

Lithosphere panel meeting,

October 7 - 9, Kanazawa, Japan, hosted by Shoji Arai

1996

Members attending the meeting:

Dave Caress	LDEO
Pat Castillo	Scripps (UCSD)
John Mahoney	Hawaii
Kathy Gillis	U. Victoria (Canada)
Roland Rihm	Geomar (Germany)
Anne Sheehan	Univ Colorado
Jeff Gee	Scripps (UCSD)
Dominique Weis	UL Brussels (ESF)
Godfrey Fitton	Edinburgh (UK)
Shoji Arai	Kanazawa (Japan)
John Ludden	Nancy (France)

Members absent for the meeting:

Andy Fisher	UCSC
Jim Moore	USGS
Suzanne Carbotte	LDGO
Randy Koski	USGS

Liasons and Guests

Paul Wallace	TAMU
Catherine Mevel	PCOM
J-P Montagner	ION
Kathy Ellins	JOIDES
Takeshi Matsumoto	JAMSTEC

Introduction:

The chairman thanked Shoji Arai for inviting the Lithosphere panel to Kanazawa

The panel was informed of the loss of both Rob Kidd and Lou Garrison, men who dedicated a considerable amount of energy towards the success of ocean drilling.

1. MEETING SUMMARY:

Monday 7th October:

The panel convened at 09:00 and spent the morning reviewing presentations from the various liasons. In particular Paul Wallace of TAMU provided an overview of the results of drilling the Juan de Fuca hydrothermal systems (leg 168).

At the request of the panel chair, part of the afternoon session was dedicated to a report from Jean-Paul Montagner on the ION project. Montagner provided a clear summary of the requirements for ION sites, for both deep mantle convection studies, and for earthquake source studies on seismogenic zones. Given that the panel was confronted with evaluation of a series of ION projects this presentation provided important technical information. In addition to the ION presentation, Takeshi Matsumoto from JAMSTEC provided the panel with an overview of the OD-21 project and a variety of sea-floor and borehole instrumentation projects with which the organisation is involved.

Part of the afternoon was spent reviewing new proposals submitted to for the July 1 deadline.

Tuesday 8th October:

Dedicated to evaluation of new proposals and LOI's, revisions and additions to old proposals.

A summary of each of the proposals evaluated in the prospectus was completed and some preliminary discussion was undertaken on how the panel would rank these proposals.

Wednesday 9th October:

Most of the morning was spent revisiting some of the proposals in the prospectus and deciding on how to divide certain proposals for ranking (in particular the ION projects).

After the ranking process had been completed, given that this was the last time the full panel would meet, the chairman asked the panel members to provide general reflections on the ODP system and also on the revised panel structure.

Nominations were made for the interim committee for proposal evaluation, co-chief scientists for upcoming legs, suggestions for the publications committee and for the Fall SSP.

The meeting was adjourned at 14:00

2. RECOMMENDATIONS AND COMMENTS FOR PCOM:

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

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

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

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

3. RANKINGS

DCS	zero	
457 Rev-Kerguelen	7,1	±1,0
"ION - mantle holes (NERO + 431 Add3 sites WP1 and WP2)"	6,7	±1,3
451 Add2 - Tonga	6,2	±1,4
472 Add - Marianas Isu	5.2	±1.5
431 Add3 - W Pac Seis net - sites JT1 and JT2 (Japan Trench)"	4.5	±1.4
447 Rev3 - Woodlark basin	3.2	±1.3
450 Add2 - Taiwan	2.3	±0.8
79 Add - Somali basin	1.8	±1.3

Comments on rankings:

474 DCS/LWD engineering leg (Pettigrew)
 RANKED AS ZERO, with the argument that LithP does not wish to rank DCS testing directly with science proposals in the prospectus as there are no proposals in the prospectus that depend on DCS, but nonetheless agrees that this tool will be essential to the lithP objectives in the future. Furthermore, DCS will probably be used in non LithP proposals - i.e., SGPP in ridge axes, chert horizons on seamounts, felsic large ore systems etc.

457 Rev Kerguelen plateau and Broken ridge (Frey et al)
 Part of LIP strategy. Heterogeneity, chemistry, unique chance in terms of available site surveys.

431 & 506 NERO Deep mantle ION sites (Montagner et al and Suyehiro et al)
(NERO + 431 Add3 sites WP1 and WP2)

The panel chose to separate the deep mantle ION sites (Pacific and Indian Ocean) from the trench-seismic related sites. Drilling of ION holes is considered to be a high priority by LITHP. We feel that mini-legs to drill ION holes should be coordinated by PCOM when the ship schedule takes it near high-priority ION sites.

472 Add Marian-Izu mass balance (Plank et al)

Some questions about cretaceous overprint, part of a programme of experiments on fluxes in subduction systems: Tonga, serpentine diapirs, Costa Rica, Nicaragua etc.....

451 Add2 Tonga Forearc: subduction geodynamics (MacLoed et al)

Some questions about difficulties in orientation of cores in reconstructing the tectonic history. Interesting use of use sediments to record compositional change in arc magmatism. May be able to track mantle reservoirs using influx of IO asthenosphere Very successful site survey sediments pre-Louisville ridge - viable proposal flowing mantle is Samoan

431 Add3 West Pacific Seismic network (Suyehiro et al), sites JT1 and JT2 (Japan Trench)

The panel ranked the Subduction-zone objectives of the ION programme separately to the deep-mantle objectives. Drilling of ION holes is considered to be a high priority by LITHP. We feel that mini-legs to drill ION holes should be coordinated by PCOM when the ship schedule takes it near high-priority ION sites.

447 Rev3 Active extension in the Western Woodlark basin (Taylor et al)

450 Add2 Taiwan Arc-Cont collision (Lundberg et al)

79 add Deep hole in the Somali basin (Hinz et al)

Has been poorly ranked by the panel in the past. Have not included LithP objectives in proposal. Why was this site chosen as a selected deep hole despite being poorly ranked in the past?

Antarctic DPG 3 - BRANSFIELD STRAIT site

Lith objectives poorly ranked do not support this sites as the ideal region to address back arc rifting problems

Proposals not ranked

WW367 Great Australia Bight Cenozoic cool-water carbonates; James / Feary
WW464 Southern Ocean Palaeoceanography; Gersonde et al
WW441 SW Pacific gateway; Carter et al
WW485 Australia-Antarctic southern gateway; Exon et al.
WW### Antarctic DPG 1, 2, 3
445 Nankai trough

4. PCOM's 5 YEAR PLAN:

We much appreciate the fact that Pcom used our plan (from the Spring 1996 meeting) as a template for defining their long term goals. *In particular we suggest to Pcom that a summary of the plan should be disseminated in a format such as that made available by EOS. as soon as possible*

Suggestion for working groups: Given that these working groups will be critical in defining the science programme of the future ODP, the panel spent some time discussing possible groups. In general our recommendations fell into long-lived groups (3-4 years) and short-lived groups (1 year).

Long-Lived groups:

Mantle dynamic experiments: Discussion on LIPS, which have sometimes been considered as "non-ocean crust experiments" by some members of the grilling community, resulted in the suggestion that these projects should be incorporated into one or two global projects looking at mantle dynamics in general. For example, a West Pacific mantle dynamics experiment would look into mantle convection regimes and petrochemistry, before, during, and after a large igneous event. These events must be considered as an integral part of the mantle convection and ocean-crust formation process.

Areas of interest - West Pacific Ocean; Eastern Indian Ocean; AAD etc..

These experiments should include ION type imaging and would ultimately serve to include a broader community in the planning process (i.e. mantle convection modellers) and would have strong links to programmes such as, IAVCEI, ION, CSEDI and Margins (continental breakup)

RIDGES: Working group with links to Inter-ridge accretionary processes, melting regimes below fast and slow ridges - fluxes and crustal ageing.

This should include plans for deep hole (e.g. H2O site).

Active convergent margins: Should include fluxes through arcs and have links to inter-ridge all aspects of arc magmatism, tectonics and fluid fluxes - links to Inter-ridge

Bore hole Instrumentation working group: Links to Inter-ridge ION, Margins.

Biology group: All environments

Short-lived groups (not DPG's!)

Large ore-deposits: Recommendation for a *short-lived* group which would include representatives from the mining industry and would define one or more drilling programmes dedicated to understanding major hydrothermal fluxes leading to the formation of a large ore deposit : VMS and/or sedEX

Fluxes: A *short-lived* group to get with a mission to obtain a consensus on what needs to be measured and how to measure it. Arcs, ridges old crust - links to GERM

5. NOMINATIONS

Nominees for transition meeting:

Ludden (Petrology/geochem., Chair LithP);
Gillis (Canada, hydrothermal metamorphic);
Rihm (Germany, Seismics);
Gee (USA, paleo magnetics);

Nominee for publications committee:

Pat Castillo (Scrips)

Representative at Fall SSP meeting:

Suzanne Carbotte (Lamont) expecting a newborn
Dave Caress (Lamont) probably at sea
Anne Sheehan (Boulder) could make it if pushed

6. END OF MEETING:

The chairman thanked the panel for their efforts of the past few years and encouraged the panel members to remain active within ODP.

C. Mevel (Pcom) added her thanks for our work in supporting ODP.

The panel greatly appreciates the efforts that Shoji Arai put into hosting the meeting in and associated field-trip in Kanazawa

John Ludden
Nancy, France
4 November 1996

REVIEWS OF NEW PROPOSALS, ADDITIONS AND REVISIONS SUBMITTED FOR THE JULY 1 1996 DEADLINE.

Note that three additional proposals were reviewed:

- 506 NERO Ninety East Ridge (Montagner et al.,)
- xxx Back-arc rifting and crustal fluid circulation in the Okinawa through (Li et al.)
- xxx Geologic evolution of a back-arc basin by drilling the South China Sea and the Bashi Strait (Ju-Chin Chen,)

Proposals not evaluated

- 498 Barents sea drilling program Gamsakhourdia et al (penetration into sedimentary "basement")
- 502 Paleoproductivity in the Antarctic coastal ocean
- 503 East Artic ice shield and Weddell basin (Penetration into basement age of unconformity)
- 485 Southern Gateways sedimenatry basement

496 VRM'S and Oceanic Plateaux - Western Australia (Planke et al.)

This is a well written proposal with objectives relevant to LITHP. The principal objective, to test the hypothesis that the volcanic rifted NW margin of Australia had a non-plume origin, is highly pertinent. The secondary objectives are more relevant to TECP. Although sympathetic to the objectives of the proposal, panel members felt that the evidence provided by dredge samples pointed towards a plume origin for the volcanic activity. This reduced the priority the panel was prepared to give to the proposal since it seems highly likely that drilling will confirm this origin. Geochemical data on dredge samples were not provided in the proposal and it was not possible, therefore for the panel to judge the strength of the evidence against the non-plume hypothesis. In view of the limited number of drilling legs available to achieve LITHP objectives over the next five years, the panel are unlikely to support this proposal in the foreseeable future. The panel feels that significant advances towards resolving this problem could be achieved through a comprehensive dredging programe.

494 Rev: Rifting Processes of the Passive Continental Margin and Tectonic Evolution of the South China Sea

This proposal seeks to discriminate among various models (pure shear, simple shear, layered shear) for rifting and extension of the northern continental margin of the South China Sea, as well as to test models of multiple spreading episodes in this marginal sea. The panel noted the significant improvement in this revised version of the proposal although the role of drilling in answering the proposed questions still needs to be better developed. While the panel is generally interested in processes of extension in continental margins, these questions do not fall within our mandate.

Recommended action: A5, F4

501 - Western Pacific Cretaceous LIP formation (Castillo et al.)

Several different interesting issues are addressed in this proposal. The introduction and aims of the proposal are well defined. The formulation of the proposal is a little awkward - the summary of the objectives deals only with the OJP part and the effect of the emplacement of this LIP on the sediments and seawater - it doesn't address the Cretaceous igneous complex. The links between the objectives for each hole are not clearly defined.

For both models the explanation for the formation of the igneous Cretaceous complex is a little awkward and LITHP would like to see a more detailed discussion concerning the preservation of the magnetic anomalies. Also the 2nd model is not very clear - what is the origin of the material? In some ways the presentation is too regional, despite the fact that the problem being addressed is global.

There are also quite a few technical issues. For instance, in the study of the old MORB samples, the issue of age correction has to be addressed - this is a major point which is not considered at all here as it can change the distribution of the data quite significantly.

Another question that is very interesting and should be addressed: when does the role of the OJ plateau influence in the Pacific MORB end? Where do we drill to test the mixing of the OJ plume source and the MORB source?

The main recommendation of LITH is that this proposal is integrated into the Ontong-Java Plateau proposal - especially for the reference hole, thus defining a global west Pacific magmatic experiment, looking at plume inputs, residence times, mixing of sources etc.. The objectives of this part of the proposal are entirely within the main goals of LIP studies.

Recommended action: A2-B1.2-B2.1-C2-D1-E8-F3

Proposal 504 - Newfoundland Basin (Driscoll et al.)

This proposal involves an interesting area of continental break-up and early oceanisation, with an ambitious drilling plan. LithP does not, however, recognize major objectives of the panel being addressed in this proposal. It is suggested that the proponents assess the results of drilling the Iberian margin, before defining a program for its conjugate margin, and to prioritize the suggested sites in such a way, that a single leg of drilling can be defined.

Recommended action: A5, F4

505 - Slab-derived fluids and geochemical mass balance in the Mariana convergent margin (Fryer et al.)

Although geochemical mass balance experiments are of great interest to LithP, the panel felt that the present proposal was not well presented and somewhat premature. The two upcoming cruises (heat flow/sediment coring and a side scan/geophysical survey) may answer several of the questions raised in the proposal. It is unclear how other objectives (e.g., quantification of diffuse versus focussed flow) will be addressed, even if both drilling and survey results were available. A more cogent discussion of the necessity of drilling is required, outlining what unique results the drillcore samples could provide and how these would be merged with additional data to meet the objectives outlined. It was also noted that other nonaccretionary convergent margins do not have active fluid egress sites. In view of this, some effort should be made to place the Mariana convergent margin in a more global context. Are the fluid egress sites representative of nonaccretionary margins in general? Finally, we note that 2 of the 3 sites (at 7,000 to 8,000 m water depth) in the southern transect lie beyond the reach of the present drilling technology.

Recommended action: A1, B1.3, B2.1, C3, D1, E2, F3

497 - Ryukyu Forearc, Ujiie

This proposal is not of high priority to LITHP, as it addresses mainly TECP and OHP objectives. We feel that the proposal would benefit from the addition of more proponents with various backgrounds and viewpoints. The proponent may wish to contact the proponents of "Back arc rifting and crustal fluid circulation in the Okinawa trough" (Li et al).

Recommended action: A5, F4.

507 - TAG II (Rona et al.)

Proposal 507 outlines a second phase of drilling at the TAG hydrothermal field to 1) further characterize the nature of the subsurface in the active mound and, in particular, the expected Cu-rich and stockwork zone and 2) investigate the maturation processes in this type of deposit. LITH P found the proposal lacking sufficient detail to evaluate the proposed drilling strategy and site selection. For example, what site survey data is available for the inactive mounds? An additional goal of the proposal is to investigate the linkages between magmatic and hydrothermal processes. The proponents suggest that this may be achieved by drilling the SE corner of the active and MIR zones. The proponents do not specifically state how further drilling will address this goal and what was learned from the sites that penetrated volcanic basement through the sulfide cover.

Although this proposal addresses high priority themes stated in the long range plan, it is unlikely that further drilling of this type of deposit will be a high priority within

the next 5 years. LITHP expects to focus on large ore deposits associated with arcs and felsic magmatism.

Recommended action: A1; B1.3; B2.1; C2; D"; E6,8; F4

499 - Equatorial Pacific (Orcutt et al.)

Drilling of ION holes is considered to be a high priority by LITHP. We feel that mini-legs to drill ION holes should be coordinated by PCOM when the ship schedule takes it near high-priority ION sites. Clarification is needed regarding drill-string versus submersible deployment of borehole seismometers.

The proponents need to talk with Wilson and Alt (LOI 64) to assess common interests in 10-12 Ma reference hole. Clarification is needed on whether the drill-string is needed for the deployment. Little detail is given on the exact instruments to be deployed at this site. JOIDES informs us that more site survey information is needed (eg 3D seismics) for ION holes. Of the eastern Pacific sites we find the H2O site to be more interesting in terms of evolution of the ocean crust, and has the distinct advantage of cable vs ship access.

Recommended action: A1,F2.

506 - ION Siting Plan, (Ion Steering committee, Stephen and Orcutt)

(To be distributed to proponents of all ION sites)

Drilling of ION holes is considered to be a high priority by LITHP. We feel that mini-legs to drill ION holes should be coordinated by PCOM when the ship schedule takes it near high-priority ION sites. Clarification is needed regarding drill-string versus submersible deployment of borehole seismometers.

LITHP agrees with the general siting plan outlined in Proposal 506, with the understanding that the exact order that the holes are drilled will be dictated to some degree by the ship schedule. We feel that mini-legs to drill ION holes should be a high priority, coordinated by PCOM.

A short document including a full discussion of the technical aspects of a mini-leg to drill and ION-hole should be developed : depth, casing requirements, logging, time on site, means of reading data, means of occupying the hole etc..

Recommended action: A1,F2.

506 - NERO Ninety East Ridge (Montagner et al.)

Drilling of ION holes is considered to be a high priority by LITHP. We feel that mini-legs to drill ION holes should be coordinated by PCOM when the ship schedule takes it near high-priority ION sites. Clarification is needed regarding drill-string versus

submersible deployment of borehole seismometers.

We request that the proponents obtain drilling time estimates from TAMU. In particular, it is likely that time will need to be added for logging. The proponents should contact the co-chiefs of Leg 121 in order to get information on drilling conditions of site 756 vs 757. Clarification is needed on drill-string versus submersible deployment of the seismometer.

Included are estimates of drilling times obtained from TAMU

PROPOSED ION SITE AT 756:

It will require 7.4 days to perform the following:

1. Set a reentry cone with 70 m of 16-inch casing and 140 m of 10 3/4-inch casing. This is what would be required to case the sediment section of this site.

2. Core 200 m into basaltic basement. The total depth is 340 mbsf. I based coring time upon data obtained from the Core Tech sheets on Hole 756D. During Leg 121, deteriorating hole conditions were experienced after penetrating only 30 m into basalt. They gave up after penetrating 81 m into basement because of the rough going. This suggests that two hundred meters of basement penetration may be too optimistic.

PROPOSED ION SITE AT 757:

It will require 5.1 days to perform the following:

1. Set a reentry cone with 70 m of 16-inch casing and 370 m of 10 3/4-inch casing. This is what would be needed to case the sediment section of this site.

2. Core 100 m into basaltic basement. The total depth is 470 mbsf. I based coring time upon data from Hole 757C. Operations were terminated after 48 m of basement penetration due to a medical evacuation. No hole problems were noted while coring basement at this site. Based upon the lack of hole problems while coring basement in Hole 757C, 757-ION would appear to be more feasible than 756-ION. The cost estimate for hardware and cement to accomplish 756-ION is \$63.7K.

The cost estimate for hardware and cement to accomplish 757-ION is \$77.6K.

Recommended action: A1, B1.2, B2.1, C1, D1, E0, F1.5.

500 - Drilling fast spread Pacific crust at the H2O long term seafloor observatory (Stephen et al.)

LITHP is strongly supportive of drilling the ION borehole seismometer sites outlined in the ION siting plan (Proposal 500) (including this site) as logistical opportunities

arise.

LITHP is particularly interested in the H2O location as the possible site of a reference hole for fast spread Pacific crust. We advocate the devotion of a complete leg to the H2O ION installation. This leg should involve drilling to the greatest depth that circumstances allow and a full suite of downhole logging and permeability experiments prior to the installation of the seismometer. This approach would address crustal evolution as well as providing the first significant sampling of layer 2 in old Pacific crust. Should the drilling results prove encouraging, the OSN location could later become the site of a second hole which would sample deep into the crust.

Note - This is a potential legacy site for the program

Recommended action: A1, B.1,2, B2.1, C2, D1, E0, F2

LOI 71 SE Indian Ocean hotspots (Johnson et al.)

LITHP appreciates the efforts by the proponents in presenting the scientific significance of the newly discovered seamount chain. The chain is very important particularly with regard to testing whether the Ninetyeast Ridge was produced by 2 hotspots (ASP + Kerguelen) or by only one (Kerguelen). The Panel, however, does not think that in the current situation, a drilling proposal will be likely to be ranked highly in the next few years. The Panel wishes the proponents well in pursuing other means (e.g., dredging, surveying) to investigate this fascinating, newly discovered structure.

LOI 70 Hydraulic piston coring deepwater site study (Dunlap et al)

This proposal aims to test the ODP piston coring technique and aid in a significant transfer of technology to the industry. We fully encourage ODP to undertake whatever is required to interest the petroleum industry.

LOI 69 - Refurbishment of Barbados Cork experiments on 174B (Becker et al.)

Given the investment already made to these experiments during leg 156, LITHP considers the CORK refurbishment to be very high priority. The packer work should be done if time is available, but is of lesser priority than the CORK refurbishment. Recommendation strongly that ODP makes time available to complete this cork experiment

Recommended action: A1, F1

LOI 72 - RAB and ISONIC LWD tool engineering test (Goldberg + Iturrino)

This LOI is mainly based on inside information not available to the panel members

involved in the evaluation. Having been informed about the background by PCom and JOI office during the meeting, LithP members are fully supportive of testing this sort of tool, and a trial run is recommended for the next opportunity available, which probably will be the DCS engineering leg. Some concerns remain, whether reorientation of the cores can be done in some types of environment with significantly magnetized rocks - serpentinised-peridotites, gabbros.

xxx - Back-arc rifting and crustal fluid circulation in the Okinawa through (Li et al.)

One of our main goals, in our long range plan, is to drill a hydrothermal system in a felsic context in a back-arc system. The proponents have to come back to ODP/LITHP with more focused objectives. The proposal still needs to be rewritten and to be more specific as too many issues are raised in the present proposal. LITHP suggests that the proponents contact the Joides office for information similar proposals in the system (for example the Manus basin drilling by Binns et al.). Given the changes in the structure of the ODP proposal system, we recommend that the authors contact JOIDES and find the best way to have their proposal evaluated in the new system. The authors may well want to participate in a working group on hydrothermal systems or back-arcs, if such a group is proposed.

Recommended action: A3-B1.3-B2.1-C3-D? (DCS)-E8-F3.

XXX - Geologic evolution of a back-arc basin by drilling the South China Sea and the Bashi Strait (Ju-Chin Chen, Taiwan)

This proposal is of marginal interest to LithP, although some of the objectives of back arc rifting, and hydrothermal alteration, if developed, could be of significant interest to the lithospheric community. We draw the proponents attention to the fact that a proposal (494-Rev) with very similar target and objectives by B. Yao et al (Guangzhou, China) is already in the ODP proposal system.

448-Rev - Ontong Java Plateau (Kroenke et al)

LITHP strongly endorses the revised drilling program for Ontong Java Plateau and appreciates the response of the proponents to our previous concerns. Site survey data is essential for this highly ranked proposal to become mature. The panel hopes that the funding agencies will respond to this need.

The proponents are encouraged to formally contact the proponents of Proposal 501 (Castillo et al.) in order to develop a 2-3 leg drilling strategy that addresses the broad question of Pacific magmatism related to the emplacement of large igneous provinces. LITHP envisions that such a "Pacific magmatic experiment" would be designed to characterize the geochemical evolution of the western Pacific, pre-, during, and post-LIP emplacement. The proponents should refer to the Dick and Mével document (Woods Hole, May 1996) that presents a possible strategy for this

problem.

Recommended action: A1; B1.1; B2.1; C2 (pending site survey); D1 (pending site survey); E8 (pending site survey); F2 (pending site survey).

463 - Shatsky Rise (Sager et al.)

The proponents have provided convincing evidence for the suitability of Shatsky Rise as a site for testing some aspects of current LIP hypotheses. Good tectonic control provided by magnetic anomalies, and the evidence for age progression are useful features lacking in the larger oceanic LIPs. However, panel members felt that comparing the size of Shatsky Rise with Hawaii was not a convincing argument. The origin of Shatsky Rise through the effects of a mantle plume on a spreading center makes the area more analogous with Iceland, which is of a comparable size. If the Hawaiian plume were superimposed on a fast spreading center, it is likely that an oceanic plateau much larger than Shatsky Rise would be produced. Consequently the panel were unconvinced that Shatsky Rise is a suitable site for the testing of hypotheses for *giant* LIP formation. The age of Shatsky Rise would still make it an interesting site for drilling, but ODP is unlikely to schedule more than three LIPs Legs over the next five years. LITHP feels that these Legs should be devoted to drilling the larger LIPs, for which there is no modern analogue. Drilling Shatsky Rise is unlikely to become a high-priority objective.

Recommended action: A2 F4

426 Rev 2 - Mantle Reservoirs and Mantle Migration associated with Australian-Antarctic Rifting (Christie et al.)

Establishing the long term relationship between the AAD and the Pacific/Indian mantle boundary will address a fundamental aspect of mantle dynamics and hence is of great interest to LithP. The panel continues to be highly supportive of this well-defined test of a first order geologic problem. This revision presents results from the site survey cruise conducted in February, 1996. Results from this cruise demonstrate the difficulty in obtaining suitable (or any) material from dredging crust > 7 Ma. Preliminary geochemical data from newly acquired dredges nearer the ridge (< 7 Ma) corroborate the migration of the isotopic boundary across spreading segment B5, but these new data do not preclude any of the three possible relationships between the AAD and the isotopic boundary. Together with the difficulty in dredging older crust, there is little remaining doubt that drilling will be required to accomplish the objectives of this proposal.

The panel noted that the rapid (few hours) acquisition of geochemical data will likely require revision of the shipboard analytical procedures. Finally, the panel was disappointed that the site survey geophysical data (3.5 kHz, single channel seismics) were deemed unusable by SSP. We would strongly support additional funding to acquire site survey data necessary to make this program ready for drilling.

Recommended action: A1, B1.1, B2.1, C1, D1, E8, F2 (site survey data)

491 Add Defining Ocean Crustal Categories (Hinz)

The panel acknowledges the receipt of this letter stating that they are going ahead with preparation of a revision of this proposal. Understanding the evolution of oceanic crust remains a first order priority of the panel

481 Add - Red Sea Deeps (Ludden and Rihm)

This proposal addresses important LITHP objectives, particularly with regard to penetration of the hydrothermal system in the Atlantis II deep. We encourage the proponents to continue to develop the proposal and to seek funding for site surveys.

This interdisciplinary proposal remains immature. The proponents need to discuss fully how the three sites in the new tectonic transect address their objectives. Also, at present the site survey forms are not filled out correctly (e.g. locations do not agree with the maps). The Atlantis II deep site will likely require DCS or hammer-in-core technology, both of which are under development. The proponents need to provide more complete estimates of drilling times and logging procedures.

Recommended action: A1, B.1.2, B.2.1, C2, E3, E6, F2/F5

479 rev Felsic Backarc Hydrothermal systems in the Manus basin (Binns and Scott)

The proposal is of considerable thematic interest to the Panel and is maturing, thanks to the rapid and continuing growth of knowledge of the Manus area. We feel that additional sampling (via shallow DCS, dredging, etc.) is vital to move the proposal forward, in order to confirm the proponents' present conception of the hydrothermal system and to refine selection of proposed sites and drilling goals. Although deep DCS is probably strictly unnecessary, the capability (now under development) would very probably enhance the project significantly. An apparent weakness of the proposal is that although the hydrothermal system is clearly very active, no ore deposits of significant size seem (as yet) to be present; hence, only a part of the problem of ore-deposit formation can be studied in this location. One Panel member criticized proposed site EMB-5C, arguing that the record of the hydrothermal system as preserved in sediments is likely to be compromised by water-current variation in time. Several members advised inclusion of more biological aspects, with possible inclusion of an expert in the field as a co-proponent. A general consensus was that addition of a short background discussion of felsic-rock-hosted hydrothermal ore deposits would be very helpful for nonspecialists.

Recommended action: A1, B1.2, B2.1, C2, D1 and D3M E8, F2

495 Rev: Seychelles microcontinent (Stephens et al.)

The proposal addresses an interesting regional problem, namely the disassembly of the continental fragments of the western Indian Ocean. The geophysical data are fairly convincing in supporting the overall ideas expressed in the proposal. It is thus unclear, taht a significant increase in understanding can be gained from drilling, that is not already known from existing samples and geophysical data. Furthermore, despite the fact that microcontinent fragments are part of the general accretionary scenario for many accreting margins, LithP does not regard the problem posed for the Seychelles microcontinent as being of global interest.

Recommended action: A5, F4

432-ADD, Deep Hole off Galicia (Reston et al.)

This proposal is not considered to be a high priority by LITHP.

Recommended action: A5, F4.

466-Rev Investigation of linearly magnetised, Great Australian Bight region by the Ocean (Stagg et al.)

The proposal is devoted to investigation of origin of non-volcanic rifted margin, especially of its linearly magnetised rifted crust. The drilling data on the non-volcanic rifted margin around Australia-Antarctica are poor and may be important to more thoroughly understand the processes of continental break-up and sea-floor spreading. The objectives are interesting but are not relevant to LITHP in the present form. The proposal should be revised, and the following are the points for further consideration.

1. There are some drilling data on other non-volcanic rifted margins (e.g., Iberian Margin). To highlight the necessity of drilling GAB evaluation of the data from other rifted margins should be added. Petrological examinations are necessary both for GAB and ever drilled non-volcanic rifted margins.
2. The proponents proposed only one site (SAAP02A) for investigation of pseudo sea-floor spreading magnetic lineations. We think that the crustal structure due to the magnetic lineations is possibly too complex to understand through one site which has only 100 m basement penetration.
3. please state more clearly the difference between the pseudo ocean-floor spreading magnetic lineations and the ordinary ones.
4. Figures are of such low quality and the captions are insufficient
5. Please provide estimate the drilling times.

Recommended action: A-5 , F-4

469 Add: Argo abyssal plain (Stagg/Symonds)

Proposal 469 has been of moderate interest to LithP in the past (see reviews spring 1995, ...). Following our last recommendations, we are awaiting the announced seismic results to be in the position of better assess the scientific feasibility of the program. We underline the fact that the water depths and the basement penetration required are outside the present limits of the Joides Resolution

Recommended action: A3, F3

494 Rev: Rifting Processes of the Passive Continental Margin and Tectonic Evolution of the South China Sea (Yao et al)

This proposal seeks to discriminate among various models (pure shear, simple shear, layered shear) for rifting and extension of the northern continental margin of the South China Sea as well as to test models of multiple spreading episodes in this marginal sea. The panel noted the significant improvement in this revised version of the proposal although the role of drilling in answering the proposed questions still needs to be better developed. While the panel is generally interested in processes of extension in continental margins, these questions do not fall within our mandate.

Recommended action: A5, F4

Review of the prospectus - proposals considered by LithP

- 457 Rev Kerguelen plateau and Broken ridge (Frey et al)
- 472 Add Mariana-Izu mass balance (Plank et al)
- 451 Add2 Tonga Forearc: subduction geodynamics (MacLoed et al)
- 431 Add3 West Pacific Seismic network (Suyehiro et al)
- 450 Add2 Taiwan Arc-Cont collision (Lundberg et al)
- 447 Rev3 Active extension in the Western Woodlark basin (Taylor et al)
- 79 Add Deep hole in the Somali basin (Hinz et al)
- 474 DCS/LWD engineering leg (Pettigrew)

Other proposals in the prospectus:

- 367 Great Australia Bight Cenozoic cool-water carbonates (James /Feary)
- 464 Southern Ocean Plaeoceanography (Gersonde et al.)
- 441 SW Pacific gateway (Carter et al)
- 485 Australia-Antarctic southern gateway (Exon et al.)
- ### Antarctic DPG 1, 2, 3
- 445 Nankai trough