JOIDES LITHOSPHERE PANEL:
MINUTES OF 14-16 MARCH 1991 MEETING
LA JOLLA, CALIFORNIA

EXECUTIVE SUMMARY

1.0 LIAISON REPORTS

1.6 Downhole Measurememts Panel

LITHP is concerned about the status of the Wireline Packer, which it views as critical to meeting the high priority objectives of several upcoming legs.

LITHP endorses DMP's requests for a group to be convened to address this issue, and stresses the urgency for the 1992 drilling schedule. In addition, high temperature capabilitities need to be investigated.

1.8 North Atlantic Rifted Margins DPG

LITHP is in overall agreement with the preliminary selection of the high priority transects. However, a number of concerns, particularly relating to the timing of magmatism and the development of testable models of magmatic evolution during early rifting need to be addressed.

LITHP recommends to PCOM that an additional petrologist be added to the NARM-DPG, and nominates A. Saunders (U. Leicester) for that position. In addition, S. Cloetingh will act as LITHP liaison to the NARM-DPG.

2.0 RESULTS OF RECENT CRUISES AND PLANS FOR UPCOMING CRUISES

2.1 Preliminary results of Leg 135

This leg emphasized the need for 24-hour coverage of the XRF and thin section labs during cruises with hard rock objectives.

LITHP endorses the recommendation of the Shipboard Measurements Panel that shipboard technician coverage on hard rock legs be sufficient for the XRF, XRD and thin section facilities to be operational continuously throughout each day.

2.2 Plans for Leg 137

The possibility exists that the viability of Hole 504B, or the likelihood of being able to deepen it significantly, may not be clear-cut after Leg 137. A decision to continue or to abandon future efforts at this Site will need to be made quickly so that appropriate preparations can be made for Leg 140.

If this situation arises, LITHP will review the results of Leg 137 as soon as they are available and make a recommendation to PCOM regarding the future of Hole 504B.

2.4 Plans for Leg 142

LITHP strongly supports the change in primary site for EPR drilling to the on-axis site--EPR-2--to be started during Leg 142. This recommendation is based on an examination of recent seismic data, consideration of the scientific objectives of EPR drilling, and the desire to select the least problematic drilling site to adequately test the DCS Phase II system for bare-rock drilling.

4.0 UPDATE ON ENGINEERING DEVELOPMENTS

LITHP is concerned with the current communication mechanisms that exist between the panel and ODP Engineering activities. It is critical that concerns arising during engineering development that could seriously impact LITHP's planning process be conveyed to the panel.

Given the sensitivity of LITHP decisions concerning scheduling of high priority drilling programs to the timeliness of engineering developments, LITHP requests that an ODP Engineer attend both of its meetings each year.

5.0 RANKING OF PROPOSALS

Twenty-nine programs were considered in the ranking procedure, which was carried out be each panel member ranking their top ten priorities. The top ten highly ranked programs were:

Rank	Program/Theme	Proposal #	Area	Total Votes
1	Offset drilling: Layer 2/3, etc.	375-Rev.	Hess Deep	106
2	Hydrothermal processes at slow spreading ridge	361/A	TAG	78
3	Axial crustal drilling-- EPR II	EPRDPG Report	EPR, 9°30'N	75
4	Volcanic rifted margins	392-396	N. Atlantic	62
5	Sedimented Ridges II	SRDPG Report	Escanaba Trough	45

6	Layer 2/3, Layer 3/ mantle transitions	376/A, 382/A	Vema FZ	45
7	Upper mantle	369/A	MARK area, MAR	43
8	Non-volcanic rifted margins	334-Rev., 365-Rev., et al.	N. Atlantic	29
9	Hydrothermal processes at medium spreading ridge	325/E	Endeavor Ridge	26
10	Oceanic plateaus	142/E-Rev.	Ontong-Java	21

Two PCOM action items arose from this procedure:

1) There are now three programs within the top seven that relate to offset drilling strategies. The first leg of Hess Deep is on the 1992 schedule, and offset drilling is specifically mentioned in the Long Range Plan.

   LITHP once again strongly urges PCOM to create an Offset Drilling Working Group to establish and prioritize the scientific objectives of a program for drilling offset sections of the crust and upper mantle. It is critical that this begin as soon as possible in order that a program be formulated for implementation within the upcoming drilling schedule.

2) The Red Sea is a region of high scientific interest to LITHP, but there are concerns over the availability of research clearance.

   LITHP requests an update from PCOM and/or ODP concerning the status of obtaining research clearances in the Red Sea, and advice as to whether drilling in this region can now be considered.

7.0 OTHER BUSINESS

7.1 Panel Replacement

M. Perfit is due to rotate off LITHP. LITHP nominates S. Bloomer (Boston University) as his replacement (he is willing to serve).

7.3 Next Meeting

The next meeting will include a joint session with TECP and will be held on 9-11 October 1991 in Cyprus.

JOIDES LITHOSPHERE PANEL:
MINUTES OF 14-16 MARCH 1991 MEETING
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Attending: J. Bender, T. Brocher, M. Cannat, S. Cloetingh, J. Erzinger, S. Humphris, D. Moos, M. Parfit, J. Phipps-Morgan, A. Saunders (alternate for P. Kempton), G. Smith, Y. Tatsumi, R. Zierenberg

Liaisons & Guests: J. Natland (PCOM), J. Karson (TECP), J. Allan (TAMU), M. Storms (TAMU)

Regrets: J. Franklin, J.McClain

WELCOMING REMARKS

J. Phipps-Morgan welcomed the Panel to Scripps Institution of Oceanography and discussed meeting logistics.

S. Humphris welcomed J. Bender, M. Cannat and R. Zierenberg as the new members of LITHP, J. Karson as the new liaison to TECP, A. Saunders as the U.K. representative in place of P. Kempton who is at sea, and M. Storms as a guest.

1.0 LIAISON REPORTS

1.1 PCOM (J. Natland)

The major item of business at the November meeting of PCOM in Hawaii was to establish a schedule for drilling between mid-November 1991 and October 1992 based on the thematic panel rankings of the programs presented in the Pacific Prospectus. The following sequence of legs were approved, resulting in a two-month extension of Pacific drilling:

Leg 140	Site 504B* or Hess Deep
Leg 141	Chile Triple Junction
Leg 142	Engineering Leg - East Pacific Rise
Leg 143	Atolls and Guyots A
Leg 144	Atolls and Guyots B
Leg 145	North Pacific Transect
Leg 146	Cascadia Accretion
Leg 147	Hess Deep or Engineering - EPR**

* If cleaning operations are successful on Leg 137
**If DCS Phase III System is ready.

In view of this schedule, PCOM created an Atolls and Guyots DPG to construct a two-leg drilling plan that maximized the scientific return for the two proposals under consideration. PCOM chose not to set up an Offset Drilling Work Group at this time, even though the recommendation had been made jointly by TECP-LITHP.

TAMU engineers reported that the DCS Phase II System, which incorporates a platform occupied by 3-4 drillers above the rig floor, raises some serious safety concerns, particularly in high temperature environments and in hydrothermal settings, where blow-outs and high H_2S concentrations are possible. Even though these concerns will be less serious once the DCS Phase III system is operational, the unlikelihood of achieving the scientific objectives for East Pacific Rise and Sedimented Ridges II drilling with the present status of technological development seriously impacts the planning process. In recognition of this problem, PCOM agreed to consider these two programs as high priorities for drilling, which should occur at the earliest possible date commensurate with technological development and ship scheduling, assuming that the science remains a high priority for the thematic panel.

PCOM also discussed the concept of Supplemental Science (or "Add-On") proposals and generally endorsed the recommendations of the PANCHM (see PANCHM report) for the implementation of such a program. This will begin in FY92 and has been advertised in EOS and the JOIDES Journal.

Another major activity of the meeting was the presentation of Annual Reports by the Panel Chairs (LITHP Annual Report is attached in Appendix I).

The purpose of the next PCOM meeting will be to advance the direction of the ship by one year, based on the global rankings of the thematic panels to be completed at the March meetings.

1.2 PANCHM (S. Humphris)

The PANCHM meeting which was held in November in Hawaii prior to the PCOM meeting addressed a wide range of topics, including proposal review and panel membership procedures, the need for flexibility in facilitating meetings of specialist groups, and the ODP Long Range Plan.

The most substantive issue concerned the requirements for Supplemental Science ("Add-On") proposals, which are encouraged for drilling that can be completed along the cruise track for a particular fiscal year. The following guidelines were suggested:

- The science must be exciting and consistent with ODP high priority objectives.

- The proposal must be mature and meet SSP guidelines.
- Operation time, including transits from the scheduled ship's track, must be only 1-4 days.
- Proponents should be prepared to serve in the shipboard party.
- Total Supplemental Science should not run to more than 12 days of operations in any fiscal year.

1.3 Ocean History Panel (G. Smith)

OHP met in early March at the University of North Carolina, Chapel Hill. The usual reports were presented (e.g., PCOM, TAMU, etc.). The two most important objectives of the meeting were planning the North Pacific Transect (for which OHP is functioning as a DPG) and ranking programs. The North Pacific Transect serves a variety of purposes. The primary one is a paleo-ocean/climate transect. A secondary goal is to obtain a basement age in two locations in the north central Pacific (NW-3&4) in order to distinguish between two Pacific plate reconstruction models (one which has only a single plate, and one with the proposed Chinook plate). Another objective is to drill into basement at several sites on the transect. Two of these sites are on seamounts and the remainder on normal Pacific crust. These basement sites are of some LITHP interest, especially Patton Murray seamount, which is at the old end of the Cobb-Eickleberg chain.

The basic problem is that one of the proposed sites (NW-1) was originally placed on the now defunct CEPAC Bering Sea leg, primarily for logistical reasons. It was thus necessary to reduce the leg length to the current ODP maximum.

The major modification to the leg was the elimination of one of the tectonic sites (NW-3). NW-4 was judged sufficient to resolve the plate reconstruction issue (with Rea, one of the proponents, concurring). The Detroit Seamount program was modified to eliminate deep penetration at the medium depth site (DS-2) and to add an additional APC site to provide a better depth transect. Basement penetration (bit destruction) on top of Detroit seamount was maintained. Significant basement penetration at the deep site (on normal Pacific crust) is debatable. I argued (after discussion with Bob Duncan) that LITHP was more interested in the seamount drilling than another small chunk of normal Pacific crust. Patton-Murray was left pretty much intact. It was originally slated for 50 m of basement drilling (or to bit destruction).

The most interesting site of the leg is Patton-Murray seamount which addreses the issue of long term evolution of seamounts. Detroit Seamount is close to Meiji and will probably not provide any major new information (especially with no more than

50 m of penetration). The major problem is that Patton Murray is the last site on the leg, which leaves the basement drilling here in an exposed position. Given the tight time constraints, LITHP should investigate the option of suggesting deeper penetration at Patton Murray (150 m?) while sacrificing other basement drilling as necessary.

The other major endeavor was ranking the twelve proposals judged interesting and sufficently mature. The proposals were divided into five groups (high frequency, low frequency, sea level, upwelling, and high latitude) and ranked within each group. The best of the top five was then chosen, the next in the group moved up and the process repeated. In order:

1. North Atlantic Gateways (305/320/336)
2. Miller, New Jersey Margin (348)
3. Angola/Namibia (354/339)
4. Ceara Rise (388)
5. Shatsky Rise (253 Rev)
6. S. Equatorial Atlantic (347)
7. Bering Sea (CEPAC/229)
8. California Current (386)
9. West Florida Margin (345)
10. Rifted Margins (DPG)
10. Ross Sea (296)
12. Jones Equatorial Atlantic (313)

The tie for tenth was resolved for Rifted Margins as it was judged more mature (and low enough on the list that it didn't really matter that much). The next meeting will be Oct. 1-3 and is proposed for Yamagata, Japan.

1.4 Tectonics Panel (J. Karson)

The tectonics panel is scheduled to meet next week in Davis, California. E. Moores is the new Chairman, and J. Karson is the new TECP liaison to LITHP. S. Cloetingh has replaced C. Mevel as the LITHP liaison to TECP.

1.5 Sedimentary and Geochemical Processes Panel (R. Zierenberg)

The SGPP meeting in March at College Station, TX was preceded by an ODP Gas Hydrate Workshop chaired by Keith Kvenvolden. General topics of discussion included:

1) The global distribution of gas hydrates (GH) and their role in the global carbon cycle.
2) The chemistry and physics of GH.
3) The geophysical signature of GH, in particular the evidence supporting the presence or absence of a free gas phase, and alternative models of formation

requiring upward advection of a methane-bearing fluid through the zone of GH stability verses subsidence of a sedimetary section containing biogenic methane produced in situ through the zone of GH stability.

4) The current status of the Pressure Core Sampler (PCS), including recommendations to PCOM to "revive" engineering efforts on both the PCS and a compatible sampling manifold.
5) Safety considerations of drilling through GH, including consensus views that neither overpressured gas or H_2S hydrates represent significant drilling risks in area where structurally trapped thermogenic gas is avoided.

The primary business of the SGPP meeting was the discussion of new proposals and a global ranking of proposals that addressed long range SGPP goals. The approach taken was to include both mature and immature proposals and to rank them for their potential to address SGPP priorities rather than to strictly evaluate proposals based on their content as submitted. The resulting ranking is more a reflection of where SGPP would like to see ODP science directed rather than a plan for upcoming drilling. As a result of this approach, in some cases the priorities cannot be strictly identified with a single (or in some cases with any) proposal, and those that do correspond to a proposal number may reflect SGPP's consensus on the potential for drilling in an area rather than the stated objectives of the proposal. The top 20 priorities of SGPP are as follows:

	Theme or Area	Associated Proposal
1	Gas hydrate	335
2	Mediterranean, sapropels	391
3	Sedimented Ridges II	DPG
4	New Jersey margin	348
5	VICAP (Canary Islands)	380
6	Cascadia II	DPG
7	Benguela upwelling	354
8	Sediment instabilities	59
9	EPR II	DPG
10	New Zealand sea level	337
11	Valu Fa sulfides	360
12	Ceara Rise	388
13	Return to 801	368
14	TAG hydrothermal	361
15	NW Australia	340
16	Mediterranean, Ridge	330
17	Barbados	378
18	South Australia margin	367
19	Gulf of California	275
20	North Atlantic evolution	372

The new SGPP liaison to LITHP will be J. Alt.

From an engineering standpoint, M. Storms indicated that more scientific input regarding the application of the Pressure Core Sampler (PCS) was required. It is likely that further development--specifically the method of transfer of the core at borehole pressures to a deck unit--will be put on hold until an individual with specific scientific interests is funded to continue this effort. The decision to put this project on hold is pending at PCOM.

1.6 Downhole Measurements Panel (written report from J. McClain)

The Downhole Measurements Panel met February 7 and 8 in College Station, Texas, preceded by a workshop on borehole stability in overpressured zones (see section 1.7).

A number of issues were addressed at the DMP Meeting that are of interest to LITHP.

1) The Geoprops Probe was successfully tested on land. DMP was encouraged and optimistic. However, they were adamant the tool must undergo substantial additional testing prior to deployment on the Cascadia leg. This will include additional land tests as well as at least one test deployment at sea.

2) The present Wireline Packer was judged by DMP to be an "engineering failure". The goal of the tool was to obtain uncontaminated downhole fluid samples, and this remains a critical goal for many upcoming programs. However, it is not clear that the Wireline Packer has any hope of accomplishing this task. In an excellent and useful report, the LDGO Borehole Geophysics Group (specifically Erich Scholz) evaluated the present system and presented three alternative plans. Their preferred plan was a nearly complete redesign and rebuilding program. This would cost about $250K. Their argument was based on what they interpret as the fundamental soundness of the Packer concept, but the fundamental engineering flaws of the present system.

   The response of the DMP was to recommend abandonment of the Wireline Packer. Several panelists argued that the Packer concept was flawed and "may never work". Others argued that starting over was essentially a new project, and alternatives should be explored first. The panel recommended that a "working group" or "workshop" be convened to address this critical issue. It was noted that $250K had already been lost on the present project.

3) It appears that some high-T downhole measurements will be made on LITHP relevant legs. The priorities are "temp.", "pressure", "fluid sampling", "formation resistivity".

   LDGO is negotiating a contract with JAPEX for their pressure, temp., and flow

rate tool that apparently works. Negotiations with Sandia will proceed only if money is forthcoming for testing. A French temperature tool is also being investigated.

Fluid sampling tools from Los Alamos and Lawrence Berkeley Labs are scheduled for testing on Leg 137, and are being upgraded for higher temperatures.

A proposal from LDGO to purchase a slimhole tool for "formation resistivity". This tool would then be double-dwarded for high temperature work. This is a high-risk approach and was endorsed by the panel.

4) DMP endorsed a proposal to use a sodium bromide tracer on leg 137 at hole 504B to monitor downhole mixing in hole.

LITHP is concerned about the status of the Wireline Packer, which it views as critical to meeting the high priority objectives of several upcoming legs. LITHP endorses DMP's request for a group to be convened to address this issue, and stresses the urgency for the 1992 drilling schedule. In addition, high temperature capabilities need to be investigated.

1.7 Borehole Stability in Tectonically Active Areas Workshop (D. Moos)

The problems of hole instability during Legs 110 (Barbados Accretionary Wedge) and 131 (Nankai Trough) were addressed as they pertained to the upcoming drilling on Legs 141 (Chile Triple Junction) and 146 (Cascadia Margin). Traditionally, the problems have been related to swelling clays and sandy, unstable sections that slough off into the Hole. However, some information from Nankai suggested that breakouts resulting from the borehole stresses were the principal source of the hole sloughing problems. The solution used by the oil industry is to drill with weighted mud which adds radial stress and keeps the hole open. A number of strategies were discussed to enhance the prospects of logging under these conditions. Some of these were simply modifications of the drilling plans to case upper portions of unstable holes or drill offset dedicated logging holes. Others included the use of heavy muds weighted with barite. This strategy would be more expensive and would preclude the use of some logging tools (e.g. lithodensity measurements). A major recommendation is to devote a portion of a future engineering leg to evaluate borehole stability strategies in preparation for upcoming programs.

1.8 North Atlantic Rifted Margins DPG (from a draft Preliminary Report - H.C. Larsen)

The NARM-DPG was formed by PCOM at the request of LITHP and TECP in order to develop a scientific drilling plan to study rifting and the variations in continental break-up processes.

At its first meeting in February, seven proposals were considered--additional proposals currently under review by the thematic panels will be included at the next meeting.

The NARM-DPG considered various conjugate margin segments formed in association with the Early Cretaceous to Early Tertiary progressive break-up of the North Atlantic. They identified two end member modes of continental break-up in the region:

1) multiple rift, non-volcanic margins with wide zones of continental crust thinning
2) single to no pre-break up rift, highly volcanic margins with large volumes of extrusives during break-up and early spreading.

As first priorities, the DPG will probably recommend two transects representing these end members and requiring 6-7 legs of drilling time:

1) The North Newfoundland Basin - Iberia Abyssal Plain conjugate margins - this will provide a complete cross-section of the two possibly asymmetric margins.

2) The SE Greenland volcanic margin, which is conjugate to the DSDP-drilled Faroe-Hutton margin, supplemented with one drillsite on the outer Voring Margin to provide a longitudinal transect component.

An additional high priority objective is to drill the deep seismic reflectors (e.g. the S-reflector below Galicia Bank) if and when the drilling technology is available.

The DPG will be meeting once more in the fall to consider the new proposals under review and to finalize their recommendations.

LITHP reviewed the report and is in overall agreement with the selection of the high priority transects. However, the following concerns (which are based on review of a draft report without all the Figures and Appendices) need to be considered.

1) Early rifting and continental break-up processes are a fundamental problem of high interest to LITHP. The DPG needs to focus the program on well-defined, key questions that can be addressed by a drilling strategy.

2) LITHP believes that the question of the timing of rifting and magmatism is key to our understanding of rifting processes--drilling should specifically address this problem.

3) Testing of the volcanic plume model is of high interest to LITHP and should be incorporated into the drilling program.

4) There is a need to further develop quantitative models for basin extension that can be tested by drilling.

5) There is a large geochemical database available that could be used to set up testable models of magmatic evolution, and could help define where to drill--the DPG needs to fully investigate this prior to determining drilling locations. The involvement of petrologists who are concerned with the petrogenesis of basaltic rocks in both continental and oceanic environments is critical if drilling is to address not only the tectonics, but also the evolution of magmatism, during rifting processes.

In view of these concerns, LITHP recommends to PCOM that an additional petrologist be added to the NARM-DPG, and nominates A. Saunders (University of Leicester) for that position. In addition, Sierd Cloetingh will act as LITHP liaison to the NARM-DPG.

1.9 Atolls and Guyots DPG (from a Report - D. Rea)

The A&G-DPG met in Ann Arbor in late February with the charge to construct a two-leg drilling plan to include priority 1 and 2 targets of proposal 203-Rev. and additional targets of proposals 203-Rev. and 202-Rev. A report of the most recent guyot drilling at Site 831 on Bougainville Guyot, W. of the New Hebrides Trench was presented. Drilling at a lagoonal location penetrated about 750 m of Cenozoic reef rock with recovery rates of 5%. Based on this, the sites recommended by the DPG are either in a back reef setting or on the marginal reef itself, where better recovery might be possible.

Basement objectives of interest to LITHP are to:

a) define the age of the edifices and their paleolatitudes
b) define the geochemistry in regards to the broad Southern Hemisphere geochemical anomalies (DUPAL and SOPITA).

In addition, deeper drilling (300-400 m) at one site per leg was considered preferable to shallow penetration at several sites, as it would allow evaluation of the geochemical and isotopic evolution of magmas in several flows, and would provide enough inclination data to average out secular variations in paleolatitude determinations.

The major basement penetration is currently planned for Huevo and MIT Guyots, although basement will be sampled at a number of other locations.

LITHP reviewed these recommendations and suggests that the major rationale for deeper penetration at these sites is for paleolatitudes, which will determine the motion of the Pacific plates. Hard-rock orientation will be critical--can the Japanese 3-component magnetometer to be available on this leg be used for this purpose? Since MIT and Huevo Guyots are old, it is possible that drilling will not recover basalts with the DUPAL and SOPITA geochemical anomalies, which tend to be in rocks of intermediate to younger ages.

2.0 RESULTS OF RECENT CRUISES AND PLANS FOR UPCOMING CRUISES

2.1 Preliminary results of Leg 135-Lau Basin (J. Hawkins)

The objectives of Leg 135 were to deduce the geologic and tectonic history of the Lau Basin to gain a better understanding of how backarc basins evolve, and to address broader problems of crustal evolution that pertain to other intraoceanic trench-forearc-backarc systems. A drilling transect of five sites was originally planned to sample the backarc basin crust and the arc-forearc area of the Tonga Ridge.

The Lau Basin is actively spreading and separates the Lau Ridge from the Tonga Ridge. The Lau Ridge has an age of about 14 Ma and is the remnant arc of the trench-arc-backarc system related to the convergent plate margin of the Tonga Trench. The Tonga Ridge includes the presently active arc of basaltic volcanism. Two models have been proposed for the post-late Miocene Lau Basin. The original model (proposed by Karig) suggested that the Lau Ridge arc system split and the Lau Basin subsequently formed in the rifted area. More recently, a model has been proposed (by Hawkins and others) in which the rifting to form the Lau Basin was initiated in the forearc rather than in the Lau Ridge volcanic arc.

Sites 834 and 835 were located in the western Lau Basin about 100 km and 200 km respectively east of the Lau Ridge. The objectives of Site 834 were to sample the igneous rocks formed in the first 0.5 my. of crustal extension of the Lau Basin, and to determine the age of the beginning of opening of the basin. Drilling sampled a number of sills or flows intercalated with sediments and a thick section of supposed basement. Geochemically, these basaltic lavas were more similar to Lau Basin backarc crust than to Lau Ridge arc samples. Biostratigraphic and paleomagnetic data indicated an age of 5.6 Ma, suggesting the age of inception of spreading may be greater than around 5.6 Ma.

Site 835 was located on crust of about 3 Ma according to the magnetic anomaly patterns. The principal goals were to assess the age and chemistry of the basement rocks, and to determine their petrogenetic relationship to Site 834 rocks. Surprisingly, the basalts recovered showed a closer affinity to Lau Ridge arc samples,

even though this site was closer (~80 km) to the propagating ridge of the Central Lau Spreading Center.

Sites 836 through 839 were drilled in the backarc basin close to the Lau Spreading Center on crust estimated to be less than 1 Ma. The igneous rocks recovered ranged from basalts to basaltic andesites, with an overall geochemical signature very similar to rocks of an island arc tholeiitic series. Of particular interest were the recovery of some samples with very high concentrations of Mg, Cr and Ni; these may represent near-parental magmas for some of the Lau Basin volcanic rocks with arc-like affinities.

Site 840 was drilled on the west flank of the Tonga Platform, which forms the southern crest of the Tonga Rift. It was designed to reach an acoustic unconformity of Miocene/Pliocene age, which was believed to be an event coinciding with the initiation of rifting and opening of the Lau Basin. Although drilling penetrated the reflector, no lithogic changes were observed at that depth, and drilling continued through turbidites and beds of volcanic breccia and conglomerate.

Site 841 was located on the forearc slope and unexpectedly drilled into a high-SiO_2 dacite. In the upper section of the hole, drilling encountered several hundreds of meters of volcanoclastic turbidites dating back through the Miocene with several basaltic andesite sills or dikes injected into this series. This was underlain by an Upper Eocene reef assemblage, and at about 600 mbsf, the high-silica, low potassium volcanic complex of welded tuffs and tuff breccias which had clearly erupted subaerially was encountered. This may represent the remnants of a silicic volcanic arc; however, such rocks are rare in the earliest stages of development in other intraoceanic island arcs.

One problem encountered on the cruise was that there was the limitation on XRF analyses and thin section production imposed by having only one technician on board. It is important on hard-rock legs to have sufficient personnel to provide adequate coverage of these two critical functions.

LITHP endorses the recommendation of the Shipboard Measurements Panel that shipboard technician coverage on hard rock legs be sufficient for the XRF, XRD and thin section facilities to be operational continuously throughout each day.

2.2 Plans for Leg 137--Return to Hole 504B (Engineering) (M. Storms)

The primary objective of this leg will be to attempt to clear out the Hole 504B in preparation for deepening during Leg 140. The 22 days on site will be devoted to downhole logging, clean-out operations, coring tests, and possibe contingencies.

In accordance with LITHP and DMP recommendations, a series of downhole measurements will be made prior to the clean-out operations. The casing will be inspected using the conventional casing-inspection logging tools and the borehole televiewer. If the casing is bad, it may be necesary to install a protective liner--such action would be deferred until Leg 140. LITHP had recommended that the liner be carried on Leg 137 so any hole repair could be completed on the Engineering Leg; however, due to financial and lead time considerations, this is not possible.

If clean-out operations are successful, the remainder of the leg will be devoted to deepening the hole and completing some coring tests with different types of hard-formation RCBs and new drill bits. One alternative system to be tested will be conventional oilfield diamond coring. This system is not wireline retrievable, so requires a round trip of the drill string to recover each core. However, this may not represent a major time loss as, by the time 30-60 ft. of core has been cut, it is likely that the bit needs to be changed requiring tripping the complete drill string. A new artificial diamond drill bit used by Amoco very effectively in shales and carbonates and now redesigned for crystalline rocks, will also be used. The original plan was to test one of the two bits during Leg 136 at the base of the Hole. However, one bit was lost at sea during the recent helicopter accident, so only one remains.

An additional test will be the inflation of a drillstring packer in the upper part of the hole to better document the changes in permeability. This will use conventional formation tests as well as a new flowmeter injection experiment.

In terms of contingencies, the first will be to run additional logs and downhole measurements before abandoning the Hole. If additional sufficient time (about a week) is available, one of the sites proposed for Leg 138 (Pacific Neogene transect) will be started. If only a few days are available, the investigations of the hydrogeochemistry of the sediments around Site 504 will continue with ACP and XCB coring at the site of greatest local heat flow.

There is some concern over the schedule in terms of gearing up after Leg 137 for either deepening Hole 504B or preparing for Hess Deep. If the viability of Hole 504B is not clear-cut during Leg 137, a decision to continue or to abandon future efforts at this Site needs to be made quickly. If this proves to be the case, **LITHP will review the results of Leg 137 as soon as they are available and make a recommendation to PCOM regarding the future of Hole 504B.**

2.3 Plans for Leg 139--Sedimented Ridges I (M. Storms)
(See Appendix II for overhead used)

A preliminary engineering and operations planning document has been prepared that addresses:

- the drilling environments likely to be encountered (as defined by the SRDPG report)

- the limitations of the current equipment in terms of meeting the science objectives

- the safety requirements as specified by Canada, ODP, and SEDCO

- the sampling/measurement tools required.

In addition, a high T/H_2S contingency plan has been prepared that includes safety both in the lab and on the rig floor.

All the planning documents have been reviewed by COGLA and by independent H_2S consultants.

Currently, the hardware necessary for drilling in this area is being evaluated. Specifically, it is likely that non-sealed ball-bearing bits which can withstand temperatures up to 400°C will be used rather than the current bits (which are good to only 180°C). High temperature seals will also be needed in the pressure core sampler (PCS). Borehole T will be monitored during drilling.

The motor-driven core barrel (MDCB) will not be used during Leg 139 not only because of the high T, but it also needs more testing. This means that this Leg will accomplish only the hydrological part of the experiment, because the MDCB is required to recover the top section of deposits, which is needed to study near-surface mixing, and alteration of sulfides and basalts. However, the MDCB is never effective down to 50m as the BHA system has to be buried to achieve the stability necessary to use the MDCB. It may be possible to piston core the material at the top of the section of deposits.

2.4 Plans for Leg 142--East Pacific Rise (Engineering) (M. Storms)
(See Appendix II for Overheads)

I. Engineering Concerns
About 35 days of on-site operations are scheduled for Leg 142. Although transit time is high, it can be used for setting up the DCS system.

The primary engineering goals for this leg are:

1) to maximize coring time with the DCS system
The statistics from Legs 124E and 132 show that experience actually coring with the DCS system is limited to 25 hours. The system is at a point where rotating

time is needed to prove its effectiveness, and for the drillers to gain experience using it. First and second-stage drill-in BHAs will be set to stabilize the new 3-leg guide base and to isolate the upper rubbly section.

2) to evaluate a new diamond core barrel (DCB) as an option to the second stage drill-in BHA system
This will be the first test of this bit for ODP purposes and, if successful, would allow core recovery in the upper section with a hole size of 7-1/4".

Leg 132 demonstrated the ability to pick up the guidebase and move it to a new location if drilling proved unsuccessful. This means that on Leg 142, it will be feasible to set the guidebase, attempt to drill in a minimum amount and then back-off; if unsuccessful, the guidebase can be moved. Hence, the spud-in tests that had to be completed on Leg 132 to establish the depth of the BHA will be unnecessary.

The preliminary operations plan calls for setting the mini hard rock guidebase and stabilizing the upper 10 m of rubble with the first stage drill-in BHA. Three options are then available:

- evaluation of the DCB to 50 meters with the RCB wireline system and cores of 2.31" diameter
- stabilization of the rubble zone to 50 meters with the second stage drill-in BHA without coring
- use of the DCS Phase II system with cores of 2.20" diameter in 10 ft. sections.

The overall penetration to be expected on this Leg is 100-200 mbsf.

This operation plan will allow a number of engineering developments to be evaluated that have included new design of some components as well as modification and upgrade of many others. Total funds allocated so far have been about $1.6 million, of which about $1.2 million have been spent on sea-floor structures (guidebase, BHA, etc.). Much of the effort has focussed on the new mini-hard rock guidebase, which now has 3 legs, and a reentry cone of 8^1 diameter (compared with 14' in the original guidebase), and a counter-balance gimbal system for the cone. With the smaller cone, it is now possible to see bullseyes on top of the cone with the TV, and the guidebase is also equipped with electronic tilt beacons. The nested drill-in BHA system is much the same as that used on Leg 132, and has the same back-off capability.

A number of bits will be evaluated, including a 2-cone bit, which has a 4" center

hole. This provides another option for making hole in that this bit can be used to drill in and back off, and then the DCS system can be deployed through the 4" hole in the bit. Although this may cause some deviation of the hole, it could allow further penetration.

A number of modifications to the HQ DCS core barrel have been made so that a variety of samplers (eg. push sampler, piston-type sampler, etc.) can be deployed, and there is also more flexibility in the variety of core catchers available.

A developmental system for the CSG advancer latch for the drill-in BHA will be tested. The new system is made of high impact plastic and will provide a re-entry guide for the second stage BHA. The use of plastic may provide protection for the drilling bits during re-entry.

II. Scientific Concerns (S. Humphris)

The recent refraction data collected by M. Purdy and G. Fryer have resulted in a request from R. Batiza to PCOM to make EPR-2 (rather than EPR-1) the primary site for Leg 142. This is based on the fact that there are significant and systematic differences in the thickness of the low-velocity rubble zone, with evidence that the unconsolidated surficial layer doubles in thickness during the first 10,000 yrs. Within the axial summit graben, this layer is less than 100 m thick, and within 200 m, Vp is up to 5.5 km/sec, whereas, off-axis the rubble layer is 100-200 m thick. Given the previous lack of success in drilling young mid-ocean ridge sites (Leg 54 in the East Pacific Rise and Legs 106 and 109 on the Mid-Atlantic Ridge), and the urgent need to demonstrate that DCS drilling is a viable technique in such terrain (particularly as ODP comes up for renewal), it seems prudent to drill initially at the least problematic site from an engineering point of view.

LITHP reviewed the Cruise Report submitted by M. Purdy. The data and their interpretation are consistent with submersible observations at Hess Deep (on 1 myr old crust), where more than 200 m unconsolidated rubble is exposed overlying consolidated crustal layers, and on the Juan de Fuca Ridge, where the only rubbly areas in the central rift are highly localized collapsed lava lakes. Hence, it would appear that upper crustal drilling conditions might be more favorable in the axial summit graben, particularly if detailed *Alvin* surveys can determine and mark a visually promising site.

The highest priority for drilling, as outlined by the EPRDPG was to establish "a single deep hole near the ridge axis that penetrates as closely as possible to the top of the geophysically defined axial low velocity zone, which is interpreted to be the top of an axial magma chamber". The low velocity zone appears from the seismic

data to be well-defined under both EPR-1 and EPR-2, so making EPR-2 the primary site does not compromise the highest priority. The overall plan calls for both holes to be drilled, with EPR-2 being drilled to only 500 m. In terms of meeting the hydrothermal objectives of EPR drilling, alteration may be better developed at EPR-1 (the off-axis site) so deeper penetration might be preferable. However, the most important requirement to look at fluid flow and fluid/rock interactions in the upper part of the crust is that both holes be drilled in a multi-leg program. Hence, it is critical that Leg 142 is successful to ensure the future of drilling in this region.

Given all of these considerations:

LITHP strongly supports the change in primary site for EPR drilling to the on-axis site--EPR-2--to be started during Leg 142. This recommendation is based on an examination of recent seismic data, consideration of the scientific objectives of EPR drilling, and the desire to select the least problematic drilling site to adequately test the DCS Phase II system for bare-rock drilling.

3.0 PROPOSAL REVIEWS

3.1 The following proposals were evaluated to not fall within the mandate of the LITHP:

Joides Ref. No.	Title	Author(s)
59-Add	Continental Margin Sediment Instability Investigation by Drilling Adjacent Turbidite Sequences	P.P.E Weaver and R.B. Kidd
247/E Add	Water Mass Conversion in the Glacial Subarctic Pacific (54°N, 148°W): Physical Constraints and the Benthic-Planktonic Stable Isotope Record	R. Zahn, T.F. Pedersen, B.D. Bornehold, A.C. Mix
345-Add	Drilling Proposal for the West Florida Continental Margin, Gulf of Mexico: Sea Level and Paleoclimatic History	Drs. J.E. Joyce, H.T. Mullins, L.R.C. Tjalsma, and S.W. Wise
363-Add	Paleooceanographic record at proposed drillsites NR1, NR2, and NR3	B. Tucholke
388	A Proposal to Advance Piston Core the Ceara Rise, West Equatorial Atlantic: Neogene History of Deep Water Circulation and Chemistry	Drs. W.B. Curry, J. Backman, N.J. Shackleton
389	Cretaceous N-S Traverse in the Western South Atlantic	B.A. Malmgren
391	Depositional History and Environment During the Formation of Sapropels in the Eastern Mediterranean	R. Zahn, E.A. Boyle, S.E. Calvert, F.G. Prahl, and R.C. Thunell
S-1	Documentation of Lithofacies and Depositional Cyclicity, Navy Deep-Sea Fan, California Borderland	D.J.W. Piper, M.B. Underwood, W.R. Normark

3.2 Proposal 323-Rev.

The Alboran Basin and the Atlantic - Mediterranean Gateway: Neogene Evolution of Continental Basement Overthrusting and Extension in the Alboran Sea and the Development of the Atlantic - Mediteranean (M.C. Comas, J.C. Faugere, J.A. Flores, V. Garcia-Duenas, M.J. Jurado, R. Kidd, J. Mackris, A. Maldonado, A.G. Megias, H. Nelson, F.J.Sierro, D.A.V. Stow, R. Stephenson, C. Vergnaud-Grazzini and J. Woodside)

The dynamics of rifting, and the tectonic evolution and subsidence history of the Alboran Basin are of interest to LITHP, but represent important objectives more directly related to the thematic concerns of TECP. A number of clarifications and additions to this proposal would be helpful. LITHP had some difficulty relating the proposed objectives to the specific holes to be drilled; there needs to be a more detailed description of how the proposed drilling will address the tectonic problems. For example, it is not clear how drilling will determine whether lithospheric deformation occurred by delamination or convective processes. In addition, some tectonic interpretation of information available from the many commercial drill holes in the area might strengthen the proposal.

Further development of the impact of drilling on understanding the nature of volcanism in the area is necessary. There is no mention of mineralogical or geochemical investigations of the volcanoclastics, which could potentially be most interesting, and are likely to be encountered in a number of holes. There is only one site (AL-1B) where substantial (100 m) basement penetration is proposed into a structural high. It is not clear that a single basement hole will meet the objectives defined in the proposal.

3.3 Proposal 334-Rev.

Galicia margin S reflector and ultramafic basement (G. Boillot, E. Banda, M. Beslier, and M. Comas)

This proposal addresses a number of LITHP objectives for understanding non-volcanic, stretched passive margins. Although drilling the S-reflector is important, LITHP's interest would be greater if drilling continued below this horizon. Of particular concern is the question of the regional continuity of the S-reflector--it is not clear that it can be traced seismically, particularly in a N-S direction. Hence the question arises as to whether one hole will be representative of this horizon. Site 1 is of interest, although it would help to obtain seismic refraction data prior to drilling in order to differentiate clearly between crystalline basement and syn-rift sediments.

It is also not clear from this proposal that drilling is needed to address the Site 2

objectives to determine the southerly extent of the peridotite ridge. Magnetic or seismic data might be useful. In addition, five days is an unrealistic time estimate to complete the proposed drilling and logging at this site.

Further interpretation of the data are needed--the cross-sections presented do not appear to restore successfully. Overall, this is an interesting proposal to drill in an excellent locality but additional seismic data might help better frame the problems that it tries to address.

3.4 Proposal 362-Rev 2.

Proposal for Scientific Ocean Drilling, Chile Margin Triple Junction, Southern Chile Trench (S.C. Cande, S.D. Lewis, G. Westbrook)

Sites SC-3, 4, and 5 address high-priority objectives of hydrothermal circulation and crustal accretion (mid-ocean ridge volcanism); however, this component of the proposal is currently not well-developed. While the proposal is written primarily to evaluate forearc evolution, from a LITHP viewpoint the Chile triple junction offers a unique natural laboratory to evaluate the effect on crustal genesis (and magma plumbing) from covering the crust with a thermal blanket of sediments. The proponents are encouraged to consider expanding their investigation of Site SC-3 with this viewpoint in mind. Similarly, to place the drilling results into context, it will be necessary to perform a great deal more water column work.

Site SC-6, on the Taitao ridge, would be of interest to LITHP if a second leg for this program is warranted. While the process of ophiolite emplacement is important to LITHP, the proposed drilling will provide limited information in this regard. Dating the basement rocks and determining their geochemistry will help constrain the origin of Taitao ridge, and will date the sediments overlying the ridge. It is not clear, however, that these samples could not be obtained from either dredging or submersible. Also, additional geophysical data are necessary to better constrain the subsurface geometry of the proposed "ophiolite" body.

3.5 Proposal 365-Rev.

Conjugate Passive Margin Drilling--North Atlantic Ocean (J. Austin, G. Boillot, M.C. Comas, A. Grant, F. Gradstein, L. Jansa, C. Keen, K.E. Louden, P.R. Miles, J.C. Sibuet, S.P. Srivastava, B.E. Tocholke, and R.B. Whitmarsh)

This proposal to investigate processes associated with continental rifting is of high interest to LITHP and is certainly mature! The southern transect addresses objectives of greater importance to LITHP than the northern transect. Of particular interest are the objectives at the presumed peridotite ridge (IAP4) and the conjectured continental (?) crust at NB3; this site could be either continental or

oceanic, depending on the position chosen for the OCB.

Drilling of the southern transect is estimated to require about 3-1/2 legs to complete 3 holes on each margin. LITHP suggests that the proponents consider whether some time savings can be made by drilling without coring where the objectives in the sediment column can be addressed with logging--for example, in modelling subsidence history and basin reconstruction. In addition, industry drilling results could perhaps be used to extend heat flow data.

3.6 Proposal 390.

Proposals for the drill sites location in the Shirshov Ridge region (Bering Sea) (V.E. Milanovsky and Y. Neprochnov)

LITHP considered this proposal very immature at this stage but noted that there was general LITHP interest in this area. The panel suggests that the proponents use other mature proposals that have been submitted as models for the type of proposal they should resubmit. In particular, they should detail the results of recent geophysical and geological surveys and clearly discuss the objectives they hope to meet by drilling. They should note that there have been previous proposals to drill in the region and that there are difficulties in drilling deep holes at this time, particularly in view of the thick Neogene sedimentary cover. Site selections and depths of drilling required should be well-documented in the revised proposal.

3.7 Proposal 392.

A Mantle Plume Origin of the North Atlantic Volcanic Rifted Margins: Testing the Model Against Geological Data (H.C. Larsen, J.A. Chalmers, L.M. Larsen, A.K. Pedersen, N. Hald, C. Keen, S.P. Srivastava, K.G. Cox)

This proposal addresses high priority LITHP objectives--namely, the nature of magmatism and its relationship to tectonic extension at a volcanic rifted margin (VRM). The following deficiencies need to be addressed:

1) A depth of penetration of 1000 m into basement is proposed for Site LABS-1. This would require a complete drilling leg be devoted to this hole; more justification is needed for LITHP to support this site.

2) The interpretation of the seismic data to indicate the "peridotite ridge" at proposed site LABS-5 is uncertain. Perhaps other types of geophysical surveys (e.g. bottom gravity?) may help resolve this structure and strengthen the argument to drill at this location.

3) There is a need for the formulation of a testable model using existing

geochemical data, either from this region or from analogous margins in the North Atlantic.

Overall, LITHP strongly supports the scientific objectives and would like to see them integrated with other NARM proposals.

3.8 Proposal 393.
Drilling the Continent-Ocean Transition on the SE Greenland Volcanic Rifted Margin: Linking Continental Flood Basalts to Seaward Dipping Reflector Sequences (H.C. Larsen, T.D.F. Nielsen, L.M. Larsen, C.K. Brooks, K.G. Cox, A.G. Morton, B. Larsen)

Although quite immature, this proposal to investigate the igneous and tectonic processes at the continental-oceanic lithosphere transition is important for LITHP, and its objectives should be integrated with other proposals for this region. The major criticism of this proposal is that there is no presentation of a geochemical model that can be tested. There is considerable data from this region, both from land-based field studies and previous drilling legs, which is not discussed or used to constrain the possible models. In addition, the need for Site SEG-1 needs to be more fully justified--its proximity to land raises the issue as to whether some of the objectives could not be met by drilling on the continent.

3.9 Proposal 394.
Evolution of pre- and syn-volcanic extensional basins on passive volcanic continental margins (L.V. Kiorboe, K. Gunnarson, M.S. Andersen, and L.O. Boldreel)

This proposal primarily addresses themes within the mandate of the Tectonics Panel, but potentially addresses area of thematic interest to the Lithosphere Panel (LITHP). In particular, drilling of seismic unit three interpreted to be syn-rift volcanic rocks, is of interest to LITHP, but scientific objectives that could be met by sampling these rocks are not well developed. The continuity and relationship of seismic unit 3 to well-developed seaward dipping seismic reflectors (SDSR) to the west is not described in detail. Specific geochemical models to be tested by the drilling are not presented. Expansion of this area of the proposal might increase LITHP interest in this proposal, especially how drilling volcanic rocks at this site relates to the larger problem of volcanic rifted margins. This proposal should be considered by the North Atlantic Rifted Margins Detailed Planning Group as part of an integrated approach to passive margin drilling.

3.10 Proposal 395.
Post-Breakup Compressional Tectonics on a Passive Volcanic Continental Margin

(L.O. Boldreel and M.S. Andersen)

This proposal suggests an interesting approach to investigating post-break up deformation--using basins to date deformation and, by implication, to understand internal deformation of the Eurasian plate and its relation to plate motion changes.

As presented, this proposal is too local in its scope, and needs to be defined in terms of the regional North Atlantic geology. Is this an isolated feature, or is it an example of structures that are widespread and regionally significant? It is not clear that the program is optimal to address the objectives--the justification from the bathymetric and geophysical data is not well stated.

If drilling in this area, together with other geophysical evidence, can be used to tie down the internal deformation of plates and its relation to plate motion, this would be a very interesting target of secondary interest to LITHP, but probably of high interest to TECP.

3.11 Proposal 396.
Testing of the Hot-Spot Model for the Origin of Volcanic Passive Continental Margins (M.S. Andersen)

The existing geophysical models (plume vs. convective melting) proposed for the formation of Atlantic-type volcanic passive margins are not well-constrained by the current data base. This proposal, although rather preliminary, presents a good justification for testing the plume model by drilling a "transect" of holes over a broad geographic area.

This is a fundamental problem of high interest to LITHP. The proponents need to evaluate the existing "Faroe" petrologic data, and also show how any geochemical data acquired from drilling can be effectively used to constrain the petrogenesis of the volcanics associated with North Atlantic volcanic rifted margins.

3.12 Proposal 361-Rev.
A proposal for drilling an active hydrothermal system on a slow-spreading ridge: MAR 26°N (TAG) (G. Thompson, et al.)

This proposal directly addresses high priority objectives of LITHP, COSOD II and the ODP Long Range Plan, and is strongly supported by LITHP. The proposal stresses the hydrothermal/mineralization aspects of the region and is fairly mature; however, some important structural/tectonic/magmatic aspects were not covered or discussed in sufficient detail. There is no discussion of the basalt petrology or the potential interrelationship of volcanic and hydrothermal processes in the TAG area.

For example, is there evidence for later "off axis" volcanic activity and is it chemically distinguishable from earlier activity? There is also great concern about the ability to properly site drill holes to best address objectives 2, 3, and 4. The drilling locations for priority 1 are presented with respect to a model. The detailed geologic relationships that lead to the model should be presented for consideration. Every attempt should be made to obtain further detailed site survey information, particularly as regards structural and hydrologic control of the hydrothermal system.

Perhaps the UW hard rock drill could be used to obtain a number of shallow holes in the upper sections before ODP drilling.

LITHP is also concerned with the relative importance of shallow (<200 m) and deep holes in the area. Deep drilling is necessary to address changes in T, fluid flow and mineralogy with depth. Although a great deal can be learned from the proposed holes, it is likely that more deep drilling will eventually be needed to understand the system, particularly as it is a prime locale to evaluate the evolution of ophiolite-type massive sulfide deposits.

There is concern that Phase III of the diamond coring system (DCS) will not be available to optimize the return from drilling, but the opportunity for drilling in the TAG area should not be missed even if the DCS is not available. Finally, there was discussion of the desire for extensive drilling on a slow spreading center to complement planned EPR drilling. It would be desirable to present TAG drilling as one aspect of a longer range plan to understand crustal accretion and evolution at slow spreading ridges.

4.0 UPDATE ON ENGINEERING DEVELOPMENTS (M. Storms)

A detailed description of the current configuration of the DCS Phase II system was presented. Recent modifications have been made to the mini hard rock guidebase and the re-entry cone which have resulted in the capability to build the entire assembly in the moon pool area. The total new guidebase assembly weighs about 150,000 lbs. The limitations of the DCS Phase II system include the need for a drilling platform above the rig floor, as well as the headroom problem which can accommodate only a 10' core barrel.

A feasibility study for the Phase III system--in which drilling operations are brought down to the rig floor--is in the initial stages. It is estimated that 18-24 months will be required to develop the Phase III system after the feasibility study is completed. Hence, it should be ready for scientific use by late 1993.

LITHP is concerned with the current communication mechanisms that exist between the panel and ODP Engineering activities. Over the last year, a number of decisions

have been made and actions taken (or not taken) by ODP-TAMU concerning further progress in developing drilling technology that have not been conveyed to LITHP--the panel most seriously affected by such changes in terms of realistically planning future drilling strategies. It is critical that concerns arising during engineering development that require a deviation from the projected implementation plans be communicated to LITHP, so the Panel can make informed decisions on their high priority objectives to be met within a given time frame.

The presence of an ODP Engineer at the LITHP Meetings has always proved to be extremely valuable, not only in providing an education in drilling systems currently in use and proposed for the future, but also as a reality check in terms of the time necessary for each step required to advance the drilling capabilities to meet objectives within LITHP's mandate. However, ODP Engineers are not present at all meetings and, although the ODP Liaison can bring information from them, questions and concerns always arise that cannot be addressed directly.

Hence, given the sensitivity of LITHP decisions concerning scheduling of high priority drilling programs to the timeliness of engineering developments, LITHP requests that an ODP Engineer attend both of its meetings each year.

5.0 Ranking of Proposals

LITHP identified twenty-nine programs (with associated proposals) that address high priority objectives and are of interest to the panel. These are listed in Appendix III, grouped according to themes or topics. No topic was included for which a proposal did not exist; hence, although a continuous section of oceanic crust remains a major goal, it could not be included in the rankings. In addition, it did not seem realistic to include it when the technology is unlikely to have advanced sufficiently to achieve such an objective in the time-frame for which the ranking was being done (i.e. one year beyond the current drilling schedule).

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

The total numbers of votes for each program are shown in Appendix III. For brevity, only the top ten highly ranked programs are listed below:

Rank	Program/Theme	Proposal #	Area	Total Votes
1	Offset drilling: Layer 2/3, etc.	375-Rev.	Hess Deep	106
2	Hydrothermal processes at slow spreading ridge	361/A	TAG	78
3	Axial crustal drilling-- EPR II	EPRDPG Report	EPR, 9°30'N	75
4	Volcanic rifted margins	392-396	N. Atlantic	62
5	Sedimented Ridges II	SRDPG Report	Escanaba Trough	45
6	Layer 2/3, Layer 3/ mantle transitions	376/A, 382/A	Vema FZ	45
7	Upper mantle	369/A	MARK area, MAR	43
8	Non-volcanic rifted margins	334-Rev., 365-Rev., et al.	N. Atlantic	29
9	Hydrothermal processes at medium spreading ridge	325/E	Endeavor Ridge	26
10	Oceanic plateaus	142/E-Rev.	Ontong-Java	21

A number of comments need to be made concerning some of the programs considered and the overall rankings:

1) There are now three programs within the top seven that relate to offset drilling strategies. We also have the first leg to Hess Deep on the 1992 schedule, and offset drilling is specifically mentioned in the ODP Long Range Plan. It is absolutely critical that a drilling program be formulated to use this strategy to best achieve our scientific objectives and optimize the scientific returns. This is not a project that can be undertaken by one, or a combination of, thematic panels. Individuals with expertise in the likely geophysical and geochemical structure of lower crustal and upper mantle layers is necessary, as well as others who are familiar with the tectonic settings of the proposed areas.

   LITHP once again strongly urges PCOM to create an Offset Drilling Working Group to establish and prioritize the scientific objectives of a program for drilling offset sections of the crust and upper mantle. It is

critical that this begin as soon as possible in order that a program be formulated for implementation within the upcoming drilling schedule.

LITHP would also appreciate consideration of the objectives to be outlined in the WG's mandate, and the suggestions for membership, as submitted in the LITHP minutes from last November.

2) EPR II and Sedimented Ridges II both continue to be highly ranked programs. LITHP is gratified that PCOM has recommended that these be drilled at the earliest possible date commensurate with technological progress and ship scheduling.

3) Drilling into old Pacific crust (proposal #368/E) ranked as LITHP's eleventh priority. However, there is considerable LITHP interest in returning to Hole 801C to complete detailed logging in the basement section.

4) The Red Sea is a region of high scientific interest to LITHP. There are at least three proposals to drill there; however, such a program was not included in the rankings because of the concerns over whether research clearance could be obtained to drill in the region.

LITHP requests an update from PCOM and/or ODP concerning the status of obtaining research clearances in the Red Sea, and advice as to whether drilling in this region can now be considered.

6.0 LONG-TERM PLANNING

6.1 Deep Drilling

Deep crustal drilling continues to be a high priority for LITHP. In response to a request from the Deep Drilling Working Group, who met last September, LITHP devised six "example sites" of prospective drilling locations, with details of anticipated lithologies, temperatures, permeability, etc. These "example" sites included:

1) zero age crust - fast spreading
   - slow spreading

2) off axis crust - fast spreading
   - slow spreading

3) subduction zone - forearc crust

4) passive margin - seaward dipping reflectors

C. Sparks (TEDCOM Chairman) has requested that these examples be narrowed down to one or two high priority examples.

LITHP believes that it is ultimately going to be critical to drill deep holes at a number of sites in order to understand lithospheric processes. It is likely that several deep holes in fast and slow spreading environments, together with a deep off-axis hole tied to a moderately deep on-axis site to study changes due to alteration, will be necessary.

Clearly, achieving these objectives is a long way off, and may or may not be reached using the current drilling vessel. However, it is important that the objectives of scientific drilling programs proposed for the next few years continue to push technological developments towards deeper drilling capabilities. **Hence, LITHP's short-term strategy will include drilling a scientifically sound program of intermediate (2-3 km) depth holes to maximize the present vessel's capabilities, to advance the technology, and to increase knowledge of the challenges to be faced in very deep drilling.**

For planning purposes for TEDCOM and ODP, LITHP has developed a single "ocean crust" site, that uses information from Holes 504B and 735B. The final version will be approved by all LITHP panel members before submission to TEDCOM and the JOIDES office.

6.2 ODP's Long Range Plan

LITHP continued to address PCOM's charge to consider development of implementation plans for the Long Range Plan. The major objectives of interest defined at the last meeting have been assessed in terms of:

- current status
  - submitted proposals
  - WG or DPG
  - technology

- requirements for implementation
  - other necessary proposals
  - new WG or DPG
  - technological developments
  - other (e.g. site survey, interpretation of available data, etc.)

An additional objective--Structure and Dynamics of Rifted Margins--has also been included. This is likely to be of significant interest to TECP; however, LITHP is concerned with studies of the amounts of extension and associated volcanism in different tectonic regimes.

7.0 OTHER BUSINESS

7.1 Panel Replacement

M. Perfit is due to rotate off LITHP. Mike has provided a great deal of help, and LITHP thanks him for his dedicated service.

LITHP recognizes that the panel needs an individual with expertise in the geology and geochemistry of lower crustal/upper mantle layers, and unanimously nominates:

S. Bloomer (Boston University)

as the replacement for M. Perfit. (Sherm has been contacted, and is willing to serve.)

7.2 LITHP liaisons and representatives on working groups

The following is a complete list of LITHP liaisons to other panels, Working Groups, and Detailed Planning Groups:

OHP - G. Smith
SGPP - R. Zierenberg
TECP - S. Cloetingh
TEDCOM - D. Moos
DMP - J. McClain

NARM-DPG - S. Cloetingh
Sea Level Working Group - S. Cloetingh
Atolls and Guyots DPG - T. Brocher

Offset Drilling WG - J. Phipps-Morgan (if this WG is established)

7.3 Next meeting

The next LITHP meeting will include a joint session with TECP, and will be held on 9-11 October 1991 in Cyprus.

Appendix I.

JOIDES Lithosphere Panel FY'90 Annual Report

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

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

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

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

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

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

Other important highlights of the year include the formation of two Detailed Planning Groups to formulate drilling programs for the East Pacific Rise (this is already completed) and for North Atlantic Rifted Margins. In addition, LITHP is encouraged with

the progress being made in locating or developing high temperature and slimhole logging tools, and wishes to stress that the success of LITHP's drilling programs next year depends on at least the basic suite of tools previously defined being available.

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

ODP ENGINEERING AND DRILLING OPERATIONS

HIGH TEMPERATURE DRILLING/H_2S PLANNING

LEG 139 SEDIMENTED RIDGES I

* A PRELIMINARY ENGINEERING AND OPERATIONS PLANNING DOCUMENT HAS BEEN PREPARED
    * ENVIRONMENT DEFINED
    * EQUIPMENT LIMITATIONS IDENTIFIED
    * SAFETY REQ'MTS (CANADA/ODP/SEDCO) IDENTIFIED
    * DESCRIPTION OF SAMPLING/MEASUREMENT TOOLS
* A HIGH TEMP/H_2S CONTINGENCY PLAN HAS BEEN PREPARED
    * INCLUDES LAB/RIG FLOOR SAFETY
* ALL PLANNING DOCUMENTS HAVE BEEN REVIEWED BY COGLA AND BY INDEPENDENT H_2S CONSULTANTS

LEG 142 EAST PACIFIC RISE

* COMPUTER MODELING OF POTENTIAL STEAM FLASH CONDITIONS HAS BEEN CONDUCTED (ENERTECH)
* HIGH TEMPERATURE/H_2S REGIMES SHOULD BE AVOIDED AS MUCH AS POSSIBLE.
* A TUBING BOP WILL BE MOUNTED BELOW THE DCS PLATFORM FOR LEG 142 DCS/EPR OPERATIONS.
* THE PHASE III DCS (RISER TENSIONER CONCEPT) SYSTEM IS CONSIDERED VASTLY SAFER FOR DCS DRILLING IN HIGH TEMPERATURE REGIMES.

SUMMARY OF DCS OPERATING TIME (LEGS 124E AND 132)

LEG 124E STATISTICS

(BASED ON 16.5 DCS OPERATING DAYS)

* DCS OPERATIONS DERRICK/RIG FLOOR[1,2] 44%

* DCS CORING TIME[3] 5%

20 HOURS TOTAL OF WHICH 5 HOURS IS CONSIDERED EFFECTIVE CORING TIME.

LEG 132 STATISTICS

* DCS OPERATIONS DERRICK/RIG FLOOR[1,2] 38%

* DCS CORING TIME[3]

20 HOURS EFFECTIVELY CORING (2 BIT RUNS)
79.6 METERS CORED

FOOTNOTES:

1 - EXCLUDES CORING TIME.

2 - INCLUDES DCS TRIPPING, MAST/PLATFORM RIG UP, DCS COMPONENT CHECK OUT AND FUNCTION TESTING.

3 - INCLUDES WASH CORING, WIRELINE TIME, AND DRILLING AHEAD TIME.

LEG 142 EAST PACIFIC RISE

ENGINEERING LEG III

LEG PARAMETERS

IN PORT VALPARAISO, CHILI	JANUARY 13-17, 1992
DEPART VALPARAISO, CHILI	JANUARY 18, 1992
TRANSIT TO EPR-1	13.2 DAYS
OPERATIONS ON SITE EPR-1	34.6 DAYS
TRANSIT TO HONOLULU, HAWAII	13.2 DAYS
ARRIVE HONOLULU, HAWAII	MARCH 19, 1992

TOTAL DAYS IN PORT	5.0
TOTAL TRANSIT DAYS	26.4
TOTAL DAYS ON-SITE	34.6
TOTAL DAYS ON LEG	66.0

LEG 142 EAST PACIFIC RISE

ENGINEERING LEG III

PRIMARY ENGINEERING GOALS

* THE ABSOLUTE NUMBER ONE PRIORITY FOR LEG 142 IS TO: MAXIMIZE CORING TIME WITH THE DIAMOND CORING SYSTEM.

* TO ACCOMPLISH THIS TASK A NEW 3-LEG/HEX SIDED HARD ROCK GUIDE BASE WILL HAVE TO BE SET AND THE UPPER "RUBBLY" SECTION ISOLATED BEHIND THE FIRST AND/OR SECOND STAGE DRILL-IN-BHA.

* A NEW DIAMOND CORE BARREL (DCB) WILL BE EVALUATED AS AN OPTION TO THE SECOND STAGE DI-BHA SYSTEM. SHOULD CORING WITH THE DCB PROVE UNSUCCESSFUL THE 2ND STAGE DI-BHA WILL BE DEPLOYED.

LEG 142 EAST PACIFIC RISE

ENGINEERING LEG III

SECONDARY ENGINEERING GOALS

* TEMPERATURE/CALIPER LOGS IN 7.25" DCB HOLE
* TEMPERATURE/CALIPER LOGS IN 3.96" DCS HOLE

NOTE:

A SECOND HARD ROCK GUIDE BASE (HRB) MAY BE DEPLOYED BUT ONLY UNDER THE FOLLOWING CONDITIONS:

(1) THE INITIAL HRB/HOLE IS LOST AND DEEMED UNRECOVERABLE.

(2) CONTINUED CORING OPERATIONS ON THE INITIAL HOLE ARE PREVENTED DUE TO TEMPERATURE CONCERNS.

(3) DCS CORING AHEAD OF SCHEDULE AND CANNOT CONTINUE DUE TO OTHER CONSTRAINTS SUCH AS DRILL ROD SHORTAGE, OR MECHANICAL MALFUNCTION.

LEG 142 EAST PACIFIC RISE

ENGINEERING LEG III

SPECIFIC ENGINEERING GOALS

* EVALUATE PLATFORM MODS
    * IMPROVED DCS WINCH/TUGGER CONTROL SYSTEM
    * EVALUATE SECONDARY HEAVE COMPENSATOR MODS
    * EVALUATE LOW FRICTION SEALS F/HYD FEED CYLINDERS
    * EVALUATE HIGH PRESSURE POWER PACK FILTER SYSTEM
* EVALUATE NEW MINI HRB HEX DESIGN
    * 3 LEG/HEX SIDED DESIGN
    * COUNTER BALANCE GIMBAL ELIMINATES FLOATATION
    * 8 FT DIAMETER REENTRY CONE
* EVALUATE NESTED DI-BHA SYSTEM
* EVALUATE DCB, 1ST/2ND STAGE DI-BHA BITS, AND CTR BITS
    * 2-CONE, 4-CONE, 6-CONE HYBRID TCI BITS
    * IMPREGNATED/CARBONADO DIAMOND BITS
    * 1-CONE, AND 2-CONE CENTER BITS
* EVALUATE MODS TO HQ DCS CORE BARREL
* EVALUATE CSG ADVANCER LATCH F/DI-BHA CENTER BIT
* EVALUATE RE GUIDE/DEPLOYMENT ASBLY F/DCB & DI-BHA
* EVALUATE HQ C'BBL SAMPLING OPTIONS (AS REQUIRED)

LEG 142 EAST PACIFIC RISE

ENGINEERING LEG III

PRELIMINARY OPERATIONS PLAN

* DEPLOY MINI HARD ROCK GUIDE BASE AT EPR SITE

* STABILIZE UPPER 4-10 METERS OF RUBBLE ZONE
  * WITH 1ST STAGE DRILL-IN-BHA
  * HOLE SIZE 11.25" TO 12.25", CTR BIT/NO CORE

* EVALUATE DIAMOND CORE BARREL (DCB) TO 50 METERS
  * WITH RCB WIRELINE C'BBL SYSTEM AND DIAMOND BIT
  * HOLE SIZE 7.25", CORE SIZE 2.31" X 30.0'

* STABILIZE RUBBLE ZONE TO 50 METERS
  * WITH 2ND STAGE DRILL-IN-BHA
  * HOLE SIZE 7.25", CTR BIT/NO CORE

* DIAMOND CORING (DCS PHASE IIB SYSTEM)
  * WITH HQ C'BBL SYSTEM, DIAMOND BIT
  * HOLE SIZE 3.96", CORE SIZE 2.20" X 10.0'

* ACHIEVE PENETRATION WITH DCS OF 100-200 MBSF

ODP ENGINEERING AND DRILLING OPERATIONS

DEEP DRILLING REQUIREMENTS AND PLANNING

* JOIDES PANELS HAVE BEEN ASKED FOR INPUT ON DEEP DRILLING REQUIREMENTS/GOALS (GENERIC SITE ???).

* TEDCOM PANEL HAS DISCUSSED TASK AND WILL PROVIDE INPUT TO ODP AFTER DRILLING GOALS HAVE BEEN DEFINED.

* INTERNAL ACTIVITY HAS CONCENTRATED ON:

    * DEFINING CURRENT VESSEL/TECHNOLOGY/HARDWARE LIMITATIONS.

    * IDENTIFYING POSSIBLE SYSTEMS TO BE USED, MODIFIED FOR POTENTIAL USE, ETC. (I.E. TRIPLE CASING STRING, DCB, CONVENTIONAL CORE BARRELS, ETC.)

* TIME ESTIMATING HAS LIMITATIONS BECAUSE TECHNOLOGY, HARDWARE, TECHNIQUES, AND DRILLING REQUIREMENTS ARE PRESENTLY ILL DEFINED.

Appendix III. Proposals Included in the Ranking

Program/Theme	Proposal #	Area	No. of Votes
DEEP DRILLING			
Layer 2/3 transition and other offset sites	375-Rev.	Hess Deep	106
Upper Mantle	369/A	MARK area, MAR	43
Layer 2/3, Layer 3/ mantle transitions	376/A and 382/A	Vema FZ	45
Upper mantle	374/A	Oceanographer FZ	15
Layer 3	352/E	Mathematician Ridge	2
Layer 3/ mantle transition-- extinct ridge	300/B	Site 735B, AII FZ	18
Mantle-back arc basin	379/B	Tyrrhenian Sea	10
RIDGE CREST/HYDROTHERMAL PROCESSES			
EPR II	EPRDPG Report	EPR, 9° 30'N	75
Sedimented Ridges II	SRDPG Report	Escanaba Trough	45
Hydrothermal-slow spreading ridge	361/A	TAG	78
Hydrothermal-medium spreading ridge	325/E	Endeavor Ridge	26
Zero age crust/extinct spreading ridge	331/A	Aegir Ridge, Norwegian Sea	7
Hydrothermal/back arc basin	360/D	Value Fa Ridge, Lau Basin	8
Extinct hydrothermal system	319/E Rev.	Galapagos	5
Transform-dominated ridges	333	Cayman Trough	1
OLD OCEAN CRUST			
Return to 801C	368/E	NW Pacific	19
Cretaceous volcanism	343/E	Caribbean Sea	0

HOT SPOT/SEAMOUNT			
Early hot spot evolution	252/E	Loihi Seamount	13
Near axis seamount	290/E	Axial Seamount	13
Temporal evolution of hotspots	291/E	Marquesas	3
VICAP	280/A-Rev.	Canary Islands	7
CONVERGENT MARGINS			
Ridge-trench collision	362/E Rev.	Chile Triple Junction	15
Back-arc tectonics	390	Shirshov Ridge, Bering Sea	2
Geochemical reference hole	267	W. Pacific	6
DYNAMICS OF RIFTING			
Volcanic rifted margins	392-396	N. Atlantic	62
Non-volcanic rifted margins	334-Rev., 365-Rev., etc.	N. Atlantic	29
Dynamics of early rifting	323-Rev.	Alboran Basin	9
State of stress in lithosphere	373/E	Site 505, Costa Rica Rift	8
OCEANIC PLATEAUS			
Oceanic plateau	142/E Rev.	Ontong-Java	21

1/91

ODP Proposal Review Form # 59-Add

Title: Continental Margin Sediment Instability Investigation by Drilling Adjacent Turbidite Sequences

Proponent(s): P.P.E. Weaver and R.B. Kidd

Evaluation by: ☒ LITHP ☐ OHP ☐ SGPP ☐ TECP

For panel mandates, Long Range Plan objectives, and reference to other relevant papers, see back page.

- ☒ 1 Proposal objectives are not within the mandate of this panel (as listed on back).
- ☐ 2 Does not address high-priority thematic objectives (as detailed in Long Range Plan).
- ☐ 3 Is of secondary interest to this panel if it is of high priority to some other panel.
- ☐ 4 Addresses high-priority objectives, but with deficiencies, as noted below.
- ☐ 5 Addresses high-priority objectives of this panel.

Level of proposal maturity: ☐ mature ☐ immature

Comments if within mandate of this panel (points 2-5):

Date returned to: 4/91

JOIDES Office
Institute for Geophysics
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Date forwarded to: _____

Dr. Philip P.E. Weaver
Institute of Oceanographic Sciences
Deacon Laboratory
Brook Rd., Wormley, Godalming
Surrey GU8 5UB

Mandate for JOIDES Lithosphere Panel (LITHP)

From: A Guide to the Ocean Drilling Program, JOIDES Journal, Vol. XIV, No 4, December 1988, p. 14-15.

The Lithosphere Panel is concerned with the origin and evolution of oceanic crust and mantle. In particular, important areas of investigation are volcanic, metamorphic, hydrothermal, structural and alteration processes occurring in the ocean crust. Also of importance to the Lithosphere Panel are mantle-crust interactions, mantle dynamics and composition, and solid-earth geochemical cycles.

(a) Processes of submarine volcanology, intrusion and plutonism; crustal construction at spreading axes; petrology, geochemistry, mineralogy, and magnetic and other physical properties of igneous and metamorphic rocks from the ocean floor, from seamounts, from oceanic plateaus, from volcanic arcs and from basins adjacent to volcanic arcs.

(b) Processes of submarine hydrothermal circulation; petrology, geochemistry and mineralogy of hydrothermally altered rocks and hydrothermal deposits from the ocean floor; geochemistry and physical properties of hydrothermal solutions; aging of ocean lithosphere.

(c) Processes of mantle convection and melting and their relationship to basaltic rocks of the ocean basins. Mapping of mantle (geochemical) reservoirs and domains. Implications of solid earth geochemical cycles and fluxes of the global plate tectonic cycle. Mass balance problems.

Major Scientific Objectives for Future Drilling

(From: Table of Contents, Long Range Plan 1989-2002, Ocean Drilling Program, May 1990, JOI Inc.

Objectives for studies of the structure and composition of the crust and upper mantle

1. Exploring the structure and composition of the lower crust and upper mantle
2. Magmatic processes associated with crustal accretion
3. Intraplate volcanism
4. Magmatism and geochemical fluxes at convergent margins

Objectives for studies of the dynamics, kinematics and deformation of the lithosphere

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6. Plate kinematics
7. Deformation processes at divergent margins
8. Deformation processes at convergent plate margins
9. Intraplate deformation

Objectives for studies of fluid circulation in the lithosphere

10. Hydrothermal processes associated with crustal accretion
11. Fluid processes at plate margins

Objectives for studies of the cause and effect of oceanic and climatic variability

12. Short period climate change
13. Long period climate changes
14. History of sea level
15. The carbon cycle and paleoproductivity
16. Evolutionary biology

Site specific drilling

Other Publications

— Report of the Conference on Scientific Ocean Drilling (COSOD I), November 16-18, 1981.
— Report of the Second Conference on Scientific Ocean Drilling (COSOD II), Strasbourg, 6-8 July 1987
— JOIDES Journal, published three times a year.

Publications available from: Joint Oceanographic Institutions, Inc.
1755 Massachusetts Avenue, NW, Suite 800
Washington, DC 20036-2102, U.S.A.

247-Add 2

ODP Proposal Review Form

~~247/E Add.~~

Title: Water Mass Conversion in the Glacial Subarctic Pacific (54°N 148°W): Physical Constraints and the Benthic-Planktonic Stable Isotope Record

Proponent(s): R. Zahn, T.F. Pedersen, B.D. Bornehold, A.C. Mix

Evaluation by: [X] LITHP [ ] OHP [ ] SGPP [ ] TECP

For panel mandates, Long Range Plan objectives, and reference to other relevant papers, see back page.

- [X] Proposal objectives are not within the mandate of this panel (as listed on back).
- [2] Does not address high-priority thematic objectives (as detailed in Long Range Plan).
- [3] Is of secondary interest to this panel if it is of high priority to some other panel.
- [4] Addresses high-priority objectives, but with deficiencies, as noted below.
- [5] Addresses high-priority objectives of this panel.

Level of proposal maturity: [ ] mature [ ] immature

Comments if within mandate of this panel (points 2-5):

Date returned to: 1/91

JOIDES Office
Institute for Geophysics
University of Texas at Austin
8701 Mopac Blvd.
Austin, TX 78759

Date forwarded to: _____

Mandate for JOIDES Lithosphere Panel (LITHP)

From: A Guide to the Ocean Drilling Program, JOIDES Journal, Vol. XIV, No 4, December 1988, p. 14-15.

The Lithosphere Panel is concerned with the origin and evolution of oceanic crust and mantle. In particular, important areas of investigation are volcanic, metamorphic, hydrothermal structural and alteration processes occurring in the ocean crust. Also of importance to the Lithosphere Panel are mantle-crust interactions, mantle dynamics and composition, and solid-earth geochemical cycles.

(a) Processes of submarine volcanology, intrusion and plutonism; crustal construction at spreading axes; petrology, geochemistry, mineralogy, and magnetic and other physical properties of igneous and metamorphic rocks from the ocean floor, from seamounts, from oceanic plateaus, from volcanic arcs and from basins adjacent to volcanic arcs.

(b) Processes of submarine hydrothermal circulation; petrology, geochemistry and mineralogy of hydrothermally altered rocks and hydrothermal deposits from the ocean floor; geochemistry and physical properties of hydrothermal solutions; aging of ocean lithosphere.

(c) Processes of mantle convection and melting and their relationship to basaltic rocks of the ocean basins. Mapping of mantle (geochemical) reservoirs and domains. Implications of solid earth geochemical cycles and fluxes of the global plate tectonic cycle. Mass balance problems.

Major Scientific Objectives for Future Drilling

(From: Table of Contents, Long Range Plan 1989-2002, Ocean Drilling Program, May 1990, JOI Inc.

Objectives for studies of the structure and composition of the crust and upper mantle

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7. Deformation processes at divergent margins
8. Deformation processes at convergent plate margins
9. Intraplate deformation

Objectives for studies of fluid circulation in the lithosphere

10. Hydrothermal processes associated with crustal accretion
11. Fluid processes at plate margins

Objectives for studies of the cause and effect of oceanic and climatic variability

12. Short period climate change
13. Long period climate changes
14. History of sea level
15. The carbon cycle and paleoproductivity
16. Evolutionary biology

Site specific drilling

Other Publications

— Report of the Conference on Scientific Ocean Drilling (COSOD I), November 16-18, 1981.
— Report of the Second Conference on Scientific Ocean Drilling (COSOD II), Strasbourg, 6-8 July 1987
— JOIDES Journal, published three times a year.

Publications available from: Joint Oceanographic Institutions, Inc.
1755 Massachusetts Avenue, NW, Suite 800
Washington, DC 20036-2102, U.S.A.

2/91

ODP Proposal Review Form

323-Rev

Title: **The Alboran Basin and the Atlantic - Mediterranean Gateway: Neogene Evolution of Continental Basement Overthrusting and Extension in the Alboran Sea and the Development of the Atlantic - Mediterranean**

Proponent(s): M.C. Comas, J.C. Faugère, J.A. Flores, V. Garcia-Dueñas, M.J. Jurado, R. Kidd, J. Mackris, A. Maldonado, A.G. Megias, H. Nelson, F.J. Sierro, D.A.V. Stow, R. Stephenson, C. Vergnaud-Grazzini and J. Woodside

Evaluation by: [X] LITHP [ ] OHP [ ] SGPP [ ] TECP

For panel mandates, Long Range Plan objectives, and reference to other relevant papers, see back page.

- [X] Proposal objectives are not within the mandate of this panel (as listed on back). PART 2
- [2] Does not address high-priority thematic objectives (as detailed in Long Range Plan).
- [X] Is of secondary interest to this panel if it is of high priority to some other panel. PART 1
- [4] Addresses high-priority objectives, but with deficiencies, as noted below.
- [5] Addresses high-priority objectives of this panel.

Level of proposal maturity: [ ] mature [ ] immature CLOSE TO MATURE

Comments if within mandate of this panel (points 2-5):

The dynamics of rifting, and the tectonic evolution and subsidence history of the Alboran Basin are of interest to LITHP, but represent important objectives more directly related to the thematic concerns of TECP. A number of clarifications and additions to this proposal would be helpful. LITHP had some difficulty relating the proposed objectives to the specific holes to be drilled; there needs to be a more detailed description of how the proposed drilling will address the tectonic problems. For example, it is not clear how drilling will determine whether lithospheric deformation occurred by delamination or convective processes. In addition, some tectonic interpretation of information available from the many commercial drill holes in the area might strengthen the proposal.

Further development of the impact of drilling on understanding the nature of volcanism in the area is necessary. There is no mention of mineralogical or geochemical investigations of the volcanoclastics, which could potentially be most interesting, and are likely to be encountered in a number of holes. There is only one site (AL-1B) where substantial (100 m) basement penetration is proposed into a structural high. It is not clear that a single basement hole will meet the objectives defined in the proposal.

Date returned to: 4/91

JOIDES Office
Institute for Geophysics
University of Texas at Austin
8701 Mopac Blvd.
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Date forwarded to: _____

Dr. M.C. Comas
Inst. Andaluz de Geologia Mediterranea
C.S.I.C. y Universidad de Granada
Campus de Fuentenueva
E-18071 Granada

Mandate for JOIDES Sedimentary and Geochemical Processes Panel (SGPP)

From: A Guide to the Ocean Drilling Program, JOIDES Journal, Vol. XIV, No 4, December 1988, p. 14-15.

This panel is concerned with marine sedimentation and diagenetic processes, origin and evolution of marine sediments and seawater chemistry, global sediment and geochemical mass balances, hydrothermal processes in sedimented regions. Specifically included are:

(a) Sedimentary processes, facies and physical properties — The sedimentary processes of terrigenous, biogenic, volcanogenic and chemical sediments; sedimentation and tectonics, e.g., evolution of submarine fans, and evolution of basins; factors controlling the nature of sedimentary facies; the origin of unconformities, disconformities, hiatuses and sedimentary cycles; slope stability and redeposition and; physical properties of sediments.

(b) Organic and inorganic sedimentary geochemistry and diagenesis — The rates and nature of early to late diagenetic processes; the evolution of sediment to rocks; geochemistry of interstitial and formation waters; petrology, mineralogy, magnetic and other physical properties, and geochemistry of diagenetic phases of bulk sediments; and chemical paleoceanography.

(c) Temporal and spatial global mass balances of sediments and cycling of elements — How much and what types of sediments being subducted; relationship of sediments to tectonic and paleoceanographic processes such as sea level fluctuations and anoxic events; unconformities and disconformities; the carbon, sulfur and phosphorus cycles; marine evaporites in early rifting systems and evaporite giants.

(d) Fluid circulation and geochemical budgets — Magnitudes and rates and plumbing systems of gravity and tectonically driven circulation in passive and active continental margins; chemical fluxes, biological activity, physical, mineralogical and geochemical alteration of margin sediments induced by fluid flow; interaction between submarine hydrothermal fluids and sediments, mineralogy, petrology, physical and geochemical properties of the hydrothermally altered sediments, and the geochemical evolution of the hydrothermal fluids; the origin and distribution of base metal deposits in continental margins and sedimented hydrothermal systems.

(e) The aging of the oceanic crusts — Low to moderate temperature alteration of oceanic crust; rates and types of reactions and associated chemical fluxes; changes in physical properties and fluid circulation with age.

Major Scientific Objectives for Future Drilling

(From: Table of Contents, Long Range Plan 1989-2002, Ocean Drilling Program, May 1990, JOI Inc.

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16. Evolutionary biology

Site specific drilling

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— JOIDES Journal, published three times a year.

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1755 Massachusetts Avenue, NW, Suite 800
Washington, DC 20036-2102, U.S.A.

ODP Proposal Review Form # 334-Rev

Title: Galicia margin S reflector and ultramafic basement

Proponent(s): G. Boillot, E. Banda, M. Beslier, and M. Comas

Evaluation by: ☒ LITHP ☐ OHP ☐ SGPP ☐ TECP

For panel mandates, Long Range Plan objectives, and reference to other relevant papers, see back page.

1. ☐ Proposal objectives are not within the mandate of this panel (as listed on back).
2. ☐ Does not address high-priority thematic objectives (as detailed in Long Range Plan).
3. ☒ Is of secondary interest to this panel if it is of high priority to some other panel.
4. ☐ Addresses high-priority objectives, but with deficiencies, as noted below.
5. ☐ Addresses high-priority objectives of this panel.

Level of proposal maturity: ☐ mature ☒ immature

Comments if within mandate of this panel (points 2-5):

This proposal addresses a number of LITHP objectives for understanding non-volcanic, stretched passive margins. Although drilling the S-reflector is important, LITHP's interest would be greater if drilling continued below this horizon. Of particular concern is the question of the regional continuity of the S-reflector--it is not clear that it can be traced seismically, particularly in a N-S direction. Hence the question arises as to whether one hole will be representative of this horizon. Site 1 is of interest, although it would help to obtain seismic refraction data prior to drilling in order to differentiate clearly between crystalline basement and syn-rift sediments.

It is also not clear from this proposal that drilling is needed to address the Site 2 objectives to determine the southerly extent of the peridotite ridge. Magnetic or seismic data might be useful. In addition, five days is an unrealistic time estimate to complete the proposed drilling and logging at this site.

Further interpretation of the data are needed--the cross-sections presented do not appear to restore successfully. Overall, this is an interesting proposal to drill in an excellent locality but additional seismic data might help better frame the problems that it tries to address.

Date returned to: 4/91

JOIDES Office
Institute for Geophysics
University of Texas at Austin
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Austin, TX 78759

Date forwarded to: _____

Dr. G. Boillot
Technopolis 40
IFREMER
155, rue Jean-Jacques Rousseau
92138 Issy-les-Moulineaux Cedex

Mandate for JOIDES Lithosphere Panel (LITHP)

From: A Guide to the Ocean Drilling Program, JOIDES Journal, Vol. XIV, No 4, December 1988, p. 14-15.

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Major Scientific Objectives for Future Drilling

(From: Table of Contents, Long Range Plan 1989-2002, Ocean Drilling Program, May 1990, JOI Inc.

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Site specific drilling

Other Publications

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Publications available from: Joint Oceanographic Institutions, Inc.
1755 Massachusetts Avenue, NW, Suite 800
Washington, DC 20036-2102, U.S.A.

ODP Proposal Review Form

345-Add.

Title: Drilling Proposal for the West Florida Continental Margin, Gulf of Mexico: Sea Level and Pelaoclimatic History

Proponent(s): L.E. Joyce, H.T. Mullins, L.R.C. Tjalsma, S.W. Wise

Evaluation by: [X] LITHP [ ] OHP [ ] SGPP [ ] TECP

For panel mandates, Long Range Plan objectives, and reference to other relevant papers, see back page.

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Level of proposal maturity: [ ] mature [ ] immature

Comments if within mandate of this panel (points 2-5):

Date returned to: 4/91

JOIDES Office
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Mandate for JOIDES Lithosphere Panel (LITHP)

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ODP Proposal Review Form

361-Rev.

Title: A proposal for drilling an active hydrothermal system on a slow-spreading ridge: MAR 26°N (TAG)

Proponent(s): G. Thompson, et al.

Evaluation by: [X] LITHP [ ] OHP [ ] SGPP [ ] TECP

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[5] Addresses high-priority objectives of this panel.

Level of proposal maturity: [ ] mature [ ] immature CLOSE TO MATURE

Comments if within mandate of this panel (points 2-5):

This proposal directly addresses high priority objectives of LITHP, COSOD II and the ODP Long Range Plan, and is strongly supported by LITHP. The proposal stresses the hydrothermal/mineralization aspects of the region and is fairly mature; however, some important structural/tectonic/magmatic aspects were not covered or discussed in sufficient detail. There is no discussion of the basalt petrology or the potential interrelationship of volcanic and hydrothermal processes in the TAG area. For example, is there evidence for later "off axis" volcanic activity and is it chemically distinguishable from earlier activity? There is also great concern about the ability to properly site drill holes to best address objectives 2, 3, and 4. The drilling locations for priority 1 are presented with respect to a model. The detailed geologic relationships that lead to the model should be presented for consideration. Every attempt should be made to obtain further detailed site survey information, particularly as regards structural and hydrologic control of the hydrothermal system.

Perhaps the UW hard rock drill could be used to obtain a number of shallow holes in the upper sections before ODP drilling.

LITHP is also concerned with the relative importance of shallow (<200 m) and deep holes in the area. Deep drilling is necessary to address changes in T, fluid flow and mineralogy with depth. Although a great deal can be learned from the proposed holes, it is likely that more deep drilling will eventually be needed to understand the system, particularly as it is a prime locale to evaluate the evolution of ophiolite-type massive sulfide deposits.

There is concern that Phase III of the diamond coring system (DCS) will not be available to optimize the return from drilling, but the opportunity for drilling in the TAG area should not be missed even if the DCS is not available. Finally, there was discussion of the desire for extensive drilling on a slow spreading center to complement planned EPR drilling. It would be desirable to present TAG drilling as one aspect of a longer range plan to understand crustal accretion and evolution at slow spreading ridges.

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ODP Proposal Review Form

362-Rev 2

Title: Proposal for Scientific Ocean Drilling, Chile Margin Triple Junction Southern Chile Trench

Proponent(s): S.C. Cande, S.D. Lewis, G. Westbrook

Evaluation by: [X] LITHP [ ] OHP [ ] SGPP [ ] TECP

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Level of proposal maturity: [X] mature [ ] immature

Comments if within mandate of this panel (points 2-5):

Sites SC-3, 4, and 5 address high-priority objectives of hydrothermal circulation and crustal accretion (mid-ocean ridge volcanism); however, this component of the proposal is currently not well-developed. While the proposal is written primarily to evaluate forearc evolution, from a LITHP viewpoint the Chile triple junction offers a unique natural laboratory to evaluate the effect on crustal genesis (and magna plumbing) from covering the crust with a thermal blanket of sediments. The proponents are encouraged to consider expanding their investigation of Site SC-3 with this viewpoint in mind. Similarly, to place the drilling results into context, it will be necessary to perform a great deal more water column work.

Site SC-6, on the Taitao ridge, would be of interest to LITHP if a second leg for this program is warranted. While the process of ophiolite emplacement is important to LITHP, the proposed drilling will provide limited information in this regard. Dating the basement rocks and determining their geochemistry will help constrain the origin of Taitao ridge, and will date the sediments overlying the ridge. It is not clear, however, that these samples could not be obtained from either dredging or submersible. Also, additional geophysical data are necessary to better constrain the subsurface geometry of the proposed "ophiolite" body.

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ODP Proposal Review Form

363 - Add

Title: Paleooceanographic record at proposed drillsites NR1, NR2, and NR3

Proponent(s): B. Tucholke

Evaluation by: [X] LITHP [ ] OHP [ ] SGPP [ ] TECP

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Level of proposal maturity: [ ] mature [ ] immature

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Site specific drilling

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ODP Proposal Review Form

365-Rev

Title: Conjugate Passive Margin Drilling — North Atlantic Ocean

Proponent(s): J. Austin, G. Boillot, M.C. Comas, A. Grant, F. Gradstein, L. Jansa, C. Keen, K.E. Louden, P.R. Miles, J.C. Sibuet, S.P Srivastava, B.E. Tucholke, and R.B. Whitmarsh.

Evaluation by: ☒ LITHP ☐ OHP ☐ SGPP ☐ TECP

For panel mandates, Long Range Plan objectives, and reference to other relevant papers, see back page.

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Level of proposal maturity: ☒ mature ☐ immature VERY !!

Comments if within mandate of this panel (points 2-5):

This proposal to investigate processes associated with continental rifting is of high interest to LITHP and is certainly mature! The southern transect addresses objectives of greater importance to LITHP than the northern transect. Of particular interest are the objectives at the presumed peridotite ridge (IAP4) and the conjectured continental (?) crust at NB3; this site could be either continental or oceanic, depending on the position chosen for the OCB.

Drilling of the southern transect is estimated to require about 3-1/2 legs to complete 3 holes on each margin. LITHP suggests that the proponents consider whether some time savings can be made by drilling without coring where the objectives in the sediment column can be addressed with logging--for example, in modelling subsidence history and basin reconstruction. In addition, industry drilling results could perhaps be used to extend heat flow data.

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Date forwarded to: _____

Dr. S.P. Srivastava
Atlantic Geoscience Centre
Bedford Institute of Oceanography
P.O. Box 1006
Dartmouth, Nova Scotia B2Y 4A2

Mandate for JOIDES Lithosphere Panel (LITHP)

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ODP Proposal Review Form

388----

Title: A Proposal to Advance Piston Core the Ceara Rise, West Equatorial Atlantic: Neogene History of Deep Water Circulation and Chemistry

Proponent(s): W. B. Curry, J. Backman, N. J. Shackleton

Evaluation by: [X] LITHP [ ] OHP [ ] SGPP [ ] TECP

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ODP Proposal Review Form

389----

Title: Cretaceous N-S Traverse in the Western South Atlantic

Proponent(s): B.A. Malmgren

Evaluation by: ☒ LITHP ☐ OHP ☐ SGPP ☐ TECP

For panel mandates, Long Range Plan objectives, and reference to other relevant papers, see back page.

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Comments if within mandate of this panel (points 2-5):

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University of Texas at Austin
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Austin, TX 78759

Date forwarded to: _____

Dr. Björn A. Malmgren
Department of Marine Geology
University of Göteborg
Box 7064
S-402 32 Göteborg

Mandate for LITHP: Lithosphere Panel

From: A Guide to the Ocean Drilling Program, JOIDES Journal, Vol. XIV, No 4, December 1988, p. 14-15.

4.3 Lithosphere Panel: Mandate

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Major scientific objectives for future drilling

From: Table of Contents, Long Range Plan 1989-2002, Ocean Drilling Program, May 1990, JOI Inc.

Other Publications

— Report of the Conference on Scientific Ocean Drilling (COSOD I), November 16-18, 1981.
— Report of the Second Conference on Scientific Ocean Drilling (COSOD II), Strasbourg, 6-8 July 1987
— JOIDES Journal, published three times a year.

Publications available from: Joint Oceanographic Institutions, Inc.
1755 massachusetts Avenue, NW, Suite 800
Washington, DC 20036-2102, U.S.A.

11/9-

ODP Proposal Review Form # 390----

Title: **Proposals for the drill sites location in the Shirshov Ridge region (Bering Sea)**

Proponent(s): V.E. Milanovsky and Y. Neprochnov

Evaluation by: ☒ LITHP ☐ OHP ☐ SGPP ☐ TECP

For panel mandates, Long Range Plan objectives, and reference to other relevant papers, see back page.

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- ☐ 5 Addresses high-priority objectives of this panel.

Level of proposal maturity: ☐ mature ☒ immature

Comments if within mandate of this panel (points 2-5):

LITHP considered this proposal very immature at this stage but noted that there was general LITHP interest in this area. The panel suggests that the proponents use other mature proposals that have been submitted as models for the type of proposal they should resubmit. In particular, they should detail the results of recent geophysical and geological surveys and clearly discuss the objectives they hope to meet by drilling. They should note that there have been previous proposals to drill in the region and that there are difficulties in drilling deep holes at this time, particularly in view of the thick Neogene sedimentary cover. Site selections and depths of drilling required should be well-documented in the revised proposal.

Date returned to: 4/91

JOIDES Office
Institute for Geophysics
University of Texas at Austin
8701 Mopac Blvd.
Austin, TX 78759

Date forwarded to: _____

Dr. V.E. Milanovsky
Institute of Oceanology
USSR Academy of Science
Krasikova 23
Moscow 117218

Mandate for JOIDES Lithosphere Panel (LITHP)

From: A Guide to the Ocean Drilling Program, JOIDES Journal, Vol. XIV, No 4, December 1988, p. 14-15.

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Major Scientific Objectives for Future Drilling

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11. Fluid processes at plate margins

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12. Short period climate change
13. Long period climate changes
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16. Evolutionary biology

Site specific drilling

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Washington, DC 20036-2102, U.S.A.

1/91

ODP Proposal Review Form

391----

Title: **Depositional History and Environmental Development During the Formation of Sapropels in the Eastern Mediterranean**

Proponent(s): R. Zahn, E.A. Boyle, S.E. Calvert, F.G. Prahl, and R.C. Thunell

Evaluation by: ☒ LITHP ☐ OHP ☐ SGPP ☐ TECP

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Level of proposal maturity: ☐ mature ☐ immature

Comments if within mandate of this panel (points 2-5):

Date returned to: 4/91

JOIDES Office
Institute for Geophysics
University of Texas at Austin
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Austin, TX 78759

Date forwarded to: _____

Dr. Rainer Zahn
Forsch.zentr. für Marine Geo-wissensch.
GEOMAR
Wischhofstrasse 1-3, Gebäude 4
D-2300 Kiel 14

Mandate for JOIDES Lithosphere Panel (LITHP)

From: A Guide to the Ocean Drilling Program, JOIDES Journal, Vol. XIV, No 4, December 1988, p. 14-15.

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Site specific drilling

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1/91

ODP Proposal Review Form

392----

Title: A Mantle Plume Origin of the North Atlantic Volcanic Rifted Margins: Testing the Model Against Geological Data

Proponent(s): H.C. Larsen, J.A. Chalmers, L.M. Larsen, A.K. Pedersen, N. Hald, C. Keen, S.P. Srivastava, K.G. Cox

Evaluation by: ☒ LITHP ☐ OHP ☐ SGPP ☐ TECP

For panel mandates, Long Range Plan objectives, and reference to other relevant papers, see back page.

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Level of proposal maturity: ☐ mature ☒ immature

Comments if within mandate of this panel (points 2-5):

This proposal addresses high priority LITHP objectives--namely, the nature of magmatism and its relationship to tectonic extension at a volcanic rifted margin (VRM). The following deficiencies need to be addressed:

1) A depth of penetration of 1000 m into basement is proposed for Site LABS-1. This would require a complete drilling leg be devoted to this hole; more justification is needed for LITHP to support this site.

2) The interpretation of the seismic data to indicate the "peridotite ridge" at proposed site LABS-5 is uncertain. Perhaps other types of geophysical surveys (e.g. bottom gravity?) may help resolve this structure and strengthen the argument to drill at this location.

3) There is a need for the formulation of a testable model using existing geochemical data, either from this region or from analogous margins in the North Atlantic.

Overall, LITHP strongly supports the scientific objectives and would like to see them integrated with other NARM proposals.

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Institute for Geophysics
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Date forwarded to: _____

Dr. Hans Christian Larsen

Geological Survey of Greenland
Øster Voldgade 10
DK-1350 København

Mandate for JOIDES Lithosphere Panel (LITHP)

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Site specific drilling

Other Publications

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1/91

ODP Proposal Review Form

393----

Title: Drilling the Continent-Ocean Transition on the SE Greenland Volcanic Rifted Margin: Linking Continental Flood Basalts to Seaward Dipping Reflector Sequences

Proponent(s): H.C. Larsen, T.D.F. Nielsen, L.M. Larsen, C.K. Brooks, K.G. Cox, A.G. Morton, B. Larsen

Evaluation by: ☒ LITHP ☐ OHP ☐ SGPP ☐ TECP

For panel mandates, Long Range Plan objectives, and reference to other relevant papers, see back page.

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Level of proposal maturity: ☐ mature ☒ immature

Comments if within mandate of this panel (points 2-5):

Although quite immature, this proposal to investigate the igneous and tectonic processes at the continental-oceanic lithosphere transition is important for LITHP and its objectives should be integrated with other proposals for this region. The major criticism of this proposal is that there is no presentation of a geochemical model that can be tested. There is considerable data from this region, both from land-based field studies and previous drilling legs, which is not discussed or used to constrain the possible models. In addition, the need for Site SEG-1 needs to be more fully justified--its proximity to land raises the issue as to whether some of the objectives could not be met by drilling on the continent.

Date returned to: 4/91

JOIDES Office
Institute for Geophysics
University of Texas at Austin
8701 Mopac Blvd.
Austin, TX 78759

Date forwarded to: _____

Dr. Hans Christian Larsen

Geological Survey of Greenland
Øster Voldgade 10
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Washington, DC 20036-2102, U.S.A.

2/91

ODP Proposal Review Form

394----

Title: **Evolution of pre- and syn-volcanic extensional basins on passive volcanic continental margins**

Proponent(s): L.V. Kiørboe, K. Gunnarson, M.S. Andersen, and L.O. Boldreel

Evaluation by: ☒ LITHP ☐ OHP ☐ SGPP ☐ TECP

For panel mandates, Long Range Plan objectives, and reference to other relevant papers, see back page.

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Level of proposal maturity: ☐ mature ☒ immature

Comments if within mandate of this panel (points 2-5):

This proposal primarily addresses themes within the mandate of the Tectonics Panel, but potentially addresses area of thematic interest to the Lithosphere Panel (LITHP). In particular, drilling of seismic unit three interpreted to be syn-rift volcanic rocks, is of interest to LITHP, but scientific objectives that could be met by sampling these rocks are not well developed. The continuity and relationship of seismic unit 3 to well-developed seaward dipping seismic reflectors (SDSR) to the west is not described in detail. Specific geochemical models to be tested by the drilling are not presented. Expansion of this area of the proposal might increase LITHP interest in this proposal, especially how drilling volcanic rocks at this site relates to the larger problem of volcanic rifted margins. This proposal should be considered by the North Atlantic Rifted Margins Detailed Planning Group as part of an integrated approach to passive margin drilling.

Date returned to: 4/91

JOIDES Office
Institute for Geophysics
University of Texas at Austin
8701 Mopac Blvd.
Austin, TX 78759

Date forwarded to: _____

Dr. L.V. Kiørboe

Geological Survey of Denmark
Thoravej 8
DK-2400 København NV.

Mandate for JOIDES Lithosphere Panel (LITHP)

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2/91

ODP Proposal Review Form

395----

Title: Post-Breakup Compressional Tectonics on a Passive Volcanic Continental Margin

Proponent(s): L.O. Boldreel and M.S. Andersen

Evaluation by: ☒ LITHP ☐ OHP ☐ SGPP ☐ TECP

For panel mandates, Long Range Plan objectives, and reference to other relevant papers, see back page.

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Level of proposal maturity: ☐ mature ☒ immature

Comments if within mandate of this panel (points 2-5):

This proposal suggests an interesting approach to investigating post-break up deformation--using basins to date deformation and, by implication, to understand internal deformation of the Eurasian plate and its relation to plate motion changes.

As presented, this proposal is too local in its scope, and needs to be defined in terms of the regional North Atlantic geology. Is this an isolated feature, or is it an example of structures that are widespread and regionally significant? It is not clear that the program is optimal to address the objectives--the justification from the bathymetric and geophysical data is not well stated.

If drilling in this area, together with other geophysical evidence, can be used to tie down the internal deformation of plates and its relation to plate motion, this would be a very interesting target of secondary interest to LITHP, but probably of high interest to TECP.

Date returned to: 4/91

JOIDES Office
Institute for Geophysics
University of Texas at Austin
8701 Mopac Blvd.
Austin, TX 78759

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Dr. L.O. Boldreel

Geological Survey of Denmark
Thoravej 8
DK-2400 Copenhagen NV

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2/91

ODP Proposal Review Form

396----

Title: Testing of the Hot-Spot Model for the Origin of Volcanic Passive Continental Margins

Proponent(s): M.S. Andersen

Evaluation by: ☒ LITHP ☐ OHP ☐ SGPP ☐ TECP

For panel mandates, Long Range Plan objectives, and reference to other relevant papers, see back page.

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Level of proposal maturity: ☐ mature ☒ immature

Comments if within mandate of this panel (points 2-5):

The existing geophysical models (plume vs. convective melting) proposed for the formation of Atlantic-type volcanic passive margins are not well-constrained by the current data base. This proposal, although rather preliminary, presents a good justification for testing the plume model by drilling a "transect" of holes over a broad geographic area.

This is a fundamental problem of high interest to LITHP. The proponents need to evaluate the existing "Faroe" petrologic data, and also show how any geochemical data acquired from drilling can be effectively used to constrain the petrogenesis of the volcanics associated with North Atlantic volcanic rifted margins.

Date returned to: 4/91

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Date forwarded to:

Dr. Morten S. Andersen
Geological Survey of Denmark
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DK-2400 Kobenhavn NV

Mandate for JOIDES Lithosphere Panel (LITHP)

From: A Guide to the Ocean Drilling Program, JOIDES Journal, Vol. XIV, No 4, December 1988, p. 14-15.

The Lithosphere Panel is concerned with the origin and evolution of oceanic crust and mantle. In particular, important areas of investigation are volcanic, metamorphic, hydrothermal, structural and alteration processes occurring in the ocean crust. Also of importance to the Lithosphere Panel are mantle-crust interactions, mantle dynamics and composition, and solid-earth geochemical cycles.

(a) Processes of submarine volcanology, intrusion and plutonism; crustal construction at spreading axes; petrology, geochemistry, mineralogy, and magnetic and other physical properties of igneous and metamorphic rocks from the ocean floor, from seamounts, from oceanic plateaus, from volcanic arcs and from basins adjacent to volcanic arcs.

(b) Processes of submarine hydrothermal circulation; petrology, geochemistry and mineralogy of hydrothermally altered rocks and hydrothermal deposits from the ocean floor; geochemistry and physical properties of hydrothermal solutions; aging of ocean lithosphere.

(c) Processes of mantle convection and melting and their relationship to basaltic rocks of the ocean basins. Mapping of mantle (geochemical) reservoirs and domains. Implications of solid earth geochemical cycles and fluxes of the global plate tectonic cycle. Mass balance problems.

Major Scientific Objectives for Future Drilling

(From: Table of Contents, Long Range Plan 1989-2002, Ocean Drilling Program, May 1990, JOI Inc.

Objectives for studies of the structure and composition of the crust and upper mantle

1. Exploring the structure and composition of the lower crust and upper mantle
2. Magmatic processes associated with crustal accretion
3. Intraplate volcanism
4. Magmatism and geochemical fluxes at convergent margins

Objectives for studies of the dynamics, kinematics and deformation of the lithosphere

5. Dynamics of oceanic crust and upper mantle
6. Plate kinematics
7. Deformation processes at divergent margins
8. Deformation processes at convergent plate margins
9. Intraplate deformation

Objectives for studies of fluid circulation in the lithosphere

10. Hydrothermal processes associated with crustal accretion
11. Fluid processes at plate margins

Objectives for studies of the cause and effect of oceanic and climatic variability

12. Short period climate change
13. Long period climate changes
14. History of sea level
15. The carbon cycle and paleoproductivity
16. Evolutionary biology

Site specific drilling

Other Publications

— Report of the Conference on Scientific Ocean Drilling (COSOD I), November 16-18, 1981.
— Report of the Second Conference on Scientific Ocean Drilling (COSOD II), Strasbourg, 6-8 July 1987
— JOIDES Journal, published three times a year.

Publications available from: Joint Oceanographic Institutions, Inc.
1755 Massachusetts Avenue, NW, Suite 800
Washington, DC 20036-2102, U.S.A.

ODP Proposal Review Form # S-1

Title: **Documentation of Lithofacies and Depositional Cyclicity, Navy Deep-Sea Fan, California Borderland**

Proponent(s): D.J.W. Piper, M.B. Underwood, W.R. Normark

Evaluation by: [X] LITHP [ ] OHP [ ] SGPP [ ] TECP

For panel mandates, Long Range Plan objectives, and reference to other relevant papers, see back page.

- [X] Proposal objectives are not within the mandate of this panel (as listed on back).
- [ ] 2 Does not address high-priority thematic objectives (as detailed in Long Range Plan).
- [ ] 3 Is of secondary interest to this panel if it is of high priority to some other panel.
- [ ] 4 Addresses high-priority objectives, but with deficiencies, as noted below.
- [ ] 5 Addresses high-priority objectives of this panel.

Level of proposal maturity: [ ] mature [ ] immature

Comments if within mandate of this panel (points 2-5):

Date returned to: 4/91

JOIDES Office
Institute for Geophysics
University of Texas at Austin
8701 Mopac Blvd.
Austin, TX 78759

Date forwarded to: _____

Dr. David J.W. Piper
Atlantic Geoscience Centre
Bedford Institute of Oceanography
P.O. Box 1006
Dartmouth, N.S. B2Y 4A2

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