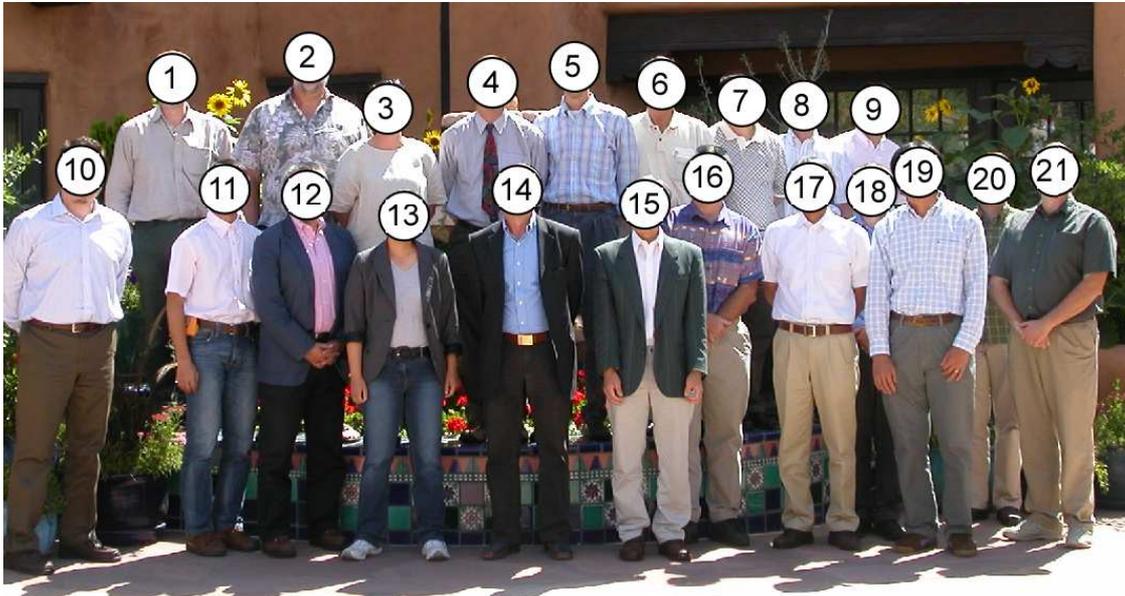


MINUTES
Eleventh Meeting of the
Engineering Development Panel (EDP)
of the
Integrated Ocean Drilling Program (IODP)
July 14 – 16, 2010
Santa Fe, New Mexico, USA

MEETING PARTICIPANTS



1. John THOROGOOD, 2. Roy WILKENS, 3. Maria ASK, 4. Dave SMITH, 5. Michael MALER, 6. Hariku INOOKA, 7. Tang HAIXIONG, 8. Saneatsu SAITO, 9. Yoshi KAWAMURA, 10. Issa KAGAYA, 11. Toru IKEGAMI, 12. Hiroshi ASANUMA, 13. Mai-Linh DOAN, 14. Lothar WOHLGEMUTH, 15. Yoshiyasu WATANABE, 16. William USSLER, 17. Kazuhiko TEZUKA, 18. Greg MYERS, 19. Masanori KYO, 20. Gabriel Filippelli, 21. John TAUXE.



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MEMBERS AND GUESTS

EDP Members

Asanuma, Hiroshi	Japan	asanuma@ni2.kankyo.tohoku.ac.jp
Ask, Maria ^{VC}	ECORD	maria.ask@ltu.se
Doan, Mai-Linh	ECORD	Mai-linh.doan@obs.ujf-grenoble.fr
Haixiong, Tang	China	xuxy_sz@cnooc.com.cn
Holloway, Leon (not attending)	USA	g.leon.holloway@conocophillips.com
Ikegami, Toru	Japan	ikegami1@fuchinobe.oilfield.slb.com
Inooka, Hariku	Japan	hariku.inooka@japex.co.jp
Tezuka, Kazuhiko ^A		kazuhiko.tezuka@japex.co.jp
Maler, Michael	USA	Mike.maler@conocophillips.com
Sakuma, Sumio (not attending)	Japan	sakuma@geothermal.co.jp
Tauxe, John	USA	jtauxe@neptuneinc.org
Thorogood, John	ECORD	john.thorogood@DrillingGC.com
Ussler, William ^C	USA	methane@mbari.org
Watanabe, Yoshiyasu	Japan	ywata@scc.u-tokai.ac.jp
Wilkins, Roy	USA	rwilkins@hawaii.edu
Wohlgemuth, Lothar	ECORD	wohlgem@gfz-potsdam.de

^C Chair, ^{VC} Vice-chair, ^A Alternate

Observers, Guests and Liaisons

Filippelli, Gabriel	SPC	gfilippe@iupui.edu
Kagaya, Issa	IODP-MI	ikagaya@iodp.org
Kawamura, Yoshi	IODP-MI	ykawamura@iodp.org
Kyo, Masanori	CDEX	kyom@jamstec.go.jp
Myers, Greg	COL	gmyers@oceanleadership.org
Saito, Saneatsu	STP	saito@jamstec.go.jp
Smith, Dave	ESO	djism@bgs.ac.uk

Executive Summary
IODP Engineering Development Panel
Eleventh Meeting
July 14-16, 2010
Santa Fe, New Mexico

**EDP Consensus Statements,
Recommendations, and Action Items**

The EDP forwards the following consensus statements and action items to SAS panels, IODP-MI, or other entities as appropriate.

EDP Consensus 1007-01: Approval of Agenda

The EDP approves the agenda for EDP Meeting #11.

Routing: IODP-MI

Priority: Medium

EDP Consensus 1007-02: Approval of EDP Meeting #10 Minutes

The EDP approves the minutes from EDP Meeting #10.

Routing: IODP-MI

Priority: High

EDP Consensus 1007-03: EDP Meeting #12

The EDP recommends that EDP Meeting #12 be held January 12-14, 2011 in Grenoble, France. Mai-Linh Doan will be host of this meeting.

Routing: IODP-MI, STP, SPC, IOs, PMOs

Priority: High

EDP Consensus 1007-04: Unfinished EDP Business

The EDP has identified the following tasks as unfinished business that require a face-to-face meeting January 12-14, 2011 in Grenoble, France:

- (1) Review and comment on an implementation plan for engineering development during the remainder of the IODP and in the post-2013 drilling program, as requested in Consensus 1007-19;
- (2) Provide follow-up and comments on active engineering development scoping studies including *Ultra-Deep Drilling* and *Core Quality and Quantity* being conducted by IODP-MI;
- (3) Assess potential improvements of the methodology and data selection used in the IODP-MI Coring Scoping Study Report “*Core Quality and Recovery Compared to Operational and Environmental Parameters: An Analysis of Selected Cores from IODP Expedition 316*”;
- (4) Receive a preliminary project review and assess status of the FY12 engineering development proposal “*Wireline Hydraulic Testing and Borehole Imaging Tool for Stress Measurements*” (EDP-2012-1B);
- (5) Review and endorse the FY12 engineering development plan submitted by IODP-MI;
- (6) Review and comment on status of engineering development by the IOs, and especially test results for the USIO Drilling Sensor Sub development project;
- (7) Receive and comment, at Greg Myers (USIO) request, on a formal report by Greg Myers on the outcome of the two IODP-related conferences on deep drilling that addressed Mohole drilling and the establishment of a Deep Carbon Observatory (EDP Consensus 1001-16);
- (8) Based on the report on the Moho drilling workshops, provide a final response to the SPC Consensus 0708-30 that requested the EDP to initiate discussions concerning technological needs required for achieving ultra-deep drilling targets such as the Moho;
- (9) Review the new science plan with respect to *engineering development issues*;
- (10) Provide input as to how to integrate engineering into the new science advisory structure; and
- (11) Meet with representatives of the European Union coordination project Deep Sea and Sub Seafloor Frontier (DS³F)

Routing: IODP-MI, IWG+, SPC, STP, PMOs

Priority: High

Background: DS³F meeting – The technology planning group (Work Package 7 – Mission-specific sub-seafloor sampling) from the EU coordination project Deep Sea and Sub Seafloor Frontier (DS³F) has proposed to meet with the EDP at its January 2011 meeting in Grenoble, France. The EDP sees great potential for synergies between the future drilling program and DS³F, and potentially a new type of capitalization for engineering development within the new scientific drilling program by ECORD in addition to ESO. This would be a source of new funding, outside of that contributed by ECORD to the ocean drilling program.

EDP Consensus 1007-05: Offer of an Engineering Contribution to the SPWC for Inclusion in the New Science Plan

With reference to EDP Action Item 1001-01 and STP Consensus Statement 1003-01, the EDP restates its offer to summarize the critical engineering issues integral to the future scientific drilling program for inclusion in the new science plan. Should the offer be accepted, the EDP would appreciate guidance as to the length and timing of the contribution.

Routing: IODP-MI, SPWC, IWG+, SPC, STP

Priority: High

EDP Action Item 1007-01: Technical Review of Draft Science Plan

The EDP will provide a technical review of the new science plan when it is publicly released in late summer of 2010. Contact person for this is Maria Ask.

Routing: IODP-MI, SPWC, IWG+, SPC, STP

Priority: High
EDP Action Item 1007-02: Invitation to Catherine Mével, ECORD Delegate to IWG+

On behalf of EDP, Maria Ask will invite Catherine Mével, member of the IWG+, to attend the January 2011 EDP meeting in Grenoble, France to discuss new science program.

Routing: IWG+, IODP-MI, SPC, STP

Priority: High

EDP Consensus 1007-06: Preliminary EDP Response to SAS Transition Questions Posed by the SPC Chair – Part 1

The EDP responds to the first of three SAS transition questions posed by SPC Chair Gabe Philippelli:

1. How are current projects progressing, and how to complete them?

The EDP has identified ten items of unfinished business and one new item of business that have significant implications for engineering development that require an additional face-to-face EDP meeting. These eleven items are listed in EDP Consensus 1007-04.

Priority: High

Routing: SPC, IODP-MI

EDP Consensus 1007-07: Preliminary EDP Response to SAS Transition Questions Posed by the SPC Chair – Part 2

The EDP responds to the second of three SAS transition questions posed by SPC Chair Gabe Philippelli:

2. *What are friction points in current interactions that need to be improved?*

- (1) Inadequate communication among SAS panels. Sending one liaison to each panel meeting is insufficient to create an effective means of communication;
- (2) Some scientists view engineering development as a competitor for scant resources;
- (3) EDP is not permitted to do a technical review of scientific drilling proposals early enough in the proposal review process; the consequence is that proposals with inadequate scoping create an unnecessary and avoidable burden to the SSEP and SPC panels, and potentially compromise the scientific objectives;
- (4) EDP has been unable to access drilling proposals so it can fulfill its mandate of providing a Technology Roadmap based on active drilling proposals;
- (5) An history of *ad hoc* engineering in the drilling program; and
- (6) Reorganization of the IODP-MI offices and associated reduction in staff resulted in loss of continuity and corporate memory. This has hampered implementation of an engineering development plan and slowed forward momentum towards integrating engineering development into the current and future drilling programs.

Priority: High

Routing: SPC, IODP-MI

EDP Consensus 1007-08: Preliminary EDP Response to SAS Transition Questions Posed by the SPC Chair – Part 3

The EDP responds to the third of three SAS transition questions posed by SPC Chair Gabe Philippelli:

3. What are the key aspects that need to carry forward, and how best can they be carried forward?

- (1) The forward-looking and proactive function of the EDP should continue in the new structure within the entity that reports directly to IODP-MI;
- (2) Collection of engineering and technical information outside of IODP from industry, academic colleagues and professional contacts;
- (3) Unbiased review of the engineering and technical requirements of IODP, assessment of technical requirements of science proposals, review of engineering and engineering development by the Implementing Organizations and provision of advice to the IOs by a independent standing committee with institutional memory;
- (4) Provision of independent, overarching long-term thinking towards the coupling of engineering development to the science plan;
- (5) Regularly scheduled face-to-face meeting of engineers with backgrounds and experience appropriate to IODP engineering and technical requirements; there is no substitute for face-to-face meetings;
- (6) Continued improvement of the visibility of the Technology Roadmap, the engineering development proposal process, and stimulation of high-quality Engineering Development proposals that address critical project-based and long-term infrastructural needs of the drilling program;
- (7) Maintenance and improvement of the Technology Roadmap and its prioritization; the Technology Roadmap is a living and evolving document;
- (8) Continued development of an implementation plan for the Technology Roadmap;
- (9) Perpetuation of corporate memory with respect to engineering and technology development – especially what has been attempted, what has succeeded and why, and what has failed and why;

How to carry forward?

- (1) Ensure continuity and increased funding to maintain progress towards creating a robust engineering development component within the IODP and the new scientific drilling program;
- (2) Insist that proponents of drilling proposals take responsibility for assessing technical and operational feasibility of their research before submission of the proposal;

(3) Engineering should have a more formal and constitutionally established role in the new scientific drilling program to ensure that the needed support of engineering to achieve new science goals and improve cost- and time efficiency.

Priority: High

Routing: SPC, IODP-MI

EDP Consensus 1007-09: Critical Importance of Engineering Development for Achieving Scientific Drilling Goals

The EDP recognizes that engineering advancements have the potential for providing new and improved ways to achieve the science goals of the IODP and future scientific ocean drilling, such as investigation of the deep biosphere, obtaining improved core quality and quantity, and exploring the seismogenic zone and other deep drilling targets. In addition, technological advancements may lead to more cost- and time-effective, safer, and environmentally friendlier operations.

The new program will be more effective in reaching its science goals if engineering development is on par with science within the new program. The EDP is concerned that the importance of the engineering is not fully appreciated because engineering development has not been included explicitly in the planning efforts for the new program. For example, engineering expertise was not included in the Second Triennium review, IWG+ or the SPWC.

New science proposals have *always followed* the introduction of new capabilities.

Routing: SPC, IODP-MI, SASEC, IWG+, SPWC, STP

Priority: High

EDP Consensus 1007-10: Sustained Funding and the Potential for Expanded Collaboration and Partnerships for Support of Engineering Development

In order to achieve some of the critical scientific breakthroughs that require advances in engineering and technology, a long-term commitment by the IODP and its successor for sustained funding and management of engineering development projects is required. Establishing partnerships with other science programs, governmental agencies, and industry can enhance this commitment to long-term engineering development.

Routing: IODP-MI, SPWC, IWG+, Lead Agencies

Priority: High

Background: DS³F meeting – The technology planning group (Work Package 7 – Mission-specific sub-seafloor sampling) from the EU coordination project Deep Sea and Sub Seafloor Frontier (DS³F) has proposed to meet with the EDP at its January 2011

meeting in Grenoble, France. The EDP sees great potential for synergies between the future drilling program and DS³F, and potentially a new type of capitalization for engineering development within the new scientific drilling program by ECORD in addition to ESO. This would be a source of new funding, outside of that contributed by ECORD to the ocean drilling program.

EDP Consensus 1007-11: EDP STP Liaison

The EDP designates Yoshiyasu Watanabe as the EDP representative at the next STP meeting to be held August 5-7, 2010 in Geneva, Switzerland.

Routing: IODP-MI, STP

Priority: High

EDP Consensus 1007-12: EDP SPC Representative

The EDP designates Bill Ussler as the EDP representative at the next SPC meeting to be held August 30-September 1, 2010 in San Diego, California.

Routing: IODP-MI, SPC

Priority: High

EDP Consensus 1007-13: EDP SSEP Liaison

The EDP designates Bill Ussler as the EDP representative at the next SSEP meeting to be held November 8-11, 2010 in Portland, Oregon.

Routing: IODP-MI, SSEP

Priority: High

EDP Consensus 1007-14: Drilling Sensor Sub Engineering Development by USIO

The EDP agrees that the Drilling Sensor Sub (DSS) has the potential to provide information relevant to identifying factors that contribute to poor core quality and quantity. The EDP endorses the USIO plan to further develop the DSS and the proposed acceptance testing criteria.

Routing: IODP-MI, USIO

Priority: High

EDP Consensus 1007-15: Engineering Development Proposal “Wireline Hydraulic Testing and Borehole Imaging Tool for Stress Measurements” (EDP-2012-1B)

The EDP responds to IODP-MI's request for review of engineering development proposal **EDP-2012-1B** by forwarding a technical review and star-ranking to IODP-MI for distribution to the proponents.

Routing: IODP-MI

Priority: High

EDP Action Item 1007-03: Progress Report on the “Wireline Hydraulic Testing and Borehole Imaging Tool for Stress Measurements” (EDP-2012-1B)

Because the proponents intend to initiate the project before formalizing a contract with IODP-MI, Lead watchdog Roy Wilkens will obtain a status report from the proponents for EDP review at the January 2011 EDP meeting in Grenoble, France and forward EDP comments to the proponents and IODP-MI.

Routing: IODP-MI

Priority: High

EDP Consensus 1007-16: STP Scientific Technology Roadmap version 1.0

The EDP thanks Saneatsu Saito for his excellent presentation of the STP Scientific Technology Roadmap version 1.0. The EDP and STP have included links between common engineering needs in their respective roadmaps to strengthen the cross-connection between them. This emphasizes the importance of these technologies to the IODP and future scientific drilling programs.

Routing: STP, IODP-MI, IOs

Priority: High

EDP Consensus 1007-17: EDP Response to STP Consensus Statement 1003-13 Regarding ROV-guided Deployment of Logging Tools

The EDP has reservations about ROV-guided deployment of logging tools. This type of operation is susceptible to environmental forces (currents and heave) and combined with cost, logistics, risk associated with two wires in the water, and the additional personnel involved in operating an ROV off an IODP platform, and given that the *JOIDES Resolution* will be equipped to use standard industry large-diameter pipe (LDP), the use of LDP is preferable to ROV-guided logging. No change in personnel is needed when deploying standard industry wireline tools through LDP. However, the EDP endorses selected use of ROV-guided logging when conditions are appropriate, and logistics and costs are favorable.

Routing: STP, IODP-MI, IOs

Priority: High

EDP Action Item 1007-04: Identify a Microbiology Contamination Expert

The EDP responds to the STP request (STP Consensus 1003-23: Detection and Control of Contamination Issues) for EDP to provide contact information for a person familiar with drilling fluids and microbiological contamination. Mike Maler will attempt to obtain this contact information as soon as possible and the EDP chair will forward this to the STP.

Routing: STP, IODP-MI, SPC

Priority: High

Background: The initial EDP attempt to identify a person familiar with contamination of microbiological samples by drilling fluids was unsuccessful.

EDP Consensus 1007-18: EDP Technology Roadmap version 4.0

The EDP formally adopts version 4.0 of the Technology Roadmap. This version is released as a public document. It will be appended to the minutes for EDP Meeting #11 and will be posted on the IODP-MI website.

Routing: IODP-MI, STP, SPC, SSEP, IOs, Lead Agencies

Priority: High

EDP Consensus 1007-19: Implementation of the EDP Technology Roadmap

The EDP requests that IODP-MI provide at EDP#12 meeting its plan for how it will implement the EDP Technology Roadmap version 4.0 for engineering development during the remainder the IODP and in the post-2013 drilling program.

Routing: IODP-MI, STP

Priority: High

EDP Consensus 1007-20: Public Accessibility of all legacy EDP and Engineering – related Documents Developed by EDP and IODP-MI

The EDP requests that IODP-MI develops and executes a plan to preserve all legacy EDP documents, including Technology Roadmap version 4.0, meeting minutes, executive summaries, appendices; and all engineering development-related documents, including the Engineering Development proposal process, Scoping Study reports, and to continue to make them readily available to the scientific and engineering community via the internet.

Routing: IODP-MI, STP, SPC, SSEP, IOs, Lead Agencies

Priority: High

EDP Consensus 1007-21: IODP-MI Scoping Studies

The EDP endorses the continuation of the IODP-MI scoping studies on *Ultra-Deep Drilling* and *Core Quality and Quantity*.

Routing: IODP-MI, STP

Priority: Medium

EDP Consensus 1007-22: Update IODP Drilling and Coring Technology – Past and Present Phase 2 Final Report

The EDP supports IODP-MI's continued effort to update the "IODP Drilling and Coring Technology – Past and Present Phase 2 Final Report", and encourages IODP-MI to incorporate drilling and coring technologies from all IOs.

Routing: IODP-MI, STP, IOs

Priority: High

EDP Action Item 1007-05: EDP Review of IODP-MI Coring Scoping Study Report

The EDP requests that John Tauxe and colleagues at Neptune, Inc., Los Alamos, NM, review methods used in the report "Core Quality and Recovery Compared to Operational and Environmental Parameters: An Analysis of Selected Cores from IODP Expedition 316". They will provide suggestions for potential improvements of the methodology and data selection for consideration at the next EDP meeting.

Routing: IODP-MI, STP

Priority: High

EDP Consensus 1007-23: IODP-MI Allocation of at-sea Engineering Testing Time to Active Engineering Development Projects

The EDP strongly endorses allocation of at-sea engineering testing time to the SCIMPI and MDHDS engineering development projects prior to the end of the current drilling program in order to adequately test and qualify these 3rd party tools for future use on IODP platforms.

Routing: IODP-MI, IOs, SPC, STP

Priority: High

EDP Consensus 1007-24: Development of Wireline Logging Capability for Seabed Drills

The EDP thanks David Smith (ESO) for his informative presentation on the status of seabed drilling technology development by the British Geological Survey. Wireline logging capability has not been implemented on seabed drilling systems, and the EDP endorses continued planning and development of this technology which is critical for scientific drilling.

Routing: IODP-MI, IOs, STP

Priority: Medium

EDP Consensus 1007-25: Outgoing EDP Members

The EDP thanks outgoing member John Thorogood for his dedicated service to the panel.

Routing: PMOs, IODP-MI

Priority: Medium

EDP Consensus 1007-26: IODP-MI Personnel at the Washington DC Office

The EDP thanks Kelly Oskvig formerly with the IODP-MI Washington DC office for her dedicated service to the panel.

Routing: IODP-MI, PMOs

Priority: Medium

EDP Consensus 1007-27: ConocoPhillips Sponsorship

The EDP thanks panel member Mike Maler and ConocoPhillips for organizing and supporting a pleasant dinner reception.

Routing: PMOs, IODP-MI

Priority: Medium

Draft Minutes
IODP Engineering Development Panel
Eleventh Meeting

In these minutes, the Recommendations, Consensus Statements, and Action Items are not repeated in detail. Please refer to the Executive Summary for the full text of each, as indicated.

1. Welcoming Remarks; Meeting Logistics (by John Tauxe)

The meeting was convened in the conference room of La Fonda Hotel in Santa Fe, New Mexico, USA. The host of EDP Meeting #11, John Tauxe, welcomed all participants and made a few opening remarks regarding safety, meeting logistics, and post-meeting activities.

2. Introduction, Robert's Rules (by Bill Ussler)

After a round of self-introduction by the EDP members and other meeting participants, it was noted that this is the last meeting of John Thorogood. Bill Ussler reviewed Robert's Rules of Order, the EDP Terms of Reference, and the main goals and tasks of EDP meeting #10 (Appendix A). Ussler noted that two persons that participated at the first EDP meeting were present at this meeting, Kasuhiko Tezuka and himself. [Editorial note: Leon Holloway was also a participant at EDP #1, but was unable to attend EDP #11].

Ussler requested that the following EDP members take the meeting minutes:

Roy Wilkens, morning minutes, Wednesday, July 14, 2010

Toru Ikegami, afternoon minutes, Wednesday, July 14, 2010

John Thorogood, morning minutes, Thursday, July 15, 2010

Mike Maler, afternoon minutes, Thursday, July 15, 2010

In addition, Issa Kagaya and Yoshi Kawamura were asked to do handwritten notes for the IODP-MI record in the Executive session (Friday, July 16, 2010). All participants are asked to forward their presentations to Kagaya who is in charge of assembling the meeting appendices.

The goals and tasks of the meeting are to complete the new version of the EDP Technology Roadmap (Version 4.0), evaluate proposal ED-2012-1B (Wireline Packer Proposal), push forward with scoping studies, and to comment on IODP-MI request for the Operations Review Task Force (ORTF), ship-time request, and discuss and comment on the proposed changes in the SAS structure.

John Tauxe asked when the latest version of the EDP Technology Roadmap had been distributed to the EDP. Maria Ask replied that it had been distributed to EDP on 13 July, and apologized for the late distribution.

Item #1. 3. Approval of Meeting Agenda (by Bill Ussler)

Ussler informed the panel about the memo on “*Planned changes to SAS and the program renewal process*” from the Science Advisory Structure Executive Committee (SASEC) and Science Planning Committee (SPC) chairs. The memo was distributed to all SAS panel chairs on July 9, 2010, and Ussler forwarded it to the EDP members on July 10, 2010. The proposed structural changes to the SAS panel resulted in two modifications to the draft agenda: Item 6b on preliminary meeting location of EDP meeting #13 was removed from the agenda, and Item 9, *Preliminary Discussions on the new SAS structure*, was added to the agenda. Wilkens moved to accept the agenda with these changes, and Ask provided a second. The agenda was approved by consensus.

4. Quorum Discussion (by Bill Ussler)

Ussler said that Leon Holloway had to cancel his participation at the EDP meeting at a late stage, and no alternate was to participate in his place. He also informed the panel that Tezuka Hazuhiko is the alternate for Sumio Sakuma. Ussler asked if anyone would leave before the end of the meeting. No one planned to leave early. Hence, quorum should be maintained throughout the meeting.

5. Approve Minutes from EDP Meeting #10 (by Bill Ussler)

Because of late distribution, the meeting minute approval will be taken up on Thursday.

6a. Preliminary Discussion of next Meeting Location and Time, EDP #12 - Europe (by Mai-Linh Doan)

Mai-Linh Doan presented background information on hosting EDP Meeting #12 in Grenoble, France, from 12 to 14 January 2011 (Appendix B). She provided travel and accommodation information, local and regional attractions, and ideas for an excursion on January 15, 2011.

Hiroshi Asanuma informed the panel that several Japanese meeting participants had arrived late to Santa Fe due to flight delays. He asked if field trips proposed for future meetings could be made before the meeting to serve as a buffer for flight delays. Ussler forwarded this discussion to Item 24, Next Meeting Location and Time.

7. Review Status of Previous Meeting Action Items and Recommendations (by Yoshi Kawanura)

Yoshi Kawamura reviewed the status of Consensus Statements (CS) and Action Items (AI) from EDP Meeting #10 (Appendix C):

CS 1001-06: *EDP SPC Representative*. Kawamura noted that it was Ask who attended the SPC meeting in Sydney, not Ussler (correction to slide).

AI 1001-01: *INVEST Implemental and Renewal Process*. IODP-MI has forwarded to the EDP comments to the International Working Group Plus (IWG+), but has not yet received a reply.

CS 1001-10: *IODP-MI Engineering Development Proposal Process*. IODP-MI followed current processes for FY12 proposals, but without the screening of the Engineering Task Force (ETF). IODP-MI has modified the proposal submission process on the IODP website (ETF-related issues were deleted).

- CS 1001-11: *IODP-MI Engineering Development Demobilization Funding*. Kawamura noted that the chances for demobilization funding are very slim.
- CS 1001-12: *Encouraging the Submission of Engineering Development Proposals*. Because of the tight budgetary situation, no action has been taken by IODP-MI to encourage the submission of new ED proposals.
- CS 1001-13: *Proposal 743-Full*. EDP final review sent to the Science Steering and Evaluation Panel (SSEP)
- CS 1001-14: *Proposal 758-Full*. EDP final review sent to SSEP
- CS 1001-15: *Scoping Studies*. The FY11 budget has been requested and is most likely secured to allow continuation of scoping studies.
- CS 1001-16: *Report from the planned two IODP-related conferences on Deep Drilling in January 2011 EDP meeting*. Greg Myers will present a report at the January 2011 meeting. Myers will also present some information at this meeting and Yoshiyasu Watanabe.
- CS 1001-17: *EDP Microbiology Contamination Report*. Watanabe presented the report at the Scientific Technology Panel (STP) meeting in March 2010 in Sydney, Australia. Asanuma asked if the industry contact had been provided to STP, according to the Consensus Statement. John Thorogood replied that he had discussed this issue with his industry connections, but that industry seemed to have little interest and/or expertise. Ask suggested forwarding this discussion to Agenda Item 22, *Microbiology Contamination Report Discussion*.
- CS 1001-18: *At-sea Engineering Testing Time Request for SCIMPI*. This item is to be discussed further in Agenda Item 27, *Review of Ship-time Request and Results for Engineering Testing*.
- AI 1001-02: *EDP Technology Roadmap development*. This item is to be discussed several times during the meeting, for example in Agenda Item 16, *Technology Roadmap Modifications and Prioritization*.
- AI 1001-03: *Improving EDP meeting efficiency*. Kawamura reported that EDP and IODP-MI have failed to achieve this action item. Ask provided a partial correction: While the draft agenda and meeting logistics had been distributed one month prior the meeting, unfortunately the draft minutes of EDP meeting #10 had been delayed, and presentations were not distributed one week prior to meeting.
- CS 1001-19: *Engineering input to the new science plan*. The draft of the new science plan is delayed to late July or early August. Public comments are to be gathered in August and September 2010. Asanuma noted that EDP had requested that a member of IWG+ attend the EDP Meeting #11. Kawamura said that IODP-MI had not had any contact with IWG+ on this matter. Ussler asked if EDP is to be included in the review of the new science plan. Kawamura replied that the steering committee is preparing an implementation plan, for which EDP's involvement will be more relevant.
- Ussler asked how existing projects are going to be funded, and if they will terminate with the end of IODP. Kawamura replied that funding is there and that completion is expected before the end of the project. Ussler asked if new

development proposals would be accepted. Kawamura replied that this is still under discussion.

8. SPC Report and SAS Transition Presentation (Gabriel Filippelli)

Gabe Filippelli informed EDP about the role of the SPC, and presented an update on three SPC activities (Appendix D): (1) Two Ancillary Project Letter (APL) proposals forwarded by the SSEP; (2) SPC Meeting #15 that was held in Sydney, Australia, March 23-26, 2010; and (3) SAS reconstructing.

(1) The SPC decisions regarding the two APL's were:

SPC Motion 1001-01, SPC does not forward Proposal 757-APL, *South Pacific Eocene-Oligocene*, to the Operations Task Force (OTF). SPC considered that this deep biosphere APL was off cycle with respect to ship schedule.

SPC Motion 1001-02, SPC forwards Proposal 762-APL Grizzly Bare Outcrop Microbiology to the OTF for potential scheduling within the Cascadian program.

(2) The following Consensus Statements (CS) were reached during SPC Meeting #15:

SPC CS 1003-06. SPC approves the nomination of Yasufumi Iryu as the new co-chair of the SSEP.

SPC CS 1003-03: There is a need to develop new borehole monitoring capabilities for biosphere, seismic, and displacement monitoring. This will also provide synergistic observatory activities. Filippelli said that funding is needed for development of these expensive and custom-made monitoring systems.

SPC CS 1003-07: SPC is establishing a Joint Program Planning Group with the International Continental Drilling Program (ICDP). There is of high scientific value and societal interest to understand how climate influenced the early stages of human evolution on the African continent. The task is to plan an integrated drilling program that addressed the influence of climate on the early stages of our evolution.

Filippelli reported that proposals forwarded to SPC either were ranked, returned to the SSEP or decommissioned. Those that were ranked were either forwarded to OTF for scheduling or sent to the holding bin because they lacked critical data (e.g. new site survey data).

SPC CS 1003-08: Proposals 547-Full4, *Oceanic Subsurface Biosphere* and 557-Full2 *Storegga Slide Gas Hydrates* were deactivated because the proponents had not responded to the panel comments.

SPC CS 1003-09: Proposal 703-Full, *Costa Rica SEISCORK* was not ranked at the meeting, because the engineering was not adequate.

SPC CS 1003-10: Proposals 667-Full, *NW Australian Shelf Eustasy*, 595-Full3 *Indus Fan and Murray Ridge*, and 698-Add2, *Izu-Bonin-Mariana Arc Middle Crust* were returned to the proponents for revision. The SPC reasons for asking for new revisions were, for example, that new seismic results indicated different science objectives.

SPC Ranked 18 proposals (Appendix D). Filippelli noted that Proposal 732-Full2, *Antarctic Peninsula Sediment Drifts* is an example of a new proposal that

has moved quickly through the SAS system. Because OTF needs a pool of proposals to choose among for scheduling, SPC forwarded eleven proposals to OTF. Filippelli commented that Proposal 672-Full3, *Baltic Sea Basin Paleoenvironment* is an example of a proposal where the proponents are excellent scientists with little drilling expertise. SPC has encouraged the proponents to develop a scoping group with drilling experts, and Filippelli hoped to review an improved proposal soon.

SPC CS 1003-17: The SPC deactivated Proposal 556-Full4, *Malvinas Confluence* because it had received low ranking in the last several SPC evaluations, and because of its small chance of being implemented during the current IODP phase.

SPC CS 1003-13: The SPC endorsed Proposal 763-APL, *Iberian Margin Paleoclimate*, and forwarded it to the OTF.

SPC CS 1003-15: SPC placed Proposal 681-Full2 *Lesser Antilles Volcanic Landslides* in the holding bin until after new site survey data have been released.

SPC CS 1003-16: SPC has withdrawn the tier designation system, resulting in that existing tier designations at the OTF were removed, and no new designations were determined for the new proposals forwarded to OTF this year.

(3) SAS restructuring

Filippelli commented on the memo "*Planned changes to SAS and the program renewal process*". The memo was distributed on July 9, 2010 by the SASEC chair Maureen Raymo and the SAS chair Gabe Filippelli as a response to a request by IODP-MI the week before.

IWG+, with the assistance of SASEC, aims at obtaining a seamless transition to the new program, without hiatus in drilling activities. Because drilling operation plans are outlined until the end of the IODP, Raymo and Filippelli argued that the jobs of most of the current SAS advisory panel are largely done. They conclude that it is time to start phasing in the new SAS structure. IWG+ has set the goal to have the new SAS structure in place on October 2011.

Filippelli said that IODP needs to have developed this new science advisory structure to be in operation by the dead line. He further said that all SAS panels have been working based on Terms of Reference (ToR), and that the structure was adopted from the Ocean Drilling Program (ODP). In comparison to the rather seamless transition from ODP to IODP, this transition is anticipated to be more competitive. Our program must show why another ten years of ocean drilling is warranted, and what the addition is to the 30 previous years of scientific drilling. The new science plan is intended to show funding organizations why ocean drilling still is needed. US National Science Foundation (NSF) thinks that the chances for renewal are improved by providing input from a new science plan and a new SAS structure. Filippelli stresses that input from the existing SAS structure is needed in order to be successful.

Based on comments heard and own experience, the new SAS structure should fulfill two things: The structure should be simpler and it should better integrate key advice functions. Issues being dealt with in restructuring include: (1) redundancy of science evaluation between SSEP and SPC delays progression; (2) Inadequate

technical/operational input at early stage of proposal development; (3) SASEC is responsible for approving the program plan, but has little understanding of science and the technical aspect understanding; and (4) Lack of clarity of how technical, engineering and scientific measurements advice is integrated among each other and the Implementing Organizations (IOs).

Filippelli pointed out that the new structure is under development, and that advice from current SAS panels is needed. He presented the preliminary view of how key functions in the new SAS structure might be handled:

- Simplified evaluation and approval structure. SASEC, SSEP, SPC should be condensed into two panels;
- Proposal driven workshops during which scientists, engineers and operators develop the science and operational drilling plan. A higher level panel will determine which proposals and larger programs that will be subject for workshop development. This is an opportunity to bring technical input to the proponents;
- More direct early input on science and technology realities, and
- Some service panel function will be integrated within IODP-MI, others with IOs in addition to science advice.

Filippelli informed that a SASEC sub-committee is writing Terms of References (ToR) for the two new science panels. SPC has asked SSEP to develop a system that allows them to evaluate the current proposals to decide which of the existing proposals are high priority proposals by SSEP at their November 2010 meeting. Proposals that do not meet the requirements will be deactivated, whereas those that fulfill the requirements will be forwarded to SPC. SPC will rank these proposals at their March 2011 meeting and create a proposal pool for the next program.

According to the memo of 9 July, 2010, “*EDP functions will be handled by Task Force(s) hosted by the CMO and/or the IOs as appropriate.*”

Advice is needed from the panels regarding:

- How are current projects progressing and how to complete them?
- What are friction points in current interactions that need to be improved?
- What are the key aspects that need to carry forward and how best can they be carried forward?

Asanuma asked for a clarification if SPC and SASEC wanted input from the panels on the new SAS structure, and then he asked if the EDP activity will be handled via task force activities. Filippelli clarified that input from the panels is wanted, and that the Memo outlines a process of transition. He said that the plan is not yet concrete, so no complete structure is yet available. Ussler said that the wording could imply that the memo presents a firm conclusion that is pre-determined. Filippelli replied that the idea was not to write as if that everything already has been defined; some issues have been decided, but not all issues.

Ask asked for further details regarding the work with the new ToR's. Filippelli restated that the details are not ready yet. At this stage, he could inform that SASEC, SPC and SSEP will be reorganized into two upper- and lower-level panels.

- The upper-level panel will handle all SASEC functions, and about half of the SPC functions. This panel will be comprised of senior-level scientists, as well as members of IODP-MI and Central Management Organizations (CMOs). In contrast to the current SASEC structure, the upper-level panel will contain delegates who are investing funding and people into the program. As a result, there is no need for a separate OTF. The upper-level panel will be responsible for developing medium- and long-term scientific planning, approve drilling and program plan, give advice to the lower-level panel that deals with science evaluation on issues such as scientific topics that are important to scope for workshops, as well as guidance of evaluation priorities.
- The lower-panel is a science evaluation panel will be reviewing proposals and is to be composed of scientists, engineers, and technical people. In contrast to the current long proposal-nurturing process, the new panel will gather the right expertise in workshops during which the proposals will nurture themselves. This panel will not be concerned about drilling schedule, or in overseeing service panels. Hence, the lower-level panel will evaluate science; foster it through work shops, which will forward excellent science up for implementation.

Regarding the composition of the new service panels, Ussler commented, and was seconded by Tauxe, that EDP has advocated for more integration of technical and operational aspects into science planning, and that it would be very nice to see this going into a new plan. Tauxe welcomed the restructuring idea with a higher technological involvement at development stage of proposals. Tauxe noted that continuity lives within a panel and might be lost if panel is dissolved. Thorogood said that there is a need to produce a flow chart where needed engineering contribution is highlighted. Ussler said that there has been a problem to obtain expertise needed, as a result from decreasing the number of EDP from 18 to 14. An additional pool of people may be needed to be able to address program needs. Asanuma commented that EDP also distributes information from other efforts like HiT, ICDP, and Moho projects. Wohlgemuth agreed citing an ICDP example.

9a. Preliminary Discussion of SAS Transition, EDP path forward (by Ussler)

Ussler presents 10 questions to open discussion (Appendix E), some of which have brought up already:

- When is the last face-to-face meeting? (Grenoble, January 2010?)
- Rotation schedule. It may not make sense to rotate-off the members at this stage?
- What date is EDP to be disbanded? September 30, 2011
- What are the EDP unfinished businesses?
- What tangible products do IODP-MI and/or the SAS want from the panel before disbandment?
- How will the contributions of the EDP to scientific ocean drilling be preserved and/or archived for the future public access?

- How will the technical expertise of the EDP be maintained and/or utilized?
- How will engineering development (ED) needs be identified, developed, and funded?
- Who oversees ED for the new program?
- What is the fate of the EDP Technology Roadmap?

Filippelli commented that other panels are choosing not to rotate members until the disbandment date, September 30, 2011. He also said that the most effective way is to send comments in form of consensus statements from EDP to IODP-MI and SPC.

Additional discussion followed:

- Tauze asked who will own the information produced by the EDP. Ussler said that the EDP Technology Road Map will be sent to IODP-MI.
- Ask asked how membership contribution in the new program will be handled? Filippelli said that the current approach is to assume that the current quota will be maintained.
- Wilkens commented that he anticipated that several past panel members will be re-invited to the new program. Ussler noted that a sort of “staggering” rotation might help to bring new people and adapt to new technology.

9a. Preliminary Discussion of SAS Transition, Impact on IOs (by Greg Myers)

Greg Myers presented results from discussions by the IOs representatives at the meeting, Nori Kyo, Dave Smith, and Myers. Myers said that EDP has worked really well for USIO and CDEX, but not so well for other IOs. The goal for the new program should be that the next panel should be adapted for all IOs.

In slide *Project Specific Engineering Development* of Appendix E, they present a plan for how task forces may be utilized to provide efficient and focused advice for the IOs. Each IO would have a list of technical EDP-STP-type of experts that can be called upon to man task forces for specific projects. The list could be identified by the IOs or SAS, and to keep the international flavor, each group should have global composition. Experts may also be called upon to review drilling proposals. The task force travel would be funded by Program Member Offices (PMO). Annual IODP engineering workshops would occur where task forces meet together.

Kyo added that the IOs have responsibility to successfully integrate the wanted expertise. The task force style may fit with current operation style.

Wilkens asked for an example of a Task Force. Myers gave the example of long term monitoring. A task force with about six members would meet once a year to discuss details of the project. The task force would look much closer to the project than the current EDP, which looks at a higher level.

Asanuma feared there will be too many task forces. Myers said that the number of task forces could be controlled against a threshold, for example project size funding and length of project. Smith commented that the current EDP system poorly fits the ESO structure with Mission Specific Platform (MSP) projects as time scales are too short. The IOs would like to have access to a big group of experts and use them in more focused

projects. Asanuma appreciated the advantage of task forces, and asked if some task forces also should evaluate ED proposals.

Myers commented that it would be difficult to use commingled funds for the ED projects. To do larger EDs such as deep riser drilling, new sources of funding need to be found.

Thorogood said that engineering input from diverse expertise such as current EDP will be necessary, and that peer review and/or peer challenge regarding technical development will be essential. He questioned if selection of task force members by IOs is good enough for the overall needs of the program. Ussler said that there should be more peer review of ED projects, and that there are not sufficient design reviews (concept, preliminary). Getting into details, providing rigor would ensure better outcome. Thorogood agreed and said that engineering aspects needs to be considered at a much earlier stage than currently.

Wilkens asked if task forces would be useful as enabling separate technologies, such as seabed frames, riser, and monitoring technologies. EDP has not handled those well. He said that an integrated EDP of may give more visibility to the large issues, such as improved core recovery.

Kawamura said that based on current discussions among funding agencies, there is a slim to low chance have unsolicited funding (<\$1M/year) for ED funding in the new program.

10. SSEP Report (by Ussler)

Ussler reported the outcomes from the SSEP meeting #14 in Kochi, Japan, May 2010 (Appendix F).

Fourteen proposals were reviewed, eight of these were pre-proposals, two were full proposals, and four were APL proposals). This is the smallest number of submissions since 2001. There are currently 102 active proposals and three active complex drilling projects (CDP): 23 of these are related to Theme 1 (Deep Biosphere); 41 are related to Theme 2 (Climate Change); and 41 are related to Theme 3 (Solid Earth). Currently, 55 proposals are handled by SSEP, 9 by SPC, 38 by OTF and four are held in a holding bin. The OTF would need a higher number of ready to drill proposals for optimizing scheduling of coming expeditions. The average time from proposal submission to expedition is 87.5 months (>7 yr), with a maximum of 168 months (14 yr).

Ussler reported that no proposals were forwarded to EDP for evaluation. He said that five proposals would benefit from by existing IODP-MI ED projects: Two proposals would benefit from the Single Cable Installation for Measuring Parameter In-situ (SCIMPI); two proposals would benefit from the Motion Decoupled Hydraulic Delivery System (MDHDS); and one proposal would benefit from Long Term Borehole Monitoring System (LTBMS).

Ussler said that there were no technical issues for EDP to review at the SSEP meeting, but that he had recommended that the proponents of two proposals should confer with the IOs. He commented that proponent communication with IOs is uneven, and that proponents may benefit from establishing a dialog with the IOs at early stages of proposal development.

Ussler noted that EDP has only reviewed Category A and B proposals, but that no calls for category C proposals (solicited proposals) have been made by IODP-MI. This aspect needs to be considered when defining the new SAS structure.

11. STP Report (by Sanny Saito)

Sanny Saito reported from the STP Meeting #10, held in Sydney, Australia, on 17-19 March 2010 (Appendix G).

Saito reminded the EDP of the role of STP. The STP discusses technology needs, but not the technological development. Six out of 18 Consensus Statements (CS) were relevant to the EDP. These are briefly summarized below:

STP CS 1003-01: The STP supports the EDP memorandum and recommends that both EDP and STP are to be involved in the review and revision of the new IODP Science Plan.

STP CS 1003-02: The STP recognizes the need for a closer connection between the STP and EDP roadmaps.

STP CS 1003-12: The STP endorsed the plan for a two-day SCIMPI deployment during IODP Expedition 327: *Juan de Fuca Ridge-Flank Hydrogeology*. STP is looking forward to see the data after the deployment

STP CS 1003-13: Open-water reentry logging. STP added this technique to the STP roadmap

STP CS 1003-07: Release of the Scientific Technology Roadmap 1.0. The new roadmap is categorized by implementation. It is posted on www.iodp.org/stp.

STP CS 1003-23: Reception of EDP report on “Detection and Control of Contamination Issues”. STP recognizes the need to trace microbiological contamination for quality assurance/quality control QA/QC of core samples. STP will collect information from contacts to be supplied by EDP, and will present a plan for tracer testing at the next meeting.

STP have listed the ten most needed developments, and these fall within the following six categories: Deep hole/water penetration technologies; Enhanced core recovery and quality; Evaluation of core contamination; Stress and pressure measurements; Large diameter pipe; and X-ray CT system on the *JOIDES Resolution* (JR). Saito said that the EDP Technology Roadmap highlights all categories but the last one.

The STP recognizes the need to trace microbiological contamination for QA/QC of core samples (STP CS 1003-23). STP will collect information from industrial contacts to be supplied by EDP. Thorogood reported that he had been unsuccessful in finding an industrial contact for microbiological contamination because industry lacks the experience within this field. Saito said that STP would be interested in contamination in general, and Mike Maler offered to find an industrial contamination specialist.

Additional discussion on open-water reentry logging (STP CS 1003-13) followed:

- Wilkens questioned the availability of an ROV. Saito replied ROV was expected to be operated from the drill ship.

- Ask questioned the operational possibilities should the tool get stuck. Saito replied that such operations have not yet been considered.
- Ussler noted there are two technological possibilities for allowing for standard-diameter (large) logging tools: One is to refit the JR to support an ROV, and another is to complete its refitting to handle large diameter drill pipe—a project already well underway. Myers noted that large diameter drill pipe will be discussed in the USIO presentation (Agenda Item 13c). Ussler also noted that there were two options regarding the compatibility of drill pipe and downhole tools: Either we use large diameter pipe, or develop a full suite of slim hole logging tools. The cost for developing and maintaining new slim hole logging tools needs to be compared to the cost for acquiring large diameter pipes for the JR. Smith noted that ESO already uses slim hole logging tools. Saito said that it is an implementation issue, because ROV and large diameter logging tools are already existing technologies.
- Thorogood said that deep water tool handling is complicated, for example strong currents makes is difficult to steer logging equipment and obtain good depth control. Smith said that ESO uses guiding wires to steer logging tools in the hole, but was informed that the Chikyu and JR do not use guiding wires. However, Wilkens said that the drill-string camera is deployed alongside the drill pipe of the JR, and that logging tools may also be deployed using these guide wire. Thorogood said that jamming of the wireline and current-induced depth registration problems still would occur for combined guide wires from the ship with the existing drill string.
- Tezuka pointed out that success of open water reentry logging depends on the borehole stability. The use of drill pipe as a guide is preferred since it reduces the risk of the tool getting stuck in the shallow part of the well.

12. IODP-MI Operations and Engineering Development Report (by Kawamura)

Yoshi Kawamura provided an update on the IODP-MI operations and ED (Appendix H). He first listed the SAS meetings that have been completed from January to July 2010, with comments on the main tasks for some meetings.

The JR FY2011 expedition schedule includes five expeditions, one transit, and one maintenance period. For FY2012, JR is scheduled for IODP drilling in the Atlantic Ocean and in the West Pacific Ocean, as well as non-IODP operations. For FY2013, the JR is scheduled for IODP drilling in the east Pacific Ocean and Indian Ocean, as well as non-IODP operations. The Chikyu FY2011 expedition schedule includes three IODP expeditions and one non-IODP expedition. Deep riser drilling by Chikyu will begin in August 2011. CDEX is working hard on resolving the high-current issues of the Chikyu.

The status of ongoing ED projects are as follows:

- Long Term Borehole Monitoring System (LTBMS). CDEX conducted resistance tests on the electronics by running it at 150°C for 10.9 months.
- Multi-sensor Magnetometer Module (MMM). This is a USIO project.
- Single Cable Installation Measuring Parameter In-situ (SCIMPI). The University of Rhode Island (URI) was originally planning to conduct deployment tests during Expedition 327, *Juan de Fuca Ridge-Flank Hydrogeology*, but USIO was not able to

accommodate the sea trials at such short notice. The current plans are to conduct land tests in August 2010. If Proposal 633-Full2, *Costa Rica Mud Mounds*, ranked as number 9 at the SPC meeting in Sydney in March 2010 (Appendix D), is potentially suited for sea trial tests. Kawamura said that the USIO development of the Multi-Function Telemetry Module (MFTM; Appendix K) is of interest for the SCIMPI project.

- Electronic Release System (ERS). The ERS module has been built by Mohr Engineering. Two prototypes have been fabricated that are to be deployed during Expedition 327, *Juan de Fuca Ridge-Flank Hydrogeology*, for deployment of the 1301 and 1027 CORK instrument strings. Upon return, the prototype ERS real time communication capability will be added.
- Motion Decoupled Hydraulic Delivery System (MDHDS). The development continues, and its telemetry system was successfully tested at the LDEO test site in April 2010. In June 2010, T2P was deployed at Land Site in Cambridge, MA. Full system bench test is planned for September 2010. The project follows the time plan, although some late stage design changes and overlap our project with other IODP projects, as well as lengthy contract negotiations with both main- and subcontracts. The budget is confirmed, and it is time to establishing contracts. The proponents called for information from the EDP, on the current procedure for getting engineering time on board the JR, but the proponent stated that an important goal is to get the MDHDS to be actively used on the IODP platforms.

Ussler responded to the call for EDP advice that there is a sea time policy. The procedure is to send in a sea time request through EDP via IODP-MI. Ask suggested that IODP-MI should inform the proponents about the transition plans, and recommend them to submit request for sea trial in time for EDP Meeting #13, in January 2011. Kawamura agreed.

The FY2011 Draft Engineering Plan is under development. No Science Operating Costs (SOC) engineering projects were approved for FY2011. As the result, the focus is on continuing ongoing projects, i.e. SCIMPI and MMM.

13a. Operator Reports and Status of FY10 Engineering Developments (including 3rd party tools), CDEX (by Nori Kyo)

Nori Kyo reported on CDEX ED and provided a LTBMS status report (Appendix I).

The following CDEX EDs have been made:

12,000 m long drill pipe (EDP TR B-29). In order to recover core from the upper mantle with 4,000 m water depth and 7,000 m below seafloor drilling. In Japanese FY2009 (JFY), a prototype of S-155, 5-7/8" was produced and tested. In JFY2010, the plan is to test S-160 material property tests.

Riser fairings (EDP TR B-23). CDEX is developing riser fairings to reduce the vortex induced vibrations (VIV) to allow riser drilling under conditions with strong currents. In JFY, riser fairings were installed under actual condition of high currents (max. 2.7 knots). Riser motion has been monitored by the standalone monitoring system. Data analysis will be conducted this year. Thorogood pointed out that these riser systems have already been developed in the petroleum industry, and that there is no need to design new systems.

Small-Diameter Rotary Core Barrel (SD-RCB; EDP TR A-7 and A-19). The objective is to improve circulation characteristics, modify core catcher and the annulus of the outer core barrel, and to produce a new diamond impregnated PDC bit. Tests of the new bits will be done on shore.

Turbo-Corer (EDP TR A-10, B-15). A turbine prototype has been built, and turbine performance tests have been conducted onshore at RPM from 800 to 8000 rpm, and torque of 350Nm. A test under real drilling condition will be done in JFY2010.

Directional measurements (EDP TR A-22, B-9, B-10, B-15). A directional sensor (Inclination/Azimuth/tool face sensor) has been produced. The sensor is to be tested in JFY2009, and developments are done on the data transmission and weight-on-bit and torque-on-bit (WOB/TOB) sensors.

Acoustic position reference system upgrades (EDP TR B-24). The wideband system has been upgraded from Acoustic Position Reference System (APRS) to Sonardyne. This will allow for more efficient use of bandwidth, increase the immunity to noise, improve the accuracy, and improve the telemetry capability. The result is more robust and faster communications, and a faster array calibration, but the disadvantage is a detriment of battery life of transducers

The status report on the Long Term Borehole Monitoring System (LTBMS) included:

- The long-term resistance test at high temperature was finished in March 2010. The test was done at 139°C, which was determined to be the maximum operating temperature. The electronics failed after 2868 h, because a soldering at the pin of a FPGA cracked. Kyo estimated the system life to 5 yr at a temperature of 100°C.
- Tauxe asked about the method for determining life expectancy. Kyo answered that it is based on established mathematical models of time-temperature-failure relationships.
- C0002 riserless observatory. Hydraulic isolation will be provided by a swellable packer, since there is no seal in the head of a CORK. At the bottom, a strain meter and strain gauge will coexist. Gel will be injected to fill the pore pressure chamber as a temporary bridge before cementing the strain meter.
- Lessons learned from at-sea testing on Expedition 319. Strengthening of the system has followed data analysis of the failed tool lowering during Expedition 319. Spiraling a rope around the equipment greatly reduced vortex-induced vibration (VIV).
- Ask asked where the idea of wrapping a rope around the sub came from. Thorogood stated that this technique has been around for some 30 years.
- Kyo also indicated that numerical simulations were underway to estimate the acceleration experienced by the string under various conditions.
- Thorogood pointed out that industry data showed that the software used, Shear7, has recently been shown to underpredict VIV by a factor of 10, and wonders how its results compare with the actual measurements. Kyo replied that the numerical results were compared to actual data.

Asanuma suggested using SiC for producing PCB, as it is done in geothermal projects. Kyo responded that the current material in use is FP4, and said that this was worthy of consideration.

Doan asked for clarification about the cementing technique of the riserless observatory. Kyo answered the cement would be injected directly downhole through a tube within the observatory string, after placement of the temporary gel plug.

13b. Operator Reports and Status of FY10 Engineering Developments (including 3rd party tools), ESO (by Dave Smith)

Dave Smith reported on the latest ESO activities, including an update on completed ESO expeditions (Expeditions 315 and 325), future MSPs and other EDs (Appendix J).

The review of Expedition 315 (New Jersey) will be conducting from 19-23 July, the week following the EDP Santa Fe meeting. Expedition 325 (Great Barrier Reef) was executed from February to April 2010. Smith underlined the difficulties of the expedition, including difficulties in getting permits, delays with the ship provider and bad weather conditions. In total, 759 meters were cored with a 30% recovery. Logging was limited, with only 46 m logged after 4 attempts. Downtime was 37%, including interruptions due to bad weather. Scientists were disappointed about the low recovery, but nevertheless, available data is sufficient to meet the scientific objectives. John Tauxe asked what the water depths (WD) were, and Smith replied 40-160m.

There are sufficient funds for one additional MSP mission before the end of the IODP. OTF has tasked ESO to assess an expedition to the Chixculub in 2010/2011. However, ESO still will consider additional proposals if they are ranked by SPC. In addition, ESO will investigate the potential for seabed rock drill deployment from research vessels as a cost-effective alternative.

Regarding other EDs outside of IODP, Smith briefly presented two British Geological Survey (BGS) seabed drilling systems: BGS RD2 Rockdrill (WD 3500m) and Seabed Rockdrill Lars that is a fold-up and easy transported rig. On going ED include wireline coring- and geophysical logging capabilities that should be completed in December 2010 and during 2011, respectively. In addition, Smith informed about offshore installations for renewable energy that is both cost effective and able to stand high tidal flow and scoured seabed. Smith also showed a film from Blade Offshore Remote on techniques for pile mooring.

John Tauxe asked what the relationship between pile driving and drilling is, and Smith replied that the technology is the same. Tezuka asked about the reasons for unsuccessful logging in Expedition 325. Smith replied that the logging tools were slimhole tools with 2.5" diameter, which is not suited for the large API holes with an outer diameter of: 5-1/2". The tight ship time allocation, combined with scientific priorities, was also an issue that also influenced logging.

13c. Operator Reports and Status of FY10 Engineering Developments (including 3rd party tools), USIO (by Myers)

Myers provided a report on the USIO Engineering Projects, maintenance actives, and third party tools (Appendix K).

Myers presented the JR schedule from 2009-2011, which also include two maintenance periods. Several expeditions in 2010 and 2011 include CORK installations:

- Expedition 327 (Juan de Fuca), with 2 lateral CORK and 1 CORK-II. Swellable packer experimentation is ongoing, which will solve many problems once they work. Four TAMU engineering personnel will sail.
- Expedition 328 (Cascadia) with 1 ACORK. The equipment is in fabrication. Two TAMU engineering personnel will sail.
- Expedition 336 (Mid-Atlantic Ridge Microbiology), with 3 CORK with microbiology focus, e.g. including teflon pipe. This expedition is still in the planning stage.

Several ED projects are ongoing, including:

Drilling Sensor Sub (DSS). This tool is placed in the BHA during coring to record WOB, TOB, annulus pressure, and annulus temperature. The goal is to better understand heave effects on core quality and recovery. The former concept was adopted in 2003, but the prototype failed due to leakage, and the project has been on hold since 2008. The project was recommenced in 2010, with the goal to complete three lab rig tests from February to September 2011. Sea trials will be conducted in FY12 provided that the four acceptance criteria are met. If acceptance criteria are not met, the project will be definitively abandoned. Myers requested input from the EDP regarding the project development, which is provided in EDP Consensus 1007-14

Multisensor Magnetometer Module (MMM). A prototype made by off-the-shelf sensors is under design. Electronics components will begin to get assembled in Fall 2010/Spring 2011. The prototype is to be built from Fall 2011 to Spring 2012, to be tested in Spring 2012, and to be deployed in late 2012.

Magnetic Susceptibility Sonde-B (MSS-B). The replacement of the MSS-A tool lost during Expedition 320 is underway; two new tools will be built. Tool parts are being assembled and to be completed by September 2010, and bench testing is scheduled in November/December 2010. Myers thinks the project will be completed on time. MSS-B will have a separate section for electronics, in contrary to MSS-A.

Multi-Function Telemetry Module (MFTM). The MFTM for MDHDS was successfully tested with the Temperature and dual Pressure (T2P) probe at LDEO in May 2010. MFTM has also been proposed to be adapted for the Deep Exploration Biosphere Investigative – tool (DEBI-T). The estimated time for completion for both SCIMPI and DEBI-T MFTM is January 2011, and they are to be employed during Expedition 336, Mid-Atlantic Ridge Microbiology. Kawamura remarked that there are several groups that develop telemetry tools and that there is a lot of sharing of information. As new measurement devices are being used, existing telemetry systems can be used

Large Pipe Handling Infrastructure. The goal is to allow efficient handling of 6-5/8” pipes on JR. Pipe racks have been converted to store large diameter pipe onboard and a dual elevator is to be installed on the JR. The elevator should have the right handling for not damaging the pipes, as there is no grip marks on the pipe. LDEO hired Howard and Associates, Inc (HAI) to prepare a request for quote (RFQ) that was issued in June

28, 2010 with a 30-day response time. USIO and HAI will review the responses. Large diameter pipes may be leased; the infrastructure and ability is there to handle it.

Maintenance period in Victoria. The maintenance concerned vessel and science systems.

Two aspects on the vessel system were maintained, the primary engines were rebuilt and the elevator was repaired. Five aspects of science systems were maintained, including: (1) Engineering and operations; (2) IT infrastructure; (3) IT development; (4) Lab infrastructure; and (5) Logging projects.

Myers also presented an update on other activities and third party tools, including:

- *Riserless Mud Recovery (RMR).* There are ongoing efforts to get funding for field trials.
- *SCIMPI deployment assistance.* The University of Rhode Island team visited JR the week before the EDP#11 meeting.
- *Mohole*
- *Dark energy borehole infrastructure tool (DEBI-T).* The DEBI-T is a microbiology tool funded by the DEBI project to explore the deep biosphere. Katrina Edwards leads a project adapting existing ROV-operated microbiology activity sensors into a downhole tool. The tool is to be interfaced with MFTM (see above).

Questions & comments: (1) Asanuma: What is the maximum water depth that can be achieved with the RMR? Myers: Currently, 5000ft (1524 m) is the maximum. If we need more power, we can cascade the pumps; (2) Watanabe: Isn't BOP necessary even with RMR? Myers: It depends on drilling location. We may need some system to control the well; and (3) Asanuma: Do you expect any influence that the BP accident would cause? Myers: We will watch it very carefully since it could affect the drilling program. But we're not clear at this point.

14. Report from IODP-China (by Haixiong Tang)

Haixiong Tang gave a review on the deepwater operations conducted by Chinese oil companies (Appendix L).

They have three major challenges: (1) The interesting areas lie at WD >3000m; (2) Climate; and (3) Oceanic currents. Deepwater operations in China started in 2004. In 2006 and 2008, the first wells at >1000 and >3000 m WD were drilled, respectively. Currently, more than 16 deep wells to over 3000 m WD have been drilled, and wells to over 3500m WD can be drilled. The plan ahead is to drill 6 to 10 exploration wells per year with partners.

A new semi-submersible rig (HY981) is being built, and more deep water drilling is scheduled in the South China Sea. After the Deep Horizon incident, Chinese government decreed tighter Health, Safety & Environment (HSE) rules for Chinese oil companies. One additional deepwater rig (HY982) has to be built for relief well.

Tang finally informed that the Chinese government can support IODP activities so that China can be the full member of IODP.

Hariku Inooka remarked that the presentation focused on oil- and gas industry, and asked whether any academic projects are ongoing. Tang replied that he was unaware of the Chinese government plan.

15. FY 12 Engineering Development Proposal (by Wilkens)

Conflict Of Interest (COI) was checked by the chair. Mai-Linh Doan declared having COI and she was requested to leave the room. Kyo informed that he worked at the same institute, and Asanuma informed that he worked at the same university as one of the proponents; these connections were not considered to be COI.

The lead watchdog, Roy Wilkens gave a presentation of the proposal. The other watchdogs were Leon Holloway, John Thorogood, Hiroshi Asanuma, and Toru Ikegami. Pros and cons of the proposal were discussed.

16. Technology Roadmap Modifications and Prioritization (by Ask)

This item will be discussed under Item 18, because the meeting is behind schedule. The meeting was adjourned.

5. Approve Minutes from EDP Meeting #10 (by Ask)

Lead by John Tauxe, some amendments were made to the minutes of EDP 10. Specifically:

- Names of folk in the group photograph.
- Proposed editorial changes to consensus items were not accepted.
- There were some technical clarifications concerning the CEDEX presentation that would be left to Nori to fix offline.
- A number of other wording issues were identified that would also be fixed offline.

John Tauxe proposed a consensus item to approve the minutes subject the amendments being made. Thorogood provided a second.

17. ORTF Discussion (by Kawamura)

Kawamura presented a brief summary of the Operations Review Task Force (ORTF) status (Appendix M). Their report was short because there had been no activity during the last six months.

Kawamura summarized the remit of the ORTF for the benefit of the attendees. He ran through the plan for future ORTF reviews and stated that if any panel members were willing to participate, to let him know. Current reviews include:

- Exp 313, New Jersey
- Exp 319 & 322 NantroSEIZE
- Exp 323 Bering Sea Paleooceanography
- Exp 324 Shatsky Rise

Ussler requested a summary of the expertise required for the latter two. Kawamura replied that it was mainly coring issues. There may be some issues over the laboratory set-up following the upgrade to the vessel.

Asanuma asked whether panel members were optional or compulsory. Essentially, it is optional based on the required skill set and the individual's ability to contribute. Smith pointed out that scheduling the right people at the right time in the same place is, in itself, quite a challenge. Thorogood requested that in future, if possible, three or more months notice should be given to ensure attendance. Saito questioned the linkage with the STP reviews. During STP meetings, STP reviews onboard measurements and QA/QC. STP should not necessarily attend the reviews, but IODP-MI should collate all the separate reviews.

18. Technology Roadmap discussion – part 1 (by Ask)

Asanuma asked that we prepare a consensus item regarding preservation of the Technology Roadmap going forward following the demise of EDP.

Ask introduced the session by reviewing the current state of the roadmap (Appendix N). Due to a number of calendar clashes over the last 6 months, there had not been time to finalize it for release. She briefly reviewed the evolution of the road map from versions 1 to 3. She highlighted the shortcomings of V3 and showed how these were intended to be rectified in the new structure in V3.3, especially as it related to the future of the program. She highlighted a number of comments that had been raised that needed resolution to improve clarity, structure and readability of the document. There should be a summary of the ED achievements and some mechanism for assessing feedback and its impact.

Doan suggested that the impact of the TR on the community should be captured on the website. She asked for information on how it is used. John Tauxe wondered who has actually read this document outside of the EDP. While some specialist proponents might have seen it, he questioned the level of the awareness amongst the wider community. He illustrated the case of one researcher in the field that was completely unaware of its existence or its potential contribution to the science community. Ussler agreed and suggested that IODP-MI was the initial audience and provided a structure for assessing incoming proposals, especially unsolicited ones. Bill showed there is now a portfolio of developments underway. He suggested that there ought to be a session at EGU with representatives from IODP-MI to further publicize the roadmap and facilitate its continuation into the future. It is an opportunity to get out the message, publicize its successes and future opportunities.

The next phase of future deep water ocean drilling should be included in it. Further areas of work were identified. Ask negotiated a split of duties around the group to address the outstanding topics. The sub-teams then split up and worked on their respective sessions.

19. Status and Discussion of Scoping Studies (by Kawamura)

Kawamura reported back on the status of the scoping studies (Appendix O):

- Ultra deep water drilling scoping study: There was the 3-5 June 2010 workshop in Kanazawa and the report is due 20 July 2010. There will be a follow-up meeting on 9-11 September 2011 to focus on implementation issues in Washington DC by the Deep Carbon Observatory (DCO) and the IODP.
- Coring Scoping Study: Assessment of the NantroSEIZE Exp 316 data: it involved a comparison of core quality and recovery against operational and environmental

parameters. The results showed little if any correlation between drilling parameters, vessel heave, core recovery and quality. There were a number of recommendations made concerning further data acquisition and lines of investigation. Comprehensive report on past and present drilling and coring technologies: a detailed description of past and present technologies and experience.

Kawamura asked for EDP input regarding what are the next steps for the drilling and coring scoping studies?

Ask inquired whether the coring study has been updated following the request at the last meeting for inclusion of CDEX tools and methods. The feeling was that the report should be kept up to date with the different coring systems used by all the IOs. Kawamura said that the aim would be to keep the document live and available on the website. Ask suggested that ED links should be stored on the website.

IODP-MI specific next steps include a package available to the public. What more data analysis should be done? Not only tracking operational statistics and also, as discussed at EDP Meeting 9 (Luleå), there should be work on integrated downhole coring systems to build on the coring study to develop a platform-independent map of downhole coring systems to show how the different systems relate and where future developments are required to overcome shortfalls.

Additional studies are needed. Possibly, we should retain a contractor familiar with IODP goals, with experts from ICDP, industry and Europe. Thorogood offered to locate key personnel, for example Marshall Perdee (sp), and Wohlgemuth advised that Bernd W would be willing to assist. Following from this, then the study should move on to integrated downhole and surface drilling systems.

Thorogood articulated the need for two things: (1) Scientists happiness with status quo; and (2) Data acquisition and analysis to define the problem.

Tauxe described the data acquisition, quality and analysis methods used to inform future decisions. He suggested that techniques were available elsewhere that would help to progress this issue further. It was suggested that Neptune should make a proposal. At the last meeting TAMU personnel had suggested that such an approach would not be worthwhile due to the poor quality of the data. Ussler suggested that this would raise a question mark over how TAMU might use future data from the DSS for assessment of core quality. He suggested that this point is considered in writing a consensus statement around the DSS. TAMU were also worried about the quality of the Driller's records. Better record keeping would help, but this could be automated.

Smith reported problems of drilling contractor data acquisition and core quality assessment on MSPs. Ask proposed a consensus statement to assess the quality of the analysis methodology of the NantroSEIZE report. Thorogood seconded it. Tauxe suggested that there might be benefit in reviewing some of the historical data as a starting point for future analysis and improvement. Wilkens pointed out the limitations experienced by TAMU were founded on a feeling of cost versus value. Tauxe suggested that expert elicitation of the people involved that can be used to feed knowledge into the analysis and assessment. The techniques could bring valuable new insights to the problem.

20. Lessons learned from the KTB borehole (by Lothar Wohlgemuth)

Lothar Wohlgemuth gave a detailed presentation about the KTB borehole and project (Appendix P). He remarked that all the data are over 15 years old, but holds much value for future projects. It was a project that underwent multiple phases from 1984 through 1996 with experiments still ongoing. The project had a number of major scientific goals, including a long term deep crustal laboratory.

The project involved two holes: pilot hole 3-5km depth complete with 6" wireline coring system integrated into the rig. The pilot hole produced many samples. During the final phase of the pilot hole rig it was clear that the main hole would involve an automated rig, vertical hole drilling system, downhole motors to 180°C, slim clearance casing, high strength drillpipe, special coring capabilities.

It allowed the first 4 km of the main hole to be drilled efficiently before going on to 10-12 km target. The operations involved special hard formation rock bits. The need for the straight hole drilling tool was learned from the pilot hole and the Kola deep well. The Vertical Drilling System (VDS) was used to 7.5km depth and kept the deviation to within 2 degrees, low torque and drag and enabled the slim hole casing concept. The pilot hole drifted 190m in 4000m, while the main hole drifted 10m in 6000m.

The main hole was achieved with a 6-casing string design. 6km 13 3/8" casing was run into a 14 3/4" hole. The total project cost was 264 million Euros.

The project provided a lot of information about the history of the collision of the crustal plates. A custom laboratory was built. Results from the well showed that it was drilled into highly dipping formations. Wide angle reflection seismics show the complexity of the geological structures. The coring system produced 11 3/4" diameter cores. Many fluids were found in the individual cores. The maximum temperature was 249°C at 8549m and over 265°C at 9101m. The new rig included many novel features: automatic pipe handler, gear driven drawworks and many other features.

The existing wells provide a deep crustal laboratory facility, including VSP experiments.

Major problems and important conclusions:

In the deep well, performance was good down to about 6,500m. Thereafter, there were many problems with difficult zones. 468 days was the total lost time, or 32%, at a cost of about 28 million Euros. A caliper log 7,000 to 7,200m showed substantial breakouts. The reasons were anisotropic stress conditions, excessive breakouts, unfavorable orientation in relation to the principle stresses. The main reason was most likely to be the use of water-based mud.

Key lessons learned include:

- Careful site selection
- Extensive subsurface investigation with 2D & 3D seismic
- Integrated planning and engineering for the well and casing plan
- Assessment of borehole direction in relation to the stresses
- Consider future use of oil-based mud.

Borehole stability is the key problem for ultra-deep drilling and is the top priority for planning such deep wells. It must have top priority. Pre-drilling the first priority is to get an accurate view of the subsurface stresses and then to design the trajectory to minimize the breakout.

Questions & comments: (1) Wilkens asked about temperatures of the drilling fluids. Wohlgemuth suggested that borehole fluids were also a considerable problem, but was not able to comment on the thermal effects; (2) Myers asked about the knowledge gained from the pilot hole. Wohlgemuth said that a lot of the real stability problems only became apparent deeper than the pilot hole depth; (3) Kazuhiko Tezuka asked about mud weights. Wohlgemuth said that normally, mud weights were around 1.15. They had tried to increase it to 1.4, but after a while the problems manifested themselves. It only provided temporary stabilization. Wohlgemuth concluded that mud weight was not the right solution. The other problem was that they have a complete lack of information about the subsurface conditions.

21. Progress and next steps on Deep Drilling Frontiers (by Myers, Thorogood and Watanabe)

Myers/Thorogood and Watanabe presented summaries of the Deep Drilling Frontiers workshop held in Kanazawa, Japan on 3-5 June 2010 (Appendix Q). This was an interim update with no action items or deliverables intended.

Aspirations to drill to the Moho date back to the early 1960's. There have been several workshops as well, e.g. Mission Moho held in Oregon, but not always with consensus statements or follow-up in Myers' opinion.

The Kanazawa workshop developed a short list of three possible sights, which Greg reviewed on a live Google Earth link available from the IODP web site. The overlay displays both the current proposed sights and previous attempts to reach the Moho.

The workshop focused on site selection, engineering needs, and operational issues. Participants included a broad cross section including representatives from industry, IODP, and EDP.

The short list of sites are Hawaii, Baja California, and Site 1260.

Previous workshops did not prioritize the engineering aspect. At Kanazawa, they identified three key issues (a draft report is in circulation amongst the steering committee):

1. Water depth – all sites will be on the order of 4000m.
2. Time – extensive time for planning and execution required. CEDEX estimates over 400 days will be needed just to drill the well.
3. Price is roughly estimated \$US 1B. A NASA engineer who was present thought that this was low because it did not capture the associated science proposals, just the planning and drilling effort. Myers observed that it might be necessary to drill in stages in order to fit funding cycles and availability.
4. Industry engagement was identified as a critical success factor. They have been very receptive to helping but will volunteer basis be sufficient? At the workshop

three methods to engage on a paid basis were identified: (1) Ad hoc engagement; (2) Contractual services; and (3) Workshops, symposiums.

Wilkens asked: What is the crustal thickness that will need to be drilled? Myers replied: 5000m plus another 1000m of upper mantle at the Baja site. The science community has acknowledged that continuous coring is not realistic; Tauxe asked: Is it feasible to re-enter site 504B and deepen it? Wilkens said no. That well is already at 200°C because the crust is very young at that location. Myers commented that temperatures at the Baja sites are not as severe.

The workshop did not address specific solutions to engineering challenges but rather they focused on the identification of key issues. Ultimately it will take a full time effort to solve problems and plan the well. The challenges (see PowerPoint for details):

1. Mud circulation: borehole stability and circulation; consider oil-based mud. The latter was an idea Myer's learned from Wohlgemuth's presentation on the KTB well.
2. Logging and coring: high temperature; if <175°C then possible with existing industry tools. This was fed back to the site selection sub-group.
3. Bit and drill string: a primary issue to solve; CEDEX has been working on these engineering issues – should the effort be expanded to the full international community?
4. Drill mud: industry mud engineers have been invited to the September meeting to give a report on the state of the art.
5. Casing and cement: IODP lacks any significant expertise and will need outside help.
6. Assess past experiences and test ideas in current program: Site 1256D will be revisited – could this be an opportunity to test different ideas while drilling at this site?
7. Operations: personnel moves to/from drill ship; supply chain for long term operation offshore; logistical complexity will depend on distance from shore base; pilot hole merits debated and there were strong opinions on both sides.

The next Deep Drilling Frontiers will be held in Washington D.C. on 9 – 11 September 2010. The DCO, a group funded by the Sloan Foundation rather than NSF, will be present. They would like to take advantage of IODP drilling expertise and infrastructure. IODP will gain from DCO capability in microbiology. This workshop will produce a refined draft of the scoping study that will ultimately go to NSF, Sloan, DoE, and possibly other funding sources. The funding needs will be very large and Myers reiterated that the effort will ultimately be too big for a volunteer group.

Smith asked how much core? Myers replied that the science community wants continuous core but in their report they will acknowledge the difficulty of continuous core. They will propose a point to begin continuous coring that will be close to the Moho, e.g. 1000 m above. There will be little control on the actual depth, though. Regarding coring difficulties, the scientists have emphatically pointed out that there is “zero chance of encountering any hazards.” Thorogood said that addressing hazards is a fundamental part of design and is a piece of work that needs to be done. Both points of view need to be

represented to avoid becoming too risk adverse or too gung ho. If nothing else, this debate and resulting decisions should have an auditable trail.

Watanabe provided additional feedback from his perspective (Appendix Q):

Workshop objectives were (1) Develop a roadmap for technology development; and (2) Create a site selection short list.

The water depth at the three sites ranges from 3650 – 4300 m and temperature estimates range from <150°C (Hawaii) to >250°C (site 1260). Geophysical site surveys will be conducted at the three sites over the next two years.

Watanabe summarized recent records achieved with pertinent technologies:

1. Conventional steel riser: 3051 m water depth (Chevron) and 3658 m water depth (Discovery Clear Leader)
2. Riser-less mud return system: successful field trial in 1500 m water depth in Malaysia
3. Surface BOP: 5200m TD in 2887 m water depth (2003); this is only appropriate for benign sea conditions, however.

No consensus on a roadmap for technology development was produced. Myers interjected that a draft is in circulation with the sub-group and will be distributed in a week or two.

Asanuma commented that the Mohole is an example of a project where a combined science and technology development consensus is required. Both the science and technology groups need to develop a single roadmap.

22. Microbiology Contamination Report Discussion (by Ussler)

Ussler asked: Is there anything to discuss?

Asanuma remarked that the EDP owes the STP an industrial contact. Ussler replied that Thorogood investigated and did not find any help from industry. Asanuma said that the STP needs help from a mud engineer who can help or work with a microbiologist. Thorogood: This issue should be investigated from the bottom as a funded research program. The scientists need to realize [the technology gap] and research the issue systematically. Maler: Industry tends not to focus on prevention but rather on remediation. We tend to assume contamination will occur. Tauxe: Would there have been interest if [industry engineers] were paid? Maler: There are microbiologists who do work with industry and are familiar with oil field operating procedures and conditions, e.g. Joe Suflita at the University of Oklahoma. He might be interested in the problem; I can inquire. Saneatsu: As an action item, STP will pursue experiments to determine if drilling mud infiltrates core under borehole conditions.

23. Preliminary Agenda for EDP Meeting #12/DSSF (by Ask)

Ask briefly presented the Deep Sea and SubSeafloor Frontiers (DS3F) and Workpackage 7, Mission-specific subseafloor sampling (Appendix R). This EU coordinated project has been funded for 30 months and began January 2010. Nine work packages have been designated (Appendix R) each with goals, tasks, and deliverables. Catherine Mével and Ask co-lead WP7: Mission Specific Sub-Seafloor Sampling. Its mission is to identify

technology needs for the other work package programs. They are currently setting-up a core group of 10 – 12 experts that will be drawn from science, engineering, and industry. (EU desires a dominantly European group.) To be successful, Ask foresees the need for collaboration with IODP. Ask proposes a joint meeting on the first day of EDP #12 to exchange ideas and discuss joint funding to drive ED.

Kawamura (in response to prodding by Ask): A good opportunity, even if it is just an exchange of information. I am quite happy to support [a joint meeting]. Filippelli: I'm supportive of the idea. Doan asked how often have they met? Ask said that there is a plan for meetings (Appendix R). Asanuma said it will be very positive to exchange information with WP7. Travel restrictions very strict, however; so that JASEC will pay we need justification. [Japanese contingent] needs to find out what is needed to get permission. Ussler said that this exchange will be during EDP. Asanuma replied: No problem. Ask said that if a Japanese member were asked to join the core group of experts, then travel funds are available from the EU funding.

25. Technology Roadmap discussion – part 2 (by Ask)

The watchdogs for each chapter presented a brief summary of their findings.

Tauxe commented on Chapter 3: There is good information in the EDP TR, but not presented clearly. Not organized around science objectives – that might be a better way to organize. Currently it is an ad hoc organization. We concluded that it was premature to look at details. We need to step back and the timing is good: IODP is entering a transition period and a new science plan is coming soon. Recommend:

1. Review the new Science Plan
2. Organize around the objectives of the Science Plan because that is what the science community will look at.

Kawamura said that once the Science Plan is released, there will be an Implementation Plan developed. Then the Technology Roadmap can be integrated as well. Tauxe said that the EDP TR should be a reference document so people can find technologies that are relevant to their problems. Ask said excellent idea and a task for the next EDP. Let's call this one version 4.0 and bring it to a close. We have had problems as it grew with different groups, but it is good enough. Tying to the Science Plan is a good idea to communicate to the scientists. Ussler said that the key objectives are to find omissions, address clarity, and fix glaring errors. We need to leave with a finished v. 4.0. At next EDP meeting we will review in light of the new Science Plan and set priorities. Thorogood remarked that there is a glaring gap in the Implementation Plan, which won't be addressed by September [when the Science Plan is released]. Ussler said that EDP will write a consensus statement and offer to develop an implementation plan for the Science Plan.

Doan presented the status for Chapter 4: There has been a lot of discussion and a little editing. She presented a summary of their edits and changes. The IOs need to respond with achievements and with respect to success and implementation. Myers said that IODP-MI needs to comment on this because they have the responsibility, not the IOs.

Asanuma presented a summary of the edits and changes in Chapter 5. Ask wondered whether the technology list was in priority order? Asanuma replied no. Thorogood asked: How do we capture that not everything needs new technology? Some are existing technology that needs to be implemented. Ussler replied: That information is captured in the appendices but it is not very visible. Do you have a suggestion? Thorogood: Industry riser drilling is and will be ahead of scientific drilling. They should not waste money on development. Are we putting things in the Technology Roadmap that industry will develop anyway? Ussler gave the historical aspect: When the list of technologies was assembled, we were capturing needs for the program and didn't have the expertise to verify commercially available solutions. Proponents need to do their homework before venturing out on new developments. IODP-MI shouldn't fund proposals that will duplicate existing technologies.

Ussler showed a slide with a proposed flow for evaluation of new proposals in the new 2-tier system described by Filippelli (see Item 8). The key point is to move implementation earlier in the process so that technical challenges and science goals are evaluated simultaneously.

Questions & comments: (1) Wilkens: Does the science review come too late? Does every proposal get an implementation plan? Even if its scientific objectives are low ranking? Thorogood: That is the problem with the current system: proponents can develop ideas without a sense of reality; (2) Doan: How much interaction is there between the IOs and the proponents? Ussler: Proponents are encouraged to contact IOs before submitting proposals to get their feedback and help. It varies widely, though.

26. Transition Discussion (by Ussler)

Ussler informed that the EDP will be disbanded on 30 September 2011. At the next meeting, unfinished business is to be discussed.

Wohlgemuth asked what is the procedure for interim discussions by the EDP? Ussler replied that e-mails, on-line tools, etc; There are procedural questions such as time limits on discussions. Wohlgemuth thought e-mail is a good tool, but remarked that industry uses it and video conferencing, but that it isn't good enough. Wilkens also remarked that time zone differences make it difficult to manage phone or video conferences.

Ussler requested everyone to consider: *What are current friction points that need to be addressed?* Discussion followed:

- (1) Difficult to achieve more interaction with STP in order to work together on common problems. Liaisons were not addressed until the Sapporo meeting, which was late in the program. A lost opportunity. (Ussler)
- (2) EDP expertise not consulted for active proposal development (Filippelli)
- (3) We need to make this point clear if it is not: projects go through the process with clear short comings (Thorogood)
- (4) It is an opportunity to be more cost effective from better engineering control earlier (Ask)
- (5) Consider salaried engineering support (Ask)

- (6) Task forces would open this opportunity (Ussler)
- (7) Technology Roadmap should be based on active drilling proposals but EDP has no access to proposals because they are confidential (Ussler)
- (8) To breakdown barriers and build trust, combine the engineering and science technology roadmaps into one document (Smith)
- (9) IODP-MI will not fund ED in the future. How will we execute future proposals without money to develop the technology? Combining the roadmaps will get science buy-in for ED. (Smith)
- (10) Scientist view ED as a threat for scarce resources (Ussler)
- (11) We need to educate with engineering outreach to both the public and the scientists. (Ask)
- (12) We can't shift ED money to a project basis (Kawamura)
- (13) Engineering historically has been in the back seat. There is a high risk of failure because it is not given adequate resources to develop robust solutions. (Ussler)
- (14) Backseat status and funding are related problems. We need to educate the scientists. A combined [roadmap] document is really important because the scientist won't be able to ignore ED. It will improve communication, too. (Tauxe)
- (15) The new science plan has to be combined with an implementation plan. (Kawamura)
- (16) Provide a consensus statement to IODP-MI offering specific help to create the implementation plan. The Science Plan group needs help with the implementation plan. (Filippelli)
- (17) Once a proposal is approved, then ED in the implementation plan is funded. (Smith)
- (18) Proponents view EDP review as an impediment to the review of their proposal. We need to educate them. Sound engineering actually facilitates approval. (Ussler)
- (19) While liaison to SEP, Ussler reviewed proposals and flagged implementation problems. They appreciated early feedback on high risk elements engineering and operations. Unfortunately, instituting EDP review happened simultaneously with a plummet in proposal submissions. (Ussler)
- (20) Everyone is on board with review the new Science Plan but it is not realistic to review and [compose] an implementation plan by September. We offered to help in January and there was no reply at that time. (Ask)
- (21) The writing group was in over their heads all spring. Now they might be more receptive. (Filippelli)
- (22) Is this the place for more details? Especially ones requiring more money? Could EDP help with implementation plan be an opportunity?
- (23) The implementation plan will be developed after the September review of the Science Plan. (Filippelli)

Ussler said that Thorogood, Asanuma and himself will write a draft consensus statement that offers EDP help with writing the implementation plan.

Kawamura said that the implementation plan for the Science Plan and the Technology Roadmap are essentially the same. Ask remarked that the new Science Plan will be more concise but the Roadmap is more detailed. Kawamura said that the final Science Plan could have different versions with different levels of detail depending on the intended audience.

Smith asked Should ED link to science plan or projects? Ussler said that those are two things at different levels.

27. Review of Ship-time Request and Results for Engineering Testing (by Kawamura)

Kawamura presented a summary of the SCIMPI request:

- EDP and STP supported and endorsed the trial;
- USIO raised planning issues. They need 12 months lead time for 3rd party deployments; and
- Too late for Expeditions 327 and 328, but FY12 with Costa Rica Mud Mound would be possible.

Myers said that the science community understands and is open to sea trials. The twelve months are needed to avoid cascading scheduling problems caused by last minute changes. Ussler said that it is helpful for proponents and IODP to encourage completion and trials prior to the end of the program. Otherwise it is unfinished business for both the program and EDP.

28. Review Consensus Items, Recommendations, and Action Items (by Ussler/Ask)

The Consensus items were reviewed regarding phrasing, routing and background.

29. Editing of Technology Roadmap and Completion of Writing Assignments (by Ussler), Executive session

30. Finalize Consensus Items and Recommendations (by Ussler), Executive session

31. Finalize New Version of Technology Roadmap (by Ussler), Executive session

32. Parting Comments (by Ussler), Executive session

Executive Summary
IODP Engineering Development Panel
Eleventh Meeting
July 14-16, 2010
Santa Fe, New Mexico

**EDP Consensus Statements,
Recommendations, and Action Items**

The EDP forwards the following consensus statements and action items to SAS panels, IODP-MI, or other entities as appropriate.

EDP Consensus 1007-01: Approval of Agenda

The EDP approves the agenda for EDP Meeting #11.

Routing: IODP-MI

Priority: Medium

EDP Consensus 1007-02: Approval of EDP Meeting #10 Minutes

The EDP approves the minutes from EDP Meeting #10.

Routing: IODP-MI

Priority: High

EDP Consensus 1007-03: EDP Meeting #12

The EDP recommends that EDP Meeting #12 be held January 12-14, 2011 in Grenoble, France. Mai-Linh Doan will be host of this meeting.

Routing: IODP-MI, STP, SPC, IOs, PMOs

Priority: High

EDP Consensus 1007-04: Unfinished EDP Business

The EDP has identified the following tasks as unfinished business that require a face-to-face meeting January 12-14, 2011 in Grenoble, France:

- (1) Review and comment on an implementation plan for engineering development during the remainder of the IODP and in the post-2013 drilling program, as requested in Consensus 1007-19;
- (2) Provide follow-up and comments on active engineering development scoping studies including *Ultra-Deep Drilling* and *Core Quality and Quantity* being conducted by IODP-MI;
- (3) Assess potential improvements of the methodology and data selection used in the IODP-MI Coring Scoping Study Report "*Core Quality and Recovery Compared to Operational and Environmental Parameters: An Analysis of Selected Cores from IODP Expedition 316*";
- (4) Receive a preliminary project review and assess status of the FY12 engineering development proposal "*Wireline Hydraulic Testing and Borehole Imaging Tool for Stress Measurements*" (EDP-2012-1B);

- (5) Review and endorse the FY12 engineering development plan submitted by IODP-MI;
- (6) Review and comment on status of engineering development by the IOs, and especially test results for the USIO Drilling Sensor Sub development project;
- (7) Receive and comment, at Greg Myers (USIO) request, on a formal report by Greg Myers on the outcome of the two IODP-related conferences on deep drilling that addressed Mohole drilling and the establishment of a Deep Carbon Observatory (EDP Consensus 1001-16);
- (8) Based on the report on the Moho drilling workshops, provide a final response to the SPC Consensus 0708-30 that requested the EDP to initiate discussions concerning technological needs required for achieving ultra-deep drilling targets such as the Moho;
- (9) Review the new science plan with respect to *engineering development issues*;
- (10) Provide input as to how to integrate engineering into the new science advisory structure; and
- (11) Meet with representatives of the European Union coordination project Deep Sea and Sub Seafloor Frontier (DS³F)

Routing: IODP-MI, IWG+, SPC, STP, PMOs

Priority: High

Background: DS³F meeting – The technology planning group (Work Package 7 – Mission-specific sub-seafloor sampling) from the EU coordination project Deep Sea and Sub Seafloor Frontier (DS³F) has proposed to meet with the EDP at its January 2011 meeting in Grenoble, France. The EDP sees great potential for synergies between the future drilling program and DS³F, and potentially a new type of capitalization for engineering development within the new scientific drilling program by ECORD in addition to ESO. This would be a source of new funding, outside of that contributed by ECORD to the ocean drilling program.

EDP Consensus 1007-05: Offer of an Engineering Contribution to the SPWC for Inclusion in the New Science Plan

With reference to EDP Action Item 1001-01 and STP Consensus Statement 1003-01, the EDP restates its offer to summarize the critical engineering issues integral to the future scientific drilling program for inclusion in the new science plan. Should the offer be accepted, the EDP would appreciate guidance as to the length and timing of the contribution.

Routing: IODP-MI, SPWC, IWG+, SPC, STP

Priority: High

EDP Action Item 1007-01: Technical Review of Draft Science Plan

The EDP will provide a technical review of the new science plan when it is publicly released in late summer of 2010. Contact person for this is Maria Ask.

Routing: IODP-MI, SPWC, IWG+, SPC, STP

Priority: High

EDP Action Item 1007-02: Invitation to Catherine Mével, ECORD Delegate to IWG+

On behalf of EDP, Maria Ask will invite Catherine Mével, member of the IWG+, to attend the January 2011 EDP meeting in Grenoble, France to discuss new science program.

Routing: IWG+, IODP-MI, SPC, STP
Priority: High

EDP Consensus 1007-06: Preliminary EDP Response to SAS Transition Questions Posed by the SPC Chair – Part 1

The EDP responds to the first of three SAS transition questions posed by SPC Chair Gabe Philippelli:

1. How are current projects progressing, and how to complete them?

The EDP has identified ten items of unfinished business and one new item of business that have significant implications for engineering development that require an additional face-to-face EDP meeting. These eleven items are listed in EDP Consensus 1007-04.

Priority: High
Routing: SPC, IODP-MI

EDP Consensus 1007-07: Preliminary EDP Response to SAS Transition Questions Posed by the SPC Chair – Part 2

The EDP responds to the second of three SAS transition questions posed by SPC Chair Gabe Philippelli:

2. What are friction points in current interactions that need to be improved?

- (1) Inadequate communication among SAS panels. Sending one liaison to each panel meeting is insufficient to create an effective means of communication;
- (2) Some scientists view engineering development as a competitor for scant resources;
- (3) EDP is not permitted to do a technical review of scientific drilling proposals early enough in the proposal review process; the consequence is that proposals with inadequate scoping create an unnecessary and avoidable burden to the SSEP and SPC panels, and potentially compromise the scientific objectives;
- (4) EDP has been unable to access drilling proposals so it can fulfill its mandate of providing a Technology Roadmap based on active drilling proposals;
- (5) An history of *ad hoc* engineering in the drilling program; and
- (6) Reorganization of the IODP-MI offices and associated reduction in staff resulted in loss of continuity and corporate memory. This has hampered implementation of an engineering development plan and slowed forward momentum towards integrating engineering development into the current and future drilling programs.

Priority: High
Routing: SPC, IODP-MI

EDP Consensus 1007-08: Preliminary EDP Response to SAS Transition Questions Posed by the SPC Chair – Part 3

The EDP responds to the third of three SAS transition questions posed by SPC Chair Gabe Philippelli:

3. What are the key aspects that need to carry forward, and how best can they be carried forward?

- (1) The forward-looking and proactive function of the EDP should continue in the new structure within the entity that reports directly to IODP-MI;
- (2) Collection of engineering and technical information outside of IODP from industry, academic colleagues and professional contacts;
- (3) Unbiased review of the engineering and technical requirements of IODP, assessment of technical requirements of science proposals, review of engineering and engineering development by the Implementing Organizations and provision of advice to the IOs by a independent standing committee with institutional memory;
- (4) Provision of independent, overarching long-term thinking towards the coupling of engineering development to the science plan;
- (5) Regularly scheduled face-to-face meeting of engineers with backgrounds and experience appropriate to IODP engineering and technical requirements; there is no substitute for face-to-face meetings;
- (6) Continued improvement of the visibility of the Technology Roadmap, the engineering development proposal process, and stimulation of high-quality Engineering Development proposals that address critical project-based and long-term infrastructural needs of the drilling program;
- (7) Maintenance and improvement of the Technology Roadmap and its prioritization; the Technology Roadmap is a living and evolving document;
- (8) Continued development of an implementation plan for the Technology Roadmap;
- (9) Perpetuation of corporate memory with respect to engineering and technology development – especially what has been attempted, what has succeeded and why, and what has failed and why;

How to carry forward?

- (1) Ensure continuity and increased funding to maintain progress towards creating a robust engineering development component within the IODP and the new scientific drilling program;
- (2) Insist that proponents of drilling proposals take responsibility for assessing technical and operational feasibility of their research before submission of the proposal;
- (3) Engineering should have a more formal and constitutionally established role in the new scientific drilling program to ensure that the needed support of engineering to achieve new science goals and improve cost- and time efficiency.

Priority: High

Routing: SPC, IODP-MI

EDP Consensus 1007-09: Critical Importance of Engineering Development for Achieving Scientific Drilling Goals

The EDP recognizes that engineering advancements have the potential for providing new and improved ways to achieve the science goals of the IODP and future scientific ocean drilling, such as investigation of the deep biosphere, obtaining improved core quality and quantity, and exploring the seismogenic zone and other deep drilling targets. In addition, technological advancements may lead to more cost- and time-effective, safer, and environmentally friendlier operations.

The new program will be more effective in reaching its science goals if engineering development is on par with science within the new program. The EDP is concerned that the importance of the engineering is not fully appreciated because engineering development has not been included explicitly in the planning efforts for the new program. For example, engineering expertise was not included in the Second Triennium review, IWG+ or the SPWC.

New science proposals have *always followed* the introduction of new capabilities.

Routing: SPC, IODP-MI, SASEC, IWG+, SPWC, STP

Priority: High

EDP Consensus 1007-10: Sustained Funding and the Potential for Expanded Collaboration and Partnerships for Support of Engineering Development

In order to achieve some of the critical scientific breakthroughs that require advances in engineering and technology, a long-term commitment by the IODP and its successor for sustained funding and management of engineering development projects is required. Establishing partnerships with other science programs, governmental agencies, and industry can enhance this commitment to long-term engineering development.

Routing: IODP-MI, SPWC, IWG+, Lead Agencies

Priority: High

Background: DS³F meeting – The technology planning group (Work Package 7 – Mission-specific sub-seafloor sampling) from the EU coordination project Deep Sea and Sub Seafloor Frontier (DS³F) has proposed to meet with the EDP at its January 2011 meeting in Grenoble, France. The EDP sees great potential for synergies between the future drilling program and DS³F, and potentially a new type of capitalization for engineering development within the new scientific drilling program by ECORD in addition to ESO. This would be a source of new funding, outside of that contributed by ECORD to the ocean drilling program.

EDP Consensus 1007-11: EDP STP Liaison

The EDP designates Yoshiyasu Watanabe as the EDP representative at the next STP meeting to be held August 5-7, 2010 in Geneva, Switzerland.

Routing: IODP-MI, STP

Priority: High

EDP Consensus 1007-12: EDP SPC Representative

The EDP designates Bill Ussler as the EDP representative at the next SPC meeting to be held August 30-September 1, 2010 in San Diego, California.

Routing: IODP-MI, SPC

Priority: High

EDP Consensus 1007-13: EDP SSEP Liaison

The EDP designates Bill Ussler as the EDP representative at the next SSEP meeting to be held November 8-11, 2010 in Portland, Oregon.

Routing: IODP-MI, SSEP

Priority: High

EDP Consensus 1007-14: Drilling Sensor Sub Engineering Development by USIO

The EDP agrees that the Drilling Sensor Sub (DSS) has the potential to provide information relevant to identifying factors that contribute to poor core quality and quantity. The EDP endorses the USIO plan to further develop the DSS and the proposed acceptance testing criteria.

Routing: IODP-MI, USIO

Priority: High

EDP Consensus 1007-15: Engineering Development Proposal “Wireline Hydraulic Testing and Borehole Imaging Tool for Stress Measurements” (EDP-2012-1B)

The EDP responds to IODP-MI’s request for review of engineering development proposal **EDP-2012-1B** by forwarding a technical review and star-ranking to IODP-MI for distribution to the proponents.

Routing: IODP-MI

Priority: High

EDP Action Item 1007-03: Progress Report on the “Wireline Hydraulic Testing and Borehole Imaging Tool for Stress Measurements” (EDP-2012-1B)

Because the proponents intend to initiate the project before formalizing a contract with IODP-MI, Lead watchdog Roy Wilkens will obtain a status report from the proponents for EDP review at the January 2011 EDP meeting in Grenoble, France and forward EDP comments to the proponents and IODP-MI.

Routing: IODP-MI

Priority: High

EDP Consensus 1007-16: STP Scientific Technology Roadmap version 1.0

The EDP thanks Saneatsu Saito for his excellent presentation of the STP Scientific Technology Roadmap version 1.0. The EDP and STP have included links between common engineering needs in their respective roadmaps to strengthen the cross-connection between them. This emphasizes the importance of these technologies to the IODP and future scientific drilling programs.

Routing: STP, IODP-MI, IOs

Priority: High

EDP Consensus 1007-17: EDP Response to STP Consensus Statement 1003-13 Regarding ROV-guided Deployment of Logging Tools

The EDP has reservations about ROV-guided deployment of logging tools. This type of operation is susceptible to environmental forces (currents and heave) and combined with cost, logistics, risk associated with two wires in the water, and the additional personnel involved in operating an ROV off an IODP platform, and given that the *JOIDES Resolution* will be equipped to use standard industry large-diameter pipe (LDP), the use of LDP is preferable to ROV-guided logging. No change in personnel is needed when deploying standard industry wireline tools through LDP. However, the EDP endorses selected use of ROV-guided logging when conditions are appropriate, and logistics and costs are favorable.

Routing: STP, IODP-MI, IOs

Priority: High

EDP Action Item 1007-04: Identify a Microbiology Contamination Expert

The EDP responds to the STP request (STP Consensus 1003-23: Detection and Control of Contamination Issues) for EDP to provide contact information for a person familiar with drilling fluids and microbiological contamination. Mike Maler will attempt to obtain this contact information as soon as possible and the EDP chair will forward this to the STP.

Routing: STP, IODP-MI, SPC

Priority: High

Background: The initial EDP attempt to identify a person familiar with contamination of microbiological samples by drilling fluids was unsuccessful.

EDP Consensus 1007-18: EDP Technology Roadmap version 4.0

The EDP formally adopts version 4.0 of the Technology Roadmap. This version is released as a public document. It will be appended to the minutes for EDP Meeting #11 and will be posted on the IODP-MI website.

Routing: IODP-MI, STP, SPC, SSEP, IOs, Lead Agencies

Priority: High

EDP Consensus 1007-19: Implementation of the EDP Technology Roadmap

The EDP requests that IODP-MI provide at EDP#12 meeting its plan for how it will implement the EDP Technology Roadmap version 4.0 for engineering development during the remainder the IODP and in the post-2013 drilling program.

Routing: IODP-MI, STP

Priority: High

EDP Consensus 1007-20: Public Accessibility of all legacy EDP and Engineering – related Documents Developed by EDP and IODP-MI

The EDP requests that IODP-MI develops and executes a plan to preserve all legacy EDP documents, including Technology Roadmap version 4.0, meeting minutes, executive summaries, appendices; and all engineering development-related documents, including the Engineering Development proposal process, Scoping Study reports, and to continue to make them readily available to the scientific and engineering community via the internet.

Routing: IODP-MI, STP, SPC, SSEP, IOs, Lead Agencies

Priority: High

EDP Consensus 1007-21: IODP-MI Scoping Studies

The EDP endorses the continuation of the IODP-MI scoping studies on *Ultra-Deep Drilling* and *Core Quality and Quantity*.

Routing: IODP-MI, STP

Priority: Medium

EDP Consensus 1007-22: Update IODP Drilling and Coring Technology – Past and Present Phase 2 Final Report

The EDP supports IODP-MI's continued effort to update the "IODP Drilling and Coring Technology – Past and Present Phase 2 Final Report", and encourages IODP-MI to incorporate drilling and coring technologies from all IOs.

Routing: IODP-MI, STP, IOs

Priority: High

EDP Action Item 1007-05: EDP Review of IODP-MI Coring Scoping Study Report

The EDP requests that John Tauxe and colleagues at Neptune, Inc., Los Alamos, NM, review methods used in the report "Core Quality and Recovery Compared to Operational and Environmental Parameters: An Analysis of Selected Cores from IODP Expedition 316". They will provide suggestions for potential improvements of the methodology and data selection for consideration at the next EDP meeting.

Routing: IODP-MI, STP

Priority: High

EDP Consensus 1007-23: IODP-MI Allocation of at-sea Engineering Testing Time to Active Engineering Development Projects

The EDP strongly endorses allocation of at-sea engineering testing time to the SCIMPI and MDHDS engineering development projects prior to the end of the current drilling program in order to adequately test and qualify these 3rd party tools for future use on IODP platforms.

Routing: IODP-MI, IOs, SPC, STP

Priority: High

EDP Consensus 1007-24: Development of Wireline Logging Capability for Seabed Drills

The EDP thanks David Smith (ESO) for his informative presentation on the status of seabed drilling technology development by the British Geological Survey. Wireline logging capability has not been implemented on seabed drilling systems, and the EDP endorses continued planning and development of this technology which is critical for scientific drilling.

Routing: IODP-MI, IOs, STP

Priority: Medium

EDP Consensus 1007-25: Outgoing EDP Members

The EDP thanks outgoing member John Thorogood for his dedicated service to the panel.

Routing: PMOs, IODP-MI

Priority: Medium

EDP Consensus 1007-26: IODP-MI Personnel at the Washington DC Office

The EDP thanks Kelly Oskvig formerly with the IODP-MI Washington DC office for her dedicated service to the panel.

Routing: IODP-MI, PMOs

Priority: Medium

EDP Consensus 1007-27: ConocoPhillips Sponsorship

The EDP thanks panel member Mike Maler and ConocoPhillips for organizing and supporting a pleasant dinner reception.

Routing: PMOs, IODP-MI

Priority: Medium