

## MEETING OF THE JOIDES DOWNHOLE MEASUREMENTS PANEL

SCRIPPS INSTITUTION OF OCEANOGRAPHY  
LA JOLLA, CALIFORNIA  
MAY 25-27, 1993

### EXECUTIVE SUMMARY

The DMP has instituted a policy of focusing its attention on legs that present difficult drilling and downhole measurement scenarios. Past work at accretionary prisms indicates that the Barbados exercise (Leg 156) falls into this category. Accordingly, Barbados was featured at the present meeting. The next DMP Meeting will feature the TAG Hydrothermal System (Leg 158).

*In view of the potential benefit of using measurement-while-drilling technology at Barbados, a team drawn from the ranks of the Wireline Logging Service Operator, the Science Operator, the Barbados Co-Chiefs, and interested scientific personnel was formed to generate an appropriate position statement for consideration by the DMP. Since contractual interactions with Schlumberger play an essential role in this activity, the Wireline Operator will take the lead in generating the statement which will be presented to the DMP at its next meeting. (Minutes, Items 7-10.)*

*The DMP notes that the DCS effort, presently Leg 157, may be dropped from the schedule thus moving the TAG program forward and causing a very short time frame for high-temperature tool development. The DMP further notes that none of the tools proposed by the Wireline Logging Service Operator for the TAG operations are operational, let alone having passed any third-party-tool requirements. Finally, the DMP notes that budgetary resources are scarce, yet TAG represents a very important forward step for the ODP. Thus the DMP makes the following recommendation:*

#### RECOMMENDATION 93-2.

*The DMP recommends to PCOM that the TAG Downhole Measurements Program be given the highest priority by the Wireline Logging Service Operator, that the resources necessary for the success of this effort be drawn from those presently available to the Operator, and that the Operator present a plan for downhole measurements at TAG to the DMP and the LITHP during their joint meeting next October. This plan should include input from the TAG proponents, as well as a statement as to how the Third-Party Tool Requirements will be satisfied. (Minutes, Items 11.a.-11.c)*

The DMP reviewed the logging plans presented by the Wireline Logging Service Operator for Legs 150-155. The DMP noted that the proposed plans were an extension of past activities that were successful. Thus, the DMP formulated the following recommendation:

#### **RECOMMENDATION 93-1.**

*The DMP recommends that PCOM approve the proposed logging activities for Legs 150-155 as put forth by the Wireline Logging Service Operator with the understanding that the Operator initiate discussions with the appropriate Co-Chiefs so that the logging program can be incorporated into the science plans. (Minutes, Items 5.e. and Appendix)*

The DMP is very cognizant of the strong support for the pore-fluid-sampling initiative coming from SGPP, LITHP, and TECP. Furthermore, the DMP recognizes the reality of the budgetary situation that caused PCOM to withhold monetary support for the initiative, but the DMP is concerned that momentum will be lost unless forward steps are made in the very near future. Thus, the DMP formulated the following recommendation:

#### **RECOMMENDATION 93-3**

*The DMP recommends to PCOM that; (1) a group of self-supported experts pertinent to the pore-fluid-sampling RFP be drawn from the ODP community, (2) that Joris Gieskes be responsible for the institution and coordination of this group, and (3) that this group provide documentation as to the feasibility and costs associated with the development and deployment of a fluid-sampling system. The DMP further recommends that PCOM help promulgate the thrust throughout the ODP. (Minutes, Item 18.)*

The DMP and the Wireline Logging Service Operator both noted that there is a litany of downhole measurement tools and interpretation techniques that are not achieving fruition due to a lack of attention. Included in this list are essential tools such as the BHTV, and newer tools that result from very real needs of the community. The source of this difficulty a general lack of resources, and the situation is not likely to improve.

*To address the difficulties caused by a general lack of resources, the DMP asks that the Wireline Operator develop a draft plan for the prioritization of its overall efforts including those associated with technology development, that this plan contain a metric for judging the support of its efforts by the ODP community, and that the Operator present this plan to the DMP at the Santa Fe meeting. (Minutes, Items 4.a.-4.d., 5.b.-5.e., 6.a.i., 6.a.v., 8.-11.)*

In view of the budgetary situation, the PCOM Chair had requested the DMP to reduce its number of meetings to two per year. To make this system work, communication between DMP Members and Liaisons will have to be improved so that discussions can continue outside of the meeting format.

*To improve communications, the DMP has instituted an e-mail service. The address for DMP business is: DMP@SANDIA.GOV. Access to the address is open; anyone can bring issues to the attention of the entire DMP through it. However, mail is forwarded only to DMP Members; to PCOM, Thematic, and Service Panels Liaisons (or Panel Chairs if there is no DMP Liaison); and to the contract operators. (Minutes, Items 3., 4.a., 21.e.)*

#### Next Meeting.

*The next meeting of the JOIDES Downhole Measurements Panel will be in Santa Fe, NM, October 12-14, 1993. A joint session with LITHP will take place on October 12.*

#### Farewell.

*Last December, Paul Worthington stepped down from his position as Chairman, DMP, and he is now the Alternate Representative from the United Kingdom. It is important that the ODP recognize the contributions that Paul made in his tenure. In years past, logging operations were not an integral part of the scientific endeavors. Almost single-handedly this situation was changed by Paul's expertise, foresight, perseverance, and enthusiasm. Furthermore, Paul, through his leadership of the DMP, set the stage for systematic advances in third-party instrumentation. This instrumentation will influence future directions in all earth science programs.*

**MEETING OF THE JOIDES DOWNHOLE MEASUREMENTS PANEL**

**SCRIPPS INSTITUTION OF OCEANOGRAPHY  
LA JOLLA, CALIFORNIA  
MAY 25-27, 1993**

**DRAFT MINUTES**

**Present**

<b>Chairman:</b>	<b>Peter Lysne</b>	<b>US</b>
<b>Panel Members:</b>	<b>Robert Desbrandes</b>	<b>US</b>
	<b>Johann K. Draxler</b>	<b>Germany</b>
	<b>Gilles Dubuisson</b>	<b>France</b>
	<b>Gerard J. Fryer</b>	<b>US</b>
	<b>Joris Gieskes</b>	<b>US</b>
	<b>Stephen H. Hickman</b>	<b>US</b>
	<b>Mark W. Hutchinson</b>	<b>US</b>
	<b>Roger H. Morin</b>	<b>US</b>
	<b>Laust Pedersen</b>	<b>ESF</b>
	<b>Henry A. Salisch</b>	<b>Australia-Canada</b>
	<b>Makoto Yamano</b>	<b>Japan</b>
	<b>Michael D. Williams</b>	<b>US</b>
	<b>Paul F. Worthington</b>	<b>UK</b>
<b>Liaisons:</b>	<b>Susan Agar</b>	<b>TECP</b>
	<b>Elizabeth Ambos</b>	<b>NSF</b>
	<b>Frank Felice</b>	<b>ODP-LDEO</b>
	<b>David Goldberg</b>	<b>ODP-LDEO</b>
	<b>Dan Moos</b>	<b>LITHP</b>
	<b>Tom Pettigrew</b>	<b>ODP-TAMU</b>
	<b>Laura Stokking</b>	<b>ODP-TAMU</b>
	<b>Peter Swart</b>	<b>SGPP</b>
<b>Guests:</b>	<b>Tony Boegeman</b>	<b>SIO</b>
	<b>Leroy Dorman</b>	<b>SIO</b>
	<b>Jean-Paul Foucher</b>	<b>France</b>
	<b>Casey Moore</b>	<b>UCSC</b>
	<b>Thomas Shipley</b>	<b>Univ. Texas at Austin</b>
<b>Apologies</b>	<b>Karen Von Damm</b>	<b>US</b>

## **DRAFT MINUTES**

### **MEETING OF THE JOIDES DOWNHOLE MEASUREMENTS PANEL SCRIPPS INSTITUTION OF OCEANOGRAPHY**

#### **1. WELCOME AND INTRODUCTIONS**

The second meeting of the JOIDES Downhole Measurements Panel for 1993 was called to order at 0910 hours on Tuesday, May 25, 1993, in the Summer House Inn, La Jolla, CA. This location was a temporary change of venue due to a thesis defense occurring in the customary meeting room at Scripps Institution of Oceanography (SIO). The meeting was moved to SIO after the noon break.

A welcome was extended to Gilles Dubuisson, the new DMP representative from France; to Peter Swart, the Alternate Liaison from the Sedimentary and Geochemical Processes Panel (SGPP); to Laura Stokking, an ODP Staff Scientist and a representative of the ODP Science Operator; and to Frank Felice, a new representative of the Wireline Logging Service Operator (WLSO). Welcomes were extended to the following Members, Liaisons and Guests of the panel when they arrived later in the session: Paul Worthington, the Alternate UK Panel Member; Elizabeth Ambos, of the US National Science Foundation; Keir Becker, the Planning Committee (PCOM) Liaison; Leroy Dorman and Tony Boegeman, Invited Speakers from SIO; Casey Moore, an Invited Speaker; Thomas Shipley, an Invited Speaker and a Co-Chief for Barbados; and Jean-Paul Foucher, the previous DMP representative from France. Panel Member Karen Von Damm was at sea and could not attend the meeting.

The Chair noted that Panel Liaisons were especially important to the success of the meeting, and encouraged them to be very active participants. It was agreed that technical terms and jargon would be explained as required to improve communications between individuals with different backgrounds.

Edward Frieman, the Director of SIO, welcomed the Panel, its Liaisons, and Guests to the Institution. He noted the ODP is regarded as a model for international scientific cooperation in addition to its reputation for excellence in research. He pointed out that vigorous thrusts must be instituted to maintain the budgetary momentum necessary for a successful program.

Joris Gieskes, the host for the meeting, was thanked for his efforts and those of his wife, Barbara. The Chair noted that the present meeting was Joris' last as a member of the DMP, and that he would go on to be Chairman of the Shipboard Measurements Panel (SMP). The SMP and the DMP will benefit from Joris' future endeavors, and the DMP is looking forward to continued interactions with the SMP.

The DMP Chair reminded the Panel that in the future it would focus on legs presenting difficult logging situations, and that the current meeting would feature Leg 156 (Barbados). To this end, scientists and engineers familiar with previous drilling operations in accretionary prisms had been invited to the meeting.

The following modifications to the Draft Agenda were proposed;

1. Portions of the Executive Summary for the PCOM April meeting would be presented by the DMP Chair due to the temporary absence of the PCOM Liaison (Draft Agenda Item, 4.a). This action was necessary due to the importance of PCOM input to the DMP.
2. A discussion of the proposed San Andreas Drilling Program would be presented by Steve Hickman as a new Agenda Item, 4.f.
3. Draft Agenda Item 20, Downhole Measurements on Future Legs, would be rescheduled as Agenda Item 5.e. for the convenience of the WLSO team.
4. A new Agenda Item, 5.f., would be inserted into the WLSO's report to deal with Data Base Systems.
5. Joris Gieskes would present the *In-Situ* Fluid Sampling Report due to the absence of Karen Von Damm.
6. A new Agenda Item 21.e. dealing with a DMP e-mail system would be presented by the DMP Chair.
7. A new Agenda Item 6.a.i. dealing with the GEOPROPS tool was inserted on the second day of the meeting due to a request from the PCOM Chair.

With the above modifications, the Draft Agenda was adopted as the working document for the meeting.

## **2. MINUTES OF THE MEETING, COLLEGE STATION, TX, JANUARY 18-21, 1993**

The following changes were made to the Draft Minutes of the College Station Meeting:

page 6, paragraph 4: "Panel interactions with other *global programs with interests in drilling*, e.g. InterRidge..."

page 7, paragraph 7: "Susan Humphris reported progress on the re-write of the LITHP White Paper, a five to ten-year view of *issues of importance to the LITHP*."

page 7, paragraph 8: "SGPP asked that the DMP review logging activities at 504B..."

page 9, paragraph 3: "A *mud resistivity* log indicated a zone of saline water..."

page 10, paragraph 1: "The sampling problem was first visited *during* a 1987..."

page 15, paragraph 6: "Goldberg reported that logging operations on Leg 145 (North Pacific Transit) were *successful* in that..."

With the above changes, the Draft Minutes of the College Station Meeting were approved as a fair representation of the proceedings.

### **3. IMPLEMENTATION OF WATCHDOGS INTO THE DMP**

The DMP Chair noted that the concept of Watchdogs is used by the thematic panels to enable a better evaluation of proposals submitted to the ODP. Thematic Watchdogs are advocates for assigned proposals (perhaps two or three per individual), and they nurture and promote the proposals as they move through the review process.

At the Texas A&M meeting, the Watchdog concept was introduced into the DMP with the intent to provide points of contact for various thrusts of the downhole measurement program. The intent is that Watchdogs can devote a concentrated effort on the scientific gains, the engineering and physical constraints, the interpretative techniques, and the costs associated with downhole measurements. An important responsibility of the Watchdogs is to minimize oversights that lead to false expectations within the ODP community. Finally, Watchdogs will insure a smooth passage of third-party tools through the certification process.

It was noted that the JOIDES Advisory Structure Review Committee (Drubaum Committee) recommended that the DMP adopt the Watchdog concept in its Draft Report of April 15, 1993.

The following DMP Members and Liaisons have accepted Watchdog responsibilities:

Keir Becker	CORK Experiments
Johann Draxler	Third-Party Tool Certification Process
Robert Desbrandes	Magnetometer Tools
Joris Gieskes	Water Sampler, Temperature, Pressure Tool (WSTP)
Steve Hickman	Lateral Stress Tool (LAST) Tool
Mark Hutchinson	Measurement While Drilling (MWD)
Peter Lysne	High-Temperature Tools, Memory Tools
Karen Von Damm	Fluid-Sampling Tools, WSTP
Mike Williams	Land-Based Tool Test Facilities

The ODP community is encouraged to contact the above individuals for further information regarding specific areas of importance. Other areas of importance will receive Watchdogs as the program unfolds.

#### **4. LIAISON REPORTS**

##### **a. Planning Committee (PCOM)**

The PCOM Liaison was unable to attend the first day of the DMP meeting. In view of the important issues raised at the April PCOM Meeting, the DMP Chair reviewed pertinent portions of the Executive Summary of the PCOM Draft Minutes, and summarized a communication with Brian Lewis, the Chairman of PCOM. Issues are:

1. PCOM appreciated that sampling of pore fluids in low permeability rocks is of importance to several thematic panels. However, the poor prospects for success and budgetary constraints preclude issuing a Request for Proposals (RFP) for evaluation of the feasibility of sampling pore fluids at this time. PCOM recommends that the DMP either use or acquire panel expertise to address this issue, or seek funding from other sources for the RFP.
2. PCOM has asked the DMP and the SMP to investigate the prospects for the core orientation tool, and to present the results of this investigation to the PCOM at its December meeting. This issue will be discussed at the Santa Fe Meeting of the DMP.
3. If the budgetary situation becomes severe, the test of the Diamond Coring System (DCS) will be eliminated from the 1994 drilling schedule. Currently the DCS is scheduled as Leg 157. An elimination of the DCS Leg would mean that the TAG Hydrothermal drilling will become Leg 157, and it will be immediately preceded by Barbados, Leg 156. Thus, the two legs identified by the DMP as being challenging, and requiring CORKs, will be consecutive. This point was noted to Lewis in an e-mail communication from Lysne; it will be revisited when the budgetary situation is better understood.

The DMP Chair noted that the Deep-Drilling RFP put forth by the Technology and Engineering Development Committee (TEDCOM) suffered a fate similar to that of the fluid-sampling RFP. The Chair also noted that the prospects for funding any RFP through the JOIDES structure are small due to severe budgetary constraints. At best, the ODP budget is flat. This fact means that the Long Range Plan, which allowed for limited technology development, cannot be followed. At worst a disintegration of the Canada-Australia consortium means that cut-backs in the logging program may be necessary.

In view of the budgetary situation, Lewis had asked the DMP Chair to reduce the number of DMP meetings to two per year. The DMP Chair noted that such an action may mean that important issues are not resolved expeditiously. However, in the interest of the



overall program, the DMP will try the two-meeting schedule. To make this system work, communication between DMP Members and Liaisons will have to be improved so that discussions can continue outside of the meeting format. Thus, a DMP e-mail system will be implemented.

The Chair noted that budgetary constraints will become a part of DMP deliberations, and that all Panel Members must become cognizant of their ramifications. Prioritization of downhole measurement activities will be an issue before the DMP at the present and at future meetings. The prioritization process must combine the knowledge of the DMP and the feelings of the ODP community.

#### **b. Lithosphere Panel (LITHP)**

Dan Moos presented the report from LITHP, and the following points were noted:

1. LITHP reiterates its strong support for the fluid-sampler system. To be compatible with drilling in hydrothermal systems, components should be of a "slim-hole" design and operable to 350 °C.
2. The Borehole Televier (BHTV) is essential for *in-situ* stress determinations, and the present system that does not function consistently is unacceptable.
3. The LITHP supports the Ocean Seismic Network (OSN) thrust to establish ocean-floor seismic stations provided these stations yield the same quality of data as those obtained from down-hole stations.
4. Subjects for the joint DMP/LITHP meeting in Santa Fe include formation characterization in regions removed from a borehole, the LITHP White Paper, a review of technological issues, and progress on high-temperature instrumentation.
5. LITHP wished to know if CORKs were compatible with the DCS.

Pettigrew commented that CORKs are compatible with the DCS.

Lysne reported that the OSN through JOI, Inc., and the US Department of Energy (DOE) were investigating areas of mutual interest including an assessment of seismometer-deployment options. The DOE is responsible for seismic treaty-verification programs associated with nuclear weapon proliferation issues, and oceanic systems under consideration would cover areas of the world that not served by present systems.

Moos commented that many scientists do not understand logging tools. Goldberg noted the existence of the ODP Logging Manual, and stated that two logging schools will be scheduled for later in the year. The ODP Logging Manual may be obtained from Larry Sullivan: SULLIVAN@LDEO.COLUMBIA.EDU, or (914) 365-8805 [TALK], or (914) 365-3182 [FAX].

The DMP and LITHP Chairs have been discussing the Agenda for the Santa Fe Meeting, and Panel Members and Liaisons are encouraged to review the Draft Agenda as soon as it is published in August so that the meeting can move expeditiously.

**c. Sedimentary and Geochemical Processes Panel (SGPP)**

Peter Swart reported that the following issues of interest to the DMP were discussed at the March 4-6 meeting of the SGPP:

1. The SGPP strongly supports the pore-water sampling proposal of the DMP.
2. The SGPP expresses concern regarding the slow progress in developing the Pressure Core Sampling (PCS) tool, and urges continued testing and development.
3. The SGPP notes that there should be no question of funding CORKs for Barbados, Leg 156.
4. The SGPP reminds the Co-Chiefs of Barbados to ensure that correct casing screens are used in the CORK experiments.

Swart noted that geochemists do not use data from the Schlumberger geochemical tool since the assumptions and corrections that go into the Schlumberger data reduction package are unknown. Thus, the data from this tool must be questioned unless they are used only for gross geochemical information. He further noted that the Schlumberger neutron tool, sometimes called the porosity tool, should not be dropped from the logging suite merely because its interpretation is in question.

In regard to the WSTP tool, the SGPP had noted that this tool does not provide unique information in that it works only in sediments of a consistency that are compatible with uphole fluid extraction methods. When properly deployed, the WSTP is capable of producing gas samples, but they have been rarely collected and used. Swart noted that the WSTP did produce useful borehole-temperature information.

**d. Tectonics Panel (TECP)**

Susan Agar reported that a consensus on downhole measurement issues is still in evolution within TECP. In specific regard to tools, the highest priorities are: (1) fix the problems with the Schlumberger Formation Microscanner (FMS), (2) move forward with the LAST, (3) develop high-temperature tools, and (4) develop magnetometers systems. The BHTV has a low priority due to its bad showing in the past. The general priorities for short-term efforts are: (1) pore-fluid sampling, (2) deep drilling, and (3) the DCS, and (4) an upgrade of the computing system. Long-term, high-cost initiatives such as the development of seismometers and downhole radar tools are strongly supported.

Agar noted that there is a change in emphasis within the TECP; the question is now "What do we do when we get to a site?" A straightforward document discussing the merits and difficulties associated with a logging tool, or of a suite of tools, would be beneficial to discussions within the TECP. The Chair noted that the development of such documentation would be a meaningful endeavor of the DMP.

#### **e. The KTB and the upcoming "Potsdam Meeting"**

Hans Draxler reported that as of May 18, the KTB project was drilling ahead at 7,390 m in altered amphibolite with layers of gneiss. Major fault zones with a high number of shear planes, slickensides, and fractures were noted. A new lithology, indicated by strongly magnetized cuttings and an increased presence of calcite, was noted beginning at 7,336 m.

Fault zones were responsible for an enlargement of the hole and a consequential loss of support for the vertical drilling tools. The deviation was such that the hole had to be plugged back to 7100 m, and sidetracked.

A setback occurred when the drill string was being withdrawn from the hole after drilling to 7,220 m. The pipes parted about 600 m below the surface, and dropped 40 m to the bottom of the hole. The first fishing attempt was successful, the pipes were badly bent, and the recovered material indicated that the box-portion of a tool joint had split on a new section of a special, high-strength drill pipe. The special pipe was taken out of service, and drilling continues using rented pipe.

Difficulties also occurred with a loss of lost viscosity in the drilling mud, perhaps due to high temperatures downhole, or to an influx of formation fluids. A suite of logs was run at 7,190 m.

The financial situation in the KTB operation is extremely tight. Consequently, it is possible that the deeper portions of the hole will not be logged due to a lack of commercial tools suitable for operation above 260 °C, and the inability of the KTB to fund the development of a suitable suite.

The International Conference on Scientific Continental Drilling will be held in Potsdam, from August 30 to September 1, 1993. This conference is patterned after the ODP COSODs, and its goal is to create an organization for international continental scientific drilling. The thematic topics of the conference are:

- Earth History, Climate, and Extent of the Biosphere
- Meteorite Impacts and Large-scale Extinction of Life
- Crustal Fluids and Transport Processes
- Origin of Mineral Deposits
- Volcanic Systems
- Calibration of Crustal Geophysics
- Basin Evolution and Origin of Hydrocarbons

Dynamics of the Lithosphere  
Earthquake Mechanics  
Drilling, Coring, Sampling, and Logging Technologies

Further information regarding the Potsdam Meeting may be obtained from Kevin Burke, President of the International Lithosphere Program, or from Mark Zoback, a meeting organizer (and a member of TECP).

**f. The Proposed San Andreas Drilling Program**

The proposed San Andreas Drilling Program was discussed by Steve Hickman who is one of the proponents of the program; the others are Mark Zoback and Lee Younker (Lawrence Livermore National Laboratory). This initiative is of potential importance to the ODP due to its strong emphasis on technology development.

The thrust of the effort is to answer questions concerning fault behavior, fault structure and composition, fault zone properties and physical parameters, and the nature of fault-zone fluids. Investigations would be accomplished by drilling a series of holes through the San Andreas Fault at depths of approximately 1, 3, 6, and 10 km; access would be obtained by using slant or deviated drilling techniques. Long-term observation stations would be placed in the holes. Temperatures may exceed 300 °C. A consortium of US Department of Energy/Office of Basic Energy Sciences and industry sponsors is being sought to fund and develop the necessary technology. The present status of the program involves the in-depth examination of four candidate sites; proposals are being submitted to the NSF to further this effort. A final site will be selected when this work is completed.

**5. WIRELINE LOGGING SERVICE CONTRACTOR'S REPORT**

**a. Management Structure of the WLSO**

David Goldberg reported that the management structure of the WLSO located at Lamont-Doherty Earth Observatory (LDEO) underwent an extensive revision after the new logging service contract was signed with JOI, Inc. Goldberg is the program Director, and three Chief Scientists report to Goldberg; one from LDEO, one from Leicester, and one from Marseilles. The Leicester operations will center on the Schlumberger Geochemical Tool, while the Marseilles operations will be concerned with the Schlumberger FMS tool. The three Chief Scientists will steer the logging program through a semi-annual meeting process. Operationally, Goldberg envisioned that the DMP and PCOM, as well as a new Interface Working Group, would provide direct input to the WLSO.

The DMP Chair noted that the DMP reported to PCOM, and that formal DMP/PCOM input to the WLSO would come through JOI. Furthermore, he questioned the need for the Interface Working Group. Goldberg noted that the group has not been formed.

Swart requested that a geochemist be incorporated into the Leicester operations to insure that tool data were vetted.

Several thematic panels had requested that the WLSO provide liaisons so that the nuances of the logging programs could be more fully appreciated. Goldberg noted that this effort could not be instituted due to insufficient funds, and reiterated that two logging schools would be held in the near future. Goldberg stated that single-sheet documentation would be prepared on tools of importance. The Panel suggested that the WLSO institute a series of monographs on important tools, and that these volumes delineate the principals of tool operation, the assumptions that go into tool interpretation, and the applicability of the tools to scientific endeavors.

#### **b. Review of Recent Legs, Tool Reliability**

Frank Felice reported on the logging operations at holes 894, 504B, and 896. In general, the operations were successful, and the data are in the interpretation phase. However, it is notable that the Woods Hole Oceanographic Institute three-component vertical seismic profile tool failed on three separate occasions, and the digital televiwer has performed poorly.

Goldberg noted that the digital televiwer system has never performed consistently, and Draxler reported similar difficulties with this tool at the KTB operation. The difficulty lies in the data transmission package that is incompatible with long-length cables. Goldberg noted that attempts are being made to fix the tool. If this action is not successful, other options include renting a televiwer service from Schlumberger or re-deploying the analog televiwer system. In any event, Goldberg noted that incremental funds were needed if a televiwer is to be deployed in the future. Goldberg noted that US \$100K/year had been put into the digital system for the past several years, and that success was minimal.

The DMP Chair stated that LITHP and TECP are counting on the successful operation of the BHTV, and he sought assurances that the WLSO was doing everything possible to see that the BHTV program was a success. Goldberg could not give such assurances due to a lack of funds.

The DMP Chair stated that the BHTV problem will be revisited in Santa Fe in the joint session with LITHP.

#### **c. New Schlumberger Tools**

Felice reported that the Schlumberger MAXIS System, an updated computer package used in tool deployment, was operational, and that it allowed use of the Schlumberger Dipole Sonic Imager tool.

Mike Williams noted that Mobil Research and Development Corporation had tested the Dipole Sonic Imager, and found that its data were difficult to interpret. Thus Mobil had discontinued use of the service.

The Chair stated that services that did not provide a useful input to ODP science could not be part of the Downhole Measurements Program. The status of the Dipole Sonic Imager tool will be revisited.

#### **d. Status of the Digital Televiewer**

This subject was covered in topic 5.b., above.

#### **e. Downhole Measurements on Future Legs**

Felice presented a plan for logging operations on Legs 150-158; this plan is detailed in Appendix to these minutes. Goldberg put forth a set of requests for augmentation of the WLSO effort. Many of these items required incremental funding support, and a few had support from the scientific community. After a considerable discussion, the following action items were agreed upon:

1. The deletion of the "porosity" tool from the Schlumberger logging suite is not warranted at the present time even though the interpretation of the tool data are in question. The WLSO agreed to maintain the "porosity" tool as part of the tool suite; the issue of calibration will receive attention in the future.

(Note that the term "porosity" tool is somewhat of a misnomer. The tool monitors the decrease in energy of high-energy neutrons as they move through formation material. If the pore space is filled with water, this moderation is due largely to the presence of hydrogen, and the response can be related to porosity. Perturbations are caused by tool off-set from the borehole wall and by elements that are strong absorbers of thermal neutrons.)

2. The DMP noted that the proposed logging plans for Legs 150-155 were an extension of past, successful activities. Thus, the DMP formulated the following recommendation:

#### **RECOMMENDATION 93-1.**

*The DMP recommends that PCOM approve the proposed logging activities for Legs 150-155 as put forth by the Wireline Logging Service Operator with the understanding that the Operator initiate discussions with the appropriate Co-Chiefs so that the logging program can be incorporated into the science plans. (Minutes, Items 5.e. and Appendix)*

3. A discussion of logging operations for Barbados, Leg 156, was tabled until Agenda Items 7-10 had received attention.

4. A discussion of logging operations for TAG, Leg 158, was tabled until Agenda Item 11 had received attention.

5. The DMP cannot recommend the expansion of the WLSO operations into areas that do not have strong support from the scientific community. Such support is defined as being similar to that associated with the fluid-sampler thrust and the BHTV program. However, some efforts proposed by the WLSO team such as the participation of WLSO Liaisons in the workings of the thematic panels are meritorious and deserving of support even in times of a stressed budget. Therefore, the DMP asks the WLSO to develop a draft plan for the prioritization of its overall efforts, that this plan contain a metric for judging the support of its efforts by the ODP community, and that the WLSO present this plan to the DMP at the Santa Fe meeting.

#### **f. Data Base Systems**

Goldberg reported that the Leg 143 CD-ROM was published, and that Legs 144-146 were in preparation.

### **6. SCIENCE OPERATOR'S REPORT**

#### **a. Update on TAMU Tools**

##### **i. GEOPROPS**

While in session, the DMP received a communication from Brian Lewis requesting its opinion on a proposed re-deployment of the GEOPROPS tool. This initiative was originated by Dan Karig and Bobb Carson, two principal investigators with previous GEOPROPS experience. The request to the DMP was secondhand; a formal transmittal did not occur.

The DMP Chair noted that the deployment of GEOPROPS involves first coring out the bottom of the primary hole with the Motorized Core Barrel (MCB). The MCB is then removed, and the GEOPROPS inserted into the MCB-cored portion of the hole. In some past deployments, the MCB-cored hole had filled with slough, and the insertion of GEOPROPS was uncertain.

GEOPROPS received attention at the College Station Meeting where Tom Pettigrew noted that the tool was a "real nightmare to work on and deploy." Furthermore, if progress is to be made, the project must be resuscitated from the ground up, and development will be costly. Pettigrew was asked if this was still his opinion, and he answered affirmatively. Pettigrew has completed his report on the GEOPROPS tool.

Pettigrew indicated that 60-80 hours of ship time would be needed to test the MCB/GEOPROPS deployment system, and that this time would be spread out over several legs. The panel did not feel that it had enough information to justify such an expenditure of time, and it urged the tool proponents to provide more detail on their plans.

#### **ii. Hard Rock Guide Base**

Pettigrew provided the following information on engineering activities undertaken by the Science Operator. Two Hard Rock Guide Bases used on Leg 147 were being refurbished for use on Leg 153, and will be compatible with the new ODP hanger system

#### **iii. DCS Platform/Mast and Hydraulics**

The DCS is currently being refurbished for Leg 157. The bent feed cylinder which caused most of the secondary heave compensation problems has been replaced, and the secondary heave compensator hardware and software are being redesigned. Land tests are planned for late June or July.

#### **iv. Vibra-Percussive Core System**

The original Novatek tool has been abandoned, and a new tool, a Rossfelder Vibro-Bail, is being investigated. The Vibro-Bail is in the prototype stage, but has undergone initial testing with good results in tightly-packed sand.

#### **v. Pressure Core Sampler**

The Pressure Coring Sampler was modified during Leg 146. The modification resulted in full hydrostatic pressure being maintained during the last three deployments. The internal flow path and core catchers have been redesigned to reduce core-washing problems. Two new cutting shoe designs are being pursued in an attempt to increase core recovery.

#### **vi. Hard Rock Core Orientation/Sonic Core Monitor**

The Hard Rock Core Orientation tool and the Sonic Core Monitor were deployed on Legs 148 and 149 with partial success. Problems are thought to be associated with vibrations encountered while coring hard rock.

#### **vii. Tensor Tool**

The Tensor tool is an electronic core orientation probe; it is operational.

#### **viii. CORKs**

The CORK design is being changed to be compatible with the new ODP hanger system. New, higher pressure hydraulic connectors are being considered for future use. When the



redesign is complete, four systems will be available for Barbados, but it is unlikely that all will be used. At the present time, no CORKs are being constructed for TAG; CORKs not used at Barbados will be available.

Bobb Carson is scheduled to visit the existing CORK installations with the ALVIN in July/August, 1993.

#### **ix. Information Handling Proposal**

The following information was provided by Laura Stokking. The proposal for the information handling system went out on December 15, 1992. Thirteen letters of intent were received, and of these, three were awarded US \$50K each to develop a full proposal. The winners in this first exercise are:

1. A consortium of EG&G, Inc., LDEO, and Geomar
2. Tracos, Inc.
3. The Meyers Group

Proposals are due in June 15, after which the Information Services Group at ODP will conduct an internal review. Then the JOIDES Evaluation Committee will meet at TAMU to continue the review, and additional reviews will be provided by the Budget Committee (BCOM) and PCOM. A final decision is expected this summer.

#### **x. Holes 504B and 896A**

Drilling in hole 504B was terminated at 2,111 mbsf after the pipe became stuck, probably in a fault zone. After some difficulties, the hole was left with 20 m of fill, and some junk at the bottom. Hole 896A was drilled about 1 km southeast of 504B on a basement high in an area of high heat flow. Downhole logging included temperature, sonic and resistivity logs, the geochemical tool, the BGR magnetometer, the FMS, and a packer experiment. The hole appears to be slightly more sealed than 504B.

### **7. BACKGROUND FOR BARBADOS, LEG 156**

Thomas Shipley reported that the principal temporal and spatial objectives of the Barbados effort involved (1) determining the fluid pressure in the vicinity of the decollement, (2) determining *in-situ* permeability estimates of the prism host rock and in fault zones, (3) defining the nature of fluids along the decollement, and (4) investigating the nature of "bright" fault plane reflectors. Some of these investigations will require long-term monitoring of such quantities as pressure, temperature, and fluid composition. CORKs are proposed at the three first-priority sites. Casing is required to maintain hole stability and to isolate zones of interest.

## **8. PREVIOUS DRILLING IN THIXOTROPIC FORMATIONS**

Casey Moore reported on previous logging exercises at Barbados, Leg 110, and Cascadia, Leg 146. Logging exercises were attempted at three of six sites on Leg 110. In each case, bridging, probably due to formation swelling, prevented significant downhole measurement activities. Potassium chloride-inhibited mud or saltwater mud was used at these sites, so freshwater mud was not the cause of the difficulties. A side-entry-sub was not used. No holes were drilled specifically for the logging program. In some cases, packer experiments were attempted prior to logging; this action may have been detrimental to the logging exercises. The logged intervals are: Site 671 (691 m total depth), 23 m logged; Site 672 (494 m total depth), 26 m logged; and Site 676 (310 m total depth), 36 m logged.

The Cascadia program was very successful in obtaining downhole measurements, but was costly in time and equipment. At the four significant drill sites, four suites of logs were collected and three bottom-hole-assemblies were lost. Downhole measurements were conducted in dedicated holes. The logging program not only included standard logging runs, but also vertical seismic profiles and FMS logs. Various mud sweeps were made during drilling and before logging, but the holes never contained mud during logging exercises. Downhole measurements were most successful in holes that were open only for a short period of time. Packer measurements were attempted at two sites, and succeed at one. Leg 146 provided the first *in-situ* permeability measurements in an accretionary prism. Two CORKS were installed. Side-entry-subs were used occasionally.

## **9. APPLICABILITY OF SCHLUMBERGER MWD TO BARBADOS**

The DMP Chair introduced Jim Aivalis of Schlumberger to the DMP, and the Chair noted that Aivalis and Mark Hutchinson worked for competing measurement-while-drilling companies.

Aivalis reported that the Schlumberger Measurement While Drilling (MWD) capabilities included passive gamma, active gamma, neutron, and electrical logs that are similar to logs commonly used in the ODP. Two types of service are available. The first uses memory devices to store data downhole. These data are retrieved only at bit changes. Consequently, this service is less expensive than a second system that transmits data to the surface by encoding pressure pulses on the mud system. The memory system would require one additional Schlumberger technician on board the JOIDES Resolution; the mud-pulse system would require two. Aivalis chose not to discuss the costs of MWD deployment at the DMP meeting since it is a private issue between Schlumberger and the WLSO.

## **10. LOGGING PLANS FOR BARBADOS**

The Panel reviewed the options for Barbados, and the following points were noted:

1. The probability of losing downhole assemblies at Barbados is comparable to that experienced at Cascadia.
2. A sonic log is not included in the Schlumberger MWD suite. However, resistivity logs can be inverted to give rudimentary sonic information.
3. It is possible to shuttle logging equipment and personnel to the ship at Barbados. Thus, stand-by costs may be low.
4. It would be advantageous for the ODP to gain experience with MWD technology.
5. Dedicated holes would be necessary for MWD logging since MWD is incompatible with coring operations.

In view of the potential benefit of using MWD at Barbados, a team drawn from the ranks of the WLSO, Science Operator, the Barbados Co-Chiefs, and interested scientific personnel was formed to generate an appropriate position statement for consideration by the DMP. The WLSO will take the lead in generating this statement since contractual issues with Schlumberger need to be discussed. The statement will be presented to the DMP in Santa Fe. A recommendation to PCOM is likely to come from this action.

## **11. STATUS OF HIGH-TEMPERATURE TOOLS**

### **a. Tool Development in France and the United Kingdom**

Felice reported on the French Temperature Tool and the Resistivity Tool being developed at Camborne School of Mines Associates. The French tool has not progressed significantly since it was visited by the DMP at the College Station Meeting. The probe itself is comprised of sections that screw together, and even though the segments are carefully machined, the joints provide paths for fluid entry. The cable for this tool suffered corrosion problems when used in the Larderello Geothermal Field (Italy). Karen Von Damm (reporting by e-mail) tested WLSO-provided fluid specimens for compatibility with the cable. She doubted that these fluids were representative of the fluids that "ate" the cable, though if they were, the cable would not hold up in the seafloor environment. Goldberg reported that the WLSO is not funded to continue work on the French tool.

The Camborne tool still suffers from a failure of ceramic components used in the resistivity array. Even if this tool is successful, the cable available for deployment is usable only to 260 °C (Note that downhole temperatures at TAG may exceed 350 °C).

Becker commented that the downflow of cold fluids into the TAG hydrothermal system may cool the holes sufficiently to allow conventional logging to be successful. Lysne noted that such a downflow could compromise the TAG efforts, and might be controlled if

the holes were drilled slowly. Input from the TAG proponents is needed to resolve these issues. It will be sought at the joint DMP/LITHP Meeting.

The Chair noted that if above tools are to be used at TAG, they will require at least a DMP certification as Development Tools. This certification process must begin immediately if the tools are to be ready within the year.

#### **b. US Department of Energy Tools**

Lysne reported that the Precision Temperature-Pressure Tool under development at Sandia should see first deployment this summer. Furthermore, a spectral gamma tool was undergoing calibration tests, but it definitely was a prototype tool that needed further engineering assistance. Development of the fluid-sampling tool will start as soon as the pressure-temperature tool is fielded. It was noted that the Department of Energy cannot supply funds enabling its tools to pass through the ODP's Third Party Certification process, but that joint work with the ODP on subjects of common interest could further both programs.

#### **c. Preparation for TAG and the Joint Meeting with LITHP**

The DMP notes that the DCS effort, presently Leg 157, may be dropped from the schedule thus moving the TAG program forward and causing a very short time frame for high-temperature tool development. The DMP further notes that none of the tools proposed by the WLSO for the TAG operations are operational, let alone having passed any third-party-tool requirements. Finally, the DMP notes that budgetary resources are scarce, yet TAG represents a very important forward step for the ODP. Thus the DMP makes the following recommendation:

#### **RECOMMENDATION 93-2.**

*The DMP recommends to PCOM that the TAG Downhole Measurements Program be given the highest priority by the Wireline Logging Service Operator, that the resources necessary for the success of this effort be drawn from those presently available to the Operator, and that the Operator present a plan for downhole measurements at TAG to the DMP and the LITHP during their joint meeting next October. This plan should include input from the TAG proponents, as well as a statement as to how the Third-Party Tool Requirements will be satisfied.*

Finally, Lysne, acting in his Watchdog role, must report to the Co-Chiefs of TAG that the ODP high-temperature tool development program is not going well. If the PCOM Chair concurs, Susan Humphris, a Co-Chief of TAG, will be invited to the Santa Fe DMP Meeting.

## **12. OVERVIEW OF MAGNETIC MEASUREMENTS**

Magnetic measurements are becoming more prevalent in the ODP. The last several years have seen the development of the French system which has been incorporated into the Schlumberger logging suite, and the German system, which is seeking Third-Party Certification within the ODP. A Japanese system is also under development.

Robert Desbrandes gave an overview of the general field of magnetic geophysical investigations. Topics included: Principles of Nuclear Magnetism Resonance, Free Precession Logging, Spin Echo Logging, Determined Parameters, Commercial Examples, and Log Examples. A detailed set of notes was presented, and it may be obtained from Desbrandes (RND@R3.PETE.LSU.EDU).

Lysne suggested that the concept of magnetic logging was new to the ODP, that the subject was difficult, and that it would be appropriate for the DMP to generate a monograph on the technique that put forth the basic principles in an easy-to-understand format. Worthington commented that other techniques would benefit as well if further monographs were written. This issue will be a subject of further study by the DMP.

## **13. THIRD-PARTY CERTIFICATION FOR THE GERMAN MAGNETOMETER**

At the College Station Meeting, Draxler reported that the German tool had satisfied all of the ODP/DMP requirements for a Third-Party Development Tool, and that an application for the status of a Certified Tool was submitted to the WLSO. This application was dated June, 1992, and contained waivers of certain costs as the tool progressed through the certification process. No response had been obtained from the WLSO team.

In College Station, the DMP Chair had noted that it was the responsibility of the WLSO team to move forward expeditiously on such matters. Draxler has accepted the responsibility of Watchdog for all third-party tools.

A Certified Tool is deemed to satisfy all the criteria for scientific deployment within the ODP, and these criteria are defined in the Guide to Third-Party Tools. In general, the German tool has (1) satisfied the requirements for an ODP Development Tool, (2) been satisfactorily tested on ODP legs, and (3) a Request for Certification has been forwarded to the WLSO. However, documentation supporting this work, and other requirements delineated under items (4)-(6) of the Guide to Third-Party Tools, have not been formally presented to the DMP. Thus, the DMP cannot move forward on the certification process for the German magnetometer tool.

Worthington noted that the certification process was necessary due to past, negative experiences with third-party tools. He further noted that a dilution of the process at this early stage of its development would be detrimental, and would certainly lead to difficulties in the future. The DMP Chair agrees with this philosophy, and the certification process will proceed strictly in accord with the Guide to Third-Party Tools.

#### **14. OTHER MAGENTOMETER TOOLS.**

Gilles Dubuisson noted that the French magnetometer tool has been taken over by Schlumberger, and that it will see action on future ODP legs. He presented a report on the scientific successes of this tool.

Makoto Yamano had received no word concerning recent progress on the Japanese tool.

#### **15. TECHNOLOGY REVIEW--WIRELINE REENTRY**

At the College Station Meeting, the DMP received a report on cross-borehole acoustic measurements that strongly suggested that this technology was ripe for use in the ODP. However, simultaneous access to two or more holes is a requirement that cannot be met from the JOIDES Resolution. Wireline reentry from a service vessel is a candidate solution, and Tony Boegeman of SIO was invited to present an overview of this technology.

The Scripps Wireline-Reentry System utilizes downcable thrusters to maneuver the reentry package into a borehole. Real-time television pictures are transmitted to the surface to allow the final placement of the package. These pictures can give some information as to the condition of a borehole. A logging suite could be attached to the reentry cable, however ships heave could compromise the data. Clamped seismic sensors present no difficulty. Data can be transmitted to the surface at 32 K baud.

The Scripps system has been used to place ocean-bottom seismic arrays with individual positioning accurate to within a few meters. The cost of the Scripps system is low since some work can be assigned to system development.

The Scripps system overcomes the difficulty of emplacement of sensors in multiple holes for cross-borehole acoustic experimentation, and thus cross-borehole-acoustic experimentation is an option for ODP investigators. However, a great deal of work is required to bring it into fruition, and the cost in ship's time would be high. A viable experiment may require a dedicated leg.

Lysne noted that wireline reentry was necessary for the deployment of the OSN seismic system, and that he would report favorably to the DOE on the progress of the SIO wireline reentry team.

#### **16. TECHNOLOGY REVIEW--SEA FLOOR SEISMIC EXPERIMENTS**

Leroy Dorman of SIO presented a very detailed discussion of the technology used to extract information from seismic data. Anyone wishing information on such data processing should contact Leroy directly.

## 17. HISTORY OF THE WSTP TOOL

Joris Gieskes has been involved with the WSTP tool since its conception. He has written a report on the evolution of the tool, and a summary was presented.

The WSTP has produced samples from several temperature-pressure environments. The agreement with shipboard measurements from squeezings is good for major constituents. A larger data base is needed for minor constituents which can be sensitive to artifacts resulting from temperature/pressure differences, e.g., silica and boron. Gas sampling has been less successful, although only a few attempts have been made for their analysis. Gas sampling technology can be improved, but there is a need for enthusiasm from the community.

The WSTP provides a means to determine borehole temperatures that may be used to back calculate formation temperatures. The temperature measurements also provide a quality check on the fluid samples.

The success rate for fluid sampling is about 43% and that for temperature measurements is about 50%. These rates are influenced by the nature of the formation and sea conditions.

The Chair suggested that the WSTP document receive a more general distribution than is intended. Gieskes will consider this suggestion.

## 18. *IN-SITU* PORE FLUID SAMPLING

The DMP is very cognizant of the strong support for the fluid-sampling initiative coming from SGPP, LITHP, and TECP. Furthermore, the DMP recognizes the reality of the budgetary situation that caused PCOM to withhold monetary support for the initiative, but is concerned that momentum will be lost unless forward steps are made in the very near future.

Joris Gieskes proposed that he put together a team of ODP scientists and engineers to address the issues noted in the Pore-Fluid-Sampling RFP, and that these individuals find external support for their services. The DMP endorses this altruistic thrust, and, consequently, makes the following recommendation to PCOM:

### RECOMMENDATION 93-3

*The DMP recommends to PCOM that; (1) a group of self-supported experts pertinent to the pore-fluid-sampling RFP be drawn from the ODP community, (2) that Joris Gieskes be responsible for the institution and coordination of this group, and (3) that this group provide documentation as to the feasibility and costs associated with the development and deployment of a fluid-sampling system. The DMP further recommends that PCOM help promulgate the thrust throughout the ODP.*

## **19. TECHNOLOGY REVIEW--DOWNHOLE MEASUREMENTS IN THE OCEAN DRILLING PROGRAM**

In February, Paul Worthington presented a talk to the Geological Survey of Greenland entitled "Downhole Measurements in the Ocean Drilling Program- A Scientific Legacy." This talk was based on the DMP Brochure of the same title, and was very well received. Paul suggested that DMP Members give the same presentation to their consistencies at opportune times. Such action would publicize the ODP in general, and downhole measurements in particular. In view of these benefits, Paul was invited to repeat his presentation.

Paul presentation set the standards for professionalism. The talk was videotaped, and slides used in the presentation will be distributed to DMP Members.

The DMP Chair took the opportunity to acknowledge the tremendous service that Paul Worthington had made to the ODP. In years past, logging operations were not an integral part of the scientific endeavors. Almost single-handedly this situation was changed by Paul's expertise, foresight, perseverance, and enthusiasm. Furthermore, Paul, through his leadership of the DMP, set the stage for systematic advances in third-party instrumentation. This instrumentation will influence future directions in all earth science programs.

## **20. HOUSEKEEPING ISSUES**

### **a. Panel Membership**

The Panel was reminded that Joris Gieskes would be retiring from the DMP at the end of the current meeting, and that candidates for his seat were being sought by the Chair. The Chair noted that personnel from non-Schlumberger logging companies are permissible candidates.

In keeping with policy, discussions concerning membership issues are not minuted by the DMP.

### **b. Duration and Timing of Meetings**

Due to the institution of a semiannual meeting format, the timing and duration of DMP Meetings is in a state of flux. This issue will be revisited in Santa Fe.

### **c. Suggestions to the Chair**

Several Panel Members noted a possible conflict of interest presented by a proposed non-US panel member and his institution of employment. The DMP Chair will pursue this issue with the PCOM Chair.



#### **d. E-mail**

The Chair noted that the change from three meetings per year to two comes an inopportune time for the DMP due to the workload put on the Panel by extraordinary legs such as Barbados and TAG, and due to a change in the JOI contract to the WLSO. However, in the interests of the overall program, the DMP is behooved to make the most of the situation. With this issue in mind, the DMP will institute an e-mail system.

The e-mail address for DMP business is: **DMP@SANDIA.GOV**. Access to the address is open; anyone can bring issues to the attention of the entire DMP through it. However, mail is forwarded only to DMP Members; to PCOM, Thematic, and Service Panels Liaisons or Panel Chairs; and to the contract operators.

Watchdogs will play an important role in conducting business by e-mail, but everyone should comment on issues raised on the network. As usual, DMP business on issues requiring input to other panels will be conducted through the DMP Chair. In other words, the e-mail system will serve as a continuation of DMP Meetings.

Obviously, the e-mail system can work only if all Panel Members have access to INTERNET. It is understood that representation will be complete in the near future.

#### **21. FUTURE MEETINGS**

Jeanette and Peter Lysne will host the next meeting of the JOIDES DMP, Santa Fe, New Mexico, October 12-14, 1993. The session on October 12 will be joint with LITHP.

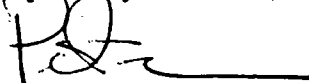
Non-US locations will receive the highest consideration for a DMP meeting to be held in the spring of 1994.

#### **22. ADJOURN**

The DMP Chair thanked Barbara and Joris Gieskes for the hospitality that they had extended to Members, Liaisons and Guests of the DMP. The Chair also noted that Joris' contributions to the DMP over the past years had been considerable, and that the DMP was looking forward to working with Joris in his new roles as Chairman of the Shipboard Measurements Panel, and Coordinator of the Fluid Sampling Effort.

The proceedings of the JOIDES Downhole Measurements Panel were concluded at 1200 hours, May 27, 1993.

Respectfully submitted,



Peter Lysne  
June 28, 1993

