

**iPPSP Meeting #2 – Minutes
December 2 – 3, 2002
ChevronTexaco
Bellaire, TX (USA)**

iPPSP members present: Bob Bruce, Neil DeSilva, Tim Francis, Martin Hovland, Hans Juvkam-Wold, Barry Katz (Chair), Jean Mascle, Toshifumi Matsuoka, Nobuo Morita, Craig Shipp, Dieter Strack, Manabu Tanahashi, and Joel Watkins

iPPSP members absent: Juanjo Danobeitia and Susumu Kato

Guests: Jamie Allan (NSF), Jan Backman (MSP-533), Gilbert Camoin (MSP-519), Andre Droxler (iSSP), Nobu Eguchi (iSAS), Hajimu Kinoshita (iPC), , Larry Mayer (MSP-533), Ted Moore, (iPC), Kate Moran (MSP-533), Gene Pollard (TAMU), Dan Quoidbach (LEDO SSDB), Alister Skinner (iESO), Mike Storms (TAMU), Uko Suzuki (CDEX), and Shinichi Takagawa (JAMSTEC)

The meeting was called to order by the chair on December 2, 2002 at 08:45. The chair, acting as host, explained the safety procedures and meeting logistics.

Self introductions were performed by panel members and guests.

Minutes of the first meeting were approved, noting that the revisions suggested by panel members after the draft minutes were circulated had been incorporated.

The proposed agenda was reviewed and modified in order to provide a better meeting flow.

Overview of Coring Tools and Sampling Technology

Mike Storms presented a summary of current ODP coring tools and available sampling and downhole measurement technology. It was noted that six coring systems are currently deployed.

APC (Advanced Piston Corer) is a hydraulically actuated piston corer designed to recover relatively undisturbed (i.e., the core barrel is not rotated), continuous 9.5 m long cores from very soft to firm sediments. It provides the best sample recovery of the available tools. The system is used until refusal occurs because of sediment firmness or cannot be pulled out without failure. Typically limited to 200 to 250 meters below the mud-line.

XCB (Extended Core Barrel) is used to recover 9.5 m long core samples from soft to moderately hard formations. It is deployed when the formation

becomes too stiff for APC. The XCB cutting shoe extends ahead of the main bit in soft sediments and automatically retracts when firm sediments are encountered. Typically limited to between 500 and 600 meters below the mud line. Unlike the APC, XCB relies on rotation of the drill string to cut the core.

PCS (Pressure Core Sampler) is capable of retrieving 1 meter core samples from the ocean floor while maintaining *in situ* pressures up to 10,000 psi. The primary application of the PCS is the recovery of gas hydrates. The tool has been commonly deployed since Leg 201. A closed gas manifold is used for sampling.

MDCB (Motor Driven Core Barrel) is a wire-line-retrievable coring system that drills ahead of the main bit. It permits the effective use of the diamond drill, thus permitting sampling of hard, fractured crystalline rock, interbedded formations, and reef complexes. Because of the tool requirements cores are limited to 4.75 meters.

RCB (Rotary Core Barrel) is a rotary coring system. It is the primary tool for sampling of firm to hard sediments and igneous basement. The core barrel can recover a 9.5 m core and is retrieved by wire-line.

ADCB (Advanced Diamond Core Barrel) coring system is an adoption of mining industry technology. This tool is used to recover core samples from firm to well lithified sedimentary or igneous formations when other techniques are ineffective. Core length is generally 4.75 meters. Core recovery is not high and its use is time consuming. It is considered a specialty operation.

Additional technologies discussed were:

LWD (Logging While Drilling) places a resistivity tool at the drill bit.

Pressure Coring and Logging (HYACINTH) includes two coring tools FPC (Fugro Pressure Corer) and HRC (Hyace Rotary Corer) plus the associated pressure logging, transfer, and storage data chambers. The FPC system was designed for soft sediment. The HRC was designed for harder rocks and includes a built-in motor for rotation. The tools recover larger diameter cores than the PCS. TAMU is currently adapting the storage and transfer technology.

Temperature Measurement Capability – Several tools were available for temperature measurement including:

Advanced Piston Corer Temperature (APCT) tool is an instrumented version of the coring shoe that is run on the Advanced Piston Corer. It is deployed in soft sediments to obtain formation

temperatures to determine the heat flow gradient. It takes approximately 8 minutes after coring to obtain a temperature measurement.

Davis-Villinger Temperature Probe (DVTP) and **Davis-Villinger Temperature Pressure Probe (DVTPP)** is designed to take temperature measurements in semi-consolidated sediments that are too stiff for the APCT tool. Coring must be interrupted to take a temperature measurement. The temperature measurement takes about 10 minutes, with pressure measurements requiring about 40 minutes.

Water-Sampling Temperature Probe (WSTP) is used to measure temperatures between cores, and requires 1-3 hours for each measurement. The WSTP is pushed into uncored sediments and disturbs the next section to be cored. The WSTP also can be used to sample borehole fluids ahead of the bit.

APC Methane Tool is designed to measure conductivity, temperature and pressure of cores. It is used to determine whether hydrates are present through an examination of changes in conductivity.

Report on ODP Drilling Activities

Gene Pollard reviewed drilling activities since the Barcelona meeting and discussed the remaining legs.

Leg 203 (Equatorial Pacific ION) established the second ocean bottom seismic network site. A narrower casing than originally planned was set because of problems encountered at the basement/sediment interface.

Leg 204 (Gas Hydrates Oregon) examined the southern part of the hydrate mound region on the Oregon accretionary prism. LWD (logging while drilling) was performed on 8 of the 9 sites. Core recovery was over 80%, with 85 meters of hydrate recovered and preserved. Special tool use was considered very successful. It was noted that the poorer than expected results from the HYACINTH tool was a result of its deployment under less than ideal rock conditions. Hole 1248C was terminated at a depth of 149 mbsf because of the presence of hydrocarbons, while 1248A was successfully drilled to 194 mbsf without any safety issues having been raised. The differences observed in the two near-by holes raise some safety issues which the panel should address sometime in the future.

Leg 205 (Costa Rica) was planned to instrument previously drilled sites. The instrumentation was designed to collect fluid samples over time from within the accretionary prism. Two of the four locations ultimately had satisfactory deployments of the instrumentation packages.

The remaining legs of the current program are:

Leg 206 (Fast Spreading Crust) is currently underway. Its objective is to drill the upper section of the crust in the eastern Pacific.

Leg 207 (Demerara Rise) has as its objective the examination of oceanic anoxic events in the Cretaceous and Paleogene.

Leg 208 (Walvis Ridge) is planned to drill a depth transect of Paleogene sediments to provide constraints on the evolution of oceanic circulation and climate. Walv-9B was added to a depth of 500 mbsf and permission was obtained to extend Walv-8A to 600 mbsf and Walv-8B to 530 mbsf.

Leg 209 (MAR Peridotite) will sample the upper mantle in a magma-starved portion of a slow spreading ridge segment. Permission was obtained to deepen holes from 200 to 300 mbsf.

Leg 210 (Newfoundland Margin) is planned to assess the stratigraphic sequence of the margin, the nature of the basement, and its subsidence history.

At the completion of Leg 210 the ship will be demobilized. Potential uses for the drillship after the completion of the program are being examined.

Report on iPC Activities and IODP

Ted Moore reviewed the IODP status. All interim panels have been set-up and will have met by the end of February with the exception of the Operations Panel. A working group is currently examining how the Operations Panel should operate. The Central Management Office (CMO) has not yet been formed. An early 2003 date is targeted. The panels are currently reporting to administrators of the funding agencies, this will change with the formation of the CMO. It is expected that new proposals will impact the iPPSP's workload. It was believed that proponents have been "sleeping" because of the upcoming drilling hiatus. With the possible availability of the non-riser ship in 2005 activity is expected to increase with planning for specific legs to begin in 2003. iSAS is going back to proponents for updates of proposals currently in the system. As many as 20 proposals may be ranked in the near future.

Jamie Allan presented a summary of the current views of the two lead agencies (NSF-MEXT). The proposed operational timeline calls for MSP operations beginning in 2004, the addition of the non-riser ship in 2005, and the full IODP drilling program beginning in 2008. It was noted that unlike ODP funding for site surveys associated with safety will be included in IODP funding. These funds will be controlled by the CMO. It is expected that the operator of the non-riser (US) ship will be selected late FY2003. US IODP participation has been approved by the NSB but the release of funds is waiting on congressional action.

Report on iSAS Activities

Nobu Eguchi presented a brief report on iSAS activities. This review included a summary of the panel structure and the current meeting calendar. It was noted that there was an active search for a new co-chair for iSSP. It was reported that there are currently about 100 proposals in the system. Some of these proposals will dropout because of a lack of activity (continued interest). It was stated during this report that iSSEPS will be responsible for platform selection.

MSP Capabilities and Interactions

Alistair Skinner presented an overview of JEODI (Joint European Ocean Drilling Institute) views on MSP operations. JEODI will operate the mission specific platforms. European funding was committed at least through the Arctic drilling program to prove that the MSP concept is viable. It was noted that good site surveys will be required as will constant safety monitoring. The MSP portion of the program will result in a shift in working methods where science is not as time constrained. Individual platforms will be selected based on both the location and the science to be conducted. Well-defined science programs will be required for the appropriate platform selection. Drilling focus will shift from legs to projects. An example of MSP activities will be the Arctic program which will use an icebreaker drillship plus several icebreaker support vessels. Unlike the current program only a minimum amount of science will be performed on the drilling vessel (i.e., science will not be conducted in “real-time”). Shipboard science activities could be limited to core curation, safety monitoring, and critical measurements (ephemeral properties). There should be technical liaison with the iPPSP. Pollution prevention and safety issues that will need to be addressed as part of the MSP portion of the program will be the different health and safety requirements and safety training for the different drillships, the presence of national as well as international drilling regulations, the potential for shallow water operations with a dynamically positioned drillship, the use of non-oilfield coring techniques, the safety monitoring to be performed during drilling (at a minimum gas detection on the drill floor will be required), the split between onshore and offshore science activities, “standard” core sizes, linkage to ICDP, and the use of wire-line BOP’s.

Preview of Proposal 519-South Pacific Sea Level

Gilbert Camoin presented an overview of the science and key safety and pollution prevention issues associated with Proposal 519 – South Pacific Sea Level. The key science objective of the proposal is to gain a better understanding of the dynamics of ice sheets during the last deglaciation through a reconstruction of sea-surface temperatures. Data is currently limited to Barbados which is clouded by a complex tectonic history and gaps in the cores. The record at Barbados is good but not complete for the past 12,000 years. These data reveal that there were two freshwater pulses introduced into the ocean during the past 18,000 years. Sites were selected in two regions – the Great Barrier Reef and offshore Tahiti. At the proposed locations the tectonic signal is small or regular within the time-frame of the investigation (20,000 years). At both locations the coral reefs will be used as a measure of sea level change. It is hoped that short-term paleoclimate cycles (e.g., El Nino events) will be identified. The natural signals will be compared to suspected anthropogenic changes. Previous drilling in Tahiti had a maximum penetration of 114 meters. It encountered Pleistocene

sediment resting on basement and provided no evidence for the previously noted meltwater pulses. Prior drilling in the Great Barrier Reef included ODP Site 820. The general status of the site survey data was reviewed. High resolution seismic data were recently collected at the three proposed Tahiti drilling locations. Penetration is poor, but considered sufficient for shallow reef drilling. Bathymetry swath data were collected between 30 and 700 meters as were 38 dredge samples. The Great Barrier Reef safety package will rely largely on pre-existing data with some supplemental new data. The drilling strategies at both locations will be similar - a depth transect. Maximum penetrations will be ~100 meters. The available data provides no evidence for oil or gas. At Tahiti the available data suggests only limited sediment resting on basement. Prior drilling in the Great Barrier Reef revealed no evidence for hydrocarbons or the presence of source material. There was also no evidence to support over-pressure. Only seawater will be used during drilling to minimize impact on living reefs. It was noted that drilling permits were previously obtained at both locations and there has been approval by the local authorities for the proposed drilling. Although it was considered that there was a low probability of drill cuttings it was noted that the operator will be required to remove them from the drillsite. The panel requested that the following be included as part of the final iPPSP review package:

- Σ A map showing the distribution of live reefs and man-made objects relative to the proposed drillsites.
- Σ High resolution back-scatter imagery/maps.
- Σ An assessment as to how drilling might impact hydrologic conditions and ultimately impact existing reefs. Comments on proposed abandonment/completion procedures should be included.
- Σ The type of drilling platform needs to be identified. If a jack-up is decided on foundation issues exist, which will need to be included in the safety package. This could require a site specific geotechnical survey.

The panel also noted that hydrocarbon monitoring will not be required and that drilling restrictions imposed by Australia (which are more stringent) should be applied in Tahiti was well. Dieter Strack is the watchdog for the proposal.

Preview of Proposal 533-Arctic Lomonosov Ridge

Jan Backman and Kate Moran presented an overview of the science and key safety and pollution prevention issues associated with Proposal 533 – Arctic Lomonosov Ridge. The key scientific objectives include the defining of the climate history of the Central Arctic Ocean and its role in the Earth's transition from the Paleogene “greenhouse” to the Neogene “icehouse”, the reconstruction of the climate and circulation histories as it relates to the exchange with the world oceans, and the origin, composition, rifting and subsidence history of the Lomonosov Ridge. The proposed transect covers a corridor of 6° of latitude which should provide sufficient locations with less than 90% ice cover. Drilling will be possible when ice cover is less than 90%. It was noted that Paleogene, laminated, organic-rich sediments have been recovered from the Arctic basin. It was also noted that organic-rich Carboniferous coals and Triassic silts with about 1% organic carbon (type III) have been recovered from boreholes on Franz Josef Land and that an examination of the burial history for the proposed drilling locations could not rule-out hydrocarbon generation. It was, however, noted that the suspected

unconsolidated nature of the sediments above the regional unconformity would lack the potential to develop a seal and that the high velocities of the pre-unconformity section makes it doubtful that a viable reservoir exists. Because the extent of ice cover is difficult to predict the proponents are seeking approval for a range of shot points to have flexibility to select an optimum drilling location under given ice conditions.

The drilling platform will need to be an ice-class vessel, with dynamic position capability, and a moonpool. A total drill string of 1800 meters will be required and core diameters can be no smaller than those of the current drilling program. Plans are for 35 days within the pack ice, with 25 days of coring. It is proposed as a four ship program including the drillship (e.g., Finnish ice breaker **Botnica**, a nuclear icebreaker (e.g., Russian icebreaker **Yamal**, and two hunter icebreakers, probably from Canada). Ice conditions will be monitored using radar, helicopters, and “real-time” GPS monitoring. The operational plans call for multiple APC cores at each site, logging as required, “real-time” organic geochemistry for hydrocarbon monitoring, measurement of ephemeral properties, and biostratigraphy as needed. The bulk of the sampling will be performed post-cruise. It was noted that site survey data is limited because of environmental constraints. The panel provided the following guidance and requests for the final iPPSP review package:

- Σ There will be a need to clearly demonstrate that proposed drilling locations are off-structure. Structure maps, with posted control, might be a viable alternative for the lack of cross-lines.
- Σ Better images of the shallow section are required, as is a seafloor swath map. The deeper seismic should be migrated, with “light AGC”.
- Σ Drilling order should be considered. The drilling sequence may permit deeper penetration.

Significant concerns were expressed about penetrating the unconformity.

The meeting was recessed at 17:00 with a request that the 533 proponents re-examine their plans and report back to the panel in the morning.

The panel meeting was reconvened at 08:30.

The discussion on proposal 533 was continued. It was agreed that penetration of the unconformity can only be approved as safe, if any chosen location or range of locations is demonstrated to be off-structure. Furthermore, the site will need to be located near an outcrop. Martin Hovland is the watchdog for this proposal.

Discussion on Proposal 564-New Jersey Margin

The panel conducted a general discussion on Proposal 564 (New Jersey Margin). Depending on the nature of the drilling platform a geotechnical survey may be required. Such a survey will be site specific. For the formal preview proponents will need to provide all data collected, including seismic data acquisition parameters and the processing scheme(s). Questions exist about the data resolution in the shallow portion of the section. A detailed shallow gas hazard survey will need to be conducted, with the interpretation provided by an independent contractor. A shallow water hazard summary

including sub-bottom profile and magnetometer or ROV surveys for man-made obstructions is also required. Craig Shipp is the assigned watchdog.

Report on Chikyu Status

Shinichi Takagawa reviewed the status of Chikyu construction. Sea trials for the ship will take place January through March. After the sea trials the drilling unit will be added in Nagasaki. The construction timeline has been shifted by about 2 months as a result of a fire in the shipyard. A test of the drilling platform is planned for the 2nd quarter of 2005.

Review of Draft Riser Drilling PPSP Guidelines

Uko Suzuki reviewed the draft of the riser drilling program safety guidelines. Among the key issues raised during the presentation was the shift of responsibility from the proponent to the operator for many of the pollution prevention issues associated with the riser operation. A discussion followed as to whether this change represented a conflict of interest because the operator is ultimately responsible for safety. It was suggested that the riser-site survey working group should be responsible for the preparation of the package. The current skill-set of the iPPSP is not adequate to deal with some of the issues raised in the guidelines, including the review of the well design. Additions to the panel should be considered or alternatively a list of potential panel consultants will need to be assembled. It was noted that a section on H₂S needed to be added. It was suggested that a common safety manual should be prepared for the three types of drilling operations (non-riser, riser, and MSP).

Site Survey Requirements and Recommendations

Joel Watkins and Dan Quidbach led a discussion on site survey requirements. It was noted that the current databank design is 25 years old and is probably not capable of addressing the changing needs of the drilling program. The databank is beginning to up-date to GIS. There are scale-up issues associated with the multiple platforms. Currently the databank acts as an archival library, with the staff helping to produce the required reports and the necessary data packages for shipboard use. Better linkage is required with proposal tracking and site survey status. Among the issues and questions raised were:

- Σ How should data be displayed?
- Σ How should digital seismic data be handled and reviewed at remote locations?
- Σ Should a standard geophysical tool kit be made available?
- Σ Should processing be specified? (relative amplitude processing? time migration? depth migration?)
- Σ What expertise is needed by the databank?

The type of site survey data required will depend on the risk category of a proposal (see minutes of iPPSP Barcelona meeting)., i.e.

- Σ Low risk locations (e-review) – standard data sufficient
- Σ Medium risk locations (riserless or rise) standard data plus specific data to achieve scientific objectives
- Σ High risk locations (riser and MSP) – standard data plus platform-specific site survey data plus specific data to achieve scientific objectives

As part of this discussion it was felt that MSP projects were more of a concern than the relatively few, mostly geophysics driven major riser projects, because MSP projects could more often encounter unexpected safety issues. It was stated that additional requirements for MSP data packages may include information on sea-state conditions and a detailed evaluation of near surface conditions (including high resolution seismic, side-scan sonar, and geotechnical information depending on the nature of the platform to be used). It was observed that “academic” processing is some 10 years out-of-date and it was suggested that site surveys for high risk proposals should be carried out or at least be checked by industry contractors.

Recommendations for site survey requirements should be forwarded to Joel Watkins in-time for the mid-February meeting in Italy of the iSSP working group. In this context, Martin Hovland, Craig Shipp, and Alister Skinner were asked to compile existing UKOOA, NPD, and US-DOE safety guidelines by February 15 to be available to the iSSP working group.

Next Meeting

The proposed next meeting date is June 16-17, 2003 in Stavanger, Norway. Martin Hovland will act as meeting host. Tentative items for inclusion in the meeting agenda include a discussion on abandonment procedures, general guidance on reef drilling (Alister Sinclair to provide contact), a review of Leg 204 (G. Claypool), final review of the Arctic Lomonosov Ridge and South Pacific Sea Level programs, a preview of the New Jersey Margin, and the PROMESS Drilling Program. Additional items will be added as suggested by members of the panel, and needed by the iPC and iSAS.

The meeting was adjourned at 11:30.