JOIDES TECTONICS PANEL MEETING MARCH 5-7, 1990
NEW ORLEANS, LOUISIANA

DRAFT MINUTES

PRESENT:
Ian Dalziel, UTIG, Chairman
Tanya Atwater, UC Santa Barbara
Jacques Bourgois, France
Roger Buck,L-DGO
Dave Engebretson, U. of Western Washington
Mike Etheridge, Australia
Kim Klitgord, USGS
Hans-Christian Larsen, ESF
Casey Moore, UC Santa Cruz
Eldridge Moores, UC Davis
Yujiro Ogawa, Japan
Mike Purdy, WHOI
Dale Sawyer, Rice U.
Graham Westbrook, UK

APOLOGIES: Karl Hinz, FRG

LIAISONS:
Shirley Dreiss, SGPP
John Ladd, NSF
Catherine Mevel, LITHP
Ralph Moberly, PCOM (also attending LITHP)
Robin Riddihough, CEPAC
Laura Stokking, ODP
Brian Tucholke, PCOM

INTRODUCTION

The Chairman welcomed new panel members Tanya Atwater, Casey Moore and Mike Purdy. He outlined the Agenda, and pointed out that the Panel should also consider appointment of a new Chairman for after the fall 1990 meeting as he will by that time have served for three years and will, in addition, be prevented from attending the Annual Meeting in early December 1990 by a commitment to field work in the Antarctic at that time.

AGENDA

Minutes
Reports of Liaisons
Proposal Review
Joint Meeting with LITHP
Prioritization of Programs
Next Meeting
Panel Membership
Panel Chairmanship

MINUTES

The minutes of the fall 1989 meeting in Honolulu, Hawaii, were adopted unanimously subject to the correction of two typographic errors.

REPORT OF LIAISONS

PCOM: Brian Tucholke reported on PCOM's plans for 1991 drilling and tentative plans for 1992. He indicated that in spite of the latter, TECP should reconsider CEPAC targets beyond 1991 with other global programs for the years 1992 through 1995.

The USSR participation is once again being reviewed.

A DPG has been set up to plan Cascadia margin drilling.

A structure is to be set up to handle liaison with other global earth science organizations.

TEDCOM: Dale Sawyer reported on the recent TEDCOM meeting at Salt Lake City, Utah, to discuss deep drilling.

CEPAC: Robin Riddihough reported on the recent CEPAC meeting at L-DGO.

SGPP: Graham Westbrook reported on the SGPP meeting at Santa Cruz, California, outlining the priorities established by that panel for the 4 years of drilling beyond 1991.

PCOM (again): Ralph Moberly (attending both the TECP and LITHP meetings) outlined PCOM's needs for a prioritization by TECP of drilling programs for the 4 years beginning October 1991.

PROPOSAL REVIEWS

265 - TECP notes with interest the plans for new data on this unusual tectonic feature, and is glad to learn of plans to revise the proposal. It is not, however, in a position to revise its former ranking in the absence of a new proposal.

286 - TECP acknowledges the high priority given to deepening Hole 504B to the layer 2/3 boundary. The Panel understands, however, that the drilling may already have encountered at least one fault. In view of this fact and of the prominent role of listric normal faults in many ophiolitic analogues of oceanic crust, it seems clear that further brittle and ductile structures are to be expected as the hole is deepened. Accordingly, TECP recommends that a structural geologist be included in the shipboard party when the hole is deepened. Ranking - #2.

317 - The TECP believes that the program for long-term monitoring is the most outstanding and important features of this proposal. The case made for diffuse flow is also an important feature. Some Panel members were concerned as to exactly how the hole in the zone of incoherent reflectors is actually going to test for that incoherency, i.e. they believe that there is a scale mismatch between the seismic imaging and the core. In other words, even if indeed the sediments cored are cut by fractures and cataclastically deformed, how will it be possible to be certain that these features cause the incoherent acoustic response? Recommendation - the proposal should be considered by the Cascadia DPG and integrated into the drilling program.

330 - TECP appreciates that the Mediterranean Ridge is an interesting tectonic feature, but it reiterates that it needs to be demonstrated that the ridge has something special to contribute to our understanding of accretionary wedge tectonics globally. While the proposal stresses the collisional context of the ridge, it is not apparent to some members of the Panel just how important that aspect is, i.e. the collision may not have gone far enough to play a significant role and thus distinguish this wedge. Many Panel members feel that the role of salt may play a unique role, and make the Mediterranean Ridge unique in reflecting the tectonics of Tethyan mountain belts in particular. The fact that many orogenic belts arise from the inversion of small oceanic basins may also be a factor in favor of trying to understand better the evolution of this ridge.

In order to further consider this proposal, however, TECP requires a multi-channel seismic survey of the proposed drilling area, comparable to those available from the Nankai, Cascadia and Barbados wedges. The data need to be processed through migration. We need to have line drawings showing the exact position and depth extent of the proposed sites. Depth conversion of the sections would be desirable. Ranking - #3.

351 - TECP noted the likelihood of an upcoming MCS survey by R/V *Bernier* and looks forward to receiving an updated proposal.

352 - Although the TECP recognizes the potential value of using abandoned spreading centers as "windows" into the lower crust, it does not perceive substantial tectonics objectives in this proposal. Most important, TECP perceives major deficiencies in the strategy and siting.

The validity of spreading rate comparisons with Hole 735B is doubtful because of major uncertainties in the effective spreading rate at the instant of emplacement of the material sampled.

A well-defined structural setting is essential for "offset" holes to be of value, and in the opinion of TECP it is missing here. Exactly how would the sampled material fit in with a model of the process of ridge abandonment? The structural model needs to be well constrained by observational data, presumably seismic.

The case needs to be made that this is an optimum place to tackle the failed rift problem. Also, it is not clear just how the drill will shed light on this process. It is difficult to shed light on tectonic problems with a single hole.

Hence, we judge this to be an immature proposal that requires the support of considerably more survey work, for example on the setting and not just on the immediate site. Ranking - #3.

353 - TECP found this to be a potentially interesting proposal to study ridge subduction (or at least ridge-trench interaction) as a complement to the planned Chile Rise drilling program. The apparently simpler structure here due to the lack of continued subduction is attractive.

Potential problems identified by TECP include:

1. The strategy of dense drilling in one transect and sparse on another should probably be replaced by one of more balance, especially in the light pf point #2.

2. The location of the key transect in the "10 my since ridge-crest subduction" zone seems inappropriate. The ridge segment in question is very short. End effects at the fracture zones are likely to make modelling difficult or even impossible. Ideally the transects should be relocated on segments of the margin with longer ridge segments.

3. The Panel would like to see a model for what the proponents expect the subsidence curves to show, and how the selected sites will result in constraints on the parameters of that model.

   What is the effect of glacial loading/unloading on the subsidence history. Panel members expressed concern that glacial seismic stratigraphy is very different from nonglacial seismic stratigraphy normally encountered, and will make interpretation difficult. Others expressed concern about the effect of glacial bottoming on the shelf on subsidence.

4. TECP noted that new surveys could be made in 1990-91 and 1991-92, and urged that deeper penetration data be obtained.

5. Finally, Panel members observed that there does not appear to be much of the uplift history visible, let alone accessible. While recognizing the difficulty, we would like to know how the proponents would expect to extract data on the uplift.

Ranking - #3.

355 - TECP considered that, while the study of gas hydrates is not *per se* of thematic interest, hydrates may impact upon the deformation of an accretionary wedge. Moreover, the information that gas hydrates provide on temperature is also of value in the interpretation of the behavior of wedges and the fluids escaping from them.

If the outcome of the proposed drilling were to be that restrictions placed upon drilling in many convergent margins by the presence of gas hydrate BSR's could be reduced, that would be of general benefit. The Panel was not sanguine, however, that the SSPP would feel that such drilling could in fact be safely undertaken.

It was not felt that information on the uplift and subsidence that might be gained from the two sites in the Lima basin would constitute a sufficiently great increment beyond the results of Leg 112 to make the sites high priority in their own right.

Hence the TECP has considerable interest in seeing drilling through a gas hydrate proceed if high-priority drilling on the Cascadia and Chile margins could not otherwise be permitted. It could, however, only support the Peru margin sites in the event that the SSPP feels these to be the only acceptable sites.

356 - The primary objective of this proposal is Cenozoic ocean- and climatic-history in the NE Atlantic, and hence it is outside the mandate of TECP. The proposal does, however, address the problem of transverse ridges in the NE Atlantic and their influence on the exchange of water masses. The proponents claim, without documentation, that the vertical movements of such large crustal blocks as the Greenland-Scotland Ridge and the Jan Mayan Ridge occurred too fast to be merely thermal events, and suggest intraplate stress as an alternative mechanism. This general theme is of interest to TECP, but it would have to be explained and documented in far greater detail than in the present proposal in order to attract a high-priority rating. Ranking - #2.

357 - The area is well surveyed for drilling and is clearly an excellent example of a fast-spreading ridge. The sites are well chosen. TECP is particularly excited about the comparison of the volcanic and fault structures at the first two sites:

1. To see the growth and development of the layer 2 extrusives between the center and edge of the neotectonic zone - i.e. how oceanic crust is constructed;

2. To learn why layer 2 decreases in velocity between the center and the edge, i.e. to test the hypotheses that the flows are solid in the center and fractured subsequently, and that the center is predominantly dikes and the margins have a greater proportion of flows,

   Site 2 is very near to a large hydrothermal field. While the hydrothermal aspect is interesting TECP hopes that the goal of characterizing layer 2 in the third dimension is kept as a high priority.

   TECP recommends that the shipboard party includes a structural geologist capable of mining microstructural information from the cores.

358 - The proposal addresses a high priority theme of TECP. The Panel sees, however, some problems in obtaining direct "tectonic" information from the proposed drilling. This is a matter of general concern with this and other volcanic rifted margin proposals. Accordingly the proposal has been ranked #3 although the theme ranks at the top.

In order to improve the overall drilling strategy for the theme, TECP and LITHP in a joint session (see below in minutes) decided to recommend that PCOM set up a Working Group to address the problem of drilling volcanic rifted margins in general.

With regard to this specific proposal, TECP felt that the Voring area is particularly well suited for drilling the regions referred to in the Larsen et al memorandum as Zones I and inner Zone II. TECP was concerned, however, about complexities in the early rift history (ridge crest migration and jumping). These may impact on strategies for drilling outer Zone II and Zone III.

Tentative TECP ranking of sites in Proposal 358 (for consideration by the proponents and/or a Working Group) is as follows (descending order): VM1, VM2, VM3. Lowest ranking goes to VM 4, 5, and 6, VM 2 and VM 3 might be combined into a fairly deep penetration site close to VM2.

359 - see 365

360 - The proposal addresses no thematic issues of interest to the Tectonics Panel. However, a revised proposal that dealt more comprehensively with the tectonic setting of the proposed sites could be of thematic interest to TECP. In view of the obvious analogue (referred to in passing by the proponents) with ophiolite complexes such as the Troodos complex, such a revised proposal should speak more directly to this analogy and to the possibility of resolving some of the controversy concerning the ocean crust/ophiolite comparison. Ranking - #2.

361 - This proposal is seriously deficient in its discussion of the tectonic setting of the proposed holes. The studies of Karson and his colleagues, and the clear analogue between the TAG area and ophiolitic complexes such as the Troodos, clearly indicate the prominent role of faulting in the development of the oceanic crust, and in the hydrogeologic system resulting in the formation of the ore deposits. These considerations clearly indicate to TECP that revision of the hole siting strategy is in order if the objectives of the proposal are to be achieved. We urge that Jeff Karson be directly involved in a revision of the proposal with the above ends in view. Ranking - #2a.

362 - TECP continues to believe that this proposal addresses a highest priority theme and presents exciting possibilities for addressing fascinating tectonic problems. However, the Panel is extremely concerned that there is urgent need for better presentation and interpretation of the seismic data in order for a detailed evaluation of the individual sites to be possible. Clearly such an evaluation needs to be undertaken no later than the Panel's fall meeting. The Chairman is to convey the concern of the panel to the proponents as a matter of urgency, pointing out to them that TECP's continuing support of the Chile Rise drilling program is at risk. A copy of Mike

Etheridge's review of the proposal that was prepared for the Panel is to be forwarded to the proponents.

363 - The proposal has several objectives. One is to determine whether the SE Newfoundland Ridge and adjacent margin-parallel bathymetric highs were formed by the same mantle plume that formed the Fogo Seamounts. This is of secondary interest to the Tectonics Panel. Another objective is to determine the age and origin of the unconformity at the top of the SENR basement. To the extent that this helps to constrain the time of margin formation, this objective is of higher thematic interest to TECP.

An implicit objective is to determine the effect of plume volcanism on margin formation. This objective has to be considered in the light of two larger-scale programs for drilling rifted non-volcanic and volcanic margins in the North Atlantic region (see 358 and 365). Taken as it stands the proposal is ranked #2a.

364 - The proposal is for one deep hole (1000m) in crystalline basement involved in the Sardinian-African continental collision in order to drill through a strong north-dipping reflector identified in seismic data. From comparison with land geology, this boundary is identified as the thrust boundary between European and African crust. The main phase of related deformation occurred between 24 and 19 Ma when the Corsica-Sardinia microplate rotated away from southern Europe.

The main purpose of the proposed hole is to determine the rheologic nature of the deformation, the character of the fluids involved, and the physico-chemical rock parameters associated with the thrust. While the strategy presented to study the boundary is good, the earthquake epicenter locations and seismic data do not make a convincing case for the deformation continuing to be active (despite the comments of the proponents to the contrary). Sedimentary layers appear to overlie the thrust, which therefore appears to have been inactive since the Late Miocene. The proposed drilling program would be of far higher thematic interest to TECP if the boundary were still active. Ranking - #2.

365 - The proposed program to investigate the synrift and post rift sedimentary units and underlying crust on this moderate sedimentation rate set of conjugate margins helps to address one of the main thematic objectives of the Tectonics Panel. The nature of these rifted margin pairs, together with existing drill hole data and geophysical data sets provide a strong basis upon which a non-volcanic rifted margin drilling program can be based. The proposal is ranked #4.

In the view of TECP, the proponents need to focus more effort on "improving" the record of synrift and early postrift sedimentary units, including migrated depth sections, balanced cross-sections, and higher resolution records of the prerift and synrift units. The results of industrial drilling and available seismic data need to be more clearly integrated into the analyses using balanced cross-sections, in order to develop the drilling strategy. A comparison with the complicated synrift structural patterns from other areas needs to be included in the site evaluations. In general, a significant effort needs to be put into identifying the distinctive tectonic processes to be addressed and how the drilling strategy will elucidate these processes.

The Tectonics Panel wishes to encourage the proponents to pursue both transects across the conjugate margins in their development of a more refined drilling program. This will provide a set of viable options as the proposal matures, with a final plan embracing one or both transects.

366 - The Tectonics Panel noted the proponents intention to undertake a geophysical survey in an area of high thematic interest, and looks forward to receiving the proposal.

368 - TECP had little time to review this proposal that arrived just before the meeting. The Panel was interested in the results of the recent drilling at Site 801A, although some concern lingered as

to whether the igneous rocks at the bottom of the hole were indeed true oceanic basement. The new proposal was ranked #2a.

369 - TECP had little time to review this proposal that arrived just before the meeting. The area is of considerable interest to the Panel, and it appreciated the discussion of faulting and deformation problems of the region that are contained in the proposal. The proponents need to consider what can be done with the drill unravel the development of what appears to be a segment of oceanic crust that has experienced amagmatic extension. It seems to TECP that a transect of holes is needed. The proponents might think of adding more scientists with structure/tectonics background to their group in order to develop a program to accomplish this. The present proposal is ranked #2a.

Proposal 370 - The Panel had little time to consider this proposal that arrived just before the meeting. A more mature proposal will be reviewed with interest. TECP continues to have concern that the so-called "offset" approach to drilling the oceanic lithosphere inevitably leads to uncertainties with regard to the tectonic/structural setting of the proposed holes. Proponents need to be especially cognizant of this problem and address the issue as fully as possible in their proposals.

Proposal 373 - The Panel had little time to review this proposal as it arrived just before the meeting. It does address high-priority themes of TECP and to date seems to be the only ODP proposal specifically aimed at the issue of the state of stress in the oceanic lithosphere. Some Panel members were concerned about the length of time needed for drilling.

JOINT MEETING WITH LITHOSPHERE PANEL

The joint meeting of the Lithosphere and Tectonics Panel was convened by I. Dalziel and R. Batiza. The two panels have many scientific interests in common, so the joint meeting presented a welcomed opportunity to discuss the best ways to insure progress on these questions using scientific drilling. An ambitious agenda was agreed upon and what follows are the joint minutes of the meeting.

Very Deep Drilling (J. Natland and K. Millheim)

The ODP Long-Range Plan discusses the importance and rationale of very deep (>2 km) drillholes in the ocean. Such deep drilling is of obvious future importance for a variety of scientific goals, including some important scientific priorities of LITHP, TECP and SGPP. However, at present, the capability to achieve such deep objectives does not exist. One purpose, then, of the joint meeting was to discuss the future prospects of very deep drilling and to begin a discussion aimed at assessing the technical feasibility and costs of such drilling.

This discussion was initiated at the mid-February TEDCOM meeting in Utah and two participants in the meeting, Jim Natland and Keith Millheim of Amoco Production Company reviewed the early findings. As an example for discussion, Natland showed that to penetrate normal ocean crust with normal rotary drilling would require an 11.5 km drill string, new heavy duty casing and a great deal of drilling time. Millheim pointed out that extrapolation of needs and costs from past ODP experience, was probably not the correct approach. Instead, he suggested that very deep holes would have to be "custom-designed" and the tools would have to be tailored accordingly. Such a procedure throws open such questions as platform capabilities, development of entirely new drilling technologies and hardware and the need for careful long-term planning.

Drilling very deep holes is a great technical challenge and is not a trivial extension of existing ODP drilling. It should be approached in a carefully phased manner. For this, Millheim considers it essential that the experience of experts in very deep on-land drilling (the Soviet Union and W. Germany) be brought to bear on the problem. The Japanese apparently are also planning for a very

deep drilling capability at sea, so the task of very deep drilling is clearly international in scope and interest. The difficulty, estimated costs and development time for such a capability appear to go beyond what is possible within the present ODP program. However, ODP can play an extremely important role by initiating the planning, engineering development and tests that are needed. If such a capability is to exist in the time frame of the ODP Long-Range Plan (next 10-12 years), the planning must begin very soon.

It was suggested at TEDCOM that a technically-oriented task force be organized to initiate planning for very deep drilling. Such a task force could be organized with leadership from TEDCOM and participation by all interested thematic panels. In addition, it is vital that TAMU and the TAMU engineering group participate also. Our joint meeting strongly endorsed the notion that planning efforts for very deep drilling should go forward.

A closely related issue is the possibility of using the new DCS system as a mini-riser for drilling 2-3 km deep holes. Such a capability requires further development, but probably can be achieved within the next 2-4 years within ODP. This capability would make it possible to achieve a variety of very high-priority goals of TECP, LITHP and SGPP and thus is of very great interest. Our joint panels strongly encourage the continued development of the DCS systems for this purpose. It is possible, but perhaps not necessary, that very deep drilling and extending the DCS capability could be considered as subtasks by the same task group. On the other hand, perhaps extending the DCS capability should be considered separately. In either case, our joint panels consider it most important that extending the capabilities of the DCS be viewed as the next logical step for engineering development within ODP. Establishing the capability for very deep drilling and development of the mini-riser DCS for 2-3 km deep holes with both require a continued commitment by ODP to long-term technological development.

Volcanic Rifted Margins (VRM)

LITHP and TECP have a strong joint interest in learning more about early continental rifting and the reasons why passive continental margins commonly have very thick sections of rift-related volcanic rocks. We need a better understanding of mantle processes that occur before, during and after rifting, as well as the effects on the style of continental breakage. Scientific ocean drilling provides a very important tool for investigating this problem. As amply demonstrated by COSOD II, the ODP long-range plan and the large number of drilling proposals that have been received, this problem is of first-order importance in modern geosciences.

However, partly because the volcanic sections at many VRMs are very thick (>5 km), an integrated strategy for study needs to be developed. Establishing this strategy and defining the role for drilling is not only essential for further progress but is also very urgent. We thus strongly urge that PCOM establish a working group on volcanic rifted margins at its April meeting. This group should consist of persons with expertise in passive margin studies as well as petrologists. Already, some members of the passive margin community have presented a document outlining one possible drilling strategy ("Drilling Volcanic Rifted Margins", H.C. Larsen and others). In addition, a large number of mature drilling proposals by several groups are available for discussion. It is our understanding that Mike Coffin of UTIG has independently been preparing a Workshop Proposal for immediate submission to USSAC on this topic (including oceanic plateaus). The plan is for there to be a European co-convenor. This Workshop could serve as community wide input to the proposed Working Group which should, in our view, definitely exist before the Workshop is convened because of the urgent need for planning.

We propose that the following working group be established at the April meeting of PCOM (we suggest the following group of 11, PCOM may wish to appoint a "Watchdog(s)":

Volcanic Rifted Margins Working Group

I. Campbell (Australia)
S. Cloetingh (Netherlands)
M. Coffin (UTIG)
K. Cox (U.K.)
O. Eldholm (Oslo)
K. Hinz (BGR)
G. Houseman (Australia)
H. C. Larsen* (Geol. Survey Greenland)
A. Morton (British Geol. Survey)
J. Mutter (LDGO)
D. Sawyer

*Suggested Chairman

We would expect the Working Group to participate in the Workshop and meet at least once and no more than twice thereafter to prepare a report soliciting revised drilling proposals that could then be evaluated by the Working Group, LITHP and TECP.

Status and Developments to the Diamond Coring System (DCS)

Steve Howard of the TAMU engineering group provided an interesting summary of the latest improvements to the DCS. The on-land tests are proceeding as planned and the system has undergone numerous design improvements. The rate of progress on the DCS system has been phenomenally good and both panels look forward eagerly to the full-scale tests of the DCS on Leg 132. S. Howard also answered numerous questions regarding the capabilities of the DCS and other active engineering development projects.

Results of Leg 129

Roger Larson, co-chief scientist on Leg 129, provided a brief summary of the drilling results of Leg 129 (old Pacific). Of greatest interest to LITHP and TECP is the fact that hole 801-C, which penetrated over 100 m of normal Jurassic, fast-spread ocean crust, is fitted with a reentry cone and is clean. A proposal to deepen this hole (368/E) was highly ranked by LITHP.

Tectonics of Mid-Ocean Ridges

Both TECP and LITHP have a strong interest in the activity of mid-ocean ridges. Traditionally, LITHP has emphasized the magmatic and hydrothermal aspects of ridges, but clearly the origin of ocean crust involves stretching, faulting and other tectonic processes. Our joint LITHP-TECP meeting provided a good forum for discussion of the tectonic activity at ridge crests. This discussion, led by E. Moores, served as an interesting focal point for joint LITHP/TECP interests. Clearly, progress on understanding the activity of mid-ocean ridges requires a committed multi-disciplinary effort, and future ODP drilling is a very important component of this effort.

Global Seismic Arrays

Mike Purdy presented a discussion of the need for establishing an array of 15-20 broad-band ocean seismic stations or observations. This long-term effort is an important initiative in the geosciences and ODP is vitally necessary in the beginning stages of the program in order to help complete critical pilot studies. LITHP has provided strong support for this initiative. Our joint panels reaffirm the importance of establishing global seismic coverage and strongly urge that the Hawaii pilot hole be drilled as soon as possible.

PRIORITIZATION OF GLOBAL PROGRAMS FOR THE NEXT 4 YEARS

Tectonics Panel considered all existing proposals for drilling tectonic targets in all the world's oceans over the four years following the program already approved by PCOM in the Pacific. The proposals were considered in terms of potential programs to address the five principal themes set out by TECP in its White Paper already published in the JOIDES Journal. Technical and political feasibility were also taken into account. Votes on programs within the individual themes were followed by a vote on the prioritization of the programs across theme boundaries, the resulting ranking is as follows:

(Relevant proposal number(s) and recommended number of drilling legs in a 4 year time slot are provided in brackets)

1. **Chile triple junction**
   (Proposal 362 - 2 legs of a 2 leg program)
2. **North Atlantic non-volcanic rifted margins**
   (Proposals 334, 365, 366 - 2 legs of a program of approximately 6 legs)
3. **Cascadia convergent margin***
   (Proposals 233 and 317 - 1-2 legs of a 1-2 leg program)
4. **Oahu geophysical observatory pilot project**
   (Proposal 315 - 10 days; could be first of approximately 15 stations)
5. **North Atlantic volcanic rifted margins***
   (Proposals 310, 311, 328, 358 and 363 - 2 legs of a 4 leg program)
6. **Barbados accretionary wedge**
   (Proposal 342 - 2 legs of a 4 leg program)
7. **Equatorial Atlantic transform margins**
   (Proposals 313 and 346 - 1 leg of a 1 leg program)
8. **North Australian collisional margin**
   (Proposal 340 - 2 legs of a 2 leg program)
9. **Antarctic Peninsula margin**
   (Proposals 297 and 351 - 2 legs of a 2 leg program)
10. **Cayman trough**
    (Proposal 333 - 1 leg of a 1 leg program)
11. **M-series anomalies in western Pacific**
    (Proposal 287 etc - 1 leg of a 1 leg program)
12. **Stress measurements at Site 505**
    (Proposal 373 - 1-2 legs of a 1-2 leg program)
13. **Bering Sea**
    (Proposals 34, 182, 207, 225, 229, and 234 - 1 leg of a 1 leg program)
14. **Caribbean crust**
    (Proposal 343 - 1 leg of a 1 leg program)
15. **Cretaceous sea mounts in western Pacific**
    (Proposal 280 etc - 2 legs of a 2 leg program)

*Indicates a Detailed Planning Group or Working Group has been established or requested to plan this program

Notes:

1. **The Tectonics Panel is strongly in favor of drilling fast- and slow-spreading ridges and "offset" holes in order to investigate the structural**

evolution of the oceanic lithosphere. It is taking steps to formulate a drilling strategy to this end.

2. **The Tectonics Panel wants to ensure that stress measurements are made at all suitable sites.**

NEXT MEETING

TECP decided to request that its next meeting be held in Paris, France November 1, 2, and 3 1990. Jacques Bourgois graciously agreed to look into local arrangements to host such a meeting. The Chairman and SGPP Liaison Shirley Dreiss volunteered to approach Chairman Erwin Suess of SGPP with regard to the possibility of having a joint TECP-SGPP meeting at that time as SGPP will also be meeting in Paris, and there are several areas of mutual concern.

PANEL MEMBERSHIP

Karl Hinz, in expressing his regrets to TECP for being unable to attend the present meeting due to a ship schedule alteration, indicated that he will be rotating off the Panel. He expressed his thanks and good wishes to the Panel members. In turn the rest of TECP wishes to express its thanks to Karl Hinz for a long and vigorous membership.

PANEL CHAIRMANSHIP

Ian Dalziel informed the Panel that the next meeting will probably be his last one after six years on TECP including three as Chairman. He invited nominees for a successor as Chairman from the members of the Panel, and promised to pass on all of these, together with his recommendation, to PCOM.

OTHER BUSINESS

1. As a result of long discussion in this and earlier meetings on the position of TECP with regard to drilling to investigate the tectonic evolution of the oceanic lithosphere, Eldridge Moores was invited to draw up a paper in this regard for consideration at the next TECP meeting. He agreed to do so.

2. Because of mounting concern about the quality of presentation of the structural setting of proposed drill sites, Mike Etheridge was invited to prepare a draft paper of TECP's position in this regard for consideration at the next meeting. He agreed to do so.

The meeting was adjourned at 5 pm on Wednesday March 7, 1990.