

MEETING OF THE JOIDES DOWNHOLE MEASUREMENTS PANEL

LAMONT-DOHERTY EARTH OBSERVATORY

PALISADES, NEW YORK

SEPTEMBER 21-23, 1994

EXECUTIVE SUMMARY

Re-Submission of Past Recommendations to the Planning Committee

DMP Recommendation 94-1 dealt with the determination of in-situ stress information through the conjunctive use of Formation Microscanner and Borehole Televiewer tools. This recommendation was accepted by PCOM, but Recommendation 94-2 dealing with funds necessary for the implementation of Recommendation 94-1 was not. Since Recommendation 94-1 is meaningless without some form of contingency funds for implementation, the DMP asks that PCOM reconsider Recommendation 94-2:

94-2 The DMP recommends that a flexible funding philosophy be adopted to insure resources for in-situ stress experiments as determined by the DMP and the Thematic Panels. (This cost is estimated to be \$40K/leg for the rental and shipping of two BHTV tools. The number of legs per year will depend on the ship's track; historically about two legs per year merit support.)

DMP Recommendation 94-3 concerned the allocation of responsibility for continuous-measurement versus point-measurement third-party tools. DMP understands questions were raised regarding the ADARA tool which is intended for use as a point tool, but which records temperature data on the way into the hole. Thus, the delegation of responsibility is in question. Since this latter application of the ADARA tool is not common and the tool is not certified as a continuous log, the DMP sees no difficulty with assigning third-party responsibilities of the ADARA tool entirely to Science Operator. With this understanding, DMP asks PCOM to reconsider Recommendation 94-3:

94-3 In regard to the Third-Party-Tool Guidelines, the DMP recommends that memory tools that provide depth-data profiles be the responsibility of the Borehole Research Group; memory tools that return point measurements be the responsibility of the Science Operator.

Submission of New Recommendations to the Planning Committee

The Downhole Measurements Panel (DMP) is cognizant of the PCOM request that the service and thematic panels review the scientific consequences of a flat budget. To proceed in this action, the DMP needs information concerning expenditures within the logging program. Thus the DMP makes the following recommendation:

94-12 The DMP recommends that the BRG develop a budget scenario detailing the programmatic impact of level funding, i.e. a yearly 3-5% inflationary decrease in real dollars. This trial scenario should include at least: (1) details of actual expenditures over the past three years, (2) an estimate of expenditures for the next three years, (3) an estimate of the cost reduction realized by eliminating either the Geochemical Tool or the Formation Microscanner from the standard logging suite (whichever the BRG deems the most expensive to operate), and (4) an estimate of the cost per leg of running the chosen tool as a specialty item. The requested information is to be presented to the DMP at its Spring meeting.

The DMP hastens to note that the Geochemical Tool and the Formation Microscanner were chosen as an aid to budgetary discussions. The choice of these tools is not intended as a comment concerning either the scientific usefulness of the tools, or the operations at Leicester and Marseilles. However, a review of the Geochemical Tool and the Formation Microscanner will be included in a general review of the Downhole Measurements Program to be initiated at the Spring meeting of the DMP.

The DMP was very impressed at the quality of the Logging-While-Drilling data obtained at Barbados, and the use to which it was put by the scientific party. Thus the DMP makes the following recommendation:

94-13 The DMP recommends that Logging-While-Drilling be an integral part of the Leg 160 operations since sloughy hole conditions characteristic of accretionary prisms will be encountered. Historically such hole conditions have thwarted conventional logging attempts; the success at Barbados demonstrates the feasibility of Logging-While-Drilling technology and the value of log data obtained in accretionary prisms. The estimated cost of this effort is \$250K.

The DMP was very impressed at the quality and utility of the Logging Brochures developed by Deborah Barnes of the BRG. Thus the DMP makes the following recommendation:

94-14 The DMP recommends that the Logging Brochures currently under development at the BRG be given distribution through out the JOIDES Panel Structure, and necessary funds be allocated for this thrust. Past experience indicates that the cost will be about \$20K.

The DMP is disturbed by the events surrounding the vertical seismic profiling experiment conducted at Barbados. Specifically, the DMP notes that add-on experiments originating outside of the JOIDES structure may have undergone superficial reviews in regard to feasibility and cost, that insufficient concern may not have been applied to the unique requirements of ODP research, and that panels are asked to comment on experiments without being given sufficient time to digest pertinent information. Thus, the DMP makes the following Recommendation to PCOM.

94-15 The DMP recommends that add-on experiments be subjected to a uniform scientific and feasibility review by appropriate JOIDES Panels, and that a minimum of six months time be allocated for this task. More time will be required if the experiment is unique, difficult, or if information given to the panels is inadequate.

The DMP concurs with other panels in that innovation is very the heart of the ODP. In this regard, the DMP notes that the logging service industry could move forward with an advanced logging concept where data are recorded on memory units incorporated into the core tube and retrieved at the end of each core run. The concept is analogous to the Logging-While-Drilling technology used at Barbados, but data are retrieved more often than after each bit trip. In the normal course of events the concept will not be moved forward by industry due to a lack of interest in coring. However, it does represent a need of all scientific drilling programs so cost-shared development is a possibility. If available, it would cut down on the time spent on conventional logging, and it would provide information useful to drilling engineers. Thus, the DMP makes the following recommendation:

94-16 The DMP recommends that a feasibility, practicality, and cost study be conducted to advance the concept of Logging While Coring in the ODP. The study would be conducted in FY96, and it would a joint effort between the BRG, ODP/TAMU, and a logging service company, with the DMP and TEDCOM acting in an advisory role. Appropriate funds, not to exceed \$30K, are sought under the BCOM mandate that 4% of a contractor's budget be spend on innovation. Significant additional funds may be sought in FY97 pending the results of the requested study.

Third-Party Tool Requirements

The DMP recognizes that there has been confusion regarding the certification of non-Schlumberger tools since test requirements are not spelled out in the Guidelines for Third-Party Tool Development. Thus, the DMP issues the following criteria by which it will judge the adequacy of a third party tool for use in the ODP:

- 1. Pressure Housing Test.** The DMP requires a test in a well or autoclave to replicate the pressure and temperature environment expected in ODP operations.
- 2. Electronics Test.** The DMP requires that the uphole and downhole electronics be demonstrated to function properly under anticipated operating conditions. This means that components subjected to high temperatures be tested at temperature, perhaps in an oven; and that the duration of such tests be consistent with the expected duration of ODP operations.
- 3. Vibration Test.** The DMP requires that tools and surface equipment be subjected to vibration tests commensurate with use, both in shipping and

downhole. Standards for these tests are to be the same as applied to commercial tools, and tests may be done best at commercial facilities.

4. Wireline Test. The DMP requires that tools using active wirelines to transmit data and receive power demonstrate successful operation on wirelines used in the ODP.

5. Systems Test. The DMP requires that a logging system demonstrate an ability to produce meaningful data. This means that a systems test that exercises simultaneously all components (downhole tools, uphole controllers, data processing algorithms, interfaces to shipboard and BRG data computers, etc.) be passed. Ideally, the systems test would be performed in an appropriate well. If the cost of such a test is prohibitive, other scenarios will be considered by the DMP.

An essential feature of DMP actions is the appointment of a Watchdog assigned to each tool progressing through the third-party system. This Watchdog will aid in the interpretation of the Third-Party Tool Guidelines and the above requirements, and report on progress periodically to the DMP. The Watchdog will not assume responsibilities assigned to the Principal Investigator, to the BRG, or to the ODP/TAMU as are stated in the Third-Party Tool Guidelines. The Watchdog is empowered to make decisions on behalf of the DMP should a fast response be necessary. The DMP philosophy is to be pragmatic and flexible in regard to third-party tool issues, but the DMP must uphold the Third-Party Tool Guidelines in order to honor its responsibilities to the ODP.

The DMP will also require that tools be calibrated so as to insure that they generate useful information. It is the responsibility of the Principal Investigators to provide the scientific rationale for a tool, and to demonstrate that the calibration of the tool is sufficient to meet the stated scientific goals. Such a demonstration can occur in an appropriately calibrated test well or test pit, and/or by convincing theoretical arguments based on the detailed physics of tool operation coupled with laboratory experimentation. The DMP Watchdog will become familiar with calibration issues for each third-party tool, and aid the Principal Investigators, the BRG, and ODP/TAMU in presenting them to the DMP. The DMP will then issue a recommendation concerning specific calibration needs.

Logging Operations in Outyear Drilling Programs

The DMP reviewed a prospectus for logging operations in outyear programs, and the DMP-modified operations are listed in the Appendix to these Minutes. The DMP flagged issues of unusual scientific importance, issues that could cause expenditures over and above normal operating expenses, and issues where tool availability was in question. Of particular importance is the strong possibility of a favorable DMP Recommendation concerning Logging-While-Drilling exercises for Costa Rica Accretionary Wedge, and special operations including televiewer logs, VSPs, CORKs, and magnetic susceptibility measurements on multiple legs. It is not clear if scientific justification is sufficient to

enable ODP or other funds to be spent on these operations; they are flagged so that the Thematic Panels or independent Principal Investigators can take action in a timely fashion.

The DMP is cognizant of the PCOM request that legs with exceptional requirements be identified prior to the PCOM review of the Drilling Prospectus. The DMP in conjunction with the BRG and ODP/TAMU can attempt to foresee these legs, but the task is difficult. Sometimes measurements are asked for as part of a general wish list that possess little real interest on the part of the scientific community. Such suggested measurements are difficult to identify, even by the Thematic Panels that are more intimate with proposals than the DMP. Hence there is a tendency to approve all asked-for experiments so as not to degrade the scientific prospects of a leg. Alternatively, advantages of in-situ stress measurements, LWD exercises, and other unique opportunities often emerge after a leg is scheduled and scientific interest is peaked within the community. Stated otherwise, the global issue is how to fund add-on science not imagined by proponents of legs in the proposal stage. DMP Recommendation 94-2 is an example of such a problem.

Next Meeting of the JOIDES DMP

Subject to PCOM approval, the next meeting of the DMP will be in Leicester, United Kingdom, March 8-10, 1995. Andrew Green will host.

DRAFT MINUTES

MEETING OF THE JOIDES DOWNHOLE MEASUREMENTS PANEL LAMONT-DOHERTY EARTH OBSERVATORY PALISADES, NEW YORK SEPTEMBER 21-23, 1994

Chairman:	Peter Lysne	US
Panel Members:	Robert Desbrandes	US
	Gilles Dubuisson	France
	Andrew S. P. Green	UK
	Steven H. Hickman	US
	Mark W. Hutchinson	US
	Richard D. Jarrard	US
	Philip H. Nelson	US
	Laust B. Pedersen	ESF
	Henry A. Salisch	Australia-Canada
	Karen L. Von Damm	US
	D. Michael Williams	US
	Juergen Wohlenberg	Germany
Liaisons/Guests:	Susan M. Agar	TECP
	Jean M. Bahr	SGPP
	Deborah Barnes	BRG
	Frank Filice	BRG
	David Goldberg	BRG
	Adam Klaus	ODP/TAMU
	Bruce Malfait	NSF
	Elizabeth Pratson	BRG
	Kiyoshi Suyehiro	PCOM and Japan
	Hezhu Yin	BRG
Apologies:	Gerard J. Fryer	US
	Makoto Yamano	Japan

1. WELCOME AND INTRODUCTIONS

The second meeting of the JOIDES Downhole Measurement Panel (DMP) for 1994 was called to order at 0910 hours, Wednesday, September 21 at the Lamont-Doherty Earth Observatory, Palisades, NY. Peter Lysne noted that the start of first-day activities for the DMP always will be 0900 hours to aid the acclimation of those who have traveled long distances.

Lysne introduced Juergen Wohlenberg, a new panel member representing Germany; Bruce Malfait, the representative of the National Science Foundation (NSF); and Kiyoshi Suyehiro, the representative from the Planning Committee (PCOM). Frank Filice, the host for the present meeting, then introduced Hezhu Yin, a new staff scientist for the LDEO Borehole Research Group (BRG); and David Goldberg, the Director of the BRG. Other BRG representatives were introduced when they appeared later in the proceedings. DMP members Gerard Fryer and Makoto Yamano were unable to attend; Suyehiro acted as the Japanese representative. Extracurricular activities were discussed.

The following changes were made to the Draft Agenda:

1. Agenda Item 3.a., the NSF Report, would be presented by Malfait instead of Paul Dauphin.
2. Agenda Item 3.e., the KTB Report, would be presented by Wohlenberg instead of Hans Draxler who has rotated off the Panel.
3. Steve Hickman would present a report on the proposed San Andreas Fault Zone Drilling Project as a new Agenda Item, 3.f.
4. Agenda Item 4.b., The Report on BRG interactions with Leicester and Marseilles, would be presented by Beth Pratson instead of David Goldberg.
5. Agenda Item 12., Status of Logging Brochures, would not be given since no action has taken place since the last DMP meeting.
6. Robert Desbrandes would present a report on Logging While Coring as a new Agenda Item 12.
7. A Panel Discussion on Technical Innovation would be included as a new Agenda Item 13.

With the above changes, the Draft Agenda was accepted as the working document for the DMP.

Lysne noted that budgetary issues will be of increasing concern within the Ocean Drilling Program (ODP), and that they arise at a number of points in the present Agenda.

2. MINUTES OF THE PREVIOUS MEETING, UPPSALA SWEDEN

The following changes were made to the Draft Minutes of the DMP meeting in Uppsala, Sweden, May 17-19, 1994.

Mike Coffin, the Lithosphere Panel (LITHP) Liaison to the Uppsala meeting, requested by mail the following clarification (page 8, Section 3.e.): "Coffin commented that deep drilling was not a high priority *between now and 1998* given budgetary constraints and possible technological difficulties, *but remains a key technical capability required to achieve LITHP's intermediate and long-term objectives.*"

Filice suggested the following addition (page 9, Section 4.e.): Future deployment of this tool will suffer in that the tool is too large to fit through the *lockable flapper valve.....*".

Filice suggested the following change (page 9, Section 4.b.): An industry standard is about one failure in 30 (*but that this rate may be inflated due to a non-reporting of difficulties*), and that the ODP failure rate compares favorably with industry.

Filice suggested the following addition (page 11, Section 4.f.): Filice noted that David Goldberg is the Director of the BRG, *and the BRG is responsible for final quality control of log data*; Chief Scientists at Leicester and Marseilles report to him.

Steve Hickman suggested the following change (page 14, Section 6.): "Andrew Green noted that hydraulic fracture techniques are often used on land, *and an experiment was attempted at hole 395A, but it was unsuccessful since the safety constraints imposed on ODP pressure systems did not allow sufficient pressure for a hydraulic breakdown of the formation.*"

Filice suggested the following change (page 17, Section 8.b.): Its design temperature is 350°C.

Filice suggested the following deletion (page 19, Section 8.e.): *Frank Filice is the Principal Investigator for the (CSMA Resistivity) Tool.*

Filice suggest the following change (page 20, Section 8.g.): *Gilles Guerin is the Principal Investigator.*

In regard to the past DMP discussion on in-situ stress measurements (Draft Minutes, Section 6.), Steve Hickman pointed out that cable twist may actually aid in the interpretation of breakouts when caliper tools are used (at Uppsala, Draxler stated that twist may be detrimental to breakout identification). Lysne noted that Hickman's thoughts were not presented at of the Uppsala meeting, and thus could not be part of the Uppsala

Minutes (Hickman was unable to attend), but they would be included in the Minutes of the present meeting. Hickman commented that his input would not change DMP Recommendation 94-2 in that televiewer measurements were still the best way in which to obtain breakout information.

With the above changes, the minutes of the Uppsala meeting were taken to be a fair representation of DMP activities.

3. LIAISON REPORTS

a. NSF

The ODP Council consists of representatives from funding agencies for ODP partner countries; the purpose of the Council is to provide advice and guidance on financial and political issues. Bruce Malfait reported that the NSF had asked for an increase in partner-shared costs (the NSF is currently supporting just over 60% of the ODP expenses), but this request had been turned down. At issue is the scarcity of money in general, not any dissatisfaction with the ODP. The ODP budget will be fixed for the foreseeable future at \$44.9M, although slight perturbations may arise from the Canadian/Australian Consortium which is currently operating at a 7/12 level. The JOIDES Panel Structure and JOI, Inc. must balance scientific, operational, and financial priorities within a budgetary structure that is expected to decrease yearly due to inflation.

The ODP is beginning a review of operations in the 1999-2003 period. Panel members for the review will be appointed by the Council, and the review is scheduled for completion of January, 1996. It will entail a discussion of accomplishments and future goals, facility requirements, organizational and management structure, and resource requirements.

The Council met with Japanese representatives to discuss Ocean Drilling-21, a new thrust of drilling activities in the 21st century. It is recognized that there is a need for a better description of the management, cost, and organizational structure for Ocean Drilling-21. It is too early to schedule international commitments; such commitments will occur in 1997 or later.

Long-duration downhole measurements are of increasing interest, and this work is often coupled with other programs. The current ODP exercises at the TAG Hydrothermal Mound are supported by Canadian, Japanese, and British investigators operating outside of the ODP structure; submersibles from several countries will visit the mound to recover data from ODP deployed CORKs and perform other experiments. Similarly, Canadian and French involvement occurred at Barbados. ODP work to provide holes aids the international Ocean Seismic Network. An upcoming workshop in France will investigate long-term experiments on the sea floor.

b. PCOM

Kiyoshi Suyehiro reported that main agenda items of the last PCOM meeting included the 1996 Drilling Prospectus, and the Long Range Plan, including budgetary issues. PCOM also discussed how the ODP could better interface with other programs.

Ten candidate drilling proposals were chosen for the Prospectus, and they will be sorted down to the six that will see operations at the December PCOM meeting in College Station. The DMP and the BRG are to provide input to this selection process.

White Papers written by the Thematic Panels will form the backbone of the Long Range Plan, and they will be published in the JOIDES Journal. Programs outside the ODP will be contacted to see how the ODP can further their scientific goals. Included in this discussion will be interfaces with Japanese efforts to further a vessel capable of very deep drilling that includes riser-pipe technology.

The Diamond Coring (DCS) effort is stalled. The Technology and Engineering Development Committee (TEDCOM) recommended, and PCOM concurred, that land tests must precede tests at sea. It is not clear if the computer system will need an upgrade before the land tests. Thus, the scheduled DCS test will not occur on Leg 164. Replacement scientific activities will be decided by PCOM in December.

Suyehiro presented vu-graphs used in a talk on preliminary budget guidance given to PCOM by Jamie Austin. Austin's first statement was: "Do not overreact". Austin did note that budgets will continue to be tight in FY96 and beyond, and that scientific expectations must correlate with these budgets. Austin noted that savings may be made by decreasing on the ship's day rate, slowing DCS development, delaying publication of ODP Volumes, reducing non-payroll support at TAMU and LDEO, and slowing the data management upgrade. PCOM favored slowing the computer upgrade, delaying publications, and slowing the DCS, program in that order.

Several DMP members expressed distress at slowing publications, and wondered if less expensive forms of publication were being investigated. Lysne noted that the Information Handling Panel was at work in this area. It was emphasized that innovation is the heart of the ODP, and it was supported by the policy-making panels. The DMP noted that in an era of flat budgets and inflationary increases, innovation means that selected mature programs will have to be culled. Lysne asked that all panels receive a uniform set of instructions from PCOM as to how to identify such mature programs.

PCOM has recommended that panel members should serve a four-year tenure. Lysne had contacted Brian Lewis, the PCOM Chairman, noting that such a long service may hinder DMP members from industry. Mike Williams and Mark Hutchinson remarked that once approval is obtained for industry personnel, the duration of service may not be an issue. Hutchinson commented that he had worked for several different companies during his tenure on the DMP, but often his participation in a meeting was decided at the last hour.

c. CLICOM

Mike Williams reported that the CLI-AN group had changed their name to CLICOM. CLICOM is an advisory committee formed under the Chairmanship of Joris Gieskes to further the core-log integration effort. Williams noted that while core-log integration is the current thrust, what is really meant is data integration achieved by making all data available at a common location (perhaps including the Internet). Essential to this goal is the establishment of a common depth for log and core. Depth will be established primarily through the use of downhole and shipboard gamma and magnetic susceptibility measurements; the sonic core monitor will play an increasing role in depth determination when it becomes available.

Recommendations from CLICOM are:

1. The CLIP program developed by Peter deMenocal and Terri Hagelberg be recognized as an important component of the future data base upgrade, and that the contractor for the upgrade be in full contact with the BRG.
2. That a very careful record be kept of depth changes achieved during the manipulations necessary to reach the common depth scale for cores and logs, and that each Initial Report of the ODP contain a separate chapter on core-log integration, or any other data integration effort.
3. That three work stations available for dedicated data integration be maintained on board ship, especially on legs in which core-log integration plays an important role. The stations would be in the core laboratory, in the Chief Scientists office, and in the library.
4. That the Multi-Sensor Track for core measurements receive the technical support of an appropriately trained specialist, and be upgraded through continued software and hardware development.
5. That a dedicated Shipboard Data-Integration Specialist be included in the scientific party to further the data-integration process.

Mike noted that the CLIP program parallels programs developed by industry in that it moves, stretches, and shrinks cored and logged intervals, but it has features that are unique to the ODP, and it is in hand. The panel emphasized data integration necessitated good coordination between the BRG (which is writing CLIP) and ODP/TAMU (which is in charge of the computer upgrade), and that this coordination will require review in the future.

The DMP endorses the recommendation of CLICOM. Williams noted that the work of CLICOM is finished, and that the DMP need not appoint a replacement when he rotates off the DMP this Fall.

c. TECP

Susan Agar reported that TECP had ranked 22 proposals with Woodlark Basin Extension receiving the most votes. Second ranking went to Costa Rica Accretionary Wedge, and the third was Taiwan Arc-Continent Collision. Agar categorized proposals in terms of stress regime and associated features (e.g., big normal faults), accretionary prisms and convergent margins, and rift initiation. There is significant interest in TECP to examine stresses within, above and below large normal faults. Many faults of interest are too deep to be dealt with on a single leg, but Woodlark Basin may be the exception. Agar noted that TECP's interests include the development of fluid and gas samplers, and techniques to measure in-situ stress and strain. TECP supports development of the sonic core monitor to augment core-log integration.

Hickman noted that it is difficult, but not impossible, to measure stress magnitudes at sea, but breakouts can define stress directions and provide some information on relative magnitudes of the three principal stresses. Lysne noted the recent DMP Recommendations (94-1, 94-2) regarding the joint Thematic Panel-DMP identification of legs with strong scientific pay-off for in-situ stress measurements, and reiterated DMP support for appropriate action.

Agar reported that TECP is taking action to ensure that structural data are systematically collected and published in Initial Report volumes. A working group has been set up to make recommendations for minimum shipboard structural measurements and descriptions, and devise the best way to develop a shipboard structural database. This action will facilitate the integration of structural data from the core with downhole measurements that has been difficult in the past.

The TECP enthusiastically endorses an explanation of downhole measurements in the Minutes of the DMP, and supports the current development of Logging Brochures. In addition, TECP would like to see more detailed descriptions of measurement tools explaining the reality of downhole measurements. Such information should be given to the Co-Chiefs. TECP also suggests that an implementation plan for downhole measurements be presented at the Pre-Cruise Meetings. Agar noted that TECP has an increased awareness of downhole measurements and their potential for scientific results.

e. KTB

Juergen Wohlenberg introduced himself as a scientist who has worked on log analysis for the KTB, but he has not been in a managerial role like Hans Draxler his predecessor on the DMP. His work involves the use of multiple logs and core to identify lithology in regions of no core recovery.

Wohlenberg reported that a 7.625 inch liner had been cemented into the KTB hole at 8,665 meters to aid in bypassing a fault zone that had caved repeatedly in attempts to deepen the hole. After some difficulties, the hole was extended to 8,720 meters, at which

point the hole became unstable. The mud weight was increased to 1.35 g-cm^{-3} , and the hole advanced to 8,955 meters when the drill pipe stuck. Currently the pipe is free, but it is not known if it is intact, or if it parted and there is junk in the hole. The hope of the program is to reach a depth of 9,000 meters. The drilling portion of the program will stop on October 10 due to a depletion of funds. Many staff of the KTB, including Draxler, will retire by the end of the year. Downhole experiments and an integration of the data will continue for another two years; the budget for this work is approximately 5-6 M DM/year. Downhole activities will include logging, fluid sampling, and a hydraulic fracturing experiment. The current bottom-hole temperature in the main hole is about 300°C , but this temperature may be lowered through the circulation of drilling fluids so that common logging and sampling tools may be used. If feasible, the pilot hole will be reopened to 3,000-4,000 meters.

f. San Andreas Fault Zone Drilling Program

Steve Hickman reviewed the San Andreas Fault Zone Drilling Program which had been featured in EOS (Vol. 75, No. 12, March 22, 1994). The San Andreas is a major transform fault, perhaps the most studied in the world. There is a high probability of a major earthquake on this fault in the next 30 years, yet the structure, composition, and mechanical behavior of the fault at seismogenic depths are very poorly understood. The purpose of the proposed program is to answer fundamental questions pertaining to the mechanics of faulting by conducting a drilling experiment within the fault zone at depths up to 10,000 meters. Fluid pressure, fluid chemistry, rock physical properties, and in-situ stress--and how these parameters change with depth, proximity to the fault, and time--are of particular concern. A feature of the program is a deep vertical hole connected to angled extensions that traverse the fault at depths of about 3,000 6,000 and 10,000 meters. Downhole temperatures are expected to reach 300°C . Since long-term monitoring within the fault zone is an integral part of the program, challenges in downhole measurement technology are abundant. Presently the project is in the stage of writing proposals for major programmatic elements; some work has already been funded to enable characterization of candidate drilling locations.

The initial deep-hole proposal was presented to the United States Department of Energy, the USGS, and to the NSF. Subsequent discussions centered about drilling difficulties led to the present proposal which features a less ambitious 3,000 meter hole with an angled portion that traverses the fault. The shallow-hole program will allow for three attempts at traversal; if the third should fail, the entire program must be rethought. If successful, the shallow hole will pave the way for the deep project, and it would provide a laboratory for technology development. It is likely that the 3,000 meter hole will be sited along a section of the fault currently exhibiting creep-like behavior as evidenced by a constant background of low-amplitude earthquakes. If the 10,000 meter hole is drilled in a locked section of the fault (another likely possibility) the combined shallow and deep hole will make it possible to compare segments of the fault that behave in fundamentally different ways. Site selection and permitting are underway for the shallow hole. Initial drilling activities at

the shallow hole site are planned for 1995-1996; deep site drilling activities are planned to start in about 2001.

In many ways, technology development for the San Andreas Program will parallel needs of the ODP in the 21st Century. A \$10M/year Lawrence Livermore National Laboratory program is being proposed by Lee Younker to address technology-development issues, and how this technology will be integrated into the San Andreas program as a whole. To be successful, this program must have a strong tie to industry.

Wohlenberg noted that the San Andreas program is a candidate for the emerging International Continental Scientific Drilling Program, the main support of which is being organized by Germany as a follow-up to the KTB Project. He noted further that San Andreas is attempting fault zone drilling, an environment that the KTB hoped to avoid. He commented that San Andreas is very risky, but the scientific pay-off may be enormous.

4. LOGGING CONTRACTOR'S REPORT

a. Programmatic Considerations of a Reduced Budget

David Goldberg reported that the BRG budget had been reduced by about 11% between FY94 and FY95, and a 15% decrease may be necessary in operating expenses due to inflationary influences of the Schlumberger contract and other increasing fixed costs. Currently the BRG is forgoing any hardware and software upgrades, and there are restrictions on travel. So far the BRG has avoided changes in either personnel or in programmatic elements that could be irreversible per instructions from JOI, Inc. However, the program is at the breaking point, and any further reductions, including inflationary reductions, must result in major changes in direction.

Lysne noted that PCOM had instructed all panels to identify areas in which savings could be made, and that the DMP had the responsibility to its sister panels to become cognizant on issues that have major programmatic impact. He then asked Goldberg to detail what changes might be necessary given that a flat BRG budget must be discounted at 3-5% per year due to inflation.

A general discussion then followed in which elements of the BRG operating budget were requested. A sub-panel of the DMP worked overnight with Goldberg to identify such elements. The results of extended DMP deliberations resulted in the following Recommendation to PCOM:

94-12 The DMP recommends that the BRG develop a budget scenario detailing the programmatic impact of level funding, i.e. a yearly 3-5% inflationary decrease in real dollars. This trial scenario should include at least: (1) details of actual expenditures over the past three years, (2) an estimate of expenditures for the next three years, (3) an estimate of the cost reduction realized by eliminating either the Geochemical Tool or the Formation Microscanner from the standard logging suite

(which ever the BRG deems the most expensive to operate), and (4) and an estimate of the cost per leg of running the chosen tool as a specialty item. The requested information is to be presented to the DMP at its Spring meeting.

The DMP hastens to note that the Geochemical Tool and the Formation Microscanner were chosen as an aid to budgetary discussions. The choice of these tools is not intended as a comment concerning either the scientific usefulness of the tools, or the operations at Leicester and Marseilles. However, a review of the Geochemical Tool and the Formation Microscanner will be included in a general review of the Downhole Measurements Program to be initiated at the Spring meeting of the DMP.

b. BRG Interactions with Leicester and Marseilles

Elizabeth Pratson introduced herself as a logging specialist for the past seven years who now oversees log analysis by subcontractors at Leicester (Geochemical Tool) and Marseilles (Formation Microscanner). She noted that there has been a difficulty with log analysis in that eight times out of nine, logs processed at subcontractor locations had to be reprocessed at the BRG. Consequently the BRG has instituted a Quality Assurance and Control procedure that contains three phases of implementation.

Phase One requires that Leicester and Marseilles log analysts spend a minimum of three weeks per year at LDEO devoted to ODP processing of log data at the expense of the subcontractors. The intent is to insure better communications between the subcontractors and the BRG, and to create a mutual understanding of what is expected and needed from the various institutions. This phase also includes a Quality Assurance Check List to insure that each step of the processing is done, problems and solutions documented, all errors in the log files addressed, and that the results look reasonable before being forwarded to the BRG. This list is operational at Marseilles and processing has improved. Leicester is in the implementation state.

Phase Two will be initiated if Phase One does not decrease the number of problems and errors. The prime element of Phase Two is that number of visits and length of stay of subcontractor personnel at the BRG will be increased.

Phase Three will be initiated if the pervious phases fail. In it, all processing will be performed at the BRG by subcontract personnel.

The DMP noted that processing at remote locations may have been based on political considerations. DMP is likely to ignore such considerations since PCOM instructions are for the DMP to identify areas in which budgetary savings may be accomplished. Lysne stated that, pending PCOM approval, the Spring DMP meeting will be in Leicester, a site convenient for investigators from Marseilles. Thus, the DMP will review the Geochemical Tool and Formation Microscanner programs by inviting presentations by appropriate Principal Investigators. These investigators should be prepared to detail how their efforts

fold in to the overall scientific operations of the ODP; contacts with and comments from user groups represented by Co-Chiefs and Thematic Panels are recommended. The DMP is cognizant that the subcontractors are financed in part by their host countries, and it commends this support.

The DMP commends Beth Pratson for her dedication to the BRG's effort on quality control. Several members of the DMP are associated with nuclear waste programs, and they know how difficult quality control issues are to address.

c. Results of Logging Operations at Barbados

Frank Filice reported that the logging operations at Barbados saw the first deployment of Logging-While-Drilling (LWD) technology in the in the ODP, it enabled for the first time the upper 70-90 meters of an open hole to be logged, and it enabled the first a complete suite of logs in an accretionary prism. The scientific party was ecstatic with the results, and no real problems were encountered. Core-log correlations from hole to hole are very encouraging. One difficulty was that the rate of penetration (50-60 meters/hour) was too fast to enable good spectral gamma ray data (15 meters/hour is a maximum optimal speed). Caliper data were not obtained, but should be available in future operations.

Lysne noted that Leg 160 will encounter an accretionary prism in the Mediterranean, and he posed the question: Should LWD be included in the leg? It was noted that Barbados operations cost about \$172K, and that this cost was lower than anticipated costs in the Mediterranean due to logistical issues. Based on the enthusiastic report made by the Barbados scientific team, the DMP makes the following Recommendation to PCOM:

94-13 The DMP recommends that Logging-While-Drilling be an integral part of the Leg 160 operations since sloughy hole conditions characteristic of accretionary prisms will be encountered. Historically such hole conditions have thwarted conventional logging attempts; the success at Barbados demonstrates the feasibility of Logging-While-Drilling technology and the value of log data obtained in accretionary prisms. The estimated cost of this effort is \$250K.

d. Status of Schlumberger Tools for use at TAG

Filice reported that the Schlumberger tools have been rotated through a factory inspection, temperature tests were complete, and the tools were ready for TAG.

e. Status of Shipboard Systems

Filice noted shipboard systems necessary to the logging program wear out or become obsolete, and that a method is in place to enable upgrades. Such systems include computers for the Downhole Measurements Lab, and an Ethernet connection between the Lab and the Schlumberger MAXIS computer unit. Filice asked the DMP to comment on the services provided by the BRG on board ship, and to suggest changes if appropriate.

The DMP will continue to review this matter, but there appears to be no pressing issue that needs attention. Lysne suggested that costly upgrades be made a line item in the budgetary input from the BRG to the Spring meeting of the DMP. They then will be discussed in the context of the overall program effort.

f. New Technologies

Hezhu Yin, a new scientist with the BRG, discussed the use of shear-wave logging tools and their special application to gas hydrates. Yin had simulated hydrates using mixtures of water and sand, and tested their acoustic properties as the mixture was cooled through the freezing point. He cited other experiments that suggest the shear velocity is greater in free gas layers than in hydrate layers, and he noted that this event needs to be examined by a shear-wave tool. He thus suggested that shear-wave velocity measurements be made in conjunction with future hydrate legs.

g. BRG Logging Brochures

Deborah Barnes presented proofs of logging brochures that she is developing for the BRG. These brochures give a two-page overview of what tools do, how the data are interpreted, and a sample log. The intended audience is shipboard scientists and others who are proposing work that could take advantage of logs. Information will accompany log data available on CD-ROMs, on the shipboard computing system, and on the Internet (not ready yet). Hard copies will also be available. The DMP was quite impressed with the quality of the work. Consequently it makes the following Recommendation to PCOM:

94-14 The DMP recommends that the Logging Brochures currently under development at the BRG be given distribution through out the JOIDES Panel Structure, and necessary funds be allocated for this thrust. Past experience indicates that the cost will be about \$20K.

The DMP commends Debbie Barnes for her efforts to promulgate the Downhole Measurements Program.

5. SCIENCE OPERATOR'S REPORT

a. Deployment of CORKs at Barbados

Adam Klaus reported that CORKs experienced a few deployment problems in that the holes tended to fill due to sediment entry; one hole was over pressured and water was produced at the rig floor. Some questions remain as to how well sealed the holes are since troubles with the latching mechanism on the CORKs occurred.

b. VSP Experiment at Barbados

Lysne noted that the VSP experiment at Barbados had been reviewed by the DMP at its Santa Fe meeting (Fall, 1993), and the DMP suggested that it not proceed due to implementation difficulties in cementing a casing into a sloughy formation. PCOM had overruled this recommendation, and the experiment went forward. Lysne further noted that the implementation had caused a difficult budget situation at ODP/TAMU in that explosives were used as sources, and shipboard safety systems had to be modified hastily to accommodate them. Consequently, PCOM has adopted a new policy that it will review all add-on experiments that have the potential of causing budgetary embarrassments.

Klaus reported that the actual implementation of the VSP experiment went well. Explosive time-bombs were deployed with about 24 hour fuses, the VSP experiment reentered the hole properly, and nearly all of the explosives detonated on schedule. However, cement bond logs indicated that the casing-formation bond was poor. Yin, who was on board during the VSP exercises, noted that the data sampling rate may have been too slow due to the constraints of the MAXIS recording computer used during the shear-wave VSP. However, reflections from the decollement were observed in the data from the zero-offset VSP experiments.

The DMP is disturbed that add-on experiments originating outside of the JOIDES structure may have undergone superficial reviews in regard to feasibility and cost, that insufficient concern may not have been applied to the unique requirements of ODP research, and that panels are asked to comment on experiments without being given sufficient time to digest pertinent information. The Panel is also concerned that its advice can be overridden, perhaps for political reasons. Thus, the DMP makes the following Recommendation to PCOM:

94-15 The DMP recommends that add-on experiments be subjected to a uniform scientific and feasibility review by appropriate JOIDES Panels, and that a minimum of six months time be allocated for this task. More time will be required if the experiment is unique, difficult, or if information given to the panels is inadequate.

6. PCOM ACTIONS CONCERNING RECENT DMP RECOMMENDATIONS

Kiyoshi Suyehiro reported that PCOM had taken for following actions dealing with DMP Recommendations made at the Uppsala Meeting:

94-1 Concerning In-Situ Stress Measurements. Accepted by PCOM

94-2 Concerning Flexible Funding for In-Situ Stress Measurements. PCOM was unsure what was meant by "flexible funding". Lysne explained that the DMP needs support from the Thematic Panels regarding in-situ stress measurements (DMP Recommendation 94-1), and this support may materialize after the BRG budget is fixed. Thus a contingency fund must be available to support appropriate

add-on science. Lysne will ask PCOM to reconsider this recommendation since DMP Recommendation 94-1 is meaningless without it.

94-3 Concerning the allocation of responsibility for continuous-measurement (BRG) versus point-measurement (ODP/TAMU) third-party tools. At PCOM, Tim Francis had raised the issue that the ADARA tool usually is used as a point tool, but it does record temperature data on the way into the hole. Thus, the delegation of responsibility is in question. Since this latter application of the ADARA tool is not common, and since the tool is not certified as a continuous log, the DMP does not see a difficulty with assigning third-party responsibilities of the ADARA tool entirely to ODP/TAMU. With this understanding, Lysne will ask PCOM to reconsider this recommendation.

94-4 Concerning Development Status for the Pressure/Temperature Memory Tool. Accepted by PCOM.

94-5 Concerning the WHOI High-Temperature Borehole Instrument. PCOM was confused in that the DMP did not state that it had no objection for the use of this tool at TAG, whereas it did make positive statements regarding other tools. Lysne noted that through such a statement, the DMP would accept responsibility for use of the tool, and the DMP did not have sufficient confidence in the WHOI tool for it to take such a position. Lysne further stated that the PCOM action of recommending this tool for TAG was tantamount to PCOM's accepting responsibility for the tool. The point is moot since the tool was destroyed in an autoclave test.

94-6 Concerning a Fluid Sampling Experiment at Barbados. Accepted by PCOM.

94-7 Concerning the DMT Borehole Televier. Accepted by PCOM

94-8 Concerning the CSMA Resistivity Tool. Accepted by PCOM

94-9 Concerning the German Magentometer Tool. Accepted by PCOM

94-10 Concerning the French Temperature Tool. Accepted by PCOM.

94-11 Concerning an Engineer at the BRG. Tabled by PCOM due to a lack of funds. Suyehiro noted that he was raising the question as to the ability of Japan to fund a full-time engineer at the BRG to enable support for third-party tools. The DMP commends this effort. Lysne, considering the need for technology development in scientific programs such as the ODP and San Andreas, posed the question: Should an international consortium for development be formed? The DMP looks forward to a dialogue on this issue.

7. STATUS OF THIRD-PARTY TOOLS

Frank Filice reported on the BRG efforts to certify tools for TAG. In lieu of actual field tests, autoclave tests were run at the Schlumberger facilities in Houston. Due to various difficulties, these tests were not on the functional capabilities of the tools; they did interrogate the integrity of the pressure housings to states of about 7,000 pounds-inch⁻² and temperatures to about 470°F. The results of the tests are:

- a. CSMA Resistivity Tool. Failed autoclave tests.
- b. German High-Temperature Magnetometer Tool. Passed autoclave test, ready for TAG.
- c. French High-Temperature Temperature Tool. Some problems with leakage. May be fixed in time for TAG.
- d. WHOI High-Temperature Borehole Instrument. Failed autoclave tests (Dewar destroyed by internal pressure).
- e. Pressure/Temperature Memory Tool. Passed autoclave test, ready for TAG.

The DMP commends Frank Filice and his colleagues in the BRG and at Schlumberger for pushing through the autoclave tests on a difficult schedule, and under somewhat adverse conditions.

8. PANEL DISCUSSION ON THIRD-PARTY TOOL CERTIFICATION

a. DMP Requirements for Land Tests

Lysne noted that the specific requirements for land tests were not spelled out in the Third-Party Tool Guidelines. These specifications need to be formalized so that plans can be made by tool proponents, the BRG, and ODP/TAMU. After some discussion, the DMP adopted the following requirements for land tests of third-party tools:

1. **Pressure Housing Test.** The DMP requires a test in a well or autoclave to replicate the pressure and temperature environment expected in ODP operations.
2. **Electronics Test.** The DMP requires that the uphole and downhole electronics be demonstrated to function properly under anticipated operating conditions. This means that components subjected to high temperatures be tested at temperature, perhaps in an oven, and that the duration of such tests be consistent with the expected duration of ODP operations.
3. **Vibration Test.** The DMP requires that tools and surface equipment be subjected to vibration tests commensurate with use, both in shipping and

downhole. Standards for these tests are to be the same as applied to commercial tools, and tests may be done best at commercial facilities.

4. **Wireline Test.** The DMP requires that tools using active wirelines to transmit data and receive power demonstrate successful operation on wirelines used in the ODP.

5. **Systems Test.** The DMP requires that a logging system demonstrate an ability to produce meaningful data. This means that a systems test that exercises simultaneously all components (downhole tools, uphole controllers, data processing algorithms, interfaces to shipboard and BRG data computers, etc.) be passed. Ideally, the systems test would be performed in an appropriate well. If the cost of such a test is prohibitive, other scenarios will be considered by the DMP.

An essential feature of DMP actions is the appointment of a Watchdog assigned to each tool progressing through the third-party system. This Watchdog will aid in the interpretation of the Third-Party Tool Guidelines and the above requirements (e.g., well tests versus autoclave/oven tests), and report on progress periodically to the DMP. The Watchdog will not assume responsibilities assigned to the Principal Investigator, to the BRG, or to the ODP/TAMU as are stated in the Third-Party Tool Guidelines. The Watchdog is empowered to make decisions on behalf of the DMP should a fast response be necessary. The DMP philosophy is to be pragmatic and flexible in regard to third-party tool issues, but the DMP must uphold the Third-Party Tool Guidelines in order to honor its responsibilities to the ODP.

b. DMP Requirements for Tool Calibration

Tool calibration is needed to insure that a tool can generate useful information. It is the responsibility of the Principal Investigators to provide the scientific rationale for a tool, and to demonstrate that the calibration of the tool is sufficient to meet the stated scientific goals. Such a demonstration can occur in an appropriately calibrated test well or test pit, and/or by convincing theoretical arguments based on the detailed physics of tool operation coupled with laboratory experimentation. A DMP Watchdog will become familiar with calibration issues for each third-party tool, and aid the Principal Investigators, the BRG, and ODP/TAMU in presenting them to the DMP. The DMP will then issue a recommendation concerning calibration needs.

9. LOGGING OPERATIONS IN OUTYEAR DRILLING PROGRAMS

David Goldberg presented, in spreadsheet form, the anticipated downhole measurements for the ten proposals contained in the current Prospectus. He also included two proposed legs, Alboran Sea and Return to 735B, since he felt that these proposals might receive PCOM attention in College Station. A DMP-modified copy of this spreadsheet is attached as an Appendix to these Minutes; Goldberg will present this spreadsheet to PCOM. To amplify this spreadsheet members of the BRG had written a detailed FY96 Logging

Prospectus. This Prospectus will be used as a basis for BRG-Scientific Party interactions on legs chosen for ODP action.

The DMP went through the proposed legs and flagged issues of unusual scientific importance, issues that could cause expenditures over and above normal operating expenses, and issues where tool availability was in question. Of particular importance is the strong possibility of a favorable DMP Recommendation concerning Logging-While-Drilling exercises for Costa Rica Accretionary Wedge, and special operations including televiewer logs, VSPs, CORKs, and magnetic susceptibility measurements on multiple legs. It is not clear if scientific justification is sufficient to enable ODP or other funds to be spent on these operations; they are flagged by the DMP so that the Thematic Panels or independent Principal Investigators can take action in a timely fashion.

The DMP is cognizant of the PCOM request that legs with exceptional requirements be identified prior to the PCOM review of the Drilling Prospectus. The DMP in conjunction with the BRG and ODP/TAMU can attempt to foresee these legs, but the task is difficult. Sometimes measurements are asked for as part of a general wish list that possess little real interest on the part of the scientific community. Such suggested measurements are difficult to identify, even by the Thematic Panels that are more intimate with proposals than the DMP. Hence there is a tendency to approve all asked-for experiments so as not to degrade the scientific prospects of a leg. Alternatively, advantages of in-situ stress measurements, LWD exercises, and other unique opportunities often emerge after a leg is scheduled and scientific interest is peaked within the community. Stated otherwise, the global issue is how to fund add-on science not imagined by proponents of legs in the proposal stage. DMP Recommendation 94-2 is an example of such a problem.

The DMP thanked David Goldberg for providing a complete briefing on prospective logging thrusts.

10. CONSEQUENCES OF DIAMETRIC CONSTRAINS IMPOSED ON TOOLS BY BHAs

Richard Jarrard investigated the problems associated with diametric constrains on logging tools imposed by the bottom-hole-assemblies used in the ODP. His findings are:

<u>BHA</u>	<u>Bit Dropped</u>	<u>Inside Diameter</u>	<u>Usual Operation</u>
XCB	yes	3.8 inches	yes
XCB	no	3.82	no
RCB	no	<2.0	no
RCB	yes	3.92	yes

The ODP guidelines for tool deployment specify a diameter equal to or less than 3.67 inches. Most tools have an outside diameter of 3.5 to 3.67 inches. The German

Magnetic Susceptibility tool has a diameter of 3.75 inches, and hence is incompatible with most ODP operations. This tool is useful for core-log integration, and it is featured in several of the proposals listed in the Appendix to these Minutes.

Gilles Dubuisson believes there is no technical reason that Schlumberger cannot modify the German Magnetometer Tool to be applicable to ODP operation. The cost of such a modification is unknown. The BRG will raise the issue with Schlumberger in the near future.

11. DOWNHOLE MEASUREMENTS IN HYDRATE ZONES

Phil Nelson reviewed the literature concerning logging in hydrate zones and concluded that we have some way to go before we understand the physical properties of hydrates since there are no good mixing rules. The density is similar to ice, but the thermal conductivity is quite different. Furthermore, the velocity of hydrate-sediment mixtures appears to be anomalous.

Examples of hydrate logging include ARCO efforts off the north slope of Alaska, ODP Leg 112, DSDP hole 570, and others. One referenced team noted: "...it has become increasingly apparent to us that the determination of permafrost in open hole logs is by no means a straightforward task". From DSDP Hole 570 one sees high resistivity, high sonic velocity, but low density in a zone interpreted as a massive hydrate. For hydrates, logging objectives would be detection, physical property determination (particularly for sonic velocities), mode of occurrence (massive versus disseminated), and volume of material. Much information can be gleaned from the standard logging suite; repeat logs would be very beneficial if the hole is changing with time.

The panel noted that a VSP experiment conducted through the hydrate zone would be particularly illuminating, but a Principal Investigator is needed to write an appropriate proposal. The Panel considered Logging-While-Drilling experiments, but concluded that they were not necessary unless dictated by safety considerations. Finally, a televiewer would be useful in determining the mode of occurrence; an analog or full-waveform digital tool would be preferable since its data can be processed to reveal subtle variations in acoustic impedance. Again, a Principal Investigator is needed to promulgate the effort within the Thematic Panels.

12. LOGGING-WHILE-CORING

At the Uppsala meeting, Robert Desbrandes presented ideas concerning Logging While Coring, a method of obtaining log data using memory logging tools imbedded in the core tube. Desbrandes reported that he had continued his discussions with Anadrill, and found that resistivity at the bit, focused resistivity, gamma ray, weight on bit, torque, and relative motion between the core tube and core barrel are straight forward measurements. This means that information pertinent to core-log integration as well as drilling parameters could be obtained using technology that is nearly on-line. However, Anadrill has no immediate industrial application (coring is not common in industry holes), so the

technology is tabled. Furthermore, the feasibility of adapting the technology to ODP bottom-hole-assemblies needs investigation.

The Panel recognized that Logging While Coring could revolutionize the Downhole Measurements Program since it would allow logging in nearly real time. It surpasses Logging While Drilling such as used at Barbados in that data are retrieved after each core run, not after each bit trip, and it should be less expensive.

Lysne suggested that the discussion on Logging-While-Coring be continued into the next topic which dealt with innovation.

13. TECHNICAL INNOVATION

At Uppsala, the Panel had noted a BCOM mandate that 4% of a contractor's budget be spent on innovation. The Panel had begun a list of topics that deserved support (see Uppsala Minutes, Section 9), and the current discussion was opened by asking for additions to this list. Additional items considered for support were: a Logging While Coring Feasibility Study, High-Temperature Logging Systems, Development of a Shear Wave Logging Tool, and Continued Logging While Drilling operations. The Panel then voted to prioritize the list. The leading candidate is Logging While Coring; High-Temperature Systems was a close second..

In view of the Panel discussions, following Recommendation is made to PCOM:

94-16 The DMP recommends that a feasibility, practicality, and cost study be conducted to advance the concept of Logging While Coring in the ODP. The study would be conducted in FY96, and it would be a joint effort between the BRG, ODP/TAMU, and a logging service company, with the DMP and TEDCOM acting in an advisory role. Appropriate funds, not to exceed \$30K, are sought under the BCOM mandate that 4% of a contractor's budget be spent on innovation. Significant additional funds may be sought in FY97 pending the results of the requested study.

14. HOUSEKEEPING ISSUES

Lysne noted to the Panel that three members would be rotating off after the present meeting, and that candidates for their replacement were sought. Ideally, these candidates should come from the industrial sector since two of the three rotating members were from industry, and since an imbalance between industry and academia had occurred when Carl Sondergeld (Amoco) was replaced by Karen von Damm (University of New Hampshire) two years ago.

15. NEXT MEETING

Pending PCOM approval, the next meeting of the DMP will be at Leicester, United Kingdom, March 8-10, 1995. Andrew Green will host.

16. ADJOURN

The Chair thanked, on behalf of the entire Panel, Robert Desbrandes, Mark Hutchinson, and Mike Williams for their dedication to the Panel over the past several years. He also thanked Frank Filice and all members of the Borehole Research Group who had extended a warm welcome to the Panel during its operations at the Lamont-Doherty Earth Observatory.

The Fall Meeting of the JOIDES Downhole Measurements Panel was adjourned on 1200 hours, September 23, 1994.

Respectfully submitted,



Peter Lysne
Chairman, JOIDES DMP

APPENDIX

A two-page spreadsheet outlining logging operations in candidate outyear operations is attached to these Draft Minutes (see **Section 9, LOGGING OPERATIONS IN OUTYEAR DRILLING PROGRAMS**).

		1996 Logging Prospectus-Summary					
TOOL		Bahamas Transect	Carib. Basalt Prov.	Caribbean Ocean History	Costa Rica Accret. Wedge	E. Juan de Fuca	California Margin
		Eberli et al.	Donnelly et al.	Sigurdsson et al.	Silver et al.	Davis et al.	Lyle et al.
Standard							
1	sonic	x	x	x	LWD, x	x	x
2	resistivity	x	x	x	LWD, x	x	x
3	density	x	x	x	LWD, x	x	x
4	neutron	x	x	x	LWD, x	x	x
5	geochemical	x	x	x	x	x	x
6	gamma ray	x	x	x	LWD, x	x	x
7	caliper	x	x	x	LWD, x	x	x
8	FMS	x	x	x	x	x	x
9	temperature tool	x	x	x	x	x	x
Special							
10	televiewer						\$
11	VSP				\$		
12	MAG/SUSP-GHMT	\$	\$	\$			\$
13	drillstring packer/CORK				\$	\$	
14	fluid sampling	x			x	x	x
Third-Party							
15	Hi-T MAG-BGR		x				
16	Hi-T Resistivity						
17	Hi-T BHTV						
18	Hi-T Temperature						
LWD=Logging While Drilling (\$)							
\$=Extra Expense							

1996 Logging Prospectus-Summary						
TOOL	Return to Iberia	SE Greenland Volc. Rift	Western Atl. Sed. Drifts	Sedimented Ridges II	Alboran Sea	Return to 735B
	Narm N-V II	Larsen et al.	Kelgwin et al.	Franklin et al.	Comas et al.	Dick et al.
Standard						
1	sonic	x	x	x	x	x
2	resistivity	x	x	x	x	x
3	density	x	x	x	x	x
4	neutron	x	x	x	x	x
5	geochemical	x	x		x	x
6	gamma ray	x	x	x	x	x
7	caliper	x	x	x	x	x
8	FMS	x	x	x	x	x
9	temperature tool	x	x	x	x	x
Special						
10	televiwer	\$	\$		\$	\$
11	VSP				\$	\$
12	MAG/SUSP-GHMT		\$		\$	
13	drillstring packer/CORK			\$		x
14	fluid sampling			x		
Third-Party						
15	Hi-T MAG-BGR					x
16	Hi-T Resistivity					
17	Hi-T BHTV					
18	Hi-T Temperature			x		
LWD=Logging While Drilling (\$)						
\$=Extra Expense						