

DRAFT MINUTES

MEETING OF THE JOIDES DOWNHOLE MEASUREMENTS PANEL TEXAS A&M UNIVERSITY COLLEGE STATION, TEXAS SEPTEMBER 26-28, 1995

EXECUTIVE SUMMARY

Cooperative Research and Development

The Downhole Measurements Panel is concerned that tight budgets are forcing a retrenchment of technological development, and that such a path is detrimental to innovative science. The panel recognizes that the situation is not likely to be transitory, and means should be sought to leverage available resources. Consequently, it initiated an investigation into cooperative dealings with other scientific drilling programs and industry. As a result of a lengthy and optimistic discussion, the panel wishes to make the following general statements:

1. Science is the core business of the ODP. Development must follow, not lead the scientific objectives of the program.
2. The time is ripe for cooperative efforts. The JOIDES panels together with JOI should explore such a thrust in an expeditious, aggressive, and in-depth manner. Success will inevitably lead to scientific innovation, and new and necessary ways of doing the business of science.
3. Difficult issues must be addressed, not the least of which is who owns technology developed with cooperative funds. While some decisions will fall outside the purview of the ODP community, impetus for decision making can only come from grass roots support within the entire JOIDES structure.

In addition, the panel recognized that a first step toward cooperative efforts would be taken if prudent actions were agreed to by the world-wide logging community. The DMP, being impressed by the scope of the OD21 initiative as it is taking shape in Japan, feels that discussions between it and the Science and Technology Agency/Japan Marine Science and Technology Center could provide an initial forum for molding cooperative programs. Thus, the DMP makes the following statement:

The DMP suggests that STA/JAMSTEC institute an international working group to gather ideas for downhole measurements in the twenty-first century. A first task of this group might be to generate a white paper on future downhole measurements utilizing the format of a workshop. Subject to PCOM approval and

an invitation from Japan, the DMP proposes to further this process by holding a joint meeting of DMP and STA/JAMSTEC at the Spring meeting of the DMP. If convenient, this meeting would follow the Eighth International Symposium on the Observation of the Continental Crust Through Drilling since members of the continental drilling community would be available to provide input to the workshop.

Efficacy of the Logging Program

Over the past eighteen months the DMP has conducted a review of the Downhole Measurements Program, and the reader is referred to the present minutes, and the minutes of the two previous DMP sessions, for a synopsis of discussions. This review included interviews with the management and staff of the BRG, input from invited speakers, and the results of a survey of about fifty recent Co-Chiefs and JOIDES Logging Specialists.

The DMP found that the BRG was diligent in addressing the jobs at hand, and it strove for excellence in an environment of declining budgets. Furthermore, it found support for the overall Program, and a recognition that it contributes to the scientific goals of the ODP. The DMP did identify two actions that would lead to program enhancement, and one area that deserves further investigation.

1. As strong as it is, the Downhole Measurements Program cannot do all things for all people. Thus, the capabilities, weaknesses, and goals of the Program should be carefully articulated to the ODP community by the BRG, and feedback noted. Portions of this effort could be accomplished simply through a closer physical integration of the logging scientists and others on the ship, and through the avoidance of logging jargon and the over-selling of capabilities. A documented vision of the future tying the Program to the goals of the community would insure support, even in an era of declining budgets.
2. Many downhole measurements are difficult, and success cannot be assured. Thus operational plans, including plans for remedial action, should be in place, and fully understood by all interested parties. A better integration of the ODP/TAMU and BRG efforts, both on land and at sea, would lead to easier solutions of difficulties.
3. The Schlumberger contract for logging services remains a document of mystery. The DMP was unable to obtain information concerning contractual issues while knowledgeable panel members felt that cost savings and better service might be achieved through negotiations. Further investigation is in order.

Core/Log Integration, and the Information System

The DMP reviewed the Janus System for information integration, and was pleased with the progress to date. However, the panel was concerned that the separation of log data

from other shipboard data was detrimental to the science produced by the ODP. Thus, the DMP makes the following recommendation to the PCOM:

95-1 The DMP recommends that the Borehole Research Group develop a plan to insure processed log data are transparently available to the average user of other ODP-generated data sets. This plan can allow for a temporary separation of data; the log data being at LDEO while being put in final form, and other data at TAMU. However, it should provide a path for the eventual integration of all data into a common base. The BRG and TAMU should work together to develop the appropriate plan, including costs, schedule, and responsibility issues, and present it to the DMP at its Spring meeting.

Third Party Tools for Leg 164 (Gas Hydrates)

Several logging systems were presented to the DMP for possible use on Leg 164. None of these systems had passed the Third Party Tool Guidelines which are intended both to insure reasonable chances for success, and to insure that commingled funds in the form of ship's time are not spent on programs of a national origin without the consent of the JOIDES system.

The DMP is concerned that some Principal Investigators procrastinate addressing the Guidelines until sailing is imminent. However the DMP recognizes that funding for third party tools is not as expedient as one could hope, and that third party tools can make an important contribution to ODP science. In view of these conflicting requirements, the DMP instituted a Watchdog System to monitor the progress of tools, and gave the Watchdogs the authority to speak for the DMP (see DMP Minutes, September 21-24, 1994). This system has been put into operation. Thus, in view of progress made to date, the DMP makes the following recommendations to the PCOM:

95-2 The DMP recommends that, subject to a final acceptance by the DMP Watchdog (Makoto Yamano), the Davis/Villinger temperature tool be tested on Leg 164.

95-3 The DMP recommends that, subject to a final acceptance by the DMP Watchdog (Andrew Green), the WHOI three-component seismic tool be used for VSP experiments on Leg 164.

95-4 The DMP recommends that, subject to a final acceptance by the DMP Watchdog (Arthur Cheng), the LDEO shear sonic tool be tested on Leg 164.

In all cases, the DMP Watchdogs are cognizant of the necessary tests, and they have been in contact with the principal investigators. It is the responsibility of the investigators to convey the results of the tests to the Watchdogs, and the Watchdogs to convey their findings to the Co-Chiefs of Leg 164 through the Chairman of the DMP. The DMP is looking forward to a report on the above tools at its next meeting.

Logging-While-Drilling for Costa Rica

The DMP recognizes the advantages of LWD for Costa Rica, and makes the following recommendation to the PCOM:

95-5 In view of the difficult history of conventional logging in accretionary prisms, the possibility of losing expensive equipment down hole, and the scientific gains that will be achieved from obtaining good log data, the DMP recommends that LWD proceed for the Costa Rica exercises.

Next Meetings

Subject to the concurrence of the PCOM and an invitation from the Japanese, the DMP will hold its next meeting in Japan. If possible, the date will be chosen so that an exchange of ideas can occur between DMP members, attendees of the Eighth International Symposium on the Observation of the Continental Crust Through Drilling, and proponents of the Japanese OD21 Program. The Eighth Symposium will be held in Tsukuba, February 26-28, 1996.

A possible venue for the following Fall meeting is San Diego, California concurrent with a port call presently scheduled for October 19-23, 1996.

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**MEETING OF THE JOIDES DOWNHOLE MEASUREMENTS PANEL
TEXAS A&M UNIVERSITY
COLLEGE STATION, TEXAS
SEPTEMBER 26-28, 1995**

Chairman:	Peter Lysne	US
Panel Members:	Dan Arnold	US
	Arthur Cheng	US
	Gilles Dubuisson	France
	Andrew S. P. Green	UK
	Richard D. Jarrard	US
	Philip H. Nelson	US
	Henry A. Salisch	Australia-Canada
	Richard Wendlandt	US
	Juergen Wohlenberg	Germany
	John Woodside	ESF
	Makoto Yamano	Japan
Liaisons/Guests:	Adam Klaus	ODP/TAMU
	Jeff Fox	ODP/TAMU
	Bruce Malfait	NSF
	Rakesh Mithal	ODP/TAMU
	Carlos Pirmez	BRG/LDEO
	Tom Shipley	Co-Chief/Barbados
	Matthew Stahl	ODP/TAMU
Apologies:	David Herrick	US
	Steve Hickman	US
	Karen Von Damm	US

1. WELCOME AND INTRODUCTIONS

The second meeting of the JOIDES Downhole Measurements Panel (DMP) for 1995 was called to order at 0900 hours, Tuesday, September 26 at the offices of the Ocean Drilling Program (ODP) in College Station, Texas.

Peter Lysne welcomed and introduced Arthur Cheng, the new US representative (from The Massachusetts Institute of Technology), and John Woodside, the new European Science Foundation (from Vrije University, The Netherlands). He then announced that Karen Von Damm had stepped off the Panel to assume the Chair of the RIDGE Committee, and that Steve Hickman would retire after the present meeting. He solicited nominations to replace these two US representatives; this issue was revisited later in the meeting.

Lysne had received apologies from Hickman and David Herrick, both of whom had commitments pursuant to their employers.

Lysne announce that the Planning Committee (PCOM) had reviewed the DMP nominations pertaining to the next Chair of the Panel, and that Richard Jarrard had received the honors. Lysne noted that Jarrard had a long experience with the Downhole Measurements Program including the responsibilities of Chief Scientist when he was at Lamont-Doherty Earth Observatory (LDEO), and that he was very confident that Rich would make important contributions to the program in his new position. The formal transfer will occur after the PCOM meeting in December; Jarrard and Lysne had been in touch and the transfer process was taking place smoothly.

Lysne then introduced DMP guests: Jeff Fox, the new Director of Science Operations for ODP work centered at Texas A&M University (TAMU), and Bruce Malfait, the individual immediately responsible for ODP operations at the National Science Foundation (NSF). Lysne noted that Tom Shipley, a Co-Chief for the Bahamas operations, had been invited to present his views as to the efficacy of the logging program on Wednesday, and that he would be introduced when he arrived. Lysne then introduced Carlos Pirmez, the new liaison from the Borehole Research Group (BRG) centered at the LDEO. General introductions were then made around the room.

Lysne recognized Adam Klaus as the host for the present meeting. Adam then gave his welcome to the DMP. Extracurricular activities were discussed.

Fox also welcomed the DMP to College Station. He recognized that the JOIDES structure of panels was comprised of volunteers, and that these individuals were responsible for the success of the ODP. He viewed one aspect of his job was to make efficient ties between his offices and the JOIDES panels by increasing communication on all fronts. Fox commented that there were over 1,000 engineers on the staff of TAMU, and he hoped that some could find ways in which to help the program in technical areas.

His immediate goal was to make the ODP function cheaper, better, and faster, and to make the JOIDES Resolution a better platform for scientific investigation.

The Draft Agenda had been circulated to DMP members, liaisons, and guests. Additions and changes were sought. None were forthcoming so the Draft Agenda was accepted as the working document for the meeting. Lysne commented that the order of Agenda items would likely be disrupted to reflect schedules and logistics. Furthermore, new business would be accepted contingent upon time constraints.

Lysne noted that the DMP adopted themes for review that covered more than one session. Two years ago, the panel had concerned itself with Logging-While-Drilling (LWD) for the Barbados operation, and high-temperature tools for TAG. Last year the DMP focused on Third-Party-Tool requirements, and initiated a review of the Downhole Measurements Program. The present agenda reflected a continuation of this latter thrust, along with a new thrust initiated by the Joint Oceanographic Institution, Inc. (JOI) regarding cooperative research and development agreements for technology development.

2. MINUTES OF THE PREVIOUS DMP MEETING, LEICESTER, UK.

Pirmez passed on comments from David Goldberg, the Director of the BRG, that the Leicester minutes contained an error on pages 10 and 12 in that the staff of the BRG was: 12.0 full time equivalents at LDEO, 3.5 at Leicester, and 3.0 at Marseilles. Lysne noted that the minutes had been passed to the managers of the BRG before seeing general distribution, and that some changes in manpower allocations were made at that time. There was uncertainty as to whether Goldberg's present figures reflected current manpower, or manpower at the time of the March meeting, which would be the appropriate values for inclusion in the minutes. The issue of a possible error in the March DMP Minutes was not resolved.

Other items in the Draft Minutes were not questioned, and they are accepted by the DMP to be a fair representation of proceedings at Leicester.

3. INITIATIVE ON COOPERATIVE RESEARCH AND DEVELOPMENT

Lysne initiated discussions by noting that the PCOM had had difficulty developing a Long Range Plan due, in part, to deficiencies in coring and logging in some environments. The Executive Committee (EXCOM) had recognized this difficulty and encouraged technology development since it led to scientific innovation that is the heart of the ODP. However, budgets are tight, and means of cost sharing with other scientific and industrial programs would be very welcome. David Falvey, the overall Director of the ODP, had consequently come up with a plan for cooperative research and development agreements, and passed it on to EXCOM. These agreements were based on Cooperative Research and Development Agreements (CRADAs) used by US government institutions such as the Department of Energy. Falvey's plan, as found in the PCOM Agenda Book for the

August meeting, had been passed on to the DMP before the present meeting, and members were aware of the basic idea.

Lysne reported that his home institution, Sandia National Laboratories, had about 200 CRADAs between itself, private institutions, and academia. By in large, these CRADAs led to true advances in technology since negotiations focused development on issues that were necessary and doable, and all parties had a vested interest in success since they were required to bring assets to the negotiation table. However, the present Republican Congress was not as amenable to government-shared programs with industry as were the Democrats, and the evolution of the CRADA system within the US was beginning to languish. He added that this problem was due to governmental issues that could change at any election, and that the CRADA framework was proven and should work outside of the local US environment.

Lysne noted that the DMP is not in a position to negotiate CRADA-like agreements, but it can be a champion. Championship was possible since the panel contains representatives from the industrial sector that are well versed in the technical aspects of development, the pitfalls that may be encountered, and in the history of negotiations between institutions that are sometimes competitors. Lysne hoped that these individuals would come forth at this and subsequent meetings with ideas that would lead to success. He would personally work to this end, especially as the ODP forms ties to the emerging International Continental Drilling Program (ICDP). The issue was then opened for panel discussion.

Jarrard asked what response EXCOM had to Falvey's proposal. Bruce Malfait said that the EXCOM response was supportive, and encouraged continuation of the idea-generation process. He also commented that the ODP Council, a group of individuals like himself that represent the funding agencies of member institutions, had a lengthy discussion of the proposal; debate centered about property rights for developed technology. It was a difficult subject and no resolution was made; currently ODP technology developed with commingled funds was open to all members. Malfait further commented that the property-right issue could involve some re-negotiation of the Memos of Understanding (MOUs) between member institutions and the NSF, and this would be a difficult process. Malfait further commented that the NSF supported the ODP as a package with no privileges given to any component part. This issue was reflected in the MOUs, and it would be protected by the NSF in any negotiations.

Malfait further noted that often the institutions that sign the MOUs are not the institutions of ultimate authority. For example, the NSF had to obtain the approval of the US State Department before MOUs were consummated, and similar situations exist within some member countries. Malfait then asked: What is the likelihood of benefits to the ODP from cooperative efforts?

Dan Arnold answered positively. He felt that there was strong support for cooperation within industry since many companies had cut their research and development efforts to the bone. Thus, there was a desire to work outside home institutions as was evidenced by

agreements between companies that were competitors. Arnold further commented that US patent laws have been changed due to agreements stipulated in the General Agreement for Tariffs and Trade (GATT). Now the first institution to file receives the patent, before the first to conceive the idea received it. This means that US patent law is now more in accord with that of other countries, and it should expedite the patent process on the international scene.

Arnold then raised three questions that he felt were of prime importance: (i) Does the ODP want an income stream from developed technology, or just exclusive right for use? Exclusive-right contracts are easier to negotiate. (ii) Will the ODP accept unsolicited proposals? The benefit is that new ideas flow into the system; the downside is that manpower must be devoted to a review process that may be lengthy. (iii) Who owns the results of cooperative efforts?

Several panel members were concerned that an income stream would be detrimental to the science. Andrew Green commented that successful businesses identified core activities, and that science is identified as the core activity of the ODP. Arthur Cheng noted that his home institution benefited financially from the inventions of its staff. Carlos Pirmez asked what is the business posture of the NSF? Malfait noted that the NSF supported Small Business Innovative Research (SBIR) programs that focused on needed technology through a solicitation process. Lysne asked if SBIR funds could be tapped by the ODP for development. Malfait replied that it was a possibility, but SBIR managers might turn around and approach him for support if the ODP were too aggressive. Cheng noted that the ODP has experience in drilling that could be used by industry. Arnold agreed that there were ODP items that would find favor in the outside world, especially in the oil and gas industries. He felt strongly that the thrust needs to be pursued.

Green noted that cooperation was common in the United Kingdom. Negotiations concerning patents were difficult, and problems increased rapidly as the number of participants increased. It was very easy to get bogged down with legal issues. Things moved faster if each party knew exactly what it wanted and what it was willing to offer. Arnold stated that his strategy while Vice President of Research at Halliburton was to decide what he was going to do, then tell the legal staff to set it straight in a designated number of days.

In summary, the DMP wishes to make the following statements:

1. Science is the core business of the ODP. Development must follow, not lead the scientific objectives of the program.
2. The time is ripe for cooperative efforts. The JOIDES panels together with JOI should explore such a thrust in an expeditious, aggressive, and in-depth manner. Success will inevitably lead to scientific innovation, and new and necessary ways of doing the business of science.

3. The JOIDES community should decide if it wants the benefits of an income stream from cooperatively developed technology at the expense of more difficult negotiations.

4. The JOIDES community should decide if it will accept unsolicited proposals that lead to new ideas, but drain manpower in the review process.

5. Other difficult issues must be addressed, not the least of which is who owns technology developed with cooperative funds. While some decisions will fall outside the purview of the ODP community, impetus for decision making must receive grass roots support from the entire JOIDES structure.

Lysne commented that the DMP will revisit cooperative work later in the day when it addresses a request from the Japanese regarding downhole measurements in their OD 21 program. The Japanese thrust could provide a focus for things that can be done immediately.

4. REPORT FROM THE NATIONAL SCIENCE FOUNDATION

Malfait commented that the Fiscal Year 1996 budget, which begins on October 1, is the same as the current year, and this constraint is likely to continue. Currently the NSF is funding 62.5% of the ODP, a figure that is up from past years due to a re-entrenchment of the Canadian contribution. Partners are being sought to augment the Canadian/Australian consortium, and discussions with South Korea and a group of universities located in Taiwan are continuing. Brazil and Mexico also have been approached.

Malfait noted that JOI and EXCOM are investigating the issue of less-than-full membership opportunities, and such plans may be instituted in the near future. These memberships give countries an opportunity to try the ODP system, they limit the advantages to less than that of full members in lieu of a lower membership cost, and they are not permanent.

The NSF has funded the offset VSP experiment planned for the Hydrates Leg. The NSF is also funding an evaluation of sea-floor *versus* borehole seismometers at previously-drilled holes near Hawaii, and a return to the CORKs deployed during the Barbados operations.

5. JAPANESE INITIATIVE ON RISER-PIPE DRILL SHIP

Makoto Yamano led a discussion concerning the Japanese initiative on a new phase of oceanic drilling, the OD21 Program. This was begun by passing out a pamphlet giving the rationale and goals for a new drill ship.

Rationale for a new program is found in the many success of the old Deep Sea Drilling Project (1968-1984) and the ODP that was initiated in 1985. Frontier areas of research

involve a reconstruction of the Earth's environmental changes based upon long undisturbed cores collected at widely separated sites, the establishment of a whole-Earth tectonics theory by drilling deep holes that go through the ocean crust and allow emplacement of permanent laboratories, and by providing a basis for the understanding of plate-subduction leading to disaster prediction capabilities.

Implementation of the OD 21 Program is centered about a proposed ship that has a riser-pipe capability so that hydrocarbon regions can be drilled safely. The ship would initially have a 2.6 km drilling capability that would be increased to 4 km as the program evolved. The Science and Technology Agency/Japan Marine Science and Technology Center (SAT/JAMSTEC) is leading the thrust for the new program, and it is meeting with the JOIDES panel structure seeking inputs as to how the proposed system could evolve. Specifically, the DMP was asked to comment on how the Downhole Measurement Program could take advantage of the new platform.

The Japanese initiative was met with enthusiasm by the DMP. Arnold noted that there were many exciting possibilities for the development of new measurements hidden in the archives of the hydrocarbon industry that had not surfaced for one reason or another. These measurements were often of a scientific bent, and an initiative to bring them out would aid the scientific community as well as provide a focus for cooperative research and development thrusts. Opportunities like logging-while-coring, underground laboratories, and borehole imaging using techniques other than electrical or sonic were raised by the panel.

In general the panel expressed strong support for the Japanese efforts, but were uncertain as how to proceed in establishing a working relationship with scientists and engineers in Japan. Also the panel recognized that input from a broader community would be useful to optimize specific measurements as well as to define the environments that would be encountered.

Lysne noted that the Eighth International Symposium on the Observation of the Continental Crust Through Drilling would be held in Japan, February 26-28, it would attract individuals interested in downhole measurements, and it might provide a forum for discussion. Other members commented that the output of any meeting should be a document, and a workshop forum would provide a needed structure. Finally, the DMP recognizes that its expertise is limited, and any proceedings should be opened internationally. In view of these remarks, the DMP makes the following statement.

The DMP suggests that STA/JAMSTEC institute an international working group to gather ideas for downhole measurements in the twenty-first century. A first task of this group might be to generate a white paper on future downhole measurements utilizing the format of a workshop. Subject to PCOM approval and an invitation from Japan, the DMP proposes to further this process by holding a joint meeting of DMP and STA/JAMSTEC at the Spring meeting of the DMP. If convenient, this meeting would follow the Eighth International Symposium on the

Observation of the Continental Crust Through Drilling since members of the continental drilling community would be available to provide input to the workshop.

6. REPORT FROM THE ODP/TAMU

a. Core/Log Integration and the Information System

Rakesh Mithal provided an update on the Janus Program that is directed toward upgrading the data management system of the ODP. The major programmatic thrust is centered within the ODP headquarters at TAMU; Tracor Applied Scenes, Inc. of Austin is developing the software and other system requirements. The system will be phased into the ODP during the course of Legs 165-168, that is in the first half of 1996.

To make matters manageable, the data upgrade has been subdivided into six user groups, some of which have been further divided into parts. Each entity contains closely-related components that possess commonality in the implementation plan, and these groups are overseen by interested scientists. Logging efforts belong primarily to Group 2A that is Chaired by Nick Piasias; Mithal suggested that comments be addressed to him.

Group 2A met in July and discussed issues dealing with calibration of shipboard measurements, the status of shipboard measurement hardware and software, the implementation of old data into the new management system, products to be produced from the data base, and logging data.

Mithal commented that preliminary log and other data will be combined in shipboard activities so that scientists can readily access them while at sea. However, when the ship reaches port, the log data will be separated and sent to the BRG for further processing. The processed data will remain at the BRG, it can be retrieved by either contacting the BRG directly, or through flags in the Janus software package that make researchers aware of its existence. Mithal also passed out a TAMU flyer that gave a brief description of the Janus Program.

Jarrard expressed concern that the separation of log and other data could be detrimental to the Logging Program and to the science produced by the ODP. At issue was the possibility that scientists would be unfamiliar with the workings of the Janus system, and fail to explore the flags that would rejoin the separate data bases. The DMP as a whole recognized this problem, and consequently makes the following recommendation to the PCOM:

95-1 The DMP recommends that the Borehole Research Group develop a plan to insure processed log data are transparently available to the average user of other ODP-generated data sets. This plan can allow for a temporary separation of data; the log data being at LDEO while being put in final form, and other data at TAMU. However, it should provide a path for the eventual integration of all data into a common base. The BRG and TAMU should work together to develop the

appropriate plan, including costs, schedule, and responsibility issues, and present it to the DMP at its Spring meeting.

Green noted that the TAMU flyer on the Janus Program mentioned logs only briefly, and it was not clear where downhole measurements fell into the new system. Mithal commented that the lack was an oversight. The panel was concerned that it demonstrated a lack of communication between the user group overseeing the Janus Program, TAMU, and the BRG.

b. Temperature Logging System for Gas Hydrates

Klaus reported on progress of the Davis/Villinger memory temperature tool that is being put together to overcome some of the difficulties with the WSTP and ADARA tools. These tools measure temperature at the tip of the drill string through the use of insertion probes and data logging electronic packages. The tool is a candidate for testing on the Gas Hydrates Leg (Leg 164).

The Davis/Villinger tool will be an improvement over existing designs for several reasons. Routine maintenance will be simplified. The tool will have sufficient battery life so that the tool case will not have to be opened during a leg; data will be extracted and the tool programmed through an external computer port. The tool will feature an upgraded version of the data logger that has been used successfully in CORK applications. An accelerometer will be on board to check for movement (causing frictional heat) during deployment. Finally, the probe tip that is inserted into soft sediments will be redesigned to lower its heat capacity and make it easily changed if damaged.

Software for data retrieval, viewing and editing is based on software used in CORK experiments. Calibration is proceeding. Tool documentation, software, cables, spare batteries, o-rings, etc. will be transported to the ship in time for the Hydrates Leg. A Pacific Geosciences Center engineer will provide necessary training; Matthew Stahl is responsible for operations at sea. Two tools are being built, one supplied to the ship, the other to the University of Bremen for environmental testing and full temperature calibration.

The DMP agrees with the proponents that it is very desirable to have a sea test of the Davis/Villinger system before it moves to its prime objectives on the Juan de Fuca and Sedimented Ridges Legs (Summer, 1996). This action will require that the DMP classify the tool as a Development Tool as specified by the Third-Party-Tool Guidelines, and the DMP requirements stated in the Minutes of the DMP Meeting, September 21-23, 1994 (Palisades, New York). These guidelines have been put forth by the entire ODP, and it is the responsibility of the DMP to see that they are adhered to. In view of all considerations, including the time constraint imposed by the imminent sailing of Leg 164, the DMP takes the actions put forth below.

The DMP accepts the Davis/Villinger tool as a Development Tool contingent upon the tool passing a pressure test, the acceptance of the tool by the TAMU Safety Officer, and the receipt of a Statement of Availability for the tool for routine operations in the ODP. Since time is of essence, Makoto Yamano, the DMP Watchdog, is given the authority by the DMP to pass judgment on these issues, and forward his conclusions to the DMP (perhaps using the DMP listserver, DMPONLY@SANDIA.GOV).

Furthermore, the DMP makes the following recommendation to the PCOM:

95-2 The DMP recommends that, subject to a final acceptance by the DMP Watchdog (Makoto Yamano), the Davis/Villinger temperature tool be tested on Leg 164.

The DMP realizes that PCOM will not meet before Leg 164 leaves port, and it may not have a chance to respond to Recommendation 95-2 and other recommendations that may follow. Lysne noted that there is an obvious deficiency in the implementation of the Third Party Guidelines, and it will be brought to the attention of the PCOM.

Finally, the DMP requests a full report on the status of the Davis/Villinger tool be presented by the TAMU Liaison at its next meeting. Should the tool suffer a failure, the DMP requests that the TAMU Liaison obtain a remedial action plan from the tool proponents, and present it to the DMP. This plan should be detailed, and it should explore the consequence of tool failure as it pertains to the success of the Juan de Fuca and Sedimented Ridges Legs.

c. Pressure Coring System for Gas Hydrates

Matthew Stahl reported on the status of the Pressure Coring System. This system is desirable for the Hydrates Leg, but not essential according to the Sedimentary and Geochemical Processes Panel.

Klaus noted that sometime ago Tom Pettigrew reported to the DMP that the PCS needed a complete redesign. Unfortunately, budgetary constraints have reduced the engineering staff of TAMU, and they do not allow for purchase of needed supplies. Thus, the PCS is moving forward in a modification of its old configuration that has seen some success. Specific changes are in the shoes (the bottom end of the tool that enters the formation), the core catchers, and in the core tubes. The tool will be available for the Hydrates leg. Land testing will occur in October. The tool does not fall under the jurisdiction of the DMP.

d. Prototype Water Sampler

Stahl reported that a new water sampler is in the advanced development stage, and may be ready for testing on the Hydrates Leg. Design for the system is being overseen by Joris Gieskes and a mechanical engineering graduate student (Gieskes is Chairman of the

Shipboard Measurements Panel, and tool qualifications fall into the jurisdiction of the SMP). The tool will be an upgrade of the WSTP tool; it features a slow movement of fluid into the sampling chamber so that flashing will not occur, a more streamlined probe geometry so there is less tendency to crack the formation, and a modular design for faster turnaround.

7. OVERVIEW OF LOGGING EXERCISES ON MEDITERRANEAN I (Leg 160)

Lysne noted that John Woodside recently completed a tour as the JOIDES Logging Specialist on the Mediterranean I Leg (Leg 160), and his views as to the efficacy of the Downhole Measurements Program were of interest to the panel. Following talks by Tom Shipley and Gilles Dubuisson were also part of this review.

Woodside reported that the results of logging on Leg 160 were mixed; bad hole conditions precluded some logs, yet the results of the FMS and Geochemical tool gave important information. An early problem was that the Co-Chiefs were not interested in the logging program. The situation improved when one Co-Chief developed an understanding of the utility of logs; the other remained uncertain as to their value.

Woodside noted a tendency of the geologists to rely on core to formulate their ideas; the logs then served to confirm them. The issue here was that core data were available early, and provided enough information so that general geological theories could be advanced; too often there was a reticence of logging scientists to present preliminary data to the shipboard party. An increase in shipboard processing capabilities would aid this situation. However, on Leg 160, logs provided important data on evaporates which were lost in the coring process. The FMS identified debris flows and clasts; the geochemists were impressed at the quality of the geochemical tool data.

Woodside noted that several improvements were needed to enrich the Logging Program. The temperature tool gave important information on fluid circulation, but it broke down and backup equipment was not available. The ship's technicians were willing and qualified to work on the tool, but could not obtain approval for this activity from their superiors. Scientists on the ship thought logging was a waste of time, and it was difficult to change this view due to the physical and psychological separation of the two communities. This situation improved when scientists were shown log data as soon as possible. The logging community, and its supportive publications, utilize jargon that is unfamiliar to the uninitiated. Finally, there was an artificial separation of work stations; integration of work spaces could elevate the difficulty.

Jarrard noted that the logging community needs to be goal-oriented to sell its wares to scientific parties. He felt the issue of jargon was very detrimental to communications, and remedial action was needed.

Tom Shipley stated that most geologists considered core more important than logs, and if core recovery was good they questioned the need for aggressive logging efforts. He

posed a rhetorical question: Do logs ever substantially change the conclusions of a leg? He felt that logs added richness, but typically do not lead the litany of scientific evidence.

Lysne was concerned that a logging scientist was at sea when an important tool broke down, and he had no place to turn for help. He felt it the responsibility of the BRG to provide support, and he was concerned that turf issues between the BRG and TAMU precluded the fix of a relatively simple tool. Pirmez stated that the BRG was unaware of the specific problem on Leg 160. Klaus felt that the logging scientist could always turn to the Co-Chiefs for a resolution of difficulties, and Shipley supported this view by noting that the Co-Chiefs can make things happen. Lysne noted that somewhere there was a breakdown in communications that had left Woodside in a bad position, and it was detrimental to the Logging Program if this difficulty persisted. Pirmez agreed there was a difficulty, and stated that the BRG will look into it and report back to the panel.

8. EVALUATION OF LOGGING EXERCISES AT BARBADOS

Lysne recalled that Tom Shipley first appeared as a DMP guest two years ago when the DMP was first proposing that LWD be part of the Barbados operations. Shipley had served as a Co-Chief at Barbados, he was a present member of PCOM, and he had been recommended by the DMP subpanel seeing speakers for the subject of the efficacy of the Logging Program. Lysne introduced Shipley as a "friend of logging".

Shipley noted that drilling was problematical in accretionary prisms, and historically hole conditions had precluded logging exercises. Barbados was a first test of the Schlumberger LWD system, and a lot was learned involving deployment and data reduction. All in all, the logging program was successful, and it led to a number of important findings. Shipley also noted that the conventional VSP experiment was successful, but the shear wave VSP had difficulties in that the Schlumberger anti-alias filters were not proper for the frequencies encountered so shear data were difficult to interpret. A contributing factor may be the softness of the seafloor that precluded propagation of shear waves.

Shipley then commented on the efficacy of the Logging Program. Strengths are that the program is flexible within the constraints imposed by available Schlumberger tools. He also noted that the scientists and Schlumberger formed a good team for both basic and advanced support functions. Program weaknesses are tied to a fixed and expensive Schlumberger contract. Any scenario to use non-standard tools requires extensive negotiation with Schlumberger which makes typical scientific budgetary what-if planning nearly impossible.

Shipley recommended that the Logging Program focus on available Schlumberger equipment while promoting scientist-developed tools and experiments. He also recommended fewer logs per year, and that a new contractual relationship be developed with Schlumberger to recognize savings from such reduced activity. He posed another

rhetorical question: Are we getting our money's worth from the Logging Program when it is 12-14% of the ODP budget?

Lysne asked Shipley if the program was sufficiently mature to provide a self-evaluation such as he suggested. Shipley noted that there was a risk to logging interests if such questions were asked.

Arnold suggested that the DMP invite senior Schlumberger scientists and engineers to present talks on what was available without the window dressing present in sales pitches. He also noted a recent reduction in the cost of logging services. Arnold further stated that logging contracts were difficult to negotiate, and asked if the DMP understood the Schlumberger contract. Lysne replied that the DMP tried to delve into the contract at its last two meetings, but requested information was not forthcoming, and some panel members felt they had been stonewalled by the BRG.

Lysne noted that the position of Chief Scientist at the BRG had been advertised some time ago, but had not been filled. He felt that a mature scientist in this position could promulgate the program by providing a vision for the future, as well as by providing a point of contact for communication difficulties such as surrounding the failure of the temperature tool on Leg 160. Jarrard noted that the position could provide these and like services if it were staffed by an appropriate individual.

Pirmez noted that two special sessions were held at last year's Fall AGU meeting on the use of logs in scientific programs. Lysne commented that he and David Goldberg had put the sessions together. While the talks were good, the attendance was not in that it averaged about 35 people representing primarily logging interests. He was now of the opinion that specialty sessions were detrimental in that they increased the distance between logging scientists and geologists, and they do not send the proper message to the overall community. Integrated sessions could have the opposite effect.

Lysne closed by reminding the panel that Dubuisson would present his survey findings to the panel in a closed session later on.

9. BRG LOGGING PROSPECTUS/DISCUSSION OF CANDIDATE CRUISES

Lysne introduced the session by noting that DMP discussions in the past concerning logging in proposed legs had been cursory, and some members wished that they be expanded. He had hoped that each panel member could be provided with a set of the proposed legs for study prior to the present meeting, but the JOIDES Office did not have sufficient funds to sustain such an effort. Lysne had received the prospectus without time for the distribution of the element proposals by mail, and thus he had made prospectus items available to panel members on the first day of the present meeting. This way, each member could Watchdog a chosen leg; unfortunately no member would be familiar with the entire prospectus.

Pirmez commented that time constraints had also hindered the BRG reviews, so what he had to present to the panel was in rough-draft form. The panel used the Draft BRG Prospectus as an outline for discussions.

The DMP spent a half-day reviewing the individual proposals as presented by the BRG. In some cases, the panel decreased the number of specialty logs to a level believed appropriate in view of programmatic resources; in others, logs were added that would enhance the scientific return of the investment. The DMP input will be incorporated into the final BRG Prospectus, and passed on to the DRILLOPS, PANCH, and PCOM members before they meet in December.

In the course of discussions, several panel members raised the issue of quality control in the logging program. Arnold noted that there are several ways of determining porosity from the standard suite of logs, and a quick test for consistency would be easy to implement. Lysne noted that there had been a workshop on log quality many years ago, and that the DMP reviewed quality issues about three years ago. The panel felt that the issue should be revisited. Arnold and Wohlenberg will lead a discussion on quality control at the next meeting; as in the past, the BRG will supply necessary information.

10. VSP EXPERIMENT FOR GAS HYDRATES

Lysne reminded the panel that it had reviewed the vertical and walk-away VSP experiments for the Gas Hydrates Leg at the last panel meeting, and Green had accepted the Watchdog assignment for the Woods Hole three-component seismic receiver.

Green reviewed the history of the proposed experiment as well as the status of the WHOI tool. He noted that the DMP is supportive of the experiment, and desires that the measurements be made with all three components recorded. He observed that the DMP had made a *de facto* decision at the last meeting when it agreed to follow the evolution of modifications to the WHOI tool; an alternate path would have been to recommend rental of a Schlumberger tool. Green had collected inputs on the history of the WHOI tool, and noted that it was a mixed bag. The tool had about as many successes as failures, and, in fact, a success/failure was very much in the eye of the beholder.

Malfait asked how the panel viewed a success. Jarrard replied that a successful tool collected useful data.

Green noted that the WHOI tool was not a development tool since it had been around for a long time, but, in view of tool modifications, the DMP could not be sure of a successful operation. The panel then chose to treat the tool as a development tool for the purposes at hand.

In view of all evidence, the DMP will accept the modified WHOI tool as a new Development Tool contingent upon the successful completion of land tests as specified by the DMP Watchdog. The Watchdog is given the authority to pass judgment on these

tests, and report his conclusions to the DMP. Consequently, the DMP makes the following recommendation to PCOM:

95-3 The DMP recommends that, subject to a final acceptance by the DMP Watchdog (Andrew Green), the WHOI three-component seismic tool be used for VSP experiments on Leg 164.

The DMP expects a report of activities involving the WHOI tool at its next meeting.

Green further noted that the VSP experiment is important to the success of the Hydrates Leg, and a failure of the WHOI tool would be detrimental to the program, especially since a shot ship would be on location and paid for. He recommended that the Schlumberger single-component tool, which is already on the ship, be prepared for possible use. This preparation will involve tool checkout, and the possible rigging of special equipment. Pirmez assured the DMP that the Schlumberger tool will be checked out and ready for use should the need arise; Klaus further assured the DMP that any TAMU responsibilities for deployment would be honored.

Lysne commented that the DMP had been struggling with the VSP issue as long as he could remember, and it continued to be a thorn in that the DMP had no policy for review. This issue was exacerbated since proposals for deployment often came from outside the JOIDES system such as from the NSF or United States Science Advisory Committee (USSAC). Green accepted an additional task to evolve a draft philosophy for DMP involving VSP experiments.

11. GERMAN EXPERIENCES IN LOGGING CRYSTALLINE ROCK

Juergen Wohlenberg had been a principal investigator for logging exercises on the German KTB program, and he reported on his work involving measurements in crystalline rock. This work is important since most log analysis is done in sedimentary formations containing hydrocarbon deposits.

The first phase of the KTB experiment was to make a 4 km deep pilot hole that was cored in its entirety. The hole was also logged, and thus detailed correlation between logs and core could be made. This correlation used cross-plot and other techniques.

The deep, 9 km hole was not cored in its entirety, however a complete suite of logs was run. The core-log correlation developed in the pilot hole were then used to establish the lithologic units penetrated by the deep hole. Spot core were used to check the results of the "log core" and the results were excellent.

Wohlenberg also noted that these "Electrofacies" techniques were used in establishing lithologies penetrated by ODP hole 642E on the Voring Plateau (Leg 104). The results of this work will be published in Scientific Drilling.

12. NEW BRG SHEAR SONIC TOOL

David Goldberg has received funding to upgrade an Arco shear sonic tool. Pirmez reported on the tool for Goldberg who was out of the country.

Pirmez noted that the electronics package on the tool is being upgraded, and that new software for data read-out is being prepared. The tool features an oriented sonic shear source. Modifications will allow a tie to the Schlumberger cable that is on the ship. The tool has been used in a test well at LDEO, and in other tests has generated data within a few percent of data from Schlumberger tools. Other modifications include a change out of the flexible tool body for one that is more rigid. The flexible body was used in the Arco design so that internal coupling between the source and receivers was minimized; the more rigid body will allow an easier entry into a hole. Goldberg would like to use the tool on the Hydrates Leg.

Cheng was familiar with the tool, and he felt that separation of tool waves from formation waves could be difficult. Lysne recalled that Mike Williams, a former DMP member from Mobil, had commented that data from a Schlumberger shear sonic tool was suspect for this reason, and that Mobil had gone over to using a tool of their own design. Cheng pointed out that David Herrick, a current member of the DMP, was absent from the present meeting because he was leading an industry group looking into the application of shear tools.

The panel noted that funding for the tool came from sources outside of the ODP, and the tool thus must pass third-party requirements before deployment on the ship. Pirmez stated that pressure tests were being conducted at Woods Hole, and a vibration test would be done in a LDEO well. The panel was unfamiliar with the proposed tests and their ability to prove the value of the tool. It recognized the importance of shear-sonic measurements, but was uncertain as to the ability of the entire system, tool, software, data interpretation methodology, etc. to function as desired. The panel was interested in seeing that the tool progressed through the third-party system. Cheng accepted Watchdog duties for the tool.

Due to the short time interval between the present and sailing of the Hydrates Leg, the DMP took the actions given below.

The DMP accepts the LDEO shear sonic tool as a Development tool subject to the passage of third-party tool tests as specified in the Guidelines and in the Minutes of the DMP Meeting, September 21-23, 1994 (Palisades, New York). Necessary tests include: (1) Pressure Housing Test, (2) Electronics Test, (3) Vibration Test, (4) Wireline Test, and (5) Systems Test. The DMP watchdog is given the authority to pass judgment on these tests, and make recommendations on behalf of the DMP involving deployment on the Hydrates Leg.

95-4 The DMP recommends that, subject to a final acceptance by the DMP Watchdog (Arthur Cheng), the LDEO shear sonic tool be tested on Leg 164.

The DMP is looking forward to a report on the LDEO sonic tool at its next meeting.

13. RESULTS OF A DMP SURVEY REGARDING THE EFFICACY OF THE LOGGING PROGRAM

Lysne reminded the panel that eighteen months ago the DMP had initiated a review of the efficacy of the Downhole Measurements Program. Input had been received at the present meeting from Woodside and Shipley. A third view was the result of a questionnaire put together by Karen Von Damm and Gilles Dubuisson. Originally this issue was to be discussed in a closed session. Now Dubuisson felt that the session could be open.

Dubuisson passed out copies of the questionnaire that had been sent to about fifty Co-Chiefs and JOIDES Loggers on recent legs. The raised questions were:

- 1a. What has been the importance of logging to achieving the science objective on the ODP leg for which you served as Co-Chief Scientist?
- 1b. What has been the importance of logging to achieving the science objectives on the ODP leg(s) for which you served as JOIDES logging scientist (but not as LDEO logger)?
2. Please identify your (sub)discipline and the tools that proved most important to meeting your objectives.
3. Please identify participants on your leg, other than yourself, who have made significant use of the logging data.

Answers were received from David Rea (Co-Chief Leg 145), Catherine Melvel (Co-Chief, Leg 147), Dale Sawyer (Co-Chief Leg 149), and Chris MacLeod (JOIDES Logger, Legs 135 and 147). Representative comments are:

“Logging on Leg 145 was important to the paleoceanographic objectives of the leg, particularly those logs that identify the mineral/volcanogenic component of the sediment...and the reversal stratigraphy.”

“My experience at Leg 147 is that FMS is a very powerful tool. Even in very difficult conditions, it gave us significant results. The FMS is our only way of orienting cores, which is crucial to any structural study. This tool must continue to be used systematically in any cruise where structures are likely to occur.”

“Logging was critically important for achievement of the goals of Leg 147. Acoustic well logs and a vertical seismic profile collected during the cruise have been used heavily in subsequent discussions of the nature of the seismic structure of the oceanic crust.”

"We experienced extreme hole stability problems during Leg 149, and as a result, acquired only a few short sections of log data, and no logs which proved important to meeting our cruise objectives. I think that we and the loggers got screwed by pathological hole conditions!"

"I have to say, however, that the repeated failure of Lamont to get their televiewer working seriously jeopardized the planned scientific program... If they had marketed it to us as a prototype tool (as it patently was) we, when planning our science, would not have placed the reliance we were led to believe we could place upon the damn thing."

14. LOGGING WHILE DRILLING FOR COSTA RICA

Lysne opened by noting that LWD at Barbados had been a success, and that the work produced data from an accretionary prism for the first time. He commented that past work at prisms had suffered from extremely bad hole conditions that precluded conventional logs, and, in fact, had led to the loss of equipment. The issue of LWD had been raised by Eli Silver, one of the Costa Rica Co-Chiefs, to the PCOM. Lysne noted that budgets were very tight, and DMP support was essential to further the effort.

Jarrard is a proponent-on-record for LWD at Costa Rica; his input was requested as background material for the DMP, but he was not in the room during discussions leading to the DMP Recommendation.

Jarrard noted that a primary purpose of Costa Rica is to better define the material balance and the behavior of fluids in the decollement. Porosity and density were necessary for this investigation, and core data were insufficient since core was corrupted in removal from the sea floor. Past experiences indicated that LWD would produce the necessary data.

Lysne referred to a letter from Silver to the JOIDES Office that contained budgetary figures supplied by Goldberg. Two scenarios were put forth. The first proposed logging three sites over a 15 day interval and cost \$249,500; the second proposed two sites over 10 days and cost \$184,500. Either option was satisfactory to the DMP.

The DMP recognizes the advantages of LWD for Costa Rica, and makes the following recommendation to the PCOM:

95-5 In view of the difficult history of conventional logging in accretionary prisms, the possibility of losing expensive equipment down hole, and the scientific gains that will be achieved from obtaining good log data, the DMP recommends that LWD proceed for the Costa Rica exercises.

15. HOUSEKEEPING ISSUES

a. Candidates for a New US Representative

Names were put forth to the Chairman as candidates for the position on the DMP vacated by Karen von Damm and Steve Hickman. Other names will be solicited from DMP members not at the present meeting.

b. Suggestions to the Chairman

There were no suggestions to the Chairman.

16. NEXT MEETING

Subject to the approval of the PCOM and an appropriate invitation, the Spring meeting of the DMP will be held in Japan. A possible venue for the following Fall meeting is San Diego, California concurrent with a port call presently scheduled for October 19-23, 1996.

17. ADJOURN

Lysne thanked Adam Klaus for hosting the meeting, and asked that he convey the thanks of the DMP to his colleagues who had aided him in his efforts. Lysne then thanked the panel for its support during his tenure as Chairman, and wished the best to Rich Jarrard.

The formal proceedings of the JOIDES Downhole Measurements Panel were concluded at 1030 hours on Thursday, September 28, 1995. Adam Klaus then hosted a tour of the ODP facilities for the benefit of the panel.

Respectfully submitted,



Peter Lysne
Chairman, JOIDES DMP