

Draft Minutes--(Short Version)
JOIDES Lithosphere Panel
Fall 1994
Rouyn-Noranda, Canada

Dates: October 3 to 5, 1994

Chair: Sherman Bloomer

Host: John Ludden

1. Attendees:

Panel Members:	Sherm Bloomer Kathy Gillis Anne Sheehan Doug Wilson Rob Zierenberg Shoji Arai Yngve Kristoffersen Roland Rihm (alternate for Peter Herzig) Godfrey Fitton John Ludden Dave Caress Jacques Girardeau Pat Castillo John Tarduno
Liaisons and Guests:	Bruce Malfait (NSF) Dave Goldberg (LDEO-BRG) Mike Purdy (OSN-ION)
Absent:	Andy Fisher (after Monday AM) Mike Coffin

2. Issues of interest to PCOM: Panel Recommendations, advice, and comment

Issue #1: Fiscal priorities

LITHP reviewed PCOM's request that we "prioritise... needs regarding program services and facilities and identify areas where programmatic costs can be reduced" and the specific budget items presented to us by the PCOM representative for consideration.

Response: The Panel appreciates being kept informed about the budget situation and recognises the increasingly pressing financial situation which the program faces. However, in the absence (by the time the meeting occurred) of specific budgetary goals, the panel did not feel that it could provide informed advice about budgetary prioritisation.

Explanatory notes: The panel discussed this issue at length. There was agreement that it was important that we be informed about budget projections and possible constraints. However, there was a strong opinion that we did not have enough information to make informed decisions about budget prioritisation. The Panel simply does not know the fiscal operations of the Program--where the money goes, what the magnitudes of fixed costs vs. discretionary costs are, what percentage these proposed cuts are of the total programs they involve, what contractual restrictions there are on budget-cutting measures, etc. The Panel believes that our best service to PCOM in this matter is to try to provide a clear discussion and review of our science priorities and of the tools and developments that we will need to complete those priority goals. We are, of course, willing to work with PCOM if the budgetary environment prevents the development of those tools and requires that we re-focus our goals. We hope that PCOM will continue to keep us informed of the fiscal climate in the program and we will continue to provide the best advice we can about the science program, which includes setting goals which are not only scientifically important, but which are fiscally and operationally achievable.

Issue #2: DCS development

Recommendation to PCOM: The Panel recommends to PCOM that they review the development of DCS and make a commitment to its development, in light of the recommended changes in engineering development and operations at ODP-TAMU, as a tool to be deployed in phases, with clearly stated specific short-term and long-term operational goals. For example, after the resolution of the present status of the software, we could aim for the development of a system which between 1998 and 2003 could be deployed to recover short cores (in up to 4500 m of water) in selected, difficult lithologies or locations (carbonate caps, exposed or near-surface fault surfaces, zero-age basalts). This development would be a stepping-stone to the development, post-2003, of a DCS which could be routinely deployed for more standard coring operations in various locations and lithologies.

Explanatory notes: The Panel reviewed, after an overview by the PCOM representative, the history of DCS. It is clear that the system cannot be evaluated on the basis of the event of the last two or three years. The last sea-test was not in any way a test of the system, as the key components had been damaged in shipment. The subsequent problems with the land test, stemming from a variety of contractual and management problems, also do not tell us anything about the viability of the concept. A prototype of the system has been deployed at sea (Sumisu Rift) and did recover a significant amount of core with good recovery. There is evidence that the system can work.

The Panel believes that diamond coring at sea represents the most innovative engineering that the program has undertaken and that it holds potentially tremendous rewards for the entire scientific drilling community. Diamond drilling on land is standard technology--it drills straight holes, it has very high recovery (90% or more), and it can drill through fractured and brittle intervals that are impenetrable with rotary coring techniques. Moving this technology to sea is, obviously, complicated. But if even a part of its production on land occurs at sea, our results from drilling in nearly every kind of lithology will improve. There are very few rocks (as opposed to sediments) in which RCB coring produces anything near 50% recovery. We still can't penetrate chert-chalk sequences, we can't drill zero-age basalts, we're having tremendous problems drilling in faulted, tectonized terrains, and our recovery in some lower crustal and carbonate sequences is extremely low. Diamond coring is not going to be a panacea for all these problems, but its success on land clearly suggests that it can ameliorate a number of them.

The Panel believes that there is no more innovative development we can undertake than the construction of an ocean-going diamond coring system. The development of that system likely requires a phased approach, in which we set clearly defined goals for the system, on a clearly defined time line. There are many productive things we can do with a diamond coring system designed to drill 100 m holes in 4500 m or less of water. There are in fact a number of things we can do (on ridges, limestone caps, and fault surfaces) that probably can't be done any other way. A DCS which such capabilities could be set as an interim goal, on the way to the development of a system which can be routinely deployed for drilling deep holes in any water depth.

The problems with the software development and the land test have forced upon us a pause in DCS development. We believe we should use that pause to redesign a plan for the development of a viable DCS system and that we commit to the development of a fully operational system by the beginning of the next phase of scientific ocean drilling.

Issue #3: Offset-drilling progress and strategy

The Panel reviewed the progress of offset-section drilling, after a presentation on the results of a workshop at ODP-TAMU on such drilling.

Recommendation to PCOM: The Panel recommends to PCOM that they seriously consider the request from ODP-TAMU for an engineering leg to test a variety of tools and techniques that may improve our drilling results in tectonized and faulted terrains. The Panel still believes that the recovery of significant sections of the major layers of the ocean crust and of the transitions between those layers are among its highest priority goals. It is, however, unclear how to proceed with our offset section strategy until we can identify the key variables which are influencing drilling conditions and recovery in different environments.

Explanatory notes: The Panel reviewed the results from the principal offset-section legs to date (735B, Hess Deep, and MARK) and again concluded that the scientific return for these legs had been tremendous. We now have a first-order view of the vertical and lateral heterogeneity of a small part of the lower crust; the two sites at Hess Deep also demonstrated (as they drilled clearly different stratigraphic levels in the crust) the viability of the offset-section strategy. However, there is also no doubt that the drilling at MARK and Hess did not go as we expected and that we need to evaluate those legs with the aim of making better predictions about what we can expect to accomplish in these environments.

We have tried offset-section drilling in all three types of tectonic windows: old crust exposed along transverse ridges (735B), crust rifted apart by propagating ridges (Hess), and crust exposed by detachment faulting in median valleys (MARK). The first type yielded one long section of gabbro, the last two a number of short sections of gabbro and ultramafic rock. Drilling was difficult in both Hess and MARK, and in both the exposures had been created by quite recent faulting and as a result the crust was profoundly fractured. However, on both Hess and MARK, there were technical problems (guide-base siting, site survey, casing deployment) which contributed to the difficulty of drilling. We do not, at this stage, have enough information to identify the important variables. Was 735B successful because it was older crust? Or was it because it was shallow? Is the young crust at MARK drillable with the right approach or because of the faulting in it is it only going to be possible to drill 100 or 200 m holes there?

The offset-section review meeting at ODP-TAMU identified two strategies for improving our results in these tectonic windows. The Panel finds them both sound. First, we can learn how to find easier places to drill. This requires understanding the important variables in determining drilling conditions and it making better site surveys (mainly in terms of marking sites better and making better detailed local bathymetric maps). Such an approach may work for slow-spreading ridges, where there is a diversity of tectonic windows. However, at fast-spreading ridges, there are only a limited number of tectonic windows. In such cases we may have to pursue the second strategy, which is to learn to drill in the hard places. That will require devoting some time to testing techniques and designs for these brittle, faulted terrains.

The Panel notes that there are two very important questions: is drilling in old crust (like that exposed at 735B or Vema) inherently easier than drilling at exposures that have been more recently faulted? Second, can improvements like flagging sites by submersible, drilling in casing, etc., make significant improvements in our results in places like MARK and Hess? The Panel is a bit at sea in evaluating our results to date. Our scientific priorities require that we pursue offset-section drilling. Such drilling at fast-spread ridges appears to require drilling in hard places and hence requires that we spend some time testing equipment and techniques, if we are to sensibly plan our strategy for understanding the lower crust.

If PCOM endorses an engineering leg for testing some innovative approaches to crustal drilling, the Panel wants them to be aware that Jeff Karson has offered to mark some sites at MARK during his ALVIN dives this January. We also understand that there are gabbro exposures along the crest of the Vema transverse ridge that might be appropriate as a 735B analogue. If we have calculated correctly, Vema is about 3 days steam from MARK, and it might be possible to design an engineering leg which addressed both the drilling hard places question (MARK) and the is old crust better questions (Vema).

Issue #4: Return to 735B

Comment to PCOM: The LITHP is disappointed by the removal of Return to 735B from the FY95 schedule. The sudden loss of this leg has hurt our long-term strategy for understanding the lower ocean crust and left a key part of our offset-section strategy drilling uncompleted. The Panel wants PCOM to realise that Return to 735B will continue to be one of our high priority sites and we hope that a serious effort will be made to drill this globally important site at the first opportunity.

The Panel strongly endorses the idea of ranking proposals by science, and does not want to be put in a situation in which logistic factors influence our deliberations. We trust PCOM to create areas of operation within which highly ranked proposals can realistically expect to be drilled.

The Panel also wishes to note that this kind of sudden change in scheduling can create serious personal and professional problems for scientists who have accepted positions as co-chief scientists or scientific staff for legs which are subsequently cancelled. We hope that PCOM recognises this and will make every effort to see that we do not again begin to staff a leg until we are committed to drill it.

Explanatory notes: The Panel reviewed the sequence of events leading up to the decision to drop 735B from the schedule and is aware of the fiscal realities that contributed to that decision. We are, however, concerned about how the decision was reached. Panels have always been told to rank proposals in the prospectus on science, without regard for logistic considerations. The expectation is that PCOM, by placing a site in the prospectus--by definition therefore placing it in the area of operations--will make a serious effort to schedule that program if it is highly ranked. The drilling at 735B, from the start, was tied to an operational and logistic decision (about which there was very limited information). The scheduling, and then loss, of Return to 735B disrupted not only our long-term planning but also our global rankings at the last Spring meeting.

Recommendation to PCOM: The Panel recommends to PCOM that they explore options to occasionally accommodate mini-legs for transit to reach high priority sites. We fear otherwise that the ship will become mired in limited areas of the ocean because of the strictures of long transits and 56-day legs.

Issue #5: Computer upgrade

Recommendation to PCOM: The Panel recommends that PCOM review the status of the computer upgrade to confirm that the goal of the project is to produce a true relational database, which will allow easy access to, and manipulation and combination, of all forms of data on the core. We also recommend that clear statement of the goals of the upgrade and the structure of the development and review process be prepared and disseminated to all of the panels as soon as possible.

Explanatory notes: The limited information that the Panel has about the computer upgrade has led to some serious concern. First, we have very little direct information about the specific goals or requirements of the upgrade or about how the programs are to be developed and tested by the user community. Our biggest concern, based on the little information we have seen, is that what we are embarking on is a larger, faster, more modern version of what we have now--a data archiving system. This is not what the Panel has been supportive of and is not what we envisioned the upgrade to be. Our view of the upgrade was the development of a relational database that would allow access to and manipulation of all kinds of data collected on the core--the idea of core-log integration is a small part of that goal. We understand such a system to require that every piece of data is linked to some marker in the core (depth, time, whatever). We have not seen any description of the upgrade which requires such a development and are very concerned that what we may be developing is not what the scientific community has been advocating. We do not believe that the development of a fast, modern data archiving system will be considered a successful upgrade by our part of the scientific community. Much of our concern stems from lack of information and we strongly urge PCOM to carefully review the direction and progress of the upgrade and bring the Panels up to date on what is happening.

Issue #6: Chip catcher tool

Recommendation to PCOM: The Panel recommends that PCOM facilitate (through whatever action they deem most appropriate) the development and testing of a chip-catching tool as outlined in correspondence between Hartley Hoskins (WHOI) and engineers at ODP-TAMU.

Explanatory notes: Hartley Hoskins had forwarded to a LITHP representative copies of correspondence between him and engineers at ODP-TAMU concerning the development of a tool which would collect chips created during the drilling process. This modification would allow the collection of chips in addition to the collection of core and would serve two important purposes. First, it could provide much needed samples in intervals of difficult core recovery (friable, brittle materials) and while not a substitute for core would be a vast improvement over empty core liners. Second, it might alleviate some drilling problems by collecting chips which would otherwise have to be washed out of the hole as it was advanced. The Panel was not sure about the appropriate recommendation for development. It seems to be a modification that would fall within the purview of the engineering group at ODP-TAMU. However, Hartley has been talking to engineers both within and (now) out of TAMU and we felt we should leave the development issue to PCOM in-house vs. third party). The technical modifications required did not appear dramatic, and could provide a substantial improvement in our results in difficult-to-core lithologies at minimal cost (we understand that copies of this correspondence had been forwarded to the JOIDES office, but if not the LITHP chair can supply them).

Issue #7: White paper review and long-range planning

Comment to PCOM: The Panel confirms that the most recent version of its White Paper is indeed an accurate representation of our scientific priorities and of a ten-year plan, given our present understanding, which should allow us to accomplish a number of those goals. We recognise that PCOM's vision of those White Papers changed as they were being written, and that we have not provided a longer-term vision or overall thematic focus. A subcommittee of the Panel will develop some materials addressing those specific issues before the December PCOM meeting.

Explanatory notes: The Panel reviewed their White Paper in response to an apparent concern at PCOM that it overstated our commitment to some goals. After some discussion, it was clear that the Panel endorsed the White Paper, and its 5 and 10-year time lines, given our current understanding of the lithosphere.

Our goals still focus heavily on mid-ocean ridge systems including the zero-age magmatic processes, hydrothermal processes, and crustal ageing. We have, perhaps, given some more emphasis to hydrothermal systems, in part in response to the apparent de-emphasis of hydrothermal processes at SGPP. We have had a lack of highly-ranked ocean ridge proposals, but that stems more from a lack of such proposals overall. The recent InterRidge meeting in Boston outlined a number of experiments of interest on mid-ocean ridges (and areas appropriate for those experiments),

and scientific ocean drilling featured prominently in those discussions. We are trying to strengthen our communication with the various national and international ridge initiatives and believe that we will shortly have a number of new proposals to study young ridge systems.

Our new white paper does emphasise intraplate and convergent margin themes more than our previous version. We believe that this reflects an increased awareness of the importance of lithosphere and crust created in these environments to earth evolution and is an appropriate focus for our Panel.

The Panel recognises that, by the time we finished our White Paper, we had not developed a vision of our overall scientific theme or vision. The goals of the White Paper seemed to evolve as we were writing and so our product was a bit different than that from some of the other Panels. We have asked a subcommittee to develop a short discussion of our larger themes in Lithosphere drilling, along with some discussion of our needs in the next phase of ocean drilling. These should be ready by the December PCOM meeting.

Issue #8: NARM

Comment to PCOM: The Panel reviewed the NARM DPG Report and the various NARM proposals and concluded that we had to begin ranking NARM proposals individually, using the DPG report as a conceptual guideline rather than a concrete plan.

Explanatory notes: The Panel has been using the DPG report as a guide to the strategy for drilling rifted margins. It has become clear that the results from legs to date and the lack of progress on planning for some legs has made that approach unworkable. We intend to use the DPG report as a guide which defines the problems to be addressed. We will evaluate each proposal individually, much as we do for proposals for offset-section drilling.

3. Prospectus Rankings:

Number of proposals considered LITHP reviewed the existing proposals of interest and decided not to add any proposals to the prospectus. It was noted that parts of the Vema Fracture Zone proposal and the just-drilled MARK proposal might be appropriate for an engineering leg and that the existing databases for both should be examined by SSP. The Panel elected not to rank 412-Add3 Bahamas Transect and 404 Blake-Bahamas as they were not within our mandate.

Total number of voting members: 14

Prospectus Rankings:

Rank	Number	Proposal Title	Score	SD	# voting
1	411-Rev	Caribbean Basalt Province ¹	7.21	0.97	14
2	SR-Rev3	Sedimented Ridges II	6.62	0.96	13
3	440-Add	Eastern Juan de Fuca hydrothermal circulation	5.79	1.19	14
4	460	SE Greenland Volcanic Margin	5.31	1.70	13
5	400 Rev2	Costa Rica mass balance	5.00	1.62	14
6	415-Rev2	Caribbean Basin multi-objective drilling	2.86	0.86	14
7	386-Add3	California Margin drilling	2.14	0.95	14
8	461	Rift-to-drift processes off Iberia	1.79	1.19	14

¹ 411-Rev is for 1 leg of drilling combining elements of basement drilling from proposals 384R3, 415R, and 411 as presented by Donnelly, Abrams, Sigurdsson, Carey, Duncan, Sinton, and Mauffret. LITHP sees this as one-half of a 2-leg program (the other portion being that emphasising principally OHP objectives). The two legs are complementary and should be planned in tandem. However, the four principal sites outlined in the ranked proposal are all required for a proper characterisation of the basement of the basin (see Appendix 2).

4. Proposal Reviews

Scores in the A to F categories are from the new proposal review guidelines.

Review Form: Fall Lithosphere Panel
Proposal Number: 411 Rev
Short Title: Caribbean Basin

Proponents: Donnelly et al.

Criteria Categorisation:

A	B1	B2	C	D	E	F
A1	B1.1	B2.1	C1	D1	OK	F2

Comments: The Panel reviewed the first version of this proposal at the Spring meeting--this program appears to be complete and ready to drill: the comments from the Spring review are repeated here. We do note that the proponents have completed the proposal as required.

LITHP would like to compliment the proponents of all the proposals for responding fully to previous panel comments and concerns. The revised LITHP proposal of Abrams, Carey, Donnelly, Duncan, Mauffret, Sigurdsson and Sinton from the Caribbean drilling planning meeting in Puerto Rico replaces the previous active proposals addressing LITHP objectives (combining basement drilling objectives from #411, #415rev and #384rev3). Therefore, LITHP has decided to review (and rank) this proposal. LITHP appreciates the efforts of the proponents of the original Sigurdsson et al. proposal in constructing a revised 2-leg scenario. If OHP and LITHP both rank Caribbean drilling highly, such an effort to combine the legs is natural. However, since basement drilling is contingent on a high ranking by LITHP, review and ranking of this combined proposal by LITHP is viewed as premature. However, LITHP is concerned with the classification of Site C as an alternate site in the Sigurdsson et al. potential 2-leg scenario. This site appears crucial to the age transect approach and its exclusion would need substantial justification; the 4-site scenario outlined in the Donnelly et al, 1-leg hard-rock proposal is preferred. The major objectives of the Mauffret and Leroy proposal have been incorporated in the LITHP-focused Caribbean proposal. A few clarification's are needed in the description and justification of the sites, particularly Site A1. Questions were raised as to whether a position of the site to the south (the other side of the fault) might reach below B'' more easily. Complete site summary forms are needed. Some panel members requested a complete reference list. The proponents should make revisions to this proposal and submit it to the JOI office by July 1. LITHP would also ask the proponents (or the JOI office) to remove their previous proposals from the system. Total basement penetration will ultimately depend on time. The proponents should prepare themselves for less penetration at all sites. While seeking at least 150 m at each site (less than 100 m may not be meaningful for palaeomagnetic measurements) some priorities should be considered between the 4 sites for deeper penetration. Previously, LITHP has voiced its support for drilling in the Caribbean region addressing K-T boundary questions. In a LITHP Caribbean leg, such problems could be studied in recovered K-T boundary sequences. Therefore, LITHP views its support of a leg of Caribbean drilling as outlined in this proposal, (in addition to a leg with primarily OHP objectives) as the best way to support K-T boundary drilling while still acting within its mandate.

Proposals **384-Rev3** (Pacific-Atlantic Connection), **408-Add2** (Caribbean Transects), **415-Add2** (Caribbean Ocean History), and **436** (Campeche Bank) were not reviewed as they were superseded by the above reviewed proposal or (in the case of 436) were not within the mandate of the panel. Proponents of 384-Rev3, 408-Add2, and 436 are referred to the comments contained in the review of the above proposal.

Review Form: Fall Lithosphere Panel

Proposal Number: 415 Rev2

Short Title: Multi-objective Caribbean drilling

Proponents: Sigurdsson et al.

Criteria Categorisation:

A	B1	B2	C	D	E	F
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Comments: The panel chose to review only the Donnelly et al. proposal for Caribbean basement drilling, as it focused on Lithosphere objectives. We understand that proposal, and a modified one-leg proposal focused on OHP objectives, to be complementary programs which were crafted during a multi-disciplinary working group meeting in Puerto Rico last winter. The combined two-leg program addresses problems of LIPs, impacts and extinction's, and ocean history. The review for the associated Donnelly et al. proposal is reproduced here for information.

LITHP would like to compliment the proponents of all the proposals for responding fully to previous panel comments and concerns. The revised LITHP proposal of Abrams, Carey, Donnelly, Duncan, Mauffret, Sigurdsson and Sinton from the Caribbean drilling planning meeting in Puerto Rico replaces the previous active proposals addressing LITHP objectives (combining basement drilling objectives from #411, #415rev and #384rev3). Therefore, LITHP has decided to review (and rank) this proposal. LITHP appreciates the efforts of the proponents of the original Sigurdsson et al. proposal in constructing a revised 2-leg scenario. If OHP and LITHP both rank Caribbean drilling highly, such an effort to combine the legs is natural. However, since basement drilling is contingent on a high ranking by LITHP, review and ranking of this combined proposal by LITHP is viewed as premature. However, LITHP is concerned with the classification of Site C as an alternate site in the Sigurdsson et al. potential 2-leg scenario. This site appears crucial to the age transect approach and its exclusion would need substantial justification; the 4-site scenario outlined in the Donnelly et al, 1-leg hard-rock proposal is preferred. The major objectives of the Mauffret and Leroy proposal have been incorporated in the LITHP-focused Caribbean proposal. A few clarification's are needed in the description and justification of the sites, particularly Site A1. Questions were raised as to whether a position of the site to the south (the other side of the fault) might reach below B'' more easily. Complete site summary forms are needed. Some panel members requested a complete reference list. The proponents should make revisions to this proposal and submit it to the JOI office by July 1. LITHP would also ask the proponents (or the JOI office) to remove their previous proposals from the system. Total basement penetration will ultimately depend on time. The proponents should prepare themselves for less penetration at all sites. While seeking at least 150 m at each site (less than 100 m may not be meaningful for palaeomagnetic measurements) some priorities should be considered between the 4 sites for deeper penetration. Previously, LITHP has voiced its support for drilling in the Caribbean region addressing K-T boundary

questions. In a LITHP Caribbean leg, such problems could be studied in recovered K-T boundary sequences. Therefore, LITHP views its support of a leg of Caribbean drilling as outlined in this proposal, (in addition to a leg with primarily OHP objectives) as the best way to support K-T boundary drilling while still acting within its mandate.

Proposals **384-Rev3** (Pacific-Atlantic Connection), **408-Add2** (Caribbean Transects), **415-Add2** (Caribbean Ocean History), and **436** (Campeche Bank) were not reviewed as they were superseded by the above reviewed proposal or (in the case of 436) were not within the mandate of the panel. Proponents of 384-Rev3, 408-Add2, and 436 are referred to the comments contained in the review of the above proposal.

Review Form: Fall Lithosphere Panel

Proposal Number: 448 Rev

Short Title: Ontong-Java plateau

Proponents: Kroenke et al.

Criteria Categorisation:

A	B1	B2	C	D	E	F
A1	B1.2	B2.1	C2	D1		F2

(high priority but needs revision)

Comments:

This proposal clearly addresses a high priority of LITHP, and is generally well thought out and justified. LITHP does have questions regarding some of the sites and drilling priorities. LITHP views the characterisation and dating of the bulk of the OJP as the highest priority objective; the seamount flank (OJ5) and diatreme (OJ4) sites are interesting but lower priority. Some on the panel think that these sites, while interesting, should be dropped in favour of additional basement sampling sites; others agree with the proponents that these sites are an important component of the proposed drilling program and should be retained in the case of a two leg program. In the case of a one leg program, the panel consensus is that the seamount flank site (OJ5) should be dropped in favour of another basement sampling site (OJ7?). LITHP would like additional information, if available, regarding the seamount site and the likelihood that the seamount is associated with one of the primary episodes of the formation of the OJP. With regard to the diatreme site, the panel is concerned about the feasibility of "hitting" such a small target; more discussion of this issue is needed. The proponents need to provide estimates of expected drilling times and recovery for the deep basement hole (OJ2), as deep drilling can be problematic. Additionally, the panel wonders about the possible utility of land based drilling on Ontong Java Island.

LITHP thanks the proponents for considering the relationship of their Ontong Java proposal to the proposal for drilling the Kerguelan/Broken Ridge. The proponents should be aware that both proposals are very high priority for LITHP, and that the realities of planning and scheduling drilling legs may ultimately require that one of the two programs be scheduled for drilling while the other is not. We encourage the proponents to continue to compare and contrast these two provinces as they develop their ideas for understanding large igneous provinces through drilling.

Review Form: Fall Lithosphere Panel

Proposal Number: 457

Short Title: Kerguelan Plateau and Broken Ridge

Proponents: Frey et al.

Criteria Categorisation:

A	B1	B2	C	D	E	F
A1	B1.1	B2.1	C3	D1 (possibly)	E6,E8	F2

seismic profiles

Comments:

This proposal aims at geochemical and chronological investigation of the Kerguelan Plateau, one of the giant LIPs on earth. LIPs, especially oceanic plateaux, have a prime importance for understanding the evolution of the earth as well as plume tectonics (mantle-core dynamics). Oceanic plateaux have been poorly sampled and will be one of the most important targets for future earth science, especially in ODP. The proposal, therefore, has great scientific merit despite some incompleteness of style.

The authors propose 13 drill sites covering the whole area of the Kerguelan Plateau and Broken Ridge. They intend to clarify the origin and tectonic/geochemical history of the LIP; the spatial and temporal change of the degree of continental involvement in the mantle source for the Kerguelan Plateau is a key point in this proposal. The Panel had several suggestions for the authors. First, we wondered why there was not a site located near the central part of the Plateau. The question was raised whether there was an appropriate place for an offset drilling strategy on the plateau, to look at some of the deeper crustal levels. There was also a concern expressed that the study of the sedimentary section associated with the plateau needed detailed study as they would be important for understanding the entire history of the plateau. Some documentation (specifically site summary forms and seismic profiles) are missing from the proposal and need to be supplied in the next version.

LITHP thanks the proponents for considering the relationship of their Kerguelan/Broken Ridge proposal to the proposal for drilling the Ontong Java Plateau. The proponents should be aware that both proposals are very high priority for LITHP, and that the realities of planning and scheduling drilling legs (particularly two leg programs) may ultimately require that one of the two programs be scheduled for drilling while the other is not. We encourage the

proponents to continue to compare and contrast these two provinces as they develop their ideas for understanding large igneous provinces through drilling.

Review Form: Fall Lithosphere Panel

Proposal Number: 376 Rev3

Short Title: Vema Fracture Zone

Proponents: Bonatti et al.

Criteria Categorisation:

A	B1	B2	C	D	E	F
A1	B1.2	B2.1	C3	D1,D2	E5,E9	F2

Comments:

The proposal is greatly improved over the last few versions that we have reviewed. The additional site survey data has greatly strengthened the case that the Vema transverse ridge exposes an uplifted section of oceanic crust. The Panel views the Vema transverse Ridge as an excellent candidate site for drilling the dike-gabbro boundary and for understanding vertical tectonics on transverse ridges. In fact, Vema is probably our leading site now to drill the dike-gabbro transition. However, at this meeting, the Panel is concerned about the direction of offset-drilling overall, and is trying to evaluate our chances for success in different offset-section environments. We have some specific recommendations for the proponents in preparing a revision for ranking at our spring meeting:

1. It would still appear that the gabbro-peridotite contact is not primary. The gabbro section is very, very thin, as shown in the cross-sections, and the descriptions of the rocks sound much like high-level gabbros, not those near the Moho. It seems more likely that the peridotites are faulted against the gabbros or that they are diapirically emplaced against the gabbros. This does not mean the peridotites are necessarily a poor target, but it does mean we need to think about drilling them differently. We encourage the proponents to develop some more reasonable cross-sections of the transverse ridge and to re-site the ultramafic hole accordingly.

2. The results from offset-section drilling to date show that detailed site survey data, including side-scan data, high resolution bathymetry and probably markers on the site are going to be needed. Can the proponents document adequate bare-rock (truly bare-rock that is, 100 m square) which can be relocated well enough for a guide-base? Alternatively, are there sediment pockets on the benches that might allow starting a hole with a re-entry cone, rather than with a guide-base? This would greatly reduce the problems in siting the hole.

3. Given that DCS will not be available for the limestone cap site, is the recovery of the limestone with rotary coring going to be high enough to get an adequate biostratigraphy and palaeodepth curve? Was what was accomplished on the 2 Atolls and Guyots legs, in terms of recovery, sufficient to the task?

We want to encourage the proponents that we view this proposal as much stronger than it was in previous versions. We are not ready to commit to a full leg here yet, but this may be an excellent site for an engineering leg to test some offset drilling strategies, with a full leg devoted to science objectives possible in the future.

Review Form: Fall Lithosphere Panel

Proposal Number: SR-Rev3

Short Title: Sedimented Ridges II

Proponents: Zierenberg et al.

Criteria Categorisation:

A	B1	B2	C	D	E	F
A1	B1.1	B2.1	C1	D1	OK	F1

Comments:

SR-Rev 3 remains a high priority of LITHP and is a mature, well planned program. This revised proposal outlines a second leg of drilling at sedimented ridges that builds on the successes of Leg 139. The goals of drilling Middle Valley and Escanaba Trough are to study the genesis of massive sulphide deposits at sedimented ridges, the magmatic and tectonic processes associated with crustal evolution, and to further study the hydrology of the Middle Valley sites. It should be a high priority to drill both sites as the hydrothermal fluids at the Middle Valley deposits have a strong basaltic signature whereas fluids at Escanaba Trough indicate that the system is sediment-dominated. The sites were selected to investigate ore deposition at varying stages of their evolution: Escanaba Trough and Dead Dog represent an early stage (pre-re-mobilisation), Sunnyside Up an intermediate stage (with active re-mobilisation), and Bent Hill a late stage (re-mobilisation and re-crystallisation). The drilling plan is too long for a standard leg and sites will have to be prioritised. The proponents have ranked their sites as first and second priorities. LITHP feels that specific site selection should be up to the proponents, however, they feel that the reference sediment site (ET-6) should be considered priority 1. Site survey data for Middle Valley will be complete after a heat flow survey in 1995. A working group has developed a plan to monitor the sites before, during, and after drilling.

Review Form: Fall Lithosphere Panel

Proposal Number: 440-Add

Short Title: Hydrothermal circulation on the east flank of Juan de Fuca

Proponents: Davis et al.

Criteria Categorisation:

A	B1	B2	C	D	E	F
A1	B1.1	B2.1	C1	D1		F1

Comments:

LITHP is very interested in the characterisation, evolution, and alteration of oceanic crust. The experiments outlined in this proposal will provide some important constraints on the movement of fluids through the uppermost layer of ocean crust and will provide constraints for understanding the process that alter the crust. Particularly strong aspects of the Juan de Fuca sites are the extensive seismic data showing the increase in velocity and thickening of layer 2A. Identifying the layer 2A/2B boundary and documenting the processes involved in its evolution with distance from the ridge axis are considered of high fundamental importance to this panel. While the sites proposed for drilling will contribute to understanding the evolution of layer 2A, the panel feels it is important that any deeper drilling should be targeted considering the seismic data that images this boundary, even though it is possible that such a site may not correspond to one of the sites proposed for re-entry cones by the hydrologic experiment. The panel also noted that the proposed transect of hole lies along a single flow line and that examination of the petrologic evolution of basalt along flow lines tied to active spreading centres is an area of overlapping interest between RIDGE and LITHP. Addition of a petrologist to develop this aspect of the proposal could broaden the appeal of this proposal to this panel without compromising the primary objectives of the proposal. The proponents justify their use of Leg 139 experience for time estimates for drilling, logging and coring, however, the lists of holes should be prioritised with contingency plans for drilling if the significantly longer time estimates provided by ODP-TAMU prove correct.

Review Form: Fall Lithosphere Panel
Proposal Number: LOI 34
Short Title: Hydrothermal circulation in intraplate seamounts
Proponents: Kurnosov et al.

LOI-34 addresses a high priority of the LITHP - the geochemical fluxes associated with fluid-rock interaction in the oceanic crust. The proponents outline an interesting drilling strategy that focuses on the geochemical fluxes associated with intraplate seamounts. Although the evolution of hydrothermal systems seamounts are poorly understood, we feel that this specific problem is of second order importance to LITHP as characterising the geochemical fluxes within normal oceanic remains our top priority. We encourage the proponents to integrate their objectives with a proposal that aims at addressing a more fundamental question by drilling seamounts. crust.

Review Form: Fall Lithosphere Panel
Proposal Number: 460
Short Title: Southeast Greenland Volcanic Margin: a NARM proposal

Proponents: Larsen et al.

Criteria Categorisation:

A	B1	B2	C	D	E	F
A1	B1.1	B2.1	C1	D1	OK	F1

Comments:

This proposal is tremendously improved over the first version, which is not surprising since this one was written after the results of Leg 152 were in. There is no doubt that the site survey data for this proposal are adequate, in fact they are quite extraordinary. The results of Leg 152 will be triply valuable because of the detailed regional context in which the work can be interpreted. It is clear that the study of this margin will be the benchmark against which other volcanic rifted will be compared.

The proposal is well-prepared and its objectives, in general, are clear. The Panel felt that the most scientifically compelling part of the work is that on the EG-66 transect, closer to the plume. This transect would be asking many of the same questions as Leg 152, in a position closer to the Iceland plume axis. This strategy is an extension of the original NARM-DPG plan. The sites on the EG-63 transect are designed to recover the oldest volcanics in the sections, to examine the nature of the pre-breakup unconformity and to confirm the nature of landward dipping reflectors as dikes like those exposed in coastal exposures.

The Panel found this proposal to be sound, but its principal drawback is the tremendous success of Leg 152. That leg answered many of the first order questions about the nature of volcanism and rifting, including the timing and nature of volcanism relative to break-up. The work along EG-63 is in many ways mopping up--it is confirming some questions, completing the volcanic stratigraphy and creating a definite tie into the onland stratigraphy. There is no doubt it would be a good, solid leg of drilling that would neatly complete the offshore part of the East Greenland study. The Panel was less convinced that it would give us something fundamentally new. The EG-66 is addressing a more fundamental question--essentially re-asking the Leg 152 questions in a position closer to the plume. Some of those questions can be constrained between the Leg 49 results and work on dike and coastal exposures, but again, the EG 66 transect would be tightly constrain the story.

There is one important technical questions. There seems to be a good chance that the three shallowest sites are bare-rock sites, which would dramatically change the time estimates and the volume of work that could be completed. It may not be

much better if the benches are covered coarse gravel or rubble, as it would be hard to put a guide-base or a cone in that. If this leg is scheduled, this issue needs to be clearly resolved.

Review Form: Fall Lithosphere Panel
Proposal Number: 461
Short Title: Rift-to-drift off Iberia--Leg 149 II

Proponents: Reston et al.

Criteria Categorisation:

A	B1	B2	C	D	E	F
A3	B1.2	?	C4	D1		F4

Comments:

The proposal aims at narrowing the uncertainties on the nature of the continent-ocean crustal transition still remaining after Leg 149 drilling. LITHP maintains an interest in sampling the oldest oceanic crust at Site IAP-3C seaward of the peridotite ridge, but considers other aspects of the proposal low priority. The Panel remains unconvinced by the case made for returning to this margin, based on the available results from Leg 149.

Review Form: Fall Lithosphere Panel
Proposal Number: 333 Add2
Short Title: Cayman Trough Ocean-Continent boundary

Proponents: Mercier de Lpeinay et al.

Criteria Categorisation:

A	B1	B2	C	D	E	F
A4	B1.2	B2.1	C2	D1		F4

Comments:

With the exception of some diagrams, this proposal is the same as that reviewed at our Fall, 1993 meeting. The panel holds the same opinion of the proposal and reiterates here that the objectives presented in this proposal do not address a high priority of the Lithosphere Panel.

Review Form: Fall Lithosphere Panel
Proposal Number: LOI 33
Short Title: Gulf of Aden Project

Proponents: Cochran et al.

LOI 33 has many features attractive to LITHP's interest in the transition from continental to Oceanic crust, especially in terms of thin sediment and relatively straightforward segmentation and map-view structure. LITHP's interest will probably always be secondary to TECP's, but would support targets in oceanic basement and volcanics. The need for more data, especially seismics, is obvious for serious evaluation to proceed.

The proponents should contact T. Francis of TAMU regarding political inquiries for Red Sea work, which may be relevant for Gulf of Aden work.

Review Form: Fall Lithosphere Panel
Proposal Number: 355-Rev4
Short Title: Drilling the Peruvian convergent margin

Proponents: von Huene et al.

Criteria Categorisation:

A	B1	B2	C	D	E	F
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Comments:

The major interest of LITHP in mass balance experiments at subduction zones is quantification of sediment recycling by evaluating the contribution of subducted components to arc volcanism. As stated in LITHP's last review, input of sediment is well defined for the proposed area, no evidence, however, can be provided on how large quantities of the subducted material goes back into the mantle, is underplated, intruded or reworked in any other manner. Without significant volcanism occurring above the subducted slab, this problem can, to our opinion, not be addressed adequately. Because of this, the Peru margin is unlikely to ever become highly ranked by LITHP as an appropriate location for a subduction zone/arc volcanism experiment.

Review Form: Fall Lithosphere Panel
Proposal Number: 400-Add3 and 400-Rev2

Short Title: Mass balance and fluid flow off Costa Rica

Proponents: Silver et al.

Criteria Categorisation:

A	B1	B2	C	D	E	F
A1	B1.1	B2.1	C1	D1/D2	E5 x-section	F1

Comments:

This highly-refined proposal accomplishes a very difficult task: it describes a drilling program that, if successful, could achieve objectives that are important to several thematic panels. Of greatest interest to LITHP are 1) mass balance calculations resulting from an assessment of the composition of the underthrust sedimentary sequence and analyses of the structural style of accretion and 2) an assessment of the physical, chemical, and thermal state of basement at the reference site CR-1. Interest in the latter has only been increased with presentation of the results of the February 1994 site survey and dive program, as anomalously low heat flow values seaward of the trench, and low values, overall, landward of the trench suggest that there may be vigorous fluid flow within the basaltic basement.

The greatest weakness of the proposal, from the LITHP point of view, is that without realistic time estimates, it is not clear how many of the sites can be drilled (and associated objectives addressed) in a single leg of drilling. In particular, reference sites (like CR-1) have a history of being neglected in drilling of accretionary complexes. With present technology, CR-2 and CR-3 probably would require triple-casing systems, such as those deployed to much shallower depths on Leg 156, requiring significant time commitments, perhaps to an extent that would exclude completely operations at two or three other sites. [In fairness to the proponents, the extent of time required for these operations was not widely understood when they revised this proposal, as Leg 156 was still underway].

Lesser points: the proposal is still missing a balanced cross-section. Pressure measurements made with the installed beneath a CORK cannot provide information on 'long-term changes in...permeability' (p. 18). Why is a new WSTP needed for chemistry measurements at CR-2? (p. 18) Measurements of temperature made in open hole during the same leg on which the hole is drilled (CR-3) are unlikely to provide much insight into fluid flow in the complex (p. 9).

Review Form: Fall Lithosphere Panel

Proposal Number: 435-Rev and 435-Add

Short Title: Crustal fluxes at convergent margins-Nicaragua

Proponents: Plank et al.

Criteria Categorisation:

A	B1	B2	C	D	E	F
A1	B1.1	B2.1	Novel	D1	E3,E5	F2

Comments:

We appreciate being kept up to date by the proponents on their efforts to complete site survey work on the Nicaragua margin. We note that the site survey effort will have to include deep penetration MCS data as well high-resolution single channel work if the prism is to be imaged adequately to complete the experiment. (Essentially, we expect that the type of surveys completed for the Costa Rica margin will be needed). We repeat here our review of Spring 1994:

The panel appreciates the proponents' efforts to clarify 435 and to answer our questions from the fall meeting. The link between this proposal and 400-Costa Rica is now clear, and the two programs form a coherent strategy for a mass balance experiment on this margin. However, it is clear that the Nicaragua transect is a few years from being ready to drill, in terms of its site-survey needs, and our commitment to this proposal will depend heavily on whether or not the drilling along the Costa Rica transect demonstrates that this kind of mass-balance experiment can be completed with the drillship. We encourage the proponents to begin the site survey process, which should yield a great deal of interesting science in itself, to complete the geochemical characterisation of the volcanoes onshore of the Costa Rica transect as needed, and to wait and see what the results of the Costa Rica drilling are.

Review Form: Fall Lithosphere Panel

Proposal Number: 451-Rev

Short Title: Ocean drilling in the Tonga forearc

Proponents: Tappin et al.

Criteria Categorisation:

A	B1	B2	C	D	E	F
A1	B1.2	B2.1	C2	D1	see below	F2

high priority but needs revision of objectives, writing, and data.

Comments:

The proponents of proposals 446 and 451 have merged their respective objectives into a new proposal which addresses problems highly relevant to the interests of LITHP. However, the proposal is far from mature and needs substantial rewriting in order to clarify the ways in which the drilling strategy will achieve the stated objectives. Several points should be addressed in the revised proposal.

1. The selection of drilling sites should be more carefully matched to the objectives. Can these be achieved with less than the 6.2 km of core requested?
2. Dating and establishing the duration of the earliest volcanic rocks is critical to testing the hypothesis that the early volcanism is high-volume and short-lived. How will the rocks be dated?
3. What chemical and structural criteria will be used to assess the similarity between the early arc crust and supra-subduction zone ophiolites?
4. The arc volcanism is expected to show evidence for depletion in incompatible elements during the earliest extension phase, followed by enrichment in mobile elements as the newly-subducted slab begins to dehydrate. How likely are the volcanic rocks to be sufficiently fresh to have preserved evidence for enrichment in mobile elements? How much of the success of this objective will depend on the recovery of lava flows and how much on volcanoclastic sediments? How will the work on volcanoclastic sediments relate to Clift's analytical work on Leg 135 material?
5. To what extent does volcanoclastic stratigraphy reflect the eruption sequence?
6. The Tonga arc lies along the boundary between the Indian and Pacific Oceans and may have tapped mantle from either or both. Will it be possible to distinguish differences in mantle source from the subtle effects of mantle depletion and enrichment?

In conclusion, the Panel would welcome a much more focused and well-argued proposal. Testable hypotheses should be set out and the role of each site in testing these hypotheses clearly stated. Particular attention should be paid to the geochemical and isotopic data which will be required to assess temporal and spatial changes in the mantle source and degree of melting.

Review Form: Fall Lithosphere Panel
Proposal Number: LOI 39
Short Title: ODP drilling on the Palau-Kyushu Ridge

The main objective of the proposal is to better understand the formation and evolution of back-arcs, arcs, and remnant arcs in the Philippine Sea. The proponents plan to attain their objective by drilling a single site at the bend (~23 N) of the Palau-Kyushu Ridge. The bend is the morphological, tectonic, and geophysical boundary between the NW trending northern section of the Palau-Kyushu Ridge and the NE trending southern section of the ridge. It also represents the morphological and structural boundary between the northern and southern basins on either sides of the Palau-Kyushu Ridge. The Philippine Sea is geologically and geophysically well-mapped, making it an ideal study area.

LITHP is concerned with arc volcanism and thus it is very interested in projects dealing with this general area of study. LITHP, however, only considers proposals that deal with global problems. The project of Katsura and others, as outlined in the letter, deals with regional problems. Moreover, drilling a single site at the bend of Kyushu-Palau Ridge most probably is not sufficient to attain the main objective of the proposal. Thus, LITHP does not consider the proposal a high priority.

Review Form: Fall Lithosphere Panel
Proposal Number: LOI 36
Short Title: Crustal shortening in the Nankai Trough
Proponents: Tokuyama et al.

The letter outlines a very interesting proposal that has a potential to resolve some of the major geologic problems associated with crustal shortening due to arc-arc collision. The presentation of the objectives and ways to attain these by drilling is thorough but concise, and the proposed area of study area seems to be already well-characterised. LITHP also commends the proponents for their attempt to include as many scientific objectives as possible in a single drilling proposal. LITHP thus encourages the development of a mature proposal. It must be pointed, however, that the project is dominantly a tectonic/sedimentary study and only subsidiary lithospheric. In fact, the possible recovery of oceanic layers II and II at the bottom in one (Zenisu Ridge site) of the three proposed drilling sites is only of direct relevance to LITHP.

Review Form: Fall Lithosphere Panel
Proposal Number: LOI 37
Short Title: Nature of the sub seafloor biosphere
Proponents: Delaney et al.

LITHP recognises the importance of the objectives outlined in LOI-37 and strongly recommend that this LOI receive a careful interdisciplinary review. The objectives are outside of LITHP's mandate, however, shallow basement holes drilled for LITHP objectives may provide the core required for biological studies. We assume that the proponents have considered how drilling can achieve their goals, considering the contamination that traditional drilling techniques would likely produce. It is possible that an add-on site could be integrated into a future drilling leg that could be used to develop an appropriate drilling strategy and we encourage the proponents to follow and evaluate the upcoming (scheduled and highly ranked) LITHP cruises.

We question the selection of the Cobb segment. As the proponents point out, it is possible to make 50-200 m of penetration into young crust without DCS. Drilling problems, however, are caused more by the fractured rock than spudding into bare rock. It was not discussed how altered or sealed with minerals the crust can be before it is of no use for the biological studies.

Review Form: Fall Lithosphere Panel
Proposal Number: 456
Short Title: Tjornes Fracture Zone Sedimentary Basin
Proponents: Fridleifsson et al.
Criteria Categorisation:

A **B1** **B2** **C** **D** **E** **F**
A5

Comments:

This project is to drill a young (Miocene) basin located north of Iceland that formed in a dextral transcurrent environment probably due to a westward shift of the Kolbeinsey ridge. This basin is highly asymmetric and full of sediments that reach 4km in thickness in its deepest part and vary laterally from terrestrial to much marine lithologies. The proponents consider that these sediments have well recorded (1) the palaeoceanography of this area, in particular, the significance of Neogene glaciations in south Arctic and (2), the tectonic and geothermal history of the basin, i.e. the influence of hydrothermal circulation's on diagenesis processes. They propose two deep drills (1100 to 1600m deep) that will be also used to establish land-sea correlations.

Considering the objectives of this leg, it appears that this proposal cannot be ranked by LITHP but could interest OH and SGP panels. LITHP however recommend to the proponents to pay more attention to the study of the basaltic levels they will recovered inter-bedded within the sedimentary section and to drill more than 10m of basalts at Site 2.

Review Form: Fall Lithosphere Panel
Proposal Number: 386-Add3
Short Title: California Margin Drilling
Proponents: Lyle and Mix
Criteria Categorisation:

A **B1** **B2** **C** **D** **E** **F**
A3 B1.1 B2.1 C1 D1 some site survey F4

F94 Review

Proposal is unchanged from Spring 94 with the exception of additional site survey data, so the LITHP Spring 94 comments still apply. LITHP continues to be interested in holes drilled to basement and appreciates the responsiveness of the proponents to our suggestions.

PROPOSAL NOT REVIEWED HERE WERE NOT CONSIDERED WITHIN THE MANDATE OF LITHP.

5. Future Meeting Dates: March, College Station, Texas, host and dates TBA after consultation with ODP-TAMU

6. Current Liaisons for 1994 from LITHP to:

TECP	Doug Wilson/Kathy Gillis
SGPP	Rob Zierenberg
OHP	John Tarduno
DMP	Mike Coffin/Andy Fisher
TEDCOM	Yngve Kristoffersen

7. Membership Activity

Jacques Girardeau joined the panel, replacing Matilde Cannat for France.
Pat Castillo joined the panel, replacing John Bender for the U.S.
Godfrey Fitton joined the panel, replacing Pam Kempton for the U.K.

John Ludden will be leaving the Panel after the next meeting, as will Yngve Kristoffersen and Peter Herzig. We also have three U.S. members due to leave after the next meeting--Doug Wilson, Mike Coffin, and John Tarduno. To minimize the disruption in the Panel and to provide some continuity we ask PCOM to approve:

inviting Roland Rihm to the Fall meeting. Rihm has served as alternate for Herzig at the last two meetings and will become the German representative when Peter leaves the panel. We would like both Roland and Peter to attend the meeting to assure Roland's familiarity with the global ranking discussions this fall.

having two of the three U.S. members scheduled to rotate off stay on for one additional meeting. This would guarantee that at our Fall 1995 meeting we will have enough continuity to insure careful consideration of all of the proposals.

8. Reports at the Meeting:

Liaison reports:	NSF PCOM SGPP TEDCOM	B. Malfait J. Natland (no meeting since Spring) Y. Kristoffersen (covered by report)
	PCOM	
	OHP TECP LDEO-BRG	J. Tarduno (no meeting since Spring) Goldberg
Review of recent legs:	Leg 157/VICAP/MAP 735B changes	R. Rihm S. Bloomer
Planning/contact reports:	InterRIDGE-4D architecture meeting RIDGE Offset drilling workshop Red Sea status OSN/ION	R. Rihm P. Castillo S. Bloomer R. Zierenberg/J. Ludden M. Purdy

9. Other Business

Many thanks to John Ludden for hosting and organising our meeting. The field trips to greenstone belts, massive sulphide deposits, and komatiites were outstanding.

Lithosphere Panel Meeting
3-5 October 1994
Rouyn-Noranda, Canada

Shoji Arai, Sherman Bloomer (Chair), David Caress, Paterno Castillo, Godfrey Fitton, Katheryn Gillis, Jacques Girardeau, Yngve Kristoffersen, John Ludden, Roland Rihm (alternate for Peter Herzig), Anne Sheehan, John Tarduno, Douglas Wilson, Robert Zierenberg, David Goldberg (LDEO-BRG), Bruce Malfait (NSF), James Natland (PCOM), Michael Purdy (OSN-ION).

1. Liaison and Technical Reports

James Natland, representing PCOM, reviewed developments relevant to LITHP, the most important of which was the status of the diamond coring system. Problems encountered during recent land and sea tests, coupled with contractual difficulties, have led to the system being shelved for the time being. LITHP urged PCOM to make a firm commitment to its development and deployment. PCOM also requested panels to advise on budgetary prioritization in view of the projected shortfall in funding, but LITHP felt unable to provide the required advice on the basis of the information available at the meeting.

David Goldberg reported the results of high temperature autoclave tests carried out on downhole tools. The temperature memory tool, the backup wireline temperature tool, and the televiewer worked at 265°C and the rest of the tools at 170°C.

The success of VICAP was reported. It was possible to recognise the main phases of on-land volcanism in the sedimentary record, allowing more accurate magma generation rates to be calculated from the drilling results and seismic records. Turbidite sequences recovered from MAP had sources in the Canaries, Madeira, and the North African margin. The panel expressed concern at the removal of the planned return to 735B from the FY95 schedule and asked PCOM to make a serious effort to drill this site at the earliest opportunity.

The panel reviewed the progress of offset-section drilling after a presentation on the results of a workshop at ODP-TAMU and concluded that the scientific return from the principal offset Legs (735B, Hess Deep, MARK) had been substantial. Sampling the deeper parts of the ocean crust in this way is still regarded as one of LITHP's highest priority goals but technical difficulties make further progress difficult. The panel recommended that PCOM consider seriously the request from ODP-TAMU for an engineering Leg to test a variety of techniques to improve recovery in faulted and tectonized terrains.

The possibility of drilling in the Red Sea was discussed. Details of potential sites will be sent to the US State Department who will investigate the possibility of clearance being granted by the appropriate countries. It is hoped that a Red Sea drilling proposal will be submitted by the end of 1995.

Correspondence between H Hoskins (WHOI) and engineers at ODP-TAMU about the possibility of developing and installing a chip-catching tool was discussed by the panel. Such a tool could apparently be installed at minimal cost and would yield large volumes of rock chips which could provide a useful supplement to cores, or even allow recovery of material not preserved in cores. The panel were enthusiastic about the suggestion and urge PCOM to facilitate the deployment of the tool.

2. New Proposal Reviews

Of the twelve new or revised proposals reviewed, three include British proponents. These are 448-Rev (**Ontong-Java Plateau**; A D Saunders), 457 (**Kerguelen Plateau**; A D Saunders), and 451-Rev (**Tonga Forearc**; D Tappin, C McLeod, and P D Kempton). All three were rated as high priority projects by LITHP. The first two proposals aim to drill large oceanic plateaus and have similar objectives. The relative merits of the two proposals were discussed at length but no clear consensus emerged. Since both address similar problems, it is unlikely that both will be drilled in the short term. The Tonga Forearc proposal results from the combination of two previous proposals (446 and 451). Although the revised objectives were rated highly, the proposal is immature and requires some clarification of the scientific rationale. A revised proposal was invited.

Two other proposals received strong LITHP support. Proposal 376 (**Vema Fracture Zone**) represents the best site to drill the oceanic dyke-gabbro contact but it isn't clear that the objectives are achievable with present technology. LITHP is not yet ready to commit a full leg to the proposal but Vema may be an excellent site for an engineering leg to test offset drilling strategies. Proposal 435 (**Nicaragua margin**) is linked to prospectus proposal 400 (Costa Rica) as part of a long-term experiment to determine mass balance in subduction zones. The proposal is immature but the proponents were encouraged to carry out site surveys and to complete work on the associated arc volcanoes. Future LITHP recommendations will depend on the outcome of proposal 400.

3. Prospectus Proposals

Eight of the ten Prospectus Proposals are of interest to LITHP. Rankings are as follows.

Rank	Number	Title	Score	SD
1	411-Rev	Caribbean Basalt Province	7.21	0.97
2	SR-Rev3	Sedimented Ridges II	6.62	0.96
3	440-Add	Eastern Juan de Fuca hydrothermal circulation	5.79	1.19
4	460	SE Greenland Volcanic Margin	5.31	1.70
5	400-Rev2	Costa Rica mass balance	5.00	1.62
6	415-Rev2	Caribbean Basin multi-objective drilling	2.86	0.86
7	386-Add3	California Margin drilling	2.14	0.95
8	461	Rift-to-drift processes off Iberia	1.79	1.19

4. Panel Issues

The next meeting will be held in College Station, Texas, in March. The dates will be decided after consultation with ODP-TAMU.