $	200,504	627,314		535,000	345,000				
DCS									
MANHOURS		2,730	2,500		500				
SUBTOTAL$		$ 442,750	$ 490,000		$ 630,000				
DEEP DRILLING									
MANHOURS		900	200	400	1,000	1,500			
SUBTOTAL $	50,000		-	65,000	150,000	500,000	500,000		
LEGACY HOLES									
MANHOURS		100	500	500	500	500	500		
SUBTOTAL $				65,000	150,000	150,000	150,000		
1999 DRYDOCK									
MANHOURS		1,000	1,500	1,000					
SUBTOTAL $		1,500	5,000	217,000					
TOTAL MANHOURS		6,570	4,700	3,500	2,200	2,000	500		
TOTAL $		1,071,564	495,000	882,000	1,275,000	650,000	650,000		
MINUS Lab Stack related eqmt costs for Drydock @				519,000					
		FY99 Subtotal $		363,000					

MANAGER
DRILLING SERVICES DEPT
(DSD)
BRIAN JONASSON

STAFF ASSISTANT
MARTHA KACER

DEVELOPMENT ENGINEERING TEAM (DET)
CHARLES BOLLFRASS

MATERIAL SERVICES TEAM (MST)
PAT THOMPSON

DRILLING OPERATIONS TEAM (DOT)
RON GROUT [1]

PROJECT STAFF

ENGINEERS

MIKE FRIEDRICHS , ENGINEERING ADVISOR (DET)
LEON HOLLOWAY, SENIOR ENGINEER (DET) [1]
ROLAND LAWRENCE, SENIOR ENGINEER (DOT) [2]
SCOTT McGRATH, SENIOR ENGINEER (DOT) [1]
TOM PETTIGREW, ENGINEERING ADVISOR (DET) [1]
GENE POLLARD, OPERATIONS SUPERINTENDENT (DOT)
BILL RHINEHART, SENIOR ENGINEER (DET)
MIKE STORMS, OPERATIONS SUPERINTENDENT (DOT)
TBN , (DET) [3]

TECHNICIANS

JIM BRIGGS, ELECTRONIC TECHNICIAN (DET)
DAVID LEHNERT, SENIOR MATERIALS TECHNICIAN (MST)
MARK ROBINSON, SENIOR DESIGN TECHNICIAN (MST)
ERIC SCHULTE, SENIOR DESIGN TECHNICIAN (DET)

Task: 1803 Drilling Services
Subtasks: Downhole and ship system improvements and design, material services and drilling operations.
Function: Liaison and coordination of drilling services to support the goals and objectives of the science community.

1. Qualified to sail as Operations Superintendent.
2. Works with Drilling Operations Team when Continental Shelf Drilling activities allow. (Not charged to ODP.)
3. 50% Effort

September 6, 1996

TASK 1803: DRILLING SERVICES DEPARTMENT

POSITION:	DESCRIPTION:
Manager, Drilling Services Department (1):	**Manages and directs the Drilling Services Department as a team oriented project group to support the drilling goals and objectives of the science community. Has overall administrative and financial responsibility for the department.**
Staff Assistant (1):	**Provides administrative support, supervises student support staff, and coordinates activities for Manager and Department.**
Team Leaders (3):	**Supervises a group of professional and non-professional technical people performing a variety of duties in a single field of engineering or concerned with a single area of operations. This is the first level of direct and sustained supervision of other professionals. Requires application of mature engineering and operational knowledge in planning and conducting the activities of the team.** **Responsible for the technical oversight for their functional area and for the administrative and financial management for their team. Responsible for effective team leadership. May function as a Project Manager with full responsibility for a project.**
•Development Engineering Team (DET):	**Evaluates, modifies, develops and designs coring, drilling, and re-entry equipment, handling tools and downhole systems utilizing sound engineering practices in a cost effective and timely manner. Maintains a current knowledge of, and recommends improvements to, the capabilities of all ship systems (hull, machinery, and electrical) and drilling systems and an engineering knowledge of electrical and electronic systems to ensure all upgrades and additions to the ship, drilling system and lab stack are carried out utilizing sound engineering practice in a cost effective and timely manner. Full responsibility and accountability for design of all ODP downhole systems and ship system improvements.**
• Material Services Team (MST):	**Maintains cost effective, competitive and auditable inventory control, warehousing, procurement, quality control and shipping functions; utilizing sound material services practices and principles. Full responsibility and accountability for quality control of materials and materials in Drilling Services Department inventory.**

TASK 1803: DRILLING SERVICES DEPARTMENT

POSITION:	DESCRIPTION:
• Drilling Operations Team (DOT):	**The Drilling Operations Team Leader acts as an alternate to the Manager of the Drilling Services Department when the Manager is absent from College Station. Plans, implements and is responsible for a safe, professional and cost effective scientific drilling and core recovery operation utilizing sound drilling practices and principles to achieve the goals and objectives of the scientific community. Full responsibility and accountability for the implementation of all drilling activities on the *JOIDES Resolution*.**
Operations Superintendent (2):	**The Operations Superintendent represents the Ocean Drilling Program on the *JOIDES Resolution* and has the responsibility of ensuring that the Leg's Scientific Prospectus and SCICOM's drilling and logging guidelines are followed during the cruise operations. The Operations Superintendent is the senior representative of ODP on the *JOIDES Resolution* and works in a team environment with the Co-Chief Scientists, the ODP Laboratory Officer, the ODP Staff Scientist, and the Leg's Coordinator ashore to achieve the Leg's scientific objectives. Responsible for preparing the leg site and hole program and schedule and modifying it in the field, in consultation with the Co-Chiefs, to maximize the scientific results of the cruise.**
Project Engineers (5.5):	**Responsible to their functional Team Leader and Project Manager for completion of assigned engineering tasks utilizing sound engineering practice in a cost effective and timely manner. May function as a Project Manager with full responsibility and authority for a project, or as Operations Superintendent, if qualified and experienced.**
Project Technicians (4):	**Responsible to their functional Team Leader and Project Manager for completion of assigned technical support duties utilizing sound technical practice in a cost effective and timely manner. May function as a Project Manager with full responsibility and authority for a project.**
Engineer:	**Performs assigned duties associated with design of projects. Will use a variety of standard engineering methods and techniques and will assume responsibility for moderately complex components and systems.**
Senior Engineer:	**Carries out responsible and varied engineering assignments, requiring general familiarity with a broad field of engineering and knowledge of reciprocal effects of the work upon other fields. Problems usually solved by use of a combination of standard procedures or methods developed in previous assignments. Participates in planning to achieve prescribed objectives.**

TASK 1803: DRILLING SERVICES DEPARTMENT

POSITION:	DESCRIPTION:
Engineering Advisor:	**Works as an advisor or consultant in a particular field of engineering, development or research. Requires application of mature engineering knowledge in planning and conducting projects having scope for independent accomplishment, including coordination of professional staff. Assigned problems make it necessary to modify established guidelines, devise new approaches, apply existing criteria in new manners, and draw conclusions for comparative situations.**
Total Personnel:	**16.5 FTE**

OCEAN DRILLING PROGRAM
GUIDELINES FOR SHALLOW WATER OPERATIONS

Water Depth	Well Bore Conditions	Environmental Factors	Equipment Limitations
0-75 m	Operations will not be conducted.		
76-300 m	1-6	7,8	9-11
301-650 m	1-6	7,12	9-11
651+ m	1-3	7	10,11

<u>0 to 75 m water depth</u>:
Operations will not be conducted.

<u>76 to 300 m water depth</u>:

1. Operations will be terminated if a water flow or excessive gas is detected.
2. ODL* and ODP supervisors will be advised if overpull or torque increases.
3. Supervisors will be notified in the event of hole problems and mud sweeps will be circulated in an attempt to clean the hole. A wiper trip will be made if required, and coring may be terminated to avoid stuck pipe.
4. A wiper trip should be made every 1-2 days to eliminate tight hole sections.
5. The compensator will be left partially open while working stuck pipe.
6. Logs should not be attempted unless hole conditions are good. The CSES (side entry sub) should not be used.
7. ODL approval is required if the distance to shallow water is less than one nmi. A primary and backup beacon will be used in confined locations.
8. Coring operations will be terminated if:
   Heave compensator stroke exceeds 1.0 m,
   Wind exceeds 35 kts or roll exceeds 3 degrees,
   Weather/sea state is rapidly deteriorating,
   Floating ice enters the safety zone,
   Coring should be terminated if a loss of positioning is anticipated.
9. Preparations will be made to sever the drill pipe if stuck pipe cannot be pulled free with up to 200K lb overpull.
10. The compensator will be locked and the 500 ton elevators will be landed on the rotary in the event of an emergency "drive-off" situation if time permits.
11. The overpull limitation and maximum allowable stress on the drill string will be calculated daily and posted.

<u>301 to 650 m of water depth:</u>
Same limitations as 76 to 300 m water depth, except:

12. Coring operations will be terminated if:
    Heave compensator stroke exceeds 2.0 m,
    Wind exceeds 50 kts or roll exceeds 5 degrees,
    Weather/sea state is rapidly deteriorating,
    Floating ice enters the safety zone.

*Overseas Drilling Limited (ODL) is a joint venture corporation owned by Sedco Forex (Schlumberger) and DSND-Sondenfjeldske.

DIAMOND CORING SYSTEM
COMPOSITE DESIGN AND OPERATIONS REVIEW

1) Objectives of DCS Review:

a) to assist scientists in evaluating the potential benefits and liabilities of using the DCS system and recommend optimum test/operational conditions,

b) to provide an independent systems-level audit of the integrated DCS design and operations plan to identify safety issues, potential hidden flaws, and areas which may have been overlooked or may need further study, and to suggest improvements. The review will help solidify present DCS plans and future work proposed in FYs 97-99.

2) DCS project was divided into five systems-level portions for the study:

Gene Pollard-Team Leader (Operations Plan)
Tom Pettigrew (Mast and Platform)
Matt Stahl (Tubulars)
Roland Lawrence (Sea Floor Systems, Downhole Tools, Bits)
Pat Thompson (Mobilization and Deployment).

3) DCS Design Team provided Review Team with relevant DCS design documents, interviews, and assistance (references are listed in the Appendix):

Dan Reudelhuber (Team Leader)
Leon Holloway (Downhole Tools & Bits)
Jim Briggs (Electronics)

4) Review Team produced five brief systems-level reports (Appendix, References 1-5):

a) combined into a "Composite DCS Design and Operations Review".

b) Overseas Drilling Limited (ODL) provided written comments .

5) Mining-style diamond coring was (and still is) the best coring option known to obtain good core recovery in young crustal-rocks as well as many problematic inter-bedded-hard/soft-sediments.

6) Decision to develop mining-style diamond coring system for ***J/R*** prompted by two severe operational problems encountered in initial attempts to rotary core in unstable crustal-rocks:

a) Hole Problems (i.e., starting a hole, enlarging and deepening a hole, and setting casing): The Review Team recommends additional development and testing of several promising casing emplacement technologies (i.e. the hammer drill-in casing, tri-cone replaceable bit (TRB), Drill-in-BHA, casing underreamer, etc.).

b) Coring Problems (i.e., poor recovery, slow rate of penetration, and limited bit life): The Review Team strongly recommends that the next DCS engineering leg should be in more stable rock (such as Hole 735B on SWIR) to avoid lost time in starting a hole, train crews, evaluate diamond coring performance and tools, and determine optimum operating parameters. If coring tests and DCS operations are successful at the initial site, the ship could be moved to more challenging sites for the remainder of the leg.

7) It is a tribute to the personnel involved in the DCS engineering development project that it has progressed so far with a limited budget, schedule delays, a very small work force, personnel changes, and limited shipboard/onshore testing opportunities.

8) Tremendous progress has been made towards developing a functional DCS system; however, implementation of the next DCS engineering leg is dependent on a successful DCS controller and sensor tests.

9) Recommend an independent safety assessment be conducted for the DCS system and mast/platform operations. In addition, a number of potential concerns were identified that should be addressed by further study and/or equipment modifications before the next engineering leg. Additional concerns were identified for future deeper coring with a mature DCS system.

CONCLUSIONS & RECOMMENDATIONS

A. BEFORE THE NEXT ENGINEERING LEG

MAST/PLATFORM

1) The mast, platform, electric top drive, and various support structures are adequate for carrying out DCS operations. The DCS secondary heave compensator controller is not operational yet, relies on multiple sensors, and is very complex; however, the design has been reviewed by several outside consultants and deemed an acceptable solution. A satisfactory test of the mast/platform shock system was performed under simulated conditions, and land testing of the controller and ship tests of the sensors are planned. The troublesome hydraulic wireline winch now operates efficiently.
(•) Upcoming land testing of the controller and ship tests of the sensors will help confirm general operational feasibility before deployment on the DCS engineering leg.

2) The overall platform and mast unit was found to perform reasonably well and safely considering that it and DCS coring personnel are suspended from the primary heave compensator 45 ft above the rig floor.

There are four major safety issues that must be addressed regarding the DCS in the current configuration: a) pipe failure while coring, b) sudden drive off or excursion, c) traveling equipment failure, and d) fire.

(•) A safety assessment is needed of failure mode (severity and frequency) and the potential for risk to personnel working on and below the DCS platform.

(•) The recommended modifications and improvements identified during Leg 132 (pages 160 - 162 of the Proceedings of the Ocean Drilling Program, Initial Results, Volume 132) and identified during Leg 142 (page 114 of the Proceedings of the Ocean Drilling Program, Initial Results, Volume 142) should be reviewed and addressed.
(•) A personal platform escape system is needed to provide DCS platform personnel with a quick emergency exit from the platform to outside the derrick.

3) (•) Fully evaluate the total DCS heave compensation system by collecting extensive downhole data using the DCS weight on bit tool prior to initiating any further coring operations.

TUBULARS

4) The extensive work done on the tubulars material specs and heat treatment looks thorough and to the point.
(•) Reanalyze the tubing string for stress and fatigue including the effect of large diameter tool joints, which increases bending moment in the connections.
(•) Analyze the effect of recoil and short duration shocks to determine if they can impart damaging loads in the event of DCS tubing or riser parting.

5) (•) Develop a clear procedure to calculate the proper amount of hook load to achieve the desired riser tension.

6) (•) Consider an alternate design approach for the Safety Joint to eliminate the shearing effect in the pins and consider the safety implications of removing the device from the riser.

7) (•) Reevaluate the curvature and peak stresses calculated for the existing tapered drill pipe riser stress joint to see if it will pass tools freely and meet structural requirements under reasonable operating conditions.

SEA FLOOR, DOWNHOLE TOOLS, BITS

8) The majority of the sea floor hardware appears to be well thought out and appropriate for the present DCS design. The current design of HRGB and 10-3/4 in. and 6-3/4 in. DI-BHA appears adequate for DCS work.
(•) The DCS sea floor/casing/bit equipment system should be tested thoroughly in a more benign environment (before the DCS leg) to enhance the development of casing emplacement and bit technology.

OPERATIONS PLAN

9) (•) The next DCS shipboard test should be located **initially** at a site with relatively benign lithological and environmental conditions to provide the best opportunity for a successful and productive shipboard trial of the coring system and secondary-heave-compensator controller. The goal would be a 150 m penetration with 50% recovery. This would permit evaluation of diamond coring performance and permit the crew to gain familiarity with operating techniques and equipment responses before moving to progressively more unstable zero-age formations.

10) (•) The operating procedures should be updated and consolidated into a formal written operating manual with normal and emergency operating procedures.
(•) Documentation on equipment design should be updated and improved.
(•) A formal stuck pipe procedure is needed that addresses issues such as overpull limits and catastrophic failure of drill strings simultaneously or independently.
(•) A formal rig floor calculation sheet is needed to determine maximum allowable overpull in stuck tubing and riser situations on a daily basis.

11) (•) An integrated core data spread sheet is needed to maintain records of core catchers, rop, sea state, heave, apparent wob fluctuation, and core recovery problems.
(•) It may be prudent to short trip the bit into the casing shoe every 6 to 24 hours to allow loose rubble to fall to bottom and reream tight hole sections.

12) (•) Additional fishing tools that might be useful include a lead impression block, a piloted internal-mill, a 6-3/4" side-throat boot basket and reverse circulating junk basket. A wall hook would be useful in fishing a bent flex joint or joint of pipe following a riser part.

13) (•) The Operational Safety Guidelines should clarify (for each type of emergency) the actions and notifications expected of key (and relief/backup) personnel.
(•) Specify holding individual training and integrated ship safety drills for all personnel involved in the main emergency events before starting operations.

14) (•) The fundamental operational problems that have hampered previous DCS operations suggest that an Operation's Superintendent should be assigned to the DCS Design Team and should go on DCS legs to handle routine operational matters and reports, and assist the DCS Engineering Design Team in planning operations.

15) TAMRF carries insurance in ODP's name of $1 million Workers Compensation and Maritime Employer's Liability and $1 million Comprehensive General Liability insurance that covers ODL, SOS, Consultant, and ODP personnel working on the ship and on the dock. Claims above $1 million would be covered through the NSF with government approval.
(•) The issue of insurance coverage for all personnel working on and below the platform should be reviewed.
(•) Special insurance coverage may be required to cover damage to ODL's equipment by the DCS system while the DCS is under development.

MOBILIZATION AND DEPLOYMENT

17) The average cost and time required for mobilizing and deploying the DCS equipment for a leg can be summarized as follows:
- A) DCS mobilization and demobilization costs for a leg are $245,550 with no ocean shipping and requires 16.6 days of leg time (includes setting 2 casing strings but no coring time).
- B) DCS mobilization requires 2 weeks of preparation at a yard near its storage area and 5-7 days dockside for installation on the ship. The projected cost for trucking (17 loads) to a US port is $34,000. Total mobilization without ocean shipping is $112,000. The estimated cost of one way ocean freight to Panama is $100,000, which would double the mobilization cost.
- C) Actual DCS deployment 14.9 days (includes setting 2 casing strings but no coring time). Rig down will take about 1.7 days.
- D) Coring time is more a function of water depth and bit life than penetration rate. The drilling rate is about 6 to 8 m/hr (Cores 132-11D to 18D), and bit life estimates run between 25 to 100 m/bit (formation dependent).
- E) Bit trips require 1 day to set back the DCS platform, disconnect the riser, and round trip the drill pipe riser and DCS tubing.
- F) A penetration rate of 100 meters per week seems reasonable based on Cores 132-11D to 18D.
- G) Transporting the DCS back at its storage area and moth balling it will take about 3 weeks. Moth balling the hydraulic components and derrick platform is straight forward and can be accomplished using contract labor. Tubular maintenance could take several months. The estimated cost of demobilization is $133,550, which includes trucking from a US port.

FUTURE DEEP CORING LEGS

MAST/PLATFORM

18) (•) The initial test phase configuration is designed to demonstrate the feasibility of the diamond coring concept; however, more efficient operation of the system will ultimately require that the system be reconfigured to remove the platform and associated DCS personnel from the derrick.

TUBULARS

19) (•) Assess the severity of wear on the zinc coating of the riser (drill pipe) caused by rotating the tubing string inside it. Modify maintenance, inspection, recoating, operational, or replacement procedures as necessary and note added cost.
(•) Include the effect of running knobby drill pipe at the top of the API string into any further riser analysis.

SEA FLOOR, DOWNHOLE TOOLS, BITS

20) (•) Consider narrowing the kerf on the DCS bits.

21) The majority of the sea floor hardware reviewed appears to be well thought out and appropriate for the present DCS design.
(•) The DCS sea floor/casing/bit equipment system should be tested thoroughly in a benign environment to enhance development of the cased hole technology.

22) (•) Perform sea tests with the Tricone Retractable Bit ASAP to evaluate potential for casing emplacement.

OPERATIONS PLAN

23) (•) Future operations that require unballasted spudding templates for shallow objectives may be served with a simple "spud-in base" that sits on the sea floor as a bit-guide/hole-marker, provides a tensioning structure, and release and support structure for the DI-BHA (or other multi-casing systems).

24) Multiple nested casing strings probably may be required for hole stabilization every 50 to 200 m (formation dependent) to reduce the amount of slough falling on top of the bit.
(•) The Drill-In-BHA, Hammer-Drill-In-Casing (under development), Underreamer-Casing (improved running tool after Leg 147), Tri-Cone-Retractable Bit (ready for operational testing), or hard rock Drill-In-Casing system (strengthened for hard formations) should be evaluated as methods to start holes in unstable formations before the DCS leg.
(•) A nested three or four-stage DI-BHA should be developed to stabilize surface rubble for future DCS tests for penetrations exceeding a few hundred meters.
(•) In view of the expense and commitment of time and resources required to field test the DCS, it would be advantageous to have the casing systems emplaced on a previous leg to maximize DCS coring time.
(•) The viscous polymer hole cleaning fluids (Baravis) may be adequate for the present tests, but other silicon-based low-solids sea water viscosifiers should be investigated.

25) The stripper-head's self-energizing-packer-rubber is designed to tolerate rotation and is only good for about 500 psi pressure. It has been blown out several times with just the annulus injection pump. Although the HRB is open at the sea floor, it has plugged and circulated cuttings to the rig floor and could act to funnel gas or hot water up the riser.
(•) A ram-gate-type seal or an emergency clamp-on type diverter or packoff may be needed for the riser X DCS tubing annulus to divert uncontrolled flows horizontally and away from the rig floor.

26) (•) Fatigue stresses in the knobbies against the LGH may require changing the pipe or position periodically (on bit trips) to avoid concentrating working stresses.

MOBILIZATION AND DEPLOYMENT

27) The first casing string should be redesigned to eliminate the need for a round trip to set a bit guide between the HRB and the first DI-BHA string. This would save about 3/4 of a day rig time and reduce the risk that always accompanies reentry and releasing equipment inside the well bore.

28) Develop a method of storing the hardware aboard the vessel to reduce the very large shipping costs.

FILE

LLOYD'S REGISTER
OFFSHORE DIVISION
15810 PARK TEN PLACE, SUITE 291
HOUSTON, TEXAS, 77084
Telephone (713) 578-7046/7995
Fax (713) 579-6090
Telex

Brian Jonasson
Engineering and Drilling Operations
Texas A&M University Research Park
1000 Discovery Drive
College Station, TX 77845-9547
U. S. A.

Direct dial: (409) 845-2024

Our ref: ODH 640010

Your ref: H000047

Date: 16 Aug 1996

Dear Mr. Jonasson,

Enclosed are 3 (three) hard copies and a disk copy, in WordPerfect 6.1 format, of the report "Safety Assessment of the Diamond Coring System (DCS)". I apologise for the delay in the delivery of the report.

Could you please extend my thanks for the help and cooperation provided by the DCS engineering design staff and thank you for the opportunity of working with your organisation. I hope to have the opportunity to work with you again in the future.

Regards,

B. R. Poblete
Risk Management Specialist

Encl.

Technical Report Document Page

1. Report No.	2. Report date	3. Revision date	4. Type of report
ODH640010.1-1	14 August 1996		Qualitative Safety Assessment

5. Title & subtitle

Safety Assessment of Diamond Coring System (DCS)

6. Security classification of this report

7. Security classification of this page

8. Author(s)

B. R. Poblete, B. A. Sc., M. Phil., P. Eng.
Risk Management Specialist

B. R. Poblete 14/8/96

9. Authorisation

G. Jones, B. Sc., C. Eng.
Senior Principal Surveyor & General Manager
System Integrity and Risk Management

10. Reporting organisation name and address

Lloyd's Register - Offshore Division

15810 Park Ten Place, Suite 291
Houston, TX 77084

11. Reporting organisation reference(s)

Job No: 640010

12. This report supersedes

13. Sponsoring organisation name and address

Ocean Drilling Program

Texas A&M University Research Park
1000 Discovery Drive
College Station, TX 77840

14. Sponsoring organisation reference(s)

PO#: H000047

15. No of pages

25

16. Summary

This report is to verify that the Ocean Drilling Program (ODP) has demonstrated reasonable care with regards to the safety of the personnel using the DCS platform. Lloyd's Register has been requested to perform a Safety Assessment on the Diamond Coring System (DCS) as per the recommendation result of the DCS Design and Operational Review (July 1996). The scope of work included the review of all the relevant reports and documentation needed to assess the level of risk to personnel working on the DCS platform, at the 45 ft elevation, from the identified hazards.

17. Key words

Safety Assessment, Diamond Coring System, Drill Ship

18. Distribution statement

LROD - HOUSTON
LRES - SIRM

FORM3981E (04/95)

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TITLE:	SAFETY ASSESSMENT OF DIAMOND CORING SYSTEM (DCS)
REFERENCE:	REPORT NO. RODH640010.1-1 (8/96)
PREPARED BY:	LLOYD'S REGISTER OFFSHORE DIVISION - HOUSTON
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EXECUTIVE SUMMARY

The Ocean Drilling Program (ODP) is a major research project, funded by the National Science Foundation and other foreign nations to study the geological process that have shaped the planet and modified the environment. ODP operates a modern dynamically-positioned drillship which travels the oceans of the world, all year round, in a continuous series of legs aimed at coring into the sea floor to obtain rock and sediment samples for basic marine geology research.

ODP has procured the services of Lloyd's Register (LR) to perform a Safety Assessment on the Diamond Coring System (DCS) as per the recommendation of the DCS Design and Operational Review (July 1996) and to determine if ODP has demonstrated reasonable care with regards to the safety of the personnel using the Diamond Coring System (DCS). The LR scope of work included the review all the relevant reports and documentation needed to assess the level of risk to personnel working on the DCS platform at the 13.5 m (45 ft) elevation from the identified hazards.

The report qualitatively assessed and demonstrated the acceptability of the design efforts, by ODP, to minimize the risk of the identified accidental events, fire/smoke and structural collapse, on the DCS platform safety functions (escape/access routes, primary structural support, fire protection/detection systems, control systems, etc.).

The conclusion from the safety assessment, is that for the duration of a DCS coring operation, it is highly unlikely that the DCS system will encounter the major accidental events (fire or structural collapse affecting the DCS platform safety functions) as long as a significant effort is maintained to ensure that the occurrence, of the two identified initiating events, is minimized. These initiating events are hydraulic fluid leaks from the hydraulic power pack system and hoisting equipment / drill pipe failures during DCS coring operations with a static drill pipe riser. The occurrence of these events will be minimized through good maintenance practices and procedures.

As long as the potential for the initiating accidental events are minimized the current design of the safety functions on the DCS platform will perform adequately. Several recommendations were included throughout the report which could enhance the cost-effectiveness, reliability and occupational safety of the DCS operation.

1. INTRODUCTION

The Ocean Drilling Program (ODP) is a major research project, funded by the National Science Foundation and other foreign nations to study the geological process that have shaped the planet and modified the environment. ODP operates a modern dynamically-positioned drillship which travels the oceans of the world, all year round, in a continuous series of legs aimed at coring into the sea floor to obtain rock and sediment samples for basic marine geology research.

The fundamental technique and equipment utilized for this work are similar to those normally used in the offshore oil and gas industry but the drilling activity, which is carried out in compliance with American Petroleum Institute (API) standards, is performed in more significant water depths but with less seafloor penetration. The majority of ODP's scientific coring and sampling systems have been highly specialized to optimize the quality and speed of recovering cores so as to enhance the amount of the scientific data obtained.

A method currently under development uses a Diamond Coring System (DCS) to provide a method to drill and core in crystalline rock formations to a total depth of 4500 m (water depth plus depth below sea floor).

ODP has procured the services of Lloyd's Register (LR) to perform a Safety Assessment on the DCS as per the recommendation of the DCS Design and Operational Review (July 1996) and to determine if ODP has demonstrated reasonable care with regards to the safety of the personnel using the Diamond Coring System (DCS). The LR scope of work included the review all the relevant reports and documentation needed to assess the level of risk to personnel working on the DCS platform at the 13.5 m (45 ft) elevation from the identified hazards.

This report focuses exclusively on the assessment of the hazard and accidental events that would occur inside of the perimeters of the drilling derrick, from crown block to drill floor, which is the working area of the DCS. The interface between the vessel and the drilling derrick was not part of this scope of work. It must also be emphasized that the report focuses on the drilling mode of operations rather than the transportation and rig-up or rig-down activities that are part of the life cycle of this system. The risks associated with the rig-up or rig-down activities are minimized and controlled by good operating practice, especially during the lifting of heavy equipments.

The definitions of safety terms, used in this report, could be found in Appendix A1.5.

2. SYSTEM DESCRIPTION

The drilling vessel used by ODP is the SEDCO BP/471, a dynamically-positioned drillship capable of operating in extreme water depths. All drilling and coring is performed in "riserless" mode, with no returns to the surface. Only wireline coring methods are utilized.

The DCS was developed to drill on fractured crystalline rocks (primarily volcanic), found in and around volcanic seamounts and sea floor spreading centers (deep ocean ridges). This system is a new concept developed using methods and coring tools from the mining industry and was based on coring using a narrow kerf diamond core bit rotated at high speeds with light bit weights and precision heave compensation at deep water depths. The DCS consists of a drilling package suspended from the vessel's main drillstring compensator using a motion compensated 89 mm (3- ½ inch) tubing to rotate, at high speed, a 100 mm (4 inch) diamond coring bit through a compensated riser (the 140 mm (5-1/2 inch) drillstring usually used for rotary coring). The drilling package consists of a self-contained platform/mast assembly. This assembly includes a large hydraulic power unit, a high speed hydraulic top drive, secondary heave compensation for the small tubing and core bit, and all the associated controls. The drilling personnel normally operate the system from the platform itself, suspended approximately 13.7 m (45 feet) above the normal drill floor (See Figures 1 and 2 - Appendix A1.1 and A1.2).

3. FORMAL SAFETY ASSESSMENT

To ensure that ODP has performed and demonstrated all that is reasonably practicable with regards to the safe design of the DCS, a systematic hazard assessment flow diagram was developed to verify that the hazards identified will meet the criteria that is deemed acceptable for the safe operation of equipment and personnel affected by the operation of the DCS.

The process consisted of three distinct phases:

- Hazard Identification;
- Hazard Analysis;
- Risk Evaluation/Minimization.

The hazard identification consisted of a checklist of the standard hazards identified in most safety cases for offshore installations (vessels or platforms). The hazard analysis consisted of the qualitative evaluation on how these hazards would exist under the normal operations of the DCS. Any hazard, which would be highly unlikely to occur and therefore low risk to personnel, would not be brought forward to the next step of the safety assessment cycle. It must be emphasized that the documentation of these hazards is still essential to demonstrate completeness in the assessment. The next phase of the assessment, the risk evaluation/minimization section, was used to demonstrate the operator's intent to inherently reduce the risk to a level that is **as low as reasonably practicable**. The most essential part of this analysis is the operator's acceptance or impairment criteria. These criteria are what is deemed by the operator as conditions which, if exceeded, would more than likely cause significant asset damage or personnel injury in using the DCS (see Figure 3 Appendix A1.3).

3.1. HAZARD IDENTIFICATION

The major accidental events normally identified for an offshore installation or vessel would include scenarios such as:

- Blowout;
- Explosion;
- Toxic Release;

- Environmental Pollution;
- Severe Weather;
- Ship Collision;
- Seismic Impact;
- Helicopter Crash;
- Dropped or Swinging Objects;
- Fire (pool and/or jet) and Smoke;
- Structural Failure.

3.2. HAZARD ANALYSIS

To ensure completeness of this assessment each of the hazards identified above will be qualitatively evaluated in detail.

Blowout:
The discussions with the program Petrologists has indicated that since the drilling will occur exclusively on basalt rock regions it is highly unlikely for the DCS to penetrate a region of pressurized hydrocarbon reserves thus, the potential of a blowout affecting the DCS would also be considered to be highly unlikely.

Explosion:
An explosion is the result of a delayed ignition of gaseous hydrocarbon within its flammable range. The DCS will not have any source of this type of low flashpoint hydrocarbon, on the drill floor or the DCS deck, thus ensuring that this accidental event would also be highly unlikely to occur during the operation of the system.

Toxic Release:
Steam or hot water were the only potential source of uncontrolled release, during the operations of the DCS, that were identified but, with the high rate of cooling or heat transfer through the drill pipe wall and the surrounding sea water, it is highly unlikely that it would cause any concern to personnel working on the DCS platform. There were indications that H_2S could also be a source of toxic gas during the removal of core samples. Standard operating practice, for the handling of cores with gases, such as H_2S, are part of the procedure to handle the small quantities of gas that may potentially exist.

Environmental Pollution:
The only potential major concern for environmental pollution, from the drilling rig, would be from the spill of hydraulic fluid under the DCS platform. The vessel drainage system will sufficiently cater to any spills onto the drill floor.

Severe Weather:
Severe weather is an issue to address for any offshore vessel or installation. ODP utilizes guidelines during the DCS operation which will provide the crew with the safe environmental operating parameters. A summary of these guidelines is attached in Appendix II.

Ship Collision:
The drilling activities are usually performed outside of major shipping routes thus, for this assessment, there is the assumption that the potential for ship collision is highly unlikely.

Seismic Activities:
It has been indicated that seismic activities will not have any impact on the operation of the vessel or the DCS. The only impact could be if the seismic activity causes a disconnection of the drill pipe at the seabed and this is considered to be a highly unlikely occurrence.

Helicopter Crash:
The use of helicopters during the research work is impractical due to the great distance that has to be traveled between the vessel and land during its drilling activities thus, the potential for helicopter crash is highly unlikely.

Dropped or Swinging Objects:
The risk from dropped or swinging objects is similar to that encountered on oil and gas drilling and exploration rigs. This risk is controlled by good operating practice and procedures during lifts within the confines of the drilling rig.

Fire and Smoke:
Fire can result from the immediate ignition of flammable gas or liquid during the operations and maintenance of the drilling rig. The only potentially significant source of flammable material is from the low flash point hydraulic fluid located under the DCS deck near the hydraulic pump compartment. High ignition energy (in the form of heat or electricity) is required to ignite this fluid. The design team has provided a work floor insulated with a 51 mm (2 in) layer of fire retardant insulation. This will provide personnel working on the platform with

the opportunity to ensure the safe and controlled shutdown of the DCS before evacuating the deck in the event of a fire. A fire suppression system was also included beneath the main work floor, near the hydraulic pump compartment, of the DCS platform. This suppression system is designed to discharge 11.4 kg (25 lbs) of dry powder in about 10 seconds. The system can be discharged manually from the operator's console. Smoke could be generated from this fire, but with more than adequate ventilation on the deck and the existence of the active and passive fire protection, it will be highly unlikely that the event will have the potential to escalate to a major incident.

Structural Collapse:
The major structural accidental events that would affect the performance of the DCS includes any major failures of the drilling rig primary structure, major lifting or hoisting equipment and the primary structural support of the DCS mast or deck. The failure of the drill pipe, while coring, will also be included with these events. The failure of all the above structural pieces of equipment is very much dependent on the quality of the preventative maintenance and inspection program used by ODL(SEDCO) and ODP on the structures as well as the use of good, safe operating procedures during the utilization of these supports and equipments; SEDCO has been noted to have an excellent safety record on the 471 and a sound Preventative Maintenance System (PSM) in place. With a strong quality assurance and incident preventative program total failure of these pieces of equipments is highly unlikely. It must be emphasized that there should be no complacency with regards to the above programs due to the significant consequences following the total failure of any of the above pieces of structural equipments.

The total failure of drill pipe was also included with this accidental event due to the resultant consequence of this incident on the major pieces of structural equipments (e.g. traveling blocks, DCS mast/deck, primary support of drilling rig, etc.) and potential serious injuries to personnel working on the DCS platform. The drill pipe is a very critical asset to ODP and thus, a considerable effort has been placed, especially after the three pin failures in the early 1990s, to implement a more thorough maintenance policy. The DCS platform, is the most susceptible location on the drill ship, from the increase in the likelihood of drill pipe riser failure. The indication to date is that this program has significantly reduced the potential for total drill pipe failure and thus, make it highly unlikely for the incident to occur while using the drill pipe as a static riser for the DCS.

The most vulnerable section of the drill string riser is the break-away safety joint at the base of the drill pipe riser. This joint is needed for release during drive-off scenarios and as a back-up for a normal un-jaying operation. The safety joint operates under an overpull design with the release tension based on the number of shear pins installed. With the wide variance of tension load caused by vessel motion. The shear pins are susceptible to fatigue flattening or failure. The DCS platform therefore, is the most susceptible location on the drill ship, from the increase in the likelihood of drill pipe riser failure due to a failure in the safety joint.

3.3. RISK EVALUATION/MINIMIZATION

Based on the above assessment the two major accidental events that were evaluated in more detail are:

- Fire and Smoke;
- Structural Collapse.

Theses two events were chosen based on the qualitative hazard assessment mentioned above and the concerns expressed by the ODP personnel on the potential severity of these two accidental scenarios. As indicated above, the focus will be based on the effect of these accidental events on the performance of, what ODP has indicated as, the two most critical safety functions of the DCS:

- Structural Integrity; and
- Integrity of Escape Routes.

It is very critical to highlight, in this section, the environmental work condition that significantly affects the DCS activities and why there will be a slight deviation, in primary focus, from major accidental events, to some occupational hazards that could make a significant impact on the DCS operation during a development Engineering Leg.

A Leg of the ODP program consists of about 2 months of research at some of the most remote locations on the major oceans of the earth. At the end of each leg the ship returns to port for crew changes, supplies, fuel and to off-load the core samples gathered during the leg. The research vessel may also return to port in significant emergencies. In some cases the vessel will have emergency or essential equipment brought by boat to the drill site; helicopters are rarely used because the vessel is routinely outside the operating range of helicopters. Thus, for each Leg the crew must ensure that all the possible equipment, needed or that might be required, for the planned activities is successfully loaded onto the vessel. With the budget and schedule constraint imposed upon each Leg, it is apparent that ODP must ensure that all potential risk, that could significantly hinder the current or future research programs, is addressed and minimized to a level that is as low as reasonably practicable. This would not only mean the reduction of all major hazards to an acceptable risk level but also include the minimization of occupational risk to a higher level than is normally acceptable. Any significant or severe incident offshore would require the cessation of the current research work to bring the vessel back to port to address the incident.

Another factor that has to be incorporated into the assessment of risk on the DCS platform is that the vessel will be at sea more than 330 days/year and during that time the activities or exposure of the one to three people on the DCS platform will average about 400 to 600 hours of exposure per person per Leg to a connected drill pipe riser situation. The typical worker, on the drill ship, works for about 2,196 hours/year. The exposure time of personnel to a potential accidental event, such a drill pipe failure creating a sling shot scenario, will be a factor to be considered during the evaluation of the susceptibility of personnel to major hazards on the DCS platform.

3.3.1. Damage / Impairment Criteria

Structural Integrity: ODP has classified the following events as consequences that are deemed to be unacceptable after a major accidental event:

- Loss of primary structural support of derrick;
- Catastrophic failure of hoisting equipment (i.e. crown block, traveling block, heave compensator, drill lines, draworks brakes (total failure), loss of dead line anchor and elevator links (1 out of 2 from a set of 2);
- Structural failure of DCS mast;
- Pipe and safety joint failure in drill pipe riser.

Integrity of Escape Routes: The two criteria for the integrity of escape routes after a major accidental event are:

- Ensure that there is always one safe, unobstructed, means of escape from any accidental event;
- The DCS platform must never be operated outside the vessel safe

operating parameters.

3.3.2. Evaluation / Minimization

This section of the report is intended to qualitatively assess and demonstrate the design efforts by ODP to minimize, to an acceptable level, the risk from both accidental events, fire/smoke and structural collapse, on the safety functions.

The most critical working area of the system is the DCS platform. The platform is normally located approximately 13.5 m (45 ft) from the drill floor and is exposed to both fire and structural accidental event scenarios.

Fire/Smoke Scenario: The fire scenario highlighted above in the hazard assessment section of the report has demonstrated the need for some form of fire protection/detection system to protect the integrity of escape routes and structural supports for the DCS mast/platform. The hydraulic fluid has a very high flash point and thus, would require a significant amount of energy to ignite. To ensure that the fire incident does not occur it is essential that:

- The hydraulic pump system is maintained so as to reduce the potential of any leaks from the system; and
- The area is reviewed so all potential ignition sources, such as electrical wiring, are routed as far away as possible from the drip pan under the hydraulic pump; the source of potential flammable liquid accumulation.

If a fire does occur, even after implementing the above precautions, the operator has two objectives with regards to the DCS facility:

i. Ensure that the personnel on the DCS platform have adequate time to make the DCS operation safe and to safely evacuate the platform;
ii. Minimize the damage to the facility by limiting the potential for escalation. This ensures minimal downtime for cleanup and repair and potentially eliminate the need to return to port.

The current active and passive fire protection system is more than adequate to satisfy the first and most of the second objective. The duration of the fire is dependent on the fuel quantity and quality. With proper maintenance of the hydraulic system it is unlikely that there would be a credible fire scenario which would lead to the sudden collapse of the DCS platform, thereby providing insufficient time for the personnel on the platform to evacuate, and jeopardizing the personnel and equipments on the drill floor.

- **To back-up the current manual dry powder release system it is recommended that ODP investigate the use and installation of a simple, mechanical fire detection system that will automatically release the dry powder upon detection of heat underneath the deck.**

The reason for not using an electronic system, such as rate of rise heat detectors, optical fire detectors, etc. is that the area under the deck is inaccessible for regular maintenance and prone to vibration which will cause failure of these sensors. Simple mechanical detectors such as fusible links, fire wires, etc. are inexpensive, easy to install and are maintenance free and yet will provide the added insurance of detecting a fire that may cause irreparable damage to the DCS platform.

- **ODP should also ensure that any critical pieces of emergency control equipments or hardware, near the potential fire scenario, are fail-safe under exposure to the flames. Methods such as rerouting the control and electrical lines or fireproofing the critical pieces of equipment could be solutions to any susceptible pieces of hardware. A complete, coordinated and redundant shutdown of all electrical and control systems, during an emergency scenario is essential. Manual shutdowns of electrical systems, at two remote locations such as the DCS platform and driller's console, is critical.**

Structural Collapse Scenario (Access & Escape): The normal location of the DCS platform, 13.5 m (45 ft) above the drill floor, makes it very susceptible to dropped objects from above. It must also be emphasized that the platform is attached to the heave compensation system of the drilling rig. Thus, the personnel on the DCS platform will remain in position while the vessel moves vertically up and down up to a maximum of +/- 2.4 m (8 ft); the maximum heave that ODP will allow for the operation of the DCS. The DCS platform, for the majority of the time, will operate with a vertical movement of about 0.6 to 1.2 m (2 to 4 ft). There are only two external walkways (approximately 13.7 m & 27.4 m or 45 ft and 90 ft), outside of the drilling rig derrick that are used for personnel access under normal operating conditions. There is a small gap between the DCS platform and the access platform under the derrick at the 13.7

m (45 ft) level. This gap exists because this DCS platform must also fit at the 27.4 m (90 ft) level where there is a tapering of the drilling derrick.

- **Under normal operating conditions ODP should ensure that a more suitable means for personnel to safely and dependably, move on and off the DCS platform, to the derrick platform, be developed. This would include such suggestions as to replace the chain-gate device to the DCS platform with a stronger, hinged gate that could be lifted easily for access and also ensure that the hazard of falling, to the drill floor, is significantly reduced. Additionally a ramp, with handrails, hinged at the DCS platform, could be incorporated with the gate, to ensure that all DCS personnel will have some means of walking off the platform rather than attempting to vertically jump up or down to the derrick platform with no run-up distance and thus, relying on skill and timing, with respect to the movement of the platform, relative to the derrick, to step off at the optimal distance. The ramp will also provide a safe means of evacuating injured personnel.**

The reasoning behind the evacuation of personnel to the perimeter of the derrick is that during an emergency it is essential to evacuate outside the area of hazard. If there is an incident inside the drilling derrick then an evacuation down to the drill floor, from the DCS mast, will increase the exposure time of the personnel to the hazard. Therefore, the most expedient route of escape, from the incident, would be immediately to the outside of the drilling derrick, onto the walkway, where the DCS personnel would have the opportunity for temporary refuge and to calmly evacuate the area of concern.

- **ODP will also have to determine the adequacy of the existing access platform locations (13.7 m / 45 ft and 27.4 m / 90 ft) after reviewing all the identified credible potential accidental events and operational scenarios that may occur during the operations of the DCS. If any of the identified credible scenario dictates an immediate evacuation of the DCS personnel between these two levels then a method to provide emergency access, to the outside periphery of the derrick, should be addressed.**

Structural Collapse Scenario (Dropped Objects): The DCS platform is cantilevered at an exposed location of the drilling derrick; above the drill floor. This location will be exposed to the same dropped object scenarios as those encountered on the drill floor. The use of good operating hoisting procedures, coupled with a thorough and regular maintenance and inspection program of all lifting appliances, including wireline winches and sheaves, will ensure the unlikely occurrence of dropped or swinging objects impacting on DCS personnel, and critical pieces of DCS drilling equipments and controls.

Structural Collapse Scenario (Drill Pipe Failure): The DCS mast/platform system is supported by the drilling rig's primary heave compensator system. The amount of tension exerted by the drilling system is dependent on the depth and thus, the mass, of drill pipe to be supported. The objective is try to maintain tension to keep the drill pipe as straight as possible, to ease the drilling and coring process, but at same time maintain an adequate weight on bit to get an effective drilling rate. With this condition existing during the operation of the DCS, ODP has identified, what it considers to be two types of accidental events that could occur:

- Vessel driveoff which could result in an intended or accidental release of the safety joint, on the static drill pipe riser, or the structural failure of drill pipe close to the seabed;
- Failure of drill string close to the drill floor.

The driveoff scenario is a slow, unintentional excursion from target and thus, would provide the DCS personnel with adequate warning (in the form of lights and alarms) of a potential incident. The response time of the force, from the parted pipe at the sea bed, on the DCS deck, is greater than the time produced by the main drill string failure close to the drill floor. Thus, ODP has identified the worst case scenario with regards to pipe failure as the parting of the drill pipe near the top of the drill string during actual DCS operations. This instantaneous load shedding event (described as a "slingshot" event) along with the tension exerted by the drilling rig could cause significant structural damage and personal injury inside the drilling derrick. Thus, ODP have put a significant amount of time and effort into developing a shock cylinder system that will prevent the platform from experiencing the same rate of acceleration and decelerations as exerted on the mast. The DCS platform accelerations are within the safe limits for personnel on the platform during the maximum, credible load event mentioned above. The shocks are used as the only primary means of suspending and supporting the DCS platform from the DCS mast. Secondary, emergency stops act as a backup system, if the cylinders were to fail in tension. This ensures that the platform will not slide off the bottom end of the mast.

The most cost-effective solution to minimize the potential for structural failure of the DCS platform is to reduce the risk of drill pipe or safety joint failure during operations. The failures of both the drill pipe and safety joint, during operations, could be the result of human error in judgement, knowingly exceeding the capability of the equipment, failure of release sub, or structural failure from a less than adequate inspection and maintenance program. The occurrence of these accidental events will be minimized through good maintenance practices and procedures.

- **The failure of the safety joint is more likely to occur than the structural failure of the drill pipe due to the multiple failure paths from the use of shear pins on the joint. ODP should investigate whether the safety joint is needed on the drill pipe riser. The removal of this joint will significantly reduce the potential for pipe failure on the drill string riser.**

If the pipe failure does occur, there must be a high degree of probability that both shock cylinders on the DCS deck will be available on demand. The severe shock load will open the relief valves allowing the cylinders to stroke and accelerate the DCS platform gradually, thus, minimizing the high G shocks to personnel on the DCS platform.

- **With only two shock cylinders, ODP should investigate if the unavailability of one cylinder or even one relief valve, during demand, may cause an unacceptable DCS platform condition for the DCS personnel during or after the incident; i.e. tilting of platform to an unacceptable degree.**

It is assumed that with regular inspection of the fixed DCS mast structure it will have a higher availability than the mechanical shock cylinders supporting the DCS platform. Proper maintenance and pre-testing of the cylinders and relief valves will ensure high availability during the operations of the DCS and thus, reduce the probability of damage and injury to the DCS platform and personnel from the combination of failures of the drill pipe and one or both of the shock cylinders/relief valves.

The shock cylinders, when activated, are designed to reduce the acceleration and deceleration forces on the DCS personnel on the DCS platform to about 1.0 G. The current practice is to provide, for personnel on the DCS platform, inertial lines and safety belt connector lines to the floor. This practice presents a serious operational and even occupational safety problem. The potential for trips, with this system, would be unacceptable, especially in a confined space such as the DCS platform.

- **ODP should seek to provide more mobility for the personnel on the platform thus ensuring higher operating efficiency for the personnel on the DCS platform. This could be accomplished by altering the fall protection design premise from personnel safety harnesses to higher, (equal or more than 1.5 m with an extra intermediate rung) more substantial platform handrails and gates. The higher handrails will ensure that when the shock cylinders are utilized the personnel, on the DCS platform, will more than likely, momentarily lose their balance but not fall over the handrails, because the top rail position is still higher than the position of their center of gravity or fulcrum.**

Thus, the rails will keep the personnel inside the platform and reduce the potential of a secondary, more serious fall, to the drill floor. Without the harness, the personnel on the DCS platform, will have more flexibility and not have to remember to disengage themselves from the DCS structure in an emergency such as fire, dropped objects or structural collapse. Emergency inertial reels for escape by jumping off the DCS platform could be made available for emergency situations but, ODP must be aware of the continuous training costs when utilizing this type of descent device .

4. CONCLUSION AND RECOMMENDATIONS

The conclusion from the safety assessment, is that for the duration of a DCS coring operation, it is highly unlikely that the DCS system will encounter the major accidental events (fire or structural collapse affecting the DCS platform safety functions) as long as a significant effort is maintained to ensure that the occurrence, of the identified initiating events, is minimized. These initiating events are hydraulic fluid leaks from the hydraulic power pack system and hoisting equipment / drill pipe failures during DCS coring operations with a static drill pipe riser. The occurrence of these events will be minimized through good maintenance practices and procedures.

As long as the potential for the initiating accidental events are minimized the current design of the safety functions on the DCS platform will perform adequately. The following recommendations are mentioned throughout the report and could enhance the cost-effectiveness, reliability and occupational safety of the DCS operation.

i) To back-up the current manual dry powder release system it is recommended that ODP investigate the use and installation of a simple, mechanical fire detection system that will automatically release the dry powder upon detection of heat underneath the deck.

ii) ODP should ensure that any critical pieces of emergency control equipments or hardware, near the potential fire scenario, are fail-safe under exposure to the flames. Methods such as rerouting the control and electrical lines or fireproofing the critical pieces of equipment could be solutions to any susceptible pieces of hardware. A complete, coordinated and redundant shutdown of all electrical and control systems, during an emergency scenario is essential. Manual shutdowns of electrical systems, at two remote locations such as the DCS platform and driller's console, is critical.

iii) Under normal operating conditions ODP should ensure that a more suitable means for personnel to safely and dependably, move on and off the DCS platform, to the derrick platform, be developed. This would include such suggestions as to replace the chain-gate device to the DCS platform with a stronger, hinged gate that could be lifted easily for access and also ensure that the hazard of falling, to the drill floor, is significantly reduced. Additionally a ramp, with handrails, hinged at the DCS platform, could be incorporated with the gate, to ensure that all DCS personnel will have some means of walking off the platform rather than attempting to vertically jump up or down to the derrick platform with no run-up distance and thus, relying on skill and timing, with respect to the movement of the platform, relative to the derrick, to step off at the optimal distance. The ramp will also provide a safe means of evacuating injured personnel.

iv) ODP will have to determine the adequacy of the existing access platform locations (13.7 m / 45 ft and 27.4 m / 90 ft) after reviewing all the identified credible potential accidental events and operational scenarios that may occur during the operations of the DCS. If any of the identified credible scenario dictates an immediate evacuation of the DCS personnel between these two levels then a method to provide emergency access, to the outside periphery of the derrick, should be addressed.

v) The failure of the safety joint is more likely to occur than the structural failure of the drill pipe due to the multiple failure paths from the use of shear pins on the joint. ODP should investigate whether the safety joint is needed on the drill pipe riser. The removal of this joint will significantly reduce the potential for pipe failure in the drill string riser.

vi) With only two shock cylinders, ODP should investigate if the unavailability of one cylinder or even one relief valve, during demand, may cause an unacceptable DCS platform condition for the DCS personnel during or after the incident; i.e. tilting of platform to an unacceptable degree.

vii) ODP should seek to provide more mobility for the personnel on the platform thus ensuring higher operating efficiency for the personnel on the DCS platform. This could be accomplished by altering the fall protection design premise from personnel safety harnesses to a higher, (equal or more than 1.5 m with an extra intermediate rung) more substantial platform handrails and gates. The higher handrails will ensure that when the shock cylinders are utilized the personnel, on the DCS platform, will more than likely, momentarily lose their balance but not fall over the handrails, because the top rail position is still higher than the position of their center of gravity or fulcrum.

5. REFERENCES

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6. APPENDIX A1. CONTENT OF APPENDICES

A1.1 Figure 1: Diamond Coring System

A1.2 Figure 2: Diamond Coring System Platform Configuration Phase II - 4500 Meter Depth Capacity

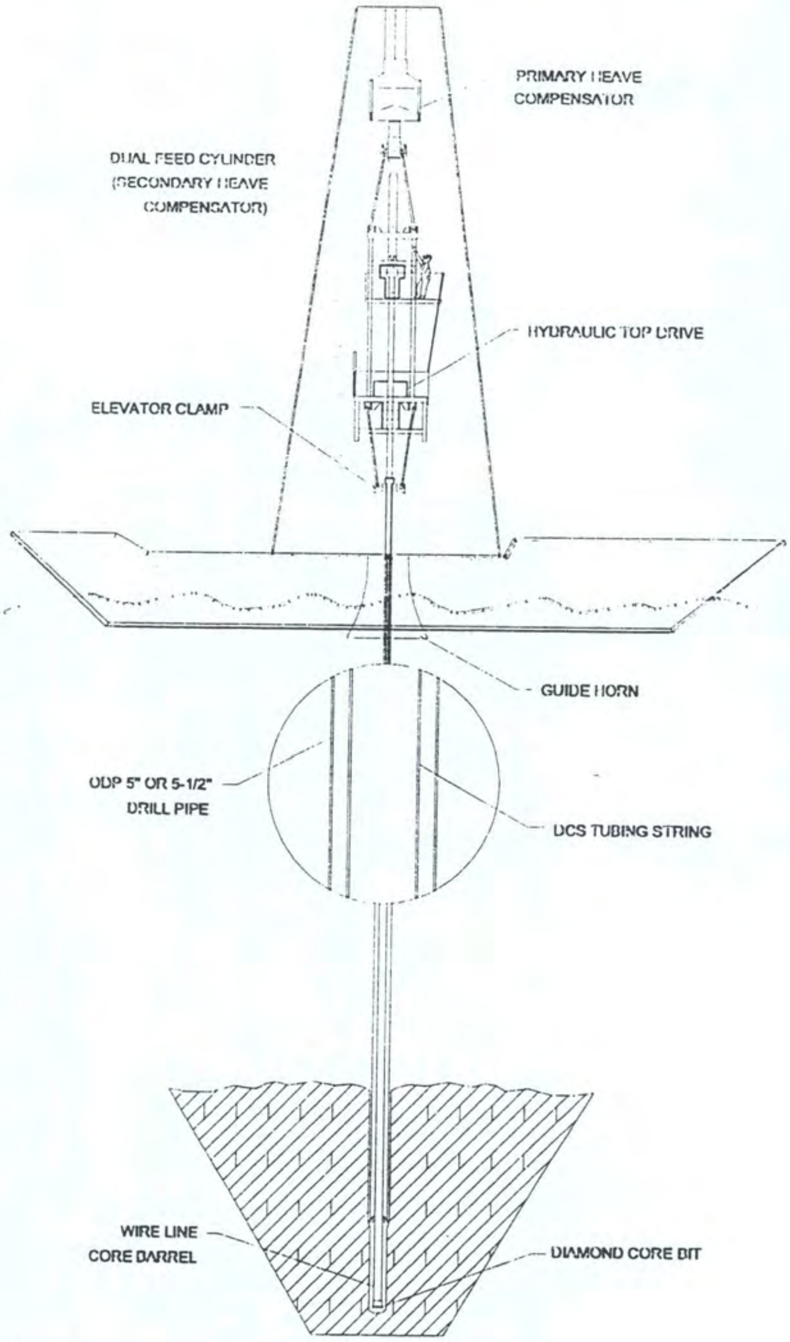
A1.3 Figure 3: Method for Determining Acceptability of Design Accidental Events (DAEs) and Major Accidental Events (MAEs)

A1.4 Environmental Operating Limitations

A1.5 Definitions of Safety Terms

Appendix A1.1

FIGURE 1: DIAMOND CORING SYSTEM



Appendix A1.2

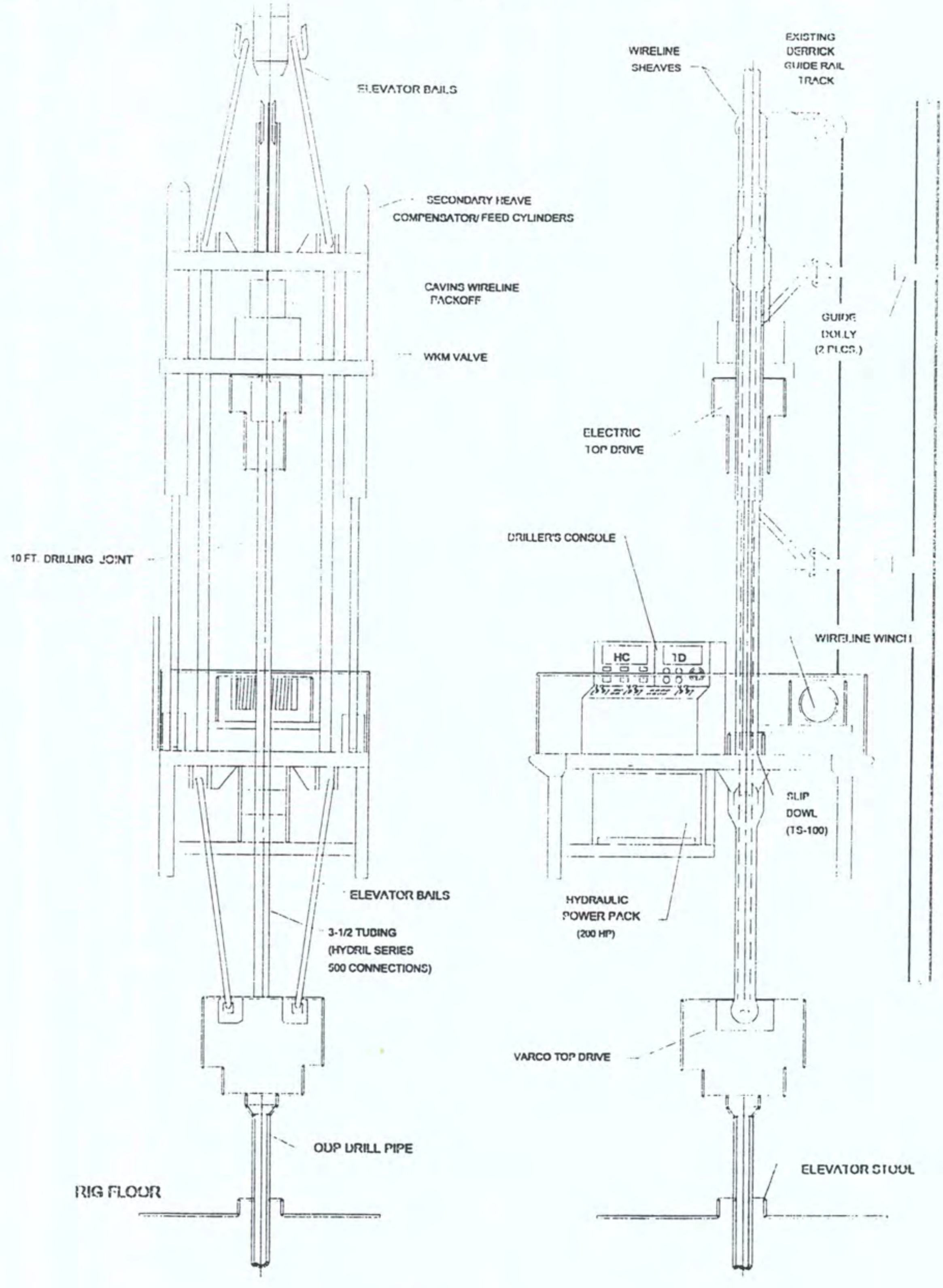
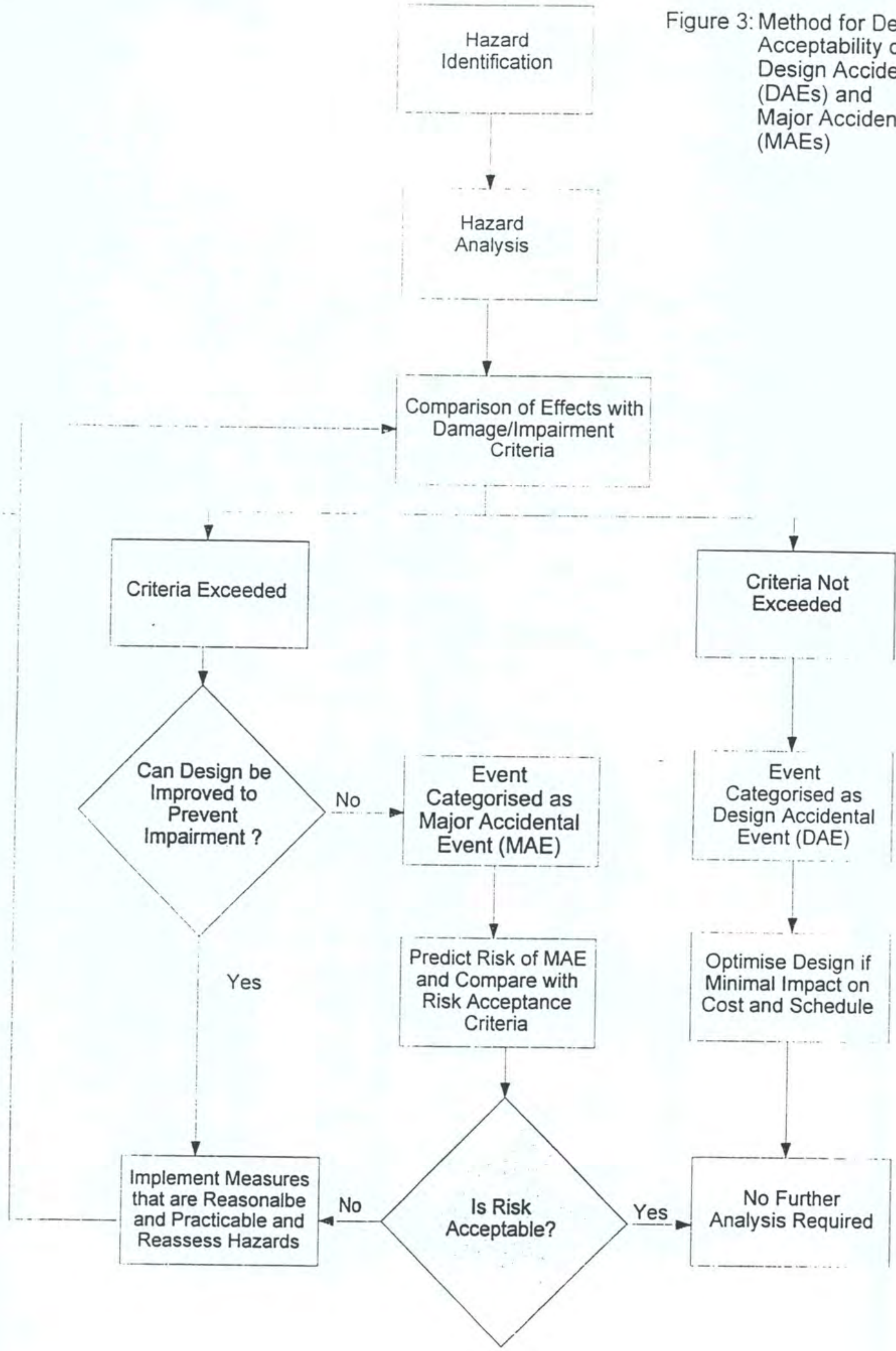


FIGURE 2: DIAMOND CORING SYSTEM
PLATFORM CONFIGURATION
PHASE II – 4500 METER DEPTH CAPACITY

Appendix A1.3

Figure 3: Method for Determining Acceptability of Design Accidental Events (DAEs) and Major Accidental Events (MAEs)



APPENDIX A1.4

ENVIRONMENTAL OPERATING LIMITATIONS

Environmental operating limitations for running pipe and coring in "normal" DCS operations are noted below (note that allowance has been made for unplanned events such as equipment failures, stuck pipe and drive offs). Five (5) ft core barrels have been developed for use in rough weather with the 16 ft hydraulic piston rods (14 ft effective stroke).

WATER DEPTH:	500 TO 4000 m. Minimal water depth is required to allow adequate API string stretch (i.e., pipe not too stiff), and allow enough catenary slack to permit minor excursions off location;
SEA FLOOR SLOPE:	less than 15 degrees (the HRB could theoretically work at up to 25 degrees in hard rock but it is not practical in sediments due to settling);
WEATHER:	15 ft seas and 40 kt winds with 8 ft rig floor heave and 5 degree roll;
CURRENT:	2.0 kt maximum to reduce API string/drill rod contact, strumming, and hole angle.
NOTE:	The DCS is currently limited to operating at less than 4500 m (WD + MBSF) and at less than 360 MBSF due to the current inventory of 3-1/2" tubing.

APPENDIX A1.5

DEFINITIONS OF SAFETY TERMS

The following definitions of key terms are used in this report (References A1.5.1 and A1.5.2):

Hazard	A physical situation with a potential for human injury, damage of property, damage to the environment, or some combination of these.
Risk	The likelihood of a specific undesired event occurring within a specified period or in specified circumstances. It may be either a frequency or a probability, depending on the circumstances.
Hazard Analysis	The identification of undesired events that lead to the materialization of the hazard, the analysis of the mechanism by which these undesired events could occur and usually the estimation of the extent, magnitude and likelihood of any harmful events.
Qualitative Risk or Safety Assessment	An evaluation of risks using judgement of the likelihood of undesired events occurring and the likelihood of harm or damage being caused together with judgements made concerning the significance of the results. Qualitative risk/safety assessments is useful where the likelihood cannot be quantified (e.g. lack of suitable frequency or consequence data) or where a significant number of assumptions are necessary such that a quantitative assessment becomes subjective. Qualitative risk/safety assessment relies on the experience and judgement of the assessors and can be used to provide a rapid assessment and ranking of alternative solutions.
As Low As Reasonably Practicable	A consideration of possible risk reducing measures to determine whether additional measures can be justified. The consideration needs to balance the benefit (risk reduction) against the penalty (cost, schedule, weight, operational constraint, etc.) using a common denominator wherever possible. Cost benefit analysis is one such tool.

Design Accidental Event (DAE)	DAEs are those events where the consequences are not severe enough to prevent the safe escape of all personnel away from the immediate vicinity of the incident.
Major Accidental Event (MAE)	MAEs are those events where the consequences impair escape routes, shelter areas, means of evacuation, or the support structure. They are more severe than DAEs but their frequency should be less than that for DAEs. The principal distinction between DAEs and MAEs is that for a DAE, only those personnel in the "immediate vicinity" should be affected by the accident. The remainder of the vessel population should be able to evacuate the vessel safety should they need to. This requires that escape routes, shelter areas, means of escape and the main support structure must remain functional following a DAE.
Damage / Impairment Criteria	This criteria was developed to help distinguish between accidental events which have the potential to cause high-fatality accidents and those which do not. If any of the criterion are not satisfied then there is a likelihood (though not a certainty) that there could be many fatalities. There is also a small possibility that even if none of the criteria have been violated, a high-fatality accident could occur.
Safety Functions	These are various safety and environmental systems on the rig to detect, control, prevent the escalation of potentially hazardous incidents, and protect personnel, the structure and escape and evacuation systems. The systems are designed to function in the event of a major incident to: - Monitor the incident and provide feedback of information to a centralized control room or other locations; - Effect the necessary control actions; - Mitigate the consequences of the incident; - Reduce the risk of injury and loss of life for platform personnel; - Reduce the level of damage to the facility; - Reduce the environmental consequences of incidents.

References

[A1.5.1] Nomenclature for Hazard and Risk Assessment in the Process Industries, 2nd Edition, I Chem E, 1992

[A1.5.2] Risk Assessment - A Study Group Report, The Royal Society, London, 1983.

DCS Phase IIIA

DCS Phase IIIA is the project for qualifying the input sensors for the DCS control system. These sensors will also be used to measure the performance of the Western Gear heave compensator before and after the cylinder piston seals are replaced. The project is set up to utilize part of the DCS control computer and to use some of the existing sensors as well as new sensors.

The system is broken down into six different areas. Area 1 is the master and acquires data from all hardwired sensors and the two remote units via radio. It also performs all the data storage for the system. This unit is installed in the Downhole Measurements Lab.

Area 2 is an existing unit that is located in the Casing Hold of the ship. It is used to acquire pressure readings from the active pressure vessels (APV's).

Area 3 is another existing unit that is located the Mud Pit room. This unit contains all the sensors used to measure ship motion (heave, pitch and roll).

Area 4 is located on the aft side of the derrick. This is another set of existing sensors that measure standpipe pressure.

Area 5 and 6 are new remote units that are located on the heave compensator. Area 5 consists of two enclosures that are mounted on the Traveling Block guide dolly. One enclosure contains sensors that measure traveling block acceleration. The other enclosure contains a linear cable reel sensor that measures compensator rod position.

The Area 6 data acquisition enclosure is located on the Rod End Beam dolly and contains sensor to measure drill string weight and rod end beam acceleration. A new Motion Reference Unit (MRU) was added to Area 6 during the San Diego port call. The MRU is a processor based accelerometer that will complement the standard accelerometers that are in place.

Because of their remote location and constant motion during normal drilling and coring operations, the Area 5 and 6 sensors transmit there data to the Area 1 unit via radio. This was accomplished by mounting a radio modem in each area and installing two 115 foot coaxial transmission lines in the aft port derrick leg. These two cables function as a continuous, distributed antenna for picking up the RF signal transmitted by the Area 5 and 6 sensors. The two Radiax radiating cables are conected to the Area 1 enclosure.

The installation of the system was performed during the port call for Leg 169S by ODP, Sedco and Parvus Corporation personnel. The initial check-out of the system was performed during Leg 169S while the Parvus engineers were still on board.

The system was operational during the first week of Leg 169. The only problem was a clearance problem in the wireline sensor. During the second week of the Leg, a problem developed with the battery circuits in Area 6.

The Area 6 enclosure was designed to be a self contained system that requires lead acid batteries to power the unit. The battery capacity in the unit was calculated on a 5 day charge cycle. This requires that the system have a full charge every 5 days. Due to the drilling schedule on Leg 169, the battery charging did not occur often enough and caused damage to the batteries. To alleviate the problem with the batteries, ODP and Sedco designed an umbilical to get 120 VAC power from the Varco Top Drive heater circuits to power the Area 6 enclosure. This changing of power required that the enclosure be rewired.

During the middle of the Leg, it was observed that there was a problem with down loading data from the Area 5 unit. The radio would output garbled data during a long transmission and it was assumed that it was associated to heat. A total rewire of the Area 5 enclosure was performed to add a cooling fan and a linear power supply.

The Phase IIIA system has collected data during normal coring and drilling conditions. The chance for collecting data in an overpull situation did not become available during Leg 169. The Leg 169 data will has been sent to Stress Engineering for post processing.

DCS Phase IIIA

AREA 1 - Downhole Measurements Lab

- Enclosure - Data acquisition and storage

  PC/104 computer

AREA 2 - Casing Hold

- Enclosure - Measures APV pressure

  pressure transducer

AREA 3 - Mud Pit Room

- Enclosure - Measures ship motion

  heave motion sensor
  heave accelerometer
  pitch inclinometer
  roll inclinometer

AREA 4 - Aft Side of Derrick

- Enclosure - Measures standpipe pressure

  pressure transducer

AREA 5 - Traveling Block Guide Dolly

- **Enclosure #1 - Measures traveling block acceleration**

    accelerometer
    radio modem

- **Enclosure #2 - Measures compensator rod position**

    linear cable reel sensor

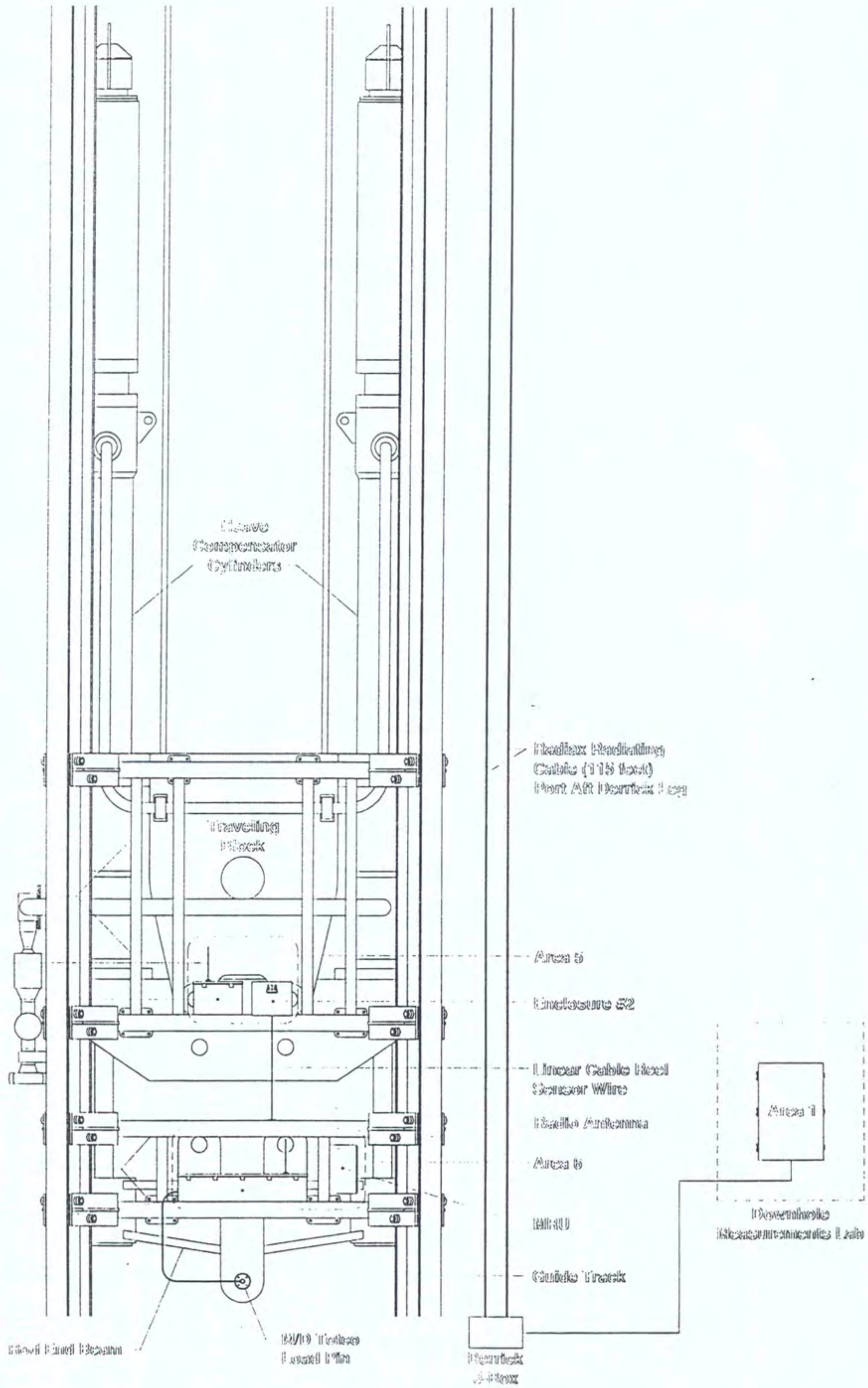
AREA 6 - Rod End Beam Dolly

- **Enclosure #3 - Measures drill string weight and rod end beam acceleration**

    load pins
    accelerometer
    radio modem

- **Motion Reference Unit (MRU) - Measures rod end beam acceleration**

    processor based accelerometer



Heave Compensator Cylinders
Radiax Radiating Cable (115 feet) Port Aft Derrick Leg
Traveling Block
Radio Antenna
Enclosure S1
Area 5
Enclosure S2
Linear Cable Reel Sensor Wire
Radio Antenna
Area 6
Area 1
Reel End Beam Trolley
Enclosure S3
Cable Track
MRU
Guide Track
Downhole Measurements Lab
Reel End Beam
MD Totco Load Pin
Derrick J-Box

Ocean Drilling Program
Texas A&M University
College Station, Texas

Date: October 25, 1996
To: Buddy Bollfrass **cc:** Brian Jonasson
Fm: Mike Friedrichs
Re: Diamond Coring System, Status Report

1.0 Present Diamond Coring System(DCS) Operation

The present concept for the "DCS" is to suspend the mini-drill floor, Secondary Heave Compensator, mini-riser, and drill string from the Primary Heave Compensator. The maximum suspended weight on the Primary Heave Compensator is expected to be 583,000 Lbs. The Primary Heave Compensator will remove approximately 80% of the heave and the balance of the heave will be removed by the Secondary Heave Compensator. The drill string(approximately 115,000 Lbs.) will be suspended from the Secondary Heave Compensator.

2.0 Risk

2.1 Safety

The mini-drill floor will be 50 ft. above the drill floor and operated by specially trained personnel who will be fastened to the derrick by safety harnesses. There is probably a minimal chance of a catastrophic failure. But knowing that safety harnesses are required to be worn by the workers implies the safety aspects of the mini-drill floor is more than a casual drilling rig operation.

2.2 Proportional Integrator-Differential Controller

By the nature of the system, there is a controller interaction between the mini-drill floor, 3.50 in. tubing string, and mini-riser. The Primary Heave Compensator, mini-drill floor, Secondary Heave Compensator, and 3.50 in. tubing string represents a two degree of motion problem with two springs and two masses. The addition of the mini-riser suspended from the Primary Heave Compensator adds to the complexity of the motion problem. Since any displacement of any of these components will displace the Primary

Diamond Coring System

Status Report

1.0 Present Diamond Coring System(DCS) Operation

- Mini-Drill Floor
- Secondary Heave Compensator
- Primary Heave Compensator

2.0 Risk

- Safety
- Proportional Integrator-Differential Controller

3.0 Present "DCS" Coring Operation

- Mini-Drill Floor Rig-up, Rig-down

4.0 Active Heave Compensation, Diamond Coring System Operation

- Passive function of Primary Heave Compensator
- Active function of Primary Heave Compensator
- Slip-Joint type Compensator

5.0 Active Heave Compensation Risk

- Safety
- Proportional Integrator-Differential Controller

6.0 Work from Consultants

- Sensor Installation
- Compensator Seal Friction Analysis
- Vessel Dynamics

7.0 Alternative Approach; Active Heave Compensator

- Vendor Selected
- Turn Key Installation
- "DCS" Issues

8.0 Proposed Plan

- Budget
- Active Primary Heave Compensator Deployment
- Alternative Approaches

Heave Compensator, all components will also have a resultant displacement which must be corrected in order to maintain a stable weight on bit. By the nature of this action-reaction; stability of the 3.50 in. tubing string becomes more difficult.

3.0 Present "DCS" Coring Operation

Assume that coring is occurring. To do a bit change, the following occurs 1) API mini-riser string disconnected and offset from bottom hole assembly; 2) 3.50 in. tubing string must be set down; 3) mini-drill floor must be de-rigged and set to the side; 4) 3.50 in. tubing tripped out of hole by the conventional drilling equipment; 5) 3.50 in. tubing string with new bit tripped into hole; 6) API string reconnected to bottom hole assembly; 7) mini-drill floor rigged up; and 8) coring continues.

4.0 Active Heave Compensation, Diamond Coring System Operation

The rod side of the Primary Heave Compensator cylinders will still serve the passive compensator function. The active function will be obtained by directing hydraulic fluid to the piston side of the compensator cylinders. The 3.50 in. tubing string will be suspended from the Primary Compensator. And the mini-riser will be suspended from the bottom of the drill floor; near the moon-pool, by a slip-joint type compensator. This arrangement allows normal drill floor operations for "DCS". The task of making up or breaking joints will be the same as any normal drill floor operation. The min-drill floor is not used with this approach. The rigs existing top drive will be used for coring, with some modifications. The existing top-drive is limited to 250 rpm. "DCS" requires a maximum speed of 450 rpm. Possibly a gear change or a different gear box may be required or possibly a different top-drive for "DCS" operation. The goal is to have this approach also function for other than "DCS" coring operations.

5.0 Active Heave Compensation Risk

5.1 Safety

The mini-drill floor will be removed, which removes all of the previous safety concerns.

All coring operations will be conducted from the drill floor with the existing crew. The need for special trained crews is removed.

5.2 Proportional Integrator-Differential Controller

Only the 3.50 in. tubing string will be suspended from the Primary Heave Compensator, this will isolate the dependence of other members of the system and allow more stability of the 3.50 in. tubing string . This controller will represent a single degree of motion system; single mass, single spring system. The motion of the 3.50 in. tubing string will not depend upon the displacements of the mini-riser or mini-drill floor as the controller in paragraph 2.2. Since the mini-drill floor has been eliminated and the mini-riser is suspended from the bottom of the drill floor by a slip-joint type compensator.

6.0 Work from Consultants

Stress Engineering Services("SES"), Inc. located in Houston, Tx has been contracted to provide the dynamic analysis of the 3.50 in. tubing and the PID Controller design for the Secondary Heave Compensator. "SES" has subcontracted the PID controller design to The Parvus Corp. in Salt Lake City, Utah. Sensors have been mounted on the stationary and moving blocks as well as in the ship hull as a means to obtain real-time data to further assist the computer simulation of the system. The data gathered will also show the static and dynamic friction characteristics of the heave compensator piston and rod seals. This data is useful, no matter which scheme of controlling the 3.50 in. tubing is used. The optimal result is to have the break-out friction of the seals to be as minimal as possible. The data also gives ODP a data base of real-time vessel roll, pitch, and heave which is beneficial data for other applications. The sensors installed are 1) acceleration sensors on both the stationary and traveling blocks; 2) displacement sensor between the stationary and traveling block; 3) motion reference unit on the traveling block; and 4) motion reference unit mounted near the node of the ship. The motion reference units are acceleration sensors that measure the ship roll, pitch and heave. "SES" is planed to gather data from all of these sensors, compare data, and determine which sensor's provide the best feedback for the PID Controller.

7.0 Alternative Approach; Active Heave Compensator

A vendor has been selected that has a complete Active Heave Compensation system packaged, who will install their equipment on our ship as a turn key project with training of our personnel. This product would benefit all aspects of our coring business. There are still issues not resolved before acceptance of this product for "DCS" operation. These issues are 1) weight on bit variation due to the system controller scheme; and 2) dependence weight on bit due to 3.50 in. tubing friction on the mini-riser. It may be possible to install this system on the ship by October, 1997. Assuming the issues are resolved for "DCS" operation, "DCS" operation may be available during fiscal year 1998.

8.0 Proposed Plan

Since "SES" have some indecision as to the controller approach to proceed with, and the lack of return for the money invested with "SES", this would be an optimal time for "ODP" to stop any further contract spending on this project. There has been renewed interest in other means; down hole mud motors, to perform the "DCS" operations. The budget set aside for "DCS" should be used for implementing the Active Heave Compensation discussed in paragraph 4.0 and for investigating other approaches to "DCS".

Passive Heave Compensator Seals

The Ocean Drilling Program (ODP) relies on the passive drill string compensator on the Sedco/BP 471 Joides Resolution drill ship to isolate the drill string from most of the ship heave. The ship heave is very detrimental to precision coring because it causes large variations of weight on bit. This in turn results in detrimental effects on coring rate and core quality.

The heave compensator (see Figure 1) is a passive system. The drill string weight is carried by two 17" diameter cylinders using air pressures of up to 2200 psi. The compensator cylinders are plumbed to a bank of air pressure vessels (APV's) located in the casing hold of the ship. This provides a soft spring effect for the compensator. The compensator also has an oil cushion riding on top of each cylinder. This oil provides the lubrication for the air cylinder, without which it would not operate. In this manner, the compensator isolates the drill string from most of the heave effects.

ODP wants to improve the efficiency of the heave compensator aboard the vessel. The main source of inefficiency in the compensator is the friction in the cylinders' seals. This was identified by Stress Engineering (SES) in the development of the DCS system computer simulation. SES has estimated the existing friction to be in the range of 16,000 pounds for the system. Since a normal desired WOB is around 30,000 pounds, this friction may cause serious variation in bit loading.

The seals currently used in the compensator are V-packing material. A search for a candidate replacement seal was performed by SES in 1993. The most promising appeared to be the Opti-ring (see Figure 2) design by CDI Seals. This utilized a graphite impregnated PTFE ring with one O-ring energizer for the piston seal and a modified V-pack arrangement for the rod seal.

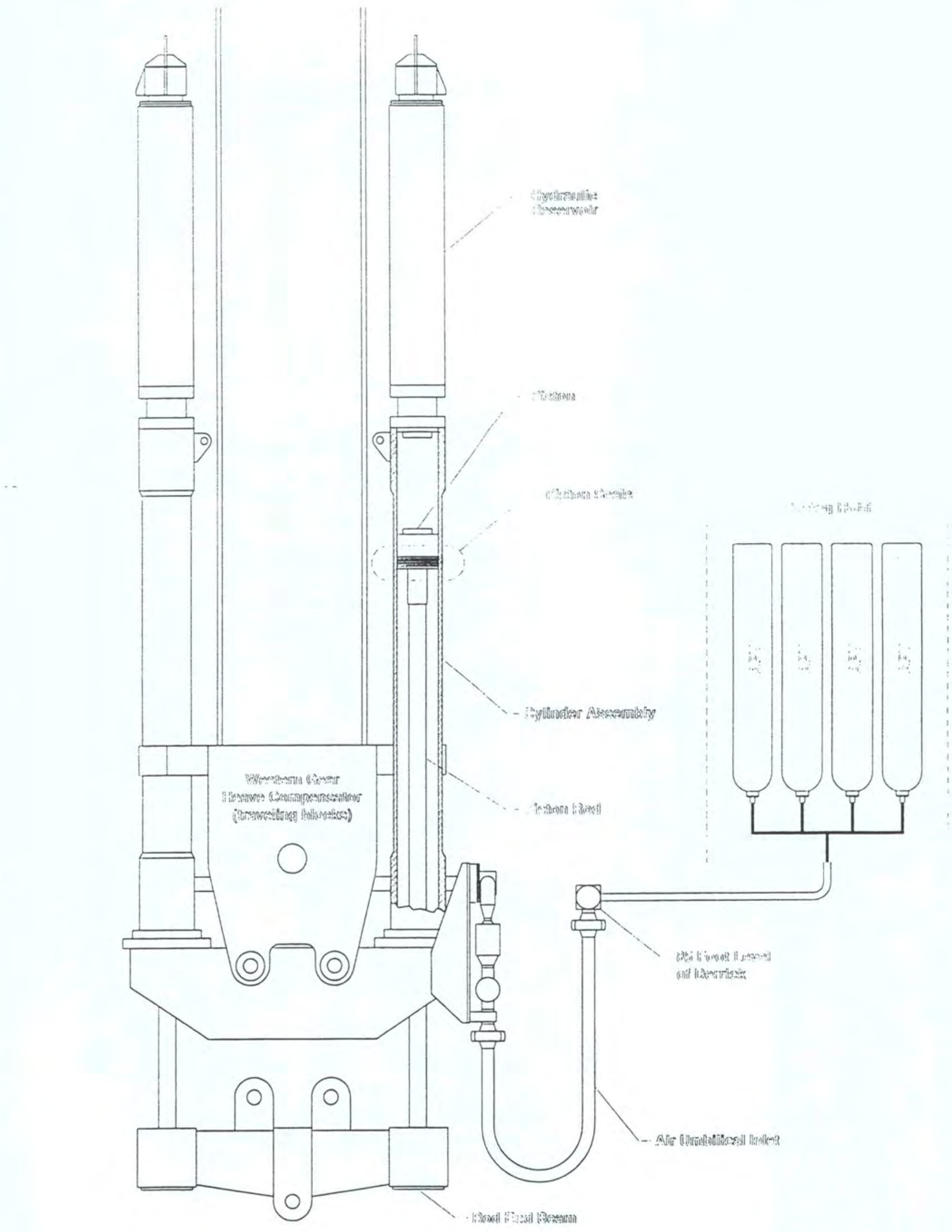
The new seal candidates were tested in two phases. The first phase was to evaluate whether the candidate seals functioned properly and indeed did have lower friction than the original seals. The second phase of testing was to determine if the new seals would have sufficient life, durability, and wear resistance to stand up to the required service.

Test results showed significantly lower seal friction for the CDI Opti-ring seals compared to the old V-pack seals. The Opti-ring seals also performed equally with the V-pack seals in terms of life expectancy, durability, sealing pressure, etc. However, the Opti-ring seal is sensitive to cylinder bore conditions (bore diameter, poor surface finish, spotty chrome, etc.). It was recommended that the Opti-ring seals not be used in the cylinders unless the bore conditions are found to be within the original manufacturers specifications.

If the new Opti-ring seals can not be used because of cylinder bore conditions, SES suggested that a notable reduction in friction can still be accomplished by using the modified V-packing seal. This alternate piston V-packing seal design consists of a geometry similar to the original V-packing. The original V-packing (see Figure 2) consists of one each Female Adapter, five each "V" Rings, and one each Male Adapter. The material consisted of cotton duck and nitrile for all components of the packing stack. The new modified V-packing (see Figure 2) consist of one each Female Adapter (made from 25% carbon filled PTFE), four each "V" Rings (two made from 5% MoS_2 filled PTFE and two made from a material similar to the original packing material), and one each Male Adapter (made from 25% carbon filled PTFE).

Determining the condition of the cylinders will require that they be disassembled and measured during a port call (see Figure 3). Piston seals can not be changed at sea. The inspection was scheduled for the San Diego port call at the beginning of Leg 170. As a result of developments in Sedco's procurement of items required for the seal change-out, the inspection and seal change have been postponed. They are currently scheduled for the Leg 172 port call in Charleston, S.C. The port call will take place during February, 1997. Instrumentation to do a visual inspection and measure surface finish and inside diameter of the compensator cylinders has been identified by ODP. A devise to utilize these tools (see Figure 4) was designed and developed by ODP and is currently be manufactured. After the compensator cylinders are disassembled the devise, with inspection instruments, will be lowered into the cylinder. All necessary measurements and a video recording of the inside condition of the cylinder will be taken utilizing the special controls and displays (see Figure 5).

The outcome of this inspection will dictate whether the original seal design is reinstalled as is, or an alternate seal design substituted. If the inspection revels that the cylinders are within original specifications - 17.000/17.004" inside diameter, 32 RMS max. surface finish and no defects in the chrome - the new Opti-ring seals will be installed. If the inspection revels only minor imperfections in the surface finish and/or minor diameter deviations, the modified V-packing seals will be installed. If the cylinders have a rough finish, spotty chrome, and ovaling of the inside diameter or diameter wear, then the Opti-ring and V-packing seals will in all likelihood have its life expectancy reduced accordingly. Therefore, if these conditions exist, the original seal design will be reinstalled as is.



Hydraulic Reservoir
Cylinder Assembly
Western Gear Heave Compensator (traveling blocks)
Air Umbilical Inlet
Rod End Beam

Figure 1

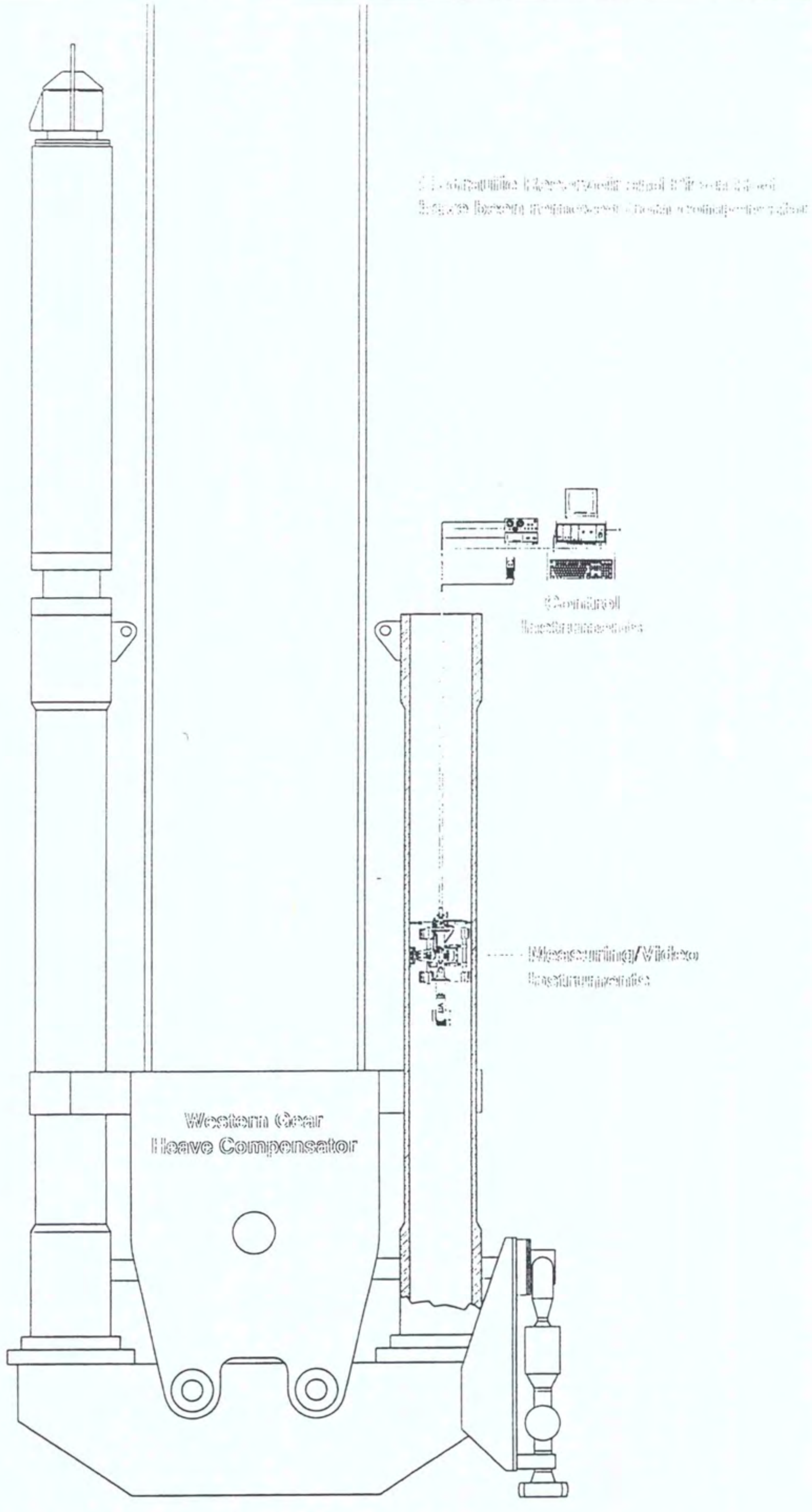

Control
Instruments
Measuring/Video
Instruments
Western Gear
Heave Compensator

Figure 3

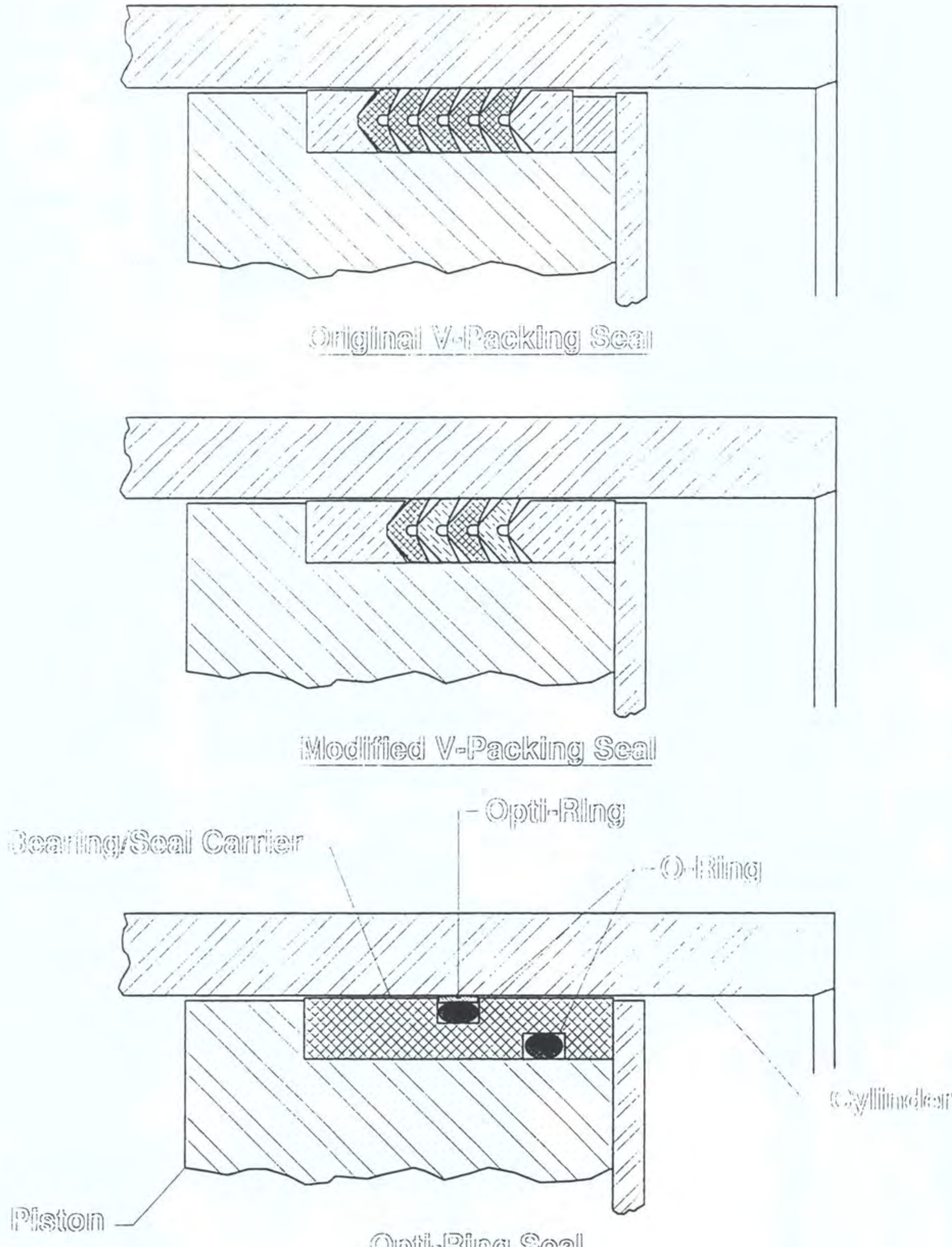
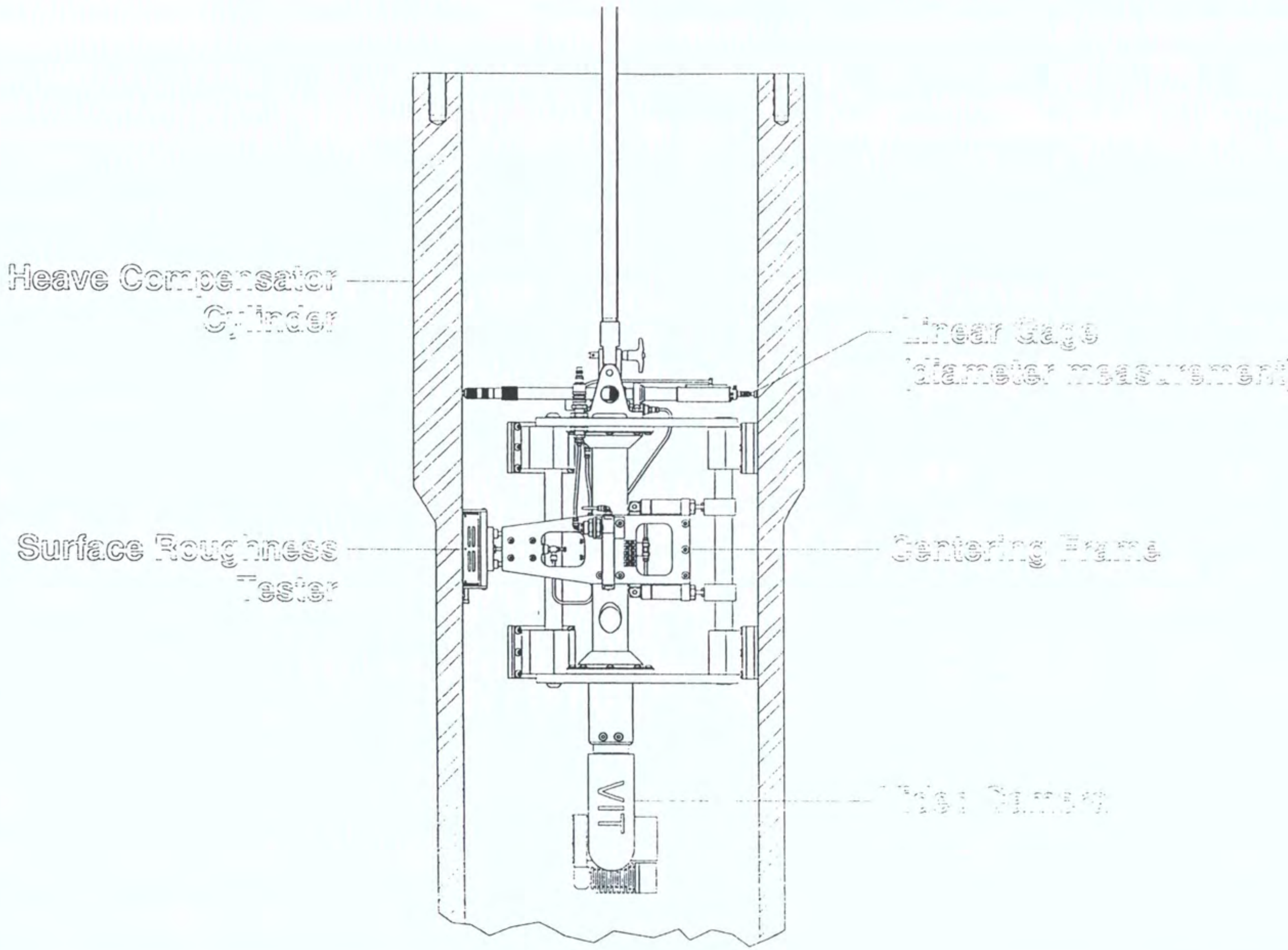
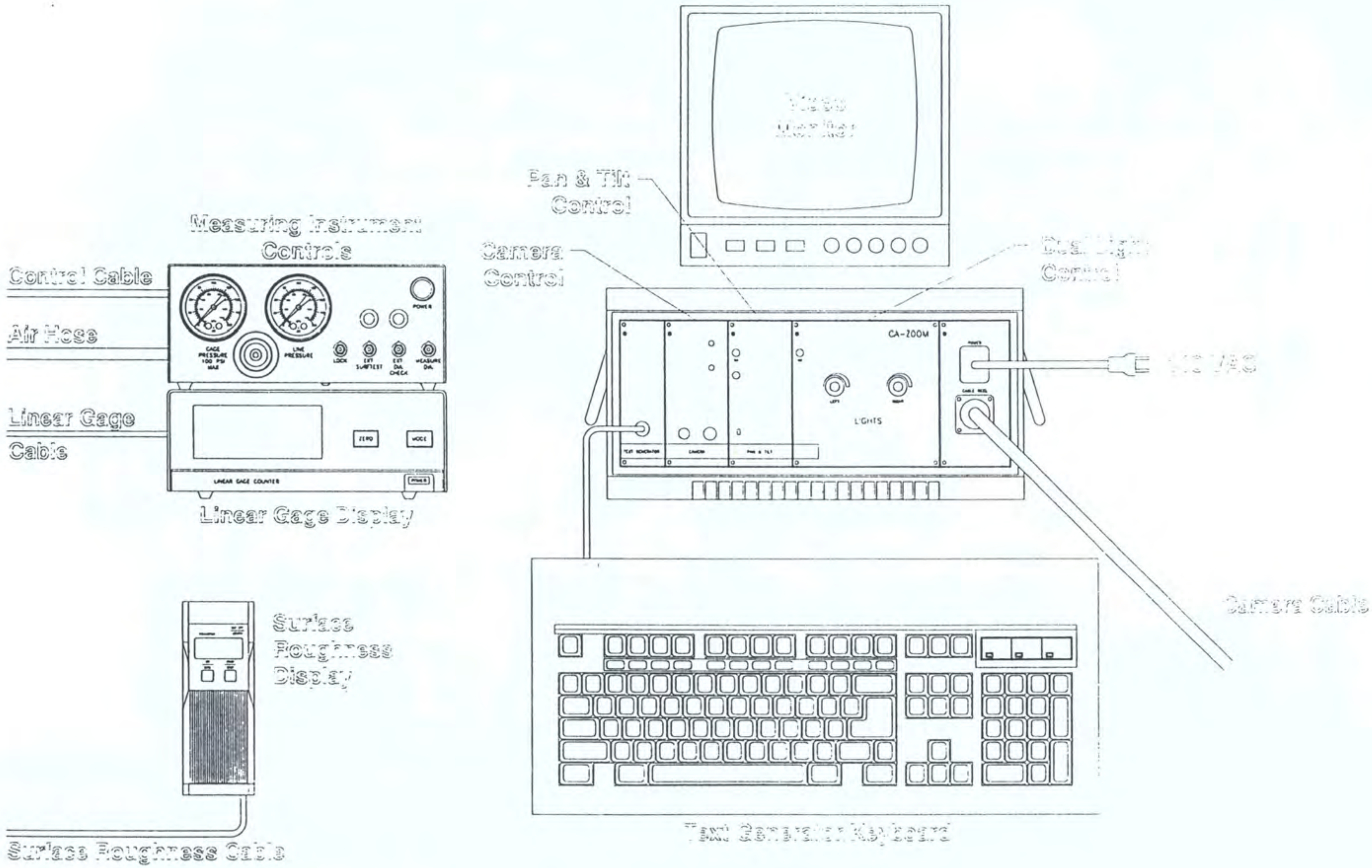

Original V-Packing Seal
Modified V-Packing Seal
Opti-Ring
Bearing/Seal Carrier
O-Ring
Cylinder
Piston
Opti-Ring Seal

Figure 2



Heave Compensator Cylinder
Linear Gage (diameter measurement)
Surface Roughness Tester
Centering Frame
VIT



Measuring Instrument
Controls
Control Cable
Air Hose
Linear Gage
Cable
Linear Gage Display
LINEAR GAGE COUNTER
ZERO
MODE
POWER
Surface
Roughness
Display
Surface Roughness Cable
Pan & Tilt
Control
Camera
Control
CA-200M
LIGHTS
Text Generator Keyboard

Passive Heave Compensator Seals

Isolates Drill String From Ship Heave

Heave Detrimental to Precision Coring

- Western Gear Heave Compensator

    Passive System

    17" Dia. Cylinders

    Compressed Air/Hydraulic System
        2200 psi
        provides soft spring effect
        oil provides lubrication

- Improve Efficiency

    Seal Friction
        main source of inefficiency
        16,000 pounds with current seals
        50-60 % reduction with new seals

    WOB - 30,000 pounds

- Seals

    V-packing - currently used

    Opti-ring Seals
        PTFE ring
        o-ring energizer

Modified V-packing

- Test Results

    Life Expectancy

    Durability

    Sensitive to Cylinder Conditions
        bore diameter
        poor surface finish
        spotty chrome

- Cylinder Bore Condition

    Disassemble Heave Compensator
        only in port

    Inspection
        visual
        diameter
        surface finish

    Inspection Instruments

- Inspection Results

    Install Opti-ring Seals

    Install Modified V-packing

    Install Original Seals

DSD - ACTIVE PRIMARY HEAVE COMPENSATOR

PURPOSE

The DCS - Active Primary Heave Compensator will provide the science community with a drilling system capable of:

1) maintaining a consistent weight-on bit to improve all coring operations,
2) maintaining small weights on bit for DCS coring with the 3½ tubing string and 4" diamond bit through the 5" DP Riser- (friction effects to be assessed),
3) improving operations on legacy holes (landing out equipment).

BACKGROUND

In October 1994 the DCS development effort was redirected to establish the feasibility of a secondary heave compensator controller. A prime subcontractor, Stress Engineering Services, was contracted to handle this work. The effort was divided into the following phases:

Phase 1 - Design Plan Development

A very specific and detailed design plan for the controller development work. Successfully completed in June 1995.

Phase II - Controller Design and Development

Practical controller configurations for use in the DCS were identified utilizing simulation software. This was completed in March 1996.

Phase III - Controller Implementation

Feasible control solutions identified in Phase II will be implemented in Software for DCS land tests.

A) This phase is a field confirmation of the selected DCS sensor packages and of the DCS controller software and hardware. The equipment was deployed on Leg 169.

B) Software Development and Hardware Integration.
This is scheduled to start, but is currently on hold pending re-assessment of the project status by Development Engineering.

Phase IV - Land Tests

Land tests are required prior to deployment of any unproven equipment (DCS - platform) on an Engineering Leg.

TEDCOM RECOMMENDATION

At the March 1996 TEDCOM it was recommended that

> "Some spade-work be funded to examine prospects for using DCS control technology developed to improve the primary compensator by addition of active biasing cylinders and controls to improve operational accuracy and responsiveness."

Technology Development Approach

It was recognized by Development Engineering staff that its current DCS related activities would not only be relevant, but important to TEDCOM's recommendation regarding the primary heave compensator.

These activities are:

- Low Friction Seal Installation on Primary Heave Compensator
- DCS Phase IIIA - Field Testing of DCS sensor packages, and controller software and hardware
- DCS Phase IIIB - Software Development and Integration, subject to a re-assessment of the current status of the project.

Drilling Services has also made inquires regarding the commercial availability of this type of system. At a technical meeting Mr. Yves Le Moign Manager Research and Engineering of Sedco Forex mentioned that Sedco was using active compensators.

The District Manager for ODL followed up on this at our request and we had a meeting in College Station with RETSCO International, the vendor for the technology.

Their systems are operational and have been installed on

- Drillstar since 1992
- Sonat Arcade Frontier since 1994
- Sedco 711 and 712 since 1994
- Sedco 714 since 1996

at the request of Shell and BP.

Attached is a budget proposal from RETSCO for the JR and summary information on the system's operational benefits.

Recommendation

Phase 3 - Procurement

It is recommended that ODP obtain a quote from RETSCO to install this proven, operational system in Capetown prior to Leg 176. This is subject to TEDCOM's review and concurrence and PCOM's approval.

Milestones -

December 1, 1996	Quotation and technical documentation from RETSCO
January 1997	Place P.O. with RETSCO for sea freight to Capetown
March 1997	Place P.O. if air freight used
October 18-22/1998	Installation of system in Capetown

Re: Budget Proposal for Active Motion Compensation Up-grade to your Western Gear 800K In-line DSC on-bo the rig **Sedco 471.**

ACTIVE MOTION COMPENSATION ADD-ON, UP-GRADE KIT FOR Western Gear DSC

General: This budgetary proposal identifies the necessary equipment to up-grade your existing Western Gear 800K In-line DSC with the Retsco International Active Motion Compensation System. Active Mo-Comp. provides the rig with the capability to compensate for fully suspended hook-loads. The various application opportunities are as follows:

- Expanded weather window for sea bed landing and retrieval operations such as BOP, LMRP, casing strings, wellhead packages. The weather windows for these operations can be expanded from 3 to 4 ft heave to 10 to 15 heave.
- Controlled entry and exit from a customers template can now be undertaken in a safer manner.
- Better drilling efficiencies can be achieved from conventional weight-on-bit drilling as the Active System filte out more of the heave disturbance to the drill string than conventional passive DSCs.
- Other drilling methods can be employed such as slim hole drilling and coiled tubing drilling.
- Coring efficiency improved.

Up-grade Kit includes the following equipment:	
- Actuating Accumulator (Active Control Cylinder)	
- Hydraulic Power Unit - providing 100% redundancy . 75KW motors all self contained in a 8'x 8' sea cab. Delivered fully tested & operational for direct hook-up for minimum offshore commissioning.	
- Computer Control Unit - A PC based IS Computer control package that forms the heart of the Active System. The CCU package includes wire wheel and accelerometer type position sensors, which provide for motion reference during guideline-less operations. The driller's control console is a TFT colour screen with a 6 button function array.	
- Commissioning Labour included, provides for 2 men for 14 days for system commissioning.	
- Software Simulation Program is a unique feature supplied by Retsco which allows the rig crew to use a custom software program to troubleshoot the system software and to make modifications to the system software without the need for Retsco personnel.	
Budgetary Total for DSC up-grade	$ 785,900-00
Retsco Labour for Installation	$ 45,000-00
Normal Delivery Houston 26 weeks	
Installation Estimate	$ 211,700-00

Active Motion Compensation Cuts Downtime

Advanced technology in Motion Compensation is enabling rigs to reduce exposure to weather in the hostile conditions of the North Sea and Atlantic Frontier regions. One company pioneering this technology is Retsco International of Aberdeen, who have installed and commissioned three Active Heave Compensator upgrades on North Sea semi-submersibles in 1995.

How it Works

An Active Drill String Compensator is an upgrade to the existing Drill String Compensator (DSC), and is designed to maintain a suspended load in a fixed position relative to the seabed. Response to rig heave is made real-time. Retsco use two independent sensors to measure rig heave. A wire wheel indicator is attached to a guideline tensioner, to provide a direct reference to the seabed. The second sensor is an accelerometer, calibrated to determine the vector components of roll and pitch in addition to rig heave. The Retsco system can therefore be used without guidelines, which makes it very attractive for deepwater operations.

Heave signals are fed to the Central Control Unit, which controls 2 x 75kW variable displacement pumps using two precise servo-valves. Hydraulic actuation takes place in a specially manufactured cylinder which, in the case of the In-line DSC's produces the hydraulic force used to combat heave. In the case of the Crown Mounted DSC, the actuating cylinder acts directly onto the existing DSC cylinder. Operation of the Active Heave Compensator, which incorporates a graphics display clearly showing the status of the system, is carried out by the Driller.

Active System

Retsco's system is unique as it allows two different Active Modes:

1. Landing (or Position) Mode, in which movement of a fully suspended load is greatly reduced. There is thus greater control in operations such as:

- Performing a subsea installation.
- Landing BOP, Lower Marine Riser Package (LMRP), Wellhead
- Drilling with Thruster Motors (Slimhole Drilling)
- Directional Drilling with Thruster Motors
- Reaming Operations.

2. Drilling (or Load) Mode, which is designed to maintain bit position relative to the datum point (sea floor), where operations require a softer response from the control system, including:

- Conventional Drilling
- Drilling with Mud Motors
- Coring operations.

Field Experience

The Retsco Active Heave Compensator was installed on the *Sedco 711* in May 1995 prior to the start of Chevron UK Ltd's 9-well Britannia pre-drilling programme. According to Richard Seaman of Chevron, when considering installing the AHC technology, advantages were anticipated primarily for landing the BOP stack in weather conditions outwith the conventional operating envelope for rig motion. However, several other benefits were experienced: more constant WOB, increases in coring efficiency, fishing operations, and liner setting operations.

Coring Efficiency

All 6 wells have been cored through the entire Britannia reservoir section. A total of 3952' of core has been cut, with an average core length of 124' and a recovery efficiency >96%. Individual cores of 244' in 8-1/2" hole and 152' in 12-1/4" hole (believed to be a North Sea record) have been achieved. Use of the AHC has been a significant contributory factor to this success, as it has provided a means to maintain more constant weight on the corehead and to allow us to make connections during coring with minimal risk of breaking or jamming the core - an important factor. *Since core analysis forms such an important part of reservoir management, improved core acquisition quality through use of the AHC is a major benefit,* when coring from a MODU in typical North Sea winter weather conditions.

Drilling Efficiency

Direct WOB measurement are not acquired from the MWD on the *Sedco 711*. The use of the AHC is designed to provide a more constant weight on bit, which should increase the drilling efficiency. It is a contributory factor to the increase in ROP from the offset wells.

DRILLING SERVICES DEPARTMENT
PROGRAM PLAN BUDGET SHEET
1803-05 DCS Active Heave Compensator

Expense Category	Description	FY96	FY97	FY98	FY99	FY00	FY01	FY02
PHASE A - REDEFINE PROJ			PHASE A	PHASE B		PHASE C		
B - ACTIVE COMPENSATOR								
C - DP TENSIONER								
2000	Payroll (MANHRS)		2,730	2,500		500		
3500	Travel		$ 26,000	$25,000		$15,000		
3580	Travel-Port Call							
3720	Business Conference							
4000	Supplies		$25,000			$50,000		
5042	Utilities-Shore		$3,750	$5,000		$5,000		
5070	Insurance							
5261	Shipping		$8,000	$10,000		$10,000		
5550	Professional Service							
5570	Consultant Service		$10,000			$50,000		
5931	Equipment Rental		$5,000					
5994	Inspections							
6820	Maintenance/Repair							
8400	Equipment		$365,000	$450,000		$500,000		
4765	Software							
6509	Subcontracts (note 2)							
	SUBTOTAL $		$ 442,750	$ 490,000		$ 630,000	$ -	$ -
Redirect to RETSCO Active Comp			400,000	490,000	for a total of $890,000 vs proposal @ $1,042,600			
	NOTE 2: Exp Cat 6509 NOT to be used							

DRILLING SERVICES DEPARTMENT
POSITION PAPER
HAMMER DRILL SYSTEM

PURPOSE

The Hammer Drill System will provide the science community with a drilling system capable of:

1) spudding-in the drilling assembly on sloped, bare, hard rock surfaces such as the mid-ocean ridge,
2) drilling-in casing to establish a reentry structure and surface casing in hard rock or fractured formations,
3) running and setting consecutively nested casing strings immediately after RCB coring refusal or hole problems without separate hole-opening and casing running trips.

BACKGROUND

To achieve the scientific objectives desired under the DYNAMICS OF EARTH'S INTERIOR theme in the ODP Long Range Plan will require successful hard rock and deep drilling capability with the JOIDES Resolution.

A significant step can be made towards this scientific objective if the program can successfully and repeatedly set 20" conductor pipe followed by 16", 13⅜" and 10¾" casing strings. It will then be possible to drill out from under the 10¾" casing with the 9⅞" RCB system and potentially follow it with the 3.5" DCS system. Once the 20" casing is set, the proposed operational procedure will be to RCB core followed by casing with the HDS.

In May 1996, the Hammer Drill development effort was initiated to establish the validity of existing hammer drills for adaptation to deep ocean drilling.

Pneumatic hammer manufacturers were reviewed and two were found to have an interest in developing larger size (>5") hydraulic hammers - SDS Digger of Australia and Nova of the USA.

PHASE I - LAND TEST OF SDS HAMMER ON SLOPED/HARD ROCK

The Hammer Drill project components have been established as hammers, hammer bits, free fall re-entry cone and casing hanger and running tools.

Phase I of the HDS testing program was completed on August 2, 1996. The first series of tests pertained to spudding a specially designed two part bit on inclined surfaces. Black granite was the test medium with slopes ranging from 15 to 45 degrees. The bit and hammer were successful in spudding at every angle attempted. The second series of tests was directed at drilling-in 7" casing into black granite at a quarry with a 4.8" hydraulic hammer. Overall, 21m of casing was installed in the granite. The average ROP was 3.72m/hr. Penetration rates of over 7m/hr were experienced during the test program.

Statoil has also carried out a successful test with the 4.8" hydraulic hammer using a 6" bit to a depth of 1220m. It drilled 3.5m into 220Mpa material at an average ROP of 4m/hr. SDS Digger Tools (SDS) has also designed and built a 12.25in hydraulic hammer for Statoil to test.

The Iceland Drilling Company is successfully drilling geothermal wells in Iceland using pneumatic hammers with Holte bits with a second hammer on top of the casing to advance the casing when it hangs up in the hole. This combination hammer approach should be tested by ODP to maximize casing setting depths on each successive casing string.

PHASE II FIELD TEST OF HAMMER ON ENGINEERING LEG 174B

Phase II of the HDS testing program involves testing a 16" or 13⅜" hammer on Leg 174B for setting 16" or 13⅜" casing strings in 1 to 3 test holes. ODP's Development Engineering Section will design and build the running tools and re-entry system for the HDS.

An SDS 13⅜" (12-¼") Hammer design exists and the prototype will be fabricated in early November 1996. The prototype will be field tested by Statoil in early December 1996.

Phase II of the HDS testing program will utilize the Holte eccentric bit with the SDS hydraulic hammer as a drive mechanism for the bit.

Hydraulic hammers will be ultimately designed to optimize their efficiency with different casing sizes, for example 20"/16" and 13⅜"/10¾" combinations.

Several issues are yet to be resolved;

A) The ship board pumps and high pressure piping system will be inspected and pressure treated during the Leg 170 transit. Sedco will provide a report recommending maximum working pressure and flow rates for the existing pumping system.

B) SDS has been requested to review the hammer design to see if the WOB requirements can be reduced without affecting the hammer efficiency.

C) A meeting is scheduled October 28, 1996 with SDS representatives in College Station to discuss hammer/bit availability and costs associated with the Phase II Proposal.

PHASE III DESIGN AND FABRICATION OF TOP CASING HAMMER

A single Top Casing Hammer will be developed to be compatible with the casing sizes to be used with the HDS. This will involve design, fabrication and functional testing of the TOP CASING HAMMER (TCH) with the 16" HDS by SDS.

ODP's Development Engineering Section will need to design and fabricate the running tool and re-entry system for a TCH.

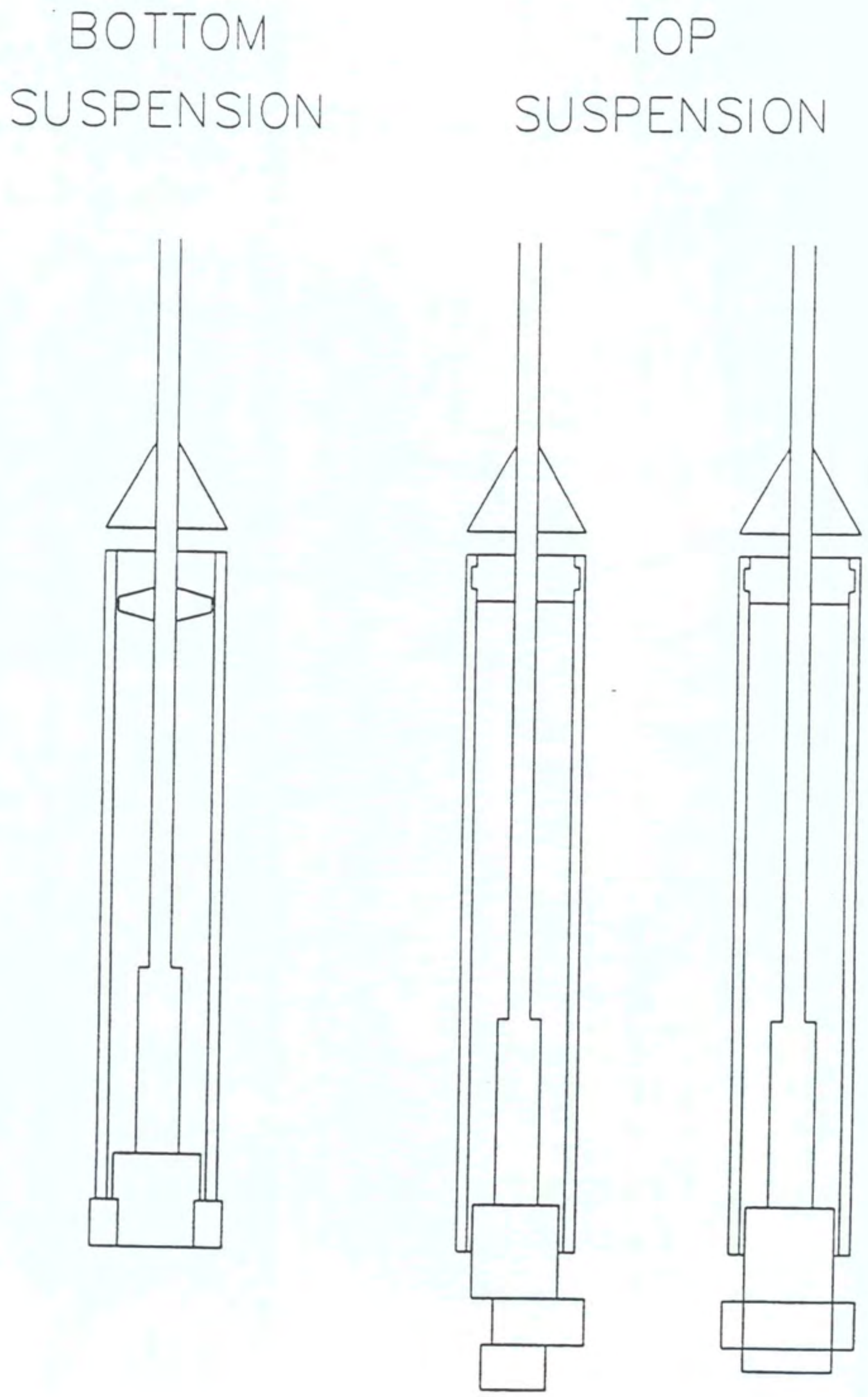
PHASE IV PROCUREMENT OF 13⅜"/10¾" HAMMER

Procurement of this final hammer size will allow ODP to optimize its casing setting capability in a deep hard rock environment.

DEVELOPMENT SCHEDULE AND COST ESTIMATE

See attached budget documentation.

Expense Category	Description	FY96 PHASE I LAND TEST	FY97 PHASEII 16" ENGR LEG 174B	FY98	FY99 PHASE III TOP CASING HAMMER	FY00 PHASE IV 13" HAMMER	FY01	FY02
		DRILLING SERVICES DEPARTMENT PROGRAM PLAN BUDGET SHEET 1803-07 HAMMER DRILL SYSTEM						
2000	Payroll (MANHRS)	750	1,840		1,600	200		
3500	Travel				10,000	5,000		
3580	Travel-Port Call							
3720	Business Conference							
4000	Supplies		125,000		120,000	85,000		
5042	Utilities-Shore							
5070	Insurance							
5261	Shipping				5,000	5,000		
5550	Professional Service							
5570	Consultant Service	200,504	147,314					
5931	Equipment Rental							
5994	Inspections							
6820	Maintenance/Repair							
8400	Equipment		375,000		400,000	250,000		
	SUBTOTAL $	200,504	647,314		535,000	345,000		



REV20

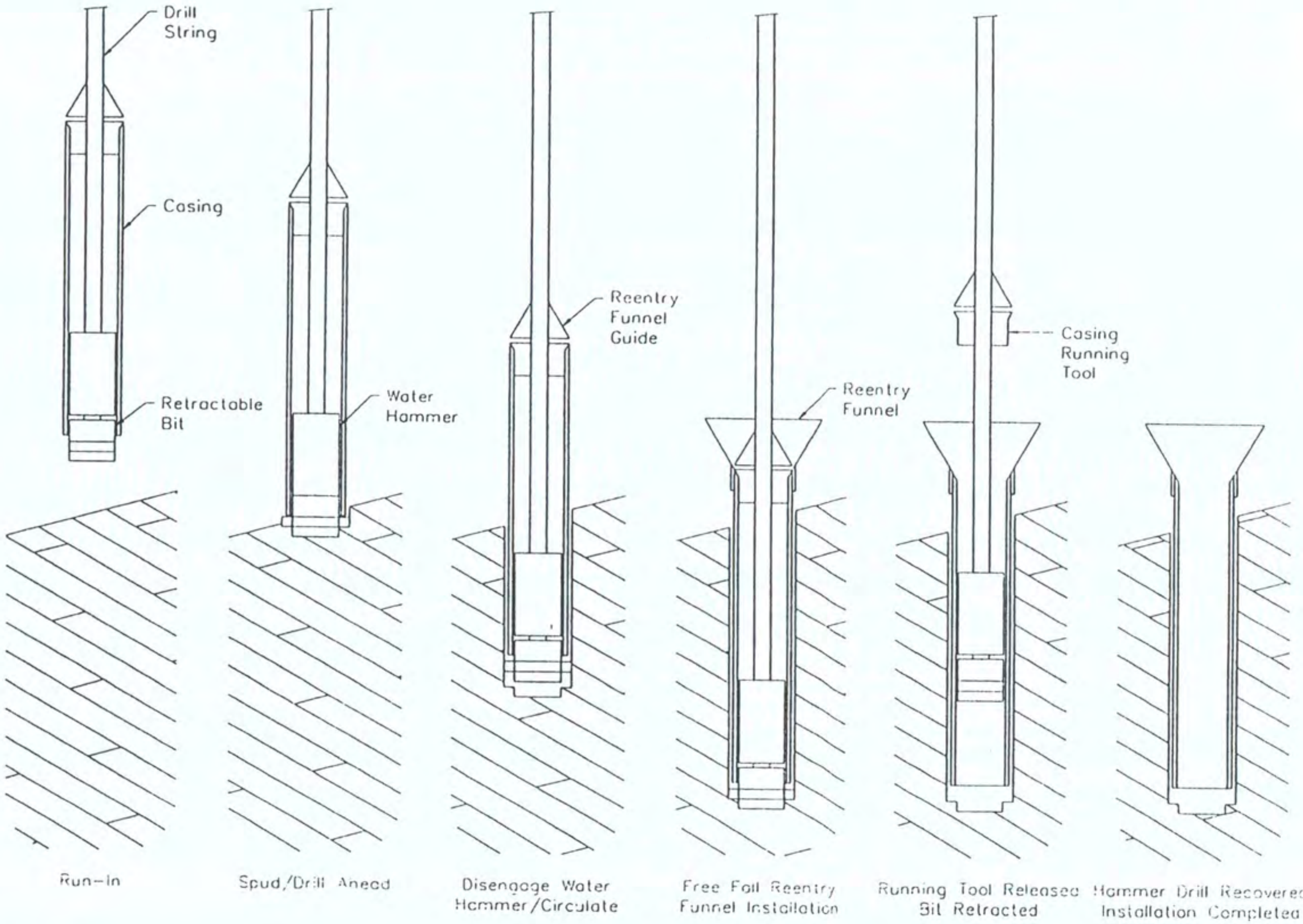


Figure 1. Schematic Diagram of Water Hammer Drill-In Casing System Deployment

- SDS DIGGER TOOLS PTY.LTD. WATER HAMMER - ESTIMATED SIZES & FLOW RATES - ODP APPLICATIONS.

M B McInnes, 29 September, 1996

Hammer version			Base prototype (no casing)	7" ODP casing hole model	ODP 13 3/8" CASING: ODP casing with custom hammer.	ODP 13 3/8" CASING: ODP casing compromise based on 12 1/4" hammer	ODP 16" CASING: ODP casing with custom hammer	ODP 16" CASING: ODP casing compromise based on 12 1/4" hammer	12 1/4" (no caseing)
Notes (see below)			(1)	(2) & (8)	(3) & (9)	(4)	(5)	(6)	(7)
Hole diameter		(")	6	7.5	14.75	14.75	17	17	12.25
		(mm)	152.4	190.5	374.7	374.7	431.8	431.8	311.2
Casing outside diameter		(")		6.626	13.375	13.375	16	16	
		(mm)		168.3	339.7	339.7	406.4	406.4	
Casing inside diameter		(")		6.248	12.515	12.515	15.125	15.125	
		(mm)		158.7	317.9	317.9	384.2	384.2	
Hammer barrel (outside housing) diameter		(")	4.8	4.8	12.313	10.226	14.191	10.226	10.226
		(mm)	121.92	121.92	312.75	259.74	360.45	259.74	259.74
Ratio of hole diameter / barrel diameter			1.25	1.56	1.20	1.44	1.20	1.66	1.20
Flow rate at 2450 psi hammer differential pressure.		(USgpm)	159	159	829	591	1076	591	591
		(l/min)	600	600	3136	2236	4074	2236	2236
Flush outside casing (between joins)	Up-hole cross section area	(inches2)	10.2	9.7	30.4	30.4	25.9	25.9	35.7
		(mm2)	6567	6256	19595	19595	16721	16721	23051
	Average up-hole speed	(ft/min)	300	315	525	374	799	439	318
		(m/min)	91	96	160	114	244	134	97
	(* compared with prototype)	Ratio *	1.00	1.05	1.75	1.25	2.67	1.46	1.06
Flush inside casing (between joins)	Up-hole cross section area	(inches2)	10.2	12.6	3.9	40.9	21.5	97.5	35.7
		(mm2)	6567	8106	2541	26376	13874	62930	23051
	Average up-hole speed	(ft/min)	300	243	4049	278	963	117	318
		(m/min)	91	74	1234	85	294	36	97
	(* compared with prototype)	Ratio *	1.00	0.81	13.51	0.93	3.21	0.39	1.06
Estimated potential drilling ROP in 150 MPa granite		(ft/hr)	43.3	27.7	47.2	32.5	47.2	24.5	47.2
(preferable to use data comparatively, not absolutely)		(m/hr)	13.2	8.4	14.4	9.9	14.4	7.5	14.4
	(* compared with prototype)	Ratio *	1.00	0.64	1.09	0.75	1.09	0.57	1.09
Drift inside diameter		(")			12.359	12.359	14.936	14.936	
		(mm)			313.9	313.9	379.4	379.4	
Casing inside diameter through pin.		(")		6.248	12.425	12.425	15.025	15.025	
		(mm)		158.7	315.6	315.6	381.6	381.6	
Casing joint					13 3/8" 61 lb/ft Atlas Bradford ST-L flush joint		16" 75 lb/ft flush joint		

Notes:

1. The current prototype water/mud hammer used to drill a 6" diameter hole for oil/gas wells.
2. The prototype water mud hammer adapted to drill in casing with a case hole bit system, tested at Black Hill quar
3. A special water hammer with the ideal bit/barrel diameter ratio, to drill in 13 3/8" casing.
4. A water hammer being manufactured to drill a 12 1/4" hole used here to drill a 14 3/4" hole for 13 3/8" casing.
5. A special water hammer with the ideal bit/barrel diameter ratio, to drill in 16" casing into a 17" hole.
6. A water hammer being manufactured to drill a 12 1/4" hole used here to drill a 17" hole for 16" casing.
7. The water/mud hammer being manufactured to drill a 12 1/4" diameter hole for oil/gas wells.
8. The actual drilling speed for the 7" ODP model was close to the estimated speed in the table.
9. The hammer barrel is too big for the driller.

HAMMER DRILL

- **16" SYSTEM VRS 13⅜" SYSTEM PUMPING REQUIREMENTS**

<u>Current Ship Pumping Capacity</u>: 1000 gpm @ 2750 psi
880 gpm @ 4000 psi
300 gpm @ 4500 psi

NOTE: The condition of existing high pressure piping system is unknown. The piping system will be evaluated during the Leg 170 transit.

<u>16" HDS SYSTEM REQUIREMENTS</u>: 1000 gpm @ 4500 psi (1)

<u>13⅜" HDS SYSTEM REQUIREMENTS:</u> 600 gpm @ 3275 psi (1)

(1) Based on 3000 m water depth

HAMMER DRILL

- **HAMMER DRILL WEIGHT ON BIT REQUIREMENTS**

WOB REQUIRED TO CLOSE BY-PASS

16" Hammer ≈ 55,000 lbs

13 ⅜" (12-¼") Hammer ≈ 36,000 lbs

MAXIMUM SAFE CASING STRING LOADING

16" Casing ≈ 22,500 lbs (1)

13⅜ Casing ≈ 25,000 lbs (2)

MAXIMUM WOB LOAD AVAILABLE FOR CLOSING HAMMER BY-PASS

16" Casing ≈ 22,500 lbs - 10,000 lbs (3) ≈ 12,500 lbs

13 ⅜" Casing ≈ 25,000 lbs - 10,000 lbs (3) ≈ 15,000 lbs

(1) Based on 8¼" drill collars inside 16" casing
(2) Based on 10½" drill collars inside 13⅜" casing
(3) 10,000 lbs WOB required to activate heave compensator

HAMMER DRILL

- 16" SYSTEM VRS 13⅜" HAMMER DEVELOPMENT COSTS

16" HAMMER COST ESTIMATE = A$165,000

13⅜" (12¼") HAMMER COST ESTIMATE = A$125,000

DRILLING SERVICES DEPARTMENT
POSITION PAPER
DCS DERRICK PLATFORM SYSTEM

1. Title: **Diamond Coring System (DCS)** Derrick Platform System

2. **Purpose:**
•A coring system to be used primarily in hard, fractured volcanic formations (oceanic crust).
•Other targets include interbedded soft/hard formations such as chalk/chert, reefal carbonates and sulfides.

3. **Objectives:**
Science:
•Examine the compositional evolution of extrusive products that form the oceanic crust
•Sample an active magmatic system
•Obtain a continuous vertical section through fast and slow spreading ridges
•Increase scientific knowledge of oceanic crust
Operational:
•Achieve good core recovery in hard fractured rock, interbedded hard/soft formations, carbonates and sulfide areas
•Provide a safe, efficient and reliable tool for high-percentage core recovery in difficult-to-core areas
•Maximize the core recovery in the target formations
•Provide scientists with a minimum of 80% core recovery in volcanics in water depths up to 4500m with up to 20 ft (nominal) waves

4. Proposal:

FY98: The current DCS project plan has the Phase IV Land Tests, the sea trial preparations, and the Sea Trials - DCS Engineering Leg scheduled in FY98. This is contingent on budget and manpower constraints and the ship's schedule.

FY99: The FY99 project proposal includes $50K for improvements to the DCS system, as identified during the sea trials. These improvements could include better heave compensator controller hardware and software, better core handling equipment, and general corrections to the system as a whole. The proposal also includes $25K for rig refurbishment, such as preventative maintenance to the rig and pipe inspection/coating.

DRILLING SERVICES DEPARTMENT
POSITION PAPER
DCS DERRICK PLATFORM SYSTEM

The DCS will also enter into its next phase starting with FY99. This phase has been named **DCS2** to signify the new initiative. The main goal of DCS2 will be to make the DCS a much more efficient coring system, reduce the rig handling time, and reduce the shipping costs to and from port. The way to accomplish this goal is by moving the DCS to the rig floor. This involves a new method of maintaining the tension in the main API string. At this point three options are being considered;

1) Riser Tensioners (similar to oil industry application)
2) Top slip joint/tensioner
3) Bottom slip joint

FY99 presently calls fro $200K to be spent on the initial engineering, analysis, and simulation.

FY00: The project proposal suggests a scientific DCS leg during FY00 to continue to meet scientific goals for the system. It also a good way to continue improving the DCS operation. This is subject to budget and manpower constraints and the ship's schedule.

FY99 also has $100K for continued development of DCS2, although at a reduced scale.

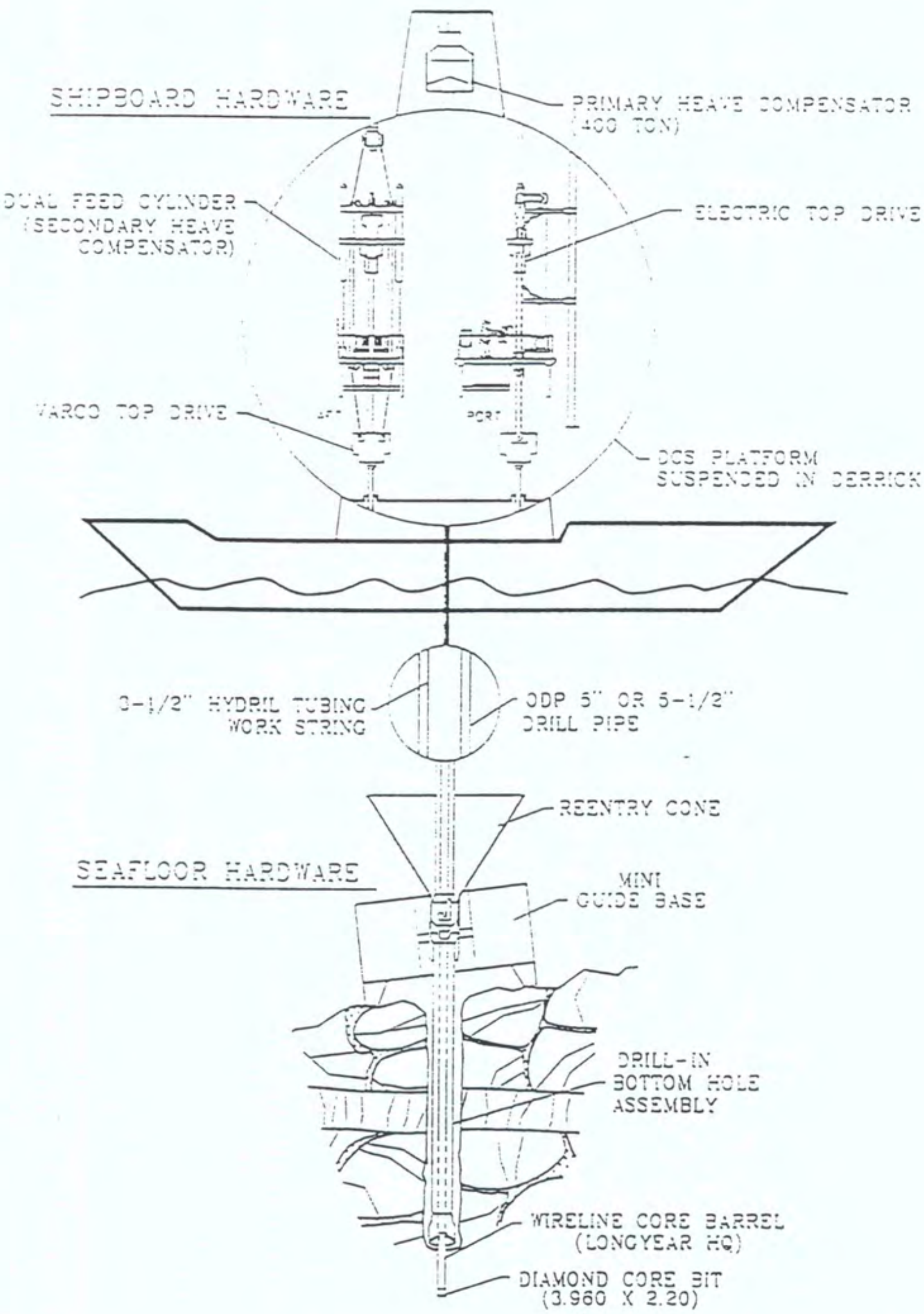
FY01: The proposal calls for $25K to refurbish the rig following its use. DCS2 has $200K scheduled for final engineering and initial purchases on the improved system.

FY02: During FY02 the development of DCS2 picks up speed. $900K is suggested for fabrication and limited testing of DCS2 components and for purchasing long-lead items for the next leg.

FY03: The DCS2 improvements are installed on the rig during a dry-dock period. The system is taken to sea and tested on an Engineering/Scientific Leg. The $600K in the schedule is slated toward that purpose.

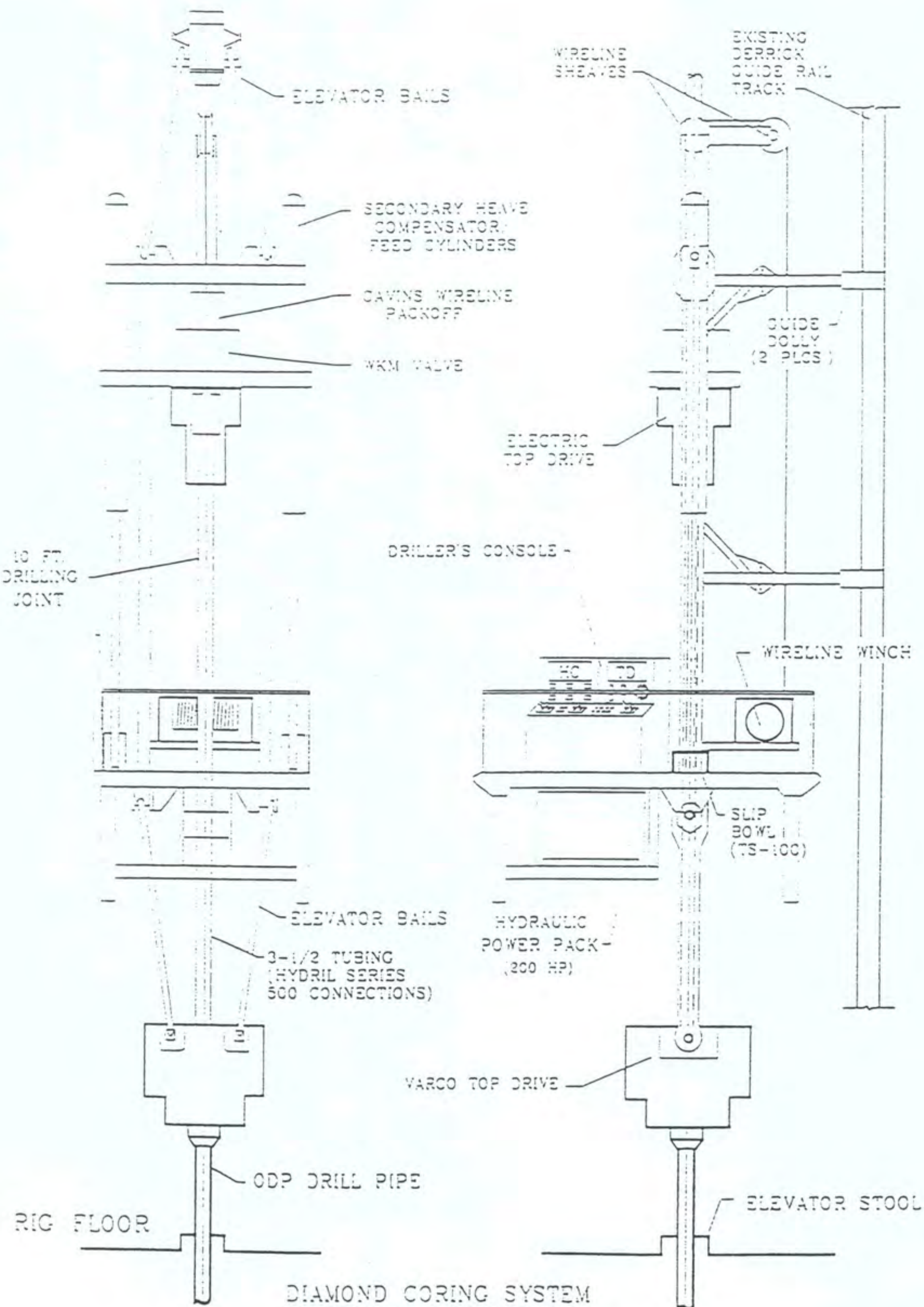
DRILLING SERVICES DEPARTMENT
POSITION PAPER
DCS DERRICK PLATFORM SYSTEM

ATTACHMENT 1: COSTS



DIAMOND CORING SYSTEM

Figure 1



DIAMOND CORING SYSTEM
PLATFORM CONFIGURATION
PHASE II - 4500 METER DEPTH CAPACITY

Figure 2

			DRILLING SERVICES DEPARTMENT PROGRAM PLAN BUDGET SHEET 1803-05 DIAMOND CORING SYSTEM					
Expense Category	Description	FY96	FY97	FY98	FY99	FY00	FY01	FY02
PHASE V (see note 1) LAND TEST/ENGINEERING LEG			PHASE III & IV	PHASE V				
2000	Payroll (MANHRS)		2,730	6,860		NOTE 1: See Proposal for DCS Engineering Leg September 96		
3500	Travel		$26,000	$76,000				
3580	Travel-Port Call							
3720	Business Conference							
4000	Supplies		$25,000	$430,000				
5042	Utilities-Shore		$3,750	$5,000				
5070	Insurance							
5261	Shipping		$8,000	$260,000				
5550	Professional Service				$25,000		$25,000	
5570	Consultant Service		$10,000	$60,000	$200,000	$100,000	$100,000	$100,000
5931	Equipment Rental		$5,000	$10,000				
5994	Inspections			$10,000				
6820	Maintenance/Repair							
8400	Equipment		$365,000	$20,000	$50,000		$100,000	$800,000
4765	Software			$7,500				
6509	Subcontracts (note 2)			$425,000				
	SUBTOTAL		442,750	1,303,500	275,000	100,000	225,000	900,000
	NOTE 2: Exp Cat 6509 NOT to be used							

DRILLING SERVICES DEPARTMENT
POSITION PAPER
DEEP DRILLING

PURPOSE:

The ODP Long Range Plan states that many fundamental scientific questions related to structure and composition of oceanic crust can only be addressed by drilling a small number of deep (greater than 2 km) holes in a few carefully selected locations.

OBJECTIVES:

Scientific

- Analyze deep structure of rifted continental margins
- Study deformation at convergent margins
- Analyze deep structure of oceanic crust

Operational

- Evaluate operational factors involved in a 2-3 km penetration of the ocean crust in 2-4 km of water depths.
- Propose how such a deep penetration might be accomplished using existing equipment and technology.
- Identify potential equipment and operating problems that should be investigated to improve success in coring deeper holes.

BACKGROUND:

The current reentry hardware consisting mainly of the Dril-Quip quad casing system is operational but has not been tested to its full potential (i.e. four casing strings). During ODP Leg 156 two triple casing reentry structures were emplaced for the first time. Other operational issues besides reentry hardware will require investigation for deep drilling.

There are three major components within the scope of deep drilling which require additional engineering evaluation. These components are drilling operations, drilling technology and drilling equipment. The individual issues under each component are listed in the following table.

TECHNOLOGY DEVELOPMENT APPROACH

The attached WBS for Deep Drilling, Figure 1, defines the top level tasks as:

- Drilling Operations
- Technology Development
- Drilling Equipment

Many areas of importance to deep scientific drilling are outlined under each of these top level tasks.

PHASE I - CONCEPTUAL REQUIREMENTS

During FY97 DSD staff will prepare position papers on the following topics:

- Drilling Operations
- Measurement While Coring (MWC)

- Riser systems
- J/R Drilling Equipment

During FY98 deep drilling is expected to occur at hole 735B on Leg 176 and in the Somali Basin. A 2 day workshop is proposed for February 1998 in College Station to discuss the scientific requirements for deep drilling, the technical position papers and the priorities for technology development of the scientific community. The recommendations from the Conoco/Hydril JIP on Riserless Drilling and from an ODP bid for a MWC development contractor will also be reviewed at the workshop.

PHASE II - CONCEPTUAL ENGINEERING

The selected MWC contractor will then proceed to the Conceptual Engineering stage in FY98/99 and into Preliminary Engineering in FY00. Design engineering/fabrication of MWC tools will occur in FY01 and FY02.

It is recommended that any development in the area of Measurement While Coring (MWC) should be managed by ODP. The impact of this technology and hardware on daily coring operations leads to the recommendation that all development efforts and coordination of a MWC project should rest within the DSD. The MWC tools would have an impact on core recovery and increased knowledge of downhole conditions. While some traditional logging measurements such as resistivity and gamma ray are obtained through the MWC system, the overall impact of MWC on drilling operations and core recovery with real time Weight on Bit would be considerable.

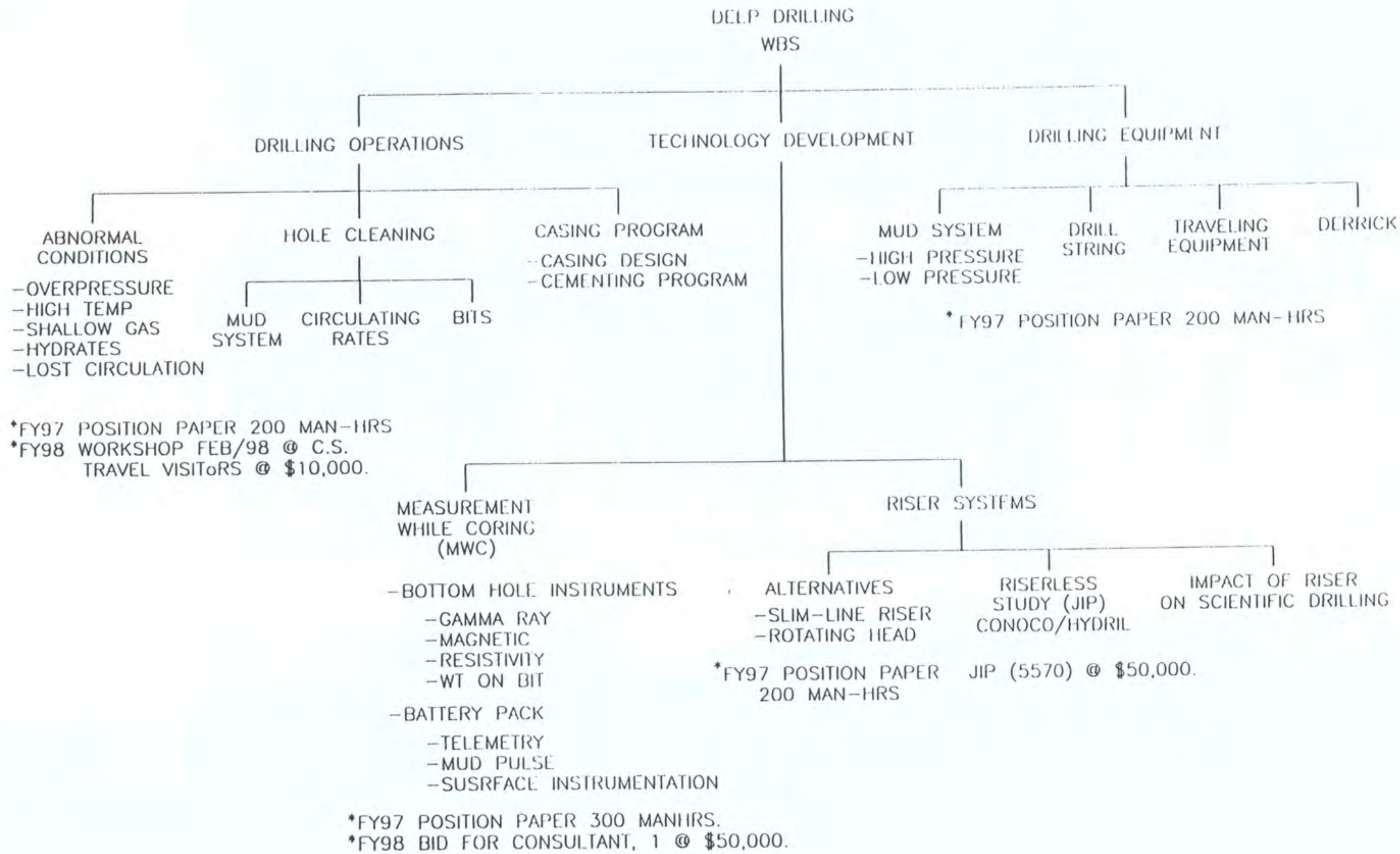

DEEP DRILLING
WBS
DRILLING OPERATIONS
TECHNOLOGY DEVELOPMENT
DRILLING EQUIPMENT
ABNORMAL CONDITIONS
-OVERPRESSURE
-HIGH TEMP
-SHALLOW GAS
-HYDRATES
-LOST CIRCULATION
HOLE CLEANING
MUD SYSTEM
CIRCULATING RATES
BITS
CASING PROGRAM
-CASING DESIGN
-CEMENTING PROGRAM
*FY97 POSITION PAPER 200 MAN-HRS
*FY98 WORKSHOP FEB/98 @ C.S.
TRAVEL VISIToRS @ $10,000.
MUD SYSTEM
-HIGH PRESSURE
-LOW PRESSURE
DRILL STRING
TRAVELING EQUIPMENT
DERRICK
*FY97 POSITION PAPER 200 MAN-HRS
MEASUREMENT WHILE CORING (MWC)
-BOTTOM HOLE INSTRUMENTS
-GAMMA RAY
-MAGNETIC
-RESISTIVITY
-WT ON BIT
-BATTERY PACK
-TELEMETRY
-MUD PULSE
-SUSRFACE INSTRUMENTATION
*FY97 POSITION PAPER 300 MANHRS.
*FY98 BID FOR CONSULTANT, 1 @ $50,000.
RISER SYSTEMS
ALTERNATIVES
-SLIM-LINE RISER
-ROTATING HEAD
*FY97 POSITION PAPER
200 MAN-HRS
RISERLESS STUDY (JIP)
CONOCO/HYDRIL
JIP (5570) @ $50,000.
IMPACT OF RISER ON SCIENTIFIC DRILLING

FIGURE 1.

Expense Category	Description	FY96	FY97	FY98	FY99	FY00	FY01	FY02
			DRILLING SERVICES DEPARTMENT PROGRAM PLAN BUDGET SHEET 1803-03 DEEP DRILLING					
2000	Payroll (MANHRS)		900	200	400	1,000	1,500	
3500	Travel			-	15,000			
3580	Travel-Port Call							
3720	Business Conference							
4000	Supplies							
5042	Utilities-Shore							
5070	Insurance							
5261	Shipping							
5550	Professional Service							
5570	Consultant Service	50,000			50,000	150,000		
5931	Equipment Rental							
5994	Inspections							
6820	Maintenance/Repair							
8400	Equipment						500,000	500,000
	SUBTOTAL $	50,000	-	-	65,000	150,000	500,000	500,000
	FY98/99-Conceptual Requirements							
	FY00 - Preliminary Engineering							
	FY01/02 - Engineering/Fabrication							
	FY98 - Leg 176 Deepen 735B Oct 23 - Dec 18, 1997							
	FY98 - Leg 179 Somali Basin, April 23 - June 18,1998							

DRILLING SERVICES DEPARTMENT
POSITION PAPER
LEGACY HOLES

PURPOSE:

Legacy boreholes are boreholes created by the DSDP and ODP which have permanent reentry structures emplaced. Legacy boreholes provide the opportunity for reentering, deepening, sampling and/or instrumenting the borehole either immediately after being completed or sometime in the future. The BOREHOLE (BOREHole Observations, Laboratories, and Experiments) organization was established in 1994 to facilitate borehole related, sub-seafloor science. BOREHOLE is an integrated support program for equipment development, testing, and funding of borehole experiments. The general purpose of BOREHOLE is to advance borehole observatories in careful coordination with the Ocean Drilling Program and the international community. The establishment of any form of borehole instrumentation at a DSDP or ODP drill site can be referred to in general terms as a Legacy Hole.

OBJECTIVES:

Scientific

- Fluid flow in crust and sediments
- Geochemical fluxes
- In situ physical properties of oceanic crust and sediments
- Deep earth structure and processes

BACKGROUND:

The DSDP and ODP have, together, completed nearly a thousand boreholes, only about 30 of which are presently suitable for post-drilling experiments and observation. Of these holes, more than half have already been used or are currently in use for experiments. As of September 1996, 8 CORK's have been emplaced <u>as long term observatories of sub-seafloor fluid pressure and temperature</u> at active lithospheric plate margins. The CORK provides for a seal at the top of the borehole. A thermistor string and data logger are an integral part of the CORK. Some of the thermistor strings have long term fluid samplers attached. The temperature and pressure in the borehole can be monitored at various pre-determined depths over time. Fluid sampling after CORK emplacement is through a free hanging plastic tube set at a specific depth, with sampling access via an ROV through a side entry valve.

Some of the ideas outlined by the BOREHOLE group include downhole geochemical monitoring, hole-to-hole seismic experiments, hole-to-hole fluid experiments, real time experiments, time-series studies, gas hydrates experiments, and a permanent globally distributed ocean seismic network.

Recent borehole measurement accomplishments by various institutions include the Seafloor Borehole Array Seismic System (SEABASS). The system consisted of a four-node array of three-component seismic sensors to autonomously record data for a period up to a month. Also, logging by wireline reentry for temperature and/or caliper logs and fluid sampling has been successfully accomplished at DSDP boreholes (333A, 395A, and 534A), during the French-American DIANAUT expedition in 1989.

Studies should be conducted to determine if third party tools, real time acoustical monitoring, seismic monitoring and biological sampling are feasible in Legacy Holes.

TECHNOLOGY DEVELOPMENT APPROACH

The attached WBS for Legacy Holes, Figure 2, defines the top level tasks as:

- Hole Design
- Hole Completion
- Intervention Methods
- Sampling Tools

Major areas of importance to Borehole Observatories and Experiments are outlined under each of these levels.

PHASE I - CONCEPTUAL REQUIREMENTS

During FY99 DSD staff will prepare position papers on the above tasks. Prior to this, the results of the successful CORK installations on Legs 168 and 169 will have produced data for scientific evaluation. This will help define parameters for future legacy hole experiments.

A 2-day workshop is proposed for FY99 in College Station to discuss the scientific measurements for legacy holes, the technical position papers and the priorities for technology development of the scientific community.

Phase I, Conceptual Requirements, will be documented in FY99 and Phase II, Engineering Development of Sampling Tools, could commence in FY00.

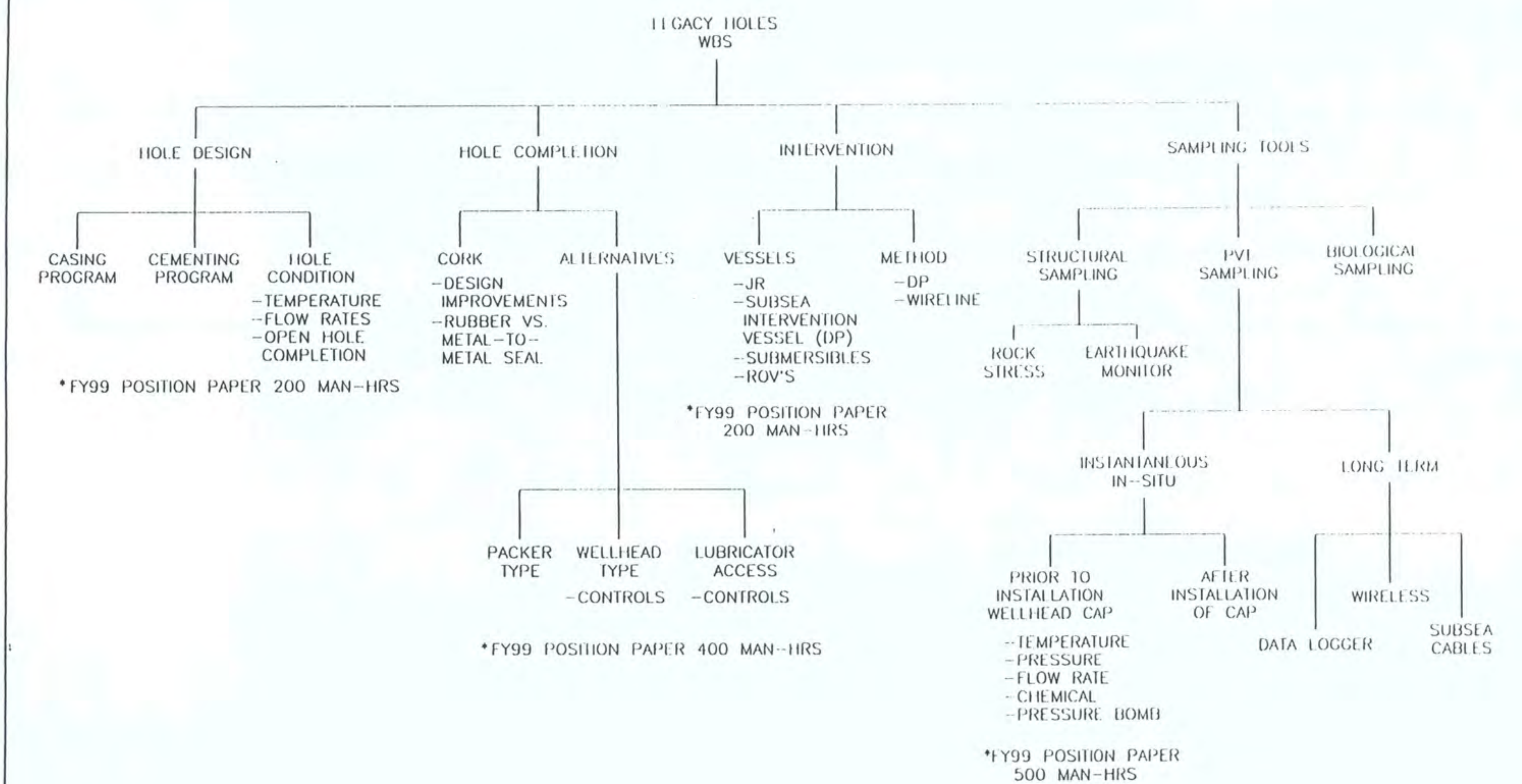

LEGACY HOLES
WBS
HOLE DESIGN
HOLE COMPLETION
INTERVENTION
SAMPLING TOOLS
CASING PROGRAM
CEMENTING PROGRAM
HOLE CONDITION
-TEMPERATURE
-FLOW RATES
-OPEN HOLE COMPLETION
*FY99 POSITION PAPER 200 MAN-HRS
CORK
-DESIGN IMPROVEMENTS
-RUBBER VS. METAL-TO-METAL SEAL
ALTERNATIVES
PACKER TYPE
WELLHEAD TYPE
-CONTROLS
LUBRICATOR ACCESS
-CONTROLS
*FY99 POSITION PAPER 400 MAN-HRS
VESSELS
-JR
-SUBSEA INTERVENTION VESSEL (DP)
-SUBMERSIBLES
-ROV'S
METHOD
-DP
-WIRELINE
*FY99 POSITION PAPER 200 MAN-HRS
STRUCTURAL SAMPLING
ROCK STRESS
EARTHQUAKE MONITOR
PVT SAMPLING
BIOLOGICAL SAMPLING
INSTANTANEOUS IN-SITU
PRIOR TO INSTALLATION WELLHEAD CAP
-TEMPERATURE
-PRESSURE
-FLOW RATE
-CHEMICAL
-PRESSURE BOMB
AFTER INSTALLATION OF CAP
*FY99 POSITION PAPER 500 MAN-HRS
LONG TERM
DATA LOGGER
WIRELESS
SUBSEA CABLES

FIGURE 2.

Expense Category	Description	FY96	FY97	FY98	FY99	FY00	FY01	FY02
			DRILLING SERVICES DEPARTMENT PROGRAM PLAN BUDGET SHEET 1803-03 LEGACY HOLES					
2000	Payroll (MANHRS)		100	500	500	500	500	500
3500	Travel				15,000			
3580	Travel-Port Call							
3720	Business Conference							
4000	Supplies							
5042	Utilities-Shore							
5070	Insurance							
5261	Shipping							
5550	Professional Service							
5570	Consultant Service				50,000			
5931	Equipment Rental							
5994	Inspections							
6820	Maintenance/Repair							
8400	Equipment					150,000	150,000	150,000
	SUBTOTAL		-	-	65,000	150,000	150,000	150,000
	FY99 - Conceptual Requirements							
	FY00-02 - Engineering Development of Tools							

DRILLING SERVICES DEPARTMENT
POSITION PAPER
IMPROVED DRILLING/CORING TOOLS

PURPOSE

Since ODP began operations, there has been a commitment to the continual improvement of existing drilling/coring tools. Not all improvements are dramatic. Many times, the changes are small in order to address some specific requirement. For example, the enhancement of coring tools can be as subtle as changing the material specification of the steel used in the core catcher springs to accommodate environments potentially rich in hydrogen sulfide.

The continuing refinement of the Advanced Piston Corer (APC) has extended the capability of the initial design from a maximum stroke of 15 feet and less than 30 kips of pullout to the present 30 feet and over 100 kips of pull out. The constant refinement has resulted in the dramatic improvement in the operating parameters of the present system. For example, the present model of the APC penetrated as deep as 398 mbsf during Leg 145.

In order to accomplish the objective of constant tool improvement, funds have been allocated in the Development Engineering Team budget to address the needs of this ongoing process.

AREAS OF IMPROVEMENT

The present rotary core barrel (RCB) system which was adopted from the oil industry for scientific coring has been extant in relatively unchanged form for decades. There are many areas in this design which potentially could be improved to yield higher core quality, faster rates of penetration, and greater recovery.

Some of these modifications are relatively straightforward such as designing a more durable bit seal or increasing the effectiveness of bit hydraulics. However, it is felt that minor design changes to the present design will not garner the significant improvements desired. One area which may hold promise is in the investigation of a radical hybrid bit design which will be a departure from the current four-cone configuration. Since a hybrid could use three-cones, a reverse cone, or diamond pads. The investigation of diamond drag type bits also holds promise for increasing coring efficiency.

Another area which may hold promise for increased operational effectiveness is the design of a "uni-BHA" which could accommodate all the standard coring systems (APC, XCB, RCB). Presently, the drill pipe must be tripped to the surface and the BHA changed when switching from the APC/XCB to the RCB.

There is also a myriad of small design changes which need to be made to our standard systems to address the recommended design improvements submitted by operational personnel. In any case, sufficient funds and manpower need to be allocated on a routine basis for the design, fabrication, and testing . It must be recognized that many of the above improvements will require overcoming some severe technological challeges.

DRILLING SERVICES DEPARTMENT
POSITION PAPER
1999 DRYDOCK

PURPOSE

This position paper outlines the engineering and project management support DSD will supply to the drydock effort.

BACKGROUND

TAMRF signed a Memorandum of Agreement which laid the groundwork for extending the contract for an additional 5 years from 1998 until 2003. The MOA was contingent upon several factors, including the provision that TAMU remained the science operator, NSF and JOI endorsement for continued utilization of the JOIDES Resolution, and the ODP contribution of up to $5.0 million in 1992 dollars for capital investment and ship repairs needed by the vessel to continue an additional five years of operations in an efficient manner.

ODL and ODP have prepared a Position Paper on the Drydocking and Upgrade which identifies areas for investment and outlines a preliminary budget.

DSD ROLES

Specifications

Assist in the preparation of ODL equipment specifications and shipyard bid packages.

Prepare ODP equipment specifications and shipyard bid packages.

Engineering

Coordinate functional requirements for the Lab Stack modifications in the riser hold and prepare structural scantlings for the new deck and associated bulkheads and partitions and general arrangement drawings for services and equipment layout.

Project Management

Act in a support management role with ODL and represent ODP in the procurement and bid cycle and at the shipyard.

Represent ODP with regards to contractual, budgetary and financial matters pertaining to the drydock.

Act as ODP's Project Manager.

Travel (3500)

Travel expenses are for visits with consultants, vendors and equipment acceptance testing at suppliers facilities.

Travel Port Call (3580)

Covers 5 trips and 15 weeks of subsistence in Singapore for project management, drilling operations, material services and engineering support representing ODP during drydock activities.

Shipping (5261)

Shipping of ODP supplied equipment to Singapore.

Professional Services (5550)

Consulting services from a microbiologist.

Consultant Services (5570)

Engineering services and design reviews by Earl and Wright, American Bureau Shipping.

Equipment (8400)

1) Replacement/upgrades to existing DSD and Lab Stack equipment ($200,000).

2) Microbiology Lab ($315,000): in accordance with the ODP Long Range Plan (p.29), to explore the earth's deep sub-seafloor biosphere, ODP will install a microbiology lab on the ship, so that real-time analyses of bacteria can be made as soon as cores are retrieved. The initial ideas for a microbiology lab are based on functional specifications and an full itemized list, constructed with the help of microbiologists Stephen Giovannoni (Oregon State), Melanie Summit (U. Of Washington, working with Marv Lilley), Yves Prairie (U. Of Quebec), R.J. Parkes (U. Of Bristol), and Pam Morris (Medical University of South Carolina). The construction cost of a fully-equipped lab is estimated at $290,000, with $25,000 budgeted for an advisory subcontract with a microbiologist.

Principle items are:

a) Outfitting of a 200 ft^2 microbiology lab with internal deskspace, sink, cabinet space, hoods, and hookups for water, power, computer network, compressed air, etc. is $20,000.

b) Microbiology lab equipment: based on responses from 4 microbiologists, 3 of whom have worked on ODP cores, a draft list of equipment, prioritized shows that high priority equipment would cost roughly $170,000 - $220,000. Adding moderate and low priority equipment (DNA related, image analysis system, etc.) adds up to roughly $235-290,000.

3) A dedicated Zeiss Axioplan microscope for the microbiology lab, with UV/blue/green autoflourescence, phase contrast, w\and 1x-2x Optivar, is about $60,000. This microscope is essential for observing bacteria with stains, tracers, etc. This cost is part of overall lab total given above.

Budgetary Estimate

See attached budget documentation.

DRILLING SERVICES DEPARTMENT
PROGRAM PLAN BUDGET SHEET
1806-3 1999 DRYDOCK

Expense Category	Description	FY96	FY97	FY98	FY99	FY00	FY01	FY02
2000	Payroll (MANHRS)		1,000	1,500	1,000			
3500	Travel		1,500	5,000	10,000			
3580	Travel-Port Call				45,000			
3720	Business Conference							
4000	Supplies							
5042	Utilities-Shore							
5070	Insurance							
5261	Shipping				37,000			
5550	Professional Service				29,000			
5570	Consultant Service			-	125,000			
5931	Equipment Rental							
5994	Inspections							
6820	Maintenance/Repair							
8400	Equipment				490,000			
	SUBTOTAL $		1,500	5,000	736,000			
MINUS Lab Stack related eqmt costs @					(519,000)			
Drilling Services related expenses @					217,000			
NOTE: Money available from drydock savings in fuel, catering and standby rate differential	to offset ODP equipment costs							

JOIDES Resolution Contract Extension,

Drydocking and Upgrade

INTRODUCTION

JOIDES Resolution is the ship from which the Ocean Drilling Program's scientists extract and study samples of ancient sediments from the depths beneath the seas in order to discover and release the mysteries of our planet Earth's past. From evidence discovered in these prehistoric records of the Earth's life cycle, the scientists hope to better understand the history of our Earth which will assist them in making predictions of what can be expected in the future. The JOIDES Resolution is, and has been, the very heart and the soul of the Ocean Drilling Program for the past decade and has attained a very remarkable reputation as the world's most successful ocean research vessel. While many in the scientific community view the JOIDES Resolution as belonging to, and an inherent part of, the Ocean Drilling Program, in reality the vessel is contracted from Overseas Drilling Limited (ODL), the company which owns the vessel. ODL is a joint venture company registered in Liberia which is owned in equal parts by the companies Sedco Forex / Schlumberger and Sondenfjeld. Sedco Forex, who mans and operates the JOIDES Resolution, is a world class drilling contractor and part of the oil field service giant Schlumberger, and Sondenfjeld is a Norwegian company specializing in owning and operating other dynamically positioned vessels around the world.

CONTRACTUAL TERMS

While the success of the JOIDES Resolution is widely recognized in the scientific community, it is equally recognized that the Ocean Drilling Program's future over the next several years is entirely dependent on the JOIDES Resolution. It may be less recognized, however, that the contract with the owners of the vessel which provides for continued use of the JOIDES Resolution ends on September 30, 1998 and does not provide for use of the vessel beyond this date.

In 1992 TAMU and the NSF recognized the vulnerability of the Program's future with it's dependence on the uncertain continued availability of the JOIDES Resolution. In conjunction with the vessel's owners, TAMRF signed a Memorandum of Agreement (MOA) which laid the groundwork for extending the contract for an additional 5 years from 1998 until 2003. The MOA was contingent upon several factors, including the provision that TAMU remained the science operator, NSF and JOI endorsement for continued utilization of the JOIDES Resolution. and the ODP contribution of up to $5.0 million in 1992 dollars for capital investment and ship repairs needed by the vessel to continue an additional five years of operation in an efficient manner. TAMU has since been awarded the science operatorship for the program until 2003 and it is fully expected that NSF and JOI will endorse the JOIDES Resolution for continued used for the Ocean Drilling Program. TAMU is currently discussing with ODL the recommended work to provide for an additional 5 years of efficient ship operation. Based on the current rate of escalation it is anticipated that the contribution expected by the ships owners will be $6.0 Million spread over 1997. 1998 and 1999. The owners of the JOIDES Resolution. Overseas Drilling Limited. have also indicated a willingness to contribute to the costs associated with the drydock and upgrades related to the contract extension. With present estimates of the drydock and upgrade in the range of $9.3 million dollars this means that the owners may be willing to contribute $3.3 million above the $6.0 million contributed by ODP. naturally subject to owners management final approval

Review of the current market indicates that. providing final agreements can be developed with the ships owners, the opportunity to extend the contract for the JOIDES Resolution at the present terms and conditions is of significant benefit to the Ocean Drilling Program. The 1996 competitive market for dynamically positioned drillships indicates present rates ranging from a low of $60.000 / day to a high of $125,000 per day, while the present rate for the JOIDES Resolution is less than $45,000 per day. It is anybody's guess what the market rates will be in 1998. In addition. if the JOIDES Resolution were not available, the cost for converting another vessel to suit the programs needs would easily be in excess of $20 Million while the continuity and expertise of the JOIDES Resolutions crews would be lost. Replacing the JOIDES Resolution with a newly constructed vessel is not a consideration at this juncture due to the extreme costs involved (in excess of $250 Million). The J/R owners are very cooperatively working with TAMU and it is hopeful that an agreement can be made to execute the contract extension so that the JOIDES Resolution continues to be the scientific platform for the Ocean Drilling Program into the next millennium. In order to ensure that the J/R continues to be available for the Program it is important that TAMU obtain the necessary approvals to execute the contract extension so that the vessel owners can begin planning for the upgrade.

CONSTRUCTION AND DRYDOCK

The JOIDES Resolution was constructed in 1978 as the Sedco / BP 471, initially for use as an oil exploration vessel. In 1984. after being awarded a long term and exclusive contract with the Ocean Drilling Program. the vessel was converted from oil exploration service to function as a scientific research vessel. Since January 1985. the Sedco / BP 471 has been known in the scientific community as the JOIDES Resolution and has been the center of the very successful Ocean Drilling Program. During this operation the

JOIDES Resolution has operated extremely efficiently and has attained a reputation as one of, if not, the worlds most successful ocean research vessels. In the later part of 1996 the Sedco BP 471 will undergo an official name change to the JOIDES Resolution.

In 1998 the JOIDES Resolution will be 20 years old. While the vessel continues to operate very efficiently and successfully there are several vital systems aboard which are obsolete by today's technological standards. Many of the system's original manufacturer's are no longer in business and spare parts are no longer obtainable. In addition, new technological advances have been introduced into the industry which provide for enhanced safety, efficiency and reliability when compared to the older technology now aboard the vessel. Even though the J/R is 20 years old, with the proper upgrades in equipment and maintenance there is no reason to suggest that the vessel can not continue to operate as efficiently and effectively as it has in the past for another 15 to 20 years into the future.

The owners of the vessel have implemented an effective preventative maintenance program, however the uninterrupted operations over the past 15 years has not allowed for complete strip-down, inspection and repair of several systems. If the Ocean Drilling Program is to continue operating as successfully into the next century as the scientific community has become accustomed to, the opportunity to extend the existing contract for another 5 years at the existing conditions with the injection of up to $5,000,000 in 1992 dollars is in effect a very attractive consideration when viewing the other options available. After such an upgrade and repair period, the JOIDES Resolution can once again embark, with confidence, on a journey to continue unraveling the mysteries of the Earth. This report is intended to summarize the proposals being considered for upgrades and repairs.

CONTRACT EXTENSION DRYDOCK AND UPGRADE

Drydocking typically means taking the vessel completely out of the water so that those sections normally under the water can be inspected and protected. The current plan is to carry out the necessary drydock activities required to meet classification society requirements and the terms of the contract extension over a two month period in June / July 1999. This schedule accommodates the J/R's scientific program plan and allows for appropriate management planning, design and equipment procurement activities prior to the drydock.

The vessel has been drydocked two times since the Contract with the Ocean Drilling Program commenced in 1984. Summary of the past and future drydock costs are as follows:

Year	Location	Approximate cost	Purpose	Upgrades
1989	Singapore	$1.200.000	Routine - maintain class	None
1994	Falmouth	$1.500,000	Routine - maintain class Repaired tank corrosion	None
Planned 1999	Far east Singapore??	Estimated $ 6.000.000 ODP $ 3.300.000 ODL $ 9,3000 Total	Routine - maintain class Prepare for 5 more years Replace obsolete eqpt. Service existing eqpt. Improve quarters Add improvements	See lists

Proposed drydock activities, differentiating between classification requirements and capital investment improvements are summarized in Table A. Major areas of drydock activity are reviewed later in this document.

INDIRECT COST SAVINGS TO ODP

While it is anticipated that the Ocean Drilling Program would be expected to contribute up to $6.0 million in 1999 dollars this cost will be offset to a small degree due to the period of time the vessel is not operating. While the drydock and upgrade is underway the J/R will be using substantially less fuel and the day rate will be reduced from the operating rate to the standby rate which could translate into a saving of $3,600 / day in 1996 dollars. The following table indicated magnitudes of savings that may be expected assuming a 60 day upgrade period.

Fuel savings	**19-3 = 16 MT/day; 60 days**	**$250 / MT**	**$240,000**
Dayrate savings	**$3600/day**	**60 days**	**$216,000**
ODP staff hotel /food	**25 techs for 60 days**	**$125/day**	**($190,000)**
Possible savings			**$266,000**

This savings could be directed to equipment costs for upgrading the Lab stack.

MAINTAINING CLASS:

ABS, or the American Bureau of Shipping, is the Classification organization contracted to survey the vessel and ensure that minimum requirements are met and maintained related to the safety and seaworthiness on behalf of the vessels owners and the owners insurance representatives. ABS has very well defined requirements to which the vessel was originally constructed, and to which modifications and upgrades can be made. ABS also has very specific and scheduled inspection requirements over the life of the vessel. As part of the ongoing inspection cycle, ABS calls for a "drydocking" every 2 1/2 years to maintain the vessel in class. Generally ABS will accept an underwater inspection in lieu of drydocking every other drydocking. An underwater inspection in lieu of drydocking is planned for mid 1997 and the next full drydocking is planned for mid 1999 when the vessel is expected to be in the Far East. The drydocking period is the logical time to perform any additional repairs and upgrades that are planned for the vessel.

Station Keeping, Propulsion and Power Generation:

Station Keeping: The ASK (Automatic Station Keeping) system is the nerve centre of the dynamic positioning system which gathers signals from various sources and sends orders to the thrusters and propulsion system so the vessel stays on location without being attached to the seabed. While this system remains functional, it is obsolete by today's standards. The original manufacturer, Honeywell, no longer manufacturers ASK systems and parts are no longer available on the market. It is becoming more difficult to maintain as components within the system continue to wear out. The existing ASK system is not as responsive as the new generation of ASK systems. As a result, the system is now operated with a positive bias, meaning the vessel is powered upwind or up current from the actual drilling location. This will ensure that an increase in weather related force driving the vessel off location will not create a drift off situation while coring due to the slow response time of the existing system. As a result of the positive bias, the existing ASK demands higher fuel consumption, additional diesel generator sets on line, and a lower power factor. The new systems manufactured today will operate much more efficiently and therefore save fuel and wear and tear on the vessel equipment. It is very important that the ASK system be replaced to ensure the vessel's continued ability to maintain position dynamically while also saving on fuel consumption.

A new ASK system is a fraction of the size of the existing system allowing the new system to be located on the bridge. This will free up virtually two complete rooms which now house the ASK equipment. Some of the additional space could then become available for additional accommodation space. As a side benefit, with the new ASK system on the bridge, it could be monitored and handled by the marine crew rather than the very specialized Dynamic Position Operator's position.

Power Generation; Data Management System (DMS): A Data Management System (DMS) is the brain that controls the distribution of power to the vital pieces of equipment on the vessel. The JOIDES Resolution is equipped with a DMS system which is obsolete by today's standards and is not particularly effective. A new state of the art DMS system will pay for itself over the first few years of the project by better management of the power which will directly translate into better fuel economy. Such a system will help eliminate the need to run extra engines to ensure adequate power availability and will ensure engines are better loaded, all of which will improve the efficiency, fuel consumption, and reliability while also reducing engine operation and maintenance.

Thrusters, propulsion, and steering: These systems are 20 years old and will require a thorough inspection and servicing to ensure their life for another 15-20 years of service. It goes without saying that if the propulsion and thruster systems are no longer functional the vessel loses it's ability to stay on location or transit between locations. While these systems are quite old they continue to be very reliable and it is not planned to replace them with new units. The main propulsion system is subject to ABS inspection as it relates to the seaworthiness of the vessel.

Drilling Systems

Drilling Equipment and systems: Drilling systems are not included in any classification society requirements therefore their condition is subject to the maintenance standards maintained by the vessel owner. The Drilling systems have been the workhorses of the JOIDES Resolution since the program has began. Normal preventative maintenance has been performed routinely however certain systems have not been completely overhauled due to virtually continuous operations since the program began. To avoid equipment breakdowns and to ensure a trouble free operational future it is important that all of the drilling systems and equipment be thoroughly inspected, overhauled and upgraded as required. A listing of the main drilling systems and the summary of the work to be performed is defined below.

Coring Winch - this equipment is a two drum winch with wireline installed to run and recover the core barrels and the cores. The winch should be torn down so that the internal components i.e. bearing, gears, electric motors etc. can be inspected and refurbished as required.

Derrick - The derrick is the 147 foot tall structure rising from the center of the vessel which houses and supports the main drilling equipment. It is bolted together in a latice work arrangement. It will be important to inspect the derrick components for damage, corrosion, bolt tightness etc. to ensure that it can continue to support the heavy loads associated with the drilling function.

Heave Compensator- The heave compensator is the equipment mounted in the derrick which keeps the drill string on bottom with constant weight by compensating for the up and down motion (heave) of the ship as it rides the ocean waves. The heave compensator on the J.R is the only one in existence and the manufacturer is no longer in business. While it continues to be functional and reliable it will be important to inspect the equipment and repair any items as required with custom made spares that have reasonably long delivery times.

Drilling Hook: The hook is a piece of equipment mounted in the derrick that supports the weight of the top drive drilling unit. It is important to inspect the structural integrity of the unit and inspect for cracks and wear.

Blocks: The crown block and traveling block are the components mounted in the derrick through which wire rope from the drawworks travel in order to develop the mechanical advantage necessary to support, raise and lower the weight of the overhead drilling equipment and drill string. Each block is fitted with several sheaves and bearings. It would be appropriate to strip the equipment, inspect the sheaves and shafts for cracks or wear and replace the bearings.

Top Drive Drilling system: The top drive is the electrical equipment hanging in the derrick which creates and transmits rotation and torque to the drill string. The J/R is fitted with one top drive and has a complete back up unit. Since the back up is available it should not be necessary to invest significant money to service the units however it will be appropriate to inspect and service the power lines and supports associated with the top drive.

Swivel: The drilling swivel is the piece of equipment supporting the top drive which allows drilling fluid to be pumped down the drill pipe while also allowing rotation. It should be stripped and serviced.

Drawworks: The drawworks is the hoisting mechanism used to raise the lower the drill string in and out of the hole. This piece of equipment is under constant use when coring. It is advisable to strip and inspect the drawworks to ensure that it can continue to operate trouble free.

Drawworks electric brakes: the drawworks on the J/R is fitted with two electric brakes. While the drawworks has a mechanical band brake, in order to stop the extreme weights carried by the drawworks the electric brakes are a necessity. The brakes act as large electromagnets which are used to slow the decent of the drill string. It is appropriate to inspect the internals of the brakes and their controls to ensure continued functionality.

Rotary table: the rotary table is the unit mounted on the drilling floor which supports the drill string while it is not connected to the blocks. The rotary table also can be used to rotate the drill string while not using a top drive however it is not routinely used for this purpose on the J/R. It would be appropriate to inspect the rotary table and components for wear however.

Iron Roughneck: the Iron roughneck is the mechanical "robot" that tightens and untightens pieces of drill string as they are being make up or broken down to run into or pulled out of the hole. The equipment should be inspected and serviced since the iron roughneck in use on the J/R is no longer manufactured (newer units won't fit on the J/R drilling equipment without significantly modifying the equipment in use.).

Pipe rackers: the pipe rackers are the mechanical mechanisms which handle, store and transfer the drill string from the hold of the vessel to the drill floor. The manufacturers of the pipe rackers are no longer in business however the equipment remains functional and maintainable. The equipment should be inspected and repaired as required.

Mud Pumps: the mud pumps are used to pump drilling fluid down the drill string at pressures up to 4500 psi at high volumes. These pumps should be inspected and serviced.

High pressure piping: this piping and associated valves run from the mud pumps to the drill floor. The system should be inspected for wall thickness to ensure that it can contain anticipated pressures delivered from the mud pumps.

Low Pressure piping: this piping connects the mud storage pits to mixing pumps and from the pits to the mud pumps. It should be inspected for integrity and the valves in the system should be repaired and replaced.

DRILLING SYSTEM ADVANCES

There have been technological advances to various components of the drilling systems which will improve the coring capability and enhance the safety aboard the units as follows:

Drilling Instrumentation: The JOIDES Resolution's drilling instrumentation package is technology from the 1970's. The computer age has not missed the drilling instrumentation industry. There are state of the art drilling instrumentation packages which enhance the ability to monitor, record and therefore improve control of the drilling and coring parameters. A state of the art drilling instrumentation package will not only provide for increased efficiency in core recovery and improve record keeping but will also upgrade the image of the drilling function to be in line with the image expected by the scientific community of the 21st century.

Drill String Torque Feed Back: Sedco Forex has developed technology to minimize the drill string torque fluctuations which not only reduce fatigue on the drill string but also allows for more consistent rotation and torque of the drilling bits. Such technology should provide for improved core recovery.

Brake Controlers: Computer technology has been developed which adds reliability, redundancy and therefore safety to the Drawworks electric brakes. Such systems also add the ability to prevent equipment or driller error that could previously result in the drilling equipment being pulled into the crown or being allowed to drop onto the drill floor, either of which would result in catastrophe to the equipment and personnel while completely disrupting the Program.

Living Quarters:

Two month legs aboard the JOIDES Resolution puts not only a physical strain but also an emotional strain on those aboard. The comfort of the crew and scientists is extremely important to ensure efficiency while maintaining positive morale. Based on the current configuration of the JOIDES Resolution, the ability to make major living quarter improvements without very major surgery on the vessel, is limited simply due to the limitation of space available. Improvements and enhancements can be made however, to improve the utilization of the available spaces while enhancing the comfort levels in those spaces. Such improvements being considered include a general refurbishment and face lift of the quarters, sound reduction, improved entertainment systems, improved ventilation to the living and working areas. Any spaces freed up in the quarters would allow for either increased personnel aboard or preferably be utilized to minimize the number of persons assigned to some of the more crowded rooms.

Lab Stack:

The scientific laboratory aboard the JOIDES Resolution, commonly referred to the LAB Stack, is owned and maintained by TAMU. Recommendations for such improvements must come from the scientific community and will be managed and funded by TAMU. In addition to any upgrades implemented by the scientific community, however there are spaces in the lower part of the lab stack which could be modified by removing an unused bridge crane, riser supports and installing an additional deck to provide for additional offices or storage spaces all of which could provide for better use of the now limited spaces aboard the JOIDES Resolution. The offices for the Lab Officer and possibly the library could be moved to these spaces thus freeing up additional rooms for additional quarters.

Hull, Tanks and Pipework

The hull, associated tanks incorporated into the hull and the pipework allowing for the transfer and flow of the various fluids throughout the vessel are main components of the vessel. The hull of the JOIDES Resolution is still in good condition after 20 years of service and if properly maintained, another 15-20 years life expectancy is not unreasonable. It is inevitable, however, that some corrosion will occur on various sections of the hull, tanks and pipework. Various sections have been repaired as required over the years however it will be very important to thoroughly inspect, repair and protect all sections of the vessel exposed to the elements so that further corrosion does not deplete the life of the Vessel. A complete paint job not only protects the vessel from corrosion but also enhances the appearance and provides the impression of a new vessel rather than a 20 year old one. Such a paint job is above and beyond any classification society requirements. It will also be beneficial to convert the diesel tanks under the quarters back to drill water tanks to support deep water drilling activities.

Shipboard Systems:

Various major pieces of equipment aboard the JOIDES Resolution required to provide vital services to the vessel require inspection and repair or replacement to ensure continued functionality. It would be appropriate to add a 2nd replacement water maker to ensure capability of meeting the constant demand for potable water on the J/R. Installation of a refrigeration unit to air condition the thyrig room would ensure continued functionality and reduced maintenance of the electrical systems aboard. Sound proofing in some of the work areas are also recommended to ensure acceptable noise levels are met. The three cranes aboard the unit are 20 years old and while functional and meeting all classification requirements should be thoroughly inspected to ensure their continued ability to safely move equipment to, from, and around the vessel.

Health Safety and Environment:

To improve the working conditions in various working locations aboard the vessel noise reductions is recommended as is removal of asbestos material which are located in various ceiling tiles and pipe lagging (Note: this asbestos material is stenciled and indicates do not disturb. It does not provide for unsafe conditions providing it is not disturbed. It is still recommended however to eliminate it and the signs related to it from the vessel.

Planning and Preparation:

Planning is the key to an efficient and cost effective upgrading of the JOIDES Resolution. It will be important to further define the upgrades and repairs required and proposed through the development of equipment and upgrade specifications. In order to firm up the prices, competitive quotes must be obtained for the equipment before the equipment can be purchased. Detailed workscopes will have to be developed so that competitive shipyard quotations can be obtained. Poorly defined or incomplete workscopes given to a shipyard lead to extensive cost overruns since once you are captive in a shipyard they can, and will, charge whatever they want for projects not previously well defined.

In order to ensure that the proper planning and project management occurs, Sedco Forex proposes assignment of a dedicated engineer as early as mid 1997 if ODP can commit to reimbursing ODL out of their contribution to the project. The Sedco Forex engineer would function as Project Manager to work on the equipment and shipyard specifications as well as equipment and shipyard costing. In addition ODP have hired an engineer with electrical and shipyard experience who could function as the project engineer working with the project manager and would be able to assist with the workscopes and equipment specifications while ensuring that the ODP money contributed to the upgrades is appropriately used and accounted for.

Beyond 2003:

While planning and implementing improvements and upgrades to the JOIDES Resolution in 1999, to carry her and the Ocean Drilling Program into the 21st century we must also look beyond to the period 2003 - 2013. While the majority of the upgrades and repairs conducted in 1999 can contribute directly to the functionality of the JOIDES beyond 2003, all of the upgrades will contribute to the continued success and therefore the continued excellent reputation and perception of the vessel and the Ocean Drilling Program. Any work performed in 1999 to extend the life of the vessel will ensure that the main structure and equipment will continue to be functional beyond 2003. Any of the major upgrades to the major systems i.e. ASK, DMS and Instrumentation will be able to be functional and operational well beyond 2003. While a major upgrade and lengthening of the JOIDES Resolution is anticipated in 2003, the work and money contributed now will not be wasted and will ensure continued excellent results from the Ocean Drilling Program into the next millennium.

TABLE A

Joides Resolution 1999 Drydock & Upgrade Estimates for Operations Through 2003

CAPITAL INVESTMENT UPGRADES AND REPAIRS FOR 5 YEARS ADDITIONAL OPERATION

	Upgrades		Basic Drydock		Total
	Estimate Detail	Subtotal	Estimate Detail	Subtotal	
STATION KEEPING - PROPULSION - POWER GENERATION					
Station keeping					
Replace ASK (Automatic Station Keeping)	###########	$1,500,000			$1,500,000
Power management					
Replace DMS (Data Management System)	$400,000.00				$400,000.00
Reconfigure bridge to contain DP station	$50,000.00				$50,000.00
Install Phase Back system	$100,000.00				$100,000.00
Air Condition SCR Room	$75,000.00				$75,000.00
subtotal		$625,000.00			$625,000.00
Thrusters					
Thruster inspection and repair (seal replacement)	$125,000.00				$125,000.00
Inspect. repair propeller cones			$20,000.00		$20,000.00
Electrical mods to use SKEG thrusters for maneuvers.	$125,000.00				$125,000.00
Improve Thruster ventilation	$100,000.00				$100,000.00
Propulsion motor upgrade	$200,000.00				$200,000.00
subtotal		$550,000		$20,000	$570,000.00
Propulsion					
Main prop shaft extraction, inspection and overhaul			$100,000.00		$100,000.00
Overhaul reduction gears	$75,000.00				$75,000.00
Drain, clean stem tube seal oil tanks	$8,000.00		$8,000.00		$16,000.00
subtotal		$83,000		$108,000	$191,000.00
Steering					
Replace rudder bearings / packing			$50,000.00		$50,000.00
Repair rudder stock bearing housing			$10,000.00		$10,000.00
subtotal				$60,000	$60,000.00
Mooring					
Anchor chain payout, inspection			$15,000.00	$15,000	$30,000.00
Electrical / electronic system inspection and repairs					
Emergency SB and breaker inspection and repair			$40,000.00		$40,000.00
DRILLING SYSTEMS					
Heave compensator inspection / repair	$20,000.00				$20,000.00
Core winch refurbish	$35,000.00				$35,000.00
Inspect, refurbish hook	$25,000.00				$25,000.00
Derrick inspection	$40,000.00				$40,000.00
Inspect refurbish electric brakes	$125,000.00				$125,000.00
Electric brake controller, battery & fail safe device	$125,000.00				$125,000.00
Install Torque Feedback system	$100,000.00				$100,000.00
Drilling Instrumentation drillers house upgrade	$450,000.00				$450,000.00
Inspect. refurbish drawworks	$75,000.00				$75,000.00
Inspect. refurbish rotary table	$40,000.00				$40,000.00
Inspect, refurbish high pressure mud piping	$50,000.00				$50,000.00
Inspect, refurbish low pressure mud piping	$50,000.00				$50,000.00
Inspect, refurbish mud pumps - extend intakes	$150,000.00				$150,000.00
Inspect, refurbish crown block	$30,000.00				$30,000.00
Inspect, refurbish traveling block	$30,000.00				$30,000.00
Inspect, refurbish Iron Roughneck	$50,000.00				$50,000.00
Inspect, refurbish pipe rackers	$30,000.00				$30,000.00
Subtotal		$1,425,000			$1,425,000.00
LIVING QUARTERS					
General refurbishment of living quarters	$250,000.00				$250,000.00
Clean out drains			$5,000.00		$5,000.00

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	Upgrades		Basic Drydock		Total
	Estimate Detail	Subtotal	Estimate Detail	Subtotal	
Inspect/flush, repair potable water and sanitary piping			$25,000.00		$25,000.00
Improve ventilation intake/filtering, replace ducting, fumigate.	$125,000.00				$125,000.00
Replace penthouse containers with living quarter modules	$75,000.00				$75,000.00
Sound proofing: messhall, recreation room, movie room	$70,000.00				$70,000.00
Service repair refrigeration units	$30,000.00				$30,000.00
Improve onboard entertainment systems	$25,000.00				$25,000.00
Decrease sound levels (change fan blades)	$30,000.00				$30,000.00
Convert DP room and ODP library to quarters	$75,000.00				$75,000.00
Subtotal		$680,000		$30,000	$710,000.00
LAB STACK					
Riser hold convert for lab offices	$300,000.00				$300,000.00
New core receiving platform	$40,000.00				$40,000.00
HULL STRUCTURE					
Hull					
Blast & paint hull, moonpool, guide horns, marks	$100,000.00		$75,000.00		$175,000.00
Blast and paint thruster wells & Pods	included		included		
Hull plate thickness gauging and NDT			$25,000.00		$25,000.00
Inspect hull penetrations			$10,000.00		$10,000.00
Inspect, repair cathodic protection			$15,000.00		$15,000.00
Inspect / repair lower guide horn	$25,000.00				$25,000.00
Plate and stiffener replacemement/ testing			$300,000.00		$300,000.00
subtotal		$125,000		$425,000	$550,000.00
Tanks					
Gas free, clean and inspect hull tanks			$60,000.00		$60,000.00
Cathodic protection inspect, replace			$30,000.00		$30,000.00
Inspect, repair sewage tanks	$15,000.00				$15,000.00
Plate, stiffener replacement			$125,000.00		$125,000.00
Tank testing			$10,000.00		
Convert 2 fuel tanks under quarters to drill water	$125,000.00				$125,000.00
subtotal		$140,000		$225,000	$365,000.00
Pipework					
Remove, clean and paint grids	$5,000.00				$5,000.00
Inspect / repair hull valves			$50,000.00		$50,000.00
Replace sections of ballast pipework			$50,000.00		$50,000.00
Inspect, replace sections of firemain			$40,000.00		$40,000.00
Modify piping for converted drill water tanks	$20,000.00				$20,000.00
subtotal		$25,000		$140,000	$165,000.00
SHIPBOARD SYSTEMS					
Inspect and refurbish all cranes	$325,000.00		$30,000.00		$355,000.00
Replace water maker	$155,000.00				$155,000.00
Radar Service			$8,000.00		$8,000.00
Add high pressure air booster	$25,000.00				$25,000.00
Replace high pressure air dryer	$25,000.00				$25,000.00
Upgrade air conditioning system (Centrifugal not Piston type)	$40,000.00				$40,000.00
Subtotal		$570,000		$38,000	$608,000.00
HEALTH, SAFETY AND ENVIRONMENT					
Noise reduction ECR (Engine Control Room)	$35,000.00				$35,000.00
Remove asbestos material from engine room, warehouse	$50,000.00				$50,000.00
Subtotal		$85,000			$85,000.00
CERTIFICATION					
ABS survey fees	$80,000.00		$10,000.00		$90,000.00
Liberian survey fees			$5,000.00		$5,000.00
subtotal		$80,000		$15,000	$95,000.00
PERSONNEL RELATIONS					
Recon visits	$12,000		$12,000		$24,000.00

TABLE A

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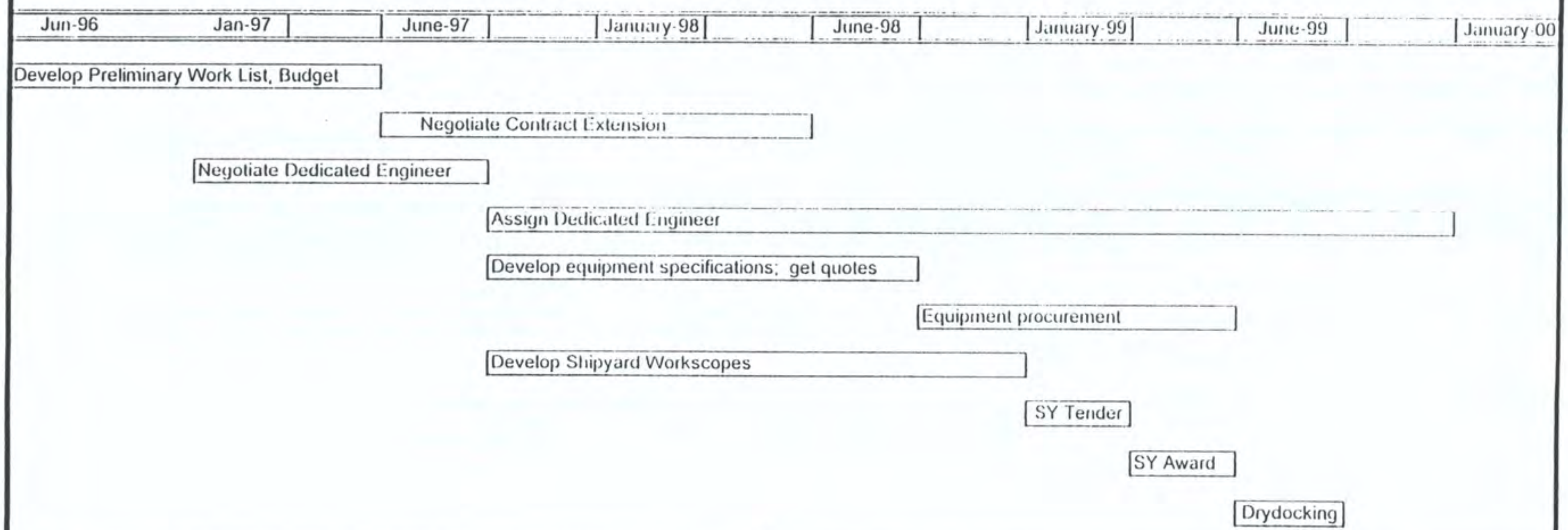
	Upgrades		Basic Drydock		Total
	Estimate Detail	Subtotal	Estimate Detail	Subtotal	
Contract negotiation visit	$10,000		$10,000		$20,000.00
Hotel/meals	$250,000		$80,000		$330,000.00
Transportation	$20,000		$7,000		$27,000.00
subtotal		$292,000		$109,000	$401,000.00
ENGINEERING - SUPERVISION - SHIPYARD SERVICES					
Assigned Engineer (required mid 1997)	$300,000.00				$300,000.00
Outside Engineering	$150,000.00				$150,000.00
Additional shipyard supervision	$75,000.00				$75,000.00
Shipyard services - Mooring			$8,000.00		$8,000.00
Drydocking fees			$85,000.00		$85,000.00
Utilities	$20,000.00		$10,000.00		$30,000.00
Shipyard services - Port fees	$6,000.00		$3,000.00		$9,000.00
Shipyard services - Wharfage	$25,000.00		$8,000.00		$33,000.00
Shipyard services - Craneage	$25,000.00		$8,000.00		$33,000.00
Shipyard services - Fire watch	$8,000.00		$2,000.00		$10,000.00
Shipyard services - Garbage disposal	$4,000.00		$1,000.00		$5,000.00
subtotal		$613,000		$125,000	$738,000.00
TOTAL		**$6,793,000**		**$1,310,000**	$8,103,000.00
Contingency / inflation adjuster 15%		**$1,018,950**		**$196,500**	$1,215,450.00
ESTIMATED TOTAL		**$7,811,950**		**$1,506,500**	$9,318,450.00

TABLE B

JOIDES Resolution Upgrade Preliminary Time Line
And spending Profile



Preliminary ODP Spending Profile ($5,000,000 1992 dollars - Forecasted to be $6,000,000 + in 1999 dollars)

Jun-96	Jan-97		June-97		January-98		June-98		January-99		June-99		Total
ODP spending profile			$50,000	$40,000	$40,000	$40,000	$60,000	$2,500,000	$600,000	$1,500,000	$1,200,000		$6,030,000
ODL spending profile								$500,000	$500,000	$500,000	$1,800,000		$3,300,000
Total spending profile			$50,000	$40,000	$40,000	$40,000	$60,000	$3,000,000	$1,100,000	$2,000,000	$3,000,000		$9,330,000

TECHNIQUES USED FOR SCIENTIFIC CORING WITH A RISERLESS DRILLSHIP BY THE OCEAN DRILLING PROGRAM

ODP Drilling Services Department
October 1996

ODP

1) ODP has completed 410 sites and 1078 holes on 67 legs, cored 199,849 m (124 mi), with 66.4% recovery in 38-5980 m (125-19,620 ft) water depths.

DRILLSHIP

1) Riser, BOP, and mud recirculation equipment were removed (reduces cost/time).
2) Draft of 7 m (21 ft) for shallow harbors and passage through the Panama Canal.
3) Derrick is 53 m (174 ft) high with A-frame folded down for passage under bridges.
4) Dynamic positioning system holds position within 2% of water depth in gale force winds and high surface currents.
5) Can operate in water depths of 75 m (250 ft) to 7540 m (24,700 ft).

DRILLING EQUIPMENT

1) Drilling equipment ensures that operations can be maintained in harsh environments.
2) Derrick is rated for 545 kg (1.2 million lb).
3) Variable-speed electric top drive.
4) Passive heave compensator with 20-ft stroke, rated for 363 kg (800 kips) compensating or 545 kg (1200 kips) locked.
5) Weight on bit controlled to 2.2-3.6 kg (5-8 kips) fluctuation.
6) Low friction seals under review-could reduce wob fluctuations to 2-3 kips.
7) Varco Iron Roughneck, dual-elevator system, and horizontal piperacker.

DRILL STRING

1) ODP owns everything that goes below the ship's keel because of risk-taking with BHA in unconsolidated formations to achieve goals.
2) Drill pipe is 12.7 cm (5 in) 5-1/2 IF and 13.97 cm (5-1/2 in) 5-1/2 FH S-140.
3) 80% of premium tensile strength used to avoid drill pipe failures-could lose entire drill string, damage equipment, and injure personnel.
4) Dynamic heave loading up to 60,000 lb depending on sea state.
5) Hole drag of about 10,000-20,000 lb is normal.
6) Maximum used string length of 7540 m could be run under normal conditions.
7) Overpull limitation in severe weather is 100,000 lb with 5° roll using a guide horn-overpulls to 250,000 lb with 20,000 ft lb torque and 3200 psi are possible.

BOTTOM-HOLE ASSEMBLY

1) BHAs use 6-5/8-in FH "modified" connections to reduce BHA failures.
2) Tapered drill collar and transition to two stands of 5-1/2-in. drill pipe.
3) Guide horn limits drill pipe bending (350 ft radius) and fatigue as the ship rolls.
4) "Knobby" joints run through the guide horn reduce drill pipe bending below keel.
5) Stuck BHAs are severed with explosives and hole is abandoned-no fishing.
6) Mechanical bit release (MBR) provides an alternate means to release the bit.
7) Hole angle usually remains at 0-5° with no stabilizers or directional control.

CORING SYSTEMS

1) Continuous wireline coring using three primary coring systems:
    a) APC for soft sediments to 100-300 m with +/-98% recovery,
    b) XCB for compacted sediments to 500-800 m with 20-55% recovery,
    c) RCB for hard sediments and basement with 12-55% recovery.
2) Penetration record is 2111 m (6925 ft) below seafloor in a water depth of 3475 m.
3) 9.5 m (31.17 ft) × 5.9 cm (2-5/16 in) cores are retrieved by wireline through DP.
4) APC and XCB systems use the same BHA and 11-7/16" four-cone or PDC core bit.
5) RCB system uses a different BHA with a 9-7/8 in OD (25.1 cm) four-cone core bit.

SITE APPROVAL, PLANNING AND PILOT HOLES

1) ***JR*** operates without a riser, seafloor BOP, or drilling fluid recirculation system-pollution prevention and safety are of paramount importance.
2) Potentially hazardous sites rejected through a rigorous review process.
3) Unknown sites proven in stages by coring several pilot holes.
4) ODP Operations Superintendent on ***JR*** responsible for ensuring safety.
5) Requests for changes in leg plans (depth, location, new holes) must be approved.
6) Site and downhole conditions are often unknown-require flexible coring tools and procedures to handle changes as leg unfolds.
7) Pre-selected sites should be well marked to assist in setting a reentry base.
8) Large-diameter holes should be drilled and cased without coring, sampling or logging

POSITIONING AND REENTRY

1) Differential Global Positioning Satellite (dGPS) routinely positions over hole.
2) Reentries made within 15 minutes using a TV and sonar frame that rides over the drill string. No ROVs or divers are used.
3) TV and sonar can be used while pipe is in the hole to check for hole enlargement, surface slumps, and fractures or for returns to the seafloor.

MULTIPLE-NESTED CASING

1) Most sites are cored open hole to 200-1500 m without any casing or reentry cones.
2) Holes in unstable formations, instrumented, or long-term observatory holes, and deep holes can be equipped with multiple-nested casing strings.
3) Multiple-nested casing strings require seafloor reentry structures and support.
4) A rotational release Dril-Quip casing-hanger system for reentry cones can run four nested casing strings as follows: 20 in (washed in or in 26 in hole), 16 in (in 18-1/2 in hole), optional 13-3/8 in (in 15 in hole), and 10-3/4 in AB ST-L (in 12-1/4 in hole as casing or liner).
5) Optional 8-5/8-in liner can be run at TD with smaller coring system to continue hole.
6) Nested drill-in casing (using conventional rotary or downhole motor) or hammer drill-in casing (under development) can be reentered even if it is set off-bottom.
7) Large-size (20-26 in) holes for the initial conductor and surface casing can be drilled without attempting to open a smaller rugose hole with large cavities.

CEMENTING

1) 100 m of 15.6 ppg API Class "G" neat cement is sufficient using a single float shoe and DP wiper plug/Sub Sea Release top plug system.

MUD

1) Seawater is main circulating fluid with returns to the sea floor.
2) Buildup of cuttings and slough in hole are indicated by changes in drilling parameters
3) Success in cleaning hole indicated by an increase in pump pressure of 50-150 psi.
4) Soft formations cored with 100-250 gpm to avoid washing away the core, and the circulation rate is increased to 350 gpm to clean annulus while retrieving core.
5) Flapper-type float valve above bit prevents cuttings-laden annular fluid from U-tubing.
6) Seawater is a poor hole-cleaning fluid, but non-polluting to the core and ocean floor.
7) Mud could contaminate porous cores with chemicals, clay, foreign rock fragments, and silt, and paleontological contaminants.
8) Seawater is circulated at 200-500 gpm with occasional hole cleaning "sweeps" of viscous "mud" (water and clay) as required to clean out cuttings and slough.
9) Bentonite clay/fresh water mud has been replaced by sepiolite clay/sea water mud.
10) Sepiolite mud is also used for stabilizing the hole for logging and casing operations.

LOGS, TEMPERATURE PROBES, AND FLUID SAMPLERS

1) Wireline electric logs, temperature probes, fluid samplers, and other special tools are run through 4-1/8 in ID drill pipe and BHA.
2) Lockable flapper-type float valve can be locked open to permit logging through the APC/XCB bit, which has a 3.8-in opening.

WELL CONTROL PROCEDURES

1) Emergency kill mud pit is maintained with 250 barrels of 10.5-12.5 ppg (1.26-1.50 g/cm^3) mud.
2) If a flow is encountered, bit would be run to bottom if possible, and the kill mud would be pumped at high pump rates (500-750 gpm) to provide a dynamic kill. The mud could be followed by cement at 16.4 ppg (1.97 g/cm^3).
3) Pore pressures are typically at seawater hydrostatic gradient 1.025 g/cm^3 (8.5ppg).
4) Flowing pressures have been measured at 1035-1242 kpa (150-180 psi).

ENVIRONMENTAL CONDITIONS

1) *JR* is normally rotated into the prevailing environmental forcing conditions.
2) All operations are possible in up to 5 m combined sea state, 4 to 7 s periods, 45 kt winds, 4° roll and pitch, 1-2 m heave, and 2.5 kt current.

GEOLOGICAL CHALLENGES

1) Oceanic sediments are typically younger, poorly cemented, and unstable, more permeable, and highly fractured.
2) Unique operational problems from combinations of geological formations are encountered in each hole:
   a) Unstable, fractured and/or uncemented-granular formations caving-in,
   b) Swelling clays closing off the hole or forming ledges,
   c) Lost circulation in porous or fractured zones that prevents hole cleaning,
   d) Hole enlargements in soft formations that reduce hole cleaning,
   e) Combinations of hard ledges and soft cavities that trap cuttings and pipe,
3) Formation fluids: gassy sediments and hydrates, hydrocarbons in active seeps, H_2S, hot holes and hydrothermal vents to 360°C (680°F) temperatures,
4) Starting holes in hard bare rock and/or unstable formations,
5) Slow rate of penetration and poor core recovery in fractured or uncemented rock.

UNSTABLE FORMATIONS

1) Techniques include frequent reaming and rereaming and short trips to get the top of the drill collars above the seafloor and permit loose rock to fall to bottom.
2) Bit is rotated off bottom without circulation to permit rubble to fall past the bit.
3) Viscous 20 to 35 bbl mud sweeps are used every three to five cores as required to carry cuttings out of the hole at reduced pump rates.
4) Fractured rock or flowing sand and gravel may be stabilized by filling the hole with sepiolite mud.
5) High annular velocities cannot be tolerated because hole enlargement can lead to loss of ability to clean the hole-must use low AV.

SWELLING CLAYS AND HOLE CLOSURE

1) Oceanic clays may extrude into the well bore under overburden pressure or tectonic stress, and hydrophilic clays can swell from water absorption-requires frequent reaming and rereaming.

LOST CIRCULATION

1) Lost circulation is a persistent problem because pelagic oceanic sediments typically are soft and undercompacted with relatively weak fracture gradients and cannot hold dense ("weighted") muds or stand high pump or annular friction pressures.
2) Many zones can take whole mud through flow channels, vuggular porosity, or fractured zones.
3) Cutting loads in the annulus can increase circulating pressure by 150-300 psi, which can fracture weak zones.
4) Rate of penetration is controlled so the hole can be cleaned at lower circulation rates
5) Cuttings and rubble can build up above the bit, pack-off, and stick the pipe.
6) Even a low-density mud can add substantial hydrostatic and friction pressures to the hole and increase lost circulation problems; therefore, casing may have to be set through loosely compacted or poorly cemented sediments down into firm or indurated rock.

GASSY SEDIMENTS AND HYDRATES

1) Gas from crushed-rock cuttings and permeable zones flows up the annulus and is vented at the seafloor; therefore, no mud handling system is required.
2) Gas released in the pipe as the core rises to the surface is partially purged by pumping seawater down the pipe at slow rates.
3) Some gas is released from the core barrel on the rig floor, and special gassy core procedures are implemented to degas the core liner before it is handled.

HYDROCARBONS

1) Cores are monitored continuously for hydrocarbons to avoid pollution, and coring is terminated immediately if anomalous migrated hydrocarbons and mature liquid hydrocarbon precursors are detected.
2) There is negligible danger to the ship from hydrocarbons because any oil and gas flows would be dispersed in the water column and carried away from the ship (or the ship could be offset).
3) There is no danger of carrying gas and oil flows back to the ship with the attendant pressure and danger of fire; therefore, blow out preventer and diverter pressure control equipment is not required.

ACTIVE SEEPS

1) Assumptions about hydrocarbon migration are based on normal hydrocarbon maturity in petroleum basins; however, higher thermal gradients near high-temperature flow features accelerate the maturation of hydrocarbons.
2) Active seeps can be cored because the "pollution" is a natural event.
3) "Killing" natural flows (décollements, mud volcanoes, gas seeps, and water flows) with mud weight may not be possible because the pressure sources may be deep-seated well beyond the reach of the bit or kill fluid. Very high mud weights would substantially pollute and could damage naturally flowing systems.

H_2S

1) H_2S normally decreases to negligible concentrations below about 40 mbsf; however, concentrations in cores in flowing zones can reach 50K ppm.
2) H_2S is vented like hydrocarbon gases, and monitoring, absorbers for the mud system, and extra ventilation and alarms in the mud pit system are not required.

HOT HOLES AND THERMAL STRESS

1) Some holes near mid-ocean ridges, hydrothermal vents, and deeper holes can have bottom-hole temperatures that exceed 200-300°C (392-572°F).
2) Butyrate coring liners can be used to 250°C if water is circulated at 100-175 gpm while running and retrieving the core barrels. Hot hole plastic and split anodized-aluminum core liners are also available.
3) Circulation of 2-4°C seawater at 300-500 gpm at normal penetration rates of 2-5 m/hr can cool holes by up to 90°C.
4) Thermal stresses can cause rock chips 2-4 cm in diameter by 1-2 cm thick to fall into the hole, and the greatest thermal stress occurs when circulation is started after the hole heats up during a trip.
5) Thermal stress sloughing has been reduced sharply by circulating in 500 m stages when running pipe in hot holes.

TECTONIC AND LITHOSTATIC STRESS

1) Effective vertical stresses increase almost linearly with depth of burial to 186.7 bars (2734 psi) at 1000 m penetration (0.1867 bar/m or 0.83 psi/ft); however, horizontal tectonic stresses can be considerably greater.
2) Rocks from chip size to fist size (2-20 cm in diameter and 1-5 cm thick) have been recovered with curved surfaces, indicating that they came out of the well bore.
3) Caliper logs typically indicate that (tectonic) stresses cause the hole to enlarge in the direction of the minor stress axis.

SLIM-LINE RISER FOR *JR*

1) Rigorous national environmental/pollution/safety requirements in Exclusive Economic Zones and on continental slopes may require BOP/riser systems to obtain drilling permits in some areas.

2) Other potential operational advantages in using a circulating mud system are:
   - a) Control of viscosity, rheology, and thixotropic properties,
   - b) Use of expensive chemical and polymer additives to improve hole cleaning,
   - c) Unstable or flowing formations might be controlled using mud density ("weight") to impose hydrostatic pressure,
   - d) Soft formations that are extruded by overburden or tectonically squeezed into the well bore might be controlled with mud density,
   - e) Filter cake or fiber mats might be used to control lost circulation or flowing granular sands/gravels/corals, and
   - f) Chemical inhibition may control swelling of hydrating clays.

3) Circulated mud weight would normally be 8.8-9.4 ppg for drilling and coring, but would not exceed 10.5 ppg.

4) Emergency kill mud weight to load the hole below the mudline (i.e., not circulated back to surface) would not exceed 12.5 ppg. Seawater will be the standby fluid

SLIM-LINE RISER CONCEPTS

1) The optimum riser design for the *JR* in a water depth of 4000 m is a "slim-line" (10-3/4 in OD × 10 in ID) riser with low pressure, integral threaded connections, and without flotation or choke/kill lines:
   - a) Riser would be bare (i.e., no fixed external lines, buoyancy material, or appliances except clips for the electric umbilical).
   - b) Only a shipboard diverter (i.e., no seafloor BOP) would be used initially.

2) Modifications to *JR* include reinstalling the original riser tensioner system or an integral riser slip joint/tensioner system:
   - a) Adding riser handling and storage capacity.
   - b) Guide horn would have to be removed to accommodate the riser.
   - c) A ball or taper joint (possibly with an internal bending radius) would be used at the ship and seafloor to reduce drill pipe fatigue and accommodate riser deflection.
   - d) Shipboard riser diverter system would have a high-pressure annular/full-closure diverter (BOP), and a choke and kill hose outlet spool (in the riser below the tensioner/slip joint and diverter) capable of sustaining full riser tension.
   - e) An integrated redundancy and risk analysis would be required.
   - f) A dynamic mechanical analysis (especially vertical forces due to vessel motion) would be required on both connected and disconnected risers.

g) To reduce the time required to pull a long riser when running larger diameter casing or for emergency disconnects, a means is needed to shift a disconnected riser from beneath the center of the rotary to enable running casing beside it.

FUTURE BOP CONCEPTS FOR *JR*

1) A future optional seafloor BOP System for the J/R would probably be configured as follows:

a) The existing TV/sonar/winch-coax system would be used for guideline-less operations (i.e., without an ROV).

b) A side funnel would be provided external to the riser so drill pipe (using appropriate wireline plugs) could be used to cement or kill flows, recharge accumulators, or hot charge batteries (using the logging line) while the riser was hung off in the moon pool.

c) The mudline BOP would have one double ram BOP (shear/blind and variable bore rams) with typical appliances for BOP disconnect, riser disconnect and flex joint.

d) This will also include a seafloor-riser pressure readout/dump valve/remote choke for low-fracture gradients, lost circulation, or uncontrollable gas kicks, and electric cable/DP recharge system.

e) The subsea BOP control system would consist of one hydraulic umbilical (preferably with redundant power fluid hose) and supply read-back, one multiplex electrical power cable (preferably with redundant circuits), two mini-electro/hydraulic control pods, and a subsea hydraulic accumulator bank capable of surface pre-charge and subsea recharge (via the umbilical).

f) A means would be required for emergency disconnect by hanging off the riser to the side of the moon pool and running drill pipe beside the riser to the seafloor and stabbing it into a receptacle for controlling flows or recharging the BOP if any.

CONOCO

HYDRIL®

Joint Industry Project
To Develop Conceptual Design for a
"Riserless / Mudlift Drilling System"

Summary

Project Focus:

- In water depths beyond 7,000 feet, conventional marine riser drilling systems require more casing strings than may be practical or possible.
- In water depths beyond 7,000 feet, conventional marine riser drilling systems require more mud volume and riser support than most existing drilling vessels can accommodate.

A Joint Industry Project has been initiated by Hydril Company and Conoco to develop a conceptual design for a "riserless/mudlift" system intended to:

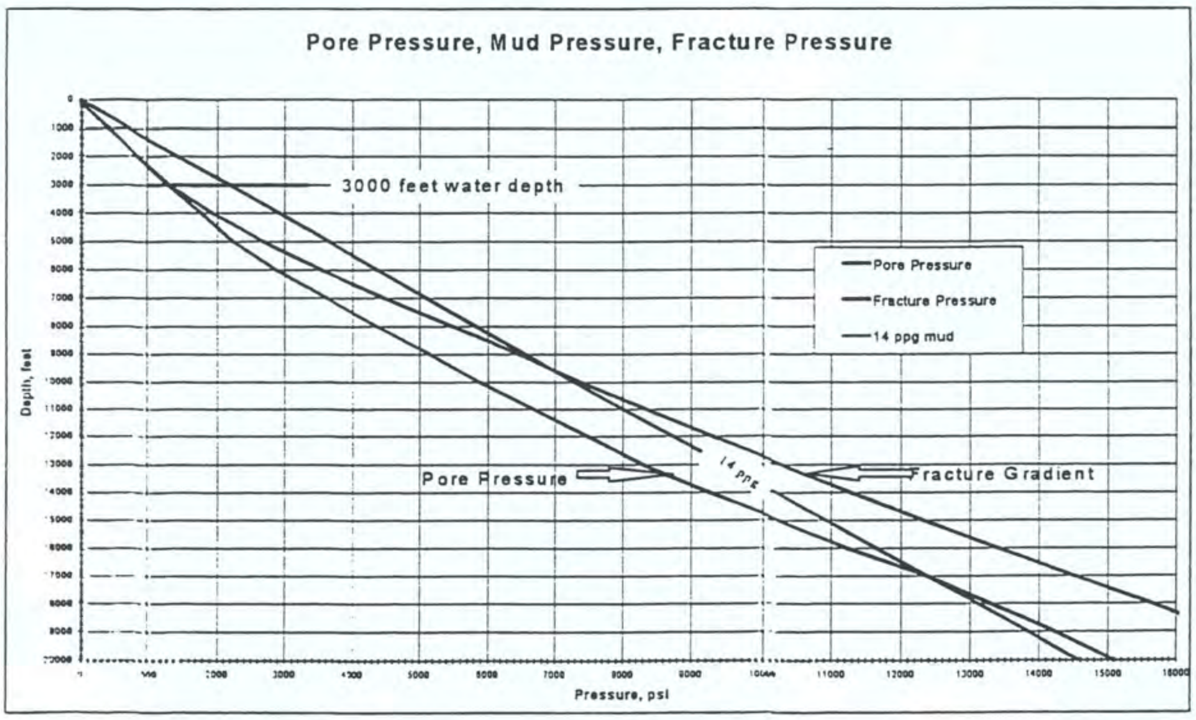
- Enable produceable bore holes in deep water lease prospects.
    - A Mudlift System will reduce the number of casing strings, thus, permitting successful drilling in much deeper water depths.
- Increase number of existing rigs capable of drilling deep water prospects.
    - Shallow water rigs can be more easily upgraded to deepwater rigs when a Mudlift System is installed. The Mudlift System return risers weigh less and contain less heavy mud than a conventional marine riser system. With the reduced riser and mud loads, an upgraded drilling vessel can handle increased deepwater mooring system loads and operational supplies.
- Substantially reduce cost of development through reduction in total drilling time, reduction in casing, mud and related drilling costs.
    - Reducing casing requirements means large time and cost savings can be realized in 2000 to 6000 feet water depth.

Objectives of Mudlift System

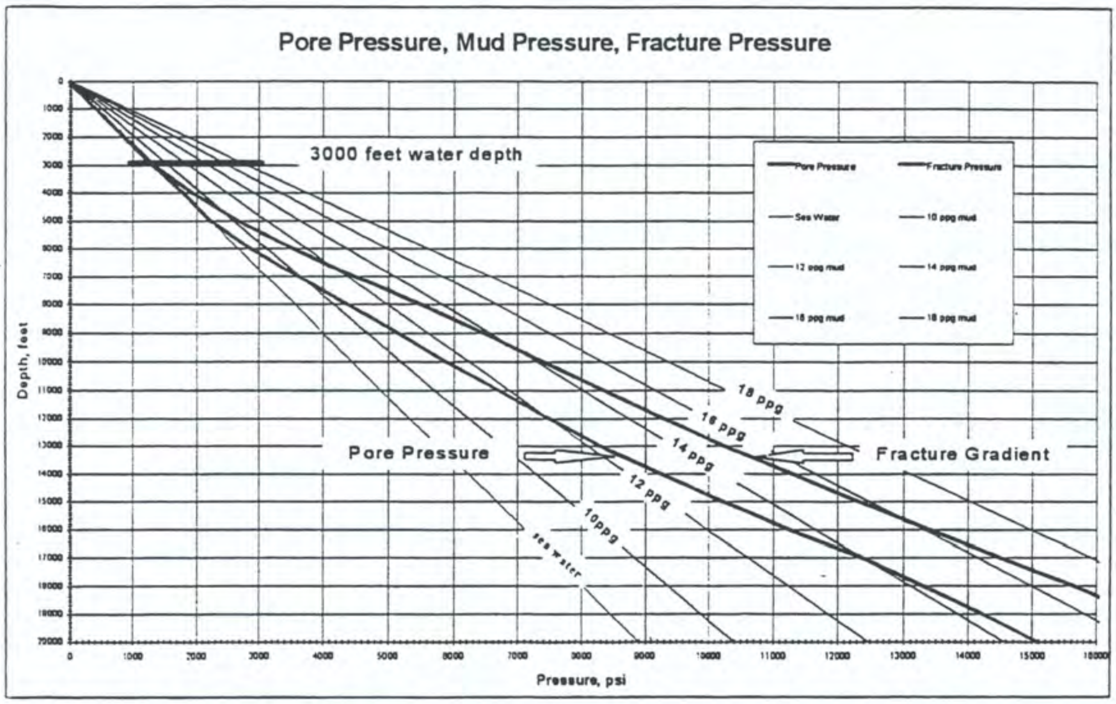
Two basic objectives for a Mudlift System are to reduce the number of casing strings required for deepwater drilling and to reduce drilling vessel load requirements.

Successfully developed, a Mudlift System could reduce the number of casing strings required for drilling deepwater wells by using a system of dual mud gradients that more nearly matches the natural seawater gradient from the vessel to the ocean floor in combination with a higher mud gradient in the wellbore. This dual gradient system overbalances formation pore pressure without exceeding fracture pressure for longer sections of hole thus reducing the required number of casing strings.

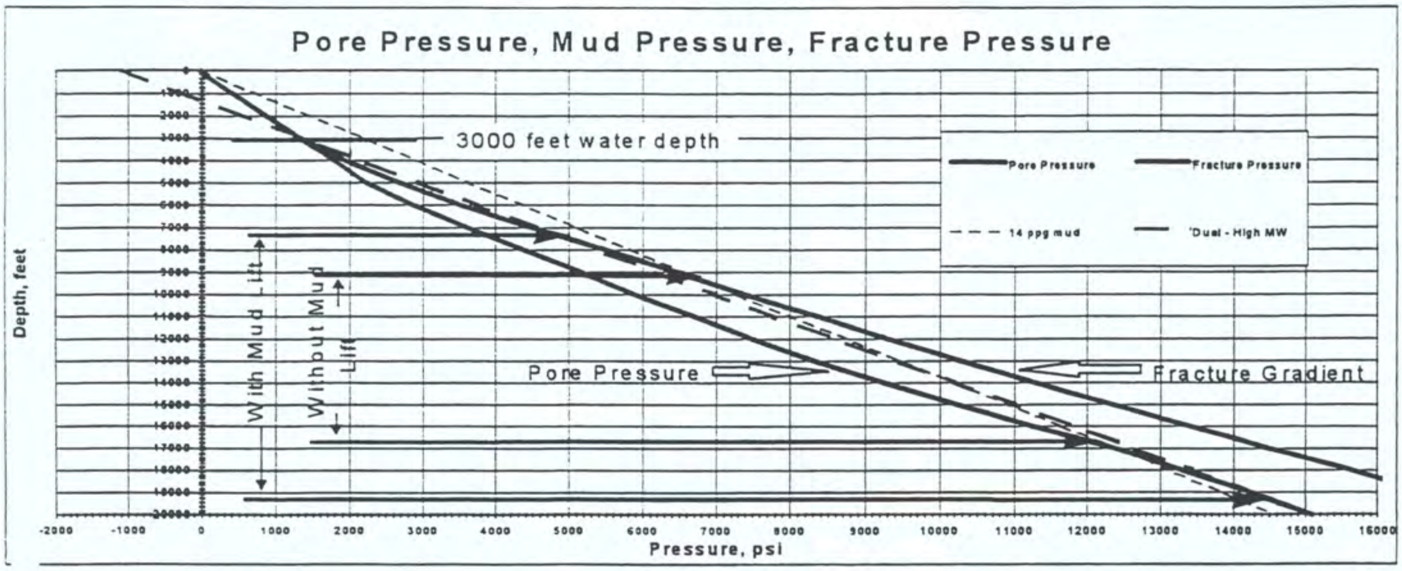
The figure below show a typical depth versus pressure chart commonly used for well planning. Successful drilling operations require that the mud column pressure exceeds the pore pressure gradient (lower line) to prevent the well from kicking. The mud column pressure must also be less than and fracture gradient (upper line) in the 'open hole' sections or the formation will fracture and result in lost returns. The figure shows, for example, that a 14 ppg mud weight is required to overbalance the formation pressure at a depth of 17,000 feet and this 14 ppg exceeds the fracture gradient of the formations above a depth of 10,000 feet. Casing must be set to progressively deeper depths to cover 'open hole' sections with insufficient fracture gradient.



Pore pressure gradient typically increases with depth, i.e., a higher mud weight is required as the well is drilled deeper, as shown in the following figure. Factors such as pressure surges caused by pipe movement and annular circulating pressures further reduce this interval between casing strings.



Dual mud gradients are achieved by applying a Mudlift Concept to effectively provide a lower mud gradient for the mud column extending from the sea floor to the vessel. A higher mud density is then used to achieve the usual mud gradient that overbalances formation pore pressure. The Mudlift Concept is accomplished by gas lifting the mud or pumping the return-mud column with a subsea booster pump to reduce the return line mud column pressure.



The figure above shows that a dual density mud column overbalances pore pressure without exceeding fracture gradient for a much longer section of hole than a single density mud column.

Further, the Mudlift System reduces drilling vessel load requirements by replacing the conventional large marine riser with small return riser(s). Riser tensioning load, caused in part by the large volume of mud in the riser, is greatly reduced. Vessel load is also reduced because the smaller riser volume greatly reduces the requirement for large active mud pit volume and storage pits to hold mud when the riser is pulled.

Benefits of Mudlift System

The following charts compare the number of casing strings required at 300, 3000 and 7000 foot water depths.

Current Offshore Drilling Technology

When This Shallow Water Casing Program Is Needed to Reach Objective at 15,000 feet Below Mudline	This Casing Program Is Required In 3000 feet Water Depth	This Casing Program Is Required In 7000 feet Water Depth	Too Many Casing Strings Are Required to Reach Objective in 10,000 feet Water Depth
36" @ 300 feet	36" @ 300 feet	36" @ 300 feet	?
		30" @ 700 feet	
20" @ 1500 feet	26" @ 1200 feet	26" @ 1200 feet	
		20" @ 1900 feet	
	20" @ 2600 feet	16" @ 2800 feet	
		13 3/8" @ 3800 feet	?
	16" @ 4100 feet		
		11 ¾" @ 5000 feet	
13 3/8" @ 5000 feet			
		9 5/8" @ 8000 feet	?
	13 3/8" @ 8500 feet		
9 5/8" @ 10,000 feet			
		7 or 7 5/8" @ 11,500 feet	?
	9 5/8" @ 14,000 feet		
7" @ 15,000 feet	7" @ 15,000 feet	5 or 5 ½" @ 15,000 feet	?

Additional casing strings require time consuming underreaming and additional rig time to run the extra casing strings. Current technology is inadequate to economically develop deepwater objectives.

With Mudlift System to Provide a Dual-Density Mud Gradient for Deepwater Drilling

When This Shallow Water Casing Program Is Needed to Reach Objective at 15,000 feet Below Mudline	With Mudlift System This Casing Program Is Required in 3000 feet Water Depth	With Mudlift System This Casing Program Is Required in 7000 feet Water Depth	With Mudlift System Objectives Can be Reached in 10,000 feet Water Depth
36" @ 300 feet	36" @ 300 feet	36" @ 300 feet	36" @ 300 feet
		26" @ 1200 feet	30" @ 700 feet
20" @ 1500 feet	20" @ 1500 feet		26" @ 1200 feet
			20" @ 2500 feet
		20" @ 3500 feet	16" @ 3500 feet
13 3/8" @ 5000 feet	13 3/8" @ 5000 feet		
		13 3/8" @ 8000 feet	13 3/8" @ 8000 feet
			11 ¾" @ 9000 feet
9 5/8" @ 12,000 feet	9 5/8" @ 12,000 feet	9 5/8" @ 12,000 feet	9 5/8" @ 12,000 feet
			7 or 7 5/8" @ 14,000 feet
7" @ 15,000 feet	7" @ 15,000 feet	7" @ 15,000 feet	5 or 5 ½" @ 15,000 feet

Mudlift System boosts the drilling mud with subsea pumping or gas lifting to maintain a seawater pressure at the sea floor and a mud gradient in the wellbore. The need for casing strings is minimized because this "Dual-Density" mud gradient overbalances formation pressures without exceeding formation fracturing pressures for much greater depth intervals.

Comparison of Expected Drilling Progress With and Without Mudlift System

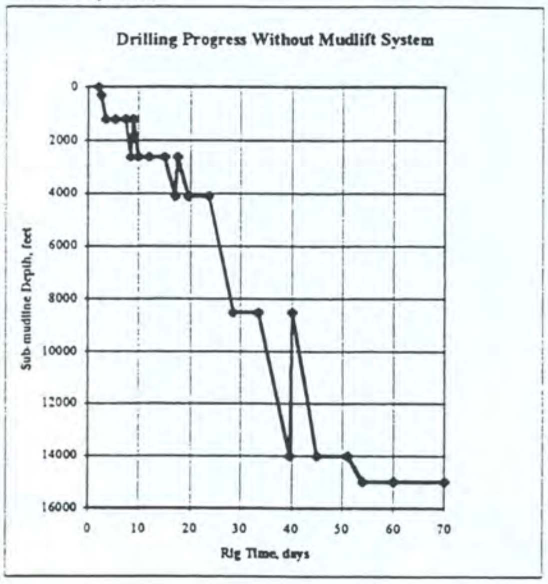
A further substantial potential benefit of the mudlift system is reduced drilling time. As noted in the following chart, avoidance of underreaming as well as fewer casing strings could be substantial – almost 20 days in a hypothetical 15,000 foot well.

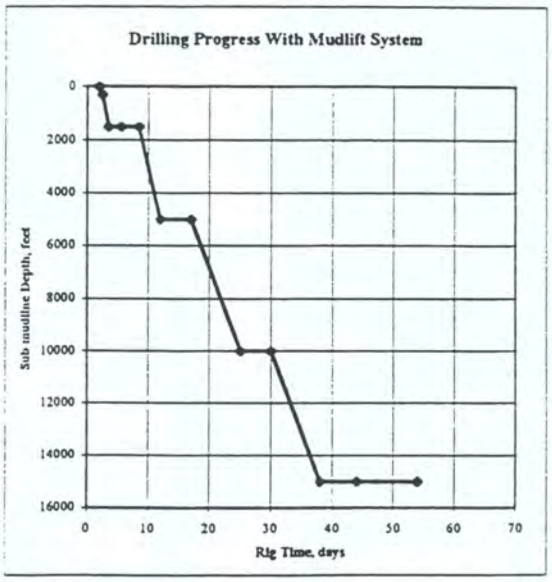
Planned Operational Summary Without MudLift System

Plan Days	Total Days	Depth submud		Planned Operation
2	2	0	1	Moor rig on location.
0.5	2.5	300	2	Set 36"structural conductor @ 300'.
1	3.5	1200	3	Drill 32" hole for 26" pipe.
2	5.5	1200	4	Set 26"conductor @ 1200'.
2	7.5	1200	5	Run riser and 26" subsea Diverter.
1	8.5	2600	6	Drill 17 1/2" hole to 2600'.
0.5	9	1200	7	Pull out to underream hole.
1	10	2600	8	Underream hole to 26" for 20" casing.
2	12	2600	9	Set 20" casing @ 2600'.
3	15	2600	10	Run and test 18 3/4" subsea BOP stack.
2	17	4100	11	Drill 17 1/2" hole to 4100'.
0.5	17.5	2600	12	Pull out to underream hole.
2	19.5	4100	13	Underream hole to 22" for 16" casing.
4	23.5	4100	14	Set 16" liner @ 4100'.
5	28.5	8500	15	Drill 14 3/4" hole to 8500'.
5	33.5	8500	16	Set 11 3/4" casing @ 8500'.
6	39.5	14000	17	Drill 10 5/8" hole to 14000'.
0.5	40	8500	18	Pull out to underream hole.
5	45	14000	19	Underream to 12 1/4" for 9 5/8"casing.
6	51	14000	20	Set 9 5/8" casing @14000'.
3	54	15000	21	Drill 8 1/2" hole to 15000'.
6	60	15000	22	Set 7 or 7 5/8" liner @ 15000'.
10	70	15000	23	Test and P&A or Complete.
70	Days total.			

Planned Operational Summary With MudLift System

Plan Days	Total Days	Depth submud		Planned Operation
2	2	0	1	Moor rig on location.
0.5	2.5	300	2	Set 36" structural conductor @ 300'.
1	3.5	1500	3	Drill 26" hole for 20" pipe.
2	5.5	1500	4	Set 20" conductor @ 1500'.
3	8.5	1500	5	Run and test 18 3/4" subsea BOP stack.
3.5	12	5000	8	Drill 17 1/2" hole to 5000'.
5	17	5000	9	Set 13 3/8" casing @ 5000'.
8	25	10000	10	Drill 12 /4" hole to 11000'.
5	30	10000	11	Set 9 5/8" casing @11000'.
8	38	15000	12	Drill 8 1/2" hole to 17000'.
6	44	15000	13	Set 7 or 7 5/8" liner @ 17000'.
10	54	15000	14	Test and P&A or Complete.
54	Days total.			





Description of Conoco/Hydril JIP

Phase I Deliverables

The primary deliverable for this JIP is to develop a Conceptual Design with a time and cost estimate for full development and implementation of a Mudlift Drilling System.

The following table, from the RISERLESS DRILLING PARTICIPATION AGREEMENT lists tasks that are included in this JIP. The Proposed Schedule will be modified since the JIP has been delayed from the original planned starting date. However, Hydril has been evaluating concepts and identifying basic component requirements since the planned starting date for the project.

Proposed Schedule

Tasks	Month 1				Month 2					Month 3				Month 4					Month 5				Month 6				Month 7				
Identify Configurations		X					X																								
Preliminary Evaluation of Concepts																															
Documentation of Concepts Being Considered	X	X	X	X	X	X	X	X																							
Selection of Concepts for Conceptual Designs									X	X																					
Preliminary Evaluation Report											X	X																			
Conceptual Designs of Selected Concepts																															
Identify Basic Component Requirements		X			X			X																							
Develop Criteria for Designs of Components											X			X			X														
Simulate Hydraulic Behavior																															
Modify Existing Software							X	X	X	X																					
Parameter Studies for Selected Concepts											X	X																			
Gas Requirement General Limits													X	X																	
Determine Gas Lift Transient Effects															X							X									
Define Transients for Various Operations																	X						X								
Document Hydraulic Simulation Results																									X	X					
Simulate Dynamic/Mechanical Behavior																															
Select Design Criteria												X																			
Basic Mooring System Analyses														X																	
Riser Analyses - Tension Req'mt, Stresses, etc.																X							X	X							
Document Dynamic/Mechanical Simulations																									X	X					
Design Concepts / Conceptual Engineering																															
Develop Cenceptual Designs for Components								X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X						
Prepare Final Report																										X	X	X	X	X	X
Cost Estimates and Time Schedules																															
Costs and Development Time for Components																										X	X	X			
Costs and Development Time for Total System																													X	X	X

Conoco and Hydril each committed as much as $125,000 to provide an adequate guaranteed minimum funding level to permit starting the Project. The Project budget was limited to $250,000 until additional participants joined the Project. These Conoco and Hydril commitments were made with the understanding that, provided sufficient additional contributors join the project, the Conoco and Hydril contributions would be reduced to the same amount as other participants in this Project. Each new participant's contribution is $50,000 to join the Project. The Project budget will increase by $50,000 for each new participant until five participants have joined in addition to Conoco and Hydril. This number of participants will guarantee funding of the maximum expected budget of $500,000. As additional participants join the Project, the commitments of Conoco and Hydril will decrease proportionately until, with ten total Project participants, each participant's contributions will be $50,000. In the event that more than ten participants join the Project, unless agreed otherwise by all participants, each participant's contribution will be reduced proportionately rather than increasing the total Project budget.

At the time of preparation of this brochure, the JIP Participants are: Conoco, Inc., Diamond Offshore Drilling, Inc., Mobil Oil and Hydril Company.

Phase II Deliverables

Phase II deliverables are expected to be a complete design and prototype testing of a Mudlift System.

Participants' Meeting

Additional details of the program will be explained at the first meeting of Participants scheduled for October 25, 1996 at Hydril World Headquarters.

Please address your technical inquires to:
Mr. Charles Peterman
Hydril Company
P. O. Box 60458, Houston, Texas 77205-0458
3300 North Sam Houston Parkway East (77032-3411)
Phone: (713) 449-2000
FAX: (713) 985-3353

Riserless drilling: circumventing the size/ cost cycle in deepwater

Allen Gault
Conoco

Conoco, Hydril project seek enabling technologies to drill in deepest water depths economically

Floating drilling operations in deepwater presently involve the use of a 21-in. marine riser. The capacity of this marine riser is about 400 bbl for every 1,000 ft of length. In deep water, the mud volume within the riser constitutes a majority of the total mud system and is of no benefit in the drilling process.

This long weighted mud column introduces hydrostatic pressures, which requires numerous casing points in areas with high pore pressures and low fracture gradients, conditions typically found in areas of rapid deposition (Gulf of Mexico). Numerous casing points require a larger subsea wellhead, which requires a larger marine riser, which means that a larger drilling rig is needed to support the riser and mud column. The cycle repeats itself as the water depth increases.

A means of breaking this cycle is needed. A key factor in the solution is reducing the hydrostatic pressure at the seafloor to near that of a column of seawater, thus tricking the well into believing the drilling rig is located on the seafloor. In order to achieve this feat, removing the riser as an annulus and replacing it with a mud return line at the wellhead is necessary.

Background

Schemes for drilling without a riser were developed in the 1960s and 1970s to reduce casing points and rig weight in deepwater floating drilling operations. The concept of riserless drilling was first promoted by Shell. Charles Peterman (Hydril) was with Shell and involved in the project at the time. Bruce Watkins (DrilQuip) was with Regan Offshore during this time period and patented a riserless drilling concept, which has since expired. Frank Williford (Sedco Forex) helped further the concept. Others also have seen merit in it.

However, these concepts were not advanced because the maximum drilling depth in the 1970's was 3,000 ft, requiring only an additional casing point or two, and the technology to implement riserless drilling was not available.

The solution at that time was to increase the size of both the marine riser and subsea wellhead. The first wellheads were 13-5/8 in. in diameter; the common size today is 18-3/4 in. Increasing the diameter of the wellhead and marine riser to drill in deeper water depths, however, greatly increased the weight and space requirements for floating drilling rigs.

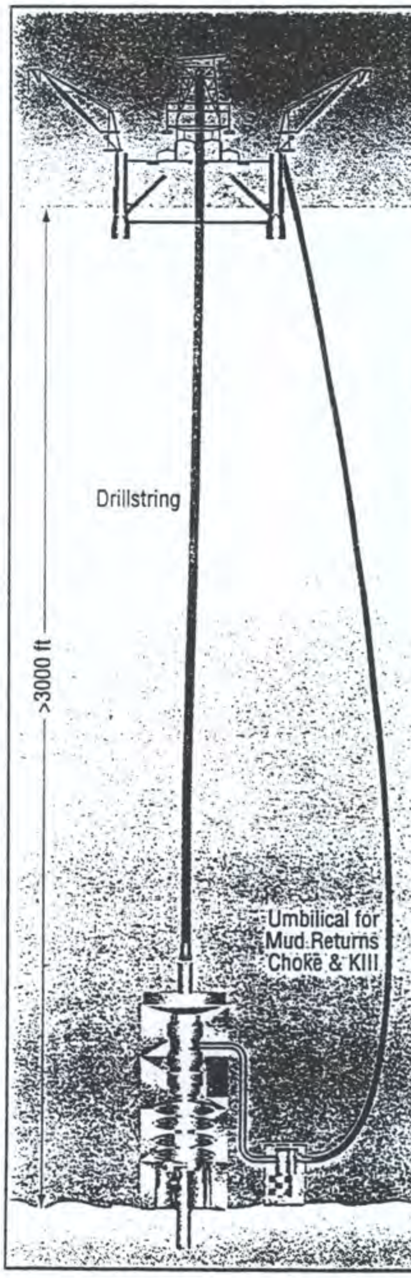
For example, the weight attributed to the marine riser, mud volume, additional mud pumps, and solids separation for a rig drilling in 6,000 ft water depths today reportedly has been estimated at 4,000-5,000 tons (Frank Williford).

In addition to additional weight and space needed, a large diameter riser requires tight stationkeeping while drilling. A usual rule of thumb is 5% of water depth for the operating radius. However, operations without the riser are not as severely restricted and can maintain an operating radius of 15-20% of water depth.

The type of well drilled also has a great influence on the casing program. Exploration wells that are not to be completed or tested only require a hole size through the pay zone that can be logged. However, development wells require that the casing through the production zone be large enough in diameter to accommodate the completion. Most deepwater developments require high flow rates to justify the high cost. Production rates in excess of 10,000 b/d are common. Equivalent flow rates are required for gas developments.

Depth constraints

Today, the industry is contemplating drilling in water depths of 10,000 ft on the



Profile of riserless drilling concept

slope and more than one operator is planning on drilling the distal plain beyond the Sigsbee Escarpment in the US Gulf of Mexico at the turn of the century. The water depth there averages 12,000 ft.

However, current equipment cannot take the industry into such depths without changes. There are three problems with existing technology:

- The 21-in. riser cannot be pushed much further.
- Even if the rig could support the riser length, the riser cannot withstand the stresses.
- Well control is marginal at best at maximum water depths now.

So, revisiting some of the earlier concepts proposed to eliminate the riser makes sense today. All too often, sound concepts were not implemented because of limits in technological capabilities at the time.

An example of such limits is horizontal drilling. The technology was first discussed and tried in the 1950s, but was limited by the technology of the time. Now horizontal drilling and completions have radically changed business is conducted. Riserless drilling falls into the same category and the industry needs to revisit the concept.

Various concepts put forth in the past have included the following:

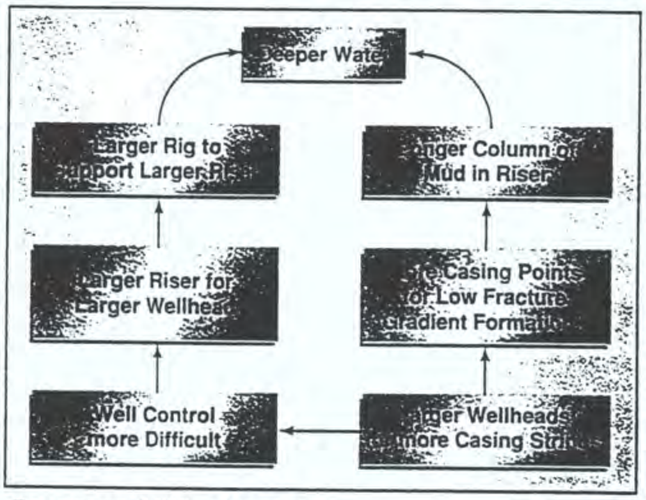
1. Diverting the flow at the sea floor to a return line
2. Gas lifting, mud density reduction, or pumping the drilling riser/return line
3. Isolating the riser from the wellhead and reducing the hydrostatic column within the riser
4. Using a reduced diameter drilling riser.

Drilling systems that use several of these concepts have been proposed. Numerous configurations of the basic concepts can be derived, due to the number of variables or degrees of freedom. The number of concepts is a function of the number of variables (4) raised to that power (superscript 4), which equates to 256 variations. Some will be trivial solutions and others will incorporate several variations.

Riserless experience

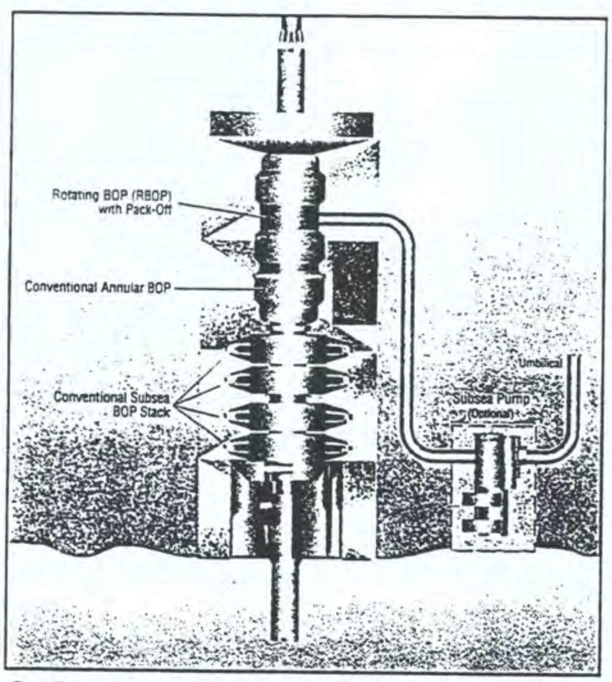
The industry actually has riserless drilling experience, but that experience does not include returning the drilling fluid column back to the rig. Texas A&M operates a drillship in a riserless configuration to obtain deep ocean floor borings and has worked in 17,400 ft water depths and drilled/cased up to 8,200 ft below the mud line. As many as three strings of casing have been run and cemented using a guidlineless re-entry system.

Stationkeeping is limited by contact of the drillpipe with the side of the moonpool and is estimated to be 20% of water depth.



Deepwater drilling dilemma.

Ocean depths of 3,000 ft or less are considered shallow water. Due to the reduction in weight and space, the drill ship operates for several months at a time without re-supply and is self sufficient.



Seafloor detail of riserless configuration.

Riserless drilling offers the capability to drill for hydrocarbons in water depths previously thought impossible. The development of a subsea BOP system capable of accommodating a riserless system would be one of the enabling technologies for drilling in very deep water.

Neil Hudson of Shell International reported it was Shell's position that riserless drilling is justified for water depths in excess of 7,000 ft and that 5th generation drilling rigs will adopt the method.

However, the concept is just as applicable for 2,500 ft water depths for the purposes of weight and space reduction, and elimination of casing points.

Benefits

There are many benefits to drilling without a riser:

- Stationkeeping: Relaxation of the stationkeeping will reduce waiting-on-weather time or a less expensive mooring system could be deployed. In the case of a dynamically positioned rig, this would reduce the incidents of drive off and provide for fewer/smaller thrusters.
- Wider well pattern: In development scenarios, a wide pattern of subsea wells could be drilled with a more flexible mooring system.
- Smaller production structure: The reduction in weight and space would greatly reduce the cost of the floating production structure. Riserless drilling would provide for drilling and workover capability without a large weight and space penalty.
- Rig upgrade: If the weight requirement for drilling in deepwater can be substantially reduced, then smaller semisubmersible drilling rigs can be used. In effect, a third generation rig could be configured to drill in 6,000-ft water depths. This step is important because all of the deepwater drilling rigs are presently in great demand.
- Time and cost: Elimination of casing points will reduce the number of days required to drill the well, in addition to the average $1 million per casing point.
- Alternative fluids: Use of a closed system to support riserless drilling will allow other drilling methods not normally considered in floating operations to be used. They include foam drilling fluids, air drilling, under-balanced drilling, and reverse circulation drilling.
- Circulate out kicks: Another benefit to the use of a return line is the additional system to circulate out gas kicks, which expand rapidly above the blowout preventer (BOP) on the seabed. An 11-in. mud return line

with a surface choke could handle up to 5,000 psi, while the conventional choke and kill lines would be available to handle higher pressures at the seabed.

Conventionally, with a 21-in. marine riser in deepwater, well control consists of "bullheading" an influx back into the formation. No attempt is made to circulate the kick in a normal manner. There is little or no kick tolerance in conventional deepwater drilling because the differential between mud weight and fracture gradient is about 0.3 lb/gallon. With this differential, predictive programs are not utilized since the analysis suggests the well not be drilled.

With a mud return line and surface choke in place, the well can be secured and the expanding gas handled separately from the well systems located on the seafloor. Kicks could be detected by an increase in pressure at the seafloor, minimizing the influx.

Rig upgrading

The current deepwater rig market is extremely tight. Fourth generation semisubmersibles and drillships are all under long term contract. Third and second generation semisubmersibles are being upgraded to extend their water depth capability.

The total number of semisubmersibles available today numbers about 130. The semisubmersible fleet is composed of the following:

4th generation units 14
3rd generation units. 40
2nd generation units. 76

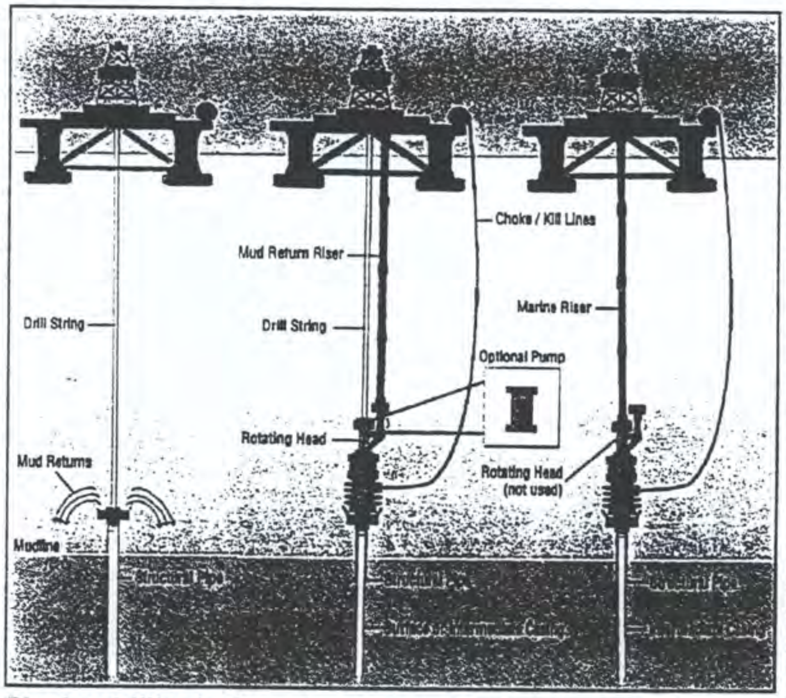
The target group for rig conversion for riserless drilling would be the more numerous second generation rigs. The water depth limit would be determined by the mooring system. At least one deepwater drilling contractor confirms that were it not for the additional weight due to drilling gear, a second generation rig could be moored in 4,000 ft water depths.

The average age of the second generation fleet is 20-25 years, which is close to the projected useful life. This life can be extended another 10-15 years. However, to get the full benefit of a 25-year life, a purpose-built rig, costing around $100 million might make sense.

An evaluation of the prospects for upgrading second and third generation semisubmersibles using small riser or riserless drilling would be necessary. Integral to this review would be modeling hydraulics and well control situations. Technical input from operators, drilling contractors, and manufacturers would be necessary.

Joint industry project

Conoco and The Hydril Company have undertaken to determine if concepts can be progressed to reduce weight and space requirements for semisubmersibles and drillships. A secondary pursuit will be to reduce the casing points required to drill deepwater wells.



Riserless drilling in three phases.

The casing point issue is related to rapid deposition and young sediments (Gulf of Mexico, Brazil, Nigeria) where the industry experiences high pore pressures and low fracture gradients. In other areas (North Sea, West of Shetlands) we experience low pore pressures and high fracture gradients. Therefore, casing points are not the issue, but weight and space for the rig are.

The initial phase will involve evaluating which methods have the best chance of succeeding. The goal is to have a commercial system developed in 3-5 years. The cost of the initial phase is estimated at $250,000-500,000. Bringing a concept to commercial development could conceivably cost $20-30 million. Conoco and Hydril have elected, contigent on additional industry participation, to go ahead with the initial phase and extend an invitation to interested operators and drilling contractors who wish to join in the joint industry project.

The Conoco/Hydril initiative could conceivably study as many as 20 concepts. Included in the concepts will be provisions for staged development, which would provide for an orderly implementation.

Technical objectives

The Conco/Hydril program's objective is to identify the most likely concept of riserless/return line drilling that can be implemented with existing technology. Prior concepts will be analyzed and input will be sought from participants for various system configurations. If required, outside services will be contracted.

Each configuration will be analyzed hydraulically and dynamically. Particular emphasis will be placed on transient conditions. Preliminary loads, forces, and energy requirements will be calculated for each system. From this analysis, a recommendation for the most likely system will be developed. Included will be a proposed workplan, cost estimate, and time schedule for the implementation of design and prototype testing for the system(s) identified as having the best potential for succeeding. Full commercial development would likely cost $20-30 million.

Conoco will offer the following concepts for the program:

1. Selective use of riserless drilling for the range of casing sizes between 20 in. down to 11-3/4 in. Reduction of hydrostatic by means of gas lift, pumping, or glass beads. Fluid returns would be via a return line and the drill string would not be contained within a riser. The return line could either be a dedicated line or the choke line.

2. With the present 21-in. riser, incorporate a subsea rotating head, bypass piping, and control system, and reduce the hydrostatic in the marine riser by use of glass beads. The application goal would be to reduce casing points and tensioning requirements. This would be a partial solution that could be addressed short term. The use of glass beads for underbalanced drilling has been utilized by the Russians.

3. Using a small diameter marine riser (13-5/8 in.), reduce the hydrostatic in the small riser through use of gas lift or glass beads. If enough casing points were eliminated, this smaller riser could be adapted for deepwater exploratory drilling for "throw away" wells, which would allow for a reasonable hole diameter (8-1/2 in.) for evaluation purposes. This system could be used as a staged development of concept.

4. With any sized riser, utilize a rotating head and control system in conjunction with a pump and bypass manifold to reduce the hydrostatic.

5. With a rotating head and subsea controls, examine reverse circulation using both a pressurized system with light mud and heavier mud with internal gas lift inside the drill string. Utilize the kill and choke lines as a means of directing flow to the annulus.

6. Use a subsea buoy to tension a return line, riser, or marine riser.

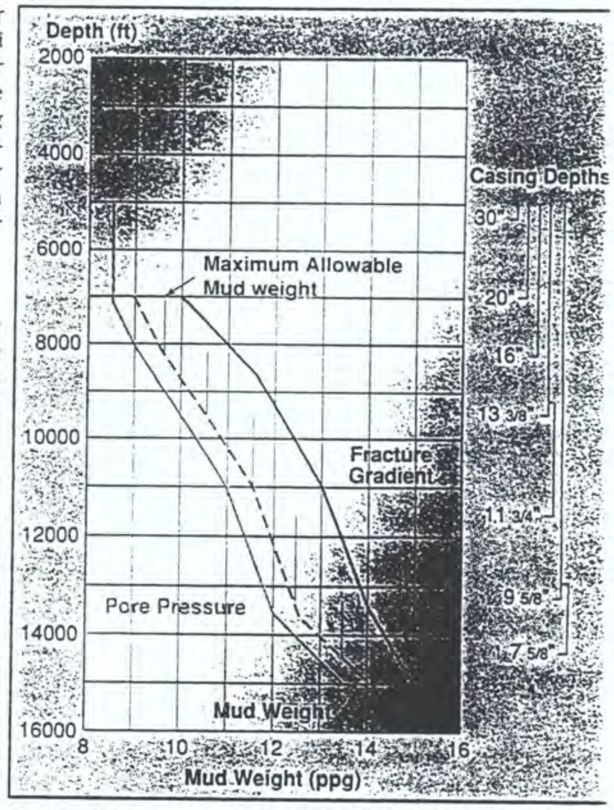
7. A staged development concept would be to isolate the current marine riser with a rotating BOP and reduce the density of the mud column by use of glass beads. Returns would be diverted around the rotating BOP back into the marine riser. The mud would mix with glass beads and carrier fluid (base mud) to lighten the mud column. A subsea choke would be used for well control. A differential pressure of zero psi would be maintained on the rotating BOP during normal drilling operations.

A high capacity centrifugal pump could be used to circulate a mixture of glass beads and clean mud to lighten the column in the marine riser. Separation of the glass beads will be done at the surface by use of settling pits. This would partially solve the problem by reducing the number of casing points and reducing weight, however it would not eliminate the large diameter drilling riser. However, the concept would provide for introducing equipment in stages to the deepwater drilling industry.

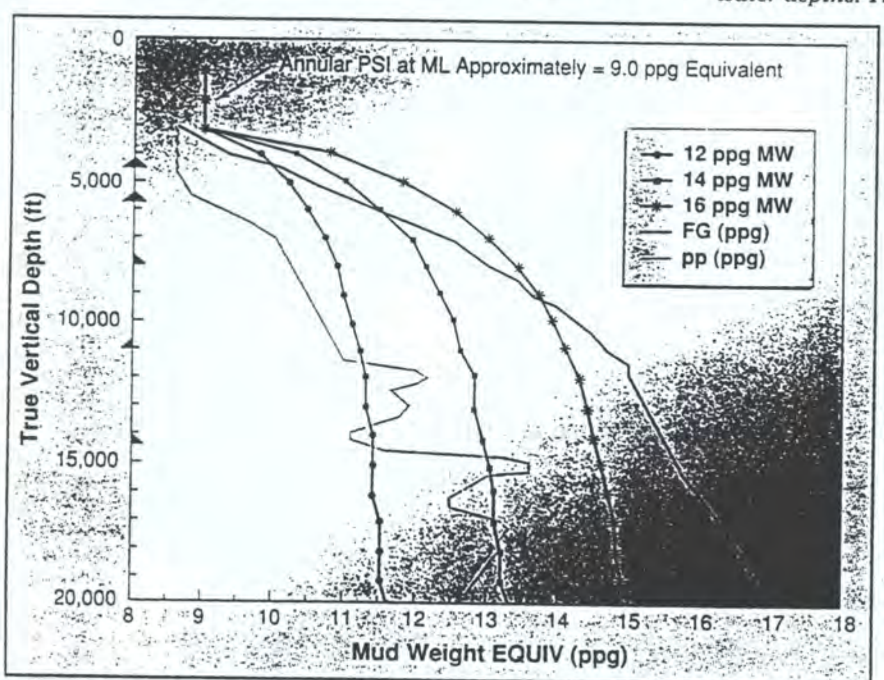
Workplan

The hydraulic behavior should be analyzed for each of the cases considered. Included in the hydraulic analysis would be the input requirements for pump or gas lift as required. Novel fluid density reduction concepts, such as foam, glass beads, and others, would be analyzed as required. The initial work will involve screening the various concepts. More detailed hydraulic work will follow for configurations with the most promise.

The configuration of the equipment will be dynamically analyzed as to practicality for use in floating drilling operations. The emphasis will be on interference between return lines, risers, and exposed drillstrings. Characteristic vessel motion will be included. More detailed dynamic behavior work will follow for configurations with the most promise.



Estimated pore pressures and fracture gradient plots typical of a US Gulf of Mexico well drilled in 5,000 ft water depths. The kick tolerance is 0.5 lb/gallon.



Proposed versus conventional casing points and mud weight equivalents with riserless drilling in 3,000 ft water depths. (ML = mudline) (PP = pore pressure) (FG = fracture gradient) (ppg = lb/gallon) (psi = lb/sq in.)

The design concepts for those configurations with the most promise will be provided. A more detailed hydraulic and dynamic analysis will be performed for those concepts. Conceivably more than one concept could be selected.

The development of a deepwater system to reduce casing points, in conjunction with reducing drilling costs and making more drilling units available for deepwater work are critical to working in depths beyond the 7,000-8,000 ft contour. Without it, development drilling will be enormously expensive and limit the development of discoveries with medium and small reserves.

Further, if the industry is to be able to drill, develop, and produce successfully in water depths beyond 10,000 ft, alternatives to conventional systems will be necessary.Δ

AUTHOR'S NOTE: *Interested participants can contact Allen Gault at Conoco, Drilling Technology, Offshore, 1028, 600 North Dairy Ashford, P. O. Box 2197, Houston TX 77252-2197; Tel: US (713) 293-3338; Fax: US (713) 293-3424.*

20th TEDCOM

LEGS 170 to 176

16 October 1996
to
18 October 1997

LEG 170
COSTA RICA ACCRETIONARY PRISM
SAN DIEGO, C. A. TO BALBOA, PANAMA
16 OCTOBER TO 17 DECEMBER 1996
Co-Chiefs: Gaku Kimura, Eli A. Silver
Costa Rica

Drilling on the Costa Rica margin may provide the first good estimates of the total material and chemical fluxes through a subduction system.

Site CR-1 (4350 m WD):
- Hole A: APC/XCB to 460 m + Adara + 5 WSTP, MDCB 460-500 m in basement, Log.
- Hole B: Drill MWD hole to 500 m.

Site CR-2 (4160 m WD):
- Hole A: APC/XCB to 450 m. + Adara + 5 WSTP.
- Hole B: Drill to 450 m, RCB to 750 m.
- Hole C: Drill LWD hole to 750 m.

Site CR-3 (3320 m WD):
- Hole A: APC/XCB to 500 m. + Adara + 5 WSTP.
- Hole B: Set R/E Cone with 10-3/4" casing to 500 m. RCB to 1400 m.
- Hole C: Drill LWD hole to 1400 m.

Time: 10.1 day transit + 33.6 day drilling +12.3 days logging = 56.0 days

LEG 171A
TRANSIT-LWD
PANAMA TO BARBADOS
17 DECEMBER 1996 TO 8 JANUARY 1997
Co-Chief: J. Casey Moore

Leg 171A will return to the North Barbados Ridge accretionary prism to continue LWD operations.

Sites: 4 (NBR-11A, -5A, -9A, -10A)
Holes: One dedicated LWD hole per site will be drilled
Penetrations: 700, 800, 600, 500 m.
Water Depth: 4894-5052 m.
Time Estimate: 6.3 days transit + 9.7 days Logging While Drilling +2 days logging = 18.0 days

LEG 171B
BLAKE NOSE
BARBADOS TO CHARLESTON
8 JANUARY TO 14 FEBRUARY 1997

Co-Chief: Richard D. Norris, Dick Kroon
Blake Plateau and Blake Nose, Western North Atlantic
Proposal: 462, 462-Rev

Sediments on the Blake Plateau and Blake Nose in the Western North Atlantic offer an ideal record for reconstructing water mass chemistry and circulation in the Cretaceous and early Cenozoic.

Sites: 5 (BN-1, -2alt, -3, -4alt, -5alt)
Holes: 3 APC/XCB holes cored per site
Penetration: 4 sites XCB cored to 450-600 m in sediments
Water Depth: 1215-2586 m
Logs: One hole will be logged at 4 sites.
Time: 7.0 days transit + 24.5 days coring + 4.5 days logging = 36.0 days

<u>LEG 172</u>
<u>NORTHWEST ATLANTIC SEDIMENT DRIFT</u>
<u>CHARLESTON TO LISBON</u>
<u>14 FEBRUARY TO 16 APRIL 1997</u>
Co-Chief: Domenico Rio, L. D. Keigwin

Sites: 10 to 12
Holes: 3 APC/XCB holes per site
Penetration: 150-200 m in sediments
Water Depth: 1205-4760 m
Notes: This could be a high recovery leg; therefore, cores from Leg 171A/B will be offloaded. Gassy core liner safety procedures will be in effect if methane hydrates are detected as expected. Hydrogen sulfide monitoring and precautions will be taken if required.

LEG 173
RETURN TO IBERIA
LISBON TO HALIFAX
16 APRIL TO 16 JUNE 1997

Co-Chiefs: M-Odile Beslier, R. B. Whitmarsh
Proposal: NARM-Add3, 461---, 461-Add, 461-Rev

Leg 173 will investigate the nature of the basement within the Ocean Continent Transition (OCT) to investicate rift-to-drift processes and test aspects of the working models.

Site	WD m	Sediment m	Basement m
Iberia-7A	5150	920	100
Iberia-8A	4830	1050	100
Site 901	4720	600	100

LEG 174A
NEW JERSEY SHELF
HALIFAX TO NEW YORK
16 APRIL TO 16 JUNE 1997

Co-Chiefs: N. Christie-Blick, James Austin, Jr.
Proposal: 348-Rev, 348-Add3, 348

The objective of Leg 174A is to define precisely the ages of depositional sequences and test models of sedimentation and relative sea-level changes on the New Jersey Shelf.

Sites: 4 (MAT-7B, -8B, -9B, -13A/B)
Holes: APC/XCB/RCB coring 812-1106 m in sediment
Water Depth: 75-427 m
Logs: All sites will be logged.

Note: 3 sites are in shallow water (75, 77, 90 m)--shallow water drilling guidelines will apply.

LEG 174B
ENGINEERING
NEW YORK TO LAS PALMAS
16 JUNE TO 19 JULY 1997

Co-Chief: Kier Becker

DSDP Hole 395A has been open for 20 years with downhole flow continuing at a significant rate. The Leg 174B CORK program is intended to determine the variability of downhole flow, pressure and temperature variations in the sealed hole as the natural hydrologic system reestablishes itself. The Leg 174B engineering program will determine the viability of the hammer drill and hammer drill-in casing system.

Leg 174B CORK program (DSDP Hole 395A):
Run 3 logs
CORK installation with pressure sensor and thermistor.

Leg 174B engineering program:
Test new hammer drill.
Test hammer drill-in casing system.
Determine maximum slope spudding capability.

LEG 175
BENGUELA
LAS PALMAS TO CAPE TOWN
19 JULY TO 18 AUGUST 1997
Co-Chiefs: Wolf Berger, Gerold Wefer

The objective of Leg 175 is to determine the history and early evolution of the Benguela Current.

Sites: Northern Angola Basin (NAB), Walvis Ridge (WR), Northern Cape Basin (NCB), and Southern Cape Basin (SCB).
Holes: Triple APC with one hole deepened with the XCB at each site.
Penetration: 400-600 m
Water Depth: 550-3001 m
Logging: standard suite at each site

LEG 176
HOLE 735B
CAPE TOWN TO CAPE TOWN
18 AUGUST TO 18 OCTOBER 1997

Co-Chiefs: Henry Dick, James Natland

Hole 735B was cored to 500 mbsf on Leg 118. A HRB was set on the hole. The rate of penetration was 60 m/day with 100% recovery and no hole problems when operations were terminated. The temperature was 11°C at 500 m; therefore, temperatures are lower than at Hole 504B. Plans are to deepen Hole 735B to 2000 mbsf or until drilling conditions force the hole to be abandoned. Time permitting a second guide base will be set 800 m south and offset hole 735C would be spudded and drilled to 500 mbsf.

Deepen Hole 735B:
Hole: RCB core 500-2000 mbsf
Penetration: Deepen hole from 500 to 2000 mbsf
Water Depth: 700 m
Logs: Run temperature profile before coring.

If time permits--Offset Hole 735C:
Hole: Set Guide Base and RCB core to 500 mbsf
Penetration: 500 mbsf
Water Depth: 700 m
Logs: deferred until next leg

20th TEDCOM

LEGS 164 to 169

31 October 1995
to
17 October 1996

LEG 164
GAS HYDRATES
HALIFAX, NOVA SCOTIA, TO MIAMI, FLORIDA
31 OCTOBER TO 19 DECEMBER 1995

CORING SUMMARY

Sites	Holes	Cores	Cored (m)	Recovered (m)	% Recovered
7	17	344	2785.9	1974.31	70.9

ACCOMPLISHMENTS

1) Leg 164 accomplished all of the major scientific goals.
2) The PCS was run 46 times and averaged 30.6% core recovery. Over 70% of the PCS runs recovered at least 75% of the hydrostatic pressure, and 56% of the runs exceeded 90% of hydrostatic pressure. Push-in and auger-type shoes, new close-catch basket and full-closure pedal core catchers, and redesigned PCS shoes were run for the first time.
3) Extremely gassy clays and whole hydrate were successfully recovered down to and through the bottom simulating reflector (BSR). The gassy cores were handled successfully using special safety precautions and kevlar protective equipment.
4) Cores were taken in an active vent area (chemosynthetic mussel bed) with H_2S concentrations of more than 100 ppm detected inside core liners. A vacutainer sample had up to 50,000 ppm (5%) H_2S. Cores were successfully handled using H_2S safety equipment and were sectioned, drilled, and allowed to degas.
5) The Fisseler Water Sampler (FWS) was used for the first time (five runs). It was developed in an attempt to improve fluid sample recovery by reducing the differential drawdown pressure. The timer and valve system functioned well, but no fluid samples were collected in the very dry, impermeable clays. Attempts to improve sampling with a 140/90/15 micron cascade-filter system and reduced drawdown were unsuccessful.
6) The Davis/Villinger Temperature Probe (DVTP) was used for the first time (four runs). Minor wiring problems were corrected early, and the tool recorded good data with minimal handling requirements and no major mechanical problems. An advantage of the present design is that the tool can be run many times without opening it. A dedicated wireline tool run is required. The DVTP can take good temperture measurements in very stiff clays that are out of reach of the APC.
7) Measurements were made with the geochemical log in the inelastic mode to determine carbon/oxygen ratios for the first time.
8) Leg 164 was devoted to refining understanding of the in situ characteristics of natural gas hydrate. Because of the ephemeral nature of gas hydrate at the surface, emphasis was placed on downhole measurements and sampling strategies that allow in situ conditions of the gas hydrate, formation, and fluids to be reconstructed. Three engineers sailed on Leg 164 to assist in running tools.

LEG 165
CARIBBEAN OCEAN HISTORY
MIAMI, FLORIDA, TO SAN JUAN, PUERTO RICO
19 DECEMBER 1995 TO 17 FEBRUARY 1996

To accomplish the scientific objectives of Leg 165, a series of sites was drilled in the Caribbean Sea and on the margin of the Yucatan Basin.

CORING SUMMARY

Sites	Holes	Cores	Cored (m)	Recovered (m)	% Recovered
5	13	453	4178.4	3358.82	80.4

ACCOMPLISHMENTS

1) The APC had the highest recovery percentage of 105.4% followed by the XCB at 75.7%, and the RCB at 69.1%. The anti-whirl polycrystalline-diamond-compact (PDC) bit used with the RCB coring system significantly outperformed the tungsten-carbide-insert (TCI) roller-cone bit.
2) Sepiolite mud was used predominantly during the leg and was far superior to bentonite in performance.
3) One free fall funnel (FFF) was deployed but could not be reentered. Only a large crater was visible on the sea floor, and there was no sign of the FFF or the glass balls tethered to it. An unsuccessful attempt was made to reenter the hole by spudding into the crater.
4) A full-sized reentry cone with 62 m of 16 in conductor pipe was deployed at Hole 999 (Site S-6). A 14-3/4 in hole was drilled to a depth of 540 mbsf, and 522 m of 11-3/4 in casing was run and cemented. Five reentries were made, requiring about 15 minutes each to position and reenter.
5) The Cretaceous/Tertiary (KT) boundary was recovered three times during the leg at Sites 1000 and 1001. Tektites and shocked quartz were identified in the K/T boundary cores, yielding further evidence of the impact of a major meteor in the Yucatan Basin.
6) The longest section of Cretaceous rocks ever cored was also double-cored during this leg, recovering valuable basement rocks from the Caribbean Plate.
7) Coring was conducted in the territorial waters of five different countries, and four of these countries required that observers be present during drilling operations. To minimize the loss of available scientific berths, several observers were changed during a mid-leg rendezvous in Jamaica.

ODP LEG 166
BAHAMAS
SAN JUAN, PUERTO RICO TO PANAMA CITY, PANAMA
16 FEBRUARY TO 11 APRIL 1996

The primary objective of Leg 166 was to address fundamental questions of synchroneity, amplitude, and rate in global sea level changes by coring a transect of sites on the western margin of the Grand Bahama Bank.

CORING SUMMARY

Sites	Holes	Cores	Cored (m)	Recovered (m)	% Recovered
7	17	572	5254.9	2933.79	55.8

ACCOMPLISHMENTS

1) Seventeen Holes were drilled successfully in shallow water depths ranging from 307.9 to 658.4 m mean sea level using newly issued "Shallow-Water Coring Guidelines".
2) Core recovery was 95.9% with the APC system, 42.2% with the XCB system, and 46.2% with the RCB system.
3) A record 57 Adara and 30 WSTP temperature measurements were taken.
4) Three holes penetrated below 1000 m (1300.0, 1052.7, and 1235.4 mbsf) in the carbonate bank.
5) Deeper holes required back reaming to get out of the hole. One BHA was lost in the 1300.0 m hole (1003C) when the hole collapsed on the conditioning trip for logs.
6) Two RBI C-4 4-cone core bits were run to 115.0 and 114.3 cumulative rotating hours, which testifies to their quality and durability and is probably a record.
7) Schlumberger's Integrated Porosity Lithology Tool (IPLT) was used for the first time.
8) The Schlumberger VSP tool was successfully retrieved twice using the Kinley crimper and cutter because the arm would not close on the VSP.

LEG 167
CALIFORNIA MARGIN
ACAPULCO, MEXICO TO SAN DIEGO, CALIFORNIA
19 APRIL 1996 TO 16 JUNE 1996

Leg 167 was dedicated to sampling upper Neogene sediments (Pliocene and younger), and five of the proposed drill sites would sample middle and lower Miocene sediments.

CORING SUMMARY

Sites	Holes	Cores	Cored (m)	Recovered (m)	% Recovered
13	52	840	7709.5	7501.54	97.3

ACCOMPLISHMENTS

1) A record was set for the most core recovered on a leg- 7501.54 m.
2) A record was set for the most holes drilled on a leg - 52 holes.
3) The 6200 m capacity of the refrigerated core storage unit on the ***JR*** would have been exceeded; therefore, a half-day port call was made to unload some core.
4) After a TV survey of the bottom, coring was conducted 5 nmi outside of a former chemical munitions dumping area at site CA-11E (Hole 1016) and 7 nmi outside of a former explosives dumping area at site CA-8A (Hole 1018).

LEG 168

JUAN DE FUCA HYDROTHERMAL
SAN DIEGO, CALIFORNIA TO VICTORIA, B. C.
16 JUNE 1996 TO 21 AUGUST

Leg 168 was an intensive downhole tools and sea floor installation leg. The installation of four CORK assemblies, conductiing fluid experiments with the TAM packer, and obtaining accurate basement temperatures were primary leg objectives.

CORING SUMMARY

Sites	Holes	Cores	Cored (m)	Recovered (m)	% Recovered
10	19	209	1867.8	1519.65	81.4%

ACCOMPLISHMENTS

1) A record 4 reentry cone deployments with 16" conductor and 10-3/4" surface casing were made.
2) A record 4 CORK installations with thermistor strings were made.
3) Packer slug and flow meter tests were successfully conducted at 3 basement penetration sites.
4) A total of 93 temperature measurements were taken using the Adara APC shoe and Davis-Villinger Temperature Probe (DVTP).
5) The first "pristine" basement fluid samples were recovered with the WSTP.
6) New Simrad/Osprey subsea TV cameras were deployed for the first time.
7) First deployment of Osmotic Samplers (below the thermistor strings).
8) New hydraulic CORK setting go-devil and hydraulic wireline data logger latching tools were used successfully.
9) A liner made of a modified mechanical bit release and junk drill pipe was installed.

LEG 169S
SAANICH INLET
VICTORIA, B. C. TO VICTORIA, B. C.
15 AUGUST TO 21 AUGUST 1996

The objectives of Leg 169S in Saanich Inlet were to obtain an ultra-high-resolution record of Holocene climate, oceanography, marine productivity, ecology, and terrestrial vegetation, establish the frequency of earthquakes on the Cascadia convergent margin, and advance understanding of digenesis in organic-rich sedimentary basins. Sites were located in the axial region of the fjord 2.6 nautical miles (nmi) apart to have different organic content and accumulation rates.

CORING SUMMARY

Sites	Holes	Cores	Cored (m)	Recovered (m)	% Recovered
2	9	72	641.7	657.45	102.5%

ACCOMPLISHMENTS

1) Recovery was nearly 100% in nine holes and ultra-high-resolution records were recovered through overlapping sections.
2) Nine holes were cored successfully in water depths ranging from 212.5 to 237.4 mbrf following the new "Guidelines For Shallow Water Operations".
3) There were numerous curious pleasure boats and water taxis in the area, and the assistance of the Canadian Coast Guard was invaluable in maintaining adequate clearance.
4) A modified low power (193 dB) Datasonics 354M retrievable commandable recall beacon was evaluated in shallow water to determine its' performance. The ship was offset 50 m (9 degrees) to test signal strength for a shallow water drill, and all 4 hydrophones were still effective. The offset warning lights were set at 4% (yellow) and 8% (red) of water depth.

LEG 169
SEDIMENTED RIDGES II
VICTORIA, B. C. TO SAN DIEGO, CA.
21 AUGUST TO 17 OCTOBER 1996

CORING SUMMARY

Sites	Holes	Cores	Cored (m)	Recovered (m)	% Recovered
5	23	363	3266.6	1203.58	36.8%

ACCOMPLISHMENTS

The primary objective of Leg 169 is to investigate the genesis of massive sulfide deposits at sedimented ridges to determine the mechanism of formation, the tectonics of sedimented rifts and controls on fluid flow, sedimentation history and digenesis, and the extent and importance of bacterial activity. A series of holes were planned across the fairly large massive sulfide deposits at Middle Valley (Dead Dog and Bent Hill mounds) and Escanaba Trough, which have different maturity and composition.

1) A Drill-In-Casing was set on Legi 139 in Hole 856H on Bent Hill, and the hole cored to 93.8 m. On Leg 169, the hole was deepened to 500.0 m total depth. This was the first penetration of an oceanic sulfide mound through the massive sulfides, stock work mineralization zone, underlying sediment, basalt sills, and upper pillow basalt section.
2) The first logs were obtained through an oceanic sulfide mound at Hole 856H.
3) CORKs and thermistor strings were removed from Holes 858G (flowing) and 857D (taking water) for the first time using fishing tools. The holes were cleaned out, and new CORKs and thermistor strings (400 and 898 m) were run.
4) Pop Up Pore Pressure Instruments (PUPPIs) were deployed at DD-2 and -3 and recovered. The instruments detected flow into the sea floor.
5) A 9-7/8" RBI CC-7 RCB bit cored 681.2 m in massive sulfides in 38.4 rotating hours, and ran at least 116 hr in hot holes at flowing temperatures above 316°C (temp tabs).
6) Two actively flowing hydrothermal vents were created (Holes 1035H and 1035F).
7) Coring tools and equipment performed well in hydrothermal holes at above rated temperatures. In Hole 1035H, both the regular butyrate (tenite-rated to 150°C) and Ultem (PEI-rated to 200°C) melted or deformed. The quick-release polypak seal at the top of the RCB inner barrel was melted in some runs.

Note: 81 stands of 5 in drill pipe and 127 m of BHA were lost on the sea floor on the trip out after finishing the last hole (Hole 1038I). Only one bail was engaged in the elevator ears when the blocks were picked up, and the elevator tilted up. The bail slipped off the ear and broke off the end of the elevator-ear latch. The elevators flipped up on one side, and the 5" pipe bent and broke 0.7 m below the top of the tool joint.

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JOIDES SITE SURVEY PANEL MEETING

November 11 - 14, 1996
Lamont-Doherty Earth Observatory,
Palisades, New York, USA

Members: Srivastava, Shiri (*GSC Atlantic, Canada*) -- Chair
Casey, Jack (*U. Houston, USA*)
Diebold, John (*L-DEO, USA*)
Enachescu, Michael (*Husky, Canada*)
Flood, Roger (*SUNY, USA*)
Hinz, Karl (*BGR, Germany*)
Lykke-Andersen, Holger (*U. Aarhus, Denmark*)
Peterson, Larry (*RSMAS, USA*)
Sibuet, Jean-Claude (*IFREMER, France*)
Tokuyama, Hidekazu (*ORI, Japan*)

Liaison: Acton, Garry (*ODP/TAMU*)
Ball, Mahlon (*PPSP*)
Ellins, Kathy (*JOIDES Office*)
Quoidbach, Daniel (*ODP Data Bank*) -- Host
Mountain, Greg (*PCOM*) -- Host

Apology: Malfait, Bruce (*NSF*)
Paull, Charles (*U, North Carolina, USA*)
Scrutton, Roger (*U. Edinburgh, UK*)
Toomey, Douglas (*U. Oregon, USA*)

AGENDA

JOIDES Site Survey Panel Meeting
November 11 - 14, 1996
Lamont-Doherty Earth Observatory,
Palisades, New York, USA

1. PRELIMINARY MATTERS (Srivastava)
- 1.1 Introduction of members, liaison, guests and meeting logistics.
- 1.2 Charge and procedures for the meeting
- 1.3 Watchdog assignments
- 1.4 Feedback to proponents
- 1.5 Action items from July 1996 LDEO meeting

2. REPORTS
- 2.1 PCOM (Mountain)
- 2.3 JOIDES (Ellins)
- 2.3 PPSP (Ball)
- 2.4 Data Bank (Quoidbach)
- 2.5 TAMU (Acton)

3. SITE SURVEY IMPLICATIONS OF RECENTLY DRILLED LEGS
- 3.1 Leg 168: Juan de Fuca (Casey/Acton)
- 3.2 Leg 169: Sed. Ridges II (Casey/Acton)

4. SITE SURVEY STATUS OF UPCOMING SCHEDULED LEGS *
- 4.1 Leg 173: Iberia II; 461 (Enachescu)
- 4.2 Leg 174A: New Jersey II; 348 (Flood)
- 4.3 Leg 176: Return to 735B; 300 (Casey)

5. POTENTIAL FUTURE DRILLING: TECP
- 5.1 447: Woodlark Basin (Enachescu) PPSP
- 5.2 431: Western Pacific Seismic Network (Peterson)
- 5.3 450: Taiwan arc-continent collision (Sibuet) PPSP

6. POTENTIAL FUTURE DRILLING: SGPP
- 6.1 452-502: Antarctic Glacial History and Palmer Deep(Lykke-Andersen) PPSP
- 6.2 445: Nankai Trough Accretionary Prism (Diebold) PPSP
- 6.3 367: Great Australian Bight Carbonate (Enachescu) PPSP
- 6.4 LOI-69: Barbados Corking (Srivastava)

7. POTENTIAL FUTURE DRILLING: OHP
- 7.1 464: Southern Ocean Paleoceanography (Flood)
- 7.2 441: SW Pacific Gateway: Paleoceanography (Peterson)
- 7.3 503: Weddel Sea (Hinz) PPSP
- 7.4 485: Southern Gateway-Australia and Antarctic (Casey) PPSP
- 7.5 482: Wilkes Land - Ross Sea, Antarctica: Paleoceanography (Flood) PPSP

8. POTENTIAL FUTURE DRILLING: LITHP
- 8.0 DCS Drilling 735B (Srivastava)
- 8.1 457: Kerguelen Plateau (Tokuyama)
- 8.2 508: Ninety East Ridge Observatory sites (Peterson)
- 8.3 451: Tonga Forearc (Diebold)

8.4 472: Mass Balance: Izu Mariana (Diebold)
8.5 426: Australian Antarctic Discordance: (Sibuet)

9. OTHER BUSINESS

9.1 JOIDES new structure: Meeting schedule and transition year (Srivastava, Ellins)
9.2 SSP meetings for 1997
9.3 Report of SSP subcommittee on Phase IV of ODP (Diebold, Casey)
9.4 Panel Membership (Srivastava)
9.5 Other business - Data requirement of previously drilled Legs in new proposals.
9.6 Suggested Co-Chiefs for future legs from SSP
9.7 Items for PANCH. meeting

* --- For Legs 171A, 171B, 172, 174B, and 175 data sets were approved at previous SSP meetings and no changes have taken place since.

PPSP - items in the proposal of concern to PPSP

Executive Summary

Charge and procedures for the meeting (Srivastava)

The goals for this meeting were to: (1) to evaluate the site survey readiness of proposals in the prospectus for FY98 drilling, including those proposals which were added to the prospectus (i.e. highly ranked) by the thematic panels at their fall meetings; (2) to evaluate the site survey readiness of legs scheduled for drilling; and (3) to assess any site survey issues arising from legs that were drilled since our July meeting. The main customer for the output of this meeting is PCOM, who uses the evaluations resulting from item (1) above as input into designing the drilling schedule for FY'98 at their December meeting.

The discussion during the meeting resulted in SSP making the following recommendation to PCOM, action items and point of consensus.

> **SSP Recommendation to PCOM for the use of GI guns on board JOIDES RESOLUTION: SSP recommends that PCOM should direct JOI to request TAMU to explore the possibility of carrying out an evaluation on the superiority of GI guns over water guns for acquiring seismic data at speeds greater than 5 knots on board Joides Resolution during one of its Legs in the coming year. These guns can be acquired on loan from interested participant(s) on a particular leg where the guns are to be used or from institutions like Lamont or IFREMER who have been using these guns on a regular basis. If such guns can be obtained, appropriate time and funds will need to be budgeted during that particular leg where this evaluation will be carried out.**

Explanatory note:

SSP appreciates the efforts being made by TAMU in procuring a new seismic system for use on board J/R. As part of this development work SSP wondered if TAMU would like to explore the possibility of using GI guns on board J/R during one of the forthcoming legs. We ask that GI guns be assessed because they have been shown to give superior results at many locations, while towed at speeds of upto 10 knots by IFREMER. One of the difficulties with the current J/R water guns is that they need to be towed at speed of about 5 knot to give reasonably good records. Owing to tight time constraints on most Legs, collection of seismic data on approaches to drill sites is, therefore, not possible, or when it is done, takes valuable time away from drilling operation. Our request has the potential to enhance the quality of seismic data collected by J/R, to reduce the time it takes to collect the data, and to provide a source that can be used on a regular basis if so proven without excessive modification to existing hardware on board J/R. We realise that getting superior quality seismic records at any speed is not merely depended on the type of guns used but also depend on many factors like, the ship's noise level, the recording streamer and the weather conditions. Ideally this evaluation should be carried out using not only GI guns but also the 6 channel streamer used by IFREMER where superior quality data have been obtained at speeds of upto 10 knots. The use of such a complete system would involve a lot of preparatory work and perhaps can be left to a later time if the presently proposed evaluation turned out to be negative.

In our opinion Leg 172 (Sediment Drift) provides an ideal opportunity for such a comparison to be made because of the requirement on this leg to acquire a lot of seismic data on approaches to the sites. Furthermore, this data is to be acquired in varying water depths making this evaluation more complete. Also Roger Flood, one of the participants on this Leg and a SSP member, is a very knowledgable worker on seismic systems and would be a valuable asset during the evaluation process. We realise that it does not provide too much time to make necessary preparation for this evaluation to be carried out on Leg 172, and for that reason we would suggest Leg 175 (Benguela Current) as a possible alternative. If this evaluation can not be done on either of these legs then we suggest that it be scheduled for the earliest possible Leg.

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Action item # 1: All watchdog to write to lead proponents of all programs discussed, reporting the sense of SSP discussion and enclosing the relevant section of the minutes. A copy of this letter must be sent to the DB. The leeter can be sent by e-mail.

Action item # 2: Data Bank manager, Dan Quoidbach, to write to the Co-Chiefs of designated legs, reporting the sense of SSP discussion and enclosing the appropriate section of the minutes.

Action Item #3 : Dan Quoidbach to circulate the new forms to all members for comments etc.

Action item #4 : SSP Chair Srivastava to write to PCOM asking for their permission to hold their spring meeting in Japan from April 1 to 4, 1997.

Action item #5 : SSP Chair to write to PCOM advising them of the decision taken by SSP to hold one of their meetings outside North America and asking for their permission to do so.

Action item # 6 : Srivastava to write to PCOM about the extension in Jean-Claude Sibuet's term of appointment with SSP panel.
****

SSP Consensus #1 : All sites for **Leg 173** are completely documented from Site Survey readiness point of view. A comprehensive set of migrated MCS lines, intersecting the approved sites and a recontoured basement map, constructed from interpreted migrated sections, have been submitted to the DB.

SSP Consensus # 2: We request that the positions of all sites for **Leg 174A** that have new coordinates be submitted to the JOIDES office on ODP Site Summary Forms, that shelf sites be prioritized, and that justification be provided for the newly designated slope sites.

SSP Consensus # 3: SSP reiterates that all the required data is now available in order to deepen Site 735B. However, SSP continues to request that the proponents submit a survey map of JOIDES Resolution video tapes to show the distribution of sediments, slopes and potential alternate sites near Site 735B. The proponents have promised to reconstruct the video track from the audio portions of the tape because the original JR track map cannot be located. This is important given the potential of selection of alternate sites if difficulties in deepening 735B are encountered (see PCOM MOTION 95-3-11). Drilling on Leg 169 has clearly demonstrated the usefulness of such maps when locating sites from video tapes. These should be submitted prior to the April, 1997 SSP Meeting. Offset sites proposed for the second Leg were not considered by SSP because the proposal is not ranked.

SSP Consensus # 4 : SSP acknowledges that a complete data package supporting drilling in the **West Woodlark Basin (447-rev3)** now exists in the Data Bank. The reviewed proposal contains four feasible, well-documented sites. Site Survey Readiness Classification: 1A.

SSP Consensus # 5: Data in support of all four western Pacific **seismic network sites (431)** , including preliminary results from a recent survey, were hand carried to our meeting and examined for the first time. These data indicate the potential viability of all four sites for seismometer installation, but vital data types and information are still lacking, and further processing of the recently collected MCS data is required. Proposed sites WP-2, JT-1, and JT-2 are classified as 2A in terms of present site survey readiness, while site WP-1 is currently ranked as 2B in anticipation of further survey efforts in early 1997.

SSP Consensus # 6: As the remaining data requested during the July 1996 meeting have been deposited in the DB, the proposal **450 (Taiwan arc-continent collision)** is rated as ready to be considered for drilling in 1998. A preview of this proposal may be required, if it gets scheduled for drilling in 1998, in view of the possibility of BSR at two of the sites TC2A and TC7A. Suggestion has been made to the proponents for moving one of their sites (TC-6A) 20 km to the north to document the sediments there by drilling into the region which may have been subjected to a large scale gravity sliding. This will not change the scientific objectives of the proposal.

SSP consensus # 7: SSP appreciates the efforts made by the proponents of **Antarctic Peninsula proposal (452-502)** to complete the site survey package, and to clarify questions concerning previously deposited data. High-resolution data for the sites APSHE-13A and -14A are still needed to make the data package complete. Furthermore it is recommended that true-amplitude plots are provided for the APRISE-sites to help the safety evaluation of these sites.

SSP Consensus # 8: The data package for **Nankai Trough (445-Rev2, Add 2)** is very nearly complete. Much of the work needed to bring the package to this stage has been provided by the Data Bank, especially in the form of detailed navigation plots for each site. These plots cannot be completed, however, until digital navigational data is delivered as promised within the coming month. The proposal is now rated 1B.

SSP Consensus # 9: A complete set of site survey data for proposal **367 (Great Australian Bight)** are in the DB. Migrated lines, isochrone maps constructed by interpreting migrated sections and seismic derived velocity information with hole plots including total depth, were reviewed and found adequate. Site survey readiness: 1A.

SSP Consensus # 10: The proposal **(LOI-69)** requires refurbishing of two of the corked sites in this region during 1997 drilling. It does not require any additional site survey data. It is therefore regarded as ready.

SSP Consensus # 11: The data package for proposal **464 (Southern Ocean Paleoceanography)** is nearly complete and is designated 1A. Deepening some of the holes is best done after consideration of the deeper seismic structure; this may involve the proponents working more closely with a seismic stratigrapher. The impact of deepening any holes on overall leg timing also needs to be considered. If any sites are moved or deepened, they will need to be re-evaluated by SSP and will need good velocity control.

SSP Consensus # 12: **SW Pacific Gateway (441)** proponents have submitted a corrected and revised data package which supersedes all previous data submissions and addresses SSP concerns from the last meeting. Their recent addendum (441-ADD2) summarizes plans to drop two sites (SWPAC-3A and -4A) in order to fit the remaining seven into a single leg of drilling. A scheduled (February 1997) site survey cruise aboard the R/V *Tangaroa* will collect additional required survey data at all seven SWPAC sites. Site survey readiness for this program stands at 2B, with the expectation that the upcoming site survey cruise will collect all requisite data and make this program a strong candidate for 1998 drilling.

SSP Consensus # 13: It is almost certain that the site survey requirement for the **Weddell Sea proposal (503)** can be satisfied by the existing data. However, the proponents must supply a large scale track plot of all existing MCS and SCS lines at the proposed sites together with the revised/upgraded version of this proposal so that all the supplied data can be evaluated systematically by SSP. The proponents should keep SSP posted of the plans to acquire additional data at proposed prime and alternate sites.

SSP Consensus # 14. Most of the data for proposal **485 (The Southern Gateways between Australia and Antarctica)** is now submitted to the DB or will be submitted in the next two months. The proponents are strongly encouraged to submit the processed and migrated ARSO Cruise 125 sections and velocity information for all the sites as soon as possible in order to complete the data package before the April 97 SSP meeting. Pertinent data for gas shows at some sites must be assembled if a preview of this proposal is required by the safety panel. A ranking of 1B is assigned to this proposal because a few required items are missing from the data bank, but the data are believed to exist and to be readily available.

SSP Consensus # 15: Not all data necessary for drilling sites in the proposal **482 (Wilkes Land)** is thought to exist, but is expected to be collected during an approved site-survey cruise. Additional data may also be available through JNOC. The proposal is ranked as 3A.

SSP Consensus # 16: A nearly complete data package has been provided in support of proposed drilling in the **Ross Sea (proposal 489)**. Some required items are missing although they are thought to exist. Also needed is a drilling plan that identifies alternate sites should ice conditions not allow some sites to be drilled.

SSP Consensus # 17: Except for a navigation map to be used with the video data for this region no additional site survey data is needed for a **DCS leg** in region of hole 735B.

SSP Consensus # 18: SSP acknowledges the efforts made by the proponents of **Kerguelen Plateau proposal (457)** to acquire additional MCS and other site survey data at most of the proposed sites during the forthcoming cruises. SSP recommends that the proponents should plan to collect seismic data along tracks which will intersect with the existing MCS lines at the proposed sites on the Kerguelen Plateau. Pending on successful completion of planned and scheduled cruises, most of the sites on the Kerguelen Plateau from this proposal should be ready for drilling in 1998. The data quality of the existing data on the Broken Ridge could not be assessed because of the unavailability of data at the time of the meeting. However, efforts should be made to collect additional data at this site. The proposal is ranked as 2B (for sites 3A/6B/7A/12A) and 2C (for sites 2A and 9A).

SSP Consensus # 19: This proposal calls for installation of a broadband ocean seismometer into a borehole drilled into basement on the **Ninety East Ridge (508)**. Plans call for reoccupation of either ODP Site 756 or 757. Since site survey data for these previously drilled sites are already on file with the ODP Data Bank, SSP requires no further evaluation and considers the site survey readiness status to be 1A.

SSP Consensus # 20: The greater part of the required site data for **Tonga Forearc proposal (451)** now resides in the DATA BANK. Since the July meeting, much of the data from the R/V Melville "Boomerang" site survey has been submitted to the data bank, including underway geopotential data, larger-scale reproductions of site-crossing SCS profiles along with swath mapping and sidescan data. Some of the data are still "in the mail," however. Velocity information in the area has been synthesized, and revised drilling time calculations have also been submitted, as have site maps and thermal gradient information. The proponents are to be congratulated for their response to SSP demands. The data package for drilling these sites is very nearly complete, and we await only large scale plots of DCS (dual channel seismics) from the Melville cruise for a few sites, and migrated sections of one older MCS line, currently being prepared under the direction of David Scholl, and this is an enhancement, not a requirement. The proposal is ranked as 1B - as a few items are still missing from the DB but are believed to exist and should be ready by 1997 making this proposal a viable candidate for 1998 drilling.

SSP Consensus # 21: A good data package has been assembled for **Izu-Mariana Convergent Marin proposal (472)**. The package is now complete and the proposal is ready for drilling. If any palaeoceanography objectives are intended, a good quality SCS profile through the BON site must be collected by the JOIDES Resolution.

SSP Consensus # 22: During our July meeting the proposal **426 (Australia Antarctic Discordance)** was judged not to be ready for 1998 drilling because of the poor quality of seismic and 3.5 kHz data collected onboard Melville at most of the proposed sites. On SSP recommendation, the proponents examined existing VEMA data and prepared a data report in which they document presence of sediment pockets in the vicinity of the proposed sites. It seems that four of the sites, sites 1, 13, 14 and 16 can now be considered as drillable sites. This, however, is not enough to meet the objective of this proposal. It was realised at the meeting that some additional seismic data exist in the region of the proposed sites which the proponents are advised to look before planning to collect any additional data in the region. However, in view of the difficulty in imaging the sediments from 3.5 kHz system only in this region, SSP recommends that 3.5 kHz system must be supplemented by single channel seismic system if additional data is to be collected in this region. The uncertainty in consideration of this proposal as a viable candidate for 1998 drilling still remains and the proposal is classed as 2C.

Minutes
JOIDES Site Survey Panel Meeting
November 11 - 14, 1996
Lamont-Doherty Earth Observatory,
Palisades, New York, USA

1. PRELIMINARY MATTERS (Srivastava)

1.1 ***Introduction of members, Liaisons and meeting logistics.***

SSP Chair Srivastava welcomed all those present, especially the old TAMU liaison member Gary Acton, who after an absence of a few of SSP meetings, was able to join the panel again.Dan Quoidbach, the host for this meeting, welcomed the members, outlined the logistics and provided information about the various facilities at LDEO which members needed to use during the meeting.He was followed by Greg Mountain who outlined some of the social activity he was able to organise for the panel during the meeting. The minutes of July 96 meeting and the agenda for this meeting were approved unanimously. Suggestions were made on the ways of reducing the size of the minutes of the meeting. As the meeting was spread over four days, the first day was devoted to examination of data by the panel members.

1.2 Charge and procedures for the meeting (Srivastava)

The goals for this meeting were to: (1) to evaluate the site survey readiness of proposals in the prospectus for FY98 drilling, including those proposals which were added to the prospectus (i.e. highly ranked) by the thematic panels at their fall meetings; (2) to evaluate the site survey readiness of legs scheduled for drilling; and (3) to assess any site survey issues arising from legs that were drilled since our July meeting. The main customer for the output of this meeting is PCOM, who uses the evaluations resulting from item (1) above as input into designing the drilling schedule for FY'98 at their December meeting.

1.3 Watchdog assignments

The new watchdog assignments as listed in the Appendix A for this meeting were discussed and agreed upon.

1.4 Feedback to proponents

SSP Chair Srivastava stressed the need for the panel members to send their watchdog letters to the lead proponents as soon as preliminary minutes have been sent to the members for corrections and comments. Appendix B gives a list of things to be include in the letter.

Action item # 1: All watchdog to write to lead proponents of all programs discussed, reporting the sense of SSP discussion and enclosing the relevant section of the minutes. A copy of this letter must be sent to the DB. The leeter can be sent by e-mail.

Action item # 2: Data Bank manager, Dan Quoidbach, to write to the Co-Chiefs of designated legs, reporting the sense of SSP discussion and enclosing the appropriate section of the minutes.

1.5 Action items from July 1996 Lamont meeting

All action items were taken care of by those responsible. Action item where TAMU was involved are described in TAMU's report.

2. REPORTS

2.1 PCOM (Mountain)

PCOM met last in Townsville, Australia Aug. 19-22. Malfait reported that the ODP Council requests a final science management plan and a 5-yr science and budget plan by Feb. 97 . The planners ought to anticipate flat funding through 98, then modest annual increases; new funds will have to be found for the JR refit in 98/99.

Falvey reported on new and anticipated memberships: KIGAM has signed on as a 1/12 member in the CanAus consortium; the status of the Taiwan Universities is unresolved; China is discussing plans to enter as a 1/6 member. RFPs for the Wireline Services and Data Bank contracts in post-98 are being prepared. Both will seek to incorporate innovative technologies and computer-based database handling capabilities. JOI and JAMSTEC have, in principle, agreed upon an international management structure of the new post-98 program. JOI is taking over the responsibility of the Co-Chiefs' annual review, and is also heading an ad hoc curation policy review.

Goldberg reported on the successful deployment of a new triple tool combination on legs 167 and 168. Log data were transmitted ashore, fully processed, and sent back to the ship before the end of leg 167. In the future, a similar system of log and core data will be put in place permanently. CLIP splicer is now tested and running; the SLIP module is still in test mode. Downhole magnetic susceptibility, density and natural gamma ray measurements are approaching the vertical resolution of shipboard lab measurements. The archiving of old log data is on schedule; the user interface and data handling capabilities of raw log data retrieval is complete; WLS programmers are working on the same with TRACOR for processed data, assuring smooth interface with the Oracle-based system under development at TAMU.

Mix reported on his July presentation to ExCom and the ODP Council. He received approval of the general science management structure prepared by PCOM and its sub-committee; ExCom endorsed the thematic balance in the SciCom design; PCOM was tasked with developing mandates for the various science advisory panels; ExCom agreed that the exact membership of the PPG's should not be fixed, but that all member countries had a right to representation; and 1/97 was set as the time for beginning the new structure. OpCom will be a sub-committee of SciCom; it will be chaired by the SciCom chair, contain several members of the latter, and will not be bound by a formula of international representation. Distribution of expertize will be the most important criteria for member selection. ExCom expanded beyond the PCOM sub-committee descriptions the role of the SSEP's. Not just review- these panels will advise SciCom on developing themes and will aid proponents not affiliated with a PPG.

PCOM chose to include proposal 79 (Somali Basin) when discussing potential proposals for the prospectus; it had inadvertently been omitted from the list of active proposals. Though not ranked by the thematic panels, Somali Basin drilling has a history of SGPP support, and addresses long-sought aspects of Tethyan history. From an engineering standpoint, Francis commented that as a location for deep drilling, this was preferred over others on active margins.

Ellins reviewed SSP's data readiness table. She noted that proposal 426 (Antarctic-Australia Discordance) did not get the required survey data that was hoped for; perhaps the JR could do the necessary search for suitable sediment cover. The Red Sea Deeps (481) data package is still in disarray; all reasonable efforts at getting clearance for drilling have been exhausted, and regrettably the proponents and the program are running out of hope for being able to drill this region. The SSP criteria of data readiness were reviewed and it was decided that proposals ranked as 2A, 1B or 1A would be automatically in the prospectus; others would be considered one at a time.

The prospectus was determined after much discussion to include 15 proposals spanning a very wide region. Despite the fact that none of the Antostrat-generated proposals had yet been ranked by thematic panels, PCOM chose to include them in the expectation that fall panel meetings would narrow the field. This large prospectus was not perceived as an especially large burden for SSP because many of the proposals under consideration were fairly well prepared already; furthermore, PCOM was willing to task additional help to the fall SSP meeting at the request of the SSP chair, if needed.

In response to NSF's request, PCOM members broke up into 5 groups to begin work on text outlining 5-yr science plans. These were to include the science themes, likely outcomes at the end of 5 years, technological requirements, and links to other programs. The themes are climate change, sea level change, sediments-fluids-bacteria as agents of change, the transfer of heat and materials, and deformation. Several PCOM members expressed concern at the lack of sediment process studies plus, no monitoring of ridge processes.

Falvey reviewed the status of the publications issue. After much discussion and polarized opinions, PCOM passed a motion to end the hard-bound issue of Scientific Results with leg 168; instead, a CD-ROM and website postings will be distributed 48-months postcruise to include all material formerly in the SR vol., as well as now to include reprints from outside publications. The IR vol. will be maintained in an abbreviated format - barrel sheets and core photos will be published on a CD-ROM and via the web. The remaining shipboard hole summaries, processed logs, and introductory chapter will comprise a less-expensive, more quickly distributed IR. Annual review of this arrangement will be led by JOI; when cost-effective and when at no risk to losing either readership or archiving stability, ways will be sought to move the IR to entirely electronic distribution.

JAMSTEC representatives discussed plans for a meeting in fall '96 to provide design engineers understanding of drilling environments to be encountered with the OD21 vessel. Plans were discussed for an international meeting on OD21 science; nominations for the steering committee and a tentative schedule leading to a Sept 97 meeting were discussed.

2.3 JOIDES (Ellins)

1. The JOIDES Office moved from Cardiff to WHOI on October 1, 1996. The new PCOM Chair is Susan Humphris. Maria Mutti (ESF) is the international liaison, Kathy Ellins is the Science Coordinator, and Shirley Wascilevecs is the Staff Assistant. The following contact information was provided: Email : JOIDES@WHOI.EDU; Office telephone: 508-289-3481; Kathy's telephone: 508-289-3440; Kathy's personal email: kellins@WHOI.edu

2. Maria Mutti attended OHP and SGPP in the Fall. Kathy Ellins attended LITHP in Japan and also visited ORI and JAMSTEC.

3. At the end of October, Susan Humphris attended the JAMSTEC Science and Engineering Workshop on Riser Drilling. Paired presentations were made on model holes in different environmental settings by JOIDES and Japanese participants. JAMSTEC has indicated that when the OD21 Riser Ship is completed in 2003, it will not be immediately available to the international community. JAMSTEC believes that since the ship and technology are untested, it will be necessary to keep the ship in the vicinity of Japan to facilitate any maintenance or

development work that is required. The ship may be available to the wider community after about two years of testing. JAMSTEC has also indicated that design of a riser that can function in 4000 m water depth will not begin until about 2005. Development will follow between 2008 and 2012. Operation of such a system is not expected before 2012.. During the design and development phase, JAMSTEC will continue to evaluate new technologies for deep ocean drilling that may become available.

4. Susan Humphris also attended the first CONCORD Steering Committee meeting. CONCORD is the Conference on Riser Drilling to be held in July of 1997 (exact dates uncertain, but it is likely to be mid-July) in either Hawaii or Japan. Approximately 100 scientists will be invited to attend. This conference will be jointly sponsored by JOIDES and Japan. Thus, there are two co-chairs for the steering committee: Ikuo Kushiro and Hans Christian Larsen.

5. Susan Humphris has just returned from a UK ODP symposium in the UK.

6. A subcommittee of PCOM, DMP, SMP, and IHP have just met in order to develop mandates for the proposed Measurement Panel (MP). These will be presented to PCOM for their consideration in December.

7. Kathy Ellins attended the September USSAC meeting at WHOI. USSAC, in response to a request from NSF, will produce a position paper on the type of science that the US marine science community wants using a riser system. This is required by late March. ODP -NSF will use this document as a key component when they go before the NFS Board to request a ramp-up in funding for ODP, as the program is slated to end in 5 years.

8. Dan Quoidbach met with the JOIDES Office staff in late October regarding the joint development of a database. The JOIDES Office will continue to use 4th Dimension as their database management application. As a first step, the SSDB will be set up as a client user of 4th Dimension and provided with remote access to the JOIDES database.

2.3 PPSP (Ball)

Mahlon Ball reported that at its September 19-20, 1996 meeting, the Safety Panel conducted reviews through Leg 176 (Return to 735B). Some difficulties were experienced in approving all sites in the Angola Basin part of Leg 175 (Benguela Current). Review of Angola Basin sites will therefore be completed at a PPSP meeting tentatively scheduled for February 20-21, 1997. The safety panel feels that reasonably safe sites, to penetration depths of 100 m, could be chosen based on data presented at its September meeting. Additional information concerning hydrocarbon occurrences in this heavily explored and produced oil province are necessary to choose sites with penetration depths greater than 100 m.

PPSP asks for assistance from SSP in advising drilling proponents of the need for information concerning hydrocarbon occurrences in and adjacent to proposed drilling areas. Ideally , this advice should be given at the initial SSP watchdog's contact with drilling proponents. Locations of commercial wells, ODP-DSDP holes, shows in shallow cores and slopes should be included on maps showing the proponents seismic networks and proposed sites. These data will be required by PPSP AT PREVIEWS OF HIGHLY RANKED PROPOSALS. Early proponent awareness of the need for oil and gas information accompanying successful drilling proposals will facilitate subsequent safety considerations.

2.4 Data Bank (Quoidbach)

Since the last meeting the Data Bank has received 475 data items for active proposals, prepared operations data packages for Legs 169S, 169, and 170, and distributed PPSP reports for Legs 174A, 175, and 176. Dan Quoidbach represented Data Bank at the September PPSP meeting in College Station.

In August the Data Bank staff attended the class in project management hosted by the Borehole research group at LDEO. The Data Bank is looking to use project management principals to help organize the data base upgrade and web development projects, as well as to help systematize recurring data bank activities.

The Data Bank is upgrading its computer systems to standardize on Power Macintosh computers and recent late versions of system and application software. A large format inkjet plotter has been purchased to allow in-house production of colour maps and graphics. A colour flatbed scanner for digitizing colour graphics has been purchased as well.

Quoidbach met with Kathy Ellins at the JOIDES Office to discuss collaboration on database development. It was concluded that 1) the JOIDES Office should continue to use 4th Dimension as their database system, 2) in order to stay with 4th Dimension, a consultant should be hired to clean up, write documentation for, and enhance the existing database, 3) the Data Bank should obtain a client license to the JOIDES 4D server, which will allow them to access the JOIDES Office database over the Internet, 4) a better Data Bank database needs to be built, possibly in 4D, but perhaps using another product, and 5) the staff who use 4D should receive training so that they can utilize it fully, as well as enhance, maintain and document changes to the database.

The RFP for Data Bank services has not yet been published. JOI indicates that it will probably be issued by the end of the week.

Quoidbach will attend the Co-chief review to be held at JOI November 20-22. Co-chief input on operations packages and site survey requirements will be solicited.

2.5 TAMU (Acton)

1. ODP/TAMU Reorganization:

The ODP director (Jeff Fox) initiated the reorganization to (I) address budgetary constraints imposed by a continuing flat budget, (ii) foster project management within ODP/TAMU, (iii) enhance communication between departments and eliminate redundancies, (iv) streamline activities, and (v) improve services to the community. The reorganization plan has been drafted by Jeff Fox and Jack Baldauf and submitted to TAMU for approval. Details of the plan will be released between 15 November and early December.

2. ODP/TAMU 5-Year Budget

The 5-Year Budget Plan, requested by JOI and NSF, is complete, but may need to be revised based on the reorganization within ODP/TAMU. The plan attempts to estimate the budget for the Science Operator for the next 5 years in light of the Science LRP, expected Special Operating Expenses (SOEs), and the projection of a continuing flat budget for the program overall.

3. ODP Publications

A new publication policy is in effect as of September. The main changes are (I) starting with the Leg 169 Initial Reports (IR) volume, prime data (core descriptions, photos, thin-section and smear slide descriptions) will be moved to CDS, (ii) starting with Leg 176, the entire IR will be

produced electronically (WWW and CD) pending approval, (iii) beginning with Leg 160, scientists can publish in outside literature at 12 months post-cruise, (iv) starting with the Scientific Results (SR) volume for Leg 169, only a CD and WWW version of the SR will be produced pending approval, and (v) beginning with Leg 164, the manuscript submission deadlines for the SR are:
Initial submission, specialty papers: 28 months post-cruise
Revised submission, specialty papers: 33.5 months post-cruise
Initial submission, synthesis papers: 34.5 months post-cruise
Revised submission, synthesis papers: 39 months post-cruise
Volume Publication deadline: 48 months post-cruise

The new publication policy can be found at: http://www-odp.tamu.edu/publications/PUBPOL.HTML

4. JANUS update

Coding and testing of several units (User Group [UG] 1 applications: corelog, operations, curation, sampling; UG 2a applications: MST and logging; and UG 2b applications: palaeontology) have been completed by programmers, but not by scientists. Other units to be completed before Leg 171B include colour reflectance & palaeomagnetic (UG 2a); physical properties, which includes moisture density, thermal conductivity, sonic velocity, shear strength, ADARA, and WSTP (UG 3); and chemistry (UG 4a).

Several units, including Underway Geophysics and Seismics, will not be completed in Phase I. Funding for Phase II is still pending.

Janus will be deployed on Leg 171B (9 Jan -14 Feb, 1997), with two TRACOR programmers on board. Further testing and acceptance will take place during Leg 172. Warranty support for Janus continues from mid-April until mid-July 1997.

5. WWW

Access is continuing to expand. The following are available
(a) Leg 172 Scientific Prospectus + Leg 168 Preliminary Report
(b) New HOMEPAGE design (Testing Phase/Release Within A Week)
© New Staffing Application Form
(d) The Drilling/Coring Time Estimator
http://www-odp.tamu.edu/dsd/drillest.html
(e) New Downhole Measurements Lab homepage
http://www-odp.tamu.edu/techlog/downhole
(f) A new publication search engine
http://www-odp.tamu.edu/publications/search_3k.html
(g) Abstracts for SR volumes (Leg 149 & 150 completed)

6. dGPS Report

At SSP requests, PCOM examined the need for differential GPS (dGPS) on the Joides Resolution at their August 96 meeting. ODP/TAMU was to report on the status and options. Randy Current and others put together a summary that was presented by Tim Francis at this meeting.

While there are several regional dGPS services in operation, only two are available for global coastal coverage. The current service to which ODP subscribes is Omnistar, which works around the continental USA. The two systems with global coastal coverage (Fugro Starfix and Racal Survey Skyfix) have small additional equipment costs, but both have annual subscription fees of ~\$50,000. They are accurate to 1-2 m (95% probability) within 1000 km from a ground station, ~3 m within 2000 km, and ~5 m within 4000 km.

P-code receivers or some combination of GPS+Glonass receivers have been considered as alternatives. P-code is not available to the Joides Resolution because it is not a USA flag ship.

The GPS+Glonass offers ~30 m accuracy from a 1-minute sample, versus 100 m accuracy for GPS with selective availability turned on. Over several hours, both systems have accuracies better than 10 m, which is about the uncertainty in the position of the end of the drill string. The cost of the GPS+Glonass receivers is between $10,000 to $20,000.

From Tim's notes, the assessment was that the current system provides position with an accuracy that has never adversely impacted a leg. Leg 168 and 169 both took advantage of the Omnistar dGPS system to which ODP currently subscribes. This system will also be available for Leg 174A. No other scheduled leg appears to require positioning more accurate than what the Joides Resolution already provides, and thus the extra cost to get the system is not warranted for now. If we were to buy a global system, the GPS+Glonass receivers would probably be the best solution. The outcome was that no recommendation was made to purchase additional positioning instruments or services for now.

It was agreed by the panel that the watchdogs will be required to flag those proposal where dGPS would be required if the proposal get to the drilling stage so that suitable measure could be taken by TAMU in ensuring the use of such system on board J/R.

8. <u>Diamond Coring System (DCS)</u>

Several changes in direction have occurred over the past two months. Most recent changes were discussed at the TEDCOM meeting in Japan (Nov 96). The main concerns are with reducing heave. Two methods are being investigated: (i) Low Friction Seals (LFS): These could potentially reduce heave from 5000-8000 lbs to around 2000 lbs. Installation depends on roughness of the surface finish on the inside of the primary heave compensator cylinders. The options are: (a) No LFS possible owing to very rough surface finish, (b) Surface finish slightly rough, seal installed that will moderately reduce heave, (c) Surface finish smooth, highest quality seal install with maximum reduction in heave. If the heave is reduced, overall core recovery should improve. The surface finish will be measured at the Leg 172 portcall in Charleston and seals will be installed if possible.

(ii) Active heave compensation (AHC): A system has been developed by RETSCO that actively monitors the motion of the ship and attempts to compensate to keep the weight on the bit constant.

Possibly both systems together could reduce heave to a level at which the DCS could be used (less than about 500 lbs of heave). More likely the secondary heave compensator will need to continue to be developed. The addition of the low friction seals and the AHC should, however, improve the performance of the primary heave compensator and thereby improve the coring performance of all types of ODP coring. The question of using DCS system on an engineering leg were discussed and are described in section 8.0.

9. <u>Hammer Drill</u>

The current hard rock base design is not optimum for establishing boreholes in fractured hard rock environments with moderate slopes, especially on thinly sedimented slopes covered with debris or rubble. ODP Engineering department is investigating new hardware and techniques for establishing a borehole in these environments in order to meet the scientific objectives of hard rock legs.

Hammer drill-in casing system has the most promise of dramatically increasing the ability to establish a borehole in a hard rock environment. There are 5 basic components to a hammer-in casing system: a drill bit, a percussion-driven hammer at the bit, a casing string, a second hammer above the casing, and the drill string. The hard rock hammer punches a hole while the upper hammer widens it for insertion of a casing string with a reentry funnel guide. No core is recovered with this system.

Tests conducted in August 1996 in Australia indicated that the hammer drill was capable of spudding into hard rocks (granite) with slopes up to 45 degrees. Casing (7" diameter) was installed in one test to a depth of 21 m.

PCOM recommended JOI's approval of adding $400,000 to the project to meet hydraulic hammer development costs with SDS Digger Tools, the company developing the tool. Negotiations are underway with SDS Digger for design of a larger hammer compatible with 16" diameter casing. A 13 3/8" diameter casing for a 12 1/4" hammer exists and may be used on Leg 174B (CORK/Engineering).

10. Paleomagnetism Lab

New LabView software was written for cryogenic magnetometer. The graphic user interface is a significant improvement over past software. Measurement accuracy and precision on new magnetometer was assessed during San Diego portcall. The magnetometer has twice the along-core resolution of the older magnetometer. The magnetic moments of standards measured on the new magnetometer and on the long-core magnetometer in the paleomagnetism lab at Scripps were indistinguishable. A new D-Tech AF demagnetizer has been order to replace a faulty GSD-1 unit.

11. Split-Core MST (GEOTECH instrument)

This instrument was purchased and is being used on Leg 170, after which it will be returned to shore for further development. The split-core MST will be available for use in the repository during sample parties and on the ship, if requested.

12. Underway Geophysics Lab

The new 6-channel streamers were tested on Leg 169. No problems were encountered during data collection. Data have been returned to shore for assessment of quality. A direct comparison to single channel streamers planned for Leg 170 if co-chiefs/time permit.

The Solaris upgrade will be delayed until ODP receives a working version of Analog-to-Digital data acquisition software from SOEST. An ODP student programmer is debugging the current version.

Four new Chart Recorders (EPC/Analog) arrived at ODP/TAMU. A statement of work is being written for Pelagos to develop automated location/time/leg-ID annotation.

13. Outcome of one of SSP's recommendations.

Leg 172 has intersecting seismic lines planned over all sites. Prospectus is now on the WWW at the URL:

http://www-odp.tamu.edu/publications/SCIPROSP.HTML

Subsequent to TAMU's report of activity some discussion took place on the adequacy of present seismic system on board J/R. The general consensus was that even though the present system does produce seismic records which on the whole are satisfactory that TAMU should be thinking of collecting such data at higher speeds and therefore, perhaps in acquiring GI guns which seems to have proven better for such jobs. This resulted in formulating the following recommendation to PCOM.

SSP Recommendation to PCOM for the use of GI guns on board JOIDES RESOLUTION: SSP recommends that PCOM should direct JOI to request TAMU to explore the possibility of carrying out an evaluation on the superiority of GI

guns over water guns for acquiring seismic data at speeds greater than 5 knots on board Joides Resolution during one of its Legs in the coming year. These guns can be acquired on loan from interested participant(s) on a particular leg where the guns are to be used or from institutions like Lamont or IFREMER who have been using these guns on a regular basis. If such guns can be obtained, appropriate time and funds will need to be budgeted during that particular leg where this evaluation will be carried out.

Explanatory note:

SSP appreciates the efforts being made by TAMU in procuring a new seismic system for use on board J/R. As part of this development work SSP wondered if TAMU would like to explore the possibility of using GI guns on board J/R during one of the forthcoming legs. We ask that GI guns be assessed because they have been shown to give superior results at many locations, while towed at speeds of upto 10 knots by IFREMER. One of the difficulties with the current J/R water guns is that they need to be towed at speed of about 5 knot to give reasonably good records. Owing to tight time constraints on most Legs, collection of seismic data on approaches to drill sites is, therefore, not possible, or when it is done, takes valuable time away from drilling operation. Our request has the potential to enhance the quality of seismic data collected by J/R, to reduce the time it takes to collect the data, and to provide a source that can be used on a regular basis if so proven without excessive modification to existing hardware on board J/R. We realise that getting superior quality seismic records at any speed is not merely depended on the type of guns used but also depend on many factors like, the ship's noise level, the recording streamer and the weather conditions. Ideally this evaluation should be carried out using not only GI guns but also the 6 channel streamer used by IFREMER where superior quality data have been obtained at speeds of upto 10 knots. The use of such a complete system would involve a lot of preparatory work and perhaps can be left to a later time if the presently proposed evaluation turned out to be negative.

In our opinion Leg 172 (Sediment Drift) provides an ideal opportunity for such a comparison to be made because of the requirement on this leg to acquire a lot of seismic data on approaches to the sites. Furthermore, this data is to be acquired in varying water depths making this evaluation more complete. Also Roger Flood, one of the participants on this Leg and a SSP member, is a very knowledgable worker on seismic systems and would be a valuable asset during the evaluation process. We realise that it does not provide too much time to make necessary preparation for this evaluation to be carried out on Leg 172, and for that reason we would suggest Leg 175 (Benguela Current) as a possible alternative. If this evaluation can not be done on either of these legs then we suggest that it be scheduled for the earliest possible Leg.

3. SITE SURVEY IMPLICATIONS OF RECENTLY DRILLED LEGS

3.1 Leg 168: Juan de Fuca (Casey/Acton)

Leg 168 had no problems with site survey data package as they did not have to use it. Co-chiefs had brought copies of their own seismic lines.

3.2 Leg 169: Sed. Ridges II (Casey/Acton)

Leg 169 data package was adequate, but used very little during the leg. The place it was used was in selecting a site along an existing SCS line ~500 m away from the proposed site. The change in position resulted from a MCS line collected roughly 1 month prior to the cruise, which showed a fault at the proposed site. The main data used were dGPS positions, which were based on prior coordinates from drill sites and from submersible dives. *Video from submersible dives were extremely valuable for locating sites in sulfide mounds, but would not have been as valuable without having a scientist who collected the data onboard.*

4. SITE SURVEY STATUS OF UPCOMING SCHEDULED LEGS *

4.1 Leg 173: Iberia II; 461 (Enachescu)

Watchdog: Enachescu/Quoidbach

SSP Proponent: Sibuet was a participant on a past site survey cruise.

Target Type(s): B (Passive margin)

SSP acknowledges that a complete set of required data now exists for this leg. The new items received in the DB since our last July meeting are: post-stack and one pre-stack migration of part of line CAM 144 across the recently designated alternate site 08B, paper displays for all MCS migrated lines collected during the last Discovery cruise and a revised depth-to-basement map. From the inspection of data we conclude that there are no problems with the placement of the altered site Iberia 08B on the CAM 144 migrated section. *Site readiness ranking 1A.*

SSP Consensus #1 : All sites for Leg 173 are completely documented from Site Survey readiness point of view. A comprehensive set of migrated MCS lines, intersecting the approved sites and a recontoured basement map, constructed from interpreted migrated sections, have been submitted to the DB.

4.2 Leg 174A: New Jersey II; (348)

SSP Watchdog: Flood/Quoidbach

SSP Proponent: PCOM liaison Mountain

Target Type(s): All sites A (paleoenvironment)

SSP received no communications from the proponents or Co-Chiefs since our July meeting; however, a safety package was presented to PPSP and discussed at their September, 1996, meeting. PPSP approved all sites after requesting one site, MAT-13B-2, be moved to shot point 1650 (now MAT-13B-3). Following the PPSP meeting, the ODP-TAMU safety committee disallowed the shallowest proposed site (MAT-7B) on the basis of water depth (65-67 m). This is the first drilling proposal to have completed the shallow-water drilling site survey requirements, resulting in two approved shallow-water areas (MAT-8B at 88 m and MAT-9B at 98 m).

The Co-Chiefs designated three potential sites in each area. These three sites, designated by appending -1, -2, or -3, need now to be prioritized as a drilling program is developed. Also, we note that the document prepared for PPSP uses MAT-13B to designate two distinctly different sites. To avoid confusion, we suggest that the initial MAT-13B (as described on data sheets submitted Nov. 1, 1995) be designated MAT-13B-1, and that the more recently proposed site and the approved sites be distinguished as -2 and -3.

In preparation for the PPSP, the Co-Chiefs also proposed two additional sites (MAT-13C and MAT-13D) along high-quality lines already in the Data Bank in order to have acceptable backup sites should weather conditions make shallow-water drilling impossible. However, no discussion has been provided supporting the location or detailed objectives of MAT-13B-3, MAT-13C and MAT-13D. These sites would meet some of the objectives of Proposal 476 (Hudson Apron).

SSP Consensus # 2: We request that the positions of all sites for Leg 174A that have new coordinates be submitted to the JOIDES office on ODP Site Summary Forms, that shelf sites be prioritized, and that justification be provided for the newly designated slope sites.

4.3 Leg 176: Return to 735B: (300)

SSP Watchdog: Casey/Quoidbach

SSP Proponent: none

Target Type(s): Bare Rock Drilling

This is a two Leg proposal to: 1) deepen Hole 735B and 2) drill five offset holes along a transect across the wave-cut platform in order to penetrate gabbros and possibly peridotites. Alternate back-up sites SWIR 5 and 6 have also been selected for the second Leg. The first Leg is now scheduled as Leg 176. SSP considered only the scheduled Leg 176 to deepen Hole 735B.

The priorities for drilling on Leg 176 were defined by PCOM consensus at the Annual Meeting.

SSP regards the first Leg to deepen 735B as having all the required data, but had asked the proponents to submit a reconstructed video survey map of the JOIDES Resolution video tape with navigation. Two unedited tapes have now been deposited in the data bank. We were informed by the proponents that the original track plots for the video survey cannot be located at ODP, but that the XY positions relative to hole 735B can be located by depths and positions called out and recorded on the tapes.

At a minimum, however, the video data confirms the suggestion that there are abundant low slope outcrops along the wave cut platform that could be used for an alternate HRGB and the proponents believe that these points along the video survey can be located using the audio on the tape. The proponents will submit a track map reconstructed from the audio tapes with a descriptions of the video.

Recent site survey proposals have not yet been funded, but these are regarded as critical prior to the second Leg for HRGB offset drilling sites as the bottom video or photographic data needs to be supplied prior to a second Leg. Based on criteria established by SSP, the HRGB offset sites and conjugate sites are not considered ready for drilling.

Site survey readiness classification. By considering separate drilling legs, it is possible to rank the proposal to deepen 735B as 1A. The second Leg for offset drilling proposed remains as 2C until additional site survey data is collected.

SSP Consensus # 3: SSP reiterates that all the required data is now available in order to deepen Site 735B. However, SSP continues to request that the proponents submit a survey map of JOIDES Resolution video tapes to show the distribution of sediments, slopes and potential alternate sites near Site 735B. The proponents have promised to reconstruct the video track from the audio portions of the tape because the original JR track map cannot be located. This is important given the potential of selection of alternate sites if difficulties in deepening 735B are encountered (see PCOM <u>MOTION 95-3-11).</u> **Drilling on Leg 169 has clearly demonstrated the usefulness of such maps when locating sites from video tapes. These should be submitted prior to the April, 1997 SSP Meeting. Offset sites proposed for the second Leg were not considered by SSP because the proposal is not ranked.**

5. POTENTIAL FUTURE DRILLING: TECP

5.1 West Woodlark Basin (447-rev)

SSP Watchdog: Enachescu
SSP Proponent: none
Target Type(s): B (passive margin)

The ODP proposal 447-rev3 was reviewed during the July 1996 and again during the November SSP meeting at Lamont. The revised proposal is a re-write of earlier versions modified to reconcile the presence of sedimentary rocks dredged from the Moresby Seamount and accommodate some of the remarks of other panels. All required data including that collected during the last winter cruise was fully processed and is deposited now in the Data Bank.

SSP acknowledges that a comprehensive set of data now exists in the DB that fulfils all the SSP requirements. Unless there are not alterations of site or new site location at request of other panels, the SSP considers this proposal ready-to-drill.

The four proposed sites are judged as passive margin targets (including, the site 3C after sampling ponded sediments on the top of the mound). All four locations are feasible and strongly documented in the revision. A dense grid of intersecting migrated MCS exists in the DB, at different display scales and with several processing variants.

All locations are now validated by SSP. We reiterate that some sub-unconformity trapping of sediments exists at ACE-1C and 7A locations; however, no hazard problems were detected on the migrated reflection lines. *We recommend that PPSP preview the sites on the intersecting migrated grid to test for gas anomalies or potential closures and PPSP would most likely preview this proposal at their February meting if it makes into the drilling leg.* Unless new objectives are added or sites are moved due to safety concerns we can give this proposal the green light.

Site Survey Readiness Classification: 1A.

SSP Consensus # 4 : SSP acknowledges that a complete data package supporting drilling in the West Woodlark Basin (447-rev3) now exists in the Data Bank. The reviewed proposal contains four feasible, well-documented sites. Site Survey Readiness Classification: 1A.

5.2 Western Pacific Seismic Network (431)

SSP Watchdog: Peterson
SSP Proponents: None
Target Types: E (open ocean with sediment > 400m).

This proposal seeks to drill four sites into basement in the western Pacific in order to install broadband ocean seismometers and create permanent seafloor seismic observatories as part of the ION program. The first site survey data in support of this program were hand carried to our meeting by SSP member Tokuyama, including results from a recent survey effort by the R/V *Hakuho Maru*. Page-sized MCS profiles from cruise KH-96-3 which cover sites WP-2, JT-1 and JT-2 are of reasonable quality, but these data have only been stacked and need further processing in order to better define basement topography and the time to MOHO. As stipulated earlier by SSP, velocity-depth models also need to be developed and supplied for all sites from seismic refraction data. Required 3.5 kHz profiles of good quality have been submitted for sites WP-2 and JT-1, but are currently lacking for JT-2 and WP-1. For site JT-2, a track line showing the track of the older JT90 line needs to be supplied.

The site survey readiness status of sites WP-2, JT-1 and JT-2 is currently considered to be 2A. Most of the required data appear to be available, but further processing of MCS data and submission of other items noted above is necessary. Available site survey data for Site WP-1 from the older (1990) Hydrographic Department survey are of relatively poor quality and plans to re-survey this site in 1997 should move forward as scheduled. Site survey readiness for site WP-1 is classified as 2B in anticipation of new survey data becoming available in the near future.

SSP Consensus # 5: Data in support of all four western Pacific seismic network sites, including preliminary results from a recent survey, were hand carried to our meeting and examined for the first time. These data indicate the potential viability of all four sites for seismometer installation, but vital data types and information are still lacking, and further processing of the recently collected MCS data is required. Proposed sites WP-2, JT-1, and JT-2 are classified as 2A in terms of present site survey readiness, while site WP-1 is currently ranked as 2B in anticipation of further survey efforts in early 1997.

5.3 Taiwan arc-continent collision (450-rev)

SSP Watchdog: Sibuet
SSP Proponent: none
Target Type(s): C(active margin for sites 1-5,7); D (open ocean for site 6)

To examine the two dimensionality of the structure at the proposed sites, SSP had requested during their last July meeting that at least 1 profile on each side of the 5 miles spaced lines on which sites are selected must be deposited in the data bank from Moana Wave cruise. In addition, stack velocity determinations of the Ewing MCS lines in the area of the sites were also requested as well as 3.5 kHz profiles across proposed sites. Since that time, all these crucial data have been deposited in the DB. SSP appreciates the efforts made by the proponents in depositing this data. This completes this high quality data package.

In anticipation of this proposal becoming a scheduled leg, we suggest to proponents that it is not too early to begin to think about eventual site safety preview which may be required by PPSP, and to start imaging the BSR reflector better which seems to be present at sites C2A and TC7A.

The ACT cruise (R/V l'Atalante) was conducted in June 1996 in the northern area of this proposal where sites TC-2A, TC-6A and TC-7A are proposed. A complete swath bathymetric map is thus available in this area and will complement preceding data. In addition, 6-channel seismic profiles were also collected together with gravity, magnetic and 3.5 kHz data.

A large scale gravity sliding nappe was identified at 22•20'N-23•N; 121•40'E-122•30'E from this data. About 400m of the sedimentary pile has been detached along a flat lying décollement. The thrust front is characterised by thin-skinned tectonics. About 1000 km^3 of sediments have been displaced 8 km in the N025 direction. It could have generated a huge tsunami in Yaeyama Island (Malavieille et al., EOS, 1996 AGU Fall meeting). As transported sediments remain undeformed, proponents can look at the possibility of moving site TC-6A about 20 miles northwards of its position, without modifying the scientific targets of site TC-6A, in order to drill through the slump down to the oceanic basement and to document this slump and associated tsunami which could be of crucial importance to the surrounding populations.

The proposal is rated 1A which means that all vital data is now available and it can be considered as a viable candidate for 1998 drilling.

SSP Consensus # 6: As the remaining data requested during the July 1996 meeting have been deposited in the DB, the proposal 450 (Taiwan arc-continent collision) is rated as ready to be considered for drilling in 1998. A preview of this proposal may be required, if it gets scheduled for drilling in 1998, in view of the possibility of BSR at two of the sites TC2A and TC7A. Suggestion has been made to the proponents for moving one of their sites (TC-6A) 20 km to the north to document the sediments there by drilling into the region which may have been subjected to a large scale gravity sliding. This will not change the scientific objectives of the proposal.

6. POTENTIAL FUTURE DRILLING: SGPP

6.1 Antarctic and Palmer Ridge Glacial History and Sea-Level Change . (452-502)

SSP Watchdog: L ykke-Andersen
SSP Proponents: None
Target Type: B (and A)

The proponents efforts to clarify questions related to the evaluation of the site survey data and the drilling strategy, and to complete the data package in the Data bank is much appreciated by the SSP. At the previous meeting (July 1996) some deficiencies in the data package was pointed out. One issue was the apparent lack of required grids of seismic lines at some of the sites classified as "Passive Margin"- sites. The panel reevaluated the data in the light of Peter Barkers suggestion that SCS-data (PD88) and MCS-data are regarded as being equivalent. The panel found that the quality of the SCS-data is sufficiently good to be part of the seismic grid. The density of lines is low in the vicinity of the sites APRIS-04A and -05A, but considering the large horizontal extension of the drift deposits and acknowledging the very good quality of the data, SSP accepts the available data coverage to fulfill the requirements for a grid at these sites.

It is noted that 3.5 kHz data is not available at sites APRIS-01A and -04A. As the architecture of the drift deposits at the proposed sites appears quite regular with no signs of disturbances (as seen on the available high-quality MCS-profiles), and the fact that 3.5 kHz data will be acquired aboard Joides Resolution on approach to the sites, the panel finds it acceptable that 3.5 kHz data is not deposited in the Data Bank. Concerning the Palmer Deep (Sites APSHEL-13A and -14A): the deep tow data (PD92-2) is accepted as valid 3.5 kHz data required for these paleoenvironment sites. It is pointed out that a map showing the location of the alternate site (APSHE-14A) is still to be provided to the Data Bank. As the intended drilling depth (50 m) exceeds the depth to which the DP92-2 profile images the subsurface, SSP strongly recommends that an attempt is made to acquire high-resolution (e.g. SCS-data) with penetration down to a few hundred msec.

Earlier expressed concerns about the locations of the sites in the South Shetland Trench (APSST-01A and -02A) was based on the occurrence of side-swipes close to the sites. The swath-bathymetric contour map that has been deposited in the Data Bank clearly shows the location of the steep flanks of the trench. On this background and with the suggested relocations in direction away from the flanks, the panel accepts the absence of an ordinary seismic grid.

The panel discussed the arguments put forward in favour of a silica-diagenetic interpretation of a possible BSR observed on seismic profiles on the continental rise. Although the seismic profile newly deposited in the Data Bank (I95-130A) shows clear indications of enhanced amplitude contrasts above the BSR, supporting the silica-diagenetic origin, the panel prefers to take a conservative standpoint. If the proposal becomes a leg it is recommended that the proponents provide true-amplitude plots of the pertinent profiles in order to facilitate the safety review.

SSP highly appreciates the proponents efforts to refine the estimation of interval velocities and want to encourage the proponents to extend this work to as many sites as possible.

The site survey readiness is considered to be 1B: i.e. "Presently viable proposal for FY 98 drilling, A few required items are missing from the data bank, but data are believed to exist and to be readily available."

SSP consensus # 7: SSP appreciates the efforts made by the proponents of Antarctic Peninsula proposal (452-502) to complete the site survey package, and to clarify questions concerning previously deposited data. High-resolution data for the sites APSHE-13A and -14A are still needed to make the data package complete. Furthermore it is recommended that true-amplitude plots are provided for the APRISE-sites to help the safety evaluation of these sites.

6.2 Deformation and fluid flow, Nankai Trough Accretionary Prism (445)

SSP Watchdog: Diebold
SSP Proponent: Tokuyama
Target Type(s): C (active margin)

Since the last meeting some new data has been supplied to the Site Survey Data Bank, and even more has been supplied through the efforts of the Data Bank. Reports on ocean currents have been supplied, as well as low resolution maps showing all of the existing MCS coverage. Fred Moore 3.5kHz data were recovered from microfilm, and JAPEX MCS data relating to leg 131 were located and examined. Dan Quoidbach of the Data Bank has made large scale site maps with all of the navigation currently available. Missing navigation will be supplied during the coming month by proponent and SSP member H. Tokuyama. When these data are delivered, the data package should be complete.

The panel took another look at the site ENT-03A, which lacks a crossing line. The data package includes three high quality , closely spaced and parallel MCS lines which show that the target features are continuous across the immediate vicinity of the proposed site. Thus, the panel is prepared to relax the crossing line requirement at this Site.

SSP Consensus # 8: The data package for Nankai Trough (445-Rev2, Add 2) is very nearly complete. Much of the work needed to bring the package to this stage has been provided by the Data Bank, especially in the form of detailed navigation plots for each site. These plots cannot be completed, however, until digital navigational data is delivered as promised within the coming month. The proposal is now rated 1B.

6.3 Great Australian Bight Carbonate (367-rev3)

SSP Watchdog: Enachescu
SSP Proponent: none
Target Type(s): B (Passive margin)

SSP acknowledges that comprehensive set of data exists for this proposal that is highly ranked by OHP and SGPP and was ranked 2A for site readiness at SSP August meeting. During spring 96, two successful cruises have collected an impressive volume of geophysical and geological data for site characterisation. All collected data has been processed, interpreted and displayed and now reside in the DB.

The latest package recently received at DB contains shotpoint maps, bathymetry, interpreted and uninterpreted migrated seismic sections (compressed and normal scale) for all sites surveyed, isochrone maps for the main interpreted horizons at each site and velocity analysis for each site based on stacking velocities from location and intersecting lines. The submitted package is well presented and organised and the graphics are excellent.

Several sites have been marginally moved for safety reasons, but the reallocations are well explained and documented. The reallocations are under half nm and are made on the same line as initial sites. New site summary forms with drilling time and total depth estimates are submitted. Reallocations of sites conform with the ODP renumbering policy. The shallow sites that in the past have created drilling safety concerns have been removed from the present proposal.

The latest submitted data fulfils all SSP requirements and brings the proposal to a 1A ranking from site readiness point of view. The proponents were extremely responsive of this panel concerns and observations, responded promptly by sending a high volume of required data and now SSP can give the green light for this proposal. In panel's opinion, the principal proponents (Dr. Feary) has conducted exemplary work on this proposal and deserve congratulations for setting a new quality standard in both the form of Data submissions and the detail of site documentation.

SSP Consensus # 9: A complete set of site survey data for proposal 367 (Great Australian Bight) are in the DB. Migrated lines, isochrone maps constructed by interpreting migrated sections and seismic derived velocity information with hole plots including total depth, were reviewed and found adequate. Site survey readiness: 1A.

6.4 Barbados Corking (LOI-69)

SSP Watchdog: Srivastava

SSP Proponent: none

Target Type(s): C (active margin)

SSP Consensus # 10: The proposal (LOI-69) requires refurbishing of two of the corked sites in this region during 1997 drilling. It does not require any additional site survey data. It is therefore regarded as ready.

7. POTENTIAL FUTURE DRILLING: OHP

7.1 Southern Atlantic Paleoceanography (464-add)

SSP Watchdog: Flood

SSP Proponent: Diebold involved in site survey

Target Type(s): all sites A (paleoenvironment) and D (> 400 m sediments in open ocean)

The proponents have provided answers to our July, 1996, comments in 464-Add3. They provided data to support drilling at DSDP Site 360 (TSO-1A), summarized existing regional velocity information (very little), provided velocity estimates for all sites, and marked the depth of penetration on seismic lines in the data base. However, we advise the proponents that the lines drawn on seismic profiles for SubSAT-1C and TSO-3C in 464-Add3 should be twice as long as they are. Also, expanding on the previous discussion of the number of APC holes at a site that should be planned, the proponents should be aware that having only one APC hole at a site guarantees that parts of the section are missed and prohibits detailed paleoclimatic analysis.

Two new sites (consisting of small shifts from prior sites) are designated. SubSAT-1C is moved slightly and deepened (from 300 to 700 m) to try and obtain a longer record. The existing seismic data suggests that this region has a fairly complex sediment structure below about 300 m, and a more detailed seismic interpretation will be needed to determine precisely where, and to what depth, a good-quality paleoceanographic record can be obtained. For example, the strong reflectors in the buried trough might include material derived from adjacent highs. Also, SubSAT-1C is not located on the 3.5 kHz data in the Data Bank, so additional 3.5 kHz data should be supplied. An offset drilling strategy may be needed in this area to get a longer record. The proponents should work more closely with a seismic stratigrapher to resolve the deeper structure in this area. TSO-3C is moved slightly to avoid a basement high, and the seismic and 3.5 kHz records at the new position appear acceptable.

Two existing sites are deepened. TSO-7A is deepened from 200 to 730 m. The seismic data in this area show a nice reflection sequence in this area, and a good paleoclimate record is likely. TSO-4A is deepened from 500 to 800 m. The seismic data suggest that an 800 m deep hole will get into sediments with a distinctly different seismic character that needs to be more carefully evaluated. The proponents should work more closely with a seismic stratigrapher to resolve the deeper structure in this area. Also good velocity control will be needed for such deep sites.

A German cruise on an Italian ship (RV Explora), apparently scheduled for March/April, 1997, would collect additional MCS data at least at TSO-2, TSO-3 and SubSAT-1. While additional seismic (and velocity; hopefully including sonobuoy) data would certainly be welcomed in these areas, the present sites are adequately imaged with the existing data. If any sites are moved or deepened on the basis of new or existing data, they will need to be re-evaluated by SSP. The data package is rated 1A. The proponents will be advised by JOIDES Office when any additional data should be submitted to the Data Bank.

SSP Consensus # 11: The data package for proposal 464 (Southern Ocean Paleoceanography) is nearly complete and is designated 1A. Deepening some of the holes is best done after consideration of the deeper seismic structure; this may involve the proponents working more closely with a seismic stratigrapher. The impact of deepening any holes on overall leg timing also needs to be considered. If any sites are moved or deepened, they will need to be re-evaluated by SSP and will need good velocity control.

7.2 SW Pacific Gateway: Paleoceanography (441-add2)

SSP Watchdog: Peterson

SSP Proponents: None

Target Type(s): all Sites A (Paleoenvironment)

This highly ranked proposal calls for the drilling of a suite of sites in the New Zealand Plateau region to study the history and evolution of the Antarctic Circumpolar Current and the Deep Western Boundary Current system that feeds deep water into the SW Pacific Ocean. Discussion at this meeting focused on a recently resubmitted data package and a new addendum (441-ADD2) which summarizes minor changes in the proposed drilling program and reviews plans for a scheduled (February 1997) site survey cruise aboard the R/V*Tangaroa*.

In response to SSP comments from our July meeting, proponents have resubmitted a much more carefully assembled data package which clears up earlier confusion regarding navigation inconsistencies and profile annotations. Proponents have heeded our suggestion to move Site SWPAC-1A (now SWPAC-1B) to somewhat deeper water to avoid potential problems with the 1000 foot rule of ODP, and have decided to drop Sites SWPAC-3A and -4A from the program in order to better fit the remaining seven sites into a single leg of drilling. Data are now on file in the Data Bank in support of all proposed sites, though a subset of the data remain of poor quality and key data items (mostly 3.5 kHz records) appear to be unavailable for a few of the sites. We expect, however, that all of these concerns will be remedied with an 18-day site survey cruise presently funded and scheduled for February 1997. Proponents have modified their earlier plans to resurvey only a subset of the sites, and now plan to conduct additional survey effort at all seven SWPAC sites. Survey plans call for collection of MCS data (with crossings and acquisition of velocity information), 3.5 kHz profiling, and sediment coring at each proposed location. Pending successful completion of this survey, we anticipate that all sites will be ready for final SSP approval, and that this program will thus be ready for inclusion in the 1998 drilling schedule.

SSP wishes to thank the proponents for their prompt attention to our previous questions and concerns about the earlier data submissions. In anticipation of this program's likely advance as a scheduled leg, we suggest to proponents that it is not too early to begin to think about the eventual site safety review required by PPSP, and to start the process of assembling available information on industry wells and hydrocarbon potential in the region.

The site survey readiness level for this program remains as 2B, though we consider it a "strong" 2B in light of the proponent's plans to expand their scheduled survey to encompass all seven SWPAC sites. We look forward to reviewing the new survey data when it becomes available and wish the proponents good luck on their upcoming cruise.

Site survey readiness level: 2B

SSP Consensus # 12: SW Pacific Gateway (441) proponents have submitted a corrected and revised data package which supersedes all previous data submissions and addresses SSP concerns from the last meeting. Their recent addendum (441-ADD2) summarizes plans to drop two sites (SWPAC-3A and -4A) in order to fit the remaining seven into a single leg of drilling. A scheduled (February 1997) site survey cruise aboard the R/V *Tangaroa* will collect additional required survey data at all seven SWPAC sites. Site survey readiness for this program stands at 2B, with the expectation that the upcoming site survey cruise will collect all requisite data and make this program a strong candidate for 1998 drilling.

7.3 Cenozoic Glacial History and the Evolution of Weddell Sea Basin (503)

SSP Watchdog: Hinz

SSP Proponents: None

Target Types: D for site WS 01A; B for sites WS03A/04A/05A/06A

In response to SSP's comments originating at July 96 meeting the proponents have submitted 12 different data sets including MCS, SCS and Parasound data to the Data Bank in support of their five prime sites, and their new alternate sites WS07 and WS08.

In their cover letter of 30th October, 1996 the proponents mention the submission of a revised/upgraded version of their proposal by the 1st January, 1997 deadline, containing also a more extensive description and documentation of all alternate sites still to be selected. The submission of weather and ice formation was also mentioned.

SSP acknowledges the efforts of the proponents to complete the site survey data set for the proposed sites which, in its present form of documentation, is still not satisfactory. A large-scale track plot of both the existing MCS and SCS data together with newly proposed and old drilled sites is recommended for easy evaluation of the proposed sites. The proponents should also supply a more careful identification of the final depth to the proposed sites in the form of a table so that these can be identified on the submitted seismic records. SSP also noted plans to collect additional data on a scheduled cruise to this region during Jan-March 1997. It is recommended that the proponents should deposit any additional data together with the list of new prime sites to the data bank as soon as possible so that this proposal can be evaluated systematically during SSP April 97 meeting should this proposal gets included in the 1998 drilling. No safety concerns were noted from inspection of the data at the proposed sites.

Site Survey Readiness Classification: 2A

SSP Consensus # 13: It is almost certain that the site survey requirement for the Weddell Sea proposal (503) can be satisfied by the existing data. However, the proponents must supply a large scale track plot of all existing MCS and SCS lines at the proposed sites together with the revised/upgraded version of this proposal so that all the supplied data can be evaluated systematically by SSP. The proponents should keep SSP posted of the plans to acquire additional data at proposed prime and alternate sites.

7.4 Southern Gateway-Australia and Antarctic (485)

SSP Watchdog: Casey

SSP Proponent: none

Target Type: B, D and G

This proposal involves drilling between Tasmania and the South Tasman Rise and Antarctica to address Cenozoic climate changes, paleo-ocean currents, the K/T boundary event, and the evolution of a transform margin. Significant new data has arrived at the data bank since the July meeting and the proponents are thanked for the high quality of the data submitted. The new data submitted include navigation, all seismic tracks, shot point data, velocity data, all 3.5 kHz data, SCS deep penetration profiles, MCS profiles (but includes only the monitor records for the ARSO Cruise 125), swath bathymetry, high resolution side looking sonar, maps of seabed sampling sites, descriptions of all samples taken during several cruises, free air gravity and magnetic profiles in the vicinity of the proposed sites. Based on data requirements for target types proposed, it appears that all of the required data is available for drilling and almost all the required and recommended data has been submitted to the DB. This data package is comprehensive and detailed.

The only required data items that remain for submission at the time of the meeting include fully processed 6 channel seismic lines from the ARSO 125 Cruise and the available velocity data for all sites. The stacked data are expected to arrive at the data bank within days of the meeting. They were sent express from Australia during the SSP meeting. but they have not arrived at the DB in time for inspection during the November meeting. The migrated lines from this cruise are expected in the DB by Christmas.

Detailed information on the velocity and depth estimates has been provided for some sites and the remaining velocity data will be sent soon according to the proponents. Drilling, transit, change over times from XCB/RCB need to be rigorously evaluated based on these results.

Data pertinent to gas shows at Sites WT1 and WT2 and other potential problem sites should be assembled for Safety Panel consideration. In particular, maps showing the position of hydrocarbon shows relative to the proposed sites should be assembled for a possible preview by the safety panel should this proposal make into a drilling leg.

SCS high resolution data is available for four of the seven sites. Intersecting seismic lines are available for most of the Sites and crossing multi channel lines are available for all sites except TFZ02, ETP1 and alternate site SET1, but there are some crossing lines nearby.

SSP Consensus # 14. Most of the data for proposal 485 (The Southern Gateways between Australia and Antarctica) is now submitted to the DB or will be submitted in the next two months. The proponents are strongly encouraged to submit the processed and migrated ARSO Cruise 125 sections and velocity information for all the sites as soon as possible in order to complete the data package before the April 97 SSP meeting. Pertinent data for gas shows at some sites must be assembled if a preview of this proposal is required by the safety panel. A ranking of 1B is assigned to this proposal because a few required items are missing from the data bank, but the data are believed to exist and to be readily available.

7.5 Wilkes Land - Ross Sea, Antarctica: Paleoceanography (482-489)

SSP watchdog: Flood
SSP proponent: None
Target Type(s): B (passive margin)

482-Add and 489-Add suggested that proposals for drilling off Wilkes Land (482) and in the Ross Sea (489) would be combined. However, the data packages for the two proposals are not at an equivalent stage, thus the proposals will be discussed separately.

No new communications have been received by the Data Bank since the July, 1996, meeting regarding 482 (Wilkes Land). Some data has been submitted to the Data Bank relevant to proposed sites, but not all needed data is thought to exist. The proponents state in 482-Add (July, 1996) that they expect to improve site locations based on data from the Japanese National Oil Company (JNOC). Also, they note approved Italian and proposed NSF site-survey cruises. Based on this, we rate the data package as 3A on the assumption that a site-survey cruise is scheduled for 97/98 and that new sites will be designated following examination of JNOC data. The proponents will be advised by the JOIDES Office when any additional data should be submitted to the Data Bank.

SSP Consensus # 15: Not all data necessary for drilling sites in the proposal 482 (Wilkes Land) is thought to exist, but is expected to be collected during an approved site-survey cruise. Additional data may also be available through JNOC. The proposal is ranked as 3A.

A variety of data was received relevant to proposed drill sites for 489 (Ross Sea). In comparing submitted maps with proposal 489, it appears that sites RSSHEL-2A and RSSHEL-7A have been moved. The moved sites are designated RSSHEL-2B and RSSHEL-7B. Updated ODP Site Summary Forms for these sites need to be submitted to the JOIDES Office. Data was submitted in support of all Ross Shelf proposed sites (RSSHEL-01A to RSSHEL-8A), but not for Ross Slope proposed sites (RSSLOP-9A and RSSLOP-10A). In additional to regional data (ANTOSTRAT CD-ROMs, gravity, sediment thickness, velocity), MCS lines were received from Germany, Italy and France, and SCS lines were received from the US.

All shelf sites (except RSSHEL-3A) are on or very near MCS lines, although no sites are where MCS lines cross. (Portions of MCS lines IT88A-34, M_87007 and M_89015 are close to proposed sites and should be provided. Portions of MCS lines IFP 201-B1 and/or M_89027-B are in the region of most of the proposed sites and should be provided.) The proponents may also consider providing enough MCS data to permit correlation between sites in different areas (esp. correlating 8A with nearby sites.) All shelf sites are also on or close to SCS lines, but again only in some cases where lines cross. The proponents should consider whether or not proposed sites can be moved to locations where MCS and/or SCS lines cross (proposed penetrations ranging from 600 to 1000 m suggest that good MCS records are very desirable at drill sites). 3.5 kHz data appears to exist near most sites, but this was not systematically evaluated.

If drilling is scheduled in this region, the proponents should visit the Data Bank to properly annotate sites and cross-reference different data types for each site. Data on sediment cores will also be needed, especially where reentry is planned, and the proponents need to consider alternate sites should ice conditions not allow some sites to be drilled. Also, there will be a need for the proponents to summarize the occurrence of organic sediments in near shore drill holes (e.g., CIROS holes) and in outcrop on land should a preview safety panel meeting is called.

In summary, a data package for the Ross Sea is nearly complete, except for data relevant to Ross Slope sites, some SCS and 3.5 kHz data, and sediment core data. The existing data will support a number of different sites in addition to the ones proposed here. The missing data are thought to exist, and we are open to a discussion from the proponents of why 3.5 kHz data may not be necessary in advance of drilling at some sites. We rate this data package as 1B. The proponents will be advised by JOIDES Office when any additional data should be submitted to the Data Bank.

SSP Consensus # 16: A nearly complete data package has been provided in support of proposed drilling in the Ross Sea (proposal 489). Some required items are missing although they are thought to exist. Also needed is a drilling plan that identifies alternate sites should ice conditions not allow some sites to be drilled.

8. POTENTIAL FUTURE DRILLING: LITHP

8.0 DCS Drilling 735B

SSP Watchdog: Srivastava

SSP proponent: none

Target Type(s): Bare Rock

Gary Acton described the present status with DCS drilling and pointed out the reasons why this site is favoured by TAMU engineers for a possible engineering Leg for DCS drilling. From SSP site survey requirement, 735B site does not require any additional data besides what already exists. SSP, however, recommends that serious efforts need to be made by the Co-chiefs of Leg 176 to prepare a navigation map of the area where Video data was collected by J/R on a previous leg. This is specially important if a particular location in the area is to be selected for DCS drilling when none of these scientists will be on board to offer their guidance.

SSP Consensus # 17: Except for a navigation map to be used with the video data for this region no additional site survey data is needed for a DCS leg in region of hole 735B.

8.1 Kerguelen Plateau and Broken Ridge: origin, growth and evolution (457-rev 4)

SSP Watchdog: Tokuyama

SSP Proponent: None

Target Type: G (Topographically elevated features)

At our July 1996 meeting, all of the proposed sites in the new proposal were judged as target type G. SSP noted that some critical geophysical data such as intersecting seismic lines, to control the spatial distribution of the basement structure and of the overlying sedimentary sequence, were required. The site survey readiness of the proposal was judged to be 2C because of the plans to collect additional data at these sites during two proposed cruises, an Australian and a French.

Since then the proponents have made serious efforts in firming up the plans for these surveys. The plans for the Australian survey is now firmed up and the cruise is to take place from January to March 97. However the plans for the French cruise are not definite yet and it may take place either in early 1997 or late 1997/98 as conveyed by one of the proponents to SSP Chair after the meeting. Multichannel seismic reflection measurements, using approximately 4000 m long digital streamer and an array of guns with a total capacity of 3000 cu in, will be made during this Australian cruise together with gravity, magnetic and 3.5 kHz/12 kHz measurements along selected tracks on the southern Kerguelen Plateau covering four of the six high-priority sites (KIP-3A, 6B, 7A, 12A). An examination of the proposed tracks shows that not all sites lie where these tracks cross among themselves or with the existing MCS tracks. It is recommended that the proposed tracks be adjusted so that they will cross with the existing MCS lines at the proposed sites. The proposed French cruise will provide data for site 2A. The panel also noted that even though site 18C is not included in Leg A of the program, MCS data will be collected at this site during the Australian cruise.

The panel also noted that site 9A lies on Conrad 2708 line whose data is being processed now at University of Texas at Austin. The panel, therefore, was not able to judge suitability of the data from this site. According to the proponents processed data from this site together with that from the Australian cruise should be in the Data Bank for evaluation at our July 97 meeting. No other lines exist near this site. It is also not certain if this site will be covered by the proposed French cruise. It is recommended that the proponents try to obtain additional data at this site during the forthcoming cruises.

Based on the scheduled and proposed cruises the proposal is ranked as 2B (for sites 3A/6B/7A/12A) and 2C (for sites 2A and 9A).

SSP Consensus # 18: SSP acknowledges the efforts made by the proponents of Kerguelen Plateau proposal (457) to acquire additional MCS and other site survey data at most of the proposed sites during the forthcoming cruises. SSP recommends that the proponents should plan to collect seismic data along tracks which will intersect with the existing MCS lines at the proposed sites on the Kerguelen Plateau. Pending on successful completion of planned and scheduled cruises, most of the sites on the Kerguelen Plateau from this proposal should be ready for drilling in 1998. The data quality of the existing data on the Broken Ridge could not be assessed because of the unavailability of data at the time of the meeting. However, efforts should be made to collect additional data at this site. The proposal is ranked as 2B (for sites 3A/6B/7A/12A) and 2C (for sites 2A and 9A).

8.2 *NERO - Ninety East Ridge Observatory (508)*

SSP Watchdog: Peterson

SSP Proponents: None

Target Type: G

This new proposal, which targets objectives of the I.O.N. program, proposes installation of a broadband ocean seismometer and instrument package into a single borehole drilled into basement on the Ninety East Ridge. Plans call for reoccupation of either ODP Leg 121 Site 756 (primary target) or Site 757 (alternate target), with placement of a re-entry cone, drilling and installation of casing to basement, and penetration of basement to a minimum of 100 m to allow for installation of the instrument package. Because this proposal targets two locations previously drilled on Leg 121, and site survey data for these sites are already on file in the Data Bank, SSP requires no further evaluation of this proposal. Site survey readiness is considered to be 1A, and we wish the proponents good luck in getting this important site of opportunity into the drilling schedule.

Site survey readiness status: 1A

SSP Consensus # 19: This proposal calls for installation of a broadband ocean seismometer into a borehole drilled into basement on the Ninety East Ridge. Plans call for reoccupation of either ODP Site 756 or 757. Since site survey data for these previously drilled sites are already on file with the ODP Data Bank, SSP requires no further evaluation and considers the site survey readiness status to be 1A.

8.3 Tonga Forearc (451-add2)

SSP Watchdog: John Diebold

SSP Proponent: none

Target Type: C (Active Margins)

The science of this proposal focuses fundamentally on crustal generative and destructive processes and effects operating at an interoceanic arc. In this example, the Tonga-Lau backarc-arc-trench system, which is presently characterized by regional extension linked to rapid trench convergence (170-180 km/my) and eastward trench rollback. Proposal 451 places specific emphasis on investigating the (1) nature, characteristics, and cause of supra subduction zone arc magmatism and ophiolitic crustal formation above new interoceanic subduction zones, (2) subsequent crustal generation processes and changing mantle sources that nourish backarc spreading (Lau Basin) and arc magmatism (Tofua arc) in particular as speculatively thought to be instigated by the subduction of a lengthy chain of seamounts, the Louisville Ridge, beneath the Tonga Ridge, and (3) background or long-term effects and rates of subduction erosion and the accelerated effects and rates hypothesized to be tied to the subduction of the Louisville Ridge.

The current addendum-2 incorporates the results of the recently completed site-survey cruise of the R/V *Melville* , May-June, 1996. The results of the gathered information served to more accurately position the coordinates of previously selected sites, move selected sites to positions at which scientific objectives could be better achieved (e.g., TONG 10A for 05B, eliminate one site (TF7) because the objectives at which were not judged achievable and basically supplied by dredge recoveries, and locate a new site, TONG 08A.

Seven sites are proposed which, together with existing drill sites 840 and 841 (Leg 135), make up three cross-arc transects at 15°, 22° and 23°S. One new site, TONG 08A was position at 26° S in response to TECP's request for a "benchmark" site south of the collision zone of the Louisville and Tonga Ridges. This site, at 3555 m along an existing 24-fold MCS line, is positioned at the inner (western) edge of a deep-water forearc terrace.

Melville 3.5 kHz system failed to recover usable data, thus site-crossing high-frequency subbottom profiles remain unavailable. High-resolution profiles exist, however, for many, but not all, of the sites selected along data-sets gathered on other cruises, and the SSP recommends that the drill ship's 3.5 kHz system be used during approach to image the upper sedimentary structure at sites 03A and 10A. The panel appreciate proponents response on many issues raised by the panel during their July meeting.

In view of the hydrocarbon exploration in the near by region, the proponents must compile all available information of the wells which have been drilled in the region, occurrence of any hydrocarbon in them, their locations on a map together with those of the proposed sites for a possible preview of this proposal by the safety panel.

Site Survey Readiness Classification: 1B

SSP Consensus # 20: The greater part of the required site data for Tonga Forearc proposal (451) now resides in the DATA BANK. Since the July meeting, much of the data from the R/V Melville "Boomerang" site survey has been submitted to the data bank, including underway geopotential data, larger-scale reproductions of site-crossing SCS profiles along with swath mapping and sidescan data. Some of the data are still "in the mail," however. Velocity information in the area has been synthesized, and revised drilling time calculations have also been submitted, as have site maps and thermal gradient information. The proponents are to be congratulated for their response to SSP demands. The data package for drilling these sites is very nearly complete, and we await only large scale plots of DCS (dual channel seismics) from the Melville cruise for a few sites, and migrated sections of one older MCS line, currently being prepared under the direction of David Scholl, and this is an enhancement, not a requirement. The proposal is ranked as 1B - as a few items are still missing from the DB but are believed to exist and should be ready by 1997 making this proposal a viable candidate for 1998 drilling.

8.4 Mass Balance: Izu-Mariana convergent margins (472)

SSP Watchdog: Diebold

SSP Proponent: None

Target type: D

After a flurry of response to the SSP comments of March `96, no new items have been submitted to the data bank. However, during the November meeting, it was noted that the single piece of data still needed - a 3.5kHz crossing of alternate site BON9 - should be present at Lamont. The 3.5kHz data were located and copied by M. Giarratano of the Data Bank, and the data package is now complete.

This proposal is classified 1A.

SSP Consensus # 21: A good data package has been assembled for Izu-Mariana Convergent Marin proposal (472). The package is now complete and the proposal is ready for drilling. If any palaeoceanography objectives are intended, a good quality SCS profile through the BON site must be collected by the JOIDES Resolution.

8.5 Australian Antarctic Discordance: (426)

SSP Watchdog: Sibuet

SSP proponent: none

Target Type(s): E (open ocean crust with < 400 m sediments)

The intent of this proposal is to locate and characterise the boundary between sea-floor basalts that were derived from the mantle of the Pacific ocean and those belonging to the Indian ocean.

During their July 96 meeting, SSP had examined the R/V Melville site survey data collected in February 96. Unfortunately the quality of seismic and 3.5 kHz data was so poor that SSP was not able to evaluate the thickness of sediments present at all sites. A retrieval search of Lamont holdings showed the possibility that some 3.5 kHZ data may be present along a Vema track through the region. It was, therefore, recommended that the proponents look at data collected on other cruises through this region and to select possible sites.

The proponents, on examination of Vema and Eltanin data, prepared a document showing the presence of sediment pockets at several locations in the vicinity of proposed sites. They also show that the unprocessed seismic data, acquired by the R/V Melville, were often of better quality than the processed data to estimate the sediment thicknesses. Judging from the Melville data supplied, sites 1, 13, 14 and 16 can now be considered as drillable sites. However, such a small number of sites are not enough to properly address the scientific objectives of this proposal. Therefore, on further examination of Lamont seismic holdings, it was found that single channel seismic data exist along VEMA and ELTANIN tracks through this region. SSP looked at these data and found several areas, in close vicinity of proposed sites, where adequate amount of sediments exist. It is, therefore, recommended that the proponents should look at this data at Lamont before making any plans for collection of additional data on forthcoming cruise on Melville.

A careful examination of Vema's 3.5 kHz data, submitted by the proponents, showed that it is very hard to judge adequacy of sediments for spudding holes at most of the sites picked by the proponents. It is thus very likely that this may be related to the characteristics of this region and not merely to the equipment used. Consequently, SSP recommends that, if an additional survey is to be conducted in this region, it must clearly show where pockets of at least 50 m of sediments exist. For that, even an operational 3.5 kHz system may not be adequate in this region to meet the site survey objective at the sites. We realise that SSP guidelines specify requirements for 3.5 kHz data for the "ocean crust <400m of sediments" category. In view of the difficulty in imaging the required amount of sediments using a 3.5 kHz system in this region, SSP, therefore, strongly recommends use of a high resolution seismic system which should be able to resolve at least top 100 m of sediment cover. One gun (water gun or GI gun) should probably be enough with a single channel streamer or better a 2 or 6 channels streamer for this purpose. In order to increase the quality of the seismic sections, the speed of the ship may need to be decreased to 5 to 7 knots in the areas of potential sites. We, therefore, highly recommend collection of additional data at the proposed sites if at all possible.

In view of the lack of required data, which is planned to be collected on a cruise, the proposal is ranked as 2C.

SSP Consensus # 22: During our July meeting the proposal 426 (Australia Antarctic Discordance) was judged not to be ready for 1998 drilling because of the poor quality of seismic and 3.5 kHz data collected onboard Melville at most of the proposed sites. On SSP recommendation, the proponents examined existing VEMA data and prepared a data report in which they document presence of sediment pockets in the vicinity of the proposed sites. It seems that four of the sites, sites 1, 13, 14 and 16 can now be considered as drillable sites. This, however, is not enough to meet the objective of this proposal. It was realised at the meeting that some additional seismic data exist in the region of the proposed sites which the proponents are advised to look before planning to collect any additional data in the region. However, in view of the difficulty in imaging the sediments from 3.5 kHz system only in this region, SSP recommends that 3.5 kHz system must be supplemented by single channel seismic system if additional data is to be collected in this region. The uncertainty in consideration of this proposal as a viable candidate for 1998 drilling still remains and the proposal is classed as 2C.

9. OTHER BUSINESS

9.1 JOIDES new structure: Meeting schedule and transition year (Srivastava, Ellins)

Kathy Ellins outlined the new "Proposal Timelines for the next two years (Appendix C)" and how they have taken into account most of SSP's concerns. The points raised during the SSP July meeting and how these have been taken care of in the new plans were briefly discussed and these are described below.

1. *The timing of the data deadlines with respect to SSP meetings:* The new time table has taken care of this by allowing a month between the data deadlines and SSP meetings.
2. *The interaction of SSP with PPG's and SSEP's and the timing of this:* This is still under discussion and will not be known for some time.
3. *The need for two proposal deadlines*: Still remains
4. *The role of the Data Bank at the preliminary stage and a checklist for proponents:* This was discussed at some length and a committee of five was formed to design a set of forms which the proponents will be asked to fill out during submission of their proposals. It was decided, as suggested by Dan Quoidbach, that the Data Bank will be prepared to run a search through their data holding about the kind of data which exist in the DB for a given region where previous drilling has been carried out. This information could then be passed on to the proponents either on demand or at the time when their proposal are reviewed by SSP.
5. *The need for any site survey review before scientific peer review:* According to the present scheme this could not be eliminated; at least for the time being.
6. *The work load on SSP - how to limit the number of proposals handed down by the SSEP's:* It was suggested that this will be taken care of by SSEP in consultation with JOIDES Office. A maximum of 15 to 16 proposals are to be reviewed by SSP at any one time.
7. *The possibility of a proposal build-up in the system - how to avoid keeping weak proposals in the system unnecessarily:* Under consideration by JOIDES Office.
8. *There should be no SSP review until the science peer review has been completed:* This does not seem to be possible in the new system; at least during the first year.
9. *Following from this, site survey data should only be requested of proponents once their proposal has been favourably reviewed by SSEP's. This will limit the amount of redundant data in the system:* It was decided that JOIDES Office will be notifying proponents when to send data to the Data Bank. First, as soon as the proposals have been sent out for peer review and the second time, when favourable comments have been received and SSEP have selected the proposals for SSP review.
10. *Establish SSEP liaison to SSP like PCOM at present:* This is still under discussion.

Action Item #3 : Dan Quoidbach to circulate the new forms to all members for comments etc.

10.2 SSP meetings for 1997

We discussed timing for the spring meeting and it was decided to hold this meeting in Japan from **April 1 to 4, 1997.** Hidekazu Tokuyama will be the host for this meeting and will notify members of the details of the meeting nearer to its time.

Action item #4 : SSP Chair Srivastava to write to PCOM asking for their permission to hold their spring meeting in Japan from April 1 to 4, 1997.

Kathy Ellins pointed out the need for SSP to shorten the duration of their meeting to three days because of the budgetary restrictions. However, this does not include the meeting in Japan which is to take place over four days because of a field trip taking place in the middle of the meeting. Several ways of reducing the meeting time to a three days period were pointed out and the panel decided that the best would be to reduce the time taken by the reports and to strictly control the time allotted to each item. The former can be achieved if all liaison members would send their reports ahead of time to SSP Chair for circulation. All that will be needed during the meeting then is any discussion arising from those reports. It was also decided that these meetings will start on Monday and finish on Wednesday to save on travel funds for those willing to spend Saturday night at Lamont. Arrangements can be made for access to the Data Bank for those willing to spend some time looking at the data on Sunday.

A question arose about the places to hold SSP meetings. As there will be only two meetings per year it was felt by most that it would be highly desirable to hold one of these meetings outside USA in another participating country. This is largely because this is one of the avenues by which participating countries can show their involvement in the program to their organizations and in general good public relation for the program. Meetings held in France, Britain and Canada are good examples of this.

Action item #5 : SSP Chair to write to PCOM advising them of the decision taken by SSP to hold one of their meetings outside North America and asking for their permission to do so.

10.3 Report of SSP subcommittee on Phase IV of ODP (Diebold, Casey)

Jack Casey, one of the member of this subcommittee, mentioned that little or no progress was made on this item since our July meeting. He also mentioned his and Srivastava's attendance at the InterRidge meeting held at WHOI dealing with the Phase IV problem. Beacuse the organisers of that meeting had sent a copy of their 29 page report only a day before this item was to have been discussed at the meeting that it was decided to defer this item to our next meeting.

10.4 Panel Membership (Srivastava)

SSP Chair Srivastava mentioned that terms of appointment for two of the foreign members, Roger Scrutton from U.K and Jean-Claude Sibuet from France were due to expire after the November meeting. He suggested that because so many changes were going to take place in the ODP in the coming year that it would be helpful to this panel if these two members would be willing to stay on for another year with the panel. Jean-Claude Sibuet had agreed to do so but not Roger Scrutton, who was not too sure if he will be able to do so because of his heavy commitments with the Chairmanship of Geology Department. Srivastava has written to ODP France requesting a one year extension in the Sibuet term of appointment with this panel. Kathy Ellins pointed out that at the previous PCOM meeting it was decided that those SSP panel members due to retire can do so. As it was not known to SSP, Srivastava to write to PCOM explaining the circumstances for the request to France for Sibuet Extension.

Action item # 6 : Srivastava to write to PCOM about the extension in Jean-Claude Sibuet's term of appointment with SSP panel.

10.5 Other business - Data requirement of previously drilled Legs in new proposals.

The question has been raised from time to time when a proposal is submitted to the program where it involves going back to a region where ODP or DSDP holes were drilled and the proponents assume that all data previously submitted to the DB should be adequate for new drilling. After an extensive discussion the panel decided that the following measures will be taken in such cases:

1. As soon as SSEP decides which proposals go out for mail review (e.g. Jan 24, 1997), then JOIDES Office or SSEP Chair will E-mail a list of these proposals to the Data Bank and the DB will begin a search of what is pertinent and available to each proposal in the data bank and tell the proponents about the DB holdings for their proposal and what they need to update and submit to the DB by the data deadline (March 1, 1996) in order for their proposal to be considered by the SSP.
2. The watchdogs to the use the list prepared by the DB during their evaluation of the proposals and any items sent to the DB after the notification from them to the proponents. They should also flag these proposals if extra input is needed from the proponents to assemble the required data at the DB before the next SSP meeting.
3. SSP together with the watchdogs must ensure that the proponents realize that their data packages must be brought upto the modern standards as outlined by SSP. In many cases old data may not be adequate to meet the stated objectives.

10.6 Suggested Co-Chiefs for future legs from SSP

Several names for different proposals were suggested to the JOIDES representative for the forthcoming PCOM meeting.

10.7 Items for PANCH meeting

The following items have been suggested to PANCH meeting.

1. Role of SSP in new ODP structure -- Liaisons with other panels
2. Systems for substituting absent US SSP members from other panels.

Site survey readiness classification of proposals considered during July 96											
Global ranking	1. Viable for 98		2.Possibly viable for 98; likely for 99			3. unlik. 98 possible 99		4.impos. 98	5. impos. 98	6.Not consid.	7.Not consid.
Fall 96	1A	1B	2A	2B	2C	3A	3B				
T1,L6,S6	447										
T2,L2			431*	431*							
T4,L7,S9	450										
S1		452-502									
S2,T5		445									
S3,O3	367										
S4	LOI-69										
L0, S13	DCS										
L1, T7				457							
L2	NERO		431(W.P)								
L3, T3, S8		451									
L4,S5,T6,O9	472										
L5				431(J.T)							
L9					426*						
O1, S7	464										
O2, S10, T10				441							
O5			503								
O6 **(482+489)**		489				482					

O8,T9		485									

* --- see detailed comments.

Quantitative Classification of proposals
Site Survey Readiness Classification Scheme.

1. **Presently viable proposal for FY 98 drilling.**
   1A. All required data are in the data bank
   1B. A few required items are missing from the data bank, but data are believed to exist and to be readily available.

2. **Possibly viable proposal for FY 98 drilling; likely for FY 99**
   2A. Substantial items of required data are not in the data bank but are believed to exist and are likely to be available in time for consideration for FY 98 drilling schedule.

   2B. Substantial items of required data are not in the data bank, not believed to exist but could be available in time for consideration for FY 98 drilling if a **scheduled** site survey proceeds as planned.

   2C. Substantial items of required data are not in the data bank, not believed to exist but could be available in time for consideration for FY 98 drilling if a **proposed** site survey proceeds as planned.

3. **Unlikely for FY 98; possible for FY 99.**
   3A. Required data are not in the data bank, not believed to exist but are likely to be available in time for consideration for FY 99 drilling if a **scheduled** site survey proceeds as planned.

   3B. Required data are not in the data bank, not believed to exist but could be available in time for consideration for FY 99 drilling if a **proposed** site survey proceeds as planned.

4. **Impossible for FY 98:** Required data are not in the data bank and not believed to exist. Data could be available after FY 98 if a **proposed** site survey proceeds as planned.
5. **Impossible for FY 98:** Required data are not in the data bank and not believed to exist. A site survey needs to be conducted but is not proposed at this time.
6. **Not considered** because data in the Data Bank does not match present proposal; awaiting a new proposal.
7. **Not considered** because no data has been submitted to the data bank.

AN OVERVIEW OF THE NEW JOIDES SCIENCE ADVISORY STRUCTURE

JOIDES - Joint Oceanographic Institutions for Deep Earth Sampling

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The **Deep Sea Drilling Project** (DSDP), the first major effort to explore the geological and geophysical structure of the seafloor through a systematic program of ocean drilling, commenced in 1964 led by four US institutions. By the mid-1970's five other nations had formally joined the US in the **Deep Sea Drilling Project** making this endeavour an international program. By 1982 the US consortium had grown from four to ten member institutions. In 1983 the **Deep Sea Drilling Project** (DSDP) was succeeded by the **Ocean Drilling Program (ODP)**. International participation in this deep sea drilling effort is one of its most distinctive features and today 19 international institutions participate in the **Ocean Drilling Program** as **JOIDES members.**

Partners in the **Ocean Drilling Program** include:

- Australia/Canada/Korea Consortium
- European Science Foundation Consortium for Ocean Drilling (ECOD), consisting of Belgium, Denmark, Finland, Iceland, Italy, The Netherlands, Norway, Spain, Sweden, Switzerland, and Turkey
- France
- Germany
- Japan
- the United Kingdom
- the United States

THE JOIDES SCIENCE ADVISORY STRUCTURE

JOIDES is responsible for providing scientific direction for ODP through an advisory structure of panels and committees. An **Executive Committee (EXCOM)** presides over JOIDES and advises the ODP prime contractor, the Joint Oceanographic Institutions (JOI) on policy issues.

Recently, the Ocean Drilling Program has take the bold step of revising the science advisory structure in order to better tackle the initiatives and objectives contained in the new ODP Long Range Plan. The new JOIDES Science advisory structure will be headed by a **Science Committee (SCICOM),** which replaces the previous Planning Committee (PCOM). As was the case with PCOM, SCICOM will receive advice from several panels and committees. The four Thematic Panels (LITHP, OHP, SGPP, and TECP), the Information Handling Panel (IHP), Downhole Measurements Panel (DMP), and the Shipboard Measurements Panel (SMP) have also been disbanded and will be replaced with two Science Steering and Evaluation Panels (SSEPs), a number of Program Planning Groups (PPGs), and a Scientific Measurements Panel (Sci MP). Two Service Panels, the Site Survey Panel (SSP) and the Pollution Prevention and Safety Panel (PPSP), and the Technology and Engineering Development Committee (TEDCOM) have not been restructured. An Operations Committee (OPCOM) has been created.

A brief description of the panels and committees that comprise the new advisory structure follows.

JOIDES PANELS AND COMMITTEES

The Executive Committee (EXCOM) is the primary governing arm of the JOIDES organization. EXCOM members are representatives of oceanographic and marine research institutions, or other organizations that are partners in the ODP. Each organization designated for participation on EXCOM by the Board of Governors provides one voting member. The President of JOI, the Director of the Science Operations Subcontractor, the Director of the Wireline Logging Services Subcontractor, the Science Committee (SCICOM) Chairperson and an appointee of the NSF are non-voting liaison members of EXCOM.

EXCOM will approve scientific and operational plans developed by the Science Committee, and set policies for the achievement of the ODP objectives. EXCOM will also evaluate and assess the program's accomplishments in the context of the established goals and objectives of the Long Range Plan.

Scientific leadership in JOIDES will rest with **the Science Committee (SCICOM)** and the **SCICOM Chair**. The Science Committee will be the custodian of the ODP Long Range Plan and, as such, will be committed to a broad-based scientific approach that includes multi-leg, multi-platform drilling programs. In carrying out its mandate, SCICOM will be particularly concerned with long-term science planning over at least the 5-year period of Phase III (1999-2003), the solicitation and ranking of drilling proposals that address the scientific themes and initiatives in the ODP Long Range Plan, and determining which major areas of technology require development to fulfill SCICOM's future drilling plans. To this end, SCICOM will receive advice from the Operations Committee (OPCOM), the two Science Steering and Evaluation Panels (SSEPs), the Program Planning Groups (PPGs), the three Service Panels (SSP, PPSP, Sci MP), and the Technology and Engineering Development Committee (TEDCOM). SCICOM will report on science progress to the Executive Committee and advise JOI, and through JOI, the Science Operator and Wireline Services Operator of drilling proposals and plans that it wishes to see implemented.

In this new structure, SCICOM will play a key role in fostering communications between ODP and other global geoscience programs, as well as the general marine geoscience community, and among and between the JOIDES panels and committees, JOI, the Science Operator and the Wireline Services Operator.

SCICOM will comprise 16 members, as was the case of PCOM, to reflect the membership of the different ODP partners. The SCICOM Chair will also serve as the Chair of the Operations Committee (OPCOM) and as the head of the JOIDES Office, which coordinates advice, science planning and has oversight of drilling results.

The Operations Committee (OPCOM) will be established by SCICOM with the SCICOM Chair also serving as the OPCOM Chair. OPCOM will report to SCICOM and advise JOI, and through JOI, the Science Operator and Wireline Services Operator on the implementation of science and technological development plans required to achieve the ODP's goals. OPCOM's primary responsibilities will include determining drilling programs for a period that may exceed one year on the basis of SCICOM ranking of proposals, receiving and acting upon reports from the service panels, and under the guidance of the Chairperson, advising JOI accordingly, and providing SCICOM advice on short-term logistical and technological, implementations of scientific programs highly ranked by SCICOM, and longer term technological requirements for implementing the ODP Long Range Plan.

The Chairs of TEDCOM, SSP, PPSP and Sci MP, and liaisons from NSF, JOI, and the Science and WLS Operators will serve on OPCOM. The SCICOM and JOIDES members of OPCOM will reflect the expertise required for the evaluation of highly-ranked proposals under consideration by OPCOM for scheduling.

Two **Science Steering and Evaluation Panels (SSEPS)** will be established by EXCOM. The Earth's Environment SSEP and the Earth's Interior SSEP will be responsible for reviewing drilling proposals that address scientific problems under the themes of Dynamics of Earth's Environment or Dynamics of Earth's Interior, respectively, as outlined in the Long Range Plan. SSEP meetings will be scheduled with a one day overlap to permit evaluation of multi-disciplinary proposals. These panels will interact with proponents and Program Planning Groups in nurturing drilling proposals to maturity. The SSEPs will interact with all proponents on an iterative basis regardless of whether they are individual scientists, groups of individuals, groups of proponents linked to global geoscience Programs, or groups of proponents linked to specific JOIDES Program Planning Groups (PPGs). The SSEPs will select scientifically mature proposals that address high priority objectives of the Long Range Plan for external mail review and send these forward to SCICOM for consideration. The SSEPs will also advise SCICOM on thematic development within the Ocean Drilling Program. Each SSEP will report to SCICOM on a regular basis and will respond directly to requests from it.

Each SSEP comprises 16 members representing the ODP member partners. Membership selection will aim to achieve appropriate expertise and balance. Additional scientists may be invited to panel meetings on an *ad hoc* basis if additional scientific expertise is deemed desirable by SCICOM.

JOIDES Program Planning Groups (PPGs) will be small focused planning groups. PPGs will be set up by SCICOM when the committee, with advice from the SSEPs, determines that drilling proposals need to be generated to fulfill the goals of the ODP Long Range Plan. As a group, the PPGs will be created to cover a broad range of fundamental science questions of relevance to the ODP Long Range Plan. Each PPG, however, will establish and prioritize scientific objectives and drilling strategies for a specific scientific theme to be addressed by ODP drilling. PPG members will be selected specialists, many of whom may also represent other international geoscience programs with which ODP actively cooperates to achieve joint goals. Liaisons to the PPGs from the Science Operator, WLS Operator, JOIDES Office, SSP, PPSP may be requested by the PPGs on an *ad hoc* basis or by SCICOM. PPGs will have a finite life-time (normally 3 years), which can be extended if desired by SCICOM. PPGs will report strategic advice directly to SCICOM through the JOIDES Office and report proposal advice to SCICOM through the SSEPs.

In order to underscore the vital role of the PPGs within the JOIDES Science planning process, SCICOM will encourage strong links between the PPGs and global geoscience programs. Furthermore, SCICOM will welcome suggestions for the establishment of specific PPGs from global geoscience programs and international workshops.

JOIDES Detailed Planning Groups (DPGs) will be short-lived planning groups created by SCICOM for more intensive study of certain aspects of planning that may arise. For example, DPGs may be convened to generate concrete drilling prospectuses from groups of highly ranked proposals united by a common theme or themes. Mandates, guidelines, and duration of operation will be specified by SCICOM. SCICOM will choose DPG members for their relevant expertise. Liaisons to the DPGs from the Science Operator, WLS Operator, JOIDES Office, SSP, PPSP may be requested by the DPGs on an *ad hoc* basis or by SCICOM. DPGs will provide written documents to SCICOM and will be disbanded by SCICOM when their function is complete.

JOIDES Working Groups (WGs) will be short-lived groups which may be created by SCICOM, in response to requests by the SSEPs, PPGs, Service Panels, ODP contractors or by SCICOM itself, for developing strategies for major scientific objectives that are not sufficiently addressed by ODP drilling proposals or PPG objectives. The specific mandate of a WG will be defined by SCICOM at the time the WG is formed. Whereas DPGs will develop a detailed drilling prospectus based on highly-ranked proposals, WGs will formulate position papers intended to guide new, specific drilling or technology development proposals. WG members will be selected on the basis of relevant expertise and experience.

JOIDES Service Panels include the **Site Survey Panel (SSP), the Pollution, Prevention and Safety Panel (PPSP),** and the **Scientific Measurements Panel (Sci MP).** These panels will provide advice and services to the JOIDES Advisory Structure, and to the various entities responsible for processing, curation and distribution of samples, data and information (including publications) to the scientific community. The Service Panels are not directly involved with selection of drilling targets or definition of cruise objectives. The Service Panels can respond to specific requests from the Science Operator, the Wireline Logging Contractor, or JOIDES Panels, but in all cases, must report their findings through OPCOM. Recommendations from the Service Panels involving major fiscal decisions or major programmatic changes will be channeled through OPCOM to SCICOM.

The Site Survey Panel (SSP) will provide information and advice to SCICOM through OPCOM on the adequacy of, and need for, site survey information relating to proposed drilling targets. SSP will also continue to prepare safety packages for drilling legs or proposals under consideration by PPSP, and to compile site survey data packages for drilling legs.

The Pollution Prevention and Safety Panel (PPSP) will provide independent advice to the Ocean Drilling Program through OPCOM regarding potential safety and pollution hazards that may exist either due to the general and specific geology of the seafloor, or as a consequence of human activities on the seafloor (submarine cables, munitions dumps, etc.) in the vicinity of proposed drill sites.

The Scientific Measurements Panel (Sci MP) will be created from the merger of the Information Handling Panel (IHP), the Downhole Measurements Panel (DMP MP), and the Shipboard Measurements Panel (SMP). The new Sci MP will provide information and advice to the Ocean Drilling Program through OPCOM regarding the needs of the scientific community for timely access to data and samples, and on methods and techniques for determining the physical state, chemical composition, and dynamic processes in ocean crust and its sediment cover from downhole measurements and experiments. In addition, the Sci MP will be concerned with the inventory, operation, and condition of scientific instrumentation on board the drill ship, currently the *JOIDES Resolution,* and data handling for on board measurements.

The Technology and Engineering Development Committee (TEDCOM) will continue to be charged with recommending the proper drilling tools/techniques to meet the objectives of any targets in the scientific plan. TEDCOM will identify, within a proper time frame, the drilling tools and techniques to be developed, and monitor the progress of their development.

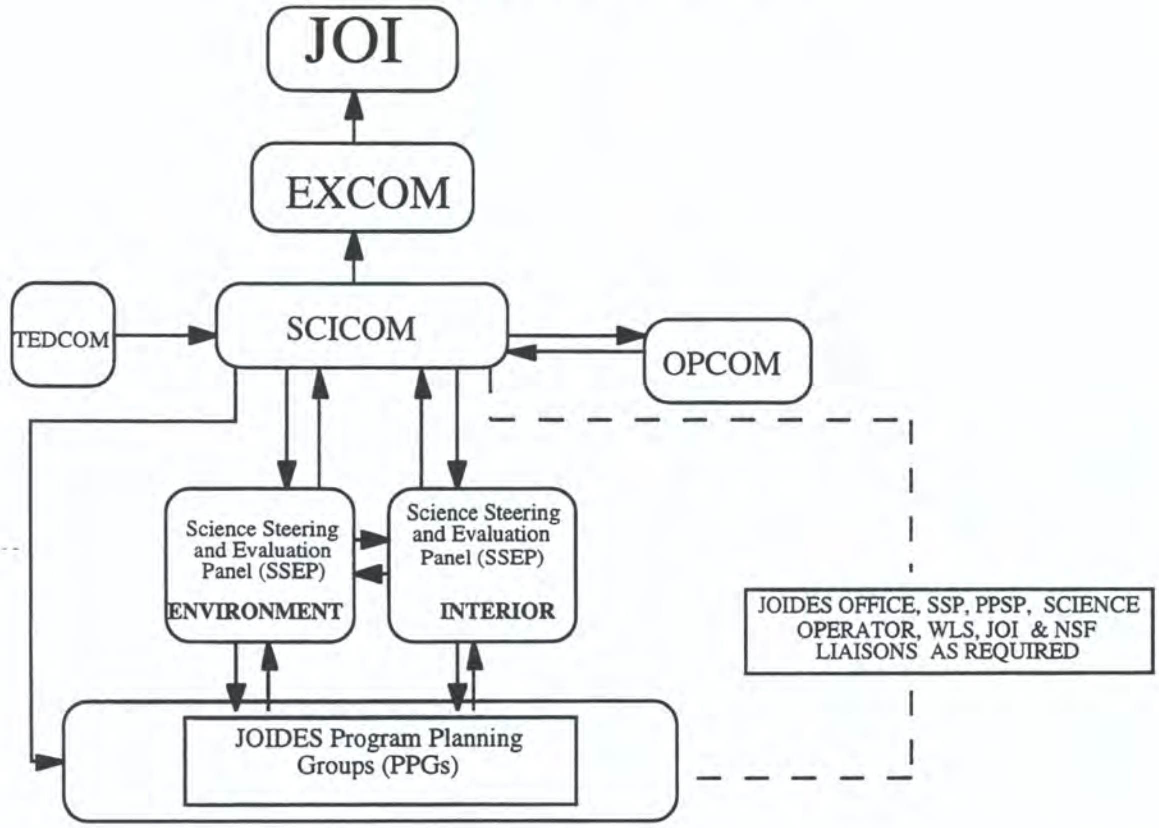
THE JOIDES OFFICE

The JOIDES Office will continue to conduct and support JOIDES activities. Under the direction of the SCICOM Chairperson, the JOIDES Office will be responsible for coordination of all the advisory committees and panels within the JOIDES Science Advisory Structure. The office will also integrate advice from the panel structure in a manner suitable for policy decisions by EXCOM. The Chairperson of SCICOM is the head of the JOIDES Office. Besides chairing the various meetings of SCICOM and OPCOM, the SCICOM Chair will also attend meetings of EXCOM, and other panels, committees, DPGs, or Working Groups.

LINKAGES IN THE NEW SYSTEM

In the new JOIDES Science Advisory Structure, linkages between the various advisory bodies, panels, and committees are best understood by considering separate functional "wiring diagrams", rather than by trying to trace the progress of science and operational advice, proposal flow, leg implementation and reporting on a single diagram.

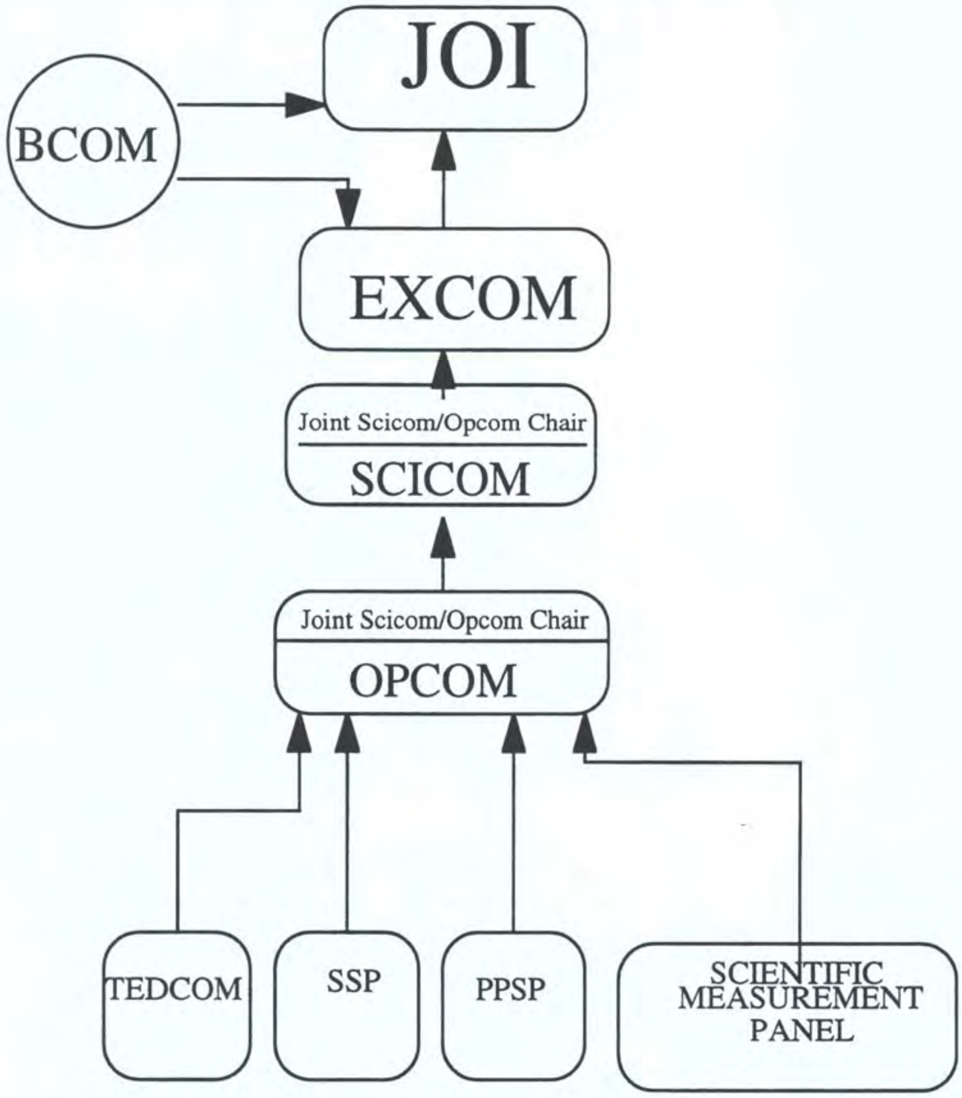
SCIENCE ADVICE FLOW DIAGRAM



Flow of science advice begins with SSEP evaluation and comment on proposals submitted. These will be communicated to the proponents as the start of a nurturing process leading to the development of a scientifically mature proposal if appropriate. The proponents of proposals that do not address high priority scientific objectives will be informed of that determination.

- PPGs set up by SCICOM work to ensure that proposals are generated and submitted that address a specific high priority objective designated by SCICOM.
- The SSEPs will select scientifically mature proposals for external mail review.
- Following external review, the SSEPs will forward to SCICOM those scientifically mature proposals recommended for inclusion in ODP's drilling plans.
- SCICOM will rank all proposals received from the SSEPs, and request that OPCOM devise a schedule for drilling within logistical limitations.
- SCICOM will then approve the proposed drilling schedule and forward it to EXCOM for approval.
- SCICOM will receive advice from TEDCOM on long-term major technical developments.
- SCICOM will advise EXCOM on its current Science Plan, which is then passed to JOI, and on progress in achieving the objectives of the LRP.
- JOI will formulate an ODP Program Plan using the SCICOM Science Plan as a basis and with additional input from the Science Operator and Wireline Logging Services Operator. Once the ODP Program Plan has been endorsed by EXCOM and approved by NSF, JOI will implement the Program Plan.

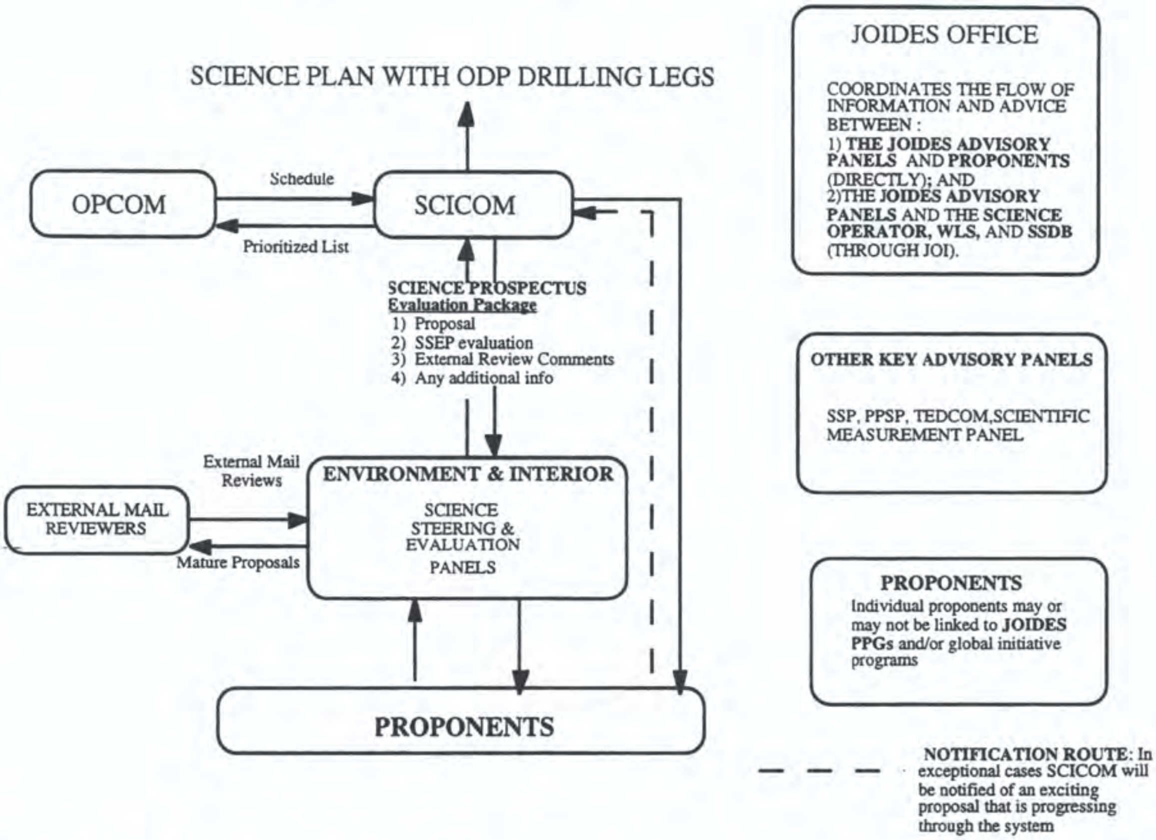
OPERATIONAL ADVICE FLOW DIAGRAM



The JOIDES Operations Committee (OPCOM) will focus on short-term science planning and implementation and longer-term technological requirements, using advice from TEDCOM, SSP, PPSP and the Sci MP.

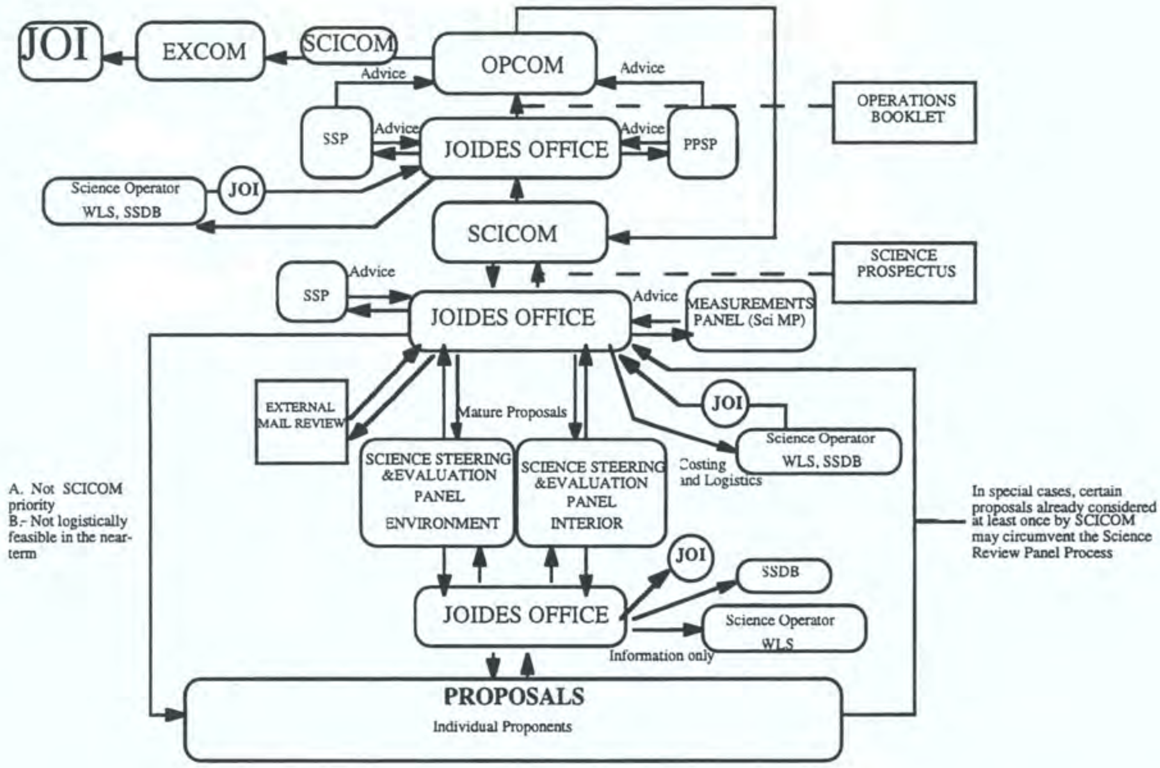
- One important task of this panel will be the scheduling of science proposals selected by SCICOM as ODP drilling legs.
- The drilling scheduled developed by OPCOM will be subject to SCICOM approval by an email vote.
- The approved schedule will be reported to EXCOM by the SCICOM Chair and, following EXCOM endorsement, passed to JOI for implementation.
- Both EXCOM and JOI will receive advice from BCOM before that year's Program Plan is finalized.
- JOI will direct the Science Operator and WLS Operator to implement the finalized drilling program.
- OPCOM will also maintain oversight on ship and shore-based instrumentation and data handling equipment and procedures.
- OPCOM will be responsible for planning for timely technological developments.

PROPOSAL FLOW DIAGRAM (SIMPLE)



- Proposals and letters of intent (LOIs) may be submitted to JOIDES by individual proponents, or groups of proponents.
- Proposals will be forwarded to the two SSEPs for scientific review and their comments will be returned to proponents following evaluation.
- The SSEPS will select scientifically mature proposals for external mail review.
- Following external review, the SSEPs will forward to SCICOM those scientifically mature proposals recommended for inclusion in ODP's drilling plans; the SSEPS will also provide proponents with the external reviews and their assessment of these reviews.
- The SSEPS will provide the primary input to an evaluation package for each scientifically mature proposal that they send forward to SCICOM. These packages will be compiled as ODP Drilling Prospectus.
- SCICOM will rank all proposals received from the SSEPs, and request that OPCOM devise a schedule for drilling. Not all highly proposals are considered by OPCOM will be scheduled as drilling legs as OPCOM will take into consideration information provided by SSP, PPSP, the Science Operator, and the Wireline Logging Services. Those proposals that are not scheduled for drilling will be returned to the SSEPs and will reenter the JOIDES science planning process.
- OPCOM will devise a drilling schedule which will be sent to SCICOM for approval.
- SCICOM will then approve the proposed drilling schedule and forward it to EXCOM for endorsement.

PROPOSAL FLOW DIAGRAM (COMPLEX)



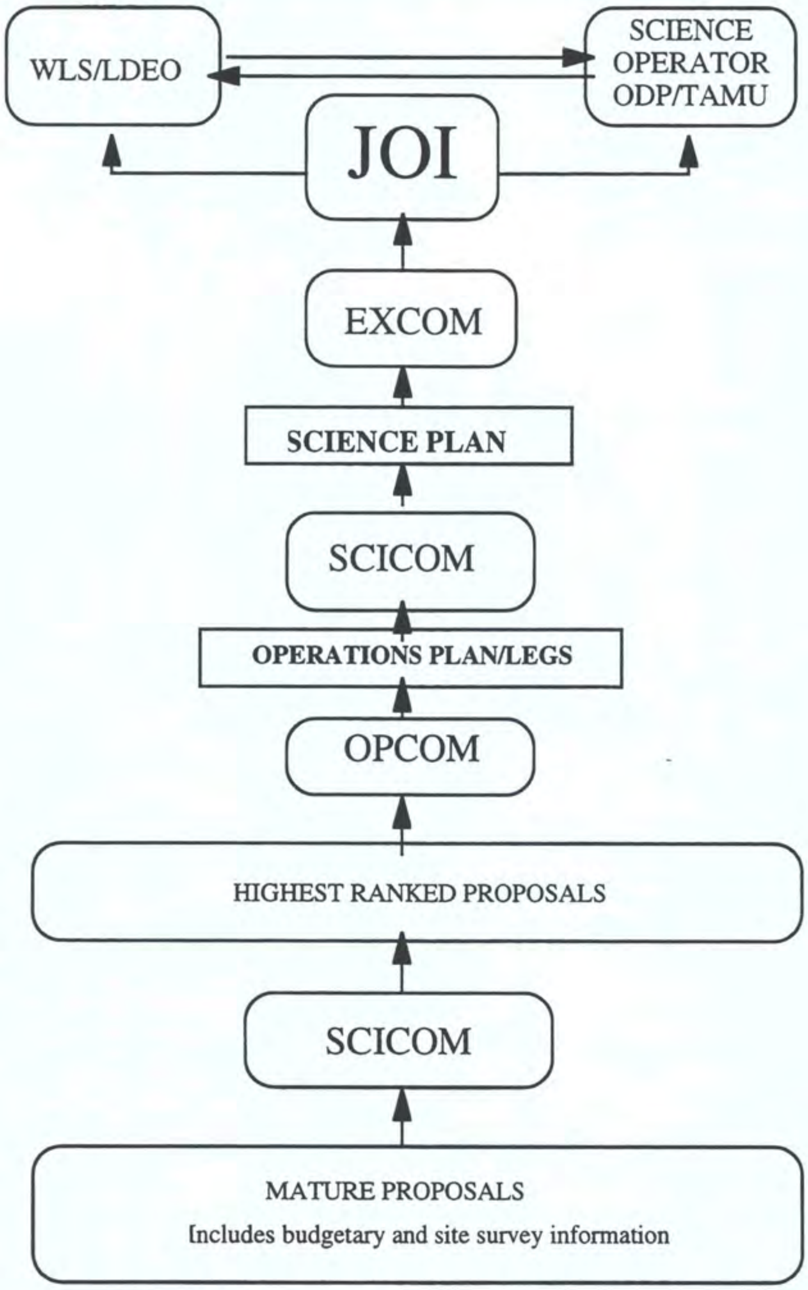
- Proposals and letters of intent (LOIs) may be submitted to JOIDES by individual proponents, or groups of proponents. Proposals received by the JOIDES Office will be forwarded to the SSDB, the Science Operator and the WLS Operator for information only. A copy of each proposal will be archived at JOI.
- The JOIDES Office will then send proposals to the two SSEPs for scientific review. Comments returned to the JOIDES Office by the SSEPs will be sent to proponents and PPGs.
- The SSEPS will select scientifically mature proposals for external mail review.
- The JOIDES Office will arrange external **mail review** ** for scientifically mature proposals, as advised by the SSEPs who will recommend names of unconflicted reviewers.
- Following external review, the SSEPS will provide proponents with the external reviews and their assessment of these reviews through the JOIDES Office.
- The JOIDES Office will solicit advice on those proposals considered scientifically mature by the SSEPs from SSP and the Sci MP, and request information on costing and logistics from the WLS Operator and the Science Operator. A **scientifically mature proposal** is one containing:
    1. clearly expressed scientific objectives that are linked to the goals of the ODP Long Range Plan;
    2. a well-defined drilling strategy to achieve the stated objectives; and
    3. sufficient supporting data to guarantee a high probability of achieving the scientific objectives.

Many proposals considered for the first time by the SSEPs will not be scientifically mature. Those containing ideas that are relevant to the goals of ODP's Long Range Plan, or that promise to yield innovative and exciting scientific results, will be returned to proponents and PPGs with detailed comments and advice from the SSEPs. It is expected that the SSEPs will serve a vital role in nurturing drilling proposals to scientific maturity.

- Following external review, the SSEPs will forward to SCICOM those scientifically mature proposals recommended for inclusion in ODP's drilling plans. Advice, requested information, comments provided by the SSEPs and external reviews will be assembled as a Science Prospectus by the JOIDES Office and presented to SCICOM. This Prospectus will also contain proponent responses (as proposal addenda) the external reviews, and to the comments of the SSEPs and service panels.
- SCICOM will evaluate and rank the mature proposals in accordance with the themes and initiatives of the 1996 ODP Long Range Plan. Highly ranked scientifically mature proposals with adequate supporting site survey data will be forwarded to OPCOM and SCICOM will request that OPCOM devise a schedule for ODP drilling.
- This selection, and information about these proposals, will be conveyed to OPCOM through the JOIDES Office in an Operations Booklet. The booklet will contain detailed advice on these proposals from SSP, PPSP, TEDCOM, Sci MP, the WLS Operator and the Science Operator. OPCOM will schedule as drilling legs those proposals that meet the criteria of evaluation. SCICOM priority proposals that remain unscheduled by OPCOM in any one year may be considered in subsequent years.
- SCICOM will then approve the proposed drilling schedule.
- The JOIDES Office will draft a science drilling plan, which will be presented by the joint SCICOM/ OPCOM Chair to EXCOM for endorsement. Using this as a basis, JOI will prepare the ODP Program Plan, which will be implemented following approval by NSF.
- Mature proposals that are NOT considered to be a SCICOM priority will be returned to proponents and PPGs through the JOIDES Office, with written comments indicating recommended actions.

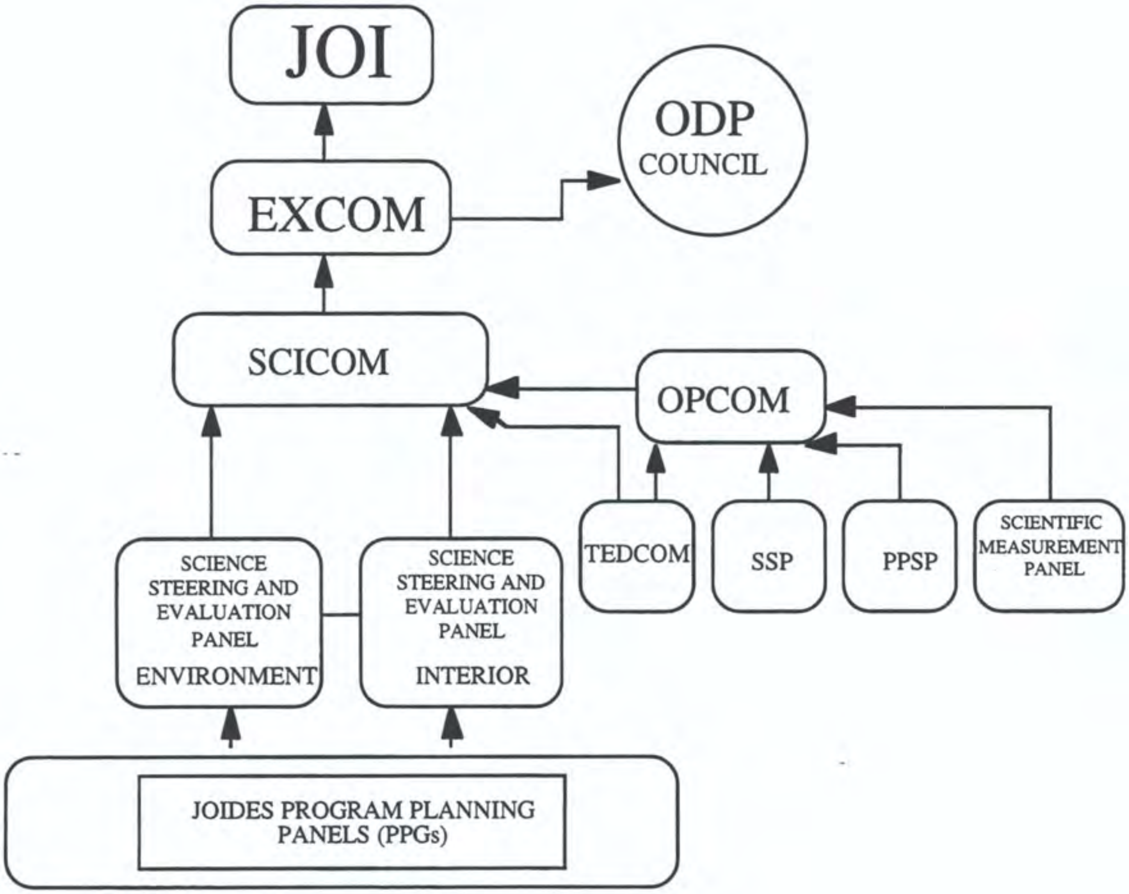
** **MAIL REVIEW**: Criteria for and whether JOI or the JOIDES Office will be charged with this responsibility has not yet been finalized

LEG IMPLEMENTATION DIAGRAM



- Highly ranked proposals selected by SCICOM will be evaluated by OPCOM on the basis of site survey readiness, safety, operational factors, the ship's track, technological requirements, and cost. OPCOM will then determine a drilling schedule.
- The schedule is subject to SCICOM approval. The approved schedule will be reported to EXCOM by the SCICOM Chair and, following EXCOM endorsement, passed to JOI for implementation.
- JOI will direct the Science Operator and WLS Operator to implement the finalized drilling program.

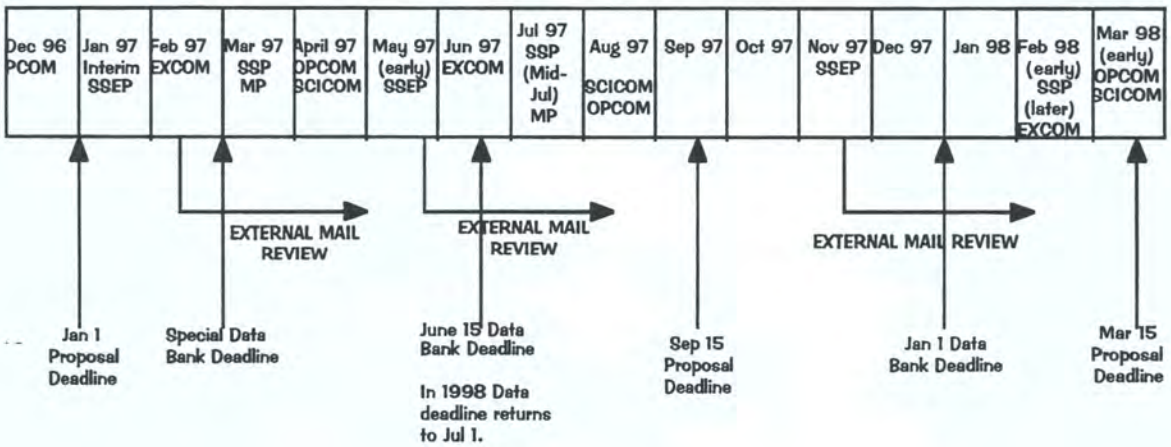
JOIDES REPORTING FLOW DIAGRAM



The ODP/JOIDES reporting structure is fairly straightforward, as shown in the diagram.

- Formal reporting in the science advisory structure will begin with the SSEPs and TEDCOM to SCICOM.
- SCICOM will report on the Science Plan and progress with the LRP through the Joint SCICOM/OPCOM Chair to EXCOM and ODP Council.
- OPCOM will receive reports from all of the service panels.
- OPCOM will report on operational matters and leg scheduling through the Joint SCICOM/OPCOM Chair to EXCOM and SCICOM.
- It is important to note that the JOIDES PPGs are accountable to SCICOM although they will report to SCICOM through the SSEPs. This accountability will be measured in terms of the quality of proposals that flow through the JOIDES system and are ultimately evaluated by SCICOM.

IMPLEMENTATION TIMETABLE FOR THE TRANSITION YEAR TO THE NEW JOIDES ADVISORY STRUCTURE 1997-1998



Dec 1996 PCOM - FY 1998 Drilling Schedule

Jan 1, 1997 - PROPOSAL DEADLINE

Jan 1997 Interim SSEP - Consider all active proposals and select scientifically mature ones to be sent out for external mail review

Feb 1997 EXCOM - Determine membership of SCICOM and SSEPS

March 1, 1997 - Special SSDB data deadline to permit proponents of proposals selected for external mail review to submit supporting site survey data to DB

Mar 1997 - SSP evaluates all scientifically mature proposals

April 1997 OPCOM - If required, will continuue the implementation and general oversight role of PCOM; Technology assessment

April 1997 - SCICOM establishes PPGs and conducts long term science and technology planning.

May 1997 - First meeting of SSEPs;consideration of previous Thematic Panel reviews and first set external reviews of ODP proposals; formulate advice to SCICOM

June 15, 1997 - SSDB Data Deadline; in 1998 the deadline reverts to July 1.

July 1997 - SSP takes a more focussed look at proposals determined to be scientifcally mature by interim SSEP (January) and by the new SSEPs in May.

August 1997 - SCICOM ranks mature proposals and conducts long term science and technology planning. Note that in 1998, SCICOM and OPCOM will meetin in early September.

August 1997 - OPCOM formulates a drilling schedule from FY 1999 onward, depending on logistical and budgetary considerations.

September 15, 1997 - PROPOSAL DEADLINE

Joint Oceanographic Institutions for Deep Earth Sampling

NOTE: THIS IS THE VERSION THAT WAS APPROVED IN PRINCIPLE BY EXCOM AND JOI BOG IN OCTOBER 1996.

The Mandates and Terms of Reference for the Proposed *NEW* JOIDES Science Advisory Structure

Prepared by the JOIDES Office, University of Wales, Cardiff, United Kingdom
September 12, 1996

Science Advisory Structure — JOIDES
Joint Oceanographic Institutions for Deep Earth Sampling

Introduction

In 1964, four institutions (University of California's Scripps Institution of Oceanography, Columbia University's Lamont-Doherty Geological Observatory, the University of Miami's Rosenstiel School of Marine and Atmospheric Science, and the Woods Hole Oceanographic Institution) joined together to form the Joint Oceanographic Institutions for Deep Earth Sampling (JOIDES). This became a national effort to explore the geological and geophysical structure of the sea floor through a systematic program of ocean drilling, the Deep Sea Drilling Project (DSDP).

In 1968, the University of Washington joined the four original institutions, and in 1975, the oceanographic institutions of the University of Hawaii, the University of Rhode Island, Oregon State University, and Texas A&M University, became members. The University of Texas joined the consortium in 1982, bringing the total to ten member institutions.

International participation in this deep sea drilling effort is one of its most distinctive features. From 1974 to 1976, five nations formally joined the Deep Sea Drilling Project to begin the International Phase of Ocean Drilling (IPOD). The oceanographic institutions of the Federal Republic of Germany, France, Japan, the United Kingdom, and the USSR became members of JOIDES and participated as full scientific and financial partners in DSDP.

Four of these nations are current members of JOIDES and are active in the Ocean Drilling Program (ODP), which succeeded DSDP in 1983. Canada and the European Science Foundation, which then represented 12 European countries, became members in 1983. In 1988, Australia became a participant through the establishment of the Canada-Australia Consortium, and Korea joined the ODP in 1996 as the third member of this consortium.

International member institutions of JOIDES are:

- The Australia - Canada - Korea Consortium: Natural Sciences and Engineering Research Council, Department of Natural Resources and Department of Fisheries and Oceans, Canada; Australian Geological Survey Organisation (AGSO), Australia; Korean Institute of Geology, Mining and Materials (KIGAM), Korea
- Bundesanstalt für Geowissenschaften und Rohstoffe (BGR), Federal Republic of Germany
- Institut Français de Recherche pour l'Exploitation de la Mer (IFREMER), France
- Ocean Research Institute of the University of Tokyo (ORI), Japan
- Natural Environment Research Council (NERC), United Kingdom
- The European Science Foundation Consortium for Ocean Drilling (ECOD), consisting of Belgium, Denmark, Finland, Iceland, Italy, The Netherlands, Norway, Spain, Sweden, Switzerland, and Turkey

In addition to the ten US institutions and the international partners, many US universities, government and private research laboratories, and private industries also participate in JOIDES and the Ocean Drilling Program.

JOIDES is responsible for providing scientific direction for ODP, and consists of an Executive Committee and a science advisory structure headed by a Science Committee. The JOIDES advisory reporting structure is shown in Figure 1.

Executive Committee

The primary governing arm of the JOIDES organisation is the Executive Committee (EXCOM). EXCOM members are representatives of oceanographic and marine research institutions, or other organisations, which have an interest in the study of the sea floor, and the capability of carrying out such studies.

Each organisation designated for participation on EXCOM by the Board of Governors shall provide one voting member. The US members of the Executive Committee (EXCOM) are the Deans or Directors of the ten US oceanographic institutions. The Executive Committee members from non-U.S institutions or countries are designated by the participating country. The President of JOI, the Director of the Science Operations Subcontractor, the Director of the Wireline Logging

Services Subcontractor, the Science Committee (SCICOM) Chairperson and an appointee of the NSF are non-voting liaison members of the Executive Committee.

EXCOM approves scientific and operational plans developed by the Science Committee, and sets policies for the achievement of the program's objectives. EXCOM also evaluates and assesses ODP accomplishments compared to established goals and objectives.

The Chairpersonship of EXCOM rotates with the JOIDES Office among the JOIDES institutions, excluding the Science Operator and Wireline Logging Service Operator institutions. The Chair position alternates between US and non-US institutions each term. The term of office is usually two years.

EXCOM operates under Terms of Reference, which are included below.

Budget Committee

The Budget Committee (BCOM) consists of three EXCOM members and two SCICOM members. A balance of three US and two non-US BCOM members is maintained. BCOM provides JOIDES overview and first review of the ODP Program Plan which is submitted in draft form to NSF. BCOM meets periodically, according to a Program Plan and budget timetable, and consults with JOI and the subcontractors if budget problems arise. BCOM provides a report to EXCOM at their summer meeting, at which time EXCOM approves the final ODP Program Plan.

BCOM operates under Terms of Reference, which are included below.

JOIDES Science Advisory Structure

The science advisory structure is headed by the Science Committee and consists of: an Operations Committee, two Science Steering and Evaluation Panels; a number of Program Planning Groups, three Service Panels; a Technology and Engineering Development Committee; and ad hoc Detailed Planning Groups and Working and Liaison Groups.

Terms of Reference for the JOIDES Science Advisory Structure (see below) includes mandates and guidelines for each panel. Each committee, panel, Program Planning Group and Detailed Planning Group, operates under a mandate, along with guidelines as to membership and frequency of meetings. The JOIDES panel meeting schedule guideline is shown in Figure 2. Standing panel mandates, guidelines, and their amendments to them shall be proposed by the Science Committee for approval by the Executive Committee. The Science Committee may ask panels to take up topics not in their original mandates. Mandates, guidelines and duration of operation for Program Planning Groups and the short-lived Detailed Planning Groups and Working Groups will be specified by SCICOM as required.

Science Committee

The Science Committee (SCICOM) evaluates advice from the science advisory structure, prioritises scientific and technological objectives within the context of the ODP Long Range Plan, and optimises the scientific productivity and operational efficiency of ODP. Recommendations on scientific objectives and final drilling plans are forwarded to EXCOM for final approval.

SCICOM is responsible for:

- custodianship of the ODP Long Range Plan
- solicitation and integrated global ranking of mature drilling proposals
- long-term science planning, over at least the 5-year period of Phase III
- approval of the annual drilling schedule provided by OPCOM
- communicating with the general community, the JOIDES advisory Panels, the Program Management and Operators
- setting up Program Planning Groups
- assigning proposals to science advisory panels for review
- recommending the names of potential leg Co-Chief Scientists (the Science Operator will make the final selection)

SCICOM members are appointed by their institutions, and all appointees must satisfy the fundamental criteria of having the ability and commitment to provide mature and expert scientific direction to the Program. If a SCICOM member is a proponent or Co-Chief of a drilling proposal, that member is not involved in any substantive advisory role or in any final voting on the proposal at SCICOM meetings. One third of the SCICOM members rotate off the Committee annually, so that the SCICOM membership is replaced every three years.

The SCICOM Chairpersonship rotates with the JOIDES Office among the JOIDES institutions, excluding the Science Operator and Wireline Logging Service Operator institutions. The JOIDES Office alternates between US and non-US institutions each term. The term of office is usually two years. The SCICOM Chairperson convenes the panel meetings and approves their meeting dates, locations, and agendas.

Operations Committee

The Operations Committee (OPCOM) is a sub-committee of SCICOM and advises SCICOM on the annual and intermediate-term scheduling of the drill ship based on SCICOM's global ranking of mature drilling proposals, short-term logistical, technological, and budgetary implications of scientific programs highly ranked by SCICOM, and on longer-term technological requirements for implementing the LRP

The SCICOM Chair will be the OPCOM Chair. Other OPCOM members are appointed by SCICOM, usually 2 other SCICOM members and 3 other members who will be drawn from the marine geoscience community based upon the upcoming meeting agenda and expertise required. The Operations Committee will make all decisions by consensus.

Science Steering and Evaluation Panels

Science Steering and Evaluation Panels (SSEPs) will be based upon the two major themes of the ODP Long Range Plan: Dynamics of Earth's Environment and Dynamics of Earth's Interior. The two panels are established by the Science Committee to assess the quality of drilling proposals. They will also nurture to maturity those drilling proposals that address problems that are best solved by ocean drilling. The objectives of the proposals are based on the contents of the ODP Long Range Plan and will be accepted from the scientific community-at-large. These panels will recommend mature drilling proposals for external mail review before they are passed to SCICOM for ranking. Science Steering and Evaluation Panels will meet at least twice a year, with overlapping sessions, to review and evaluate proposals, and may request that SCICOM establish Program Planning Groups and/or Detailed Planning Groups to assist in developing specific drilling plans for particular themes or regions.

Program Planning Groups

Program Planning Groups will be formed by SCICOM when it, with advice from the SSEPs and elsewhere, determines that drilling proposals need to be generated to fulfil the goals of the ODP Long Range Plan. The membership will be focused groups of specialists from within and outside JOIDES, and will include areas where ODP actively co-operates with other international geoscience programs to achieve joint goals.

Detailed Planning Groups

Detailed Planning Groups (DPGs) are short-lived planning groups which may be created by SCICOM as required for specific tasks, in response to requests by the Science Steering and Evaluation Panels or by SCICOM itself. The purpose of a DPG is for generating concrete drilling prospectuses from groups of highly-ranked proposals united by a common theme or themes. Mandates, guidelines, and duration of operation are specified by SCICOM as required.

DPGs are composed of a balance of US and non-US members, and proponents and non-proponents. The size of the DPG should be commensurate with the charge of the group. DPGs provide written documents to the Science Steering and Evaluation Panel(s) specified by SCICOM and are disbanded by SCICOM when their function is complete. The DPG documents are transmitted to SCICOM with the written evaluation of the appropriate Science Steering and Evaluation Panel.

Working Groups

Working Groups are short-lived planning groups which may be created by SCICOM usually for an intensive study of ways to implement an important scientific or technological advancement not covered by an existing panel or group. The Working Groups will be held to the minimum necessary membership and travel expenses. Working Groups provide written documents to SCICOM.

Technology and Engineering Development Committee

The Technology and Engineering Development Committee (TEDCOM) is responsible for recommending the proper drilling tools/techniques to meet the objectives of any targets in the scientific plan. TEDCOM identifies, within a proper time frame, the drilling tools and techniques to be developed, and monitors the progress of their development.

Service Panels

Service Panels provide advice and guidance to the JOIDES advisory structure , and to the various entities responsible for processing, curating, and distributing samples, data, and information (including publications) to the scientific community. The Service Panels can respond to specific requests from the Science Operator, the Wireline Logging Contractor, or JOIDES panels, but in all cases, must report their findings to the Operations Committee. When recommendations from the Service Panels involve fiscal decisions or major programmatic changes, these must be approved by OPCOM for recommendation to JOI.

The three Service Panels are the Pollution Prevention and Safety Panel (PPSP), Site Survey Panel (SSP), and the Scientific Measurements Panel (SMP). The Service Panels, beyond their help to the JOIDES Advisory Structure, are not directly involved with the selection of drilling targets or the definition of cruise objectives. However, the SMP may review and make recommendations on JOIDES proposals which emphasise downhole scientific programs and tools.

Travel Costs Associated with Panel/Committee Meetings

- Travel by US panel members is paid for by the JOI/United States Science Support Program (JOI/USSSP) and does not come from commingled funds in the Ocean Drilling Program.
- Travel by non-US JOIDES panel members and guests is paid for by their country.
- Travel by the EXCOM and PCOM Chairpersons is paid out of ODP commingled funds.
- Travel by non-member country panel members comes from commingled ODP funds.
- Travel by scientists employed by either JOI, the Science Operator, or by the Wireline Services Operator is included in that institution's ODP budget.

JOIDES Office

Conduct and support of JOIDES activities is provided through the JOIDES Office. This office, under the direction of the SCICOM Chairperson, is responsible for co-ordination of SCICOM, OPCOM, the other advisory bodies, and PPGs, DPGs and WGs. The office also integrates advice from the panel structure in a manner suitable for policy decisions by EXCOM.

The Chairperson of SCICOM is the head of the JOIDES Office. Besides chairing the various meetings of the Planning Committee, he/she also attends meetings of EXCOM, and other panels, committees, DPGs, or Working Groups. The JOIDES Office rotates between US and non-US institutions approximately every two years, excluding the Science Operator and Wireline Logging Service Operator institutions.

Administrative functions of the JOIDES Office include: overseeing the preparation of a Science Plan for the annual ODP Program Plan; compiling summaries of the reports of meetings of the JOIDES committees and panels and distributing these in a timely manner to JOIDES members, JOI, NSF and, when appropriate, to the scientific/technical community; providing administrative services the JOIDES Advisory Structure.

The JOIDES Office also produces the *JOIDES Journal*. The *JOIDES Journal* records the activities of all elements of the JOIDES structure and keeps the scientific community informed of the JOIDES planning process. The *JOIDES Journal* provides communication among the JOIDES committee and advisory panels, JOI, ODP-TAMU, ODP-LDEO, NSF, international members, and individual earth and ocean scientists.

Terms of Reference

JOIDES Executive Committee for the Ocean Drilling Program

1. This committee shall formulate scientific and policy recommendations with respect to the Ocean Drilling Program (ODP). It shall conduct the ODP planning, as well as evaluation and assessment of the Program as to its accomplishments as compared to the goals and objectives which have been established. It may be assigned managerial and operational responsibilities for appropriate tasks.
2. The members of this committee shall be representatives of oceanographic and marine research institutions or other organisations which have a major interest in the study of the sea floor and an adequate capability in terms of scientific human power and facilities to carry out such studies.
3. The membership of this committee is now comprised of one representative of each of the six non-US countries or consortia with an active Memoranda of Understanding (MOU) with the National Science Foundation (NSF) [Australia/Canada/Korea Consortium, European Science Foundation, France, Germany, Japan, and the United Kingdom] and one representative of each of the ten existing US institutions [University of Miami, University of Washington, Oregon State University, University of Hawaii, University of Rhode Island, University of Texas at Austin, University of California at San Diego, Texas A&M University, Woods Hole Oceanographic Institution and Columbia University]. The appointment of additional members will be determined by the JOI Board of Governors on the recommendation of the JOIDES Executive Committee. In the case of representatives of non-US country participants, the existence of a valid MOU with NSF is a prerequisite to membership.

   Membership of any member may be cancelled by the Board of Governors on the recommendation of the JOIDES Executive Committee or in the event of a non-US country participant ceasing to have a valid MOU in existence.
4. Each institution or organisation designated for participation on this Committee by the Board of Governors shall provide one voting member, normally the director or senior deputy thereto.
5. The Executive Committee shall reach all its decisions by the affirmative vote of at least two-thirds of all members, including members from at least three non-US members. A quorum shall constitute two-thirds of the Executive Committee. If a member of the Executive Committee is absent from a duly called meeting of the Executive Committee, he or she may designate an alternate with full authority to act for him or her in his or her absence.
6. The Executive Committee may establish subcommittees for cognisance of certain components of the Ocean Drilling Program. Areas of cognisance and the Terms of Reference for each subcommittee shall be defined by the Executive Committee. In particular a Science Committee and a Budget Committee shall be established.
7. The Committee, and all subcommittees thereto, shall keep written records of their proceedings.
8. Members of this Committee, and members of subcommittees duly appointed thereby, while acting within the Terms of Reference, shall be indemnified, and held harmless by the corporation from and against any and all liabilities, damages and demands, losses, costs and expenses arising from acts or omission related to performance as committee members.
9. These Terms of Reference, upon ratification by members of the existing JOIDES Executive Committee and adoption by JOI, Inc. will supersede all previous JOIDES agreements.

Ratified by EXCOM: 15 September 1988

Adopted by JOI Board of Governors: 15 September 1988

JOIDES Budget Committee for the Ocean Drilling Program

1. General Purpose. The Budget Committee provides JOIDES overview and first review of the ODP Program Plan and budgets therein.

   The ODP Program Plan is compiled by JOI, Inc., the ODP prime contractor. In it, a one-year Science Plan, developed by OPCOM and approved by SCICOM is presented. Budgets in the Program Plan include those of the Science Operator and Wireline Logging Contractor. The Program Plan also includes a list of scientific and technological development needs, including estimated costs, which have been reviewed by the JOIDES Science Advisory Structure and which are required for successful completion of the Plan.

   The ODP Program Plan (including budgets) is then submitted in draft form to the National Science Foundation (NSF). BCOM meets as occasion demands, according to a Program Plan and budget timetable, in order to provide continuous guidance in developing the final version of the budget in the Program Plan. The committee consults with JOI, Inc. and the subcontractors if budget questions or problems arise. BCOM reports to EXCOM at its spring meeting (the joint EXCOM/ODP Council meeting). At that time, the full EXCOM approves the final ODP Program Plan and a detailed budget for the upcoming fiscal year. BCOM's written reports are also submitted to SCICOM, through OPCOM.

2. Mandate. The Budget Committee is to review the ODP Program Plan and budgets therein and evaluate how well the Program Plan and budget address the priorities which have been defined by EXCOM and SCICOM. This review is to be reported to EXCOM and SCICOM.

   BCOM also acts on behalf of EXCOM on budget matters that EXCOM delegates to it. BCOM can request that liaisons from the ODP subcontractors, JOI, or NSF attend its meetings.

3. Meetings. BCOM meets in accordance with a schedule for developing the ODP Program Plan. Up to three meetings per fiscal year may be necessary to provide input on the ODP Program Plan and budget. Meetings may be required in the entire phase of developing the budget and Program Plan.

4. Membership. The Budget Committee (BCOM) consists of three EXCOM members and two SCICOM members, one of whom is the present SCICOM/OPCOM Chairperson. A balance of three US and two non-US BCOM members is maintained. The second member is ideally the immediate past SCICOM/OPCOM Chairperson. A quorum shall consist of two of the EXCOM members and one of the SCICOM members. BCOM members are appointed by EXCOM. EXCOM or SCICOM members representing JOIDES institutions with major ODP subcontracts will not be appointed.

Ratified by EXCOM: 15 September 1988

Adopted by JOI Board of Governors: 15 September 1988

JOIDES Science Advisory Structure for the Ocean Drilling Program

The purpose of the ODP Science Advisory Structure of JOIDES is to enable the formulation of the most productive scientific plan for the Program. JOIDES is open to suggestions and proposals from the entire scientific community, and its plans shall be open to continued review and revision.

1. Science Advisory Structure

The Science Advisory Structure of JOIDES will consist of a Science Committee, an Operations Committee, a Technology and Engineering Development Committee, two Science Steering and Evaluation Panels and three Service Panels. Ad hoc Program Planning Groups, Detailed Planning Groups (DPGs) and Working Groups (WGs) may be approved by the Science Committee as requested by the Science Steering and Evaluation Panels or by the Science Committee itself.

2. Committees, Panels, Detailed Planning Groups, and Working Groups

Each committee, panel, Program or Detailed Planning Group and Working Groups will operate under a mandate, along with guidelines as to membership and frequency of meetings. Mandates, guidelines, and amendments to them, for the standing panels, shall be proposed by the Science Committee for approval by the Executive Committee. Mandates, guidelines and duration of operation for the short-lived Detailed Planning Groups will be specified by SCICOM as required.

3. Science Committee

3.1 General Purpose. The Science Committee reports to the Executive Committee and advises JOI, the Science Operator and Wireline Logging Services Operator on plans designated to optimise the scientific productivity and operational efficiency of the drilling program.

More specifically, the Science Committee is responsible for:

a. providing custodianship of the ODP Long Range Plan

b. soliciting and integrating a global ranking of mature drilling proposals that address the scientific themes and initiatives in the ODP Long Range Plan

c. carrying out long-term science planning, over at least the 5-year period of ODP Phase III (1998-2002)

d. fostering communications among and between the general community, the JOIDES science advisory panels, the Science Operator, and the Wireline Logging Services Operator

3.2 Mandate. The Science Committee is responsible for the creation and mandates of the various advisory panels and planning groups and their membership. It approves their meetings and agendas and may assign special tasks to them. The Science Committee sponsors and convenes COSOD-type conferences at intervals determined by long-term science plans for ODP. SCICOM, through the JOIDES Office, assigns proposals to Science Steering and Evaluation Panels, Program Planning Groups and, if relevant, to Service Panels, for review. SCICOM sets the scientific objectives of the proposals into final priority after they are reviewed by the panels. SCICOM approves the annual drilling schedule as determined by OPCOM by a majority (e-mail) vote. The Science Committee nominates Chief Scientists to the Science Operator, who ultimately chooses them.

SCICOM periodically reviews the JOIDES advisory structure in the light of developments in science and technology and recommends amendment of its panel structure and mandates. Much of the working of the Science Committee is carried out by the commissioning of reports from OPCOM, and the other science advisory panels including Detailed Planning Groups, ad hoc subcommittees of its own membership, and by its chairman at the JOIDES Office.

3.3 Structure. The Science Committee is empowered to establish an infrastructure appropriate to the definition and accomplishment of tasks described in its annual program plan as approved by the Executive Committee and the National Science Foundation.

Communication with the panels and active DPGs is maintained by having their Chairpersons meet with the Committee annually, and by assigning committee members as non-voting liaison members to its panels and working groups. Where counsel and communication are deemed important, other individuals may be asked ad hoc to meet with the Committee or a panel.

3.4 Membership. Each non-US 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. US members of the Science Committee will be appointed by a selection committee convened by the JOI Board of Governors and USSAC. Membership terms will usually be three years and at least one quarter of the Science Committee members shall rotate off the Committee annually, so that the SCICOM membership is replaced every four years. Re-appointment shall be made only in exceptional circumstances. All appointees to the Science Committee shall satisfy the fundamental criteria of having the ability and commitment to provide mature and expert scientific direction to the program. Balance of fields of specialisation on the Science Committee shall be maintained as far as possible by requests to member committees.

3.5 Liaison. The Chief Scientists, or nominees thereof, of the Science Operator and Wireline Logging Services Contractor, the JOI Program Director and an appointee of the NSF are permanent non-voting, liaison observers, as is the TEDCOM Chair.

3.6 Organisation. The Planning Committee meets at least twice a year, normally in April and August. *Robert's Rule of Order* will govern its meetings.

3.7 Vote and Quorum. Within the framework of the Memoranda of Understanding with each non-US participating country (or consortium designee), it is intended that the US members shall constitute at all times at least a majority of members. Substantive issues decided by formal vote require the vote of a majority of all members. A quorum shall consist of at least two-thirds of the non-US members and at least two-thirds of the US members.

3.8 Chairpersonship. The SCICOM Chairpersonship rotates between US and non-US JOIDES institutions with the JOIDES Office. This excludes the Science Operator and Wireline Logging Service Operator institutions. The term of office is usually two years.

4. Operations Committee

4.1 General Purpose. The Operations Committee reports to the Science Committee and provides advice for JOI, the Science Operator and Wireline Logging Services Operator on the implementation of science and technological development plans required to achieve the goals determined by SCICOM.

4.2 Mandate. The Operations Committee is responsible for the determination of the schedule of the drilling vessel over a period that may exceed one year, based on SCICOMs global ranking. It will receive and act upon reports from the service panels, and under guidance from the Chairperson, advise JOI accordingly. OPCOM will advise SCICOM on short-term logistical, technological, and budgetary implications of scientific programs highly ranked by SCICOM, and on longer term technological requirements for implementing the ODP Long Range Plan. The committee will provide scientific advice to JOI, the Science Operator and Wireline Logging Services Operator where scientific and/or technological development projects are underway, and report progress to SCICOM.

4.3 Meetings. The Operations Committee shall meet at least twice per year, the spring meeting preceding SCICOM to allow formulation of reports, the summer/fall meeting will follow the SCICOM global ranking to allow a drilling schedule to be constructed and sent to SCICOM for approval. If a proposed drilling schedule is not approved, OPCOM will reconvene and formulate a new schedule.

4.4 Membership. The Operations Committee will consist of the SCICOM Chair plus two other SCICOM members determined by SCICOM plus 3 other members from the JOIDES community. Members will be selected by SCICOM, with a focused expertise based upon the upcoming meeting agenda. Should additional expertise be required to address specific issues, additional members will be appointed to OPCOM by the Science Committee. The term of membership is for a single meeting, renewable by SCICOM.

4.5 Liaison. The Chief Scientists, or nominees thereof, of the Science Operator and Wireline Logging Services Contractor, the JOI Program Director and an appointee of the NSF are permanent non-voting, liaison observers, as are the TEDCOM, SSP, PPSP and Scientific Measurements Panel Chairs.

4.6 Vote and Quorum. A quorum shall be at least two SCICOM members and two other members. The Operations Committee will reach all decisions by consensus.

4.7 Chairperson. The SCICOM Chair will be the OPCOM Chair.

5. Science Steering and Evaluation Panels

5.1 General Purpose. The Science Steering and Evaluation Panels are established by the Science Committee to interact with proponents and Program Planning Groups in nurturing drilling proposals to maturity, to evaluate those proposals, and then to recommend mature proposals for external mail review. The Science Steering and Evaluation Panels advise SCICOM on thematic development within the Ocean Drilling Program.

5.2 Mandate. Each Science Steering and Evaluation Panel will be responsible for:

a. nurturing to maturity and evaluating the scientific merits of drilling proposals by interaction with Program Planning Groups and proponents

b. providing Program Planning Groups, proponents, and SCICOM with written evaluations and comments on the proposals through the JOIDES Office

c. selecting mature proposals for external mail review, suggesting reviewers, and providing SCICOM with a written evaluation of that external mail review before SCICOM globally ranks the proposal

d. alerting the Site Survey Panel to proposals that will become mature and require initial site survey evaluation

e. advising and interacting with SCICOM on thematic development with ODP

f. advising SCICOM on initiatives and themes that need further development (formation of Program Planning Groups)

g. facilitating communications between SCICOM, Program Planning Groups and proponents

h. advising the Science Committee on the selection of possible Co-Chief Scientists

5.2.1 Each Science Steering and Evaluation Panel is responsible to the Science Committee, and will respond directly to requests from it, as well as reporting to it on a regular basis.

5.2.2 The Science Steering and Evaluation Panels will act as a means of disseminating and correlating information in the appropriate problem areas by:

a. monitoring the progress made by ODP cruise participants and other scientists on the results from shore-based research on samples; encouraging shore-based laboratory work on samples recovered through ODP drilling

b. encouraging its members to contribute to symposia at which the results of drilling will be discussed

c. publishing progress reports in the open literature to inform and encourage participation in the project

d. providing input to SCICOM for the summary of scientific achievements of ODP for inclusion in the ODP Program Plan

5.2.3 These mandates are guidelines and do not restrict panels. The Science Committee may ask Panels to take up topics not in their original mandates.

5.3 Dynamics of Earth's Interior SSEP: Area of Interest

The interests of Dynamics of Earth's Interior SSEP are explained in detail in the ODP Long Range Plan. In particular, important sub-themes of investigation are: exploring the transfer of heat and materials to and from Earth's interior; and investigating deformation of the lithosphere and earthquake processes.

a. Exploring the transfer of heat and materials to and from Earth's interior includes investigation of mantle dynamics, ocean crust, hydrothermal processes and sulphide mineralisation, and mass balance and temporal variability at subduction zones.

b. Investigating deformation of the lithosphere and earthquake processes includes investigation of extensional, translational and convergent boundaries, and earthquake mechanisms.

c. Along with these sub-themes the following areas of investigation have been earmarked for special investigations as ODP initiatives: in situ monitoring of geological processes; exploring the deep structure of continental margins and oceanic crust

5.4 Dynamics of Earth's Environment SSEP: Area of Interest

The interests of Dynamics of Earth's Environment SSEP are explained in detail in the ODP Long Range Plan. In particular, important sub-themes of investigation are: understanding Earth's changing climate; causes and effects of sea level change; and sediments, fluids and bacteria as agents of change.

a. Understanding Earth's changing climate investigations include changes on millennial, century and decadal time scales, climate change at the Cretaceous/Tertiary boundary, the role of greenhouse gasses in climate change, warm climates of the past, the effects of mountain building on climate, and the timing and spatial patterns of biological extinctions and how the biosphere respond to climate change.

b. Causes and effects of sea level change studies include looking at the siliciclastic sediments deposited near sea level along passive continental margins, carbonate reefs, platforms and lagoons deposited near sea level along passive margins or oceanic islands, and oxygen isotope studies of pelagic carbonate oozes. Sea level changes in the Cretaceous period, and the timing, rates and magnitude of sea level changes and its relationship to mass-wasting will also be studied.

c. Sediments, fluids and bacteria as agents of change will look principally at the complex interaction between organic and inorganic material from the continents, deposition from the marine biosphere, and circulation of fluids through the deposited material by focusing on three areas: the carbon cycle; the formation of gas hydrates; and patterns of flow and the geochemical evolution of fluids in sediments and rocks, including reactions with organic compounds and living bacteria.

d. The Earth's deep biosphere is a separate (but related) pilot project and another area for special investigation is understanding natural climate variability and the causes of rapid climate change.

5.5 Meetings. Science Steering and Evaluation Panels meet at least twice a year, but may meet more frequently as requested by SCICOM. They will always endeavour to meet at the same time and location and have overlapping sessions as considerable overlap in thematic coverage has evolved, and is expected to continue to evolve. SCICOM convenes the panel meetings and approves their meeting dates, locations, and agendas.

5.6 Membership. Science Steering and Evaluation Panels are composed of a number of members from US institutions and one member from each non-US participant. SCICOM will advise member committees of its preferred SSEP membership, including scientific balance of expertise. Panellists will serve a maximum of three years, with one-third of the panellists being replaced each year. Members of the Science Steering and Evaluation Panels will not be members of any Program Planning Group. Guests can be invited following approval of attendance by the SCICOM Chair.

5.7 Liaison. The Chief Scientists, or nominees thereof, of the Science Operator and Wireline Logging Services Contractor, the JOI Program Director and an appointee of the NSF are permanent non-voting, liaison observers. SCICOM will have a non-voting liaison to each SSEP.

5.8 Vote and Quorum. A quorum shall be two-thirds of the panel membership and decisions reached by majority voting.

5.9 Chairperson. The chairpersons are appointed by SCICOM.

6. Program Planning Groups

6.1 General Purpose. Program Planning Groups (PPGs) are small focused planning groups formed by SCICOM when it, with advice from the SSEPs, determines that drilling proposals need to be generated to fulfil the goals of the ODP Long Range Plan. This will be where ODP actively co-operates with other international geoscience programs to achieve joint goals.

6.2 Mandate. PPGs will develop drilling strategies and proposals for major scientific objectives that are not adequately covered by existing drilling proposals or strategies. Proposals arising from PPG meetings must be submitted to the JOIDES Office by individual proponents or groups of proponents. They will foster communication between ODP and international geoscience initiatives. PPGs will report strategic advice directly to SCICOM through the JOIDES Office and reports proposal advice to SCICOM through the Science Steering and Evaluation Panels.

6.3 Meetings. These will be on an as-required basis, determined by SCICOM and approved by the SCICOM Chair.

6.4 Membership. Members of PPGs will be focused groups of specialists and proponents, chosen by JOIDES member committees with SCICOM advice through consultation with SSEPs and community programs. Each full member of ODP will have the right of representation. The number of PPGs will be determined by SCICOMs need to fulfil the Long Range Plan objectives, subject to budgetary constraints. The normal term length will be three years, but is renewable by SCICOM.

6.5 Chairperson. The PPG Chairs will be appointed by SCICOM.

7. Detailed Planning Groups

7.1 General Purpose. Detailed Planning Groups (DPGs) are short-lived planning groups which may be created by the Science Committee for more intensive study of certain aspects of planning that may arise.

7.2 Mandate. DPGs will be created by SCICOM with individual mandates that may be either scientifically or technologically based. DPGs will provide written reports to SCICOM. Example tasks for DPGs include: translating highly-ranked ODP science proposals into concrete drilling plans; advising on regional and site surveys needed for future drilling; preparing drilling prospectuses which synthesise all thematic and site survey input.

7.3 Meetings. Active DPGs meet at the request of SCICOM as frequently as required by ship scheduling and routing. DPGs will be disbanded once their task is completed.

7.4 Membership. SCICOM chooses DPG members for their expertise and experience with respect to the assigned DPG mandate. Members may be recommended by the SSEPs and by SCICOM and are appointed by SCICOM or by the SCICOM Chairperson, if necessary.

The DPGs are composed of a number of members from US institutions, and should maintain full representation, if possible, from the non-US JOIDES institutions. The size of the DPG should be commensurate with the charge of the group, a maximum number of 16 members is suggested.

7.5 Liaison. SCICOM establishes liaison with standing DPGs by the appointment of non-voting liaisons.

7.6 Chairperson. The DPG Chair will be appointed by SCICOM.

8. Working Groups

8.1 Purpose. Working Groups (WGs) are short-lived groups which may be created by the Science Committee, in response to requests by SSEPs, PPGs, Service Panels, ODP contractors or by SCICOM itself, for developing strategies for major scientific objectives that are not sufficiently covered by available drilling proposals or PPG objectives. The specific mandate of any WG is defined by SCICOM at the time the WG is formed. Whereas Detailed Planning Groups develop a detailed drilling prospectus based on highly-ranked proposals, WGs develop White Papers that serve as guidelines for new, specific drilling or technology development proposals. WGs provide written documents to the JOIDES Office, which forwards them to all science advisory panels for evaluation. The Reports are then transmitted to SCICOM for further evaluation and usually published in the *JOIDES Journal*.

8.2 General Mandate for Working Groups. WGs are typically charged with:

- establishing and setting into priority scientific objectives and strategy for certain scientific or technological themes
- identifying target areas where specific objectives can be addressed and strategies can be used
- identifying survey information necessary to establish the geologic context
- identifying technological requirements to implement the strategy

8.3 Membership. SCICOM chooses WG members for their expertise and experience with respect to assigned topics. Members are recommended by the appropriate advisory panels to SCICOM and are appointed by SCICOM or by the SCICOM Chairperson, if necessary. WGs are composed of a balance of US and non-US members. The size of WGs should be commensurate with the charge of the group.

8.4 Chairperson. WG Chairpersons are appointed by SCICOM.

9. Technology and Engineering Development Committee

9.1 Purpose. The Technology and Engineering Development Committee (TEDCOM) is responsible for recommending to SCICOM and OPCOM drilling tools and techniques to meet the objectives of the scientific plan and for monitoring the progress of their development through liaison with the ODP-TAMU Engineering development department.

9.2 Membership. Members of this committee are nominated by TEDCOM and approved by SCICOM.

9.3 Liaison. Will be maintained between TEDCOM and the Scientific Measurements Panel. An ODP-TAMU engineer is assigned to act as Science Operator liaison with TEDCOM.

10. Service Panels

10.1 General Purpose. Service Panels provide advice and services to the JOIDES Advisory Structure, and to the various entities responsible for processing, curation and distribution of samples, data and information (including publications) to the scientific community. The Service Panels can respond to specific requests from the Science Operator, the Wireline Logging Contractor, or JOIDES Panels, but in all cases, must report their findings through the Operations Committee as well. When recommendations from the Service Panels involve major fiscal decisions or major programmatic changes, these will be channelled through OPCOM to SCICOM.

The Service Panels, beyond their help to the JOIDES Advisory Structure, are not directly involved with selection of drilling targets or definition of cruise objectives.

Service Panels have specific mandates. Service Panels meet twice per year or as requested by SCICOM.

10.1.1 Membership. SCICOM appoints the Chairperson and panellists and keeps membership, including representation from the non-US JOIDES institutions, under review. The Chairperson serves at the pleasure of SCICOM or their non-US appointing member. Representation from all non-US members should be maintained. Panel membership, not to exceed 15, should be maintained as small as is allowed by the range of expertise necessary to meet mandate requirements.

10.2 Site Survey Panel

10.2.1 General Purpose. The general purpose of the Site Survey Panel (SSP) is to provide information and advice to the Science Committee on the adequacy of and need for site surveys in relation to proposed drilling targets.

10.2.2 Mandate. The Site Survey Panel is mandated to:

a. review site survey data packages prepared by the ODP Site Survey Data Bank and to make recommendations as to their adequacy to the Science Committee in light of the needs defined in mature proposals of the Science Steering and Evaluation Panels, Program Planning Groups and Detailed Planning Groups

b. identify data gaps in proposed future drilling areas and to recommend appropriate action to ensure that either (1) sufficient site survey information is available for pinpointing specific drilling targets and for interpretation of drilling results; or (2) 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 co-operation and co-ordination of site surveys for the benefit of the Ocean Drilling Program, particularly between participating ODP nations' survey activities

e. promote the logging of all data used for planning drilling targets with the ODP Data Bank

10.2.3 Liaison. The Panel maintains liaison with the ODP Site Survey Data Bank Manager and the JOIDES Office, who both send representatives to SSP meetings.

10.3 Pollution Prevention and Safety Panel

10.3.1 General Purpose. The general purpose of the Pollution Prevention and Safety Panel (PPSP) is to provide independent advice to the Operations Committee and to the Ocean Drilling Program with regard to safety and pollution hazards that may exist because of general and specific geologic circumstances of proposed drill sites.

10.3.2 Mandate. All drilling operations involve the chance of accident or pollution. The principal geologic safety and pollution hazard in ocean drilling is the possible release of substantial quantities of hydrocarbons from subsurface reservoir strata. In most deep sea regions, the risk of hydrocarbon release can be reduced or eliminated by careful planning and proper site surveys. Additionally, safety problems may arise in drilling hot hydrothermal systems for lithosphere targets.

Those who plan each Ocean Drilling Program cruise and select its drilling sites are initially responsible to propose only sites that are considered reasonably safe. The JOIDES Pollution Prevention and Safety Panel independently reviews each site to determine if drilling operations can be conducted safely.

The preliminary site survey information and the operational plan are reviewed for each site. Advice is communicated in the form of: (1) site approval, (2) lack of approval, or (3) approval on condition of minor site relocation or amendment of the operational plan.

Approval is based on the judgement of the Panel that a proposed site can be safely drilled in light of the available information and planning.

10.3.3 Liaison. The Pollution Prevention and Safety Panel maintains liaison with the Site Survey Panel, and a designated SSP member attends its meetings. A representative from the Science Operator also attends the meetings. The Operations Committee Chairperson or another representative from the JOIDES Office normally attends meetings.

10.4 Scientific Measurements Panel

10.4.1 General Purpose. The general purpose of the Scientific Measurements Panel (SMP) is to provide information and advice to the JOIDES community through the Operations Committee and the Ocean Drilling Program with regard to satisfying the needs of the scientific community for timely access to data and samples, on methods and techniques for determining the physical state, chemical composition, and dynamic processes in ocean crust and its sediment cover from downhole measurements and experiments, and it is concerned with the inventory, operation, condition of scientific instrumentation onboard the *JOIDES Resolution* and data handling for onboard measurements.

10.4.2 Mandate. The Scientific Measurements Panel is mandated to advise OPCOM on: the monitoring and recommendation of development and/or acquisition and /or dissemination of scientific measurements, and to advise on the scientific and operational feasibility of proposal requirements.

10.4.3 Meetings. The panel will meet twice per year in advance of OPCOM, with a usual, but not exclusive location of ODP-TAMU in College Station. Occasional meetings that include a visit to the *JOIDES Resolution* would be valuable.

10.4.4 Membership. SCICOM will suggest nominations to member committees. The panel will consist of members from US institutions and from non-US JOIDES members or consortiums. Representation from all non-US members should be maintained, if possible. The number of members should not exceed 15 and these should be appointed so as to represent the range of disciplines within the scope of the panel's activities. The normal membership term length will be 3 years.

Ideally, a majority of those serving on the panel should have participated on a cruise of the *JOIDES Resolution*.

10.4.5 Liaison. JOI, the Wireline Services Operator and Science Operator of ODP shall each be represented by non-voting liaisons to the Panel.

Ratified by EXCOM: 15 September 1988

Adopted by JOI Board of Governors: 15 September 1988

Revised by EXCOM/JOIBoG: May 1989, October 1989, June 1990, June 1993, January 1994

Figure 1. Wiring diagram of the JOIDES science advisory reporting structure.

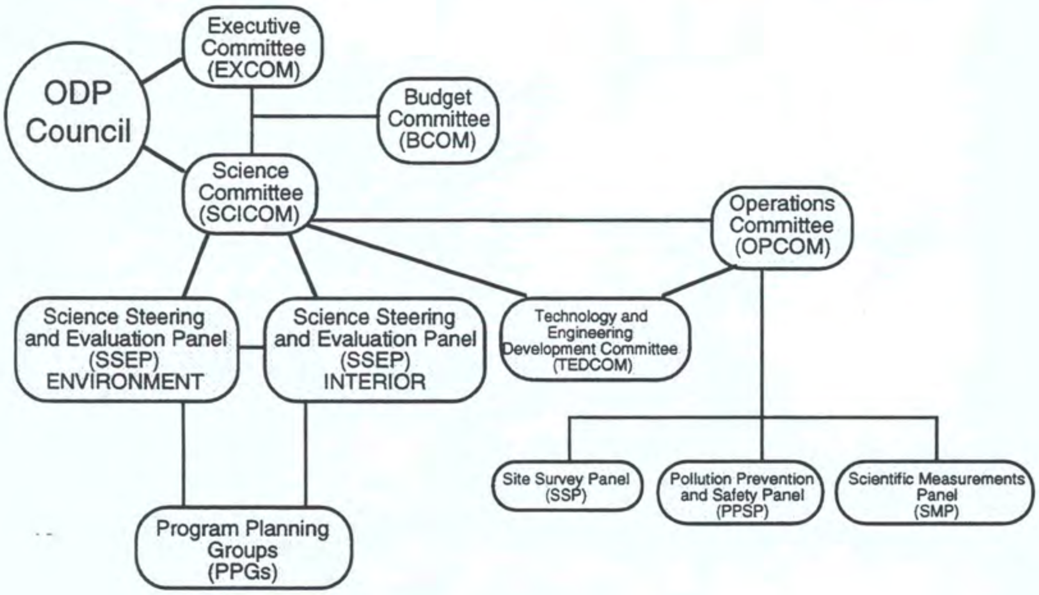
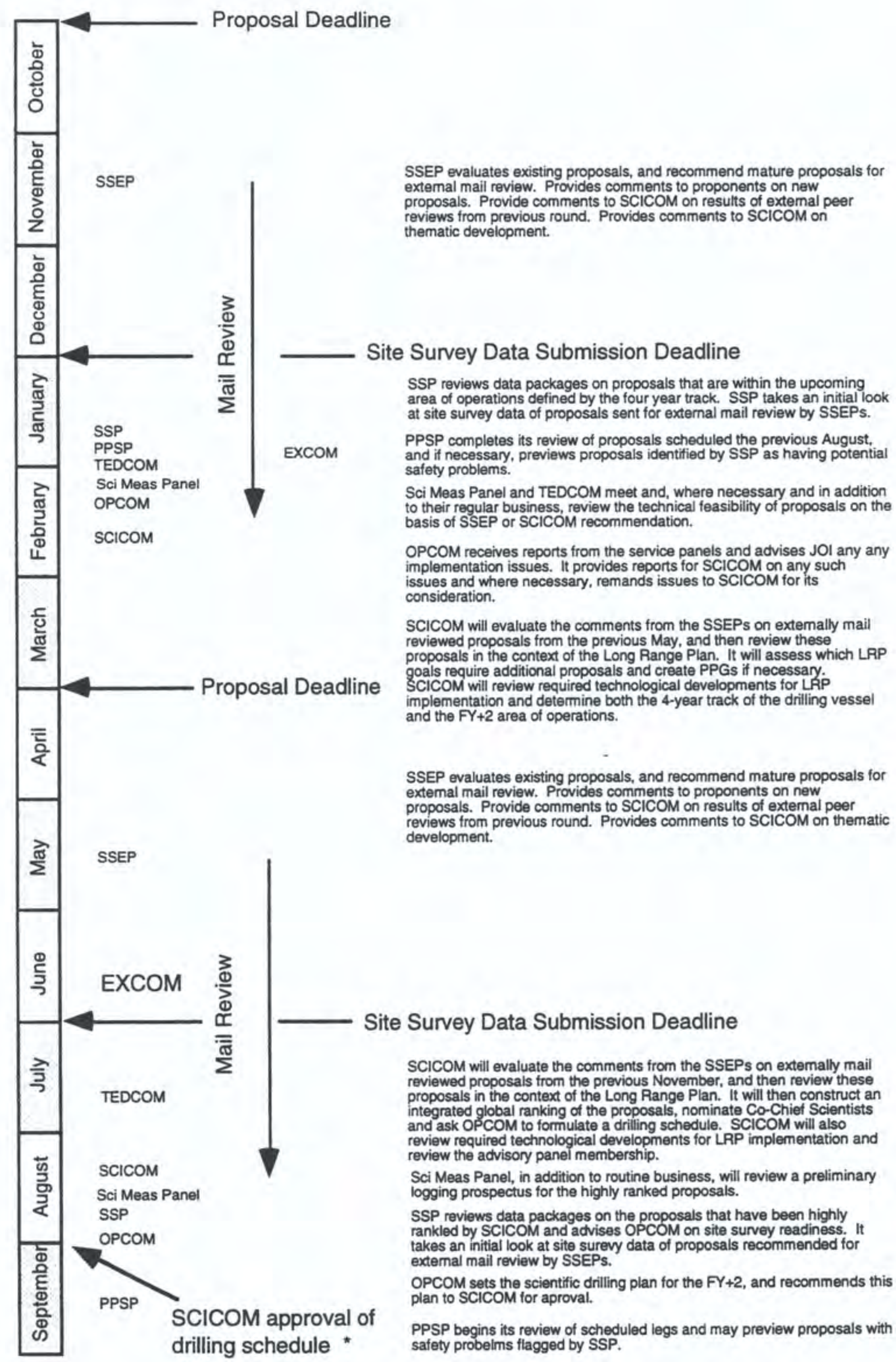


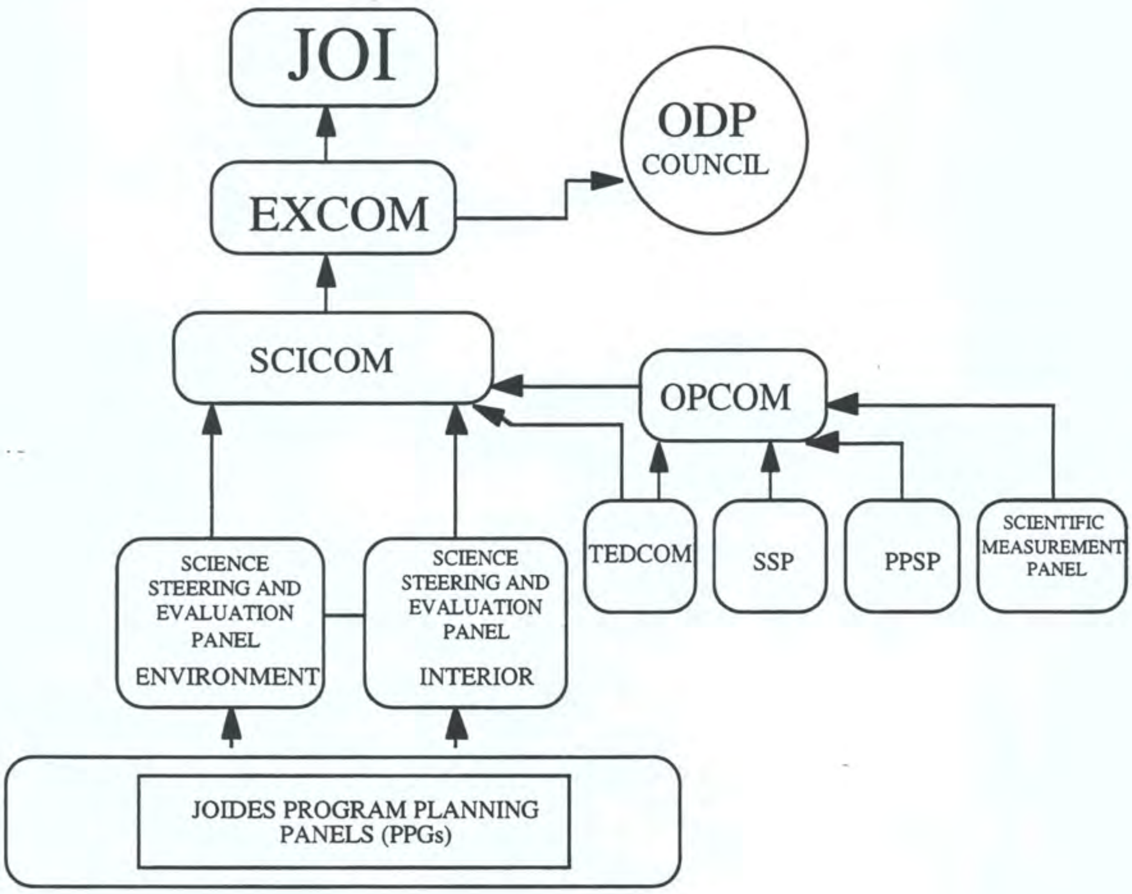
Figure 2. Annual timetable of JOIDES advisory structure meetings



* NOTE: SCICOM will approve the drilling schedule with a majority vote of unconflicted members by e-mail. Failure to confirm the schedule will necessitate re-convening OPCOM.

KEY
EXCOM = Present Committee
SCICOM = JOIDES Science Committee
OPCOM = JOIDES Science Operations Committee
SSEP = Science Steering and Evaluation Panel
SSP = Site Survey Panel
Sci Meas Panel = Scientific Measurements Panel
PPSP = Pollution Prevention and Safety Panel
TEDCOM = Technology and Engineering Development Committee

JOIDES REPORTING FLOW DIAGRAM



The ODP/JOIDES reporting structure is fairly straightforward, as shown in the diagram.

- Formal reporting in the science advisory structure will begin with the SSEPs and TEDCOM to SCICOM.
- SCICOM will report on the Science Plan and progress with the LRP through the Joint SCICOM/OPCOM Chair to EXCOM and ODP Council.
- OPCOM will receive reports from all of the service panels.
- OPCOM will report on operational matters and leg scheduling through the Joint SCICOM/OPCOM Chair to EXCOM and SCICOM.
- It is important to note that the JOIDES PPGs are accountable to SCICOM although they will report to SCICOM through the SSEPs. This accountability will be measured in terms of the quality of proposals that flow through the JOIDES system and are ultimately evaluated by SCICOM.

DRAFT

ODP FIVE-YEAR SCIENCE PLAN:

(1999-2003)

PREPARED BY THE JOIDES OFFICE
WOODS HOLE OCEANOGRAPHIC INSTITUTION

(Third Draft - 18 November 1996)

INTRODUCTION

The Ocean Drilling Program has identified two overall themes for scientific ocean drilling beyond the year 1997. The first of these themes is "Dynamics of the Earth's Environment" and it encompasses a range of scientific problems related to understanding how our planet's environment - in particular the atmosphere, hydrosphere and biosphere - changes in response to natural and anthropogenic perturbations. The second theme is "Dynamics of the Earth's Interior" which seeks to examine the properties and processes within the lithosphere in order to advance our understanding of the structure of the Earth's outer layers, global mass and energy fluxes, mantle dynamics, and deformation processes.

Within these broad themes, several "core" themes and specific initiatives are identified for which ocean drilling is either the best or only way to solve problems of a fundamental scientific nature:

Dynamics of the Earth's Environment
- *Understanding Earth's Changing Climate*
- *Causes and Effects of Sea level Change*
- *Sediments, Fluids and Bacteria as Agents of Change*

Dynamics of the Earth's Interior
- *Exploring the Transfer of Heat and Material To and From the Earth's Interior*
- *Investigating Deformation of the Lithosphere and Earthquake Processes*

This document examines in detail the scientific objectives contained within each core theme and sets out an implementation plan and the expected accomplishments for the next five years (1999 -2003), together with the required technological developments.

1. DYNAMICS OF THE EARTH'S ENVIRONMENT

1.1 UNDERSTANDING EARTH'S CHANGING CLIMATE

Exploring the causes, effects, and interrelations between climate change and oceanic circulation patterns is essential to understanding our climate system and predicting its response to such factors as global warming from greenhouse gases. ODP has already contributed substantially to our knowledge of the longer term factors that influence climate (e.g. Milankovitch cycles, evolution of oceanic gateways) and is now ready to investigate decadal-to-century time scale variations by collecting long, extremely high-resolution records from areas of rapid sedimentation rates. Drilling for the next five years (1999-2003) will focus on three major objectives.

1.1.1 Understanding Natural Climate Change and the Causes of Rapid Climate Change (ODP Initiative I)

This initiative will take advantage of new, high-resolution analytical techniques to investigate the causes and consequences of natural climate variability over short (tens to thousands of years) time scales. The nature and timing of these rapid fluctuations are extremely relevant to society in terms of understanding the climatic impact of global warming - one of the most pressing environmental issues.

ODP aims to assess (a) whether the variables linked to rapid climate change are globally distributed and mechanistically linked to some common driver, such as solar variability, or whether they represent local variations of naturally unstable systems, such as thermohaline circulation; and (b) whether rapid climate change is systematic and predictable, or whether it is random and inherently unpredictable. To achieve these aims, ODP needs to constrain the origin and history of glaciation in Antarctica, the stability of Earth's tropical thermostat; and mechanisms of heat transport in boundary currents and deep waters during anomalous warm climate regimes.

Mechanism of Implementation: High-resolution climate studies associated with ODP Initiative I will form parts of ODP Legs drilled for other objectives (climate and other). They will form parts of approximately 6 Legs in Phase III (adding up to a one-Leg equivalent). ODP expects to exploit opportunities in the Southern Oceans, in marginal basins, on continental margins, in coral sequences, drifts, and fjords. Possible targets include the South China Sea (origin and history of monsoonal climates of Asia), the Bering and Okhotsk Seas (examining polar processes, possible deep-water sources and Arctic connections), Gulf of California (investigating a productive low-latitude system), Laurentide region in Canada (monitoring ice sheet stability). In addition, ODP will expand the geographic array of sites that record climate variations on decadal to millennial scales, emphasizing locations that both monitor key oceanographic systems and can also be dated with good precision. These will typically involve 'sites' of opportunity that are of short duration between more conventional Legs.

Expected Outcomes by 2003: By the end of this phase, we expect to have a first-order global sampling of key climatic systems with resolution of decadal-to-century scale variations. Focused studies will include trade-wind processes in the tropics, productive eastern-boundary current systems in the Northern and Southern Hemisphere, deep-water flows in the Atlantic and Pacific, and polar processes in the Northern and Southern Hemispheres. With these data, ODP will assess global versus local extent and predictability of decadal-millennial scale climate changes.

1.1.2 Orbital Scale Climate Dynamics

During 1998-2002, ODP will focus on the Southern Hemisphere in order to test climatic sensitivity to changing greenhouse gases relative to orbital changes that modify solar energy and regional glacial history on a global scale. In addition, information on Pacific deep waters (including hypothesized Northern Hemisphere Pacific sources and nutrient cycles) is needed to complement our knowledge of history and sensitivity to change of Atlantic Deep water components, which are primary players in global heat transport. ODP aims to extend orbital-scale climate studies and time-scales back in time, prior to the ice ages, and hence to test the role of ice sheets in regulating global climate sensitivity. Primary focus will be on the study of South Pacific systems of glaciers and ice sheets, as well as ocean current connections to lower latitudes and Pacific deep water sources.

Mechanism of Implementation: Significant advancement of these objectives will require drilling 5 Legs or their equivalent. Required sites lie mostly in the Southern hemisphere and possibilities include: a paleoceanographic transect across the Southern Ocean - Atlantic Sector (1 Leg); studies of the W. and E. Antarctic ice-sheet history (ANTOSTRAT proposals) (1-2 Legs); studies of the Southern Hemisphere Pacific (W. and E. boundary currents) (2-3 Legs); studies of N. Pacific Deep Water sources (1 Leg); and investigation of Monsoon and the Indonesian Gateway (1-2 Legs).

Expected Outcomes by 2003: ODP will have made continued progress towards a better understanding of the changing sensitivity of the global climate system to orbital forcing, and further refinement of geologic time scales. High-resolution, orbitally-tuned geologic time scales will be extended and calibrated from their current limit of the past 10 Ma to the past 40 Ma or longer. Major steps will have also been made to establishing a hemisphere-by-hemisphere detailed history of ice sheet growth, distribution and decay.

1.1.3 Climate Extremes

Understanding processes that maintain extreme warmth in Earth's climate are key to understanding Earth's future "greenhouse" climates. They are also critical in testing the sensitivity of existing climate models and providing parameters for new predictive models for future climate change.

ODP aims to investigate anomalous, extreme climate systems of the past, test hypotheses relating to the roles of atmospheric CO_2 and warm, deep waters in driving climate change, and the role of explosive volcanism in abruptly ending warm intervals. Key processes to constrain in achieving these objectives are the origin and history of ice in Antarctica, the stability of Earth's tropical thermostat, and mechanisms of heat transport in boundary currents and deep waters during anomalous warm and cold periods.

Mechanism of Implementation: ODP will focus on key warm intervals of the Pliocene (an anomalous warm time with relative cool deep waters and some polar ice sheets, with CO_2 ranges near those of today), Eocene (a time of extreme warmth, high CO_2, warm deep waters, little polar ice, and low equator-pole thermal gradients), and the Cretaceous (oceanic anoxic events). Drilling will be required to investigate Paleogene equatorial systems (1 Leg), latitudinal thermal gradients (e.g. Bering Sea) (1 Leg), and the origins of ice in W. and E. Antarctic (ANTOSTRAT Paleogene proposals (2 Legs). Approximately 2 Legs of drilling will investigate the interactions between tectonics and climate change and may include Himalayan Uplift (1 Leg), the history of the Australia-Antarctic Gateway (1-2 Legs), the W. Pacific warm pool and Indonesian Gateway (1 Leg), and the Drake Passage and Panama Isthmus experiment (1-2 Legs).

Expected Outcomes by 2003: We will have advanced understanding how high-latitude and low-latitude systems behave during episodes of extreme warmth, the key to understanding climate system processes (stability, variability, mean state, etc.) that control greenhouse warming. Results will include the origin of Antarctic ice sheets, better constraints on Northern and Southern Hemisphere thermal gradients and heat transport in warm climate regimes, and tectonic-climate interactions such as development of Southern Ocean circumpolar climates and development of Asian monsoons associated with northward drift of Australia and Himalayan uplift.

1.1.4 Collaborations with other Global Geoscience Programs

There are several international and national programs addressing issues of Climate Change. These include GLOCHANT, IGBP/PAGES, IMAGES/MESH, CLIVAR, PANASH/PEP, ANTOSTRAT and NAD. Of particular importance in addressing the issue of rapid climate change is establishing a global array of high-resolution climate records - a goal beyond the capabilities of any one nation or program. Collaboration with other programs such as the Nansen Arctic Drilling (NAD) program working in the Arctic region, ANTOSTRAT working on the climate history of Antarctica, and the IMAGES (International MArine Global changE Study) program which is expanding geographic coverage using conventional piston cores, and the use of other drilling platforms, will be required to address this fundamental scientific problem.

1.1.5 Summary of Technology Requirements

In order to fully address questions about Earth's Changing Climate, enhanced high-resolution core logging with relevant data handling and database capabilities are required. Larger diameter, longer APC cores are needed to aid high-resolution sampling and improve continuity of section. Sampling policies must accommodate high-resolution studies. Orbital scale studies need improved recovery in XCB and RCB coring, efficiency of laboratory operations at sea, and resolution of down-hole logging. Antarctic studies will require improved recovery of coarse sediments, and ice support vessels on 4 or 5 Legs.

Opportunities in rapid climate change typically involve short but geographically-widespread drilling operations, which must be packaged with Legs examining longer-term climate variations or other regional studies.

1.2 UNDERSTANDING THE HISTORY AND EFFECTS OF SEA LEVEL CHANGE

The shoreline divides Earth into two fundamental realms. Unfortunately, little is known about the causes, mechanisms and timing of changes in sea level because we lack data in critical locations that would reveal the full geologic expression of sea level change. They occur on a variety of time scales (from tens of years to tens of millions of years) and are now hypothesized to be related to complex interactions between climate, orbital dynamics, and the vigor of thermal convection within the Earth's asthenosphere. Sea-level fluctuations have tremendous economic and environmental impact on coastal zones and oceanic islands. ODP has begun two programs of study to address these problems that will continue during the next five years. These programs are directly inter-related and results from them will be combined to address the history of sea level changes.

1.2.1 Testing Models of Global Sea Level (Eustatic) Change

The first program tests models of why sea-level changes on a global scale; it seeks to determine the magnitude, age, and mechanism of past sea level changes on vertical scales ranging from meters to hundreds of meters and on time scales from thousands of years to millions. These changes will be used to explore the complex relationship among planetary climate, orbital dynamics and thermal convection of Earth's interior. In addition, ODP aims to investigate the causes and effects of very fast changes in sea level, (cycles on the order of a few meters over a few hundred years) in order to (a) determine how they are related to large-scale mass wasting events on continental margins and oceanic platforms, and (b) assess whether this relationship will allow the prediction of coastal geohazards.

Mechanism of Implementation: Testing models of global sea-level (eustatic) change requires that geologic time be known as precisely as possible. Consequently, constructing reliable geochronologic records is a first-order issue. Because changes in global ice volume are known agents of sea-level change, both direct and proxy indicators of continental ice growth/decay are needed. These will be collected in high-latitude drill sites along the Antarctic margin, as well as in high-resolution oxygen isotopic records from the open ocean. Atolls and guyots, the nearest we have to sea-level "dip-sticks", will provide additional direct measures of eustatic change.

1.2.2 Testing Sequence Stratigraphic Models

The second program tests models of the geologic impact of changing sea level. It seeks to understand the link between sea level change and the stratigraphic record of unconformities and the sediments between them.

Mechanism of Implementation: Testing stratigraphic models of sea-level impact will require transects of drillsites across continental margins and carbonate platforms of various ages and tectonic settings. The range of factors contributing to the stratigraphic expression of sea-level change is large and complex, and sampling needs to be restricted to carefully chosen locations. Hence purely siliciclastic and purely carbonate environments will be drilled before attempting one that is a mixture of both. Records from regions of contrasting rifting age must be compared before it is assumed that all factors have been isolated. Furthermore, sampling will not be restricted to those regions now covered by water; many valuable records of the effects of sea-level change now reside beneath land requiring the continuation of drillsite transects up on to land.

Testing stratigraphic models of sea level impact will require transects of drillsites across continental margins and carbonate platforms of various ages and tectonic settings. As the range of factors contributing to the stratigraphic expression of sea level change is large and complex, ODP will drill purely siliciclastic and purely carbonate environments before sampling a margin that is a mixture of both.

Expected Outcomes of Both Programs by 2003: ODP drilling will have produced a global time scale at the precision of orbital forcing (~20 Ka) back through the entire Cenozoic. This will provide comparisons between the history and impact of sea-level changes of when ice was known to cover Antarctica (the Neogene-Oligocene) to when it was not (Paleocene-Eocene). Detailed records back to the mid-Cretaceous warm interval will have been begun, but may not be at the same level of documentation as the younger time periods, although ODP will have completed the New Jersey Margin sea level transect which will provide critical documentation of the long-term record of sea level change back to the Cretaceous. Margin transects from both hemispheres and in end-member depositional settings will show how eustacy affects the age of basin-wide unconformites and the distribution and composition of sediments between them. Both programs - testing eustatic models and testing the stratigraphic expression of eustatic change - will by that point provide baseline information on how this fundamental planetary dividing line has changed in the past, and what critical factors will affect it in the future.

1.2.3 Links to Other Global Geoscience Programs

The goals of this scientific theme are directly linked to many of the same programs as the Rapid Climate Change theme, including IMAGES, ANTOSTRAT, MARGINS, NAD, and ICDP.

1.2.4 Summary of Technology Requirements

- Coring/Drilling - (a) larger diameter and longer, less-disturbed cores that ensure complete and continuous recovery to obtain precise time scales; (b) high core recoveries and good hole conditions to ensure excellent log quality in challenging lithologies; DCS will be valuable in this regard; (c) more precise knowledge of the distance from sea floor to drill bit during operations to allow better calculation of the true sediment depths will permit sediment accumulation rates to be calculated accurately.
- Overlapping measures of stratigraphic position (bio-, chemo-, magnetostratigraphy) are essential to construct increasingly accurate geochronologies.
- Tools - (a) Improved tools to analyze sediment properties at high resolution for down-hole logging and for analysis of sediment cores to permit correlation between drill holes, and between down-hole logs and sediment cores; (b) logging techniques to log the upper part of the sediment column.
- Transects of drillsites that sample a continuum of depositional environments and subsidence histories must be collected across continental margins and platforms; onshore and shallow-water drilling are inescapable components of this strategy. This will require industry-quality seismic grids to identify drilling targets and assess drilling safety; blow-out preventers with a riser system will be needed to drill safely and effectively.
- Special "ancillary" platforms - (a) temporary access to a "jack-up" drilling rig with diamond-coring capabilities for recovering long sequences of coral reefs, or shallow shelf sediments for high-resolution climate and sea level studies; (b) specialized ice drilling platforms for drilling in polar regions.

1.3 SEDIMENTS, FLUIDS AND BACTERIA AS AGENTS OF CHANGE

Marine sediments contain a record of how the global biogeosphere operates and changes over time. ODP has been studying the sedimentary record of these processes to understand how the Earth's environment is changing and what role human activity may be playing in perturbing the natural cycles. Drilling for the next five years will focus on three major topics - one of which, the Earth's deep biosphere - represents a new and exciting Pilot Project for ODP.

1.3.1 The Carbon Cycle

Marine sediments play an integral role in the carbon cycle by mediating long-term changes in atmospheric carbon dioxide levels, and by the preservation of organic carbon by burial. However, the pathways and rates of exchange of carbon are not well understood.

A new investigative approach will be to drill in environments that result in strong, local perturbations. In addition, ODP will continue to explore the distribution and extent of gas hydrates and their mechanism of formation on the outer continental margins. A large amount of methane may be stored as frozen gas hydrates, thereby representing a significant, but yet unquantified, reservoir in the global carbon system. ODP plans to carry out drilling in a variety of settings on the outer continental margins in order to obtain a better understanding of gas hydrates, particularly (a) their global distribution and composition, (b) dynamics of their formation and destruction in the marine environment, and (c) their significance in terms of resources and the environment.

<u>Mechanism of Implementation</u>: 2-3 Legs of drilling are planned for transects of holes in sedimentary environments that may represent extreme cases in the carbon cycle. These may include restricted anoxic basins or very high productivity environments. In addition, the accretion and subduction of sediments containing organics at convergent margns leads to a linkage between global carbon fluxes, gas hydrate distribution, and the interaction of tectonic hydrogeologic processes in these systems. Opportunities are potentially available within the framework of other drilling programs located on convergent margins in the Pacific Ocean.

<u>Expected Outcomes by 2003</u>: Drilling will provide examples of how the carbon cycle is affected by extreme environments, thereby allowing the response of the carbon cycle to such conditions to be modeled. The gas hydrate drilling program will place better constraints on the global volume of gas trapped in hydrated sediments, its composition, and lateral variability. Analyses of recovered gas hydrates will (1) determine their source and, coupled with regional geophysical studies, their migration paths (if they are produced locally); and (2) ascertain whether gas hydrates stimulate or modify fluid flow on continental margins.

1.3.2 Fluid Flow in Sediments and Rocks

ODP has demonstrated that fluids flow through crustal rocks and sediments in a range of tectonic settings and interact both physically and chemically with the substrate and bacteria living within it. These processes play crucial roles in the dynamics of deformation and in formation of mineral deposits, hydrocarbon reservoirs, and global geochemical cycling. There is intrinsically a strong cross disciplinary coupling in many processes involving fluid flow. For example, in the saturated and brittle portion of the crust, the hydrogeologic system, state of stress, and resulting fault movements are coupled and interact through the fluid pressure and permeability terms. Chemical processes also interact with the tectonic system by way of mineral dehydration reactions and permeability changes resulting from chemical precipitation and rheological effects. Investigating fluid generation mechanisms and the processes that control the distribution fluid flow and the accompanying chemical fluxes will require innovative downhole sampling techniques and borehole monitoring experiments.

ODP is on the threshold of developing an integrated strategy for the study of sub-seafloor fluid flow processes for promoting an understanding of the impact of subsurface hydrogeologic and geochemical systems on the Earth's exterior and internal biosphere, mass flux balances, and the dynamics of actively deforming systems. Objectives of these studies will include investigation of (a) the coupling of subsurface fluid and chemical regimes and deformation in active tectonic environments, including spreading and subduction zone environments (i.e. including fault dynamics and earthquake processes); (b) the coupling between fluid flow and geochemical processes including the cycling of carbon and greenhouse gases; and (c) the impact of hydrogeologic (i.e. nutrient fluxes) and physical environment on the subsurface bioecology.

Mechanism of Implementation: Fluid-related implementation strategies will be included as a normal part of each relevant ODP Leg. Certain specific legs will, however, have a greater focus on fluid-related processes with the associated significant requirement for complex fluid sampling strategies, hydrogeologic monitoring experiments, and physical property studies (examples include Nankai and perhaps the Mariana system). Continued technological developments within the 1999-2003 time-frame will be key to successful progress in elucidating processes of fluid flow and their consequences within sediments and crust (see Technology Requirements section below).

Expected Outcomes by 2003. By 2003, fluid sampling and hydrogeological experimentation will be firmly in place as a routine part of each interdisciplinary ODP drilling program. First-order questions related to the magnitude of fluid flow in different tectonic settings, and the chemical reactions that take place between fluids and the host material will have been answered, thereby allowing more focused studies at specific sites in future years.

1.3.3. Earth's Deep Biosphere (ODP Pilot Project)

The recent discovery that bacteria live in sediments as far as 500 m below the seafloor, as well as in volcanic rocks along mid-ocean ridges, has raised many questions concerning the extent of the subsurface biosphere, as well as its role in global biogeochemical cycles. ODP aims to test the hypothesis that there is a substantial sub-surface biosphere in upper crustal rocks and marine sediments, and to investigate its behavior, distribution, and contribution to the global carbon budget. This is designated as a special "Pilot Project" in the ODP Long Range Plan.

Mechanism of Implementation: There are three logical stages to the development of this project that ODP will implement in the next five years:

(a) Establishment of facilities on board the *JOIDES Resolution* for sampling and analysis of the expected microbial communities, including the development of techniques for drilling and core handling that will provide a clean (not sterile) environment from which bacterial samples can be obtained.

(b) Formal and informal interaction between advocates/experts on the subsurface biosphere and proponents of drilling proposals that have other scientific objectives as the primary goals in order to (a) utilize some of these sites for preliminary tests of the hypotheses and (b) to establish the initial experience in sample handling and diversity of the microbial communities and environments.

(c) Completion of two transects to test the hypothesis of the widespread existence of microbial processes deep within the sedimentary column. One transect will likely be in sediments on either an active or passive margin (likely to be biologically very different) and the other in upper oceanic crust on the flanks (1-20 Ma) of a spreading center - a habitat that is very different from sediments.

Expected Outcomes by 2003: The ODP expects to have accomplished a fundamental test of the hypothesis of the presence of a deep biosphere in upper crustal rocks and sediments, and the links of microbial processes to sediment diagenesis. In addition, the range of environments linked with this biological activity will have been evaluated, the nature of the interaction of this biological activity (including avenues of output and input) with the oceanic and continental carbon reservoirs will have been determined, and the most appropriate site for a (post--2003) drill hole to serve as a biological observatory for long-term time-series measurements will have been identified.

1.3.4 Collaboration with Other Global Geoscience Programs

The carbon cycling aspects of Sediments, Fluids and Bacteria as Agents of Change, and in particular, the interest in gas hydrates, are closely linked with scientific objectives of MARGINS. Completion of studies of fluid flow and microbial processes deep within the sediments and crust will require collaboration with InterRidge, who have strong interests in monitoring processes within the oceanic crust, the Subsurface Science Program of the U.S. Department of Energy, and the Deep Biosphere Initiative.

1.3.5 Summary of Technology Requirements:

Continued technological development of downhole equipment for routine recovery of gas-bearing sediments, such as those containing gas hydrates, in an undisturbed condition (e.g. Pressure Core Sampler) is necessary. In addition, methods must be developed to facilitate accurate sub-sampling of fluids and gases in such sediments under pressure.

Fluids in Sediments and Rocks objectives require continued technological development of (a) observatory-based methods for long term monitoring and sampling of fluids and aqueous chemistry at multiple levels within both shallow and deep penetration observatories; (b) the development of hydrogeologic experimental equipment for conducting hydrogeologic experiments from the ship, including packers and pumping equipment with the necessary sensitivity; (c) and continued refinement of PCS-type technology.

Testing of the subsurface biosphere hypothesis requires detailed knowledge regarding the chemistry, temperature, and vigor of the circulation fluid as well as the rock/sediment matrix. New technological developments will require the ability to isolate (via packers) stratigraphic sections and sample fluids from specific permeable sections. The ability to tightly CORK holes in sediment and igneous basement and resample fluids in multiple subsequent years (wire-line re-entry) is also crucial. While "sterile drilling" is not expected to be a viable option, advances in providing "clean" samples and appropriate microbial analyses of cores will be an essential feature of technological development.

2. DYNAMICS OF EARTH'S INTERIOR

2.1 EXPLORING THE TRANSFER OF HEAT AND MATERIALS TO AND FROM THE EARTH'S INTERIOR

Quantifying and modeling the physical and chemical processes involved in the solid Earth geochemical system requires a knowledge of mantle dynamics, the formation and structure of oceanic crust, hydrothermal processes and sulfide mineralization, crustal aging, and recycling of material at subduction zones. Although some of these studies are currently limited by the need for continued technological development of new drilling techniques for hard rocks, as well as the ability to drill deep holes, considerable progress will be made during the next five years (1999-2003) focused on four scientific problems.

2.1.1 Dynamics of Mantle Reservoirs (ODP Initiative II)

Investigation of mantle dynamics will require the establishment of seafloor borehole observatories for continuous recording of broadband seismic data to obtain mantle tomographic images. This would significantly improve the coverage of global seismic stations, and allow better resolution of mantle features, as well as decreasing the threshold at which earthquakes can be detected in many areas. Another important aspect of mantle dynamics is the substantial energy transfer from the Earth's interior to the surface represented by the emplacement of Large Igneous Provinces (LIPs) in the Cretaceous, but not in the Cenozoic, suggesting a radically different mode of mantle dynamics.

ODP aims to drill holes in the oceanic crust for the emplacement of broadband seismometers that will become part of the Global Seismic Network (GSN). In addition, drilling deeply into oceanic plateaus and volcanic margins is required to examine the chronology and geochemistry of several Large Igneous Provinces (LIPs) in order to estimate magma volumes, and timing and mechanisms of emplacement.

Mechanism of Implementation: Between 1999-2003, ODP expects to drill three holes that are left in a condition suitable for emplacement of broadband seismometers. It is likely that these holes will be drilled to meet other scientific objectives, but are suitably located to become seafloor borehole observatories. An exploratory phase of LIP drilling is envisaged over the next five years in which transects of shallow holes across LIPs will be used to determine ages and geochemical trends. A total of two or three Cretaceous LIPs in the Indian and Pacific Oceans (2-3 Legs) are targeted as existing data suggest that they may have different origins. This will allow selection of sites for deeper penetration during Phase IV of the ODP.

Expected Outcomes by 2003: It is hoped that at least one or two holes drilled for seismometer emplacement will be instrumented and operational as part of the Global Seismic Network. Our knowledge of LIPs emplacement and composition will have been advanced by determination of (a) the period of time taken to form individual LIPs; (b) whether or not LIP formation was episodic; (c) the relative importance of upper and lower mantle as sources of LIPs; and (d) whether mantle circulation, as expressed by the formation of LIPs, has changed through time.

2.1.2 Characterization of the Oceanic Crust (ODP Initiative III)

A long-standing goal of the marine scientific community has been to address a number of important questions related to the structure and composition of the oceanic crust. Such questions include the early rifting history of continents and the deep structure of rifted continental margins, the process of formation of oceanic crust, and its deep structure.

Drilling in the next five years will aim to improve our understanding of the interrelationships of magmatic, hydrothermal, tectonic and biological processes that lead to the generation of oceanic crust at mid-ocean ridge. A series of experiments will provide information about the architecture of the oceanic crust by: (a) drilling a deep hole to obtain a representative section of fast-spreading oceanic crust down to the depth at which melt lenses have been imaged beneath the spreading axis; (b) drilling two holes, at the center and the end of a segment in a slow spreading ridge, to investigate crustal heterogeneity and its relation to magma production ; (c) drilling a fore-arc section that will represent a reference to test the model of ophiolites being analogs for crustal sections in these environments.

Mechanism of Implementation: For the fast-spreading crustal section, ODP will assign one Leg of preliminary drilling of several holes in Pacific crust (away from the axis) to characterize lithologic variability in the upper crust, followed by two Legs to deepen one of these holes to 3 km. Two legs will be devoted to drill the holes at the center and the end of a segment of the MAR. One leg will be devoted to drill a forearc in the western Pacific.

Expected Outcomes by 2003: By the end of 2003, the ODP expects to be able to compare and contrast the structures of fast and slow spreading crust down to depths of about 3 km, as well as test the ophiolite model for a section through a fore-arc. In addition, knowledge of the crustal structure will considerably improve our evaluation of the mass and heat budgets associated with the formation of oceanic crust.

2.1.3 Hydrothermal Processes and Formation of Massive Sulfide Deposits

Hydrothermal circulation and seawater-rock reactions are responsible for exchange of heat and mass between the lithosphere and hydrosphere. A goal of studies of these systems has been to understand hydrothermal processes and assess their role in global heat and geochemical budgets.

In order to understand active processes at mid-ocean ridges, it is necessary to carry out long term measurements of key parameters such as temperature and pressure. In the context of a ridge axis observatory, measurements in boreholes will provide information on the subsurface physical, chemical, and hydrogeological structure of the oceanic crust and allow the properties of hydrothermal fluids over the time scales of several years to be monitored. In addition, because many of the more economically important sulfide deposits formed in a back-arc, rather than mid-ocean ridge environment, drilling into an actively-forming hydrothermal deposit linked to felsic magmatism at a convergent margin will allow (a) examination of the internal structure of a large ore deposit to determine the processes that result in concentrations of metals at the seafloor and in the stockwork zone; (b) determination of the lateral and vertical heterogeneity of such a deposit, and assessment of the importance of such processes as metal remobilization and zone refinement; and (c) estimation of the geochemical fluxes associated with hydrothermal circulation.

In both experiments, the extent of the biomass associated with deep hydrothermal circulation will be of particular interest.

Mechanism of Implementation: The borehole long-term instrumentation effort will be developed in conjunction with seafloor instrumentation in the context of a ridge observatory (through InterRidge). A series of CORKed boreholes will be strategically located within the observatory site and instrumented for long-term monitoring (1 Leg). Subsequently, one of the holes may be un-CORKed, drilled to about 2 km, and re-CORKed with the objective of evaluating chemical processes occurring within the "reaction zone" of the deposit.
One additional Leg will be devoted to drilling a large, actively forming hydrothermal deposit in a convergent margin setting. It will consist of a series of short holes, to determine the extent of the deposits, and one deep hole (~ 2-3 km) to penetrate the deposit, its stockwork zone, and its underlying "reaction zone". The likely target is one of the many deposits now identified within the Western Pacific arc-basin system.

Expected Outcomes by 2003: ODP/InterRidge will have set up a ridge axis observatory and produced preliminary data addressing the temporal variability of active processes, in particular fluid circulation. The ODP will also have provided the first modern, three-dimensional analog for enhanced understanding and exploration of high grade, volcanogenic massive sulfide deposits formed at a convergent margin.

2.1.4 Mass Balance Experiments at Convergent Margins

Convergent margins are an important component of the Earth's geochemical cycle. An important ODP objectives is to understand and quantify subduction zone fluxes by investigation of the inputs (the sediment and crust of a subducting oceanic plate) and the outputs (sediments, fluids and magmas from the associated arc-basin systems).

Mechanism of Implementation: Mass flux determinations will first be attempted in the Western Pacific by focusing at least two drilling Legs most likely on the relatively simple Mariana-Izu non-accretionary convergent margin: one Leg on the subducting Pacific Plate and one on the adjacent forearc. To obtain the input fluxes, at least one of the sites on the Pacific Plate will need to penetrate through the sediments and into a significant thickness of oceanic crust. To obtain the output flux, a likely target is a fluid release site such as a serpentinite seamount. Other studies will be required to investigate the relative roles of accretion vs. subduction near the toe of the slope at a sedimented margin. Flux determinations at accretionary convergent margins can be carried out using Legs drilled for other purposes.

Likely Outcomes by 2003: ODP will obtain a more precise estimate than hitherto possible estimation of subduction fluxes at Pacific convergent margins, including: (a) the relative importance of sediments and crust to the input flux; (b) the spatial variability in source and composition of subduction-derived fluids; and (c) the net crustal flux recycled into the mantle.

2.1.5 Collaboration with Other Global Geoscience Programs

ODP drilling and instrumented boreholes will provide an integral component of *in situ* long-term monitoring strategies to study the formation of oceanic crust which have been developed by InterRidge. Drilling in oceanic crust and the development of observatories has links to InterRidge, ION and BOREHOLE, and is the bridge to riser drilling of the deep ocean crust during OD21. Selection of the site for the ridge axis seafloor observatory and the crustal studies will be part of a joint ODP-InterRIDGE initiative. Objectives of the drilling of LIPs is closely linked with goals of IAVCEI/LIPS. Convergent margin studies are of interest to both MARGINS and InterRidge.

2.1.6 Required Technology

Much of the proposed drilling, including the initiation of the ocean crust deep hole in fast spreading crust, the ridge axis observatory effort, and the penetration of an active seafloor hydrothermal system at a convergent margin, requires a fully developed high-speed diamond coring system (DCS), or a combination of hammer-in casing and DCS tools, capable of substantial penetrations and high recovery. An Engineering Leg to test the DCS is included in the 1999-2003 time period. No new technology is required to achieve the Phase III objectives of LIP transect objectives.

2.2. DEFORMATION OF THE LITHOSPHERE AND EARTHQUAKE PROCESSES

2.2.1 Extensional Boundaries

The structure and stratigraphy of passive continental margins provide information about the deformation of continental lithosphere, the nature of the continent-ocean crust transition, and the early stages of ocean basin formation. Understanding the processes that give rise to the structures of margins is a key objective of ODP.

ODP aims to focus on resolving some outstanding questions on passive continental margins by investigating: (a) the role of low-angle normal faults in continental breakup; (b) the processes that control rifting; and (c) the nature of the ocean-continent transition. This is linked with ODP Initiative III. In particular, ODP plans direct sampling of the deepest portions of extensional margins, (especially pre-rift basement rocks, rift-related volcanics, and the oldest sediments deposited on the margin) as they record the syn-rift and immediate post-rift evolution of the margin. Direct imaging via borehole logging and geophysical studies aims to reveal the structural details from which major extension processes can be inferred. Some of these objectives require deep drilling, but some progress can be made with drilling to depths of 2-3 km.

Mechanism of Implementation: For deep margin drilling, at least one pilot deep hole (>2 km) will be drilled between 1999-2003 to test the limits of the *JOIDES Resolution's* drilling capabilities (2 Legs). The Somali Basin is a possible first candidate. Drilling a series of shallower holes in an area of active rifting, such as the Woodlark Basin, is also a high-priority 1 Leg target.

Likely Outcomes by 2003: ODP expects to have drilled at least one low angle detachment fault by deep drilling (2-3 km) and have assessed their role in continental breakup, and made some advances in refining the nature of the transition from continental to oceanic crust.

2.2.2 Convergent Boundaries

Collisional processes at continental margins have formed some of the largest mountain ranges. However, the mechanisms of deformational processes at compressional margins is not well understood. Addressing this scientific problems is linked with ODP Initiative III.

ODP aims to: (a) characterize the history and style of deformation associated with mountain building from initial deformation at the toe of the subduction zone to the final stages of collision, (b) determine the mechanisms of active deformation; and (c) examine the link between climate and tectonics. In addition, the various models of décollement formation, fluid flow, and chemical fluxes in accretionary wedges will be tested.

Mechanism of Implementation: Objectives linked to orogeny will be addressed by drilling an accretionary prism as well as an arc-continental collision boundary, possibly the Taiwan margin, to study deformation (1 Leg). Links between Himalayan evolution and monsoons will be examined by drilling, most likely in the basins of the South China Sea (1-2 Legs). Deep drilling (2-4 km) above the seismogenic zone of a convergent margin will reveal the accumulated effects of earthquake faulting, tsunami generation, or slope failures (2 Legs).

Likely Outcomes by 2003: Preliminary information on the mechanisms of deformation at convergent boundaries will have been obtained, and a model for the links between climate and tectonics will be developed. In addition, a first-order understanding of the relations between fluid flow and geohazards will have been established.

2.2.3 Earthquake Mechanisms

Understanding the balance between the forces controlling plate movement, and the mechanisms responsible for the initiation and propagation of earthquakes, is critical to the development of predictive capabilities for earthquakes and tsunamis.

ODP aims to contribute to the understanding of earthquake mechanisms by carrying out *in situ* monitoring in boreholes of fluid flow, strain (stress) accumulation/release, and other physical properties using an advanced generation of LWD tools. This objective is linked to ODP Initiative II. In addition, the drillholes will provide natural laboratories for monitoring changes in the stress field, thermal conditions, fluid pressures, and other parameters that are likely to influence activity along these plate boundaries.

Mechanism of Implementation: The drilling described above will investigate deformational processes and earthquake mechanisms at different types of plate boundaries by deep drilling, coring, and *in situ* experimentation. Some of these sites can also be used for *in situ* monitoring of important physical and chemical properties that is required to understand earthquake mechanisms. In addition, a few of these sites will be selected for the establishment of these ODP boreholes as long-term seafloor observatories as part of the Western Pacific Geophysical Network.

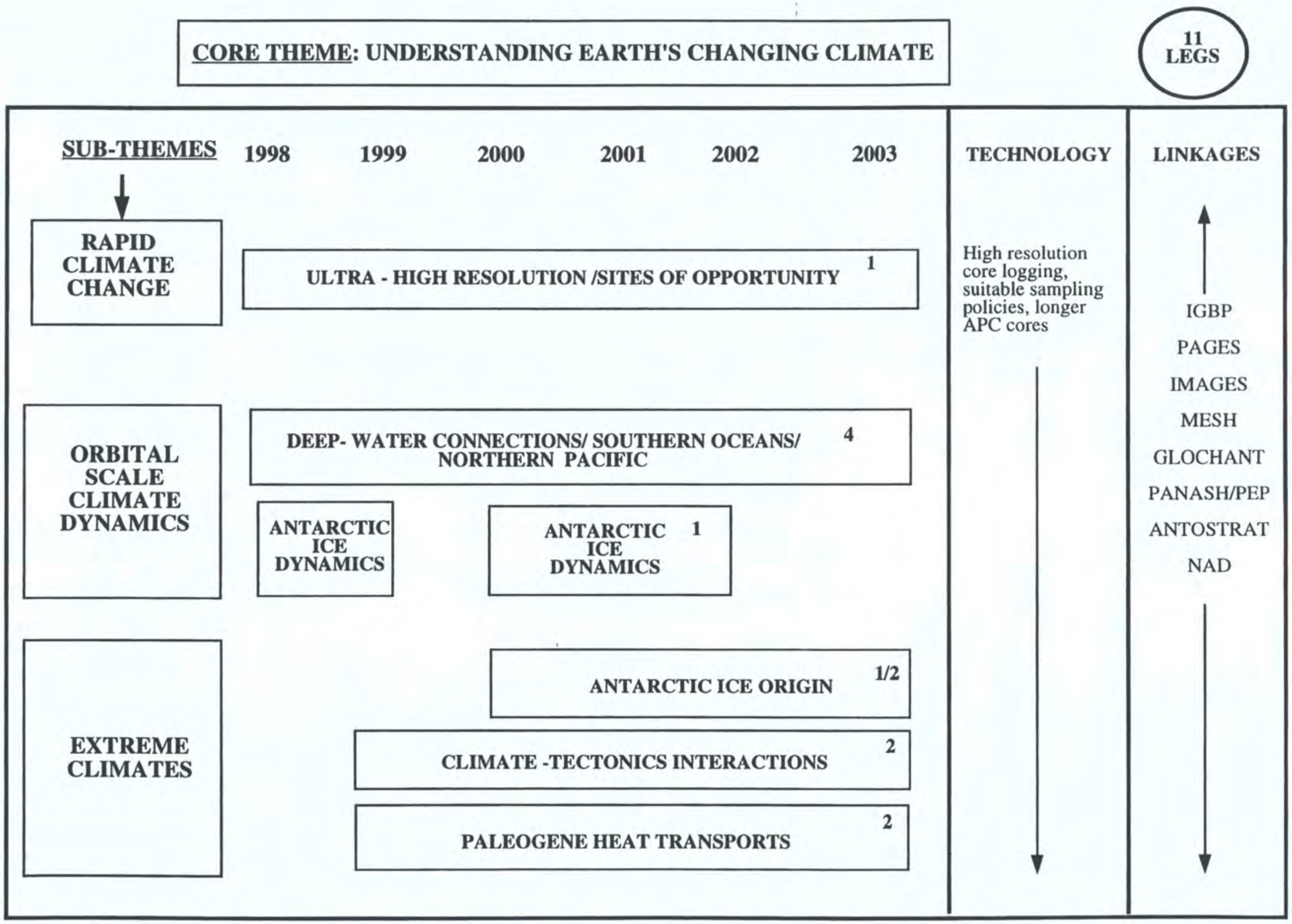
Likely Outcomes by 2003: The ODP will have laid the foundations of a global network of seafloor observatories and established a number of these in at least one tectonic setting (convergent margins). In addition, ODP aims to establish a few long-term observatories in different environments prior to full implementation of a global network of approximately 30 borehole observatories.

2.2.4 Links to Other Global Geoscience Programs

These scientific objectives have strong ties with ION, BOREHOLE, SEIZE/ILP, and FDSN-IRIS. Processes associated with convergent and extensional boundaries are also tied to objectives of MARGINS, and links with continental drilling (e.g., through ICCD, the International Consortium of Continental Drilling) may be possible with the planned ODP drilling at extensional boundaries.

2.2.5 Technology Required

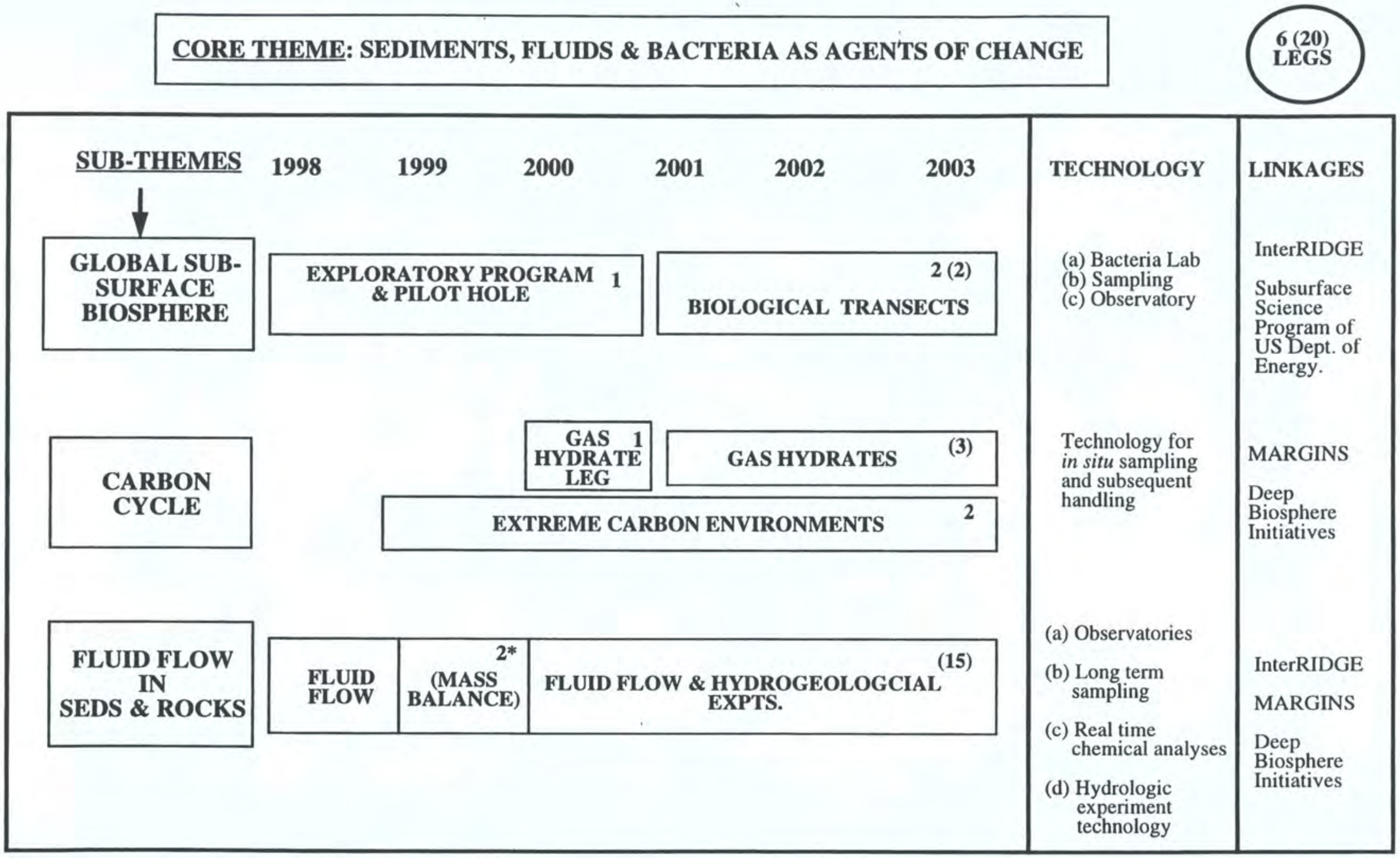
While ODP takes responsibility for drilling and casing boreholes and carrying out the initial downhole experiments, subsequent monitoring is carried out by "fly-in" re-entry through a seafloor installation set in place by the drillship, or is derived remotely. Continued development of tools for collecting *in situ* data from seafloor observatories is required. Third party logging tools will need to be developed. The Western Pacific Geophysical Network includes seismic, strain, pressure, and temperature measurements above a plate subduction seismogenic zone.


CORE THEME: UNDERSTANDING EARTH'S CHANGING CLIMATE
11 LEGS
SUB-THEMES
1998
1999
2000
2001
2002
2003
TECHNOLOGY
LINKAGES
RAPID CLIMATE CHANGE
ULTRA - HIGH RESOLUTION /SITES OF OPPORTUNITY
1
High resolution core logging, suitable sampling policies, longer APC cores
IGBP
PAGES
IMAGES
MESH
GLOCHANT
PANASH/PEP
ANTOSTRAT
NAD
ORBITAL SCALE CLIMATE DYNAMICS
DEEP- WATER CONNECTIONS/ SOUTHERN OCEANS/ NORTHERN PACIFIC
4
ANTARCTIC ICE DYNAMICS
ANTARCTIC ICE DYNAMICS
1
EXTREME CLIMATES
ANTARCTIC ICE ORIGIN
1/2
CLIMATE -TECTONICS INTERACTIONS
2
PALEOGENE HEAT TRANSPORTS
2

CORE THEME: UNDERSTANDING THE HISTORY AND EFFECTS OF SEA LEVEL CHANGE

8 LEGS

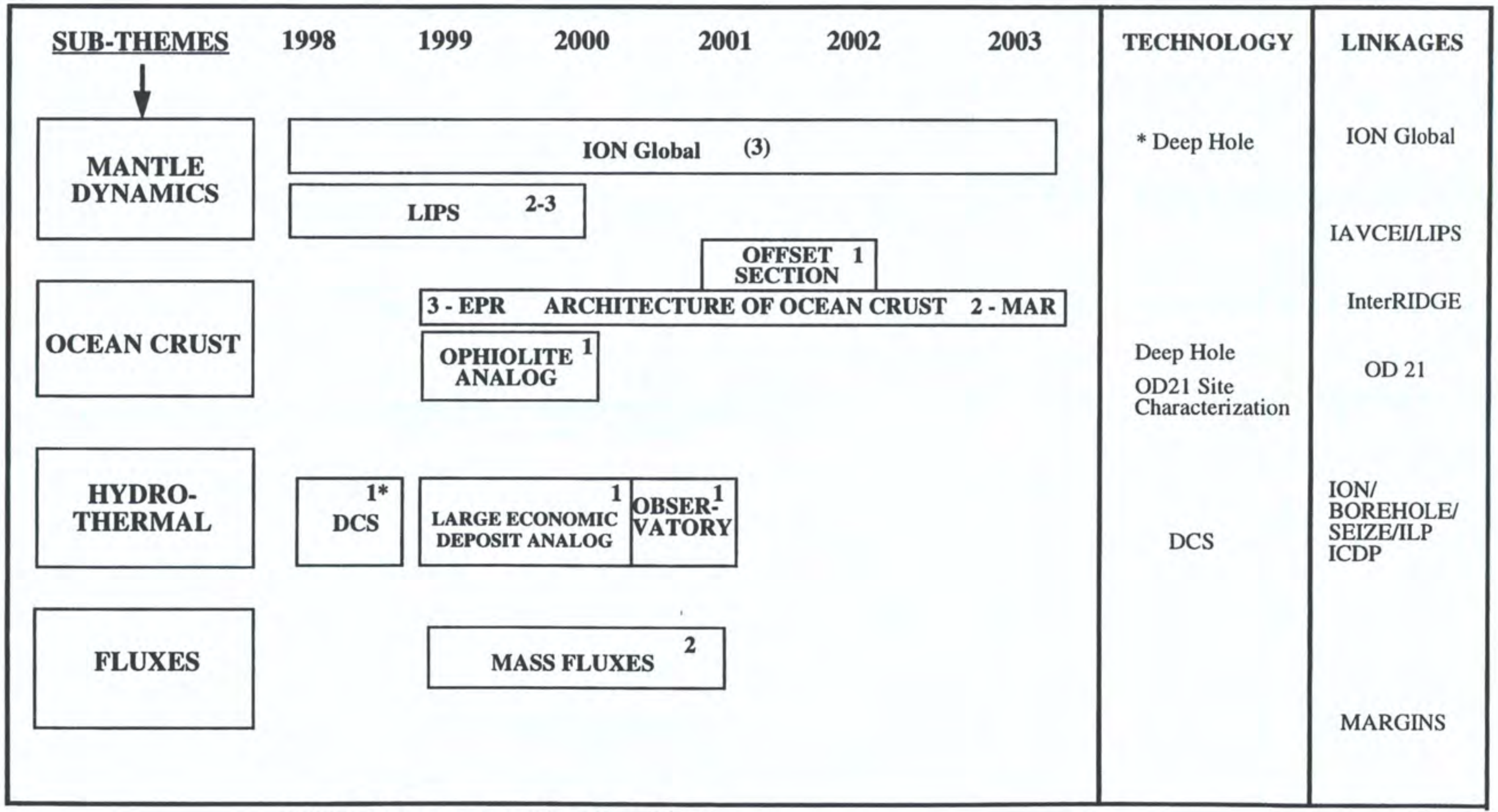
SUB-THEMES	1998 1999 2000 2001 2002 2003	TECHNOLOGY	LINKAGES
TESTING GLOBAL SEA LEVEL MODELS	ANTARCTIC MARGIN 1; ATOLLS AND GUYOTS 1	High Latitude operations. DCS, excellent logs.	ANTOSTRAT
	OPEN OCEAN SITES FOR HIGH-RESOLUTION ISOTOPIC AND GEOCHRONOLOGICAL STUDIES 2	Global coverage, high- recovery low latitude non-upwelling	IMAGES
TESTING SEQUENCE STRATIGRAPHIC MODELS (SEDIMENTARY ARCHITECTURE)	TRANSECTS ACROSS SILICICLASTIC CONTINENTAL MARGINS & CARBONATE PLATFORMS OF VARIOUS AGES AND TECTONIC SETTINGS 4	Transects of sites, including onshore seismic grids. high recovery excellent logs riser/BOP	ICDP MARGINS



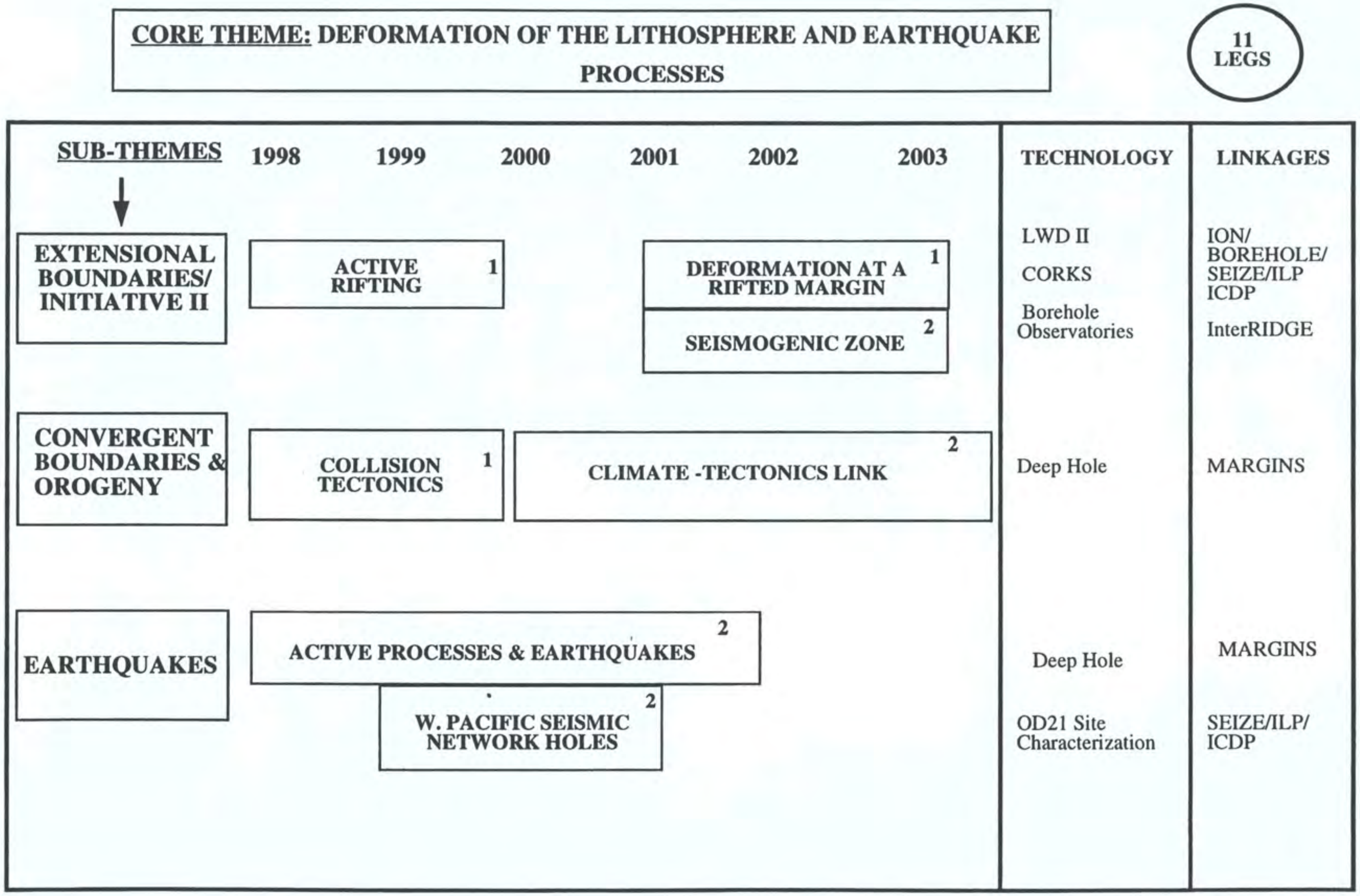
NOTE: (n) contributes to n Legs assigned elsewhere
2* - Mass Balance Included in Transfer of Heat & Materials

<u>CORE THEME</u>: EXPLORING THE TRANSFER OF HEAT AND MATERIALS TO AND FROM THE EARTH'S INTERIOR

13 (3) LEGS +1*



NOTE: (n) Legs assigned for other objectives
1* - Engineering Leg


CORE THEME: DEFORMATION OF THE LITHOSPHERE AND EARTHQUAKE PROCESSES
11 LEGS
SUB-THEMES
1998
1999
2000
2001
2002
2003
TECHNOLOGY
LINKAGES
EXTENSIONAL BOUNDARIES/ INITIATIVE II
ACTIVE RIFTING 1
DEFORMATION AT A RIFTED MARGIN 1
SEISMOGENIC ZONE 2
LWD II
CORKS
Borehole Observatories
ION/ BOREHOLE/ SEIZE/ILP ICDP
InterRIDGE
CONVERGENT BOUNDARIES & OROGENY
COLLISION TECTONICS 1
CLIMATE -TECTONICS LINK 2
Deep Hole
MARGINS
EARTHQUAKES
ACTIVE PROCESSES & EARTHQUAKES 2
W. PACIFIC SEISMIC NETWORK HOLES 2
Deep Hole
MARGINS
OD21 Site Characterization
SEIZE/ILP/ ICDP

Department of Geological Sciences, Wright Lab
Rutgers, The State University
Piscataway• New Jersey • 08855-1179
E-mail: kgm@rci.rutgers.edu;
(908) 445-3622 FAX (908) 445-3374

Lamont-Doherty Earth Observatory
of Columbia University
Palisades, NY 10964
E-mail: dvk@ldeo.edu
(914) 365-8544

October 15, 1996

Dr. Susan Humphris
JOIDES Office, WHOI
Woods Hole, MA 02540

Dear Susan:

With the following brief statement, PCOM formally recognized that onshore drilling on the New Jersey Coastal Plain (Leg 150X) is an integral part of a drilling transect across the Middle Atlantic U.S. continental margin.

"PCOM endorses the proposal... [that] land drilling efforts extending the NJ/MAT transect be treated as one with Leg 150..." PCOM minutes, April, 1992

Past, present, and future onshore activities are closely tied to offshore drilling. Onshore, future shelf, Leg 174A (shelf), and Leg 150 (slope) drilling comprise an integrated dip transect (Fig. 1) that addresses Oligocene-Recent sequence and sea-level changes. In addition to meeting a primary objective of the Transect, onshore drilling addresses three issues that are not well constrained by offshore drilling by providing: 1) constraints on along-strike variability needed to evaluate regional tectonic effects on the sea-level signature; 2) updip facies changes needed to evaluate sequence stratigraphic models; and 3) sampling of Cretaceous-Eocene sequences needed to evaluate sea-level during past warm climates.

Accordingly, onshore drilling at Island Beach, Atlantic City, and Cape May (Fig. 1) was funded by NSF (Earth Science Division, Continental Dynamics Program and Ocean Science Division, Ocean Drilling Program) as part of the U.S. Continental Scientific Drilling program (CSD). Initial results were published as Leg 150X in the *Proceedings of the ODP Initial Reports* (Miller, K.G., et al., 1994, in press) and *Scientific Results* (Miller and Snyder, Eds., in press), complementing slope drilling by Leg 150. As an extension of Leg 150X, the New Jersey Geological Survey and NSF have funded a borehole at Bass River, NJ (Fig. 1); drilling begins October 18, 1996 (2,000 ft total depth). In addition, we are proposing to NSF three additional boreholes to continue the study of global sea-level changes, regional tectonic changes, and local hydrogeological implications of onshore drilling: Parvin (1997), Corson's Inlet (1997), and Maryland Beach (1998; Fig. 1). As ODP Leg 174A prepares to return to drill the New Jersey shelf, we request that PCOM consider the following endorsement: <u>to recognize 1996-1998 onshore component of drilling (Fig. 1) as Leg 174X.</u>

It is important to keep the onshore and offshore components of this Transect closely tied to each other. We propose that PCOM designate Bass River and the three proposed boreholes as ODP Leg 174X, continuing the tradition of ODP Legs 150/150X. We propose to include Bass River as a site chapter to be bound with Leg 174A *Initial Reports*. Assuming that the three proposed boreholes are funded, they will be published in a later IR volume. Both of the Leg 174A co-chiefs (J. Austin and N. Christie-Blick) endorse this proposal.

We propose to publish a 600-800 page volume on *Global Sea-level and the US Atlantic Continental Margin* containing the Scientific Results of both ODP Leg 174A shelf and Leg 174X onshore drilling in the open literature. We have discussed publishing these results with both SEPM and Columbia University Press and both are very interested. We are investigating the costs but expect no direct requests for publication charges from JOIDES or JOI (much of the cost can be recovered through sales of the volume). Both Leg 174A co-chiefs have endorsed this approach.

Cores from Leg 150X are currently housed at the ECR. We will archive the Bass River cores that were funded by the NJGS/NSF in the Rutgers-NJGS core library at Rutgers following all ODP sampling protocols. We will propose to NSF to do the same with future onshore boreholes. This minimizes costs to ODP, maintains the cores in close proximity (~50 miles) to Leg 150, 150X, and 174A cores, and provides the cores as a valuable resource to the international community.

We thank PCOM for its previous endorsement and especially thank ODP for enthusiastically endorsing the novel Leg 150X. We believe that the scientific objectives of the Transect justify the additional platform afforded by onshore drilling. We believe that our efforts to date have been highly successful by not only addressing high-ranked scientific issues (e.g., global sea-level change) but also by yielding unexpected dividends in understanding regional tectonics, Cenozoic evolution of the NJ margin, and local hydrogeology. In addition, our efforts have provided a bridge between ocean drilling and continental drilling, and we see the need for continued growth in this area.

We appreciate your time and efforts.

Sincerely yours,

Kenneth G. Miller

Dennis V. Kent

sent via e-mail; original mailed
distribution:

T. Loutit, OHP
B. Hay, SGPP
P. Freyer, IHP
B. Malfait, NSF
L. Johnson, NSF
J. Austin, UTIG
N. Christie-Blick, LDEO
G. Mountain, LDEO

Miller, K.G., et al., *ODP, Initial Reports, Leg 150X*, 59 pp., 1994. NOTE: VOLUME IS BOUND WITH LEG 150IR AND CONSISTS OF TWO CHAPTERS:

Miller, K.G., Sugarman, P., Van Fossen, M., Liu, C., Browning, J.V., Queen D., Aubry, M.P., Burckle, L.D., Goss, M., and Bukry, D., 1994a. Island Beach Site Report. *In* Miller K. G., et al., *Proc. ODP, Init. Repts.*, 150X: College Station, TX, (Ocean Drilling Program), 5-34.

Miller, K.G., Browning, J.V., Liu, C., Sugarman, P., Kent, D.V., Van Fossen, M., Queen D., Goss, M., Gwynn, D., Mullikin, L., Feigenson, M.D., Aubry, M.P., and Burckle, L.D., 1994b. Atlantic City Site Report. *In* Miller K. G., et al., *Proc. ODP, Init. Repts.*, 150X: College Station, TX, (Ocean Drilling Program), 35-58.

Miller, K.G., Liu, C., Browning, J.V., Pekar, Sugarman, P., Van Fossen, M.C., Mullikin, L., Queen, D., Feigenson, M.D., Aubry, M.-P., Burckle, L.D., Powars, D., and Heibel, T., Cape May site report, *Sci. Results, Ocean Drilling Prog., Leg 150X suppl.*, in press. NOTE: CHAPTER IS BOUND WITH LEG 150SR

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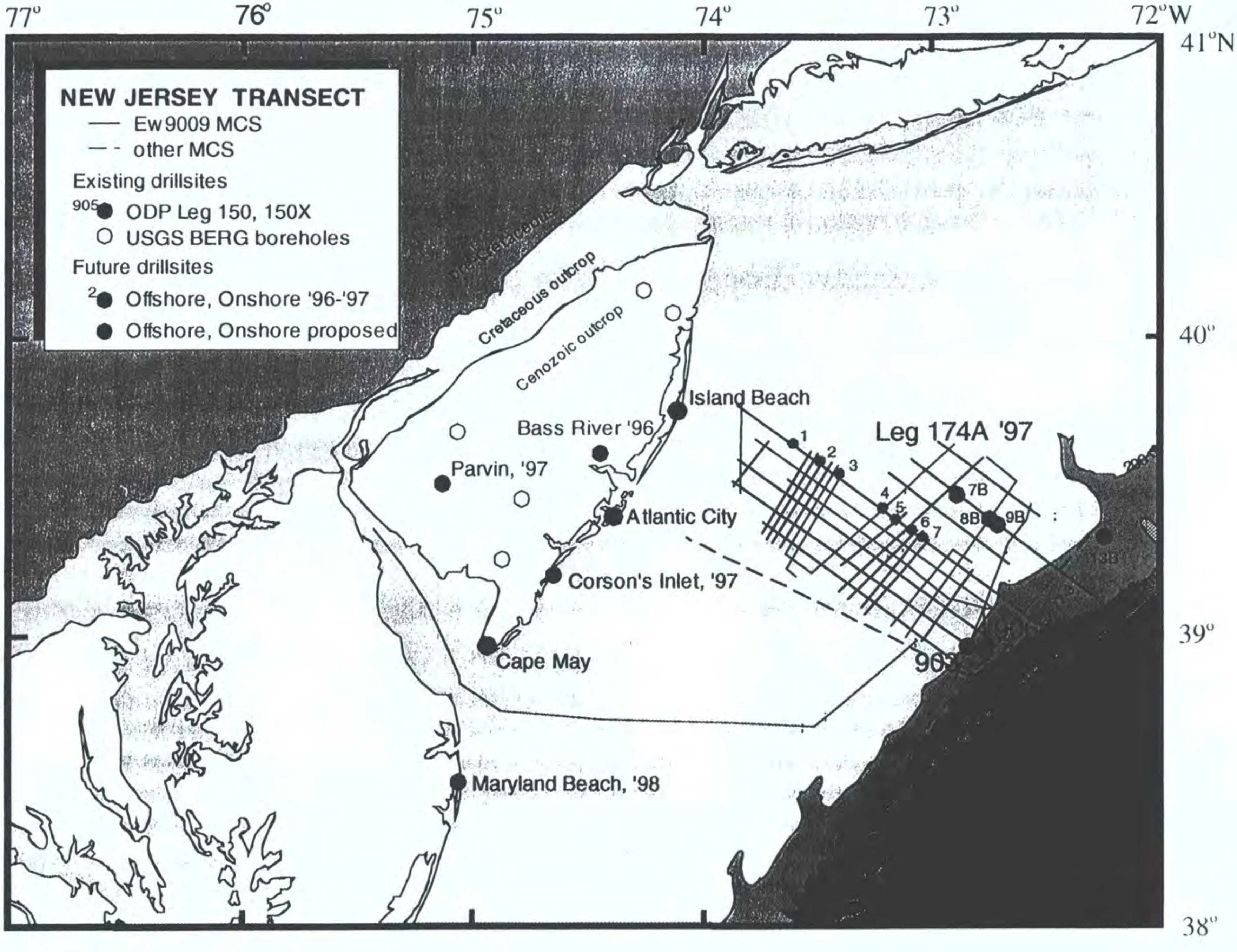

PCOM letter, Fig. 1

WOODS HOLE OCEANOGRAPHIC INSTITUTION
Woods Hole, Massachusetts 02543
Phone: (508) 457-2000
Fax: (508) 457-2183
Telex: 951679

Department of Geology and Geophysics

Oct. 10, 1996

Dr. Susan Humphris
Chair, PCOM & SCICOM
JOIDES Office
Woods Hole Oceanographic Inst.
Woods Hole, MA 02543

Dear Dr. Humphris,

This letter, on behalf of myself and Dr. Natland, is to bring you up to date with the PCOM request to the co-chief scientists that the make every effort to secure a VSP program and scientists for Leg 176. We have done this, and have provided TAMU with the name of a VSP scientist for Leg 176.

It is my understanding that the JOIDES Down-Hole-Measurements Panel has now formally recommended to PCOM that the Schlumberger three-component bore hole seismometer be deployed on Leg 176. Realizing that this requires commingled funds, we wish to stress the importance of this deployment for the objectives of our leg. Site 735 offers the only opportunity for deep bore hole seismic measurements in gabbroic layer 3 in the oceans. Moreover, if, as anticipated, the drilling demonstrates that the Moho reported by Müller et al. (in press) 5 km below the seafloor there, lies below the gabbro-mantle peridotite transition, then it will be critical to demonstrate by in-situ measurements at seismic frequencies that the rocks at the bottom of the hole do have the characteristic velocities for layer 3. This would provide direct confirmation, as anticipated by some, that crustal layer 3 can contain substantial portions of partially serpentinized mantle peridotite.

For a good VSP, it is important that there be two different sources, including both an air gun and a water gun, as used on previous ODP VSP's. This will give a broader bandwidth of source frequencies for the attenuation studies. We would also like to request an over-the-side hydrophone be deployed so that the source spectrum can be accurately characterized. This is important as Swift and Stephen (1992) felt that they found from the previous VSP in the existing 500 m hole that the seismic attenuation was too high for gabbro to be the sole component of layer 3. This appears to have been confirmed by the measurements of Goldberg et al. reported in the Leg 118 Scientific Results Volume. First, this would hopefully allow improved measurements of the notoriously difficult to measure seismic attenuation throughout the section, and, most critical, in serpentinized peridotite if encountered, providing a direct test of the Swift and Stephen conclusions. Since their model, and the geologic versions of this same model (e.g. Hess, 1962, Cannat 1995, and others) have very far-reaching implications both for crustal structure in the oceans and for the total mass elemental flux at ocean ridges from the earth's mantle, every opportunity should be taken to make the best use of what is likely to be the only deep hole in in-situ lower ocean crust and (hopefully) mantle for a considerable period of time, possibly into the next century.

In addition, the bore hole seismic experiment will permit correlation of major structural features in the hole, such as iron-oxide rich horizons and major shear zones to seismic discontinuities existing on a broader scale up to 350 m from the hole. This will allow extrapolation of the 1-D measurements of mineral and compositional fabric variations found down-hole to appropriate geologic scale, and thus allow the results of the drilling to be used to interpret deep reflectors seen in seismic studies of the ocean crust at slow spreading ridges.

It is also our understanding that the Down-Hole Measurements Panel recommended an oblique seismic experiment at Site 735 as well. The co-chief scientists would like to endorse this recommendation. This is likely to be the only opportunity to directly measure the seismic characteristics of the lower crust and correlate them to observation of physical properties in drill core in the ODP program for the next decade. Since the nature of the deep reflectors in the lower ocean crust at slow spreading ridges is a major question for marine tectonics and plate dynamics, and as their serious geologic interpretation awaits some sort of confirmation that they are real, we view the offset VSP as having the potential for a major contribution to all of marine earth science. The oblique seismic experiment would require an additional 2 days of ship time, which if there is any flexibility in the schedule, we would like to see added to Leg 176 for this purpose pending the VSP proponents securing a second ship for the experiment.

Sincerely,

Dr. Henry JB Dick
Co-Chief Scientist
Henry J.B. Dick

cc: James Natland,
Co-Chief Scientist