Minutes

First Meeting of the Engineering Development Panel (EDP) of the IODP

September 26 - 28, 2005

Boston, Massachusetts, USA

1. Peter Flemings 2. Bill Ussler 3. Jack Germaine, 4. Yoshihiro Masuda 5. Mike Coffin
6. David Goldberg 7. Richard Von Herzen 8. Eli Silver 9. Tom Janecek 10. Frank Rack
11. Jamie Allan 12. Kelly Kryc 13. Mike Lovell 14. Manik Talwani 15. Axel Sperber
16. Keir Becker 17. Ying Chen 18. Stephen Sears 19. Leon Holloway 20. Tomoya Inoue
21. Masahiro Kamata 22. Dan Evans 23. Haruya Nakata 24. Jun Fukutomi
25. Mitsugu Takemura 26. Kazuhiko Tezuka 27. Kenji Kimura

Attendees

EDP

Chen, Ying*	China, Zhejiang University
Flemings, Peter**	USA, Pennsylvania State University
Germaine, Jack	USA, Massachusetts Institute of Technology
Holloway, Leon	USA, ConocoPhillips Petroleum
Kamata, Masahiro	Japan, Schlumberger K. K.
Masuda, Yoshihiro	Japan, University of Tokyo
Nakata, Haruya	Japan, Geothermal Energy R&D Co., Ltd.
Sears, Stephen	USA, Louisiana State University
Sperber, Axel	ECORD, Private Consultant, Germany
Takemura, Mitsugu	Japan, JAPEX
Tezuka, Kazuhiko	Japan, JAPEX
Ussler, Bill	USA, Monterey Bay Aquarium Research Institute
Von Herzen, Richard	USA, Woods Hole Oceanographic Institution

*non-voting member
**chair

Liaisons and Guests

Allan, Jamie	NSF, US
Becker, Keir	SPC
Coffin, Mike	SPC Chair, University of Tokyo, Japan
Evans, Dan	ESO
Fukutomi, Jun	CDEX, Japan
Goldberg, Dave	BRG, Lamont
Inoue, Tomoya	CDEX, Japan
Janecek, Tom	IODP-MI Washington DC
Kimura, Kenjii	MEXT, Japan
Kyrc, Kelly	IODP-MI Washington DC
Lovell, Mike	STP,
Rack, Frank	JOI Alliance
Silver, Eli	SPPOC
Talwani, Manik	IODP-MI Washington DC

Executive Summary

EDP Recommendations, Consensus Statements and Action Items

The EDP forwards the following recommendations, consensus statements, and action items to the SPC or the IODP-MI as appropriate.

EDP Recommendation 05-09-01: EDP mandate
The EDP recommends the following modification to its mandate (italicized).
"The EDP shall identify long-term (two to five year lead time) technological needs determined from active IODP proposals and the ISP, and recommend priorities for engineering developments to meet those needs, *both for the annual IODP engineering plan and on a longer term.* Appropriate topics shall include…"

EDP Recommendation 05-09-02: STP Liaison
EDP recommends that EDP choose a member to act as a liaison with the STP.

EDP Recommendation 05-09-03:
We recommend that the next EDP meeting be held January 25-27 in Tokyo. The meeting will be hosted by Masahiro Kamata at the Schlumberger offices. We propose the following meeting agenda.

1. Assess outcome of previous FY ED projects, drilling, etc.
    a. Core Barrel Retrievable Memory Module (RMM) and Drilling Sensor Sub(DSS)
    b. Review of observatory design, engineering, development, operational issues (pick a topic)
    c. Operational Review (Lowlights/Highlights from OTF)
    d. Heave Compensation Review (All Platforms)
2. Update on current FY issues, if any (FY06)
    a. IOs
    b. IODP-MI
3. Review/Finalize ED for Program Plan (FY07)
    a. Level 1-- conceptual
    b. Level 2—detailed design
    c. Level 3-- build
4. Examine SSEP proposals
    (To SSEP for evaluation of technological readiness)
    (For EDP technological vision)
5. Start to formulate long term EDP needs, e.g. technology roadmap.
    (Derived from ISP, TAP List, current proposals, JTT (joint technology team)
6. Choose a Vice-Chair
7. SODV Report

EDP Consensus 05-09-01: Engineering Development Project Classification
EDP recommends that IODP-MI adopt a 4-stage classification system for engineering development projects:

1. Concept
2. Design
3. Fabrication
4. Implementation

The requirements for each stage of these developments would be as follows.

1. Concept
    a. Functional requirements/specifications
    b. Rough cost
    c. What problem will be addressed/benefits
    d. Rough schedule
    e. Fit with the ISP objectives
    f. Probability of success (Risk Analysis)
2. Design
    a. Drawings and schematics
    b. Testing of unproven components
    c. Cost +/-15%
    d. GAANT chart schedule or equivalent
    e. Work breakdown structure
    f. Physical mockup if needed
    g. Testing plan
3. Fabrication
    a. Product
    b. Test results (component, performance, field)
    c. Comparison of results with testing plan
    d. Draft operations manual, shipboard procedures
    e. Training materials
    f. Sea trial or field test results, if needed
4. Implementation
    a. Evaluation of performance versus requirements

EDP Consensus 05-09-02: EDP Role
EDP recommends that a review is performed at the end of each of the 4 stages of an engineering development project (EDP Consensus 05-09-01). EDP is not the reviewer, but would like to see a summary of the review. EDP would like to give advice at the concept stage, and by exception give advice later in project life. EDP would like a summary of project status including project review results, at biannual meetings. EDP may have advice on projects deviating from plan or no longer have strategic fit.

EDP Consensus 05-09-03: USIO FY 06 Pulsed Telemetry Module (PTM) Proposal
We support IODP-MI acquiring the pulsed telemetry module as described in the proposal presented by the USIO. Although, the proposal does not meet the requirements of the recently defined stages of an engineering development proposal (EDP Consensus 05-09-01), the EDP felt it contained sufficient information for evaluation and given the short timeframe, felt it worth going forward.

Purpose: To provide real time weight on bit, torque on bit, annulus pressure and annulus temperature.

Assumptions by reviewers:
1) This is the third component of a three part system. The other two components, the sensing and recording modules, are operational.
2) A tool to provide these data while coring is not commercially available from industry

Justification: Real time data acquisition will improve safety, reduce trouble costs, and increase the probability of managing borehole stability by allowing immediate changes to drilling parameters. Data to cause a change in these drilling parameters is not currently available until the recording module is retrieved (one hour).

EDP Consensus 05-09-04: **USIO FY 06 Common Bottom Hole Assembly (BHA) Proposal**
There is not enough information in this proposal to decide whether it merits moving ahead. If the proponents complete a conceptual engineering proposal (defined in EDP Consensus 05-09-01), EDP would be interested in considering it.

It is not entirely clear however from the information provided whether all the current tools are being proposed to work with a common bit type or whether separate bit types might still be required for certain formations and thus still requiring the string pulled to change bits when encountering hard formations.

While it seems apparent that some cost savings might be seen in combining coring assemblies to use interchangeable and common hardware, a more detailed justification needs to be developed. Inventories should be reviewed and cost associated with each coring tool type should be cross-referenced to see what might be eliminated and what must be kept if the current size and general configuration is to be retained.

EDP Consensus 05-09-04: Request engineering summary and performance report on the DSS and RMM.
EDP requests that the USIO provide a summary and performance report on the drilling sensor sub and the remote memory module at the next EDP meeting.

EDP Consensus 05-09-05: CDEX FY06 Long-Term Monitoring Plan
The EDP recommends that CDEX's FY 06 proposal to IODP-MI be supported. Within the context of EDP Consensus 05-09-01, this proposal exceeds the expectations of a Conceptual Proposal (Stage 1). The EDP recommends that the IDOP-MI participate in

the Architecture Peer Review scheduled by CDEX for Q1 FY06. EDP requests that IODP-MI prepare a summary and assessment of the project review and forward them to EDP when available, but not later than 2 weeks prior to the meeting wherein they will be discussed.

EDP Consensus 05-09-06: Conceptual Agenda for EDP Meetings
The EDP adopts the following conceptual agenda and schedule for its future meetings.
July Meeting:

1. Status Report on projects
2. Prioritize FY+2 ED for Program Plan
   (To SPC)
3. Examine/Define long-term ED needs (FY>2)
   (driven by ISP, Proposals (3rd Party, unsolicited, and from IO's), EDP thinking, drilling outcomes)
   (goes to community)
4. Examine SSEP proposals
   (goes to SSEP)

January Meeting:

1. Assess outcome of previous FY ED projects, drilling, 3rd Party developments, etc. (FY-1)
   Informational item for EDP
2. Update on current FY issues and Project Status (FY0)
   Informational item for EDP (by IODPMI)
3. Review/Finalize ED for Program Plan (FY+1)
   a. Phase 1-- Concept
   b. Phase 2—Design
   c. Phase 3—Fabrication
   d. Phase 4--Implementation
   (To IO's and IODPMI for Annual Program plan)
4. Examine SSEP proposals
   (To SSEP: evaluation of technological readiness
   (For EDP technological vision)
5. Preview long term EDP needs.
   (Derived from ISP, TAP List, current proposals)

EDP Consensus 05-09-07:
EDP cares about Eng. Design Draft Plans for Hull and Machinery and Drilling and Coring Technologies. Flemings will work with SODV to formulate a plan for interaction between SODV and EDP

EDP Consensus 05-10-08:
Masuda and Flemings will form a working group to recommend a process by which a solicited and unsolicited ED proposal is submitted and evaluated and propose guidelines. Results will be presented at January '06 EDP Meeting.

Accomplished Items

EDP Accomplishment 05-10-01:

Three proposals were reviewed: 1) 574-Full2, 'Rainbow Hydrothermal Field, 2) 637-Full2**,** **'**New England Shelf Hydrogeology', and 3) 635-Full2: Torres et al., "Hydrate Ridge Monitoring."

The review addressed the ability of the IODP to accomplish the proposed science with its current technology. If new technology is needed, we suggested possible approaches to achieve the science goals. The review was forwarded to IODPMI for distribution to the SAS structure.

Minutes

Monday, September 26, 2005

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. Welcome, Introductions of Participants, and Logistics
   Flemings welcomed the panel, guests, and liaisons. Introductions were made by each attendee. Flemings reviewed key aspects of the Roberts Rules of Order, which will be used as the formal framework for meeting etiquette. Ussler was given the responsibility of taking meeting notes and preparing the minutes.

2. Review of Meeting Agenda (*Appendix 1*) by Flemings

3. Goals for the Meeting
   Flemings reviewed the goals for this meeting:
   (1) Lay out a model that the EDP will use for prioritizing, evaluating, and implementing engineering technological development. How will this panel work? The EDP did not exist before.
   (2) Comment on FY06 Engineering Development Plan.
   (3) Comment on FY07 Engineering/Technology Concept.
   (4) Decide on next meeting time and location (tentatively Jan or Feb 2006).
   (5) Comment on science proposals forwarded to EDP.
   (6) Produce minutes/recommendations/action items/consensus statements by October 15, 2005.

4. SSEP Feedback from EDP
   Becker indicated that the SSEP will meet again in November and the SSEP wants technical, not scientific feedback, from the EDP regarding proposals under consideration. Flemings framed this information need by the SSEP as to whether, in the opinion of the EDP, a proposed drilling expedition can be accomplished using current technology.

5. Interface of EDP with the STP
   Lovell (STP liaison) indicated that the STP would like to establish where the EDP and STP have overlap. The STP does not want to duplicate efforts or allow something to drop through the cracks. Dialogue between the two panels is important. He also stated that it would be counter-productive for proponents to receive opposing views from each panel, which would give the impression that the advisory system isn't monitoring the feedback. Becker clarified the procedure for handling panel comments on drilling proposals. STP and EDP comments will be filtered by the SSEP. The SSEP will not send verbatim comments to the proponents.

6. Terms of Reference (*Appendix 2*)
   Flemings reviewed the Terms of Reference for the EDP approved by the SAS. Flemings emphasized the following points:
   (1) EDP shall identify long-term (2-5 year lead time) technological needs by
      a. assessing commercial-off-the-shelf (COTS) technology versus R&D to achieve scientific goals;
      b. determine appropriate modes to achieve engineering development;
      c. develop performance requirements.
   (2) EDP shall evaluate proposals to assess IODP readiness and recommend technological approaches and necessary engineering developments to achieve scientific drilling goals.

   Von Herzen asked if the EDP was to be a clearinghouse or panel for proposal review. Flemings noted that clarification of where the EDP enters the proposal flow will be made during the meeting, in particularly how proposals originating with the IOs will receive nurturing and evaluation.

   Janecek suggested that once the panel comes up to speed with the funding process, the EDP will need to come to some agreement as to how engineering development has gone on in the past and what's now coming down the road. IODP-MI uses task forces to focus on particular advice coming from specific panels and performs operational reviews. The Task Force for Engineering Development will startup soon. When IODP-MI puts out requests for proposals (RFPs), the ED Task Force will delve into the details, not the EDP. An agreement as to the boundaries between the EDP and the IODO-MI ED Task Force will have to be forged.

   Becker had similar comments as Janecek's. Different models for engineering development may be important. Developing performance requirements for ED projects may become an important task for the EDP.

7. Review of the SAS/IDOP-MI/IO architecture/proposal flow
   A formal presentation was lead by Coffin (*Appendix 3*). Coffin is the chair of the SPC for another 5 days, completing his two-year term. On October 1st, Keir Becker of the University of Miami will begin a two-year term as SPC chair. Coffin made opening remarks and thanked members of the EDP for contributing their time to academic drilling. There are three major components to the IODP—(1) SAS – Scientific Advisory Structure; (2) IODP-MI; and (3) IO – Implementing Organizations. Science operating funds contributed to the IODP by member countries (via NSF/EMA/MEXT) are funneled through a CMO (central management organization, which is currently the IODP-MI), and these commingled funds are dispensed to the 3 implementing organizations (IOs) and other sub-contractors. Coffin emphasized that proposals can be submitted by any individual or group, not necessarily belonging to member countries or

consortia. The IODP-MI is structured for initiation of proposals from the bottom-up. Proposals are submitted to the IODP-MI and distributed to the SAS for nurturing, evaluation, and ranking. The SSEP nurtures and evaluates proposals, and then requests external reviews. It reports to the SPC (Science Planning Committee).
Other administrative points made by Coffin included: (1) The intent is for the vice-chair of a SAS panel to succeed the chair after a 3-year rotation; and (2) Representation on panels is negotiated when a new member nation or consortium joins the IODP, and can comprise full, non-voting, or observer status.

Fleming noted that the selection of the EDP vice-chair will occur at the winter meeting of the EDP.

Coffin returned to the presentation of the structure of the IODP-MI and the IOs. The IOs comprise CDEX (Center for Deep Earth Exploration-Japan); JOI Alliance (USA); and ECORD Science Operator (ECORD: European Consortium for Ocean Drilling Research), or ESO. He noted that the ESO operates the MSP portion of the IODP and one expedition each year is planned.

Proposal flow generally occurs in the following manner:

(1) Pre-proposals – the SSEP is declining more proposals at this stage to avoid wasting proponents' time
(2) Full Proposals – advance proposals suitable for panel and external review
(3) Ancillary Project Letters (APL) – short add-on types of science for a drilling expedition that would add 2 to 3 extra days of operations
(4) Proponent Response Letters – a formal opportunity to respond to reviewer comments
(5) Proposal Addenda – can be recommended by the SPC

Coffin noted that a new structure for drilling proposals has been implemented, the complex drilling project (CDP), which can encompass more than one drilling expedition and associated science. Examples include NanTroSEIZE and CRISP seismogenic zone drilling proposals.

The Sapporo office chooses external reviewers. The SSEP nurtures and evaluates each proposal, and decides whether or not to forward each to the SPC. SPC evaluates and ranks proposals (the committee could request a re-submission of a full proposal or an addendum), and decides whether or not to forward each proposal to the IODP-MI OTF (Operations Task Force) for consideration regarding scheduling, consider of weather windows and other operational requirements. Annual science and engineering plan recommendations from the SPC go to the SPPOC for

consideration. The IOs often need as much lead-time as possible for expedition planning.

Coffin discussed annual program plan development and the involvement of the advisory structure (SPC, SSEP, SSP, EDP, STP, and EPSP) and the management structure (IODP-MI/NSF/MEXT/EMA).

Von Herzen asked if the structure of the IODP is more or less complicated than what we had in the ODP.

Coffin replied that IODP is more diverse; we now have plans for CDPs, are making financial commitments to multi-year projects and programs. In an increasing number of cases several drilling expeditions are needed to complete the science needs (e.g., Juan de Fuca, Expedition 301 and a future expedition). We couldn't do this during DSDP and ODP, but with the larger scale of the IODP, we now may have the resources to undertake complex drilling projects. In addition, durations of individual drilling expeditions are also considerably more flexible.

Masuda remarked that 3 proposals have been forwarded to the EDP for nurturing and evaluation at this meeting. At the present time it is up to the SSEP to forward a proposal to the EDP for nurturing and evaluation. Could there be a mechanism for EDP to have a broader understanding of the proposals that our working their way through the system?

Coffin replied that the EDP could see pre-proposals, which would alert the EDP to future, potential technological needs. It is new that the EDP is being asked to nurture and evaluate proposals. However, it is not entirely clear how EDP nurturing and evaluation will interact with SSEP nurturing and evaluation.

Flemings pointed out that in previous programs (i.e., DSDP and ODP) very little engineering or technology nurturing and evaluation occurred early in the proposal nurturing and evaluation process. One of the jobs for the EDP is to flag good science that needs technology development or the necessary focus to get the job done.

Coffin remarked that there are ambitious goals in the IODP Initial Science Plan (ISP). Many of which will require new engineering technology development. He noted that Becker will discuss OTF identified engineering technology needs in the proposal stream.

Germaine asked what constitutes a review number for a proposal.

Coffin explained that the x in "Fullx" indicates the version number; however the proposal may not have been externally reviewed yet.

8. The Funding Process and Structure from the IODP-MI Perspective
   Tom Janecek made a formal presentation (*Appendix 4*). His perspective encompassed 5 major discussion items:
   (1) Funding pathways
   (2) POCs (platform operating costs)/SOCs (science operating costs)
   (3) Engineering development definitions
   (4) Program plan development
   (5) Issue for EDP with respect to its mandate and mode of operation
   A few key points from his presentation are listed below; details are contained in *Appendix 4*:

Funding pathways – Co-mingled funds from participating agencies (NSF/MEXT/EMA/MOST) are allocated by IODP-MI for platform and sciences operating costs for all three drilling platforms (Chikyu, SODV, and MSP). IDOP-MI is the central management organization (CMO) and can also subcontract science service organizations other than the 3 IOs.

POC – comprises drilling equipment and supplies and examples are given in *Appendix 4*.

SOC – supports a wide variety of science needs and examples are given in *Appendix 4*. Janecek focused on one need—the development of new drilling tools and techniques required by IODP research. Three categories comprise this need:
(1) logging while coring and drilling
(2) engineering development (between $100K and $500K)
(3) engineering science support (less than $100K)

Janecek stated that it has not been determined what types of proposals (#1, 2, or 3) EDP will see. The engineering science support category includes expenses associated with the maintenance and upgrade of existing tools, support for facilities to improved tool performance, and for the use of third-party tools or instruments.

Rack – Emphasized that the EDP should focus on engineering development in the 3 to 5 year time-frame.

Sperber – Asked if directional drilling was a potential technology for use in the IODP.

Rack – Yes, but the costs would be included in the SOC category, not POC.

Flemings – Pointed out that the primary focus of the EDP will be the SOC category, but possibly POC, if requested.

Janecek – Gave the example that if active heave compensation was required to achieve a scientific objective(s), the EDP would be asked for its recommendation.

Allan – The EDP is a resource for the SAS and IOs. Thus, a flexible arrangement of advising is preferred.

Sears – Asked how operation of a drillship was structured.

Rack – Gave the USIO as an example. The Texas A&M Research Foundation (TAMRF) has a contract with the drillship operator for the JOIDES Resolution; and Lamont has a contract with Schlumberger for all the wireline logging performed on the JOIDES Resolution.

Janecek – Returned to his formal presentation. He further described the development of an annual program plan. The SPC and IODP-MI interact, using input provided to IODP-MI by the IOs. Once a plan is approved by the SPC, it forwarded to the SPPOC, which in turn is reviewed and approved by the Board of Governors (BoG) and the lead funding agencies. He showed a timeline for proposal ranking and the annual science and engineering plan approval process. Presently, we are at the time point where SPC will approve the science plan for FY07 operations.

Nakata – Asked about the EDP meeting schedule in the context of the proposal planning process that Janecek presented.

Talwani – Stated that the FY06 science plan has been approved by the BoG. Asked Allan if the lead agencies have approved the FY06 plan.

Allan – No. NSF has not as yet approved the FY06 science plan.

Rack – Re-emphasized that the main focus of the EDP is the 3-5 year time frame and its activities are "above" this timeline.

Janecek – Raised a few issues for the EDP to consider: (1) the timelines of operations – for example comments from EDP on the SODV engineering issues will need rapid turnaround, EDP response for third-party tool proposals; (2) a yearly review of engineering needs and technological development; (3) long-term vision for engineering development (ED); (4) EDP's role and responsibilities – developing formal engineering requirements for projects and proposal, proposal evaluation, prioritization of ED, and nurturing, evaluation, and assessment of engineering development projects to-date and future projects; (5) How EDP communicates within the IODP structure – with SAS, IODP-MI and the IOs; (6) what are the EDP expectations?

He proposed a possible meeting plan, 2 times per year alternating between a "nuts and bolts" level meeting and a long-term planning level meeting.

Becker – The SSEP could ask for reviews of a proposal at any EDP meeting. He suggested moving the EDP meeting to the June/July timeframe, prior to the SSEP meeting, which is moving to a date earlier than October. This will allow EDP comments to be funneled to the SSEP without much delay.

Flemings – Asked for clarification of our responsibilities, because it appears that the EDP is responsible for issues that occur at different time-scales.

Nakata – Asked how EDP proposal comments will be treated by the SAS?

Flemings – Comments by the EDP will go directly to the SSEP and will be incorporated into the feedback sent to the proponents, but also will move upward when technological needs are identified that require development.

Becker – Provided further comments regarding proposal comments. The chair of the SPC is also the liaison to the EDP. The EDP will nurture and evaluate specific drilling proposals before the ranking of proposals occur.

Flemings – Asked whether the EDP will become a technological gate or an inducement for nurturing drilling proposals requiring new or novel engineering development.

Becker – The EDP can highlight certain types of engineering development that is required by drilling proposals and identify more general technological needs. But, the EDP can also made specific comments regarding a proposal—feasibility, technological readiness, etc.

Nakata – Asked about how budgets for new R&D and engineering support are generated. If the EDP identifies a new technology, is the cost an important consideration at this point?

Janecek – Budget amounts (shown on his slide) are a rule of thumb. The bigger, more expensive projects are the EDP responsibility; whereas the smaller budgets are generally IO generated and proposed to IODP-MI. The EDP will be asked for help with prioritization with all ED proposals, no matter their source.

Talwani – Asked if the EDP generates a proposal, will it be considered a long-term proposal?

Fukutomi – In industry, a proposal is submitted with a price tag. If the EDP prioritizes proposals, then it should consider the cost of the project.

Flemings – The EDP clearly has many potential roles and levels of responsibility. The EDP should prioritize technology even if it is expensive; it could be a high priority. At some level expensive technology should be driven.

Rack – Stated that regarding engineering support, it is unlikely that the EDP will be asked to review maintenance proposals. The EDP should be thinking about engineering development, not maintenance.

Janecek – All engineering support requests are submitted as part of the annual program plan by IODP-MI.

Talwani – Flemings has made an important point. The EDP is a driver for engineering development and should come up with proposals. The EDP should work with IODP-MI on developing proposals and their budget, and submit them to lead agencies for funding. Thus, the EDP could originate engineering proposals.

Sears – Should the EDP become involved in operational engineering questions? For example, mud weights and formulations used by an IO?

Flemings – If a technological approach is not successful, then the EDP can get involved in the operational side of drilling.

Janecek – There is an operational review after each drilling expedition. Engineering issues can come up, for example cementing programs.

Sperber – Stated that the EDP should not get bogged down in the details of operational engineering, and instead should focus on development or improvement of drilling technologies.

Flemings – It's too easy to get buried in the details.

Kamata – Commented that for the proposals nurtured and evaluated by the EDP, the scientists know technology is needed. The EDP is the only group that can propose to develop engineering solutions that will enable the science. Also, commented that he would like to have more time to nurture and evaluate the 3 drilling proposals sent to the EDP for such. Do we have to come up with a final conclusion by Wednesday?

Flemings – Made three comments: (1) One exciting role is to look at proposals and to provide potential solutions; (2) I apologize for 1 week's notice in which to nurture and evaluate the 3 proposals. This is not the preferred way to do this, but we should try to do it even if it is awkward this time; and (3) Prefer to complete the reviews by Wednesday. It is extremely difficult to get reviews after the meeting has ended.

Silver – Seconded Fleming's preceding comments. If you look at the structure of the IODP, you will realize that if the proposal reviews are delayed, then the proposal process slows down. It is critical to do as much as possible in the next 2 days.

Flemings – Presented a few slides (*Appendix 5*) clarifying the details of the organizational structure of the IODP. The EDP is part of the SAS and its role is to provide guidance to IODP-MI and the IOs. There are 5 major responsibilities thus far, for the EDP: (1) evaluate science proposals; (2) evaluate engineering development proposals; (3) evaluate outside projects; (4) develop a 2-5 year vision for engineering development; and (5) process recommendations – How do we improve the process of engineering development to get better results? Comment on FY science plans, the SODV, vision and

long-term engineering development keyed to the time-scale of the budget cycle, and the engineering development process itself.

Von Herzen – Some evaluation and information needs are short-term, i.e., up to a year. As a panel, we have to operate in between meetings. How do we decide things without talking face-to-face?

Flemings – Agreed with von Herzen. Some issues won't fit within the meeting cycle. However, panels work most successfully during meetings, not in between. Email and teleconferences have not been particularly successful.

Von Herzen – How will the EDP provide response concerning the SODV?

Flemings – Proposed that a subgroup can communicate with the EDP. Not everyone needs to be involved. Alternatively, the next EDP meeting can be timed with SODV needs.

Coffin – Made a comment about the number of proposals reviewed by the SSEP. At its last meeting the SSEP reviewed 35 proposals, and only sent 3 to the EDP for further nurturing and evaluation. The EDP will only see a small fraction of the total number of proposals processed through the SAS.

Sperber – Asked what criteria should be used to evaluate the 3 proposals before the EDP.

Flemings – Will answer this question later.

Morning discussion ended at 10:30am
Morning Break
Discussion resumed at 10:55am

9. SPC Report to the EDP (Keir Becker)

Becker – The FY07 drilling program is perhaps one of the most exciting programs. Phase II of riser-less drilling program will use the new SODV, plus the Chikyu and MSPs. Thus three platforms will be in the water by late 2007.

Flemings – Clarified that the fiscal year 2007 (FY07) starts October 1, 2006. This is based on the structure of the US government's fiscal year.

Becker – Reviewed the proposals under consideration by the Operations Task Force (see *Appendix 6*). The drilling options for the SODV for FY07/08 will be decided at the October 2005 meeting of the SPC. (Becker became chair of the SPC effective October 1, 2005). All options for the SODV start with the Equatorial Pacific program (626-Full2), a relatively straightforward paleoceanography/coring/logging expedition. The next MSP drilling target is the New Jersey transect (564-Full), if not done in

FY06. Following New Jersey might be the Great Barrier Reef expedition (519-Full2). Initially, the Chikyu will be operated in a non-riser mode and the 2 phases of NanTroSEIZE drilling (603A-Full2 and 603B-Full2) are being considered as the first expeditions for this ship.

Becker identified 3 significant engineering challenges in proposals under consideration for FY08: (1) development and deployment of seafloor observatories for Juan de Fuca (545-Full3) and Monterey Bay (621-Full2); (2) deep crustal drilling for the potential Superfast expeditions; and (3) deep prism/reference drilling for NanTroSEIZE drilling (in non-riser mode, with or without using the SODV). The EDP should look beyond this schedule regarding long-term engineering development needs.

Flemings – The EDP will discuss Juan de Fuca and Monterey Bay for those unfamiliar with these expeditions.

Becker – Juan de Fuca is a follow up expedition to Expedition 301. Expedition 301 installed 3 CORKs. The JdF expedition will drill 2 new boreholes and install 2 new CORKs and initiate hole-to-hole hydrologic experiments in ocean crust. Some engineering development is needed for cross-hole testing. An NSF proposal has been submitted for instrumentation to support this effort. The Monterey Bay expedition (621-Full) was on the schedule (formerly Expedition 312) but was postponed because it was determined by the Monterey Bay National Marine Sanctuary (MBNMS) that a full Environmental Impact Statement (EIS) was required prior to issuing a permit for conducting this expedition. The plan is to drill 2 instrumented boreholes (a dedicated seismologic borehole and a geohydrologic borehole-separated by about 3 km) that could be tied to the MARS cabled observatory (www.mbari.org/mars). The NanTroSEIZE non-riser work is sediment coring down to a couple of kilometers sub-bottom, which will not be any more challenging than previous JOIDES Resolution coring. Thus, the FY07 expeditions do not have huge technological challenges.

10. Review of the IODP Initial Science Plan (ISP) and proposals residing with the OTF – Mike Coffin (*Appendix 7*)

Coffin reviewed the history of workshops that have lead to the development of the IDOP ISP: (1) CONCORD – 1997; (2) COMPLEX – 1999; and (3) APLACON – 2001. Three themes comprise the ISP (www.iodp.org/isp): (1) The Deep Biosphere and the Subseafloor Ocean; (2) Environmental Change, Processes and Effects; and (3) Solid Earth Cycles and Geodynamics. The Solid Earth Cycles theme has the most pressing engineering and technology development problems. There are a total of 8 initiatives within the 3 main themes. Some of these sub themes require engineering development, including the deep biosphere, gas hydrates, continental breakup and sedimentary basin formation, large igneous provinces (LIPs), and a few others.

Some highly ranked but unscheduled expeditions contain significant engineering and technology development challenges: Okhotsk/Bering Pliocene/Pleistocene (477-

Full4) presents a site survey challenge; Wilkes Land (482-Full3) is challenged by the Antarctic environment; South Pacific Sea Level (519-Full2) and other sea level expeditions share the common challenge of drilling reefs and sand layers; Juan de Fuca (545-Full3) is a multi-expedition geohydrologic program; Cascadia Hydrates (553-Full2) is the second gas hydrate expedition to this area and sampling gas hydrates presents a challenge; New Jersey Sea Level (564-Full) sand recovery is an issue; and in the Gulf of Mexico (589-Full3) over-pressures present a drilling challenge.

Seven additional proposals also contain technical challenges: Indus Fan and Murray Ridge (595-Full3) targets deep drilling into a submarine fan environment where alternation between sand and soft sediment presents a core recovery challenge; Canterbury Basin (600-Full) has sea level drilling challenges; NanTroSEIZE Phase I (603A-Full2) is a relatively low-tech expedition, but subsequent phases present difficult challenges in installing borehole observatories at the plate interface—this is the most technically challenging proposal yet entertained—the EDP will become involved in meeting the engineering development challenges of 603B; Monterey Bay (621-Full); and Pacific Equatorial Age Transect (626-Full2) offers little technological challenges, primarily a paleoceanography coring expedition.

Coffin outlined what he saw major technological challenges introduced by the ISP: (1) sample recovery at close to in situ pressures and temperatures (rocks, sediments, fluids, and gases); (2) logging physical, chemical and biological parameters, especially at high pressures and temperatures; (3) installation and maintenance of borehole observatories, especially at elevated pressures and temperatures; (4) improved borehole stability, especially in shallow formations and faults/fault zones—Lamont Borehole Research Group (BRG) 4D monitoring indicates potential for tool losses, especially when drilling into tectonically active zones--tools and observatory components could be lost; (5) improved recovery statistics especially in traditionally difficult to core lithologies (i.e., sands, coral reefs and rubble, alternating hard/soft lithologies—chert/chalk and basalt/sediment sequences). Some of these technological challenges are near-term problems.

One additional point was made about meeting the goals of the Solid Earth Cycle theme. Drilling targets are deeper than what the hydrocarbon industry currently pursues. A logging program is critical for obtaining expedition science objectives. Deep targets will require long-term monitoring and observatory maintenance, which are especially important in the seismogenic zone initiatives.

Coffin opened the floor for questions.

Silver – Commented that Harold Tobin is organizing a workshop in late spring 2006 concerning drilling into faults. Representation of the EDP at this workshop is clearly very important, thus we should be aware of this opportunity.

Tezuka – Hydrocarbons are common in faults and may be a problem in the shallow subsurface adjacent to active faults. What kinds of problems are expected?

Silver – Overpressure within the fault zone is expected. Lead time to develop engineering solutions to drilling into gas-rich zones needs to be built into the long-term planning for drilling these types of targets.

Nakata – Asked how the EDP will consider sampling at high temperatures and obtaining improved quality of samples in the long-term engineering development process.

Coffin – The EDP can be proactive and could push specific engineering developments required to achieve the goals of the ISP. The EDP could also respond to proposal needs. The EDP will be asked to prioritize engineering plans and proposals. Thus, the EDP should expect to be proactive and reactive to engineering development needs.

Tezuka – Going back to my question, no one has tried to drill into large fault systems with unknown over-pressure conditions. The holes could become unstable and collapse. This is a challenging drilling target, but the IODP must try to investigate these targets.

Sperber – The most ambitious goal thus far enunciated is to improve borehole stability. He asked if anyone on the EDP is a professional in borehole mechanics. None are, but the EDP should consider identifying experienced outside consultants.

Flemings – Several (two) ECORD members have not been selected for the EDP. The hydrocarbon industry has experience with drilling faults, thus obtaining an industry-employed member would be beneficial.

Coffin – Discussed confidentiality. The interim policy has established that the Sapporo Office is responsible for proposal handling and release to the public. Distribution of proposals is limited to a need to know basis only; the proponent can agree to release the proposal with written permission. Once the proposal is in the annual IODP program plan, it becomes public knowledge except for any privileged data (a proposal can be labeled to exclude such material). Any proposal not drilled is kept at the Sapporo Office for the life of the IODP and cannot be released without permission.

11. Supported FY06 USIO Proposals – Rack

Rack made a formal presentation (*Appendix 8*) of FY06 USIO plans. The USIO (United States Implementing Organization) operates as a systems integration contractor (the JOI Alliance). The JOI Alliance includes TAMU (Texas A&M University), TAMRF (Texas A&M Research Foundation), and the Lamont Borehole

Research Group, which operate as cross-functional teams. This is a different organization than during the ODP. USIO laboratory teams are presently being created for oversight of lab and science lab capabilities as a means of gathering external comments on the past operation of these facilities on the JOIDES Resolution. The JOI Alliance is operating in 2 phases: Phase I drilling, then demobilization of the JR, followed by Phase II, which will utilize the SODV (Scientific Ocean Drilling Vessel). Phase II drilling begins in late 2007. The JOI Alliance is presently engaged in identifying a vessel for conversion and undertaking the conversion. It is also looking for bridging activities for the JR during the drilling hiatus from 1/06 until the SODV is delivered. India and China has potential projects. Plans for the Monterey Bay boreholes (621-Full) need to be crystallized and this information needs to be fed into the EIS. The MBNMS wants to know the long-term impact of observatory use.

Rack presented a time-line for the Operational Task Force. Prioritization of proposals begins at least 2 year in advance.

Flemings – Asked for a detailed explanation of the OTF time-line for the SODV.

Rack – OTF (formerly Opcom in ODP) goes over the options for scheduling. The expeditions planned for FY07 will be finalized and approved at the October 2005 meeting of the SPC and this package will be passed up to SSPOC and then the Board of Governors. Once formally approved, the USIO starts the implementation process, i.e., selects co-chiefs, identifies long lead-time items, and formulating the budget. He gave an example of the timelines for FY07: the task/project list is completed by 9/05; the final FY07 list is approved in 10/05 by SPC; the JOI Alliance reviews the task/project list from 11/05 to 1/06; NSF guidance on funding is obtained in 2/06; and a draft program plan is developed from 2/06 to 3/06.

Fukutomi – Commented that CDEX has a similar time-line for its fiscal year planning process.

Rack – Moved discussion to the interactions and challenges that the EDP faces. Procedural mechanisms and the lead-times for engineering development have to be established. Panel expectations and recommendations have to be balanced with resource availability and expertise. The EDP's role and involvement in a drilling project may involve engineering development, identifying enhancements, and providing guidance. Communication pathways between the EDP and the core organizations of the IODP need to be clearly established and should be fairly seamless. The EDP may operated at different time-scales: comments may be requested this fall concerning what initially goes into the SODV, enhancement priorities to the SODV may appear on the 1 to 2 year time frame, and guidance on how to keep the ship up-to-date may be a continuing need. By nurturing and evaluating selected proposals the EDP can obtain a sense of the proposal pressure on engineering development, and this could feed into a Technology Roadmap. The present vision is that each IO will develop a Technology Roadmap, but it is also possible that an IODP-wide roadmap is an outgrowth of this. The EDP should keep

focused on third party tool developments. While primarily externally driven, there is an interface between the third party tool developers and the IOs which require staff and resources to make third party tool deployment successful. Engineering testing during development of third party tools is needed, both on land and at sea. Assessment of these tests and post-deployment results need evaluation and the EDP can participate in this process. The SODV system priorities need feedback in a short time-frame (the next 4 months). On the other hand, the IODP is looking for a long-term development strategy in the form of a Technology Roadmap across the fleet. If specific needs and systems can be identified, then we can push the boundaries of the fleet capabilities. The EDP can provide guidance by identifying areas for enhancements in the labs, information technology, coring, achieving ISP themes, and whether commercial off the shelf (COTS) technologies can be implemented directly, with slight modifications, or a full development project is required.

Rack presented two proposed FY06 enhancements for EDP comment: (1) a pulsed telemetry system (PTM) and a common bottom-hole assembly (BHA). The PTM would provide real-time drilling data which would eliminate delays in accessing data from a memory tool, increase data rates and improve borehole management in real-time. The BHA project focuses on developing a prototype system to replace the RCB and the MDCB/APC/XCB assembly which would eliminate pipe trips, reduce costs by having a simplified inventory of hardware.

Ussler – Asked where the FTEs for the engineering in these proposals would be obtained—existing personnel or new hires?

Rack – The FTEs would come from existing personnel at TAMU and Lamont BRG.

Von Herzen – Asked if there were engineering groups at TAMU and Lamont BRG?

Rack – Yes, there are engineers on the staff in both groups and interaction between TAMU and the BRG would occur. The goal is to build the BHA with as much COTS hardware as possible.

Flemings – Reminded the EDP of the structure of the IODP. In Frank Rack's examples (the PTM and BHA) these are FY06 proposals and the flow of funds is from the NSF to IODP which allocates them as SOCs to the IOs to pursue the projects. At this meeting the EDP will examine the proposals, consider the timeline. The expenses may grow and the overall total costs need to be considered when evaluating the proposals at this stage.

Rack – Cost discussion are currently underway with the NSF. All parties agree that the BHA is at an early stage of its overall scoping and are willing to take it off the table for FY06 if some funds can be obtained for further scoping. The project could then proceed in FY07 and FY08 with a better plan. However, we would like to go forward with PTM development, which would involve COTS hardware except for the interfaces with the shipboard data systems.

Becker – Provided some clarification concerning the PTM and BHA projects along with early NanTroSEIZE developments. These projects were prioritized at the last SPC meeting. The lead agencies and IODP-MI want more details and clarification for these projects. To honor the process of including the EDP in the evaluation step, we should go ahead with scoping, but get the EDP better involved in these projects. What is the EDP being asked to do regarding these projects during this meeting?

Rack – Stepping back, what does the EDP think about this: Can input from the EDP be incorporated into the proposal evaluation process for FY06? This is not an ideal scenario from the timing standpoint.

Takemura – Are these projects being supported by co-mingled funds?

Rack – Yes

Allan – Asked if the BHA represents a define project. Should the EDP become involved in the assessment of the BHA?

Nakata – What are the specifications for the BHA?

Rack – FY06 funds are being requested for a BAH systems review and conceptual design. The rest of the activities will be prioritized for FY07/08 funding.

Nakata – Asked again about specifications for these projects. For example, what is the basic specification for temperature measurements by the PTM?

Sears – These are important questions and issues, but how will nurturing and evaluating these proposals fit into how the EDP will address future technology challenges?

Rack – The criteria for evaluating BHA/PTM type of proposal is different from the rationale behind internal initiatives by the EDP.

Flemings – If the BHA is constructed, it will save some time and money, but it will not change the future of drilling and address unresolved scientific drilling needs.

Sears – Asked how do you rank incremental improvement proposals like the BHA/PTM against a new fluid sampling tool, for example?

Flemings – We will go through this exercise at the next EDP meeting in early 2006.

Rack – In January 2006, FY07 program plan input will occur. Thus, the EDP needs to accelerate the process of assessing short-term issues and moving on to focus on longer-term needs.

Holloway – Are there any hard, tangible engineering development concepts out there?

Rack – Not really.

Holloway – Is the BHA worthy of support?

Rack – This is open to discussion and evaluation.

Flemings – Pointed out the SPC Consensus 0505-1 addresses prioritization of the CDEX long-term monitoring system (also on the EDP meeting agenda for discussion), the PTM, and BHA.

Rack – Introduced another engineering development topic. REVCOM has recently recommended that the USIO should incorporate a cementing plan for casing seals. A subcontractor should review the cementing program and identify the risks. Only $5,000 has been requested in FY06 to begin the process. Another ED problem is the borehole casing seal between the 16" and 10 ¾" casing. This needs to be improved by the time the second Juan de Fuca expedition occurs. He also stated that comments from the EDP concerning allocating a few engineering test days per year on the SODV would be helpful. These days would test new gear and allow the development of shipboard deployment protocols.

Takemura – Asked about the casing seal design.

Rack – Explained the sealing system and noted that by improving the seal, the quality of the borehole completion will increase.

Ended formal discussion at 12:30 for lunch

LUNCH

Resumed discussions at 13:35

Flemings – Made a few general announcements. Directed panel towards further discussion of FY06 issues that were introduced before lunch by Rack, which is one of the most clearly defined items on the agenda of this panel meeting.

Sperber – Commented that precision drilling systems have the capability of obtaining annular pressure and though incorporation of this measurement into the PTM would be desirable. However, a transmitting system is needed to move data from outside the drilling collar to the inside.

Rack – The PTM is like MWD systems because communications is by mud pulse.

Germaine – What is the data transmission rate?

Goldberg – 5 to 10 bits per second.

Von Herzen – Asked if the PTM would improve heave compensation? Will the bit rate allow weight on bit (WOB) in response to heave to be resolved real time?

Rack – The PTM is for drilling situations without MWD or LWD capabilities. LWD is especially expensive. The PTM will allow collection of needed data more often during coring operations where MWD or LWD are not deployed.

Goldberg – Regarding von Herzen's question. Two samples per ship heave period are required (for 10 s heave).

Silver – Asked a procedural question. Is there more extensive documentation on the PTM than provided to the EDP?

Coffin – This is all the SPC saw.

Flemings – Asked how well the RMM and DSS are working? Are they functional? (The RMM-remote memory module and DSS-drilling sensor sub are two existing subsystems that would be integrated into the PTM system).

Rack – The long-term plan for the EDP is for it to receive as part of an annual report the accomplishments of the past fiscal year. For example, regarding the RMM and DSS, a section of the FY05 annual report will summarize their accomplishments.

Goldberg – Two parts of the proposed PTM system exists: a collar measurement system (DSS?) run twice on the JR before the end of ODP--Seal problems arose and have been fixed; and the RMM which provides a short data transmission link between the DSS and the top of the core barrel. The entire system is still in development and not routinely run. The DSS has been redeployed in land tests along with the RMM. Engineering problems have not been fully resolved because the field tests are not yet complete.

Holloway – Are there plans for more RMM testing?

Rack – RMM testing will continue and be reported along with a full status of the components.

Goldberg – The next step is a full field test of the system on the drillship. This depends on the availability of shiptime for engineering development and testing.

Sperber – Asked for more clarification of the value of the PTM.

Rack – The PTM will provide more basic measurements of drill string dynamics.

Kamata – Commented that is important to use real-time data during coring.

Goldberg – Commented that another advantage is safety.

Ussler – Asked if all the data from the PTM would ultimately become available, i.e., the RMM stores all the data, while the PTM provides a real-time subsampling of the data stream.

Rack – Yes on both accounts.

Holloway – Asked if WOB and sea state information is presently being recorded?

Rack – Yes, passive heave compensation system records this data. During previous expeditions data collection was piggy-back using an Anadrill-like system. We clearly need the capability/versatility for routine measurements of drilling parameters real-time.

Holloway – What was learned from these piggy-backed expeditions?

Rack – Lamont BRG wrote a report on passive heave compensation and how active heave compensation has further reduced heave.

Flemings – The type of data that the PTM can provide is exactly what is needed to help with managing borehole stability. Asked to see at the January meeting a complete report on the success of the other two pieces of the system (DSS and RMM). The DSS and RMM are relatively large financial investments. He asked for a consensus from the EDP to request the JOI Alliance to provide an engineering summary and performance report.

No objections were heard from the panel. The consensus passed with 12 yes, 0 no, and 0 abstentions.

Flemings – Assigned 2 people to write a paragraph about the PTM effort to be reported tomorrow. Sears and Kamata were given this assignment.

Kamata – Commented that it is not wise to invest in something the hydrocarbon industry can already do, however the PTM appears to allow coring while making measurements. Coring cannot be accomplished while using MWD and LWD systems.

Sperber – MWD is normally used during directional drilling.

Kamata – Noted that safety during drilling/coring is always an issue. Having pressure measurement at the bit would enhance safety.

Flemings – Confirmed that the hydrocarbon industry routinely uses MWD, but cannot core simultaneously.

Goldberg – Made an important point that the PTM system as a whole is not available from industry and not COTS, but each component is available.

Rack – Asked if there are questions regarding the BAH. Scoping activities are recommended for FY06, not fabrication. Better vetting of the engineering issues is desirable.

Germaine – Asked if there are other applications of the BHA.

Rack – Multiple concepts are to be developed for the BHA.

Germaine – Commented that it is important not to repackage the existing coring system (the APC, ACB, MDCB, & RCB), but to look at broader applications.

Sperber – The outside diameter of the coring system is a critical parameter. Are larger outside diameters under consideration?

Rack – We need to rehash the specifications. A standard drill string in use now by the IODP non-riser ship is 5 ½" OD. We could consider other options, such as a 6 5/8" system. This introduces water depth limitations because of the added mass of the pipe. Perhaps 2 different size BHAs could be developed for different water depths. This is an appropriate question for a systems review of the BHA.

Flemings – Asked Halloway and Tezuka for a 1 paragraph recommendation on the BHA for tomorrow morning's discussion.

12. Supported FY06 CDEX Proposal – Fukutomi

Fukutomi made a formal presentation (*Appendix 9*) concerning the CDEX proposal to construct a long-term monitoring system (LTMS). As a representative from CDEX he invited the EDP to meet next in Japan. He then discussed the CDEX vision and some concerns regarding ultra-deep drilling. The LTMS addresses the scientific requirements for conducting hydrogeology and material cycling studies in boreholes. There are numerous technical challenges, including the type of data required by the science, the environmental conditions in the borehole, the need for high systems reliability, and low power consumption (because this system is not proposed to connect to a submarine cable). Some of the engineering requirements were defined by the NanTroSEIZE workshop in July 17-19, 2005 in San Jose, Costa Rica. Examples of high reliability include high temperature performance, long-life components (125°C for 5 years), and redundancy. These requirements affect costs, space and power consumption, and the configuration of the wellhead, packer systems etc. Presently, seismic monitoring systems consume 10W of power, but 2W is the design target. This and other items and systems are not COTS.

FY06 activities will include system architecture and high-level designs. Input into these activities result from an internal CDEX technology study in 2004, scientific requirements defined by the NanTroSEIZE LTMS workshop. Deliverables include the system architecture design document, high-level design document. Validation of the system architecture and high-level designs will be obtained through technical peer review. The EDP will be asked to find reviewers for the system architecture.

FY07 activities include completing the feasibility phase, complete major development of the experimental prototype (EXP). FY08/09 efforts include complete development of the engineering prototype (ENP).

Fukutomi then presented a brief overview of the Engineering Development Process (*Appendix 10*) that includes the concept phase, feasibility phase, development phase, release phase (manufacturing), and manufacturing phase. We need to have a common understanding of the ED process. He asked at what point does the EDP want to become involved. We are presently at the feasibility phase in FY06. Typically the maintenance phase (adaptation improvement) is typically the most costly phase in a product lifecycle, particularly software. The EDP needs to consider the maintenance phase in a project. This is a very important long-term issue.

Sears – Asked about the deployment depth and life expectancy of the LTMS.

Fukutomi – We want to achieve a 5-year life cycle for a single-use system (non-recoverable) that can be deployed in 2-4 km water depths, 3,000 m below the mudline.

Fleming – Commented that the ultimate costs for the LTMS are heading towards $12,000,000.

Allan – Asked the IODP-MI if CDEX will produce a written document outlining the results of the FY06 feasibility study (including depth of operations, life span, etc) and submit it to IODP-MI and the EDP? In FY07 a decision to proceed could result in a sole-source contract or a bid. If the sole-source contract option is selected, then the LTMS could go into the FY07 budget, otherwise procurement procedures developed by Janeck at IOPD-MI come into play. A contract award would be issued the following spring using FY08 funds.

Ussler – Asked if the EDP is being asked to make a recommendation regarding the procurement process for technology and engineering design?

Talwani – FY06 includes only feasibility studies, no RFP. There is no statement about procurement policy at this time.

Flemings – Asked how and in what form the products of the feasibility study will be reported?

Fukutomi – They will be sent directly to IODP-MI. The document will describe logically how the system will be built. This document will be the one to go out for peer review.

Talwani – With a $12,000,000 price tag, we must be most diligent to nurture and evaluate this proposal. We need a feasibility study first and an engineering development task force (EDTF) will look at it.

Janecek – The role of the EDP is still to be determined. One major issue is the timeline for development and the fact that the EDP only meets twice a year. An EDTF can obtain outside input in addition to the EDP and help develop a FRP.

Rack – Will peer review of the LTMS occur in FY06?

Fukutomi – Yes. We want to compress the timeline and design effort, and have the EDP join the peer review process.

Discussion on how to involve the EDP in the peer review process followed. The timeline is highly compressed and it was not clear how the EDP would get up to speed quickly and complete a peer review before its next meeting in late January, 2006.

Becker – Commented that he did not see how an accelerated nurturing and evaluation process involving the EDP would translate into creating a FY07 engineering development plan on a reasonable time-scale. The SAS is to provide guidance. The SPC will be establishing a FY07 engineering development plan in addition to a science plan.

Fleming – Commented that it was the vision of the SPC that the IOs would come to *this* EDP meeting with specific FY07 engineering proposals that the EDP would comment on technologically. This has not occurred. We're reviewing FY06 engineering development plans that have advanced beyond the stage at which the EDP can make appropriate comments. What is the proper timeframe for delivery of a science plan to the EDP from the SPC?

Becker – The problem right now is that there aren't any proposals in-line for the FY07 engineering development plan.

Flemings – Concurred with Becker, and emphasized that if the EDP isn't examining FY07 proposals at this meeting, then there is nothing SPC can act on during their October 2005 meeting.

Further discussion involved the apparent ambiguity in the reporting pathway(s) for the EDP. Does the EDP report only to the SPC or to both SPC and IODP-MI, depending on the source of the engineering development proposal?

Talwani – Stated that there should be a direct line from EDP to IODP-MI. In view of the time crunch created by starting an entirely new panel (the EDP), SPC should be involved, but there should be flexibility in reporting to meet the goal of stimulating and nurturing engineering development.

Flemings – Requests that Ussler and Takemura prepare a summary of the CDEX proposal and identify how an EDP review might be inserted into the time-line. Report is to be presented tomorrow.

Talwani – Commented that the peer reviewer should be from outside CDEX, not inside, as is presently shown in the project development time-line.

Further discussion of the nature of the peer review occurred and the depth of involvement of the EDP.

Sperber – Noted that peer review of the LTMS high-level design will require expertise that may not reside within the EDP.

Von Herzen – Asked whether the EDP could bring in short-term consultants during a review?

Flemings – No. IODP-MI would be the group to hire outside consultants.

Afternoon break began at 15:15

BREAK

Meeting resumed at 15:50

13. CDEX vision for the future – Inoue

Inoue made a formal presentation (*Appendix 11*) concerning the CDEX vision for the future and it will support the IODP ISP. Intense engineering efforts are required to provide this support. There are numerous engineering challenges, and science/engineering/industry cooperation is essential for success. He described two technical issues: (1) Core recovery improvements – An anticontamination core barrel, patented by CDEX has been designed to avoid microbiological contamination of sediment samples; and (2) Ultra-deep drilling systems- Identified needs and potential solutions for drilling deeper than 4,000m, which include slim risers, high temperature/pressure tools, and a 12,000m drillstring. Presently, the Chikyu is limited to drilling in 2,500m water depths.

14. ESO Vision Report – Evans

Evans made a formal presentation (*Appendix 12*) on the efforts of the ESO (European Science Operator) to undertake MSP operations for the IODP on behalf of ECORD.

ESO will contract a suitable drilling platform for each job given by the OTF. The ESO operates differently from the ODP, or from how the Chikyu will be operated. The FY06 plan contains only engineering development. The only task is to improve mobile laboratory facilities. Presently the ESO is using a modular lab concept—2 shipping containers, one for curation and the other for petrophysics. The vessel *DP Hunter* is presently being used for the Tahiti sea-level drilling. The vessel was modified by adding the drilling equipment and a moon pool. All drilling equipment for the Tahiti drilling is being supplied by the contractor, which comprise a mining-type rig system with heave compensation. Logging is being accomplished using slimhole logging tools. In contrast, 4 potential systems are being considered for the New Jersey shallow shelf drilling (564-Full). ESO will use what is available and most suitable for the task. The ESO is interested in developing a down-string rotating camera, which is important for environmental reasons, especially in shallow water and reef environments. Need to avoid live corals; however, such a camera system is not commercially available. The ESO strategy for drilling is to use existing oil field/mining/scientific methods, and can include the cross-platform use of USIO or CDEX equipment. The ESO currently has no plans for drilling equipment development.

Sears – Are most of the potential platforms from the oil and gas industry?

Evans – The ACEX ship was an ice breaker. DP Hunter was used for diving support.

Flemings – How is core acquired?

Evans – The piston corer is a cut-down version of the JR APC coring system, a 5m version rather than 9.5m. It uses the same size liner, but has less firing pressure. Approximately 99% recovery is typical, but there were handling difficulties on the ACEX expedition. The drillpipe is the same as that used on the JR. During the Tahiti drilling, everything is contractor supplied.

Flemings – The goal is to have the same or similar internal diameters so that the same coring tools can be run cross-platform.

Evans – If a jackup rig was used instead of the DP Hunter, than 9.5m cores could be taken.

A detailed discussion of the drillpipe and BHA used during Tahiti drilling occurred. The Tahiti string was contractor supplied, using an API string as a conductor pipe with slimline coring. The contractor for Tahiti drilling has experience drilling in reefal environments.

Becker – Provided some quick comments on SAS vision. The EDP could develop a long-term vision for engineering development within the IODP. Next year SAS want

engineering development plans to be considered in the same fiscal year as the science plans and along parallel tracks. The EDP also needs to develop an approach for creating 2-5 year time-scale engineering development plans.

Silver – Asked what are the timelines for the IOs, regarding initiation of engineering development proposals.

Becker – Proposed creating an alternating March/August schedule. In August of any year, the SPC would consider and schedule science and engineering development plans on a fiscal year basis. Thus, if the EDP meets in January and July, in between SPC meetings, FY07 engineering development plans can be presented at the January meeting, providing a way to catch up. At the July 2006 meeting, FY08 plans could be considered.
EDP went into Executive Session (members only) to formally review Proposal 637-Full2.

Resumed open session

15. EDP and the Frascoti Report – Talwani

Talwani described the IODP management forum (MF) held 24-26 May 2005 in Frascati, Italy (*Appendix 13*). The MF had representatives from SPC, SSPC, the IOs, program offices, and IODP-MI. Important issues discussed: (1) current proposals do not satisfy the ISP initiatives; (2) the SAS needs to be proactive rather than reactive; (3) The US-style bottom-up and the Japanese-style top-down for scientific initiatives should be reconciled; and (4) program resources should be most effectively utilized. One point emphasized was that an efficient proposal submission method needs to be identified.

Talwani reviewed the potential composition and role of Mission Teams (MT) in developing thematic drilling in a variety of places. For example, MTs could nurture proposal for hydrogeologic drilling at various places and try to deal with necessary engineering development, site survey methodologies, etc which are in common with these targets and theme. At the end of the proposal nurturing and evaluation process, the MT could come up with a realistic execution plan.

Talwani views the MT approach as one that encompasses both top-down and bottom-up approaches. Community response to the Frascati Report was strong. It was endorsed by the USSAC and JDESC. Japanese endorsement was particularly strong, with 53 Japanese scientists responding and 51 of those strong endorsements.

Future steps include forming a small group (Janecek, Tiara, Pearce, Pisias, Becker, Tatsumi, and Mori) that will recommend future changes. This small group will do so on the basis of comments from the science community and pass its recommendations to SPPOC and the MF. In turn, SPPOC and MF will give their recommendations to the IODP-MI BoG. Talwani pointed out that the EDP could participate in the MF process in the following ways: (1) comment on the MT approach; (2) if the MT

approach is favored, how should the EDP participate in the MTs? (3) if engineering development is important, how can funding be assured to support it; and (4) send comments to the SPC.

It is imperative to spend ED money in the best ways possible.

Evans – Commented that is a MT approach, there would be a more efficient system for scientists to conduct challenging drilling expeditions (e.g., New England Hydrogeology 637-Full2) by bringing engineering and site survey efforts together with the science at an earlier stage. This would be beneficial for all involved.

Von Herzen – Asked what aspects of the ISP are not being covered by the proposals now pending?

Talwani – In particularly, microbiology isn't being covered well. Can we continue with the unsolicited proposal model and still meet the ISP goals?

Flemings – Closed the meeting with brief announcements. Tomorrow morning's session will be a closed executive session for the EDP, SAS representatives, and Janecek from IODP-MI. The full session will resume at 10:00 am.

Tuesday, September 27, 2005

An executive sessions of the EDP was convened at 8:15am.
Attendees: Chen, Sears, Sperber, Nakata, Becker (SAS liaison), Coffin (SAS liaison), Holloway, Flemings, Takemura, Tezuka, Germaine, Kamata, Masuda, Ussler, von Herzen, Silver (SPPOC liaison), Janecek (IODP-MI) and Lovell (STP liaison).

Flemings – Introduced an additional member of the EDP, Dr. Chen, from China. He was delayed by a typhoon. Pointed out that the EDP has an independent role, distinct from the SAS and other groups present in the open sessions. Discussions during the Executive Session will be informal and no minutes will be taken. The main topic of discussion was the FY06 proposal presented to the EDP. Ussler and Flemings self-identified their conflict of interest with Proposal 635-Full2 and were not present during discussion of this proposal. Recommendations regarding this proposal were passed directly to Janecek.

Discussions ended at 10:00am

BREAK

Open session resumed at 10:15am

Additional attendees: Rack, Kyrc, Inoue, Fukutomi, Goldberg, Evans, Kimura, Talwani, and Allan.

1. SODV Presentation – Kyrc (*Appendix 14*)
Kyrc presented a status report on the SODV specifications and acquisition. Specific details about the actual ship cannot be answered at this time because of a need for confidentiality. The IODP-SODV organizational chart was reviewed and it was demonstrated that a lot of engagement of potential users was built into the scheme. Projected funding needs are on the order of $115,000,000 over 3 years, with the funds coming from the NSF, MRE (major research equipment) program. The SODV timeline presented is subject to change depending on signing of the contract. The target date is 11/01/05.

The SODV engineering design phase will occur between 11/05 and 5/06. The SODV procurement strategy has the JOI Alliance sub-contracting TAMURF issuing the RFP (www.joialliance.org/MREFC) and acquiring the ship. The present plan regarding science facilities during the drilling hiatus includes: (1) establishing a test and integration facility at TAMU; (2) storing JR science gear; (3) replacing, upgrading, or eliminating equipment; (4) IT integration; (5) training of staff; and (6) writing of procedure manuals. Shipyard solicitations will be handled by the drilling contractor. Potential shipyards are in Asia, North America, and Europe.

Sears – Does the drilling contractor own the vessel?

Kyrc – Yes. Further comments—the extent of sea trials and shakedown cruises will depend on funding available at that time. Simultaneous with the construction of the SODV is logging system development at Lamont BRG. The BRG has released their RFP (www.joialliance.org/MREFC). The BRG will make sure the logging contractor requirements are integrated into the SODV design. Kyrc emphasized that community involvement/engagement is critical. The SODV Program Advisory Committee (PAC--Peggy Delaney, chair) is another set of community eyes and communicates directly with the management structure for the SODV acquisition project. There are 4 conversion design teams (CDTs): (1) science lab; (2) IT group; (3) vessel; and (4) support facilities. Each design team has a statement of task. Support facilities include education and outreach. Critical dates for the SODV conversion were illustrated on a slide (*Appendix 14*).

Kyrc asked if the EDP would become involved in the SODV project in the following ways:

(1) That EDP members read the Briefing Book, which outlines the design requirements for the SODV, and provide an independent report.
(2) The SODV team will forward the Design Team's deliverables to EDP in ~6 weeks. EDP will have 2 weeks to respond to the SODV team.
(3) The EDP formulates a list of their top 5 priorities for the new drillship with an explanation of the scientific or operational benefits.

Point of contact: Kelly Kryc at JOI (kkryc@joiscience.org; 202-787-1606)
EDP Point of Contact: TBN

In terms of the EDP timeline the window of influence on the SODV design is short. The maximum opportunity for influence is the October/November 2005 timeframe.

There will be a 50% increase in the science lab space on the SODV.

Von Herzen – Asked if the logging cable was part of the SODV and whether high temperature cables are being considered.

Goldberg – The logging cables are part of the logging system, not SOC or ship expenses.

Rack – High temperature logging cables have to put into the priority list. We need comments from the community and have to evaluate priorities against available funds.

More discussion focused on the short timeline for EDP comments on the SODV deliverables. CDTs are presently active, and the dimensions of the ship are not critical for many of the design activities.

Rack - Indicated that the Briefing Book is the first step toward understanding SODV requirements. The EDP should identify the types of items that should be included, and should note that the SODV list is not inclusive of what might be needed. CDTs will be putting together documents on how to translate the RFP into design documents. In December 2005, a draft document will exist. The EDP can then comment on this document. Priorities for the systems that will be delivered need to be established.

Flemings – Asked about the short time frame, i.e., responses in a few weeks.

Rack – NSF is driving the 2007 operational date for the SODV. Shipyards are tightly constrained at this time. The JOI Alliance has hard and fast milestones set by the NSF and by the US Congress.

Germaine – Proposed 3 possible options for obtaining EDP input on the SODV: (1) distribute the SODV deliverables documents to the full panel and each person responds individually; (2) form a subgroup of the EDP; or (3) have the EDP provide a group response.

Ussler – Asked if establishing a threaded discussion group on the internet (essentially an email list server) would facilitate communications.

Janecek – IODP-MI has the capability to establish a threaded discussion group and can manage the list server. The EDP would be the guinea pig.

Discussion of the specific items on Kyrc's list occurred. Comments focused on the very short timeframe for the EDP to prioritize the list and to respond to the deliverables. Communication will be difficult once everyone returns to their respective organizations.

a. Compensation systems with regard to coring
b. ROV Technology and the SODV
c. CDEX modifications to IODP coring suite
d. Magnetic Overprint reduction
e. Drill Pipe Design
f. High pressure mud system upgrade
g. Increasing length of vessel (20')
h. Improved Rig Instrumentation
i. Subsea Camera System upgrade
j. Electric Wireline for coring (real time DHM)
k. Drilling Equipment upgrades – Dual Elevator system,
l. Iron Roughneck etc.
m. Intellipipe
n. Slick OD Drill Pipe – in ground section only
o. Streamlining hull and/or new propellers

Nakata – Stated that he did not understand the role of the EDP in the SODV project?

Becker – Comments on the SODV project are indeed something extra, over and above the EDP's mandate.

Allan – Stated that the NSF has requested as much input as possible, which is dictated by the MOU (memorandum of understanding). The SODV project has slipped several years because of the US Congress and President's budgets. The NSF had hoped to have the SODV project start in 2003, but now it's delayed at least 3 years, perhaps 4. In the interim, the NSF has gone to significant efforts to keep the drilling program alive. He encouraged the EDP to participate in the SODV process and believes it has an opportunity to influence the design and decision process. Use of a threaded discussion forum was encouraged.

Some discussion centered on having an ROV on the ship and how it would assist with drilling operations, safety, and scientific missions, especially borehole observatories.

Rack – Commented that of the items on the list presented by Kyrc, the EDP should identify the ones that are critical for the initial construction of the SODV while in the shipyard, and to identify a development path for later incorporation for other needs. For example, 6 5/8" pipe may be required for scientific missions, but if the capability is built into the ship initially, but the pipe acquired later, the scientific goals can be obtained. Thus, having broad options in the operational flexibility of the SODV is desirable and will contribute to the long-term viability of the drillship. Also, noted that observatory science is beginning to drive drilling proposals. Is an ROV needed to support these efforts from the SODV?

Sears – Commented that 4 decisions were critical while designing the SODV: (1) whether ROV operations would occur; (2) length of the ship; (3) type/size of drilling equipment; and (4) style of propellers.

A number of questions were raised concerning the SODV budget and how incremental upgrades would be viewed/accomplished.

Allan – Responded that NSF was expecting to have $115,000,000 available to outfit the SODV. It might be possible to provide incremental upgrades later, but did not foresee a budget in the near future for multi-million dollar upgrades, especially through FY08, based on OMB (Office of Management and Budget) estimates.

Rack – The oil and gas industry cannot believe we do not have the capability to image the seafloor using an ROV or a rotating camera on the drillstring. ROV technology is well-established in the industry for monitoring drilling.

Some discussion occurred regarding drill pipe made from composite materials and how magnetic overprinting on cores could be reduced.

Rack – Pointed out that non-magnetic core barrels presently exist, but there is still magnetic overprinting that is induced by the metal drillpipe. The paleomagnetic community has asked for efforts to reduce overprinting on recovered samples. This would require a composite drilling system.

Sperber – The overall cost for composite drill pipe is substantial. The duty life of composite drill pipe and thread life is lower than steel.

Rack – Encouraged the EDP to examine the impact of different coring/drilling diameters on downstream core processing. The SODV could have a standard string, but careful planning for the SODV could leave open the option to have larger diameter pipe in the future.

Kyrc – The same coring tools could be used with a larger diameter drill pipe.

Holloway – There are issues with using undersized coring tools in larger diameter drill pipe, including lower core recovery, which is influenced by the kerf size. With larger diameter drill pipe, the logging community could use larger diameter, industry standard, logging tools. This would also make more types of standard tools available that cannot fit into the present 5 5/8" pipe. Pointed out that a high pressure mud system upgrade would be highly desirable. When running hammer drills on the JR, vibration problems caused lights to drop out of the derrick.

Discussion of the 20-foot increase in vessel length occurred.

Rack – Increasing the length of the SODV could provide more lab space.

Kyrc – Pointed out that a 50% increase in lab space has been achieved without the added 20 feet of length.

Germaine – The 20 foot increase could be used to accommodate an ROV.

Holloway – Is the use for the 20 foot length increase already identified? Could this space be used for seabed templates, heavy gear, storage of CPTs for geotechnically oriented expeditions?

Coffin – Asked why a 30-foot increase in length isn't an option.

Rack – In discussions with bidders, a 20-foot length increase can be made without impacting the ship's architecture. A 20-foot length increase is a realistic option that could be investigated.

Flemings – An electric wireline for coring has important advantages. Presently, the core wireline is non-conducting and has to be changed out for logging to take place on the JR. There is a significant loss of operational time when this occurs.

Germaine – A primary recommendation of the TAP (Technical Advisory Panel, predecessor to the EDP) was to obtain a conducting wireline for combined coring and logging. The technology is available.

Holloway – Asked whether having a non-conducting wireline for some operations is wise from a cost standpoint.

Goldberg – Commented that it is important to think about the rig instrumentation system with regards to the advantages heave compensation provides for executing better scientific drilling. The rig instrumentation system is used to analyze heave and generated the compensating motion.

Rack – Commented concerning intellipipe technology. This technology is under development by the US DOE and 3,000m strings exist, but require 6 5/8" drillpipe. He asked how could the SODV be used as a technology test bed for a technology like the intellipipe? He further commented that a lot of money is being pumped into the technology. With high data rates, a special logging run would not be needed.

Some discussion of the slickpipe technology occurred.

Rack – Commented that he was not sure what the reason was for the slickpipe request for the SODV. Use of slickpipe feeds directly into drillpipe design decision and affects the strength, longevity and durability of the drillpipe.

Sperber – Asked about the advantages of slickpipe.

Holloway – Slickpipe helps with recovery.

Flemings – Suggested that the EDP could make some comments concerning the SODV wish list.

Kamata – Commented that use of a ROV is standard in the oil and gas industry in Japan and is used to guide borehole re-entry. Regarding the conducting cable, is would be desirable to select a cable with more power. Intellipipe has been a development effort for more than 20 years in the commercial sector, but nothing has been commercially developed yet. The oil and gas industry still relies on mud pulse telemetry as it standard method for monitoring while drilling.

Rack – Other considerations that should be included in discussions of an ROV on the SODV include that fact that large, versatile ROVS come with crews of 6 or more people. This impacts shipboard habitability and forces a tradeoff between science and technical personnel to keep all the systems running. We will have to look at maintenance, repair, and staffing issues that this capability would introduce. It may be more realistic and cost-effective to contract ROVs for specific missions. For example, it is hard to see under a CORK with a camera sled. Science drivers for operational needs have to be identified.

2. The Role of STP and its interactions with the EDP – Lovell

Lovell made a formal presentation on the STP (Scientific and Technology Panel) (*Appendix 15*). He is presently co-chair, soon to be vice-chair of STP. His desire is to identify the common ground between EDP and STP and how to establish links and an effective dialog.

He reviewed the STP mandate, their proposal nurturing and evaluation process, and 3rd-party tool issues.

Kamata – Stated that it is not clear how to exchange information between the two panels. For example, an in situ high temperature borehole sampler is already commercialized; his company is involved in this technology.

Flemings – Kamata found the grey area that exists between the two panels, one between technical development and measurements.

Lovell – Good lines of dialogue and communication are required. Email is an important tool.

Becker – Should a liaison be required at each respective panel meetings?

Lovell – Perhaps STP and EDP should have parallel meetings. Perhaps meet simultaneously, in different rooms for the majority of the time. However, an hour meeting together, lunch, or casual time may be useful for stimulating discussion, exchange of ideas, and coordination of efforts.

Rack – There are critical pieces of information that need to be shared by the panels, for example the diameter of a tool.

Coffin – Perhaps the same science coordinator could serve on both panels.

Lovell – That would be difficult if the meetings were run in parallel.

Silver – Made two comments: (1) It was clear that the panel chairs need to meet to formulate panel meeting agenda and to stimulate cross-talk between the panels; and (2) If the meetings are run in parallel, chairs could communicate to keep both panels informed.

Lovell – Reviewed the criteria used by SSEP watchdogs to refer a proposal to both of the panels:

If any of these questions are answered in the affirmative, then they are referred to both – (1) propose new in situ technology or engineering; (2) includes observatory monitoring; or (3) involves non-standard sampling procedures or measurement technology.

STP sent a recommendation to the SPC asking to know why certain proposals were referred to STP. If both panels are asked to nurture and evaluate a proposal, then timing becomes an important issue. Parallel meetings might provide a more uniform response and timely response. The next STP meeting is in Kochi, in late January or early February.

Regarding the 3rd-party tool policy, the draft document reviewed at the SPC Lisbon meeting had to be modified and a new version will be reported to the SPC at its October 2005 meeting. There a temporary policy in place, and whatever policy is adopted, it has to accommodate the 3 different platforms and separate IOs. Issues such as insurance and policy enforcement have to be resolved.

Flemings – Announces end of morning session. Time for lunch.

Meeting adjourned at 12:40pm

LUNCH

Meeting resumed at 1:30pm for a group photo.

3. Presentation and Discussion of Proposal 574-Full2 (Executive Session)

4. Presentation and Discussion of Proposal 635-Full2 (Executive Session)

Returned to open session

5. Draft comments about the CDEX proposal were presented - Ussler

6. The EDP split into 2 working groups (for remainder of the afternoon)

    a. Working Group 1 – Winter 2006 EDP Meeting Content (?)
    b. Working Group 2 – What is an engineering development proposal

Representatives from the IOs and IODP-MI were not part of the groups, participated only as observers.

Meeting adjourned at 5:15pm

Wednesday, September 28, 2005

Meeting resumed at 8:05am

Attendees: Everyone from previous day except for Goldberg.

Flemings – Presented the STP draft executive summary as an example of what product the EDP needs to produce. This includes a series of formal recommendations, action items, and consensus statements. This document will be posted on the IODP-MI website.

The reviews of the 3 proposals do not go into the EDP meeting minutes.

1. Reports from yesterday's working groups

Insert consensus statements here…

2. Generic EDP Meeting schedule discussion

Becker – Presented scenarios and suggested activities for each of the 2 annual EDP meetings

a. July EDP meeting – the EDP is part of a system for producing program plans; at its October 2005 meeting the SPC will choose 2 possible schedules for FY07 and at the same time approve an engineering plan for FY07; both will be forwarded to SPPOC for final approval; at the July 2006 EDP meeting, FY08 engineering proposals should be reviewed; should also be concerned with longer-term vision—this is an important agenda item for this meeting; also examine proposals forward from SSEP and provide comments to SSEP.
b. January EDP meeting – (1) assess the outcome of previous fiscal year (FY-1) engineering development projects, drilling expeditions, etc.; (2) obtain an update on current fiscal year (FY+0) issues, if any; (3) review/finalize the next fiscal year engineering development program plan (FY+1) at a series of decision levels--level 1=conceptual, level 2=detailed design, level 3=build--and provide input to the IOs and IODP-MI for their annual program plan; (4) examine SSEP proposals and provide evaluation of technological readiness; and (5) preview long-term EDP needs, derived from the ISP, TAP list, and current proposals.

Sears – Asked who assembles the budgets for FY07 and FY08 and how spending levels are incorporated.

Janecek – Generally, the EDP should not get involved in level 2 and 3 budgets (detailed design and build), but should get a sense of proposals that are at those stages on an informational level. However, the EDP should be involved early in a project, at the conceptual stage (level 1).

Von Herzen – Stated that he would like to know the status of all engineering projects.

Becker – That would occur at the July meeting when reviewing the science and engineering proposals for FY+2.

Further discussion of the generic EDP meeting agendas continued.

Germaine – Asked about how a proposal like that outlined in 666-APL2 (SCIMPI) would be identified to the EDP.

Rack – This is a 3rd-party tool development and the IODP-MI has little control on these projects, learning their status, etc. But, it is up to the PI of the project to come forward with information on these projects.

3. Working Group 3 Report – Sears

The group agreed that there were 4 stages to project life and a review is needed at each stage. The EDP should not be the technical reviewer. The EDP would like to receive a summary report of the reviews. Asked if IODP-MI would be the owners of the reviews?

Flemings – Asked where would the 4 stages to project life fit into the FY07 proposal review. Two of the engineering development proposals examined by the EDP met none of the requirements of a concept proposal, and had missing pieces in the proposal concept.

Sears – Suggested that the EDP be involved at the concept phase, and IODP-MI would subsequently manage the project and give the EDP a status report of the project. EDP would not get involved in the management of a project or its review.

Tezuka – Commented that the main contribution the EDP could make is at the conceptual stage. Determining fit with the ISP would be important. The proponents will need guidelines for how to develop a successful engineering development proposal.

Von Herzen – Suggested another step in the review process for a project, a look-back review.

Sears – Agreed that a look-back review would provide interesting results and would help with evaluating new and future conceptual proposals.

CONCENSUS STATEMENT - from WG3

Discussion shifted toward defining a Technological Roadmap

Janecek – The EDP needs to develop a technology roadmap. By having a TR, this could trigger RFPs or unsolicited response in the form of 3rd-party tools.

Allan – Pointed out that IODP-MI operates with co-mingled funds and that it would be appropriate to use co-mingled funds to initiate engineering development projects.

Janaeck – Asked how an unsolicited proposal in response to the TR will enter the review system?

An executive session was called to discuss the CDEX consensus statement

Open session resumed at 11:45am

Flemings – Announced that Kamata-san has graciously offered to host the next EDP meeting in Tokyo in late January 2006.

Coffin – Reminded the EDP that the meeting time, place, and agenda has to be approved by the SPC Chair.

Flemings – Accepted Kamata's offer of hosting the meeting.

Discussion centered on specific meeting dates and a draft agenda.

Consensus was achieved on the draft agenda and meeting dates.

Adjourned for Lunch at 12:30

LUNCH

Resumed discussions at 1:15pm

Not present: Becker, von Herzen, Sears, Janecek, Goldberg, Allan, Holloway, Evans, Rack

4. <u>SODV priority list</u>

Flemings – Discussed SODV priority list at length

Meeting formally adjourned at 14:45

Appendices

1. Meeting Agenda
2. EDP Terms of Reference
3. Coffin presentation on SAS architecture/proposal flow
4. Janecek presentation
5. Flemings presentation
6. Becker presentation
7. Coffin presentation
8. Rack presentation
9. Fukutomi-san presentation
10. Fukutomi-san Engineering Development Process
11. Inoue – Vision for the future
12. Evans – ESO
13. Talwani – Frascatti Report
14. Kyrc – SODV
15. Lovell – STP

Appendices

1. Meeting Agenda
2. EDP Terms of Reference
3. Coffin Presentation on SAS Architecture/Proposal Flow **(not available)**
4. Janecek Presentation
5. Flemings Presentation
6. Becker presentation
7. Coffin presentation **(not available)**
8. Rack presentation
9. Fukutomi-san Presentation
10. Fukutomi-san Engineering Development Process
11. Inoue – Vision For the Future
12. Evans – ESO
13. Talwani – Frascatti Report
14. Kyrc – SODV
15. Lovell - STP

APPENDIX 1

EDP Meeting Agenda

(Mon., Tues., Wed, Sept 26- 28, 2005)

Monday 8am-5pm

1. Review the EDP terms of reference: (Flemings, Becker, Coffin) (10 minutes)
2. Review the SAS/IODP-MI/IO architecture/proposal flow. (Coffin/Becker)
3. The funding process and structure from IODP MI Perspective (Janecek)
4. EDP roles, responsibilities, and pathways (Flemings) (10 minutes).
5. Review most likely FY '07 science and schedule (Coffin/Becker)
6. Review IODP Initial Science Plan and IODP proposals residing with the Operations Task Force to understand priorities for upcoming engineering and technology development. (Coffin/Becker)
7. Supported FY06 IO Proposals (Janecek)
    a. USIO
    b. CEDEX
8. Visions for future engineering/technology development (from proposals most likely to be scheduled, what are most significant engineering/tech. Development issues?)
    a. IO Vision: CDEX, ESO, USIO
    b. SAS Vision: Becker/Coffin
9. Review IODP proposals forwarded from the SSEP and SPC.
    a. 637-Full2 New England Shelf Hydrogeology Person (Ussler/Sears/Evans)
10. EDP and the Frascoti Report (Talwani) (15 min).

Tuesday (8am-5pm)

11. Discuss/Prioritize FY06/FY07 proposals
12. SODV Presentation (Kryc and Midgley)
    a. Informational
    b. Issues
13. Review IODP proposals forwarded from the SSEP and SPC.
    a. 574-Full2 Rainbow Hydrothermal Field Fouquet
    b. 635-Full2 Hydrate Ridge Observatory Torres/Trehu
14. The Role of STP (Science Technology Panel & EDP). (Lovell and Flemings) (10 min)
15. Assign reporting responsibilities for Wed.
16. Discuss possible models for fostering, prioritizing, and implementing, engineering/technology development.
    a. Working Group 1: Generic EDP Meeting Agenda
    b. Working Group 2: Winter ’06 Meeting Content
    c. Working Group 3: What is an Engineering Development Proposal?

Wednesday (8am-afternoon)

17. Working Group Reports
    a. Working Group 1: Generic EDP Meeting Agenda
    b. Working Group 2: Winter ’06 Meeting Content
    c. Working Group 3: What is an Engineering Development Proposal?
18. Formulate Meeting Products

Other Issues that may/may not come up.

1. Detailed discussion of NanTroSEIZE monitoring
2. 3rd Party tools. What is temporary policy?
3. Status of Heave Compensation
4. How do IODP industry members receive appropriate support from their companies for participation?

Goals for Meeting

1. Lay out model that EDP will use for prioritizing, evaluating, and implementing engineering tech. Development. How will this panel work?
2. Comment on FY06 Engineering Development Plan
3. Comment FY07 Engineering/Technology Concept
4. Decide on next meeting time and location (tentative-Jan or Feb. ’06)
5. Comment on science proposals forwarded to EDP
6. Produce minutes/recommendations by Oct 15, 2005.

APPENDIX 2

Engineering Development Panel (EDP)

1. General Purpose. The Engineering Development Panel (EDP) reports to the Science Planning Committee (SPC), and may communicate directly with IODP Management International (IODP-MI). The panel shall provide advice on matters related to the technological needs and engineering developments necessary to meet the scientific objectives of active IODP proposals and the IODP Initial Science Plan (ISP) to the SPC; through the SPC, to the Science Planning and Policy Oversight Committee (SPPOC) and IODP-MI; and, through IODP-MI, to the implementing organizations (IOs).

2. Mandate. The EDP shall identify long-term (two to five year lead time) technological needs determined from active IODP proposals and the ISP, and recommend priorities for engineering developments to meet those needs. Appropriate topics shall include:

a. Assessment of commercial, off-the-shelf technology to determine if it can optimally meet identified IODP technological needs or whether research and development is required.

b. Appropriate modes for pursuing engineering development projects (i.e., through the IODP, universities, industry, or joint ventures).

c. Performance requirements for specific technological needs.

d. Procedures to develop and evaluate program contracts in support of technical design and innovation.

As requested by the Science Steering and Evaluation Panel (SSEP) or SPC, the EDP shall review IODP drilling proposals to assess IODP technological readiness to achieve the proposed objectives, and where appropriate, recommend priorities for technological approaches and necessary engineering developments.

3. Decisions. Decisions of EDP shall generally be made by consensus. If voting is required, motions shall be decided by a majority of all members present and eligible to vote. A quorum shall consist of at least two-thirds of the voting members. Voting records shall be kept and reported in the meeting minutes.

4. Meetings. The EDP shall convene biannually, generally approximately mid-way between SPC meetings, and additional electronic meetings may be held as appropriate. Robert's Rules of Order shall govern its meetings. Conflicts of interest shall be declared at each meeting, and treatment thereof shall be recorded in the meeting minutes. The SPC chair shall approve meeting agendas, dates, and locations, and the IODP-MI Vice-President for Science Planning and Deliverables shall authorize the meetings.

5. Membership. The EDP shall consist of members who represent the fields of marine platform operations, downhole logging and instrumentation, drilling technology (including mining technology and drilling under extreme conditions), drilling engineering development, geotechnics and other disciplines as necessary. National and consortia membership entitlements for SAS panels are stated in the Memoranda among the IODP funding agencies. The EDP chair shall work with IODP-MI and the national and consortia committees to maintain breadth of expertise in the panel membership, and to ensure regular rotation of its membership. With SPC approval, the panel augment the expertise required to address its mandate by setting up *ad hoc* advisory committees whose lifetimes are mandated by the SPC. EDP

members shall normally serve for terms of three years, with the possibility of renewal. If an EDP member misses two meetings in succession, the EDP chair or vice-chair shall discuss the problem of SAS representation with the SPC chair or vice-chair.

6. Chair and Vice-Chair. The EDP chair and vice-chair shall be nominated by the EDP membership and approved by the SPC. Their terms shall be two years. The EDP chair shall be responsible for providing the IODP-MI Sapporo Office with meeting minutes within one month of each meeting.

7. Liaisons. The EDP chair shall be liaison to the SPC, with vice-chair as alternate. The SPC chair shall be a liaison to the EDP, with the SPC vice-chair as alternate. A science coordinator from the IODP-MI Sapporo Office shall attend each EDP meeting. Representatives from the IOs shall also be invited to attend the meetings.

APPENDIX 3

(Not Available)

APPENDIX 4

IODP-MI Perspectives

Engineering Development Panel

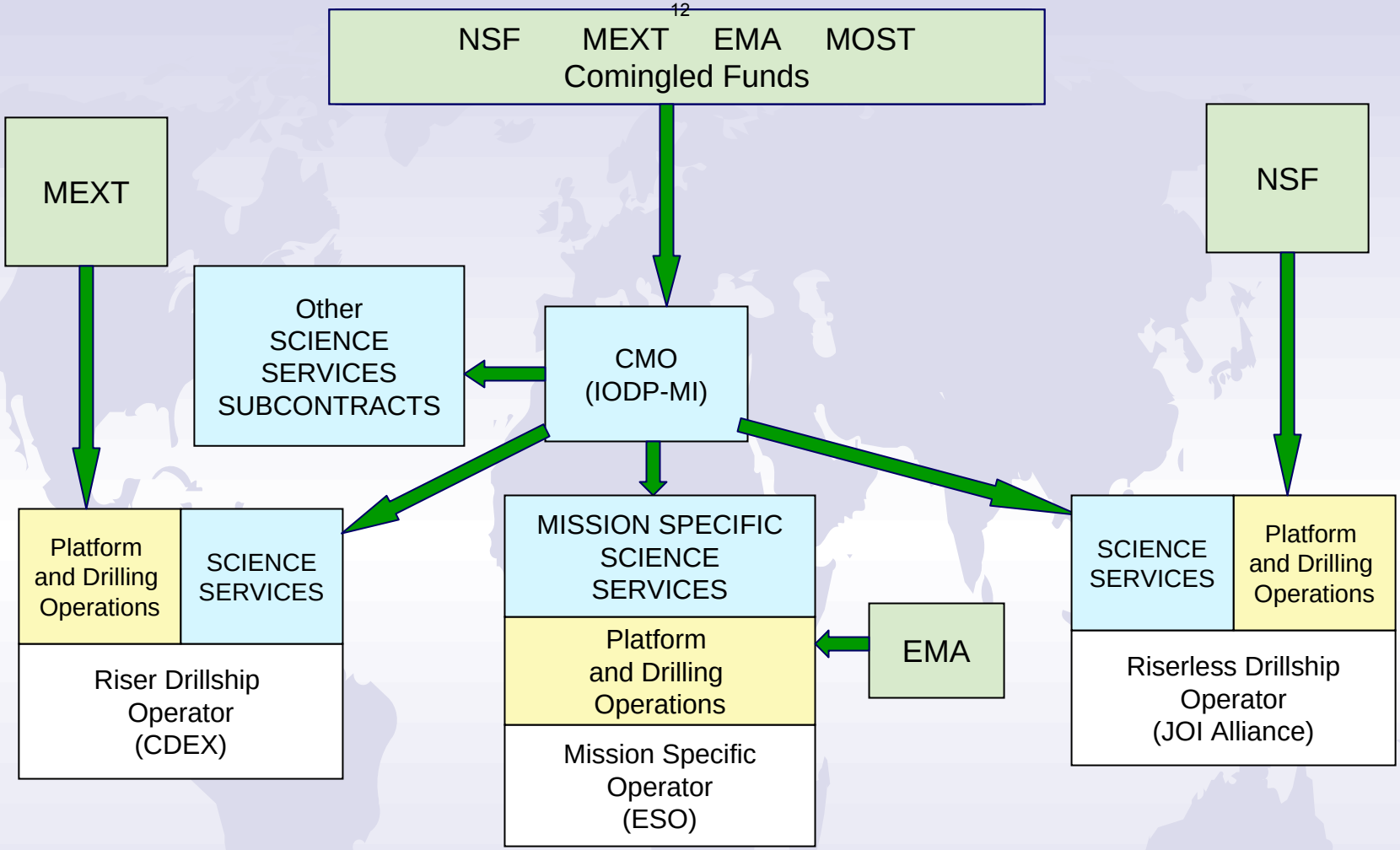
Boston, MA

September 26-28, 2005

INTEGRATED OCEAN DRILLING PROGRAM
MANAGEMENT INTERNATIONAL

Discussion Items

- Funding Pathways
- SOC/POCs
- Engineering Development Definitions
- Program Plan Development
- Issues for EDP wrt mandate/mode of operation


NSF MEXT EMA MOST
Comingled Funds
MEXT
NSF
Other
SCIENCE
SERVICES
SUBCONTRACTS
CMO
(IODP-MI)
Platform
and Drilling
Operations
SCIENCE
SERVICES
Riser Drillship
Operator
(CDEX)
MISSION SPECIFIC
SCIENCE
SERVICES
Platform
and Drilling
Operations
Mission Specific
Operator
(ESO)
EMA
SCIENCE
SERVICES
Platform
and Drilling
Operations
Riserless Drillship
Operator
(JOI Alliance)

Platform Operation Costs –

Support basic operation of drilling platforms:

- Costs of drilling and platform crews
- Catering services
- Fuel, platform supplies and other related consumables
- Berthage and port-call costs
- Disposal of wastes
- Crew travel
- Inspections and insurance
- Administration and management costs of IOs
- Drilling equipment, supplies and related consumables
- Engineering and/or geophysical surveys required for hole design or evaluation of drilling safety during final site selection

Platform Operation Costs – continued

- Drilling equipment, supplies and related consumables
  - CORK Body, Platform
  - Casing, casing hangers
  - Bits, beacons, mud
  - Back off/severing equipment
  - Explosives and cabinet
  - Drill equipment supplies and consumables
  - Camera Systems survey and borehole
  - Fishing tools
  - Reentry cone and related hardware
  - H_2S system

What goes on the CORK must come from other funding sources

Science Operation Costs –

Support platform activities necessary for proper conduct of onboard scientific research and shore-based activities for maintenance and distribution of samples and data:

- Technical services
- Computer capability
- Data storage and distribution
- Description, archiving and distribution of data and samples
- Deployment of standard logging tools
- Development of new drilling tools & techniques required by IODP Research
- Program Publications
- Costs of Consumables (not under POCs)
- Costs required for Administration and Management
- Education and Outreach

Science Operation Costs –

Development of new drilling tools and techniques

- Logging and other measurements while coring or drilling

- **Engineering Development**

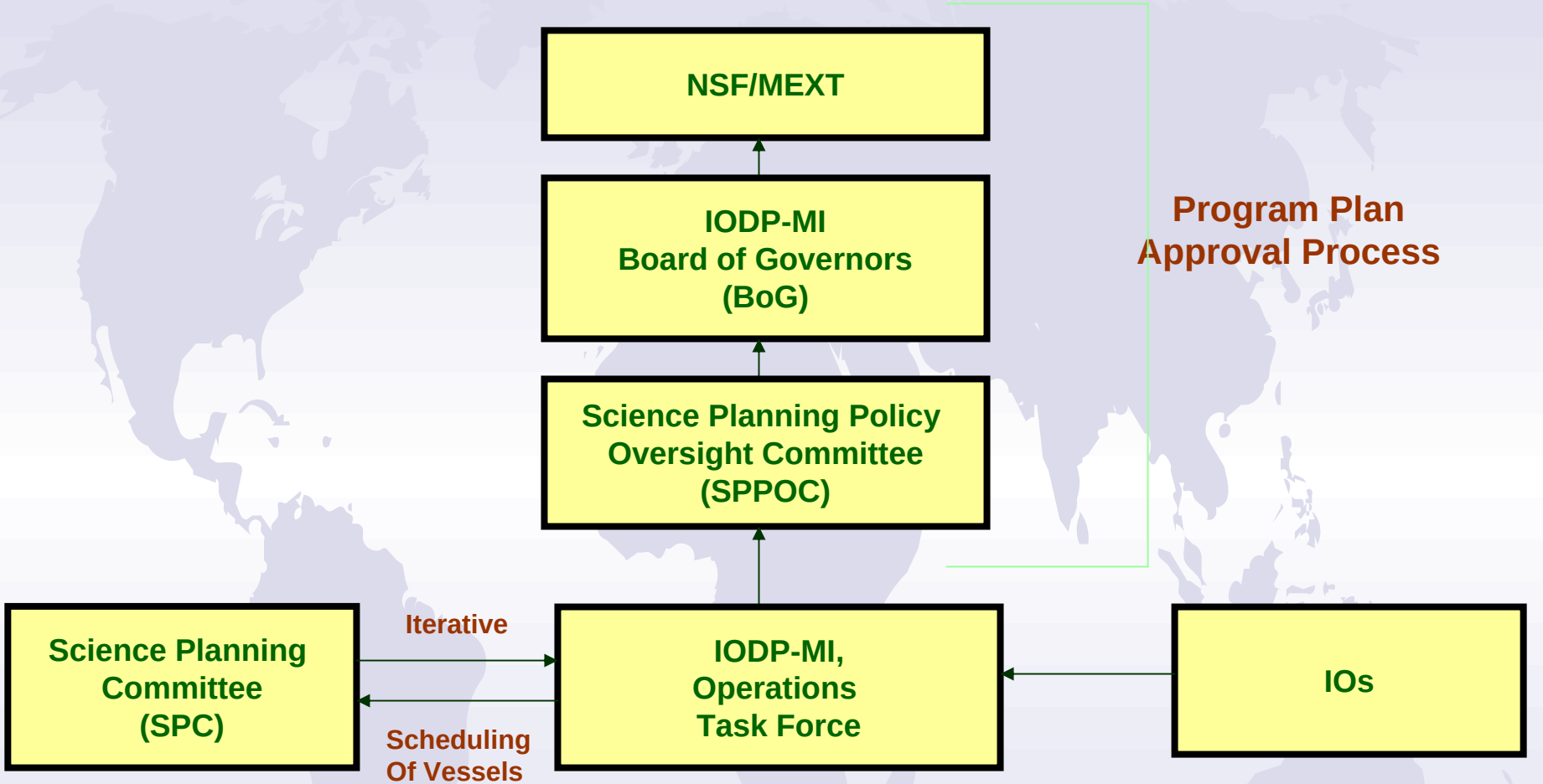
  Defined as projects with expenditures that exceed $100,000/year or $500,000 in total.

- **Engineering Science Support**

  Defined as projects with expenditures that do not exceed $100,000/year or $500,000 in total.

  - *maintenance and upgrade of existing tools*
  - *support facilities for better tool performance*
  - *use of third-party tools or instruments*

Development of Annual Program Plan



Month	MBFY*	Program Plan Function
Oct	24	
Nov	23	**SSEP forwards Proposals to SPC**
Dec	22	
Jan	21	
Feb	20	
Mar	19	SPC Ranks Proposals
Apr	18	
May	17	
Jun	16	OTF develops Science Plan (Ship schedule)
July	15	
Aug	14	
Sep	13	We are here for FY07operations
Oct	12	SPC approves Science Plan
Nov	11	
Dec	10	
Jan	9	**Budget Guidance from Lead Agencies**
Feb	8	Annual Program Plan developed
Mar	7	
Apr	6	
May	5	
Jun	4	SPPO/BoG Approve Annual Program Plan
July	3	
Aug	2	Lead Agencies Approves Annual Program Plan
Sep	1	
Oct		**Fiscal Year Begins**

Issues for EDP to consider

Timelines of Operation

- <1 yr (e.g., SODV input, third party proposals)
- Yearly (Program Plan timelines)
- 2-5 Yr (Long-term Vision)

Roles and Responsibilities

- Engineering Requirements
- Proposal Evaluation
- Prioritization
- Review/assessment

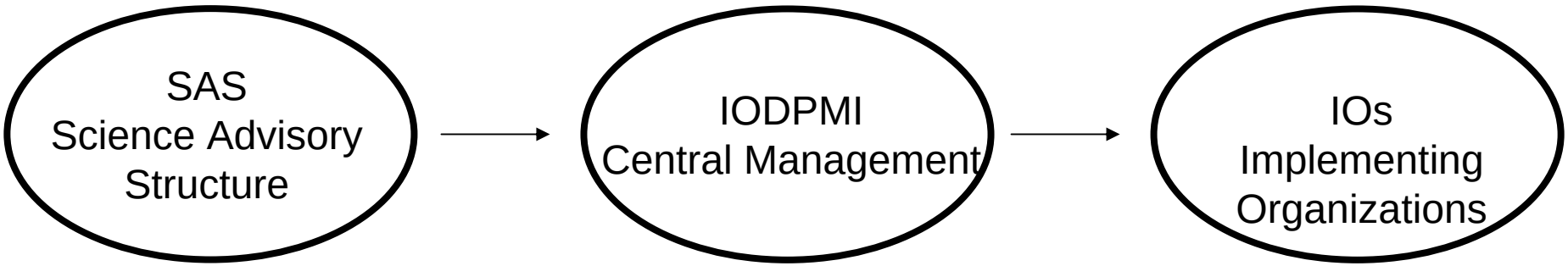
Communication

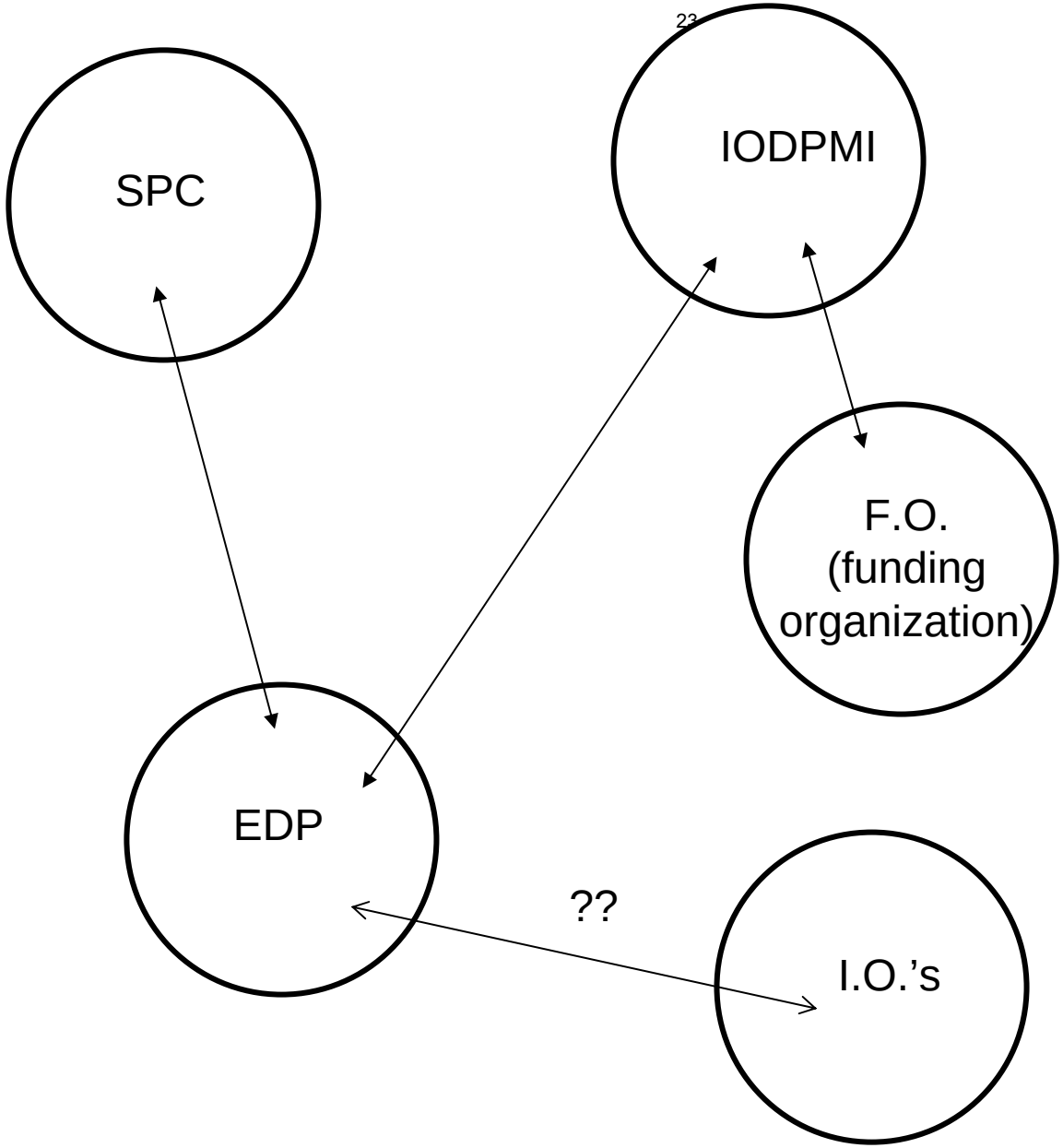
- SAS, IODP-MI, IO's
- Expectations

Possible EDP meeting plan to address evaluation, implementation, and review of Eng Development

Meeting	Agenda Topics	FY involved
Jan/Feb 06	Assess outcome of previous FY ED projects (FY-1)	FY05
	Update on current FY issues, if any (FY0)	FY06
	Review/Finalize ED for Program Plan (FY+1)	FY07
	Identify scoping needs for Outyear ED projects (FY+2)	FY08+
	Examine SSEP proposals	
July 06	Prioritize new ED projects (FY+2)	FY08
	Examine long-term ED needs (FY+3)	FY09+
	Examine SSEP proposals	

APPENDIX 5


SAS
Science Advisory
Structure
IODPMI
Central Management
IOs
Implementing
Organizations
Scientific Advice &
Prioritization
(8 panels & committees)
Annual Program Plan
Drill Wells


SPC
IODPMI
F.O.
(funding
organization)
EDP
??
I.O.'s

EDP Mandate

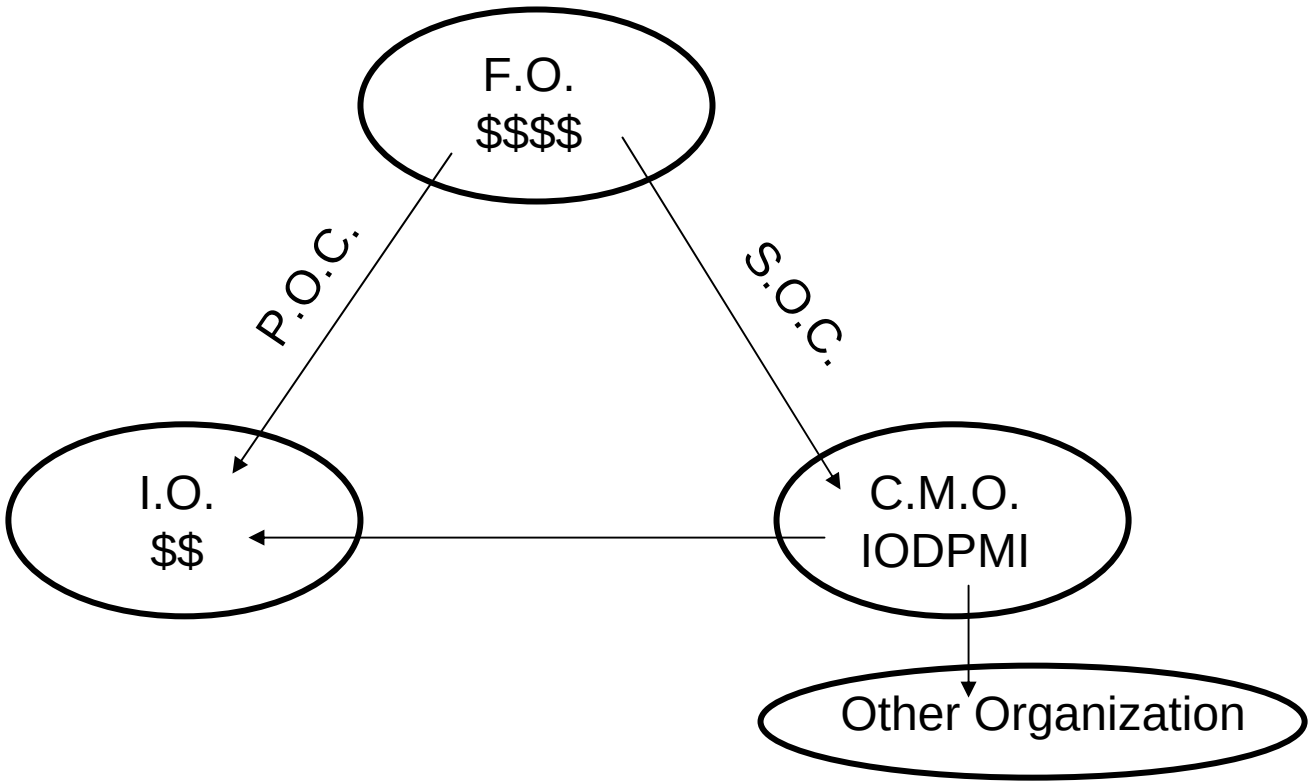
1) Identify 2-5 year technological needs
   A) Assess off-the-shelf technology vs. R&D to achieve
   B) Determine appropriate modes to achieve engineering development
   C) Develop performance requirements (???)
   D) Establish procedures to evaluate program contracts in support of technical design and innovation (are we obtaining high priority things we want)
2) Evaluate proposals to assess IODP technical readiness and recommend technological approaches and necessary engineering developments

$$$$$$$$

1) Funding Organization (F.O.) – NSF, MEXT, ECORD, MOST

2) Science Operating Cost (S.O.C.)

3) Platform Operating Cost (P.O.C.)



1) Evaluate science proposals. Evaluate technical readiness, recommend approaches and necessary engineering development (Does SPC send to us, do we look at all of them?)

2) Evaluate E.D. proposals (e.g. FY ‘07 Proposals)

3) Evaluate Outside Projects (Ex. S.O.D.V.)

4) Develop 2-5 year vision for E.D.

   A) Absorb: I.O. priorities, science proposals, science mandate.

   B) Output: Prioritized vision (drive proposal process)

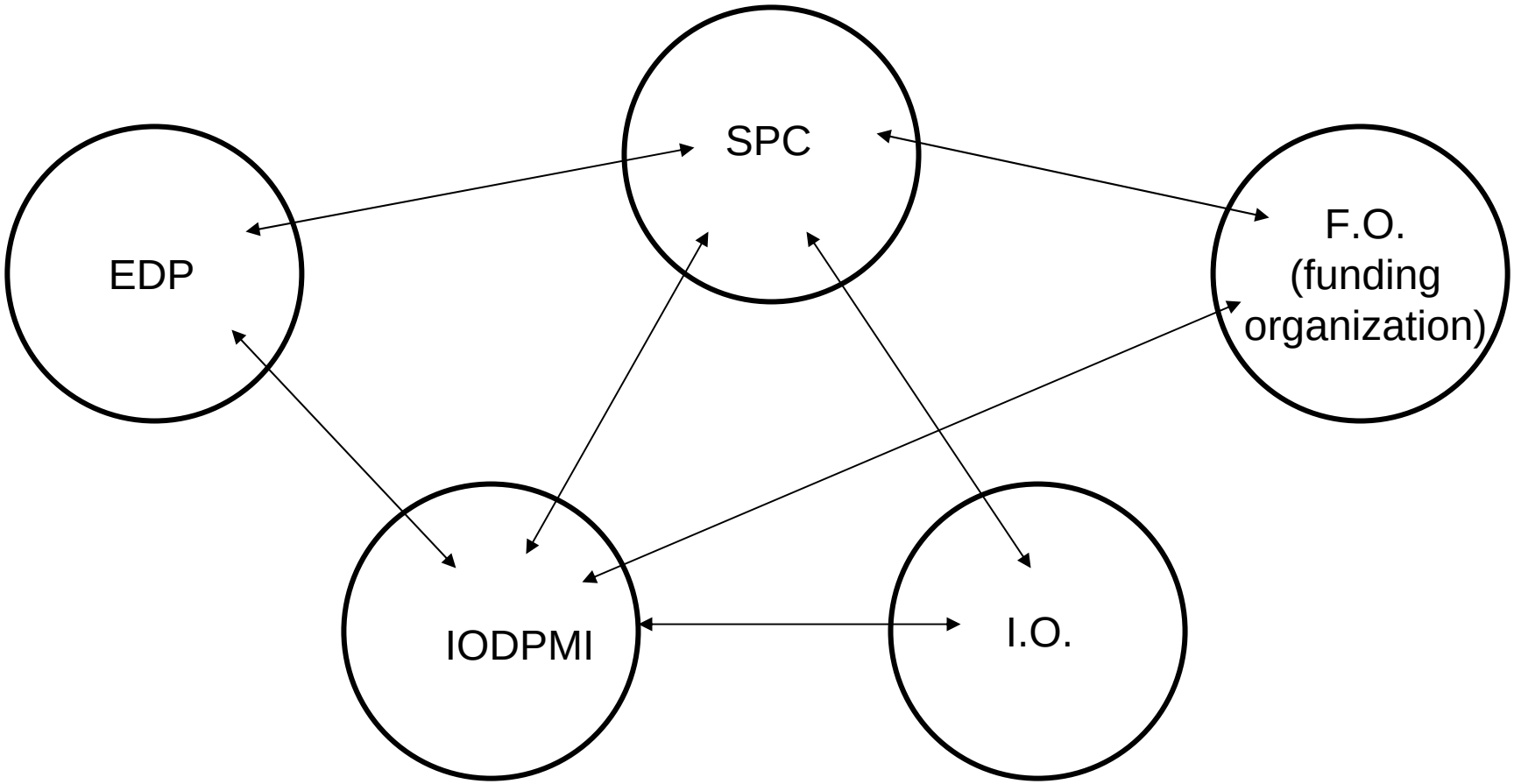
   C) Evaluate large E.D. proposals

5) Process Recommendations – How do we improve the process of E.D. to get better E.D. (Ex. Develop proposal process, develop testing process)

Timescales

1) Science Proposal Review (weeks)
2) FY ’06 Response (weeks)
3) S.O.D.V. Response (3 months)
4) E.D. Proposals for Program Plan (year)
5) Vision and long term ED (weeks to **years**)
6) E.D. Process (weeks to **years**)

To Whom Does EDP Communicate?



Science Operation Costs –

Development of new drilling tools and techniques

- Logging and other measurements while coring or drilling
- **Engineering Development**

  Defined as projects with expenditures that exceed $100,000/year or $500,000 in total.
- **Engineering Science Support**

  Defined as projects with expenditures that do not exceed $100,000/year or $500,000 in total. These projects primarily regard maintenance and upgrade of existing tools and support facilities for better tool performance and provide for integrated science requirements, including use of third-party tools or instruments on expeditions.

APPENDIX 6

SPC Report to EDP, Sept 2005
K. Becker, SPC chair as of Oct 1

- IODP scheduling and proposal update: FY07/08 scheduling, FY08/09 prospects
  - Late FY07 - start of Chikyu and SODV ops. (~1 expedition each?)
  - FY07 - also normal MSP ops - 1 program

IODP FY07/08 Update

SPC (and OTF) Report, Sept 2005 EDP

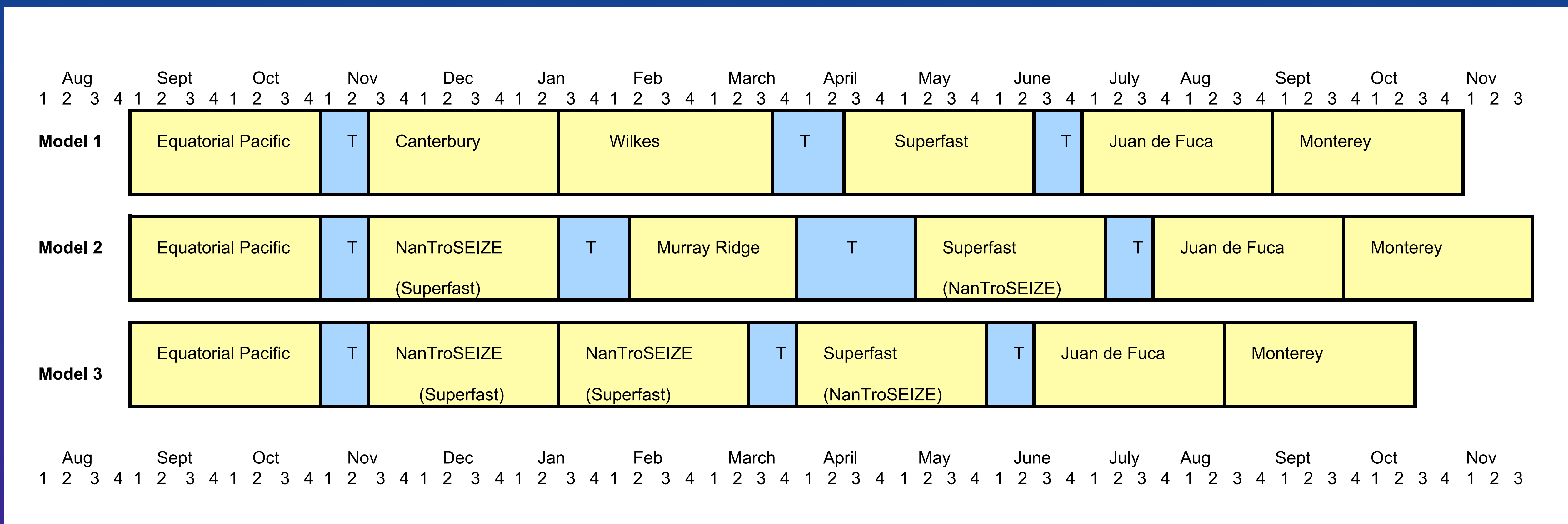
- Schedule options for FY07/08, for SPC October mtg
  - MSP: New Jersey if not done in FY06, GBR?
  - Chikyu: NanTroSEIZE non-riser drilling
  - SODV: 2 x 3 matrix [(SO or not) x (3 start dates)]
  - SODV possibilities refined to 3 FY07/08 options

Programs at Operations Task Force

SPC (and OTF) Report, July 2005 USSAC

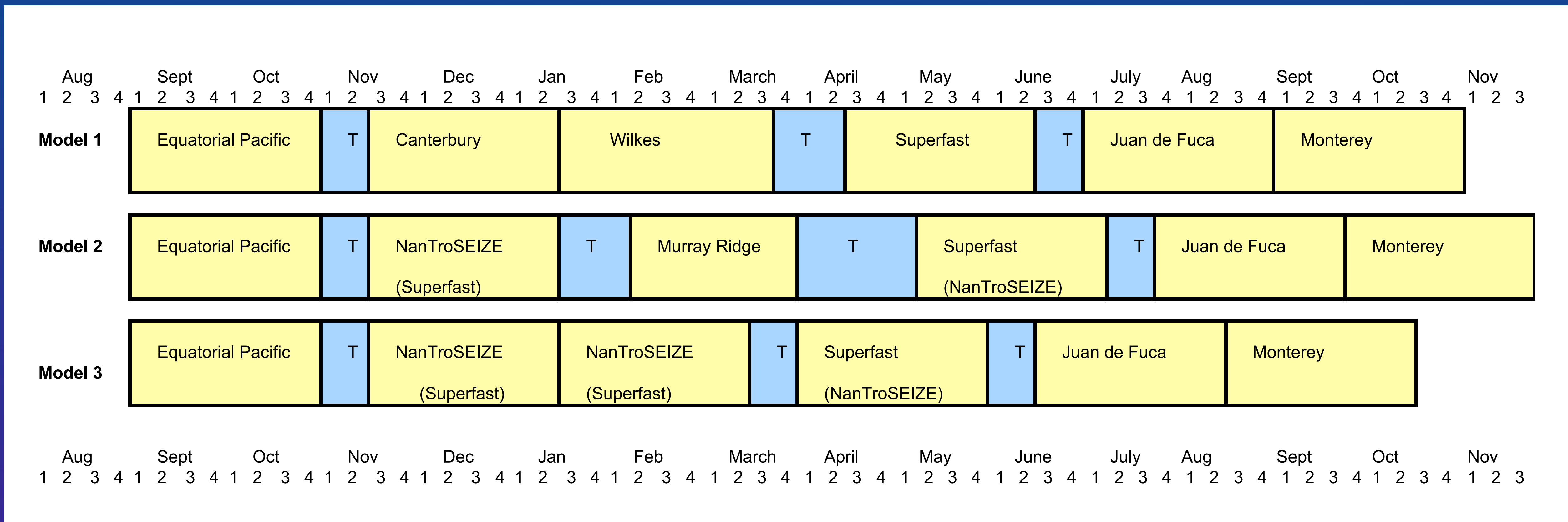
- 519-Full2 S. Pacific Sea Level (Great Barrier Reef)
- 545-Full3 Juan de Fuca Hydro (2nd expedition)
- 564-Full New Jersey Sea Level
- 589-Full3 Gulf of Mexico Overpressures (2nd exp.)
- 603A-F2 and 603B-F2 NanTroSEIZE Phase I and II
- 477-Full4 Okhotsk/Bering Pliocene/Pleistocene
- 482-Full3 Wilkes Land
- 553-Full2 Cascadia Hydrates (2nd expedition)
- 600-Full Canterbury Basin
- 621-Full Monterey Bay Observatory
- 603C-Full NanTroSEIZE Phase III
- 595-Full3 Indus Fan and Murray Ridge
- 626-Full2 Pacific Equatorial Age Transect

3 SODV OTF Options for FY07/08 to be decided at Oct 2005 SPC



All options start with Equatorial Pacific in FY07 - "simple" paleoceanography coring/logging

3 SODV OTF Options for FY07/08 to be decided at Oct 2005 SPC



Engineering challenges in FY08:

- Observatories for Juan de Fuca and Monterey
- Deep crustal drilling for potential Superfast
- Deep prism/reference drilling for NanTroSEIZE

IODP Proposals - for FY08/09 (I)

SPC Report, July 2005 USSAC

- Still at SPC from prior rankings:
  - 552-Full3 Bengal Fan (riser)
  - 547-Full4 Oceanic Subsurface Biosphere (SODV)
  - 584-Full2 TAG II Hydrothermal (SODV)
  - 505-Full5 Mariana Convergent Margin (SODV/Chikyu)
  - 581-Full2 Late Pleistocene Coralgal Banks (MSP)
  - 555-Full3 Cretan Margin (SODV)
  - 557-Full2 Storegga Slide Gas Hydrates (to be revised)
- Forwarded to SPC at May SSEP:
  - 618-Full3 East Asian Margin (riser and MSP-riser?)
  - 659-Full Newfoundland Rifted Margin (SODV)

IODP Proposals - for FY08/09 (II)

SPC Report, July 2005 USSAC

- Ten proposals sent for external review, May SSEP:
  - 537-CDP6 CRISP
  - 537-Full4 CRISP Phase A
  - 537-Full3 CRISP Phase B
  - 549-Full6 N Arabian Sea Monsoon (Indus non-riser)
  - 603D-Full2 NanTroSEIZE Observatories
  - 605-Full2 Asian Monsoon
  - 637-Full2 New England Shelf Hydrogeology (MSP)
  - 654-Full2 Shatsky Rise Origin
  - 667-Full NW Australian Shelf Eustasy (100-300 m depth)
  - 677-Full Mid-Atlantic Ridge Microbiology

SPC October 2005 Agenda

SPC Report, July 2005 USSAC

- Long-range planning issues
  - PPG's?
  - Workshops?
  - Mission planning? -respond to Frascati Report
- Recommendation re FY07/08 Science Plan
- Recommendation re FY07 Eng. Development Plan
- Proposal guidelines (APL's; proposal length)
- Expedition science assessment - start new process
- Biodiversity issues?

APPENDIX 7

(Not Available)

APPENDIX 8

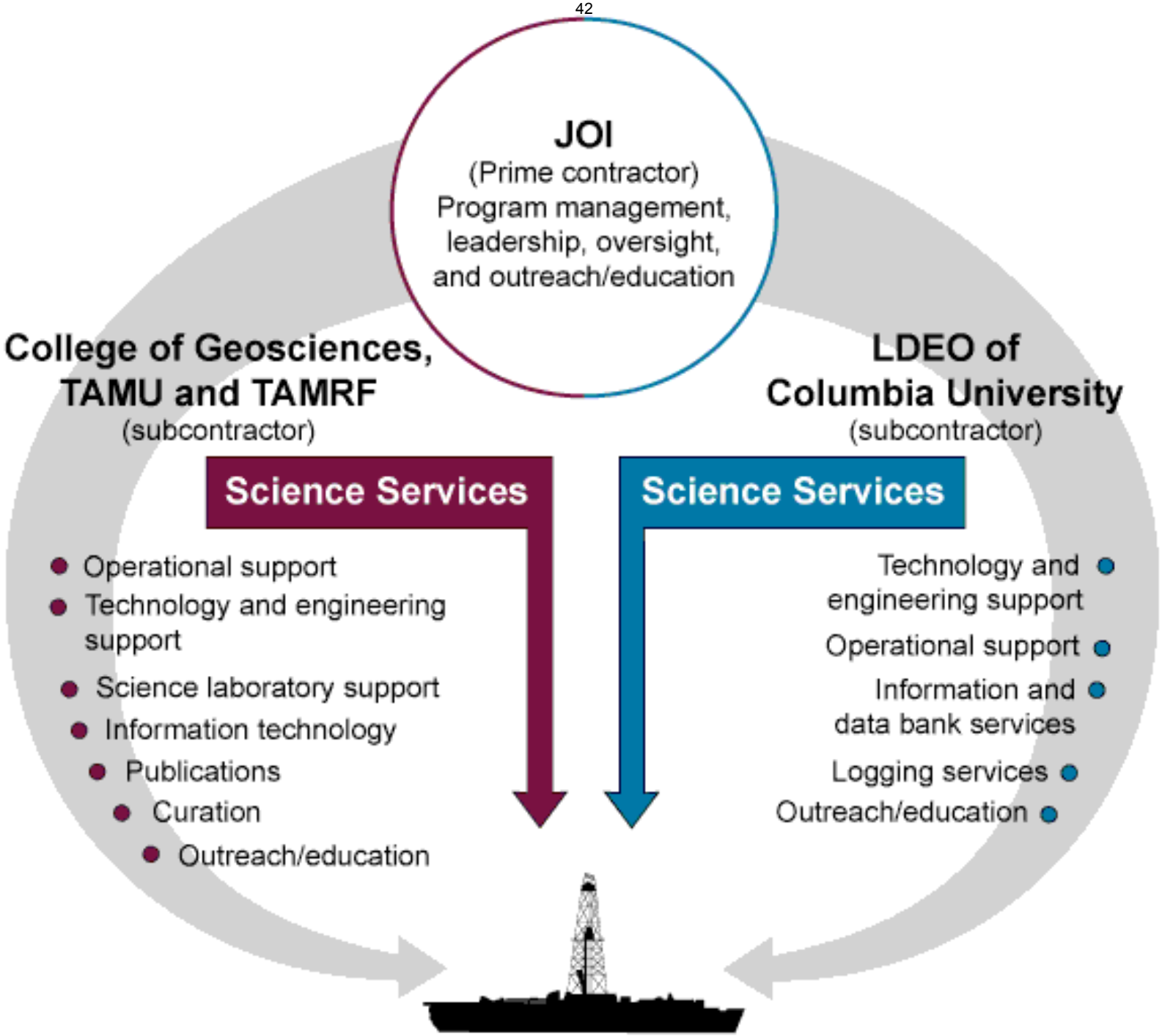
United States Implementing Organization (USIO)

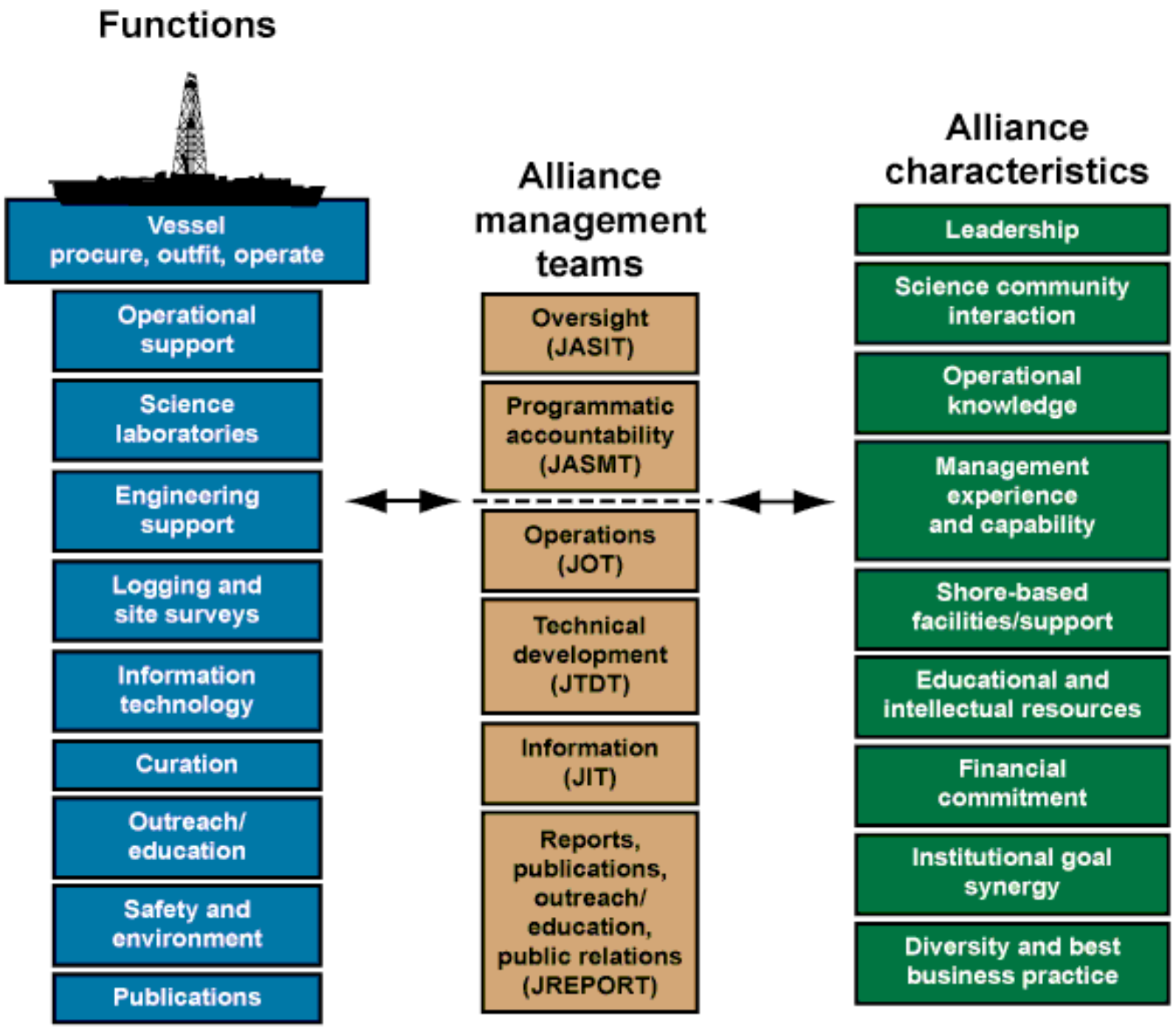
USIO Organization Elements and teams

USIO Activities/ timelines

Challenges

USIO – EDP Interactions


JOI
(Prime contractor)
Program management, leadership, oversight, and outreach/education
College of Geosciences, TAMU and TAMRF
(subcontractor)
Science Services
Operational support
Technology and engineering support
Science laboratory support
Information technology
Publications
Curation
Outreach/education
LDEO of Columbia University
(subcontractor)
Science Services
Technology and engineering support
Operational support
Information and data bank services
Logging services
Outreach/education


Functions
Vessel
procure, outfit, operate
Operational support
Science laboratories
Engineering support
Logging and site surveys
Information technology
Curation
Outreach/ education
Safety and environment
Publications
Alliance management teams
Oversight (JASIT)
Programmatic accountability (JASMT)
Operations (JOT)
Technical development (JTDT)
Information (JIT)
Reports, publications, outreach/ education, public relations (JREPORT)
Alliance characteristics
Leadership
Science community interaction
Operational knowledge
Management experience and capability
Shore-based facilities/support
Educational and intellectual resources
Financial commitment
Institutional goal synergy
Diversity and best business practice

USIO Laboratory Teams

- Computing
- Imaging
- Chemistry
- Petrophysics
- Geology
- Stratigraphic Correlation
- Coring Tools
- Observatories
- Geophysics
- Core handling
- Paleontology
- Downhole Measurements

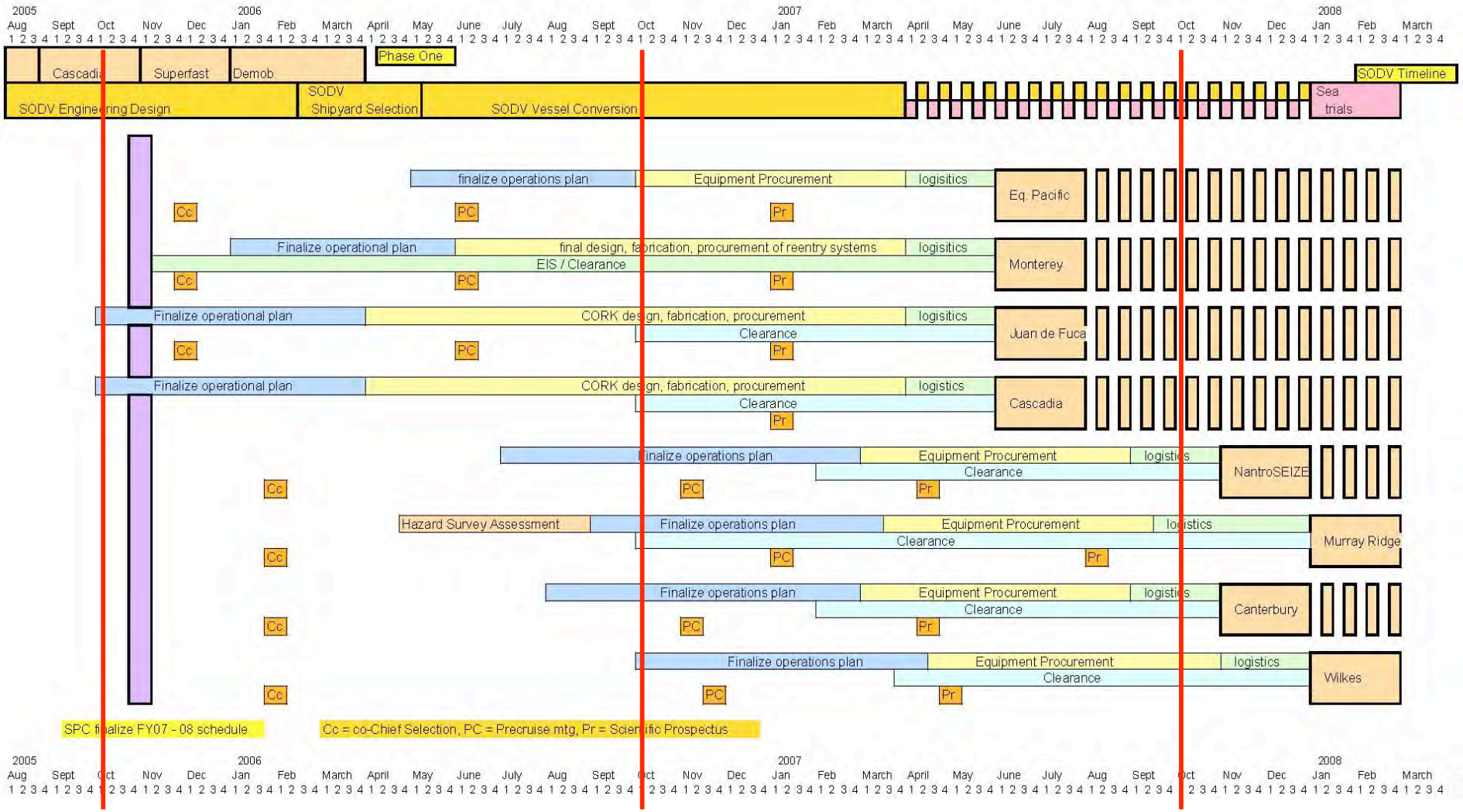
IODP-USIO Activities

- **Phase 1 IODP-USIO operations (FY04-FY06)**
- **Demobilization of the JOIDES Resolution**
- **Phase 2 IODP-USIO operations planning**
- **Scientific Ocean Drilling Vessel (SODV)**
  - Contract Negotiations
  - Design of vessel, science facilities, systems, habitability
  - Logging RFP
- **Program Plan deliverables**
- **Development of policies, procedures and mechanisms for collaboration**
  - USIO, other IO's, IODP-MI, SAS, Lead Agencies
- **Gas Hydrate cruises**

IODP-USIO FY04-06 Expedition Schedule

301:	Juan de Fuca Hydrogeology	Jun-Aug '04
303:	North Atlantic Climate 1	Sep-Nov
304/305:	Oceanic Core Complex 1 & 2	Nov '04-Feb '05
306:	North Atlantic Climate 2	Feb-Apr
307:	Porcupine Basin	Apr-May
308:	Gulf of Mexico Hydrogeology	May-Jul
309:	Superfast Spreading Crust 2	Jul-Aug
311:	Cascadia Margin Hydrates	Sep-Oct
	Monterey Observatory (removed from schedule)	
312:	(JdF) Superfast Spreading Crust 3	Nov-Dec '05
	Demobilization	Dec '05 - Jan'06

Operations Task Force (OTR) Planning Timeline: Options for Riserless Vessel



Cc = Co-Chief selection; PC = Precruise Meeting; Pr = Scientific Prospectus

FY07 Program Plan Timelines
(tentative)

• Initial task / project list	Sept. 05
• Review meeting	Oct. 05
• Final FY07 task / project list	Oct. 05
• JA draft task / project list	Nov 05–Jan 06
• IODP / NSF guidance	Feb 06
• JA Managers meeting	Feb 06
• JA draft program plan	Feb–March 06

IODP-USIO – EDP Interactions: Challenges

- **Integration of priorities into planning/ scheduling process**
  - Procedural mechanism(s), Responsiveness
  - Lead times (>2-5 years)
- **Panel expectations/ recommendations**
  - Resource availability, Expertise
- **EDP Role and Involvement in Projects**
  - Eng. developments, enhancements, expeditions
  - Guidance vs Implementation
- **Communication pathways**

IODP-USIO – EDP Interactions

- **Identification of technological priorities**
  - Technological roadmap (>2 to 5 year)
- **Enhancement and development priorities**
  - 1 to 2 year activities
- **Feedback on technological requirements for scientific proposals**
- **Development of a third party tool strategy**
- **Engineering Testing**
- **Post development assessment**
- **SODV system priorities and validation**

Technology Roadmap Development Strategy

- **Goal**
  - Exploit technology to maximize the delivery of reliable, high-quality scientific support on the riserless vessel and across the IODP fleet
  - >2-5 year perspective
  - Enhancements / new total system performance
- **Implementation**
  - Identify limitations faced by current vessel(s) capabilities
  - Identify areas of potential enhancements (Laboratory, Drilling and coring, IT infrastructure)
    - Focus on IODP Initial Science Plan themes (Deep Biosphere, Environmental Change, Solid Earth)
  - Prioritize technologies
- **Draft available for discussion at EDP '06 meeting**

Technology Roadmap Prioritization

- Scientific value
  - IODP Initial Science Plan
- Address operational challenges
  - Sand recovery, In-situ sampling, Borehole stability
- Operational Efficiency
- Cross-platform/ IO use
- Improvement in data flow/accessibility
- Environmental impact / mitigation
- Resource requirements

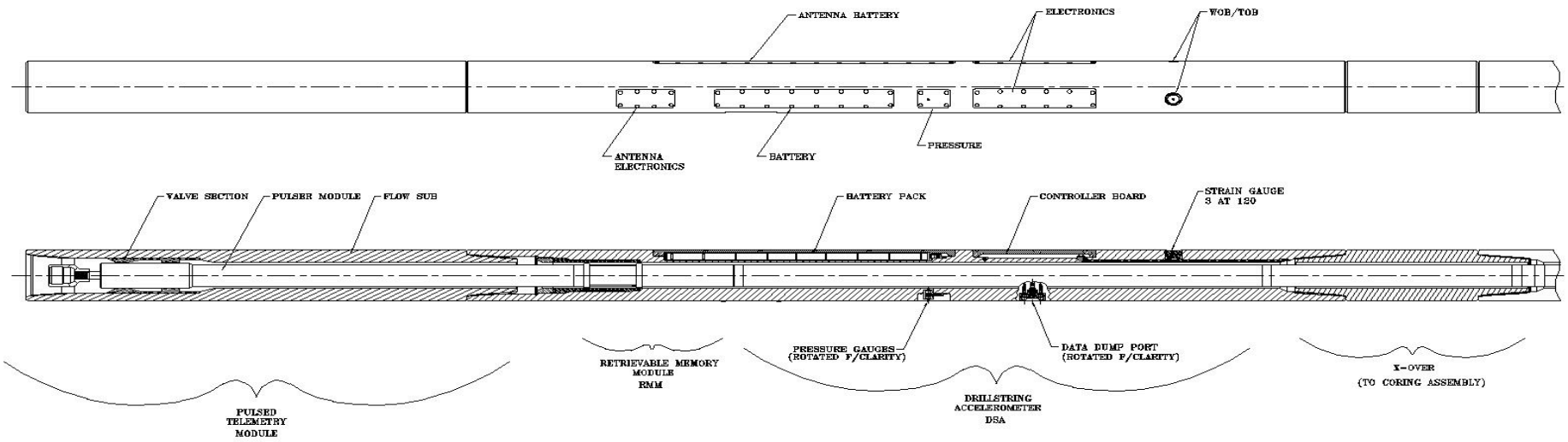
FY06 Enhancements

- Pulsed Telemetry Module (PTM)
- Common Bottom-Hole Assembly (BHA)

Pulsed Telemetry Module (PTM)

- Real-time drilling dynamics data to the driller
  - Weight on Bit, Torque on Bit, Annulus pressure and temperature
- Eliminates current ~1 hr delay in assessing data
- Allows data to be used in real time for borehole management
- Reduction in tool loss risk
- Improves real-time safety assessment (PWD) while coring

Pulsed Telemetry Module



Pulsed Telemetry Module (PTM) Deliverables

- Industrial Survey
  - Identify service companies w/ Retrievable Pulser Systems
- Select Vendor
  - Establish SOW, issue RFQ, review responses
- Obtain PTM
- Design Integration of systems
  - Integrate PTM and CB-RMM
- Fabrication
  - PTM interface hardware and cross-over subs
  - Create sub for landing of pulser unit
- Write test procedures
  - Bench Tests PTM / CB-RMM
  - Flow loop test PTM / CB-RMM
  - Land Test PTM / CB-RMM
- Assessment / modifications
- Sea - trials

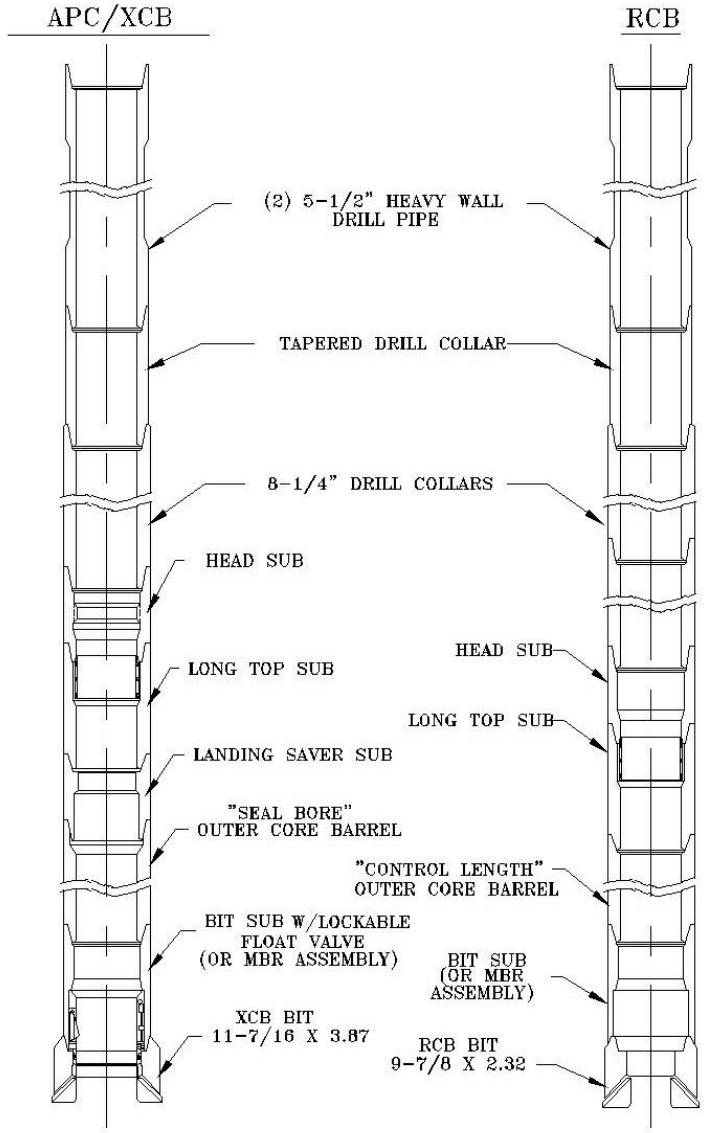
Pulsed Telemetry Module (PTM) Resources

	FY06	FY07
• Select Vendor		
• Design Integration		
• Obtain PTM	$130K	
• Fabrication	$25K	
• Bench Tests	$5K	
• Flow loop test	$15K	
• Land Test		$30K
• Assessment		
• Sea – trials		$10K
	$175K	$40K
FTEs	0.4 FTE	0.5FTE

Common Bottom-Hole Assembly

- Develop prototype common BHA with interchangeable coring system to replace two existing BHA's
  - RCB used in medium to hard formations
  - MDCB/APC/XCB used in soft to medium, and hard formations
- Eliminates need for pipe trip to change coring system (water depth dependent; about 4 days expended on this task in last 1 year)
- Reduces costs with simplified inventory
- Potential similarity of BHA's among IO's

Current BHA configurations



TYPICAL ODP BOTTOM HOLE ASSEMBLY CONFIGURATIONS

Common Bottom-Hole Assembly Deliverables

- Systems Review
  - Design specifications and requirements
  - Survey
- Development of multiple concepts
- Design mock-ups
- Assessment
  - Implementation strategies, Risks, Value
- Detail Design
- Prototype Fabrication
- Write test procedures
- Land Test
- Modifications
- Limited production run
- Sea - trials

Common Bottom-Hole Assembly Resources

	FY06	FY07
• Systems Review		
• Conceptual design		
• Mock-ups and assessment	$50K	
• Prototype Fabrication	$200K	
• Write test procedures		
• Land Test		$20K
• Limited production run		$200K
• Sea - trials		
	$250K	$220K
FTEs	0.9 FTE	0.3 FTE

REVCOM Recommendations

- USIO should incorporate a cementing program project management plan in next Annual Program Plan. All IO's need to insure that appropriate cementing expertise is used when identified in the Planning/ Integration/ Compatibility/Review process

- USIO should incorporate a design plan for casing seals in its next Annual Program Plan

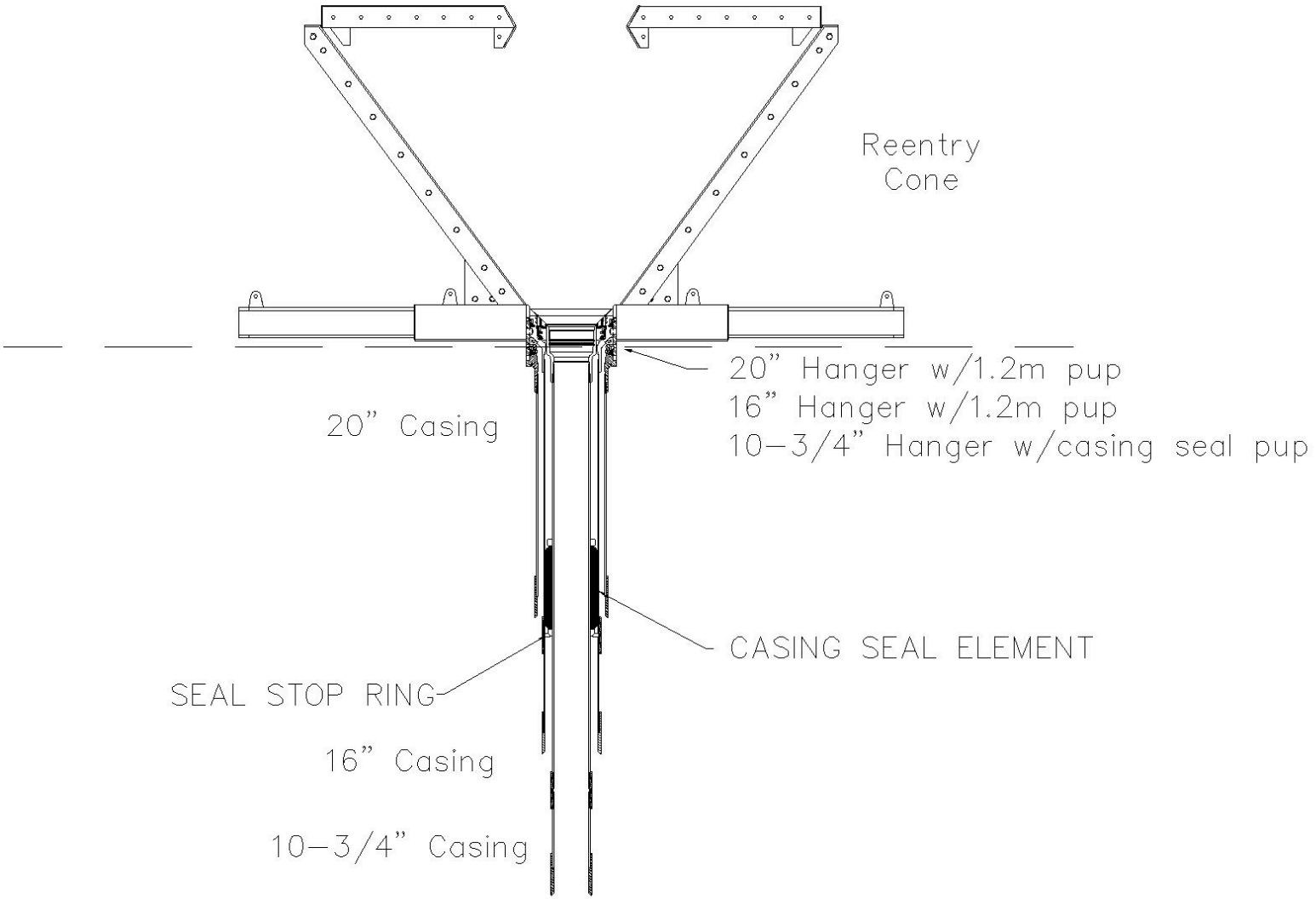
Cementing Program

- Subcontract to review to develop a cementing program management plan
  - Determine methodology for evaluating known formation properties
  - Estimate unknown properties (w/ identification of risks)
  - Recommend implementation strategy w/ resource requirements
- Estimated cost is $20,000 (note USIO FY06 draft budget justification indicates only $5K request)

Borehole Casing Seal

- Design and fabrication of a prototype seal for the 10 3/4 in casing to 16 inch casing (FY06)
- Land and sea tests in FY07
- FY06 Cost estimated at $60K (0.2 FTE)
- FY07 Cost estimated at $15K (0.2 FTE)

Casing Seal Diagram



Engineering testing

- Engineering Test Expeditions
  - Expedition dedicated to testing of technology
    - Protocols
- Engineering Test Days
  - Limited number of days (2-3) available on expeditions for tool testing
    - Minimize impact to science objectives
    - Allows for continued development

Questions?

APPENDIX 9

Long Term Monitoring System Development

For EDP Meeting
Boston, MA. U.S.A.

September 26-28, 2005

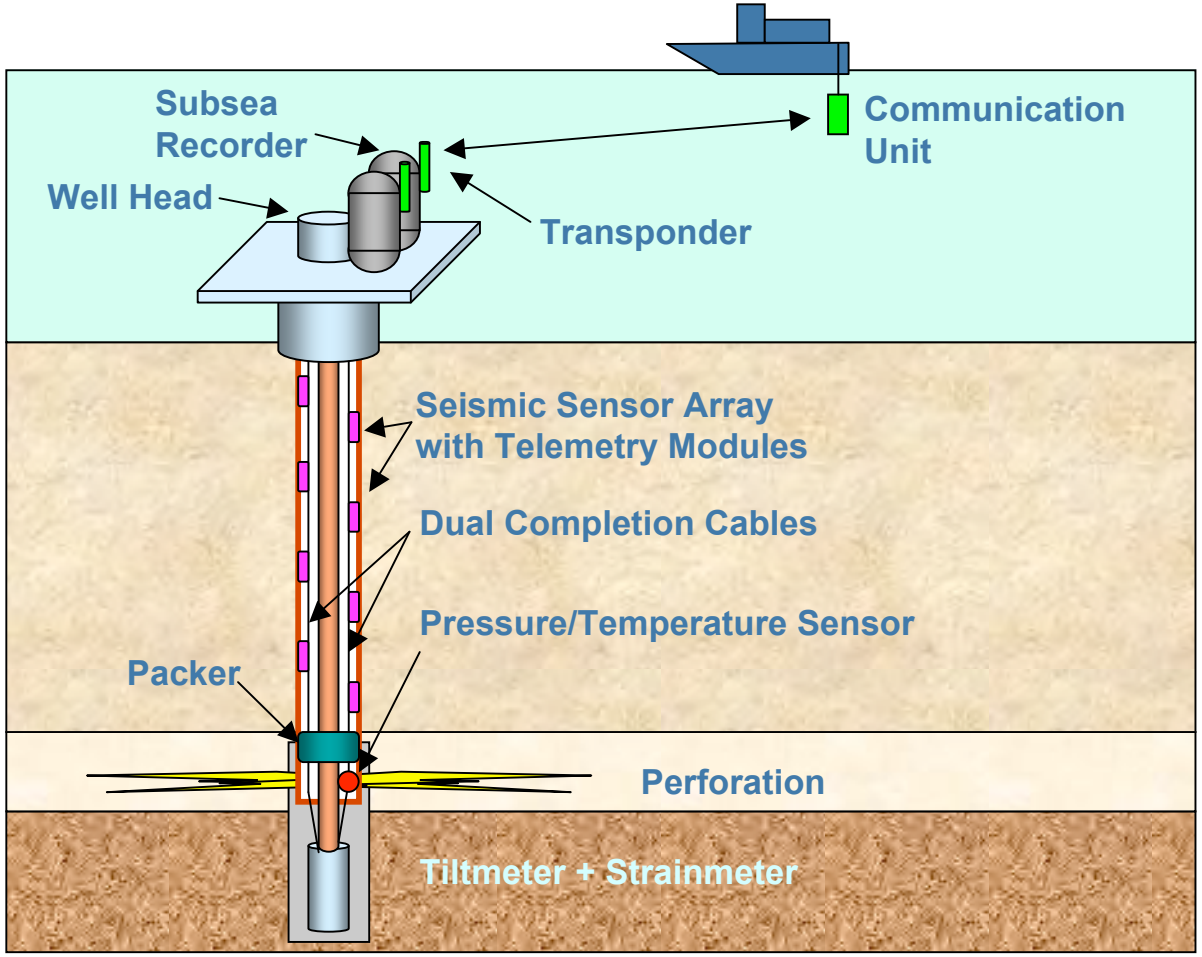
Scientific Requirements

- Seismogenic zone study
  - Construct a physical model of earthquake generation zone
- Hydrogeological study
  - Fluid flow, flux monitoring in hydrothermal and cold seep areas, and along faults
  - Gas hydrate dissociation monitoring
- Material recycling study (subduction factory)
  - Chemical tracer monitoring
  - Fluid migration monitoring

Technical Challenges

- Data Required by Science
  - Variety of data with wide dynamic range
  - Long-term continuous recording
  - Requirements should be defined by the NanTroSEIZE Long Term Monitoring workshop (July 17-19, 2005 in San Jose)
- High Reliability (examples)
  - High temp. long life components:125°C for 5 years
  - Redundancy: Affects cost, space, power, etc.
  - Leakage Protection: X'mas-Tree, Well-Head, Packer
- Low Power Consumption (example)
  - Seismic monitor: Max. 2w (Commercial one = 10w)

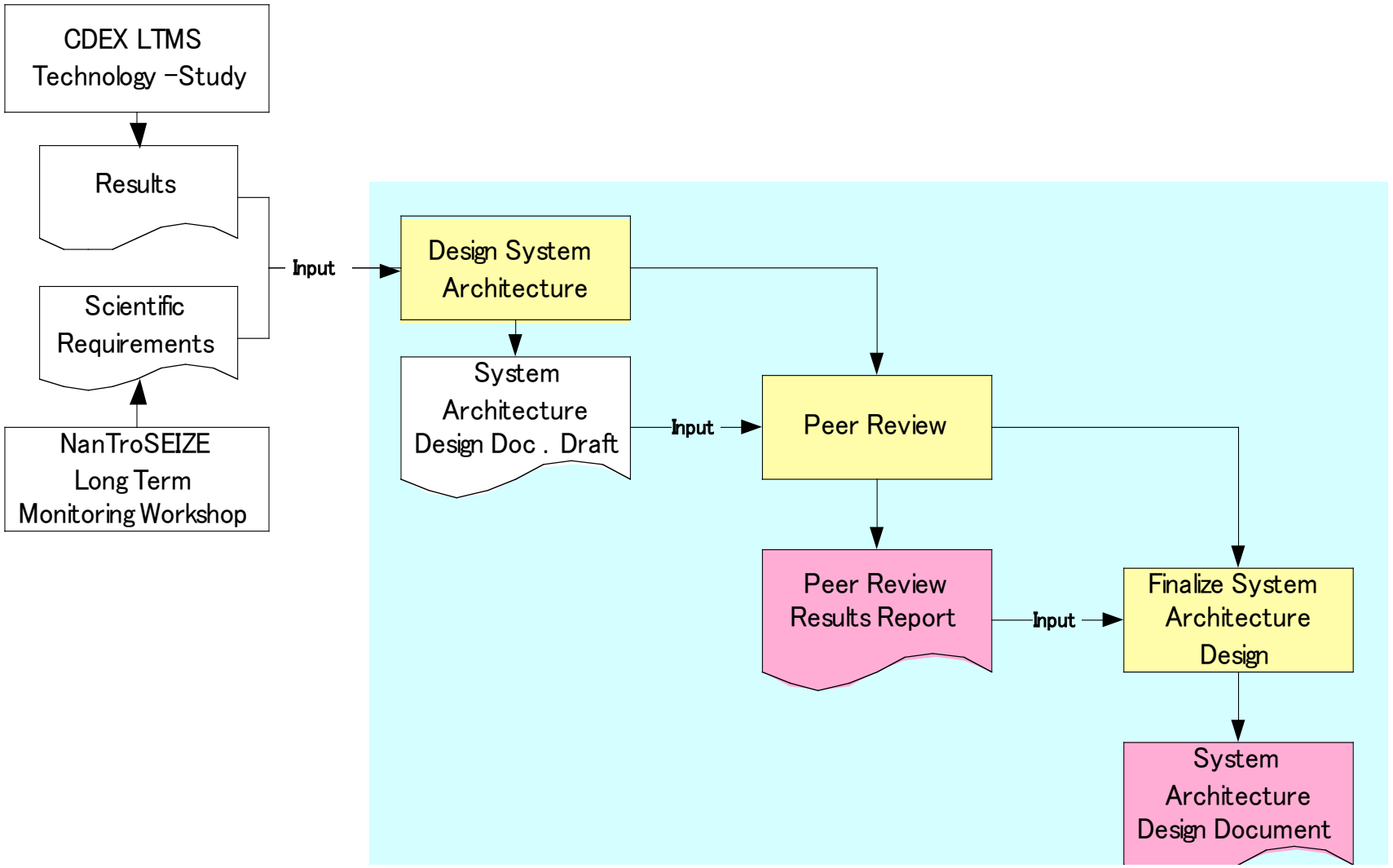
Conceptual System



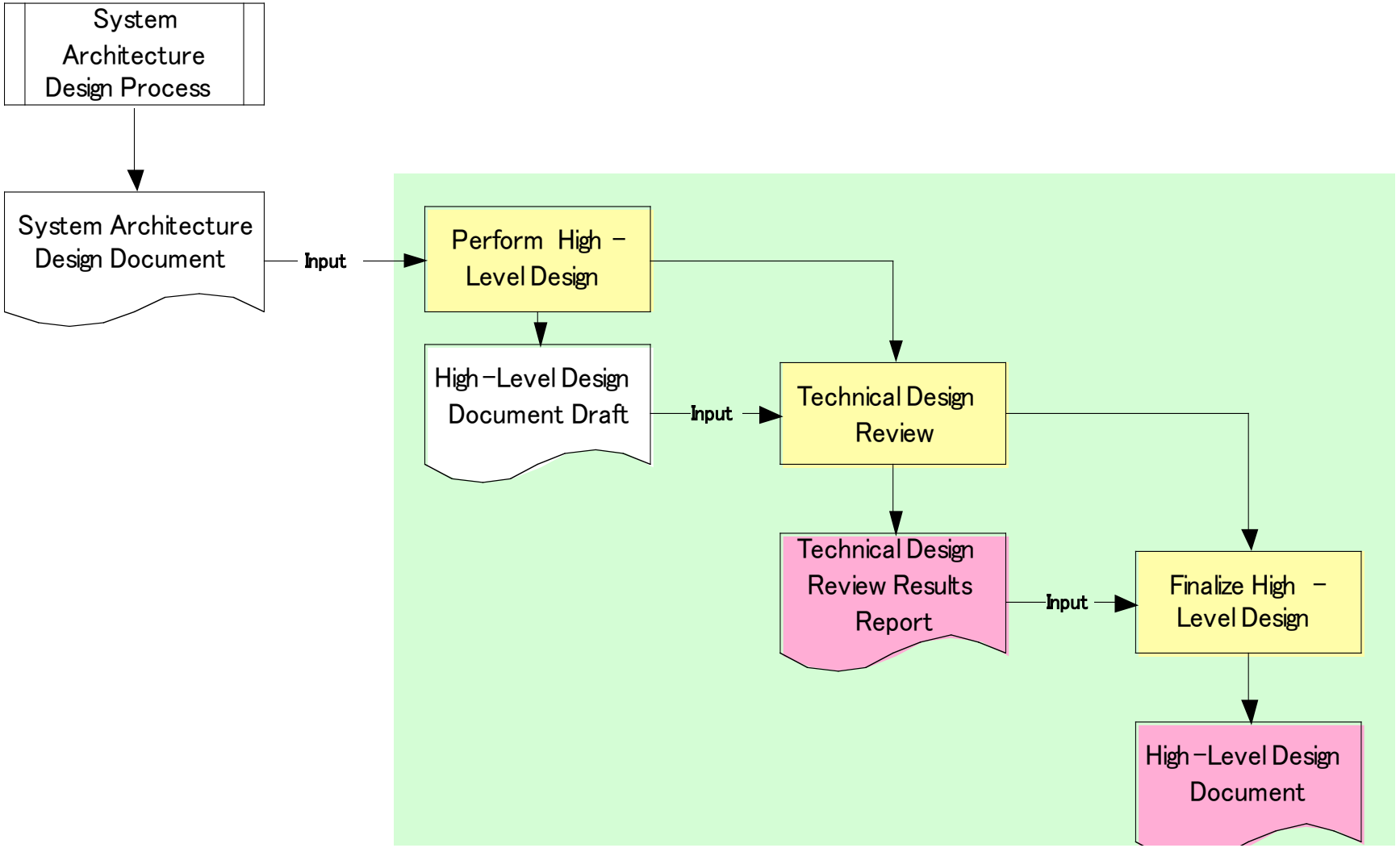
FY2006 Activities

- System Architecture and High-Level Designs
- Inputs
  - Results from CDEX's own technology study in 2004
  - Scientific requirements defined by the NanTroSEIZE Long Term Monitoring workshop
- Deliverables
  - System Architecture Design Document
  - High-Level Design Document
- Validation
  - System Architecture Design : Peer review
  - High-Level Design : Technical design review

System Architecture Design



High-Level Design



Proposal for FY07 and Later

- FY07 : Complete Feasibility Phase
  - Complete major development of EXP
- FY08 ~ FY09 : Complete Development Phase
  - Complete major development of ENP

APPENDIX 10

Engineering Development Process

For EDP Meeting
Boston, MA. U.S.A.

September 26-28, 2005

Engineering Development Process

- Concept Phase
- Feasibility Phase
- Development Phase
- Release Phase
- Maintenance Phase

Concept & Feasibility Phases

- Concept Phase
  - Questions to be answered
    - Does the product make sense from technical point of view?
  - Typical Physical Product
    - Lab mock up
- Feasibility Phase
  - Questions to be answered
    - What is the product spec?
    - Can we develop within budget and schedule?
  - Typical physical product
    - Experimental prototype (EXP)

Development & Release Phases

- Development Phase
  - Questions to be answered
    - Has the product been verified?
    - Has the production objectives been met?
  - Typical physical product
    - Engineering prototype (ENP)
- Release Phase
  - Questions to be answered
    - Has the product meeting safety and efficiency targets?
    - Has manufacturing process established?
  - Typical physical product
    - Pilot products

Maintenance Phase

- Product support, adaptation, improvement, etc.
- Many cases, the Maintenance Phase is the most costly phase in a product life-cycle.

APPENDIX 11

CDEX Engineering Development For IODP

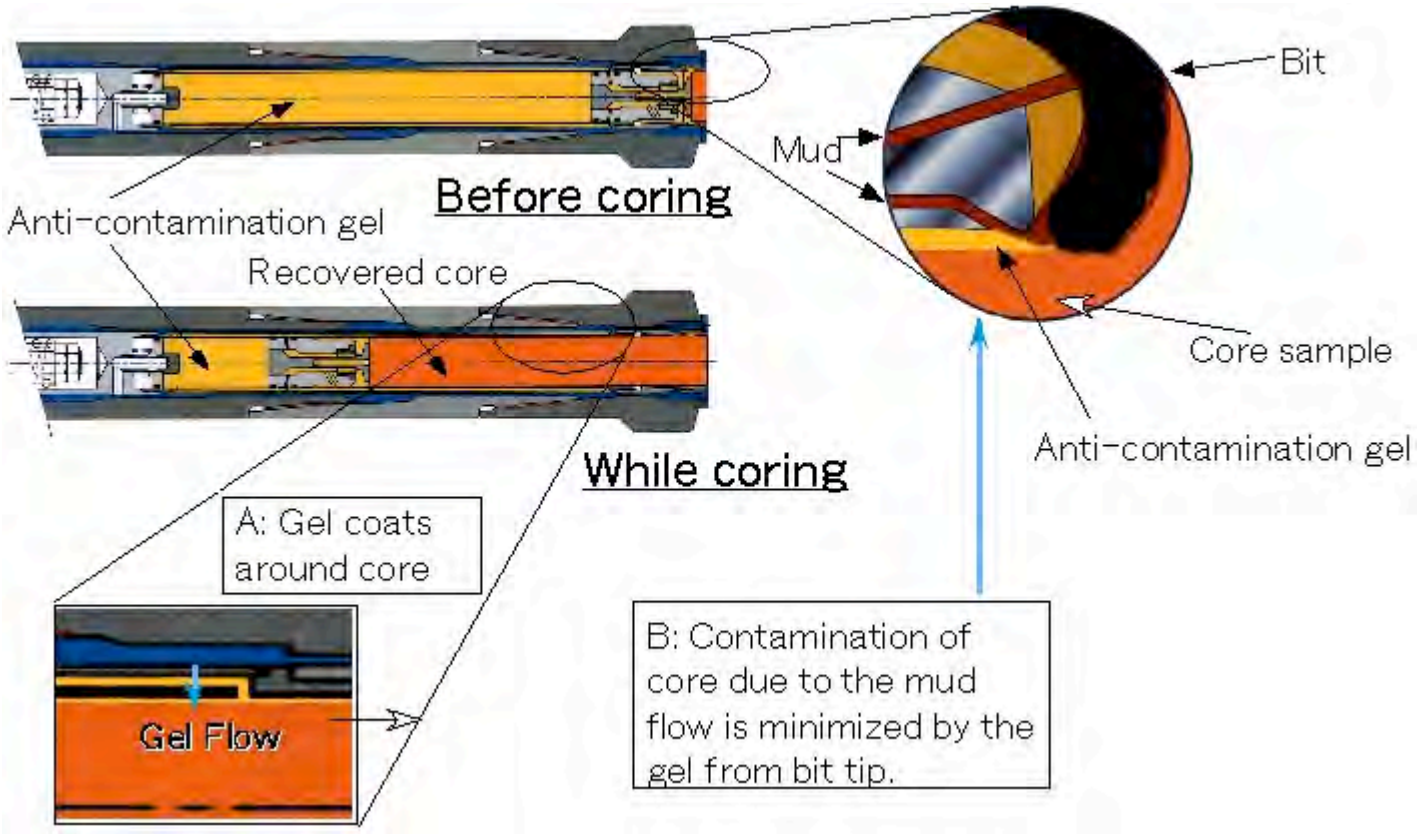
For EDP Meeting
Boston, MA. U.S.A.
September 26-28, 2005

Motivation

- Support the IODP Initial Science Plan
  - Intensive engineering efforts required
- Engineering Challenges
  - “Fit-For-Purpose” or “Off-The-Shelf” systems are not immediately available
- Science/Engineering/Industry Collaborations
  - Collaborations are essential for success.

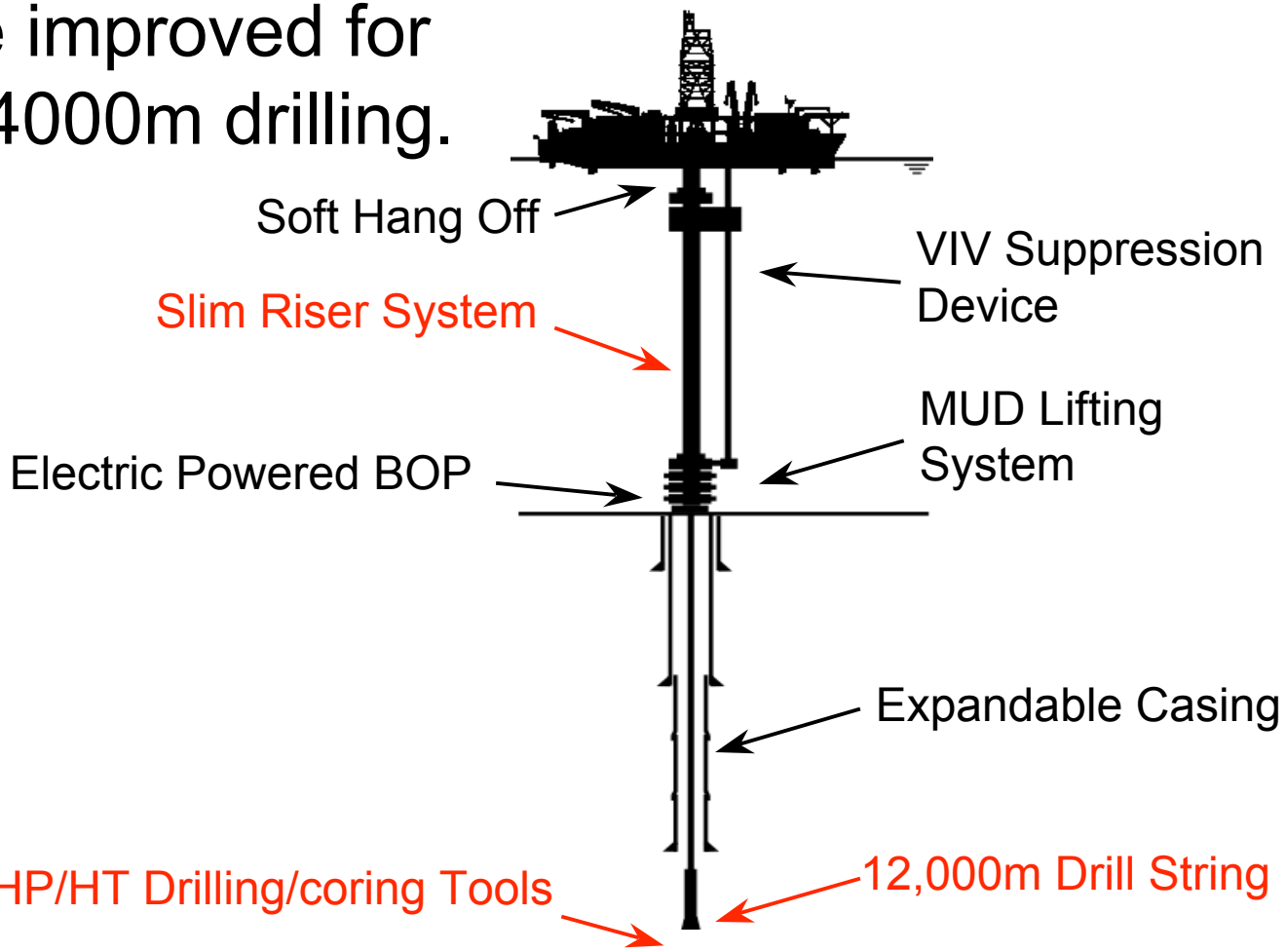
Core Recovery Improvement

- Anti-contamination Core Barrel : CDEX Patent



Ultra Deep Drilling System

Areas to be improved for more than 4000m drilling.



Main Study Areas

- Slim Riser
  - Strength of riser at BOP Hang-off
  - Detailed investigation of riser motion and tension
  - Integration of RMS and DPS for riser configuration
- HP/HT Drilling Tools
  - Drilling and coring in HP/HT formation
  - Preserve of HP/HT after core recovery
- 12,000m Drill Strings
  - Strength of drill pipe (New Material? New Design?)
  - Handling of drill pipe to avoid “Slip Crush” (Further development of Dual Elevator)

APPENDIX 12

IODP
INTEGRATED OCEAN DRILLING PROGRAM

Engineering Development Panel

26th-28th September 2005, Boston

ESO Report

Dan Evans

ECORD European Consortium for Ocean Research Drilling

ESO ECORD Science Operator

Universität Bremen
rcom
marum

EPC European Petrophysics Consortium

BGS British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

Role of ESO

- A European consortium
- Formed to undertake Mission Specific Platform (MSP) operations for IODP on behalf of ECORD
- Primary MSP implementing organisation (IO) for IODP

ECORD European Consortium for Ocean Research Drilling

ESO ECORD Science Operator

Composition of ESO

- British Geological Survey
- University of Bremen
- European Petrophysics Consortium

Composition of ESO

- British Geological Survey (BGS)
  - ESO Co-ordination
  - Operational management
  - Scientific management
  - Data management

British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

ECORD European Consortium for Ocean Research Drilling

ESO ECORD Science Operator

Composition of ESO

- University of Bremen
  - Management of curation and laboratory facilities
  - Onshore science parties
  - Provision of core repository
  - Data management services

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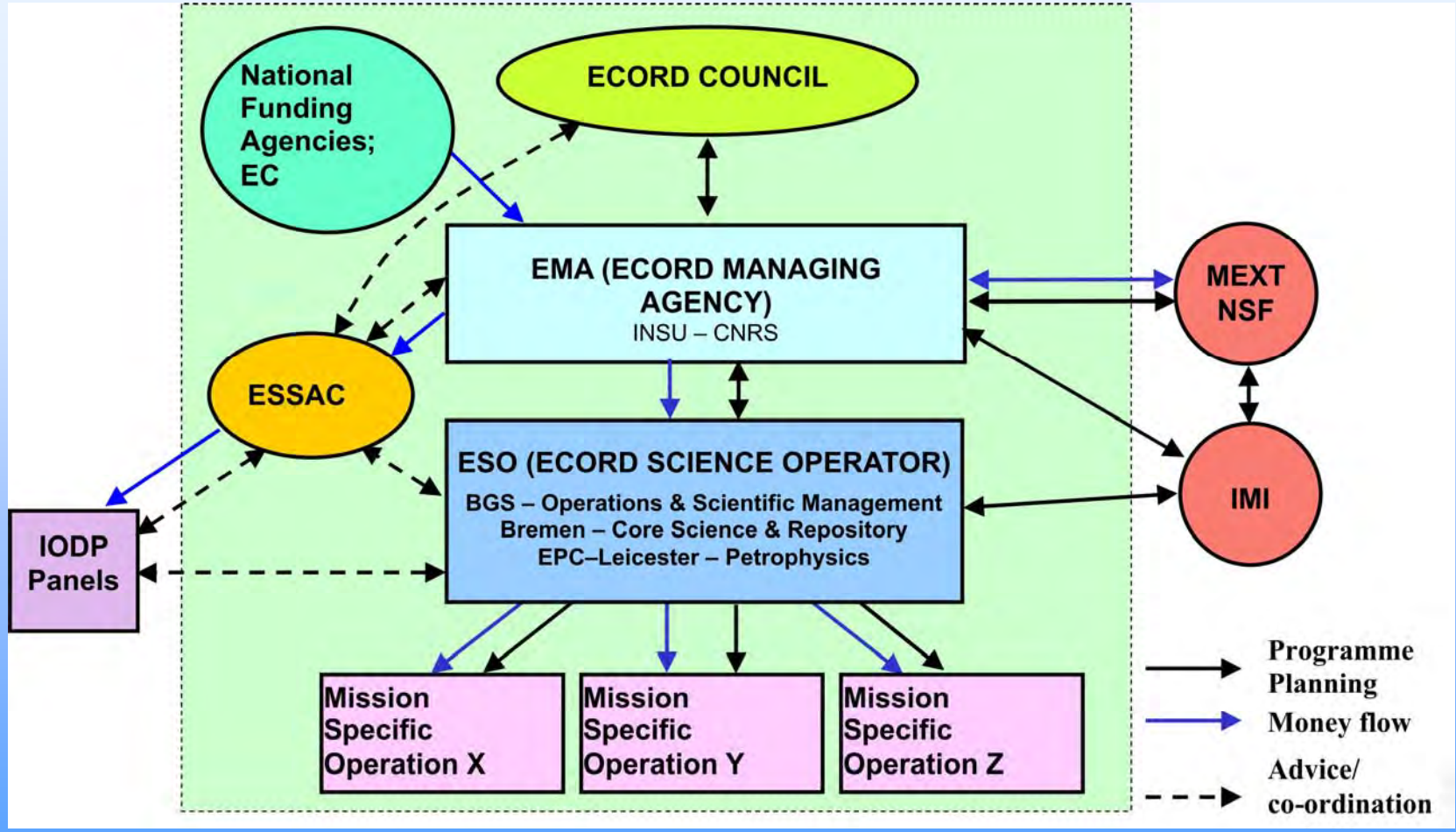
rcom
marum

ECORD European Consortium for Ocean Research Drilling
ESO ECORD Science Operator

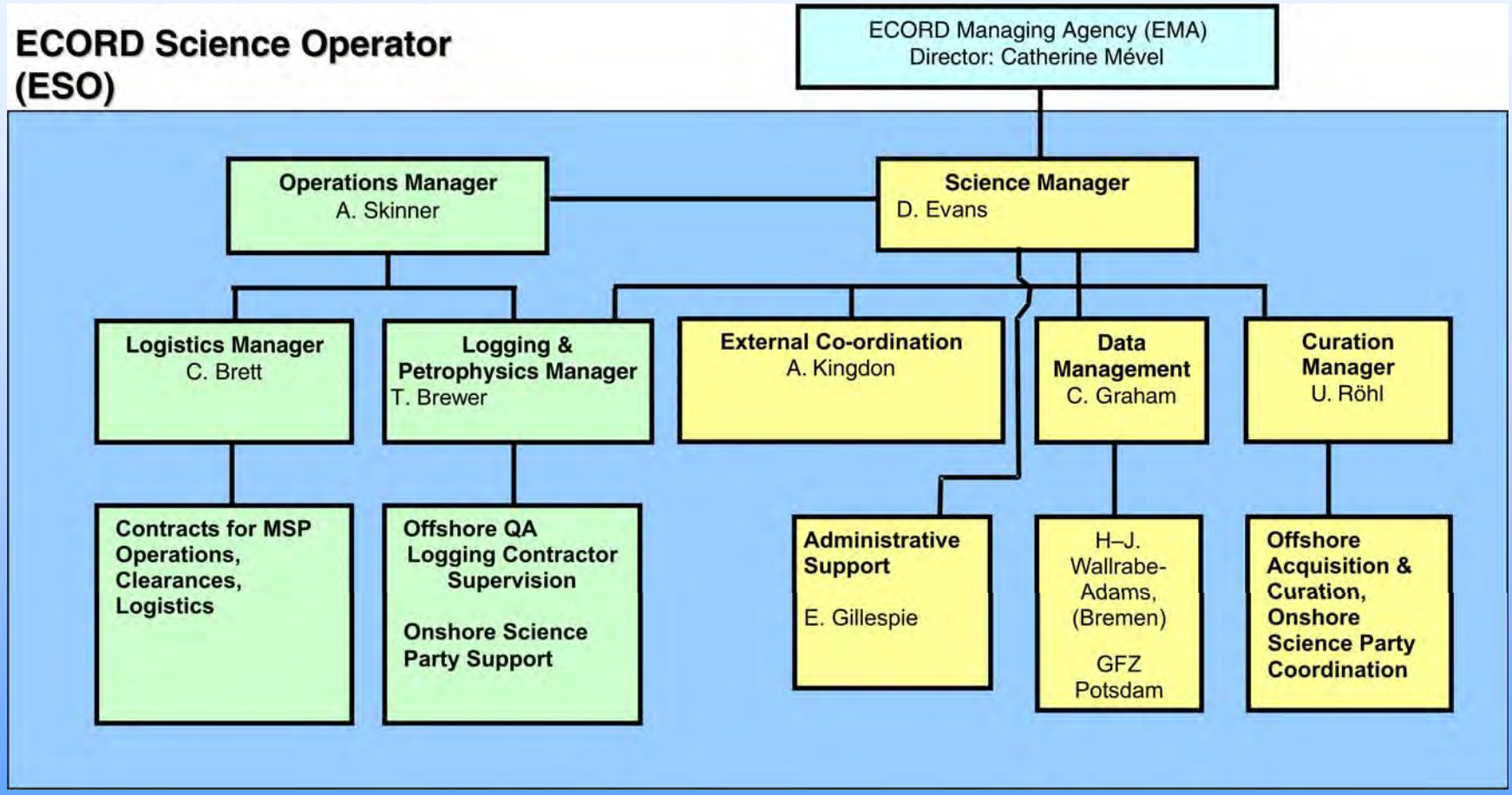
Composition of ESO

- European Petrophysics Consortium (EPC)
  - Management and provision of logging and petrophysical services
  - EPC comprises:
    - University of Leicester – Co-ordinator
    - Université de Montpellier
    - RWTH Aachen University
    - Vreije University of Amsterdam

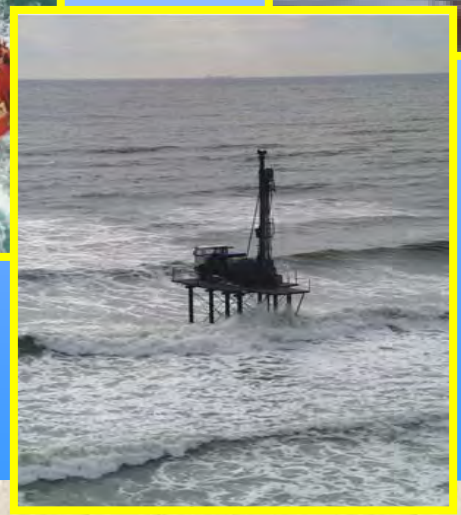
Structure of ECORD (European Consortium for Ocean Research Drilling)



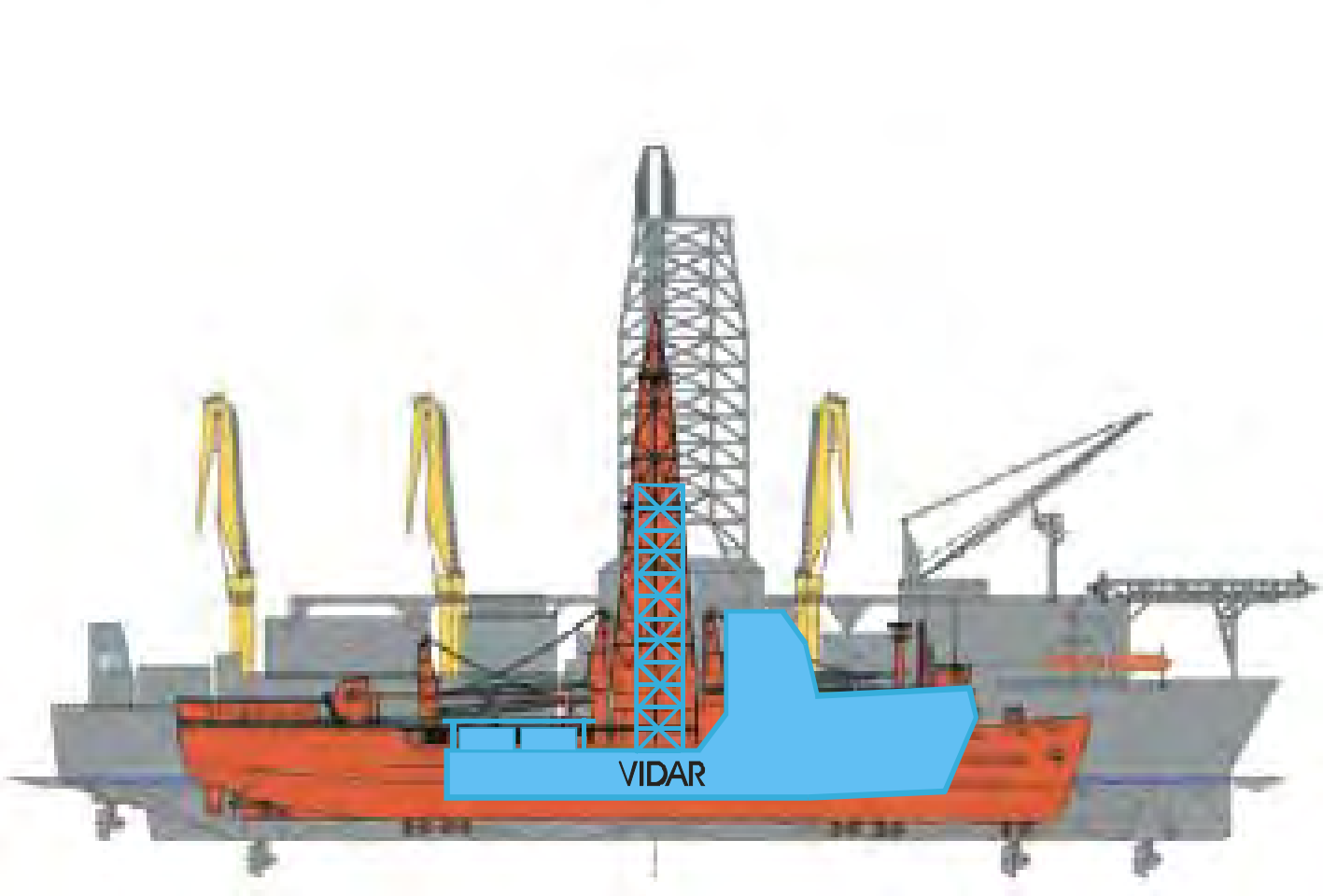
ESO Management Structure



- **ESO will contract a suitable platform for each project**



IODP
INTEGRATED OCEAN DRILLING PROGRAM



ECORD European Consortium for Ocean Research Drilling

ESO ECORD Science Operator

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EPC European Petrophysics Consortium

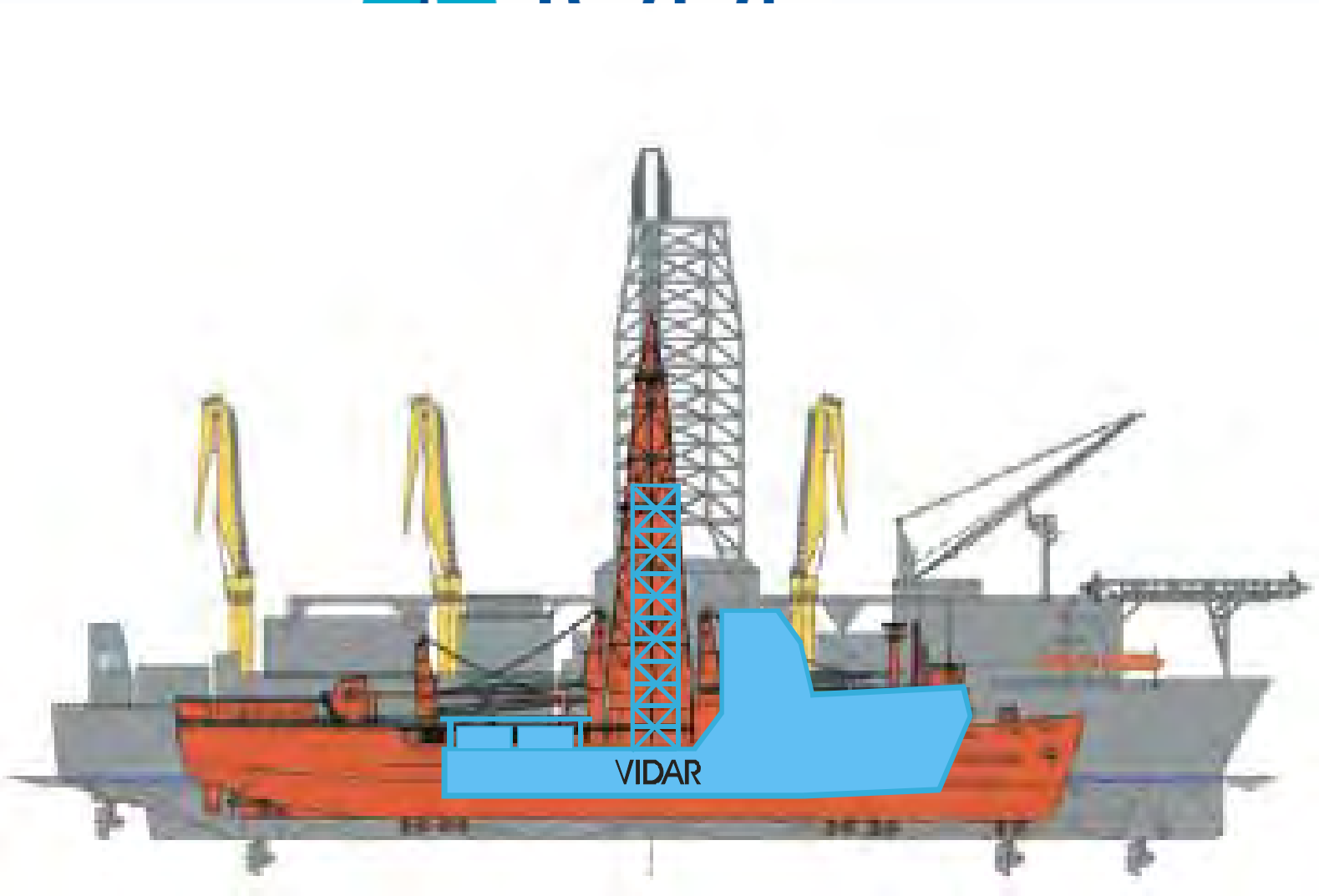
BGS British Geological Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL

ECORD European Consortium for Ocean Research Drilling

IODP will operate differently from ODP

ECORD European Consortium for Ocean Research Drilling

ECORD Science Operator



ECORD European Consortium for Ocean Research Drilling

ESO ECORD Science Operator

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EPC European Petrophysics Consortium

BGS British Geological Survey · NATURAL ENVIRONMENT RESEARCH COUNCIL

ECORD European Consortium for Ocean Research Drilling

ESO FY06 Program Plan

- *b-21. Engineering development*

- **This activity is restricted to developing improved mobile laboratory facilities.**

Modular lab concept

ECORD European Consortium for Ocean Research Drilling

ESO ECORD Science Operator

ESO Curation Container (operated by the University of Bremen) provides facilities for offshore core curation and sampling services.

ESO Petrophysics Container (operated by the ECORD Petrophysics Consortium, EPC) is equipped with a Geotek™ Multi-sensor Core Logger containing a variety of different sensors for determination of physical properties.

ECORD European Consortium for Ocean Research Drilling

ECORD Science Operator

IODP INTEGRATED OCEAN DRILLING PROGRAM

ECORD European Consortium for Ocean Research Drilling

ECORD Science Operator

Inner Barrel Types

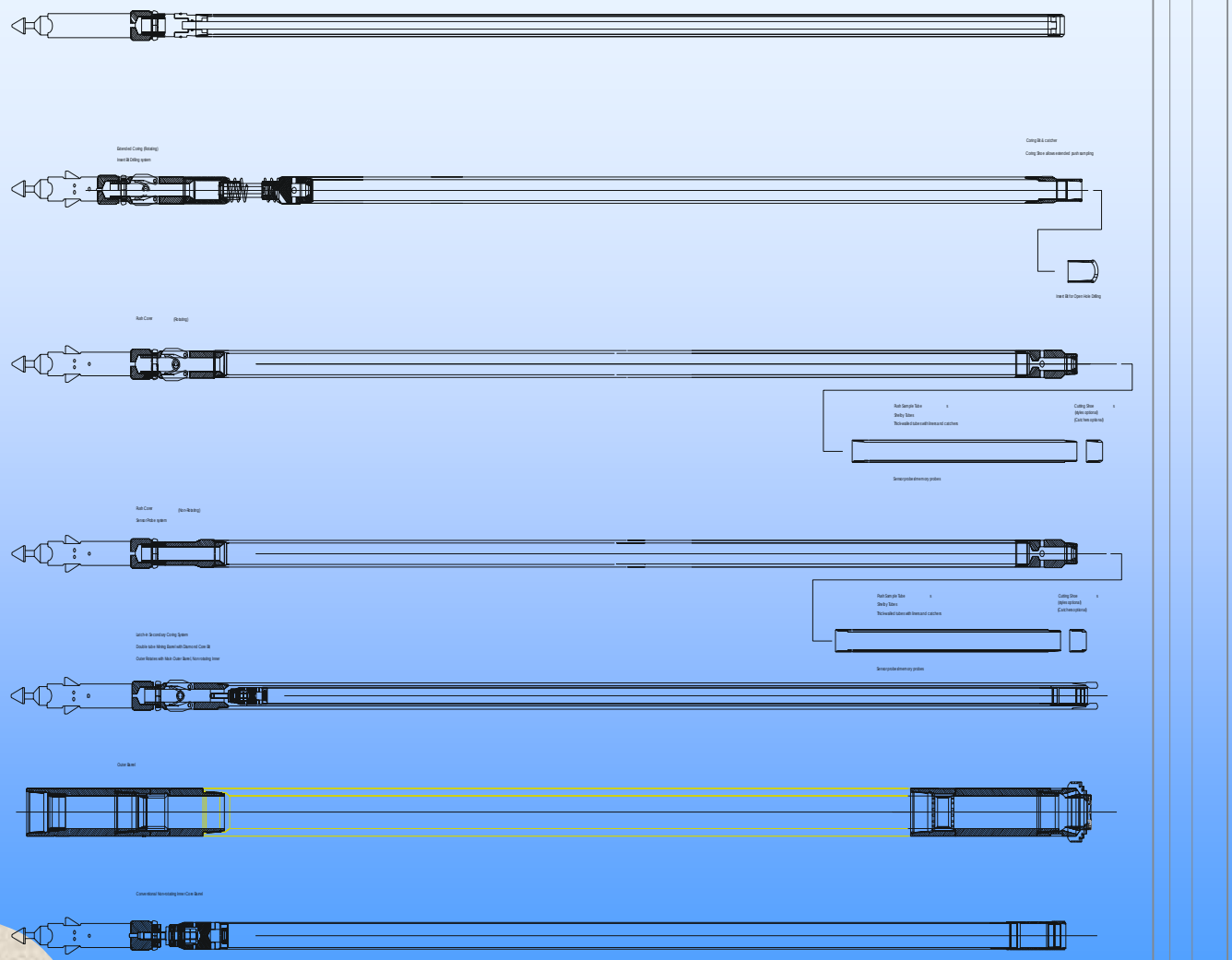
1 Head for drilling insert bit & rotating extended coring

2 Head for push coring/spot sampling

3 Head for non-rotating coring

Old BGS barrels

New BGS barrels – used in ACEX



Inter-changeable inner barrels

Piggy-Back Coring System

For Tahiti all drilling equipment is supplied by contractor

Mining type rig mounted in heave compensated API Rig

A Suite of Slimhole Logging Tools

Downhole Geophysical Logging tools are essential for extracting the maximum information from the cored borehole

The Universities of Leicester, Aachen, Montpelier and Amsterdam provide Logging Scientists and Operational expertise as part of the ESO

They liaise with Industry to obtain the best tools for a particular job

New Jersey Shallow Shelf

Tools which may potentially be used are:

- **The ODP-type piston corer and extended coring assemblies, including the BGS variations**
- **Some of the geotechnical coring tools (e.g. Geobore-S, Boart Longyear, Christensen soils-type assemblies)**
- **DOSECC coring assemblies**
- **The Fugro-Hyace percussive corner**

These and any other systems that become available will be assessed and interfaced to a suitable drilling contractor working with ESO

New Jersey Margin Drilling 2006

OJEU Notice

- All potential contractors must submit their interest via the OJEU procedure if they are to be invited to tender for this work in due course.

ESO are interested in developing a down-string rotating camera

- Important for environmental reasons, especially in shallow waters and reefs

ECORD European Consortium for Ocean Research Drilling

ESO ECORD Science Operator

ESO Strategy

- Use of existing oilfield & mining industry and/or science methods for IODP

- Can include use of USIO or CEDEX equipment
  - Cross-platform use
  - Wish to be involved in discussions of future IODP developments

- No current plans for drilling equipment development, but further testing and experience of new BGS suite is needed; monitor technical developments – especially for proposals in the pipeline, eg New England?

APPENDIX 13

REV-4

IODP Management Forum Retreat
Frascati, Italy
May 24-26, 2005

"…the Forum Retreat has established both personal connections and a venue for free flow of ideas and information among the IODP leadership. We are optimistic that future meetings will continue the tradition of constructive dialog established at Frascati."
(from Mike Coffin)

PARTICIPANTS

Manik Talwani, President, IODP-MI
Steve Bohlen, President, JOI
Mike Coffin, Chair, SPC
Dan Evans, Science Manager, ESO
Gabriel Filippelli, Chair, USSAC
Tom Janecek, Vice President, IODP-MI
Jeroen Kenter, Chair, ESSAC
Hans Christian Larsen, Vice President, IODP-MI
Catherine Mevel, Director, EMA
Yoichiro Otsuka, Special Advisor to the President, IODP-MI
Noriyuki Suzuki, Chair, J-DESC
Asahiko Taira, Director General, CDEX
Kensaku Tamaki, Chair, SPPOC

Executive Summary

Leadership of the IODP met for the first dedicated time 24-26 May 2005 in Frascati, Italy. Position papers prepared by the participants prior to the meeting highlighted both opportunities and challenges for the IODP incorporating experience gained with planning and executing complex, multi-platform operations since the IODP's inception on 1 October 2003. In Frascati, meeting participants initially distilled many ideas, and then focused on improving the delivery of community scientific objectives, as spelled out in the *Initial Science Plan*, as effectively and efficiently as possible. A highlight from the meeting is the recommendation for proactive integrated and seamless scientific planning/advice, management, implementation, and assessment of major community-defined thematic scientific goals, perhaps using NanTroSEIZE as a model. More importantly, the Forum Retreat has established both personal connections and a venue for free flow of ideas and information among the IODP leadership. We are optimistic that future meetings will continue the tradition of constructive dialog established at Frascati.

TABLE OF CONTENTS

INTRODUCTION

International scientific planning for the IODP was the focus of three major international meetings at the turn of the millennium: CONCORD (1997), COMPLEX (1999), and APLACON (2001). The IODP *Initial Science Plan, Earth, Oceans,* and *Life* (2003-2013), translated the results of these meetings into a decadal strategy for addressing significant community-defined scientific themes and initiatives. Since the IODP's inception on 1 October 2003, the innovative scientific legacy of the ODP and DSDP has been both upheld and advanced, e.g., witness the exciting initial results from first-ever, never-before-possible drilling in the Central Arctic Ocean using MSPs. Opportunities for scientists have increased manyfold with the availability of multiple platforms for scientific ocean drilling; few places in the global ocean remain inaccessible to the drill bit. Scientific, management, financial, and cultural challenges, however, have increased commensurately, and these challenges must be met with new thinking on how to deliver the science detailed in the *Initial Science Plan* as effectively and efficiently as possible. Scientific ocean drilling is probably the most successful international scientific program ever, and we must build upon its scientific culture and past successes to meet new challenges.

The role of IODP-MI is to deliver the scientific goals of the *Initial Science Plan* through integration and management of multi-platform operations. To consider issues associated with its charter, the IODP-MI president invited leaders of various IODP entities to form a Management Forum. The forum held a retreat in Frascati, Italy 24-26 May 2005. In preparing for the retreat, participants were invited to suggest topics for discussion. The following topics appeared to be of the greatest interest to the participants:

1. Discussion of the functionality and efficiency of the current structure of the IODP
2. Concerns on the horizon: three-platform phase of the IODP advancing scientific themes and initiatives
3. Long term funding
4. Improvement of the transnational and transmember collaboration, communication and exchange
5. Compatibility of national interests and IODP interests.

The participants were invited to submit position papers on the above topics. The position papers yielded a great degree of consensus on the nature of concerns facing the IODP and were the starting point of discussions on how the IODP framework might be enhanced. Recommendations arising from these discussions constituted the principal work accomplished at the retreat.

This report consists of three documents:

CONCEPTUAL FRAMEWORK FOR IMPROVING IODP

INCREASING IODP MEMBERSHIP

FORMATION OF AN ADVISORY FORUM

CONCEPTUAL FRAMEWORK FOR IMPROVING IODP

Objectives

We emphasize that the framework outlined in this report is a conceptual framework formulated to enhance implementation of the *Initial Science Plan.* We present this framework as a starting point for discussions with the scientific community, the implementing organizations, and the funding agencies from which comments will be solicited. We have learned much during the first year and a half of IODP and we would like to put those lessons to use in the future.

Concerns Regarding the Existing Framework of IODP

A. Science Program
    1. The program should involve new communities and other segments of science technology and industry.
    2. Planning and execution should be simplified to encourage broad participation.
    3. *Initial Science Plan* initiatives should be actively developed into coherent and timely executed drilling strategies.
    4. The program should have significant focus on its stated scientific goals.

B. Proposal process
    1. The proposal process is lengthy, and in many cases program resources should be better utilized. Nevertheless, the structure should allow sufficient time for development of a coherent science, education, and outreach effort.
    2. Proposal nurturing and evaluation should include timely rejection of inferior proposals.
    3. The full potential of the integrated program should be realized by going beyond the typical current process of individual and small proponent groups proposing individual expeditions.
    4. Scientific priorities of the IODP should be melded with the structure and process leading to proposal ranking and expedition scheduling.
    5. Transfer of proposals from the scientific advisory environment to operations should allow for full operational development and planning, thereby increasing the potential for expedition success.

C. Program integration
    1. Comprehensive and integrated planning from idea conception to proposal to site survey to execution should be implemented to accomplish primary science goals in a timely manner. This would promote integrated missions with other related programs (e.g. MARS, InterRIDGE).
    2. An integrated focus should supersede platform specific focus to stimulate full development of the program as an integrated entity.

D. Program Outcomes

    The societal impact of expeditions should be visible as a program-wide objective at a time when societal relevance is one of the primary drivers for science funding.

Enhancement of the Existing Framework

Recommended enhancements are designed to encourage:

1. Development of research through both unsolicited proposals and initiatives detailed in the *Initial Science Plan*.
2. Involvement of a broader scientific community, other programs and industry in the development of 'missions'(e.g., NanTroSEIZE in the IODP, and planetary missions in NASA) derived from both *Initial Science Plan* initiatives and proposals.
3. Coordinated and focused engagement of national/consortia research resources (for example, site surveys, borehole instrumentation).
4. Incorporation of operational imperatives and fiscal realities in the development of proposals and missions.
5. Streamlined planning and proposal/initiative development and effective use of program/platform resources.
6. Robust and integrated development of a comprehensive program mission of science, technology, education and outreach.
7. Early identification of priority ideas and concepts to allow integrated development of proposals (via either small proponent groups or mission teams) with a high probability of success.
8. Clear definition of roles and responsibilities of the IODP Science Advisory Structure (SAS) and program management.

An enhanced framework for proposal flow and functional structure will utilize input from and actively engage the national/consortia programs. As depicted graphically (Fig. 1), it consists of two elements:

1. Unsolicited proposals. Operational, scientific and fiscal scoping for unsolicited proposals will take place early on in the assessment process.

2. Specific missions derived primarily from the initiatives of the *Initial Science Plan*. IODP missions will be key activities to which the program commits resources to achieve important program goals in a timely fashion. They will be designated by the SAS and matured through workshops and eventually missions' teams. In addition to providing program focus, missions and their associated teams will be open to the wide community.

Missions incorporate operational, engineering and technological requirements. They imply a firm commitment of the program embodying a continuum from planning through drilling and beyond, including outreach activities.

The SAS (with appropriate input of science, engineering, technology and HSE) will identify, prioritize, steer and assist mission and proposal development. Each mission team will include scientific, operational and managerial expertise, and produce a mission plan. The SAS will then consider recommending fully developed experiment plans for implementation by IODP-MI. As NanTroSEIZE and NASA missions demonstrate, the mission concept utilizes the full resources of their respective programs in addressing outstanding targeted and focused scientific objectives.

It is emphasized that both the unsolicited proposal and the missions will go through a similar evaluation process as indicated in Fig. 1.

To ensure broad integration at all levels of program management and resources, IODP-MI is supported by a Management Forum which discusses strategic issues key to scientific ocean drilling and is composed of individuals representing core functions of IODP including the Implementing Organizations, Program Member Offices, and members of the SAS.

The enhanced IODP framework adheres to the principle of 'form follows function'. Its overarching purpose is to maximize opportunities for the global scientific community to undertake innovative research via productive participation in the IODP, extending all the way from the generation of exciting ideas through ultimate scientific assessment following execution. It provides a framework for implementation of a strategic vision for scientific drilling and observing, a vision that meshes the goals and objectives of the *Initial Science Plan* with the IODP's scientific achievements.

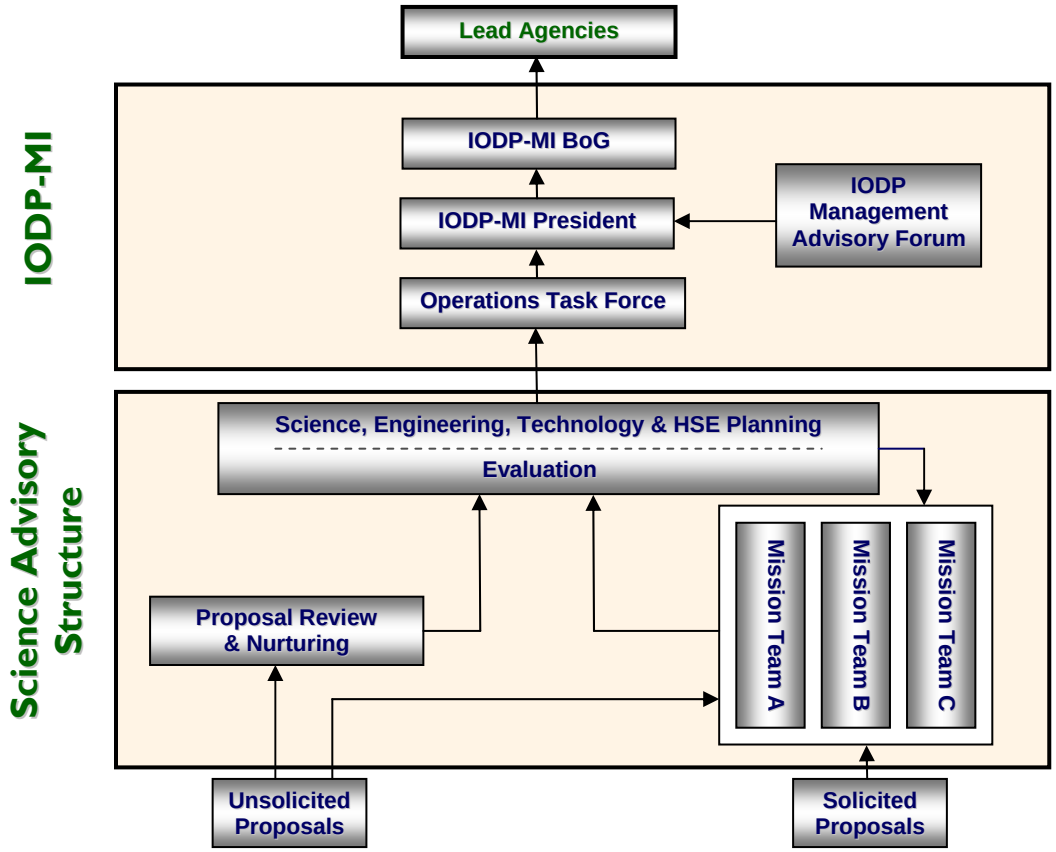


Figure 1. Recommended conceptual framework for utilizing the full resources of the IODP to address the scientific goals of the *Initial Science Plan*. The process for handling unsolicited proposals is similar to the current process, but with early consideration of technological, engineering, operational, and fiscal realities. Missions (e.g., NanTroSEIZE), will be designated by the SAS. They will arise either from initiatives in the *Initial Science Plan* or from unsolicited proposals. They will also integrate scientific, technological, engineering, operational, and fiscal considerations from idea conception to ultimate post-mission assessment.

Challenges

Outstanding challenges include:

- Fully developing and implementing the framework
- Attracting new generations of earth and biological scientists to the IODP
- Increasing funding and membership of the IODP
- Reducing duplication or triplication of efforts
- Increasing integration, including further meshing of national/consortia interests with program interests
- Bridging the shoreline divide between the IODP and the International Continental Drilling Program
- Further ameliorating language and cultural differences, i.e., 'leveling the playing field', among IODP members

In conclusion, the IODP is a new program, and in the 20 months since its inception, we have gained understanding of both the challenges it faces and the opportunities it presents. The enhanced IODP framework attempts to improve the efficiency and effectiveness of the IODP for the scientific community that it serves, while preserving the 'scientific culture' of scientific ocean drilling that has contributed strongly to its exceptional successes over the past four decades.

Appendix A

Mission Teams

It was not the intention of the Management Forum to prescribe the formation and working of the Mission Teams in any detail. Clearly, if the conceptual framework described in this report is accepted, much discussion will be needed to precisely define the make up and working of the Mission Teams.

It is, however, important to clear up two points:
Firstly, while the Mission Teams may appear to bear some resemblance to ODP's PPG's and DPG's, they are clearly not PPG's and DPG's, but have a much wider scope and many more functions.

Secondly, the proposals arising out of the Mission Teams will also be evaluated by a process which will be similar to the process of evaluation of unsolicited proposals.

Bearing again in mind that only a conceptual framework is being presented and all the details need to be filled in, **a possible definition of the formation and working of the Mission Teams (MT) is as follows:**

(1) MT consists of the following: A group of scientists, IO representatives and IODP-MI personnel and, whenever necessary, Industry and other outside sectors of IODP experts in order to formulate Expedition Program (from site survey, drilling operation to resultant publicity).

(2) MT could be proposed through various mechanisms including SAS leadership, national office leadership or by a group of spontaneous and dedicated scientists. Normally MT should be formed through a series of workshops.

The formation of MT should be approved by SAS. (SAS's initial approval)

(3) An MT approved by SAS should have realistic scientific targets that are accessible by the IODP drilling capability. MT should organize a series of further workshops and third-party evaluation meetings.

In other words, the regular SAS nurturing and evaluation processes will be taken care by the MT activity itself. Of course, SAS watch dogs and liaisons will attend and follow the MT's entire activity.

(4) Then, MT will forward the expedition plan to SAS. By that time, the plan is ready to be implemented (in other words, the basic part of plan will become the expedition prospectus).

SAS should make the final decision for implementation (SAS's final approval)

(5) IODP-MI/IO will continue to cooperate with the MT through the expedition and post-expedition activities including co-chief nomination, staffing, sampling, and post-cruise publication and syntheses and so on.

(6) Public Relation activities will be coordinated by IODP-MI/IO/MT.

MT thus represents a powerful driving mechanism of IODP science from identification of science goals, drilling targets, implementation plan to outreach activity although its relative role will change throughout the entire process. But, it is there all the time!

INCREASING IODP MEMBERSHIP

The Forum recommended IODP-MI pursue the concept of an “introductory member” proposed by IODP-MI (Appendix B), keeping in mind the vital importance of enlarging the international membership of the program.

The Forum noted other initiatives to attract new members are being developed within IODP. For example, ECORD is funded by the European Commission to attract new European countries, and is already in contact with potential candidates.

J-DESC also has offered Asian countries a portion of the Japanese berths of IODP expeditions in return for supporting the establishment of Asian Consortium now being planned by Korean scientists.

The Forum recommended that IODP-MI explain these other initiatives to potential new members to avoid confusion.

The Forum also recommended that IODP-MI convene an international workshop inviting countries which may join IODP.

Appendix B

Proposal for "IODP Introductory Member"

A stepwise mechanism encouraging non member countries to join IODP was developed in IODP-MI and discussed with Lead Agencies. This mechanism would be built around the concept of an "IODP Introductory Member". The Lead Agency encouraged the IODP-MI to discuss this proposal in the Management Retreat meeting and report to the IODP Council in June.

(Proposal)
A governmental or non-governmental body in any country interested in IODP could become an IODP Introductory Member by contributing a small sum of money, for example $50,000, annually for a period not to exceed two years. For this contribution the country would acquire the right to send:

i) one scientist for one expedition (not to exceed two months) on board one of the drill ships during the introductory two years; and
ii) one observer to a SAS Panel or Committee.

This status as IODP Introductory Member expires in two years and cannot be renewed. Within or after that period the country must become an Associate Member or participate in an existing or new consortium.

The relationship as IODP Introductory Member would be with IODP-MI. The contribution would be paid to IODP-MI.

One benefit to joining as an IODP Introductory Member is that the contribution is small; but the Member could raise the funds for individual Associate Membership or join a consortium within or after the two-year period.

This mechanism can also be regarded as an outreach activity of IODP-MI, because this would help with clearances for IODP drilling in various waters and/or contribute to the vision of IODP as a "Good Citizen" in international science.

FORMATION OF ADVISORY FORUM

The president of IODP-MI invites the participants of the management forum to constitute a task force whose mandate will be to act as an advisory body to the president. This task force will be named “IODP Management Advisory Forum”.

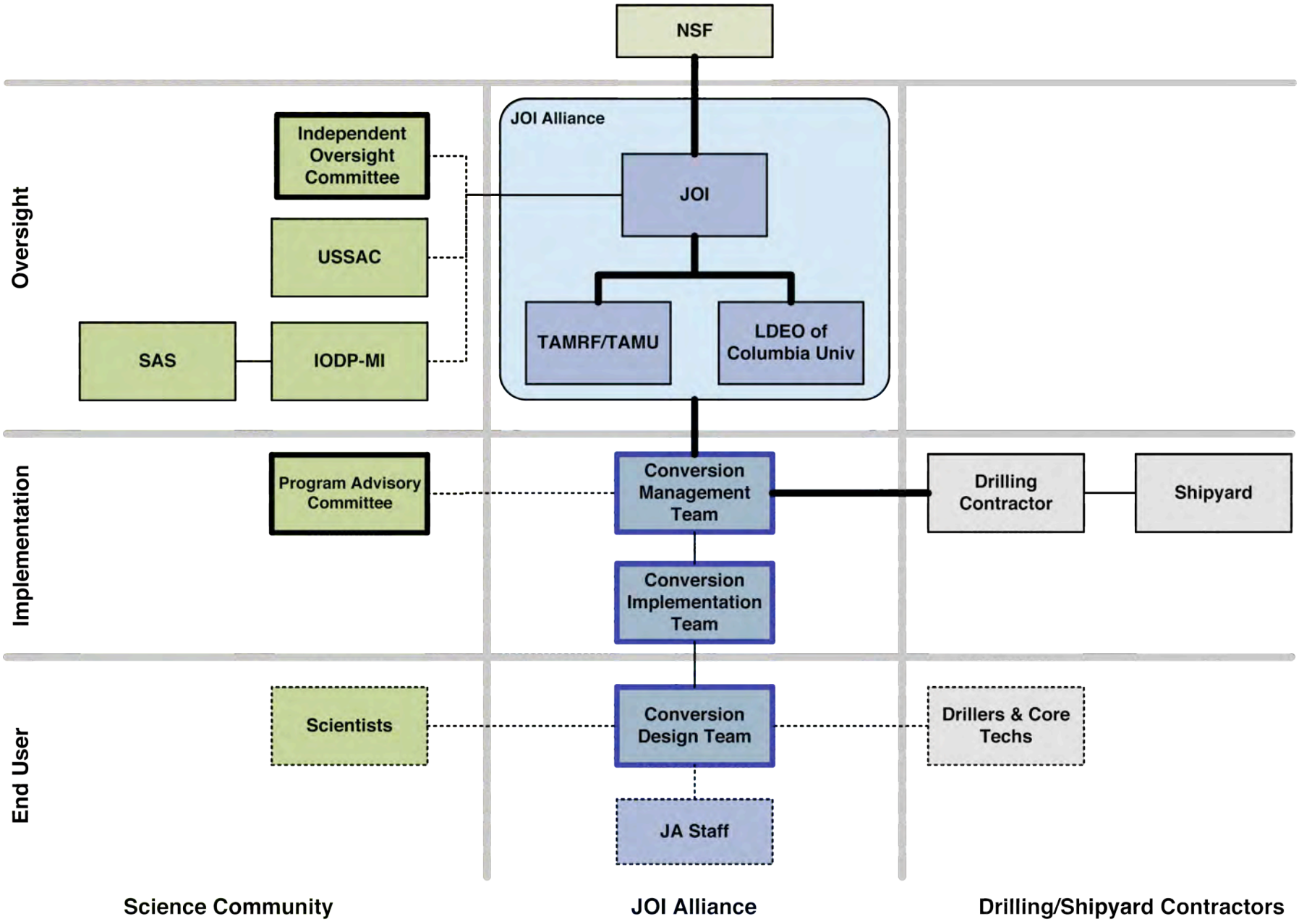
APPENDIX 14

U.S. SODV

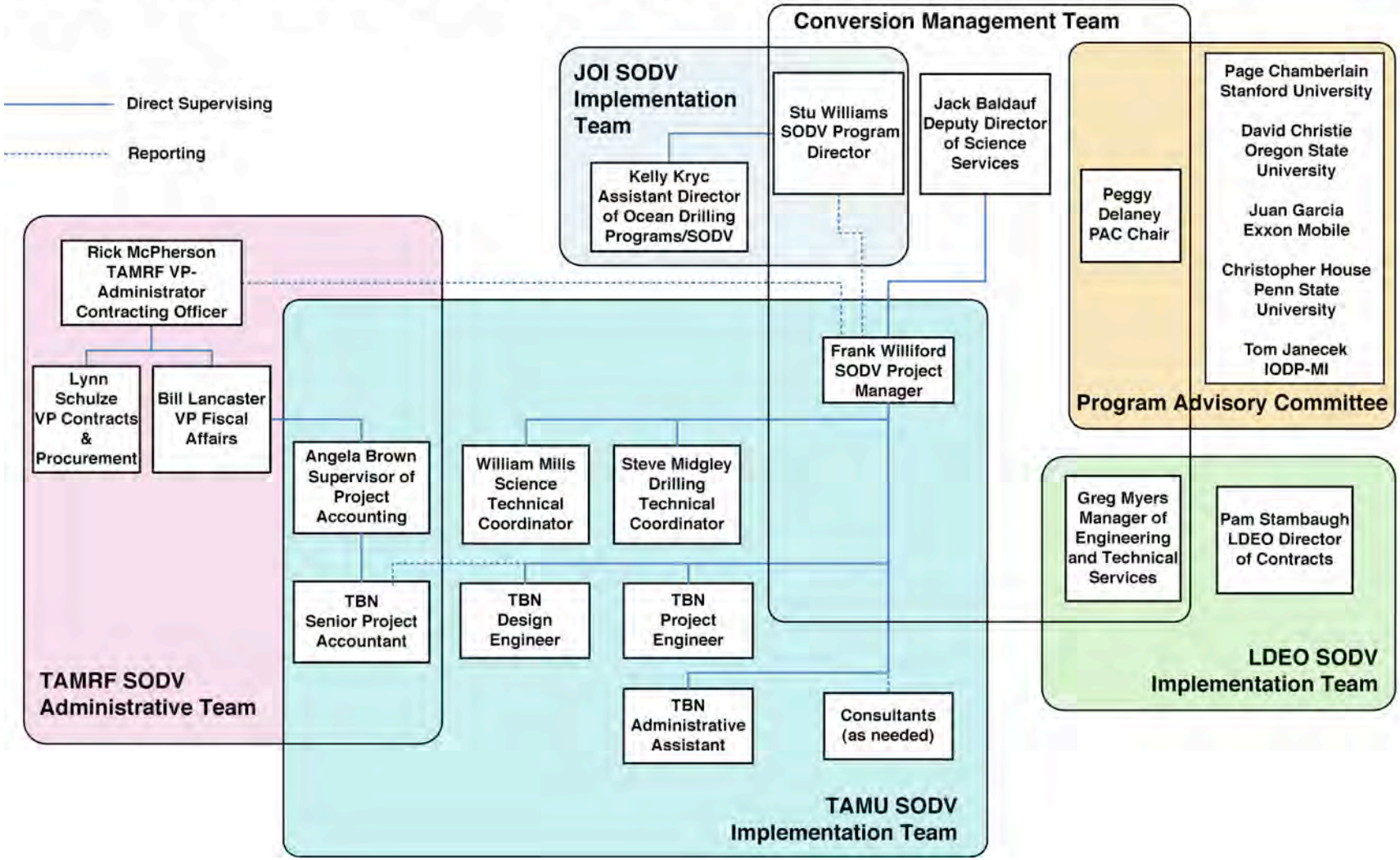
Scientific Ocean Drilling Vessel (SODV)

JOI Alliance Report to EDP 27 September 2005

IODP – SODV Organizational Chart Overview



SODV Conversion Organization Chart



U.S. SODV

Funding

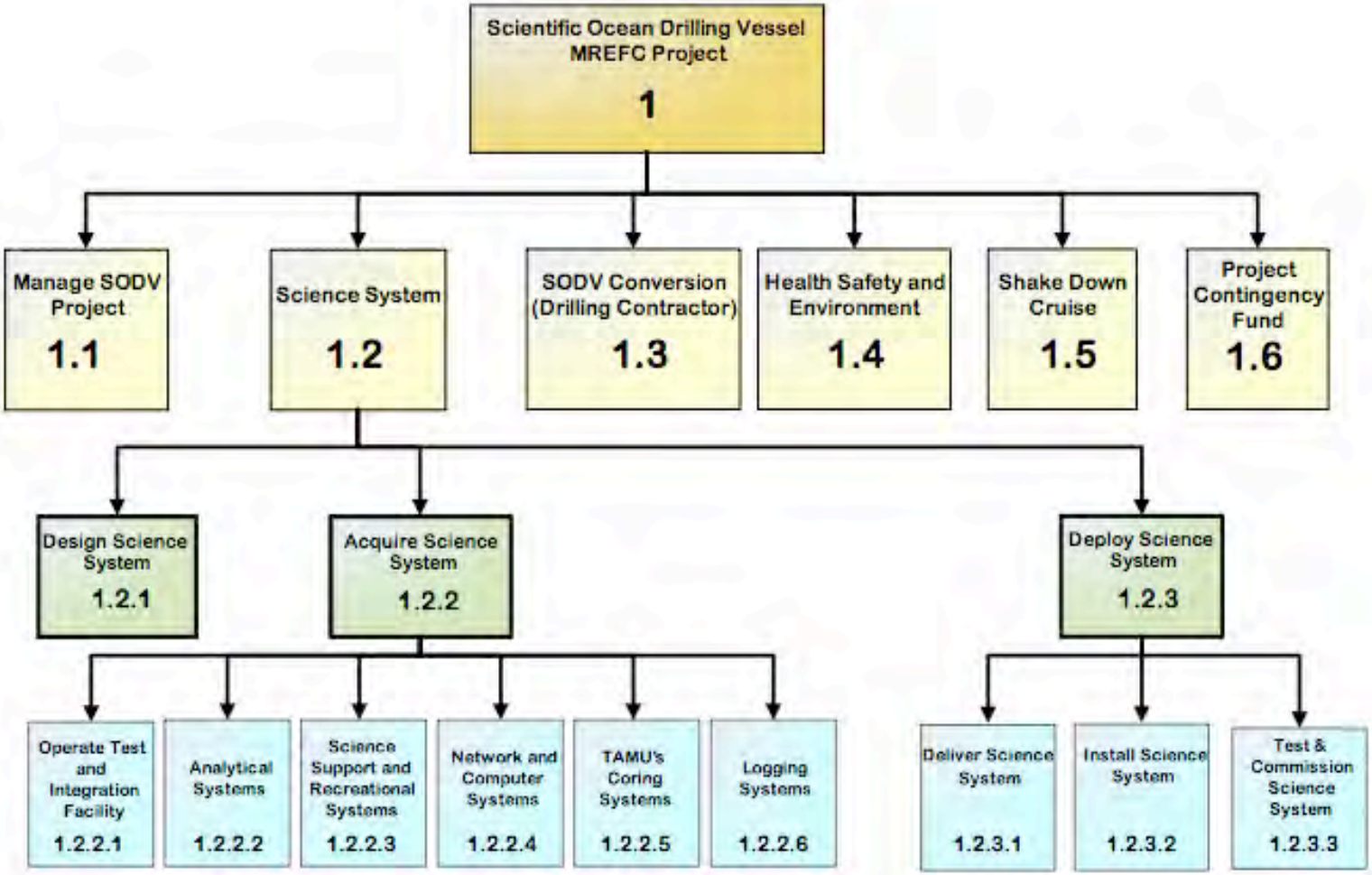
- **FY 2005 $14.88 million**
- **FY 2006 $57.92 million**
- **FY 2007 $42.20 million**

- **Total $115 million**

U.S. SODV

Annual Work Plan

	FY05	FY06
•Program Management	$1.6M	$3.0M
–Infrastructure, Consultants, Software, etc.		
•Science Systems	$1.2M	$10.0M
–Design, acquisition		
•Conversion	$0.2M	$31.0M
•HSE	$0M	$0.2M
•Contingency	$3.0M	$2.0M
Total	$6.0M	$46.0M


Scientific Ocean Drilling Vessel
MREFC Project
1
Manage SODV Project
1.1
Science System
1.2
SODV Conversion (Drilling Contractor)
1.3
Health Safety and Environment
1.4
Shake Down Cruise
1.5
Project Contingency Fund
1.6
Design Science System
1.2.1
Acquire Science System
1.2.2
Deploy Science System
1.2.3
Operate Test and Integration Facility
1.2.2.1
Analytical Systems
1.2.2.2
Science Support and Recreational Systems
1.2.2.3
Network and Computer Systems
1.2.2.4
TAMU's Coring Systems
1.2.2.5
Logging Systems
1.2.2.6
Deliver Science System
1.2.3.1
Install Science System
1.2.3.2
Test & Commission Science System
1.2.3.3

SODV Timeline: Key Dates

Task	Date
Award Drilling Contract	11/1/05
Post Award Meeting - DC Facility	11/5/05
Engineering Design Phase	11/05 - 05/06
Shipyard Period	07/06 - 02/07
Dock Trials	1/8/07
Builder's Trials	1/22/07 - 1/29/07
Acceptance Trials	1/31/07 - 2/09/07
Post-Delivery Availability	9/7/05

Procurement Strategy

- **JOI subcontract to Texas A&M Research Foundation (TAMRF)**
- **TAMRF procures new science system**

  - designs, procures and tests in College Station prior to shipment to shipyard
- **TAMRF subcontracts to a Drilling Contractor**

  - Drilling Contractor subcontracts for drill ship conversion, including drill system upgrades

Source Selection Status

- **Bids received 4 February**
- **Following TAMRF formal Source Selection Plan**
- **Negotiations ongoing**

U.S. SODV

Schedule

- **Funding profile will impact when the ship can be converted**
- **Goal is to finish conversion in late FY 2007**
- **Schedule will be updated this summer after contract award and again in the fall after the Congressional decision on FY 2006 Budget**

U.S. SODV

Engineering Design Phase

~ 6 months (October 05 - March 06) depending on Drilling Contractor

- **Will commence after the selection of the Drilling Contractor**
- **Preliminary design work will begin in August by the CDTs**
- **Goals of the Engineering Design Phase:**
  - **Fit of desired laboratory and drilling facilities to ship**
  - **Structural integrity of vessel hull**
  - **Dynamic Positioning system assessment**
  - **Stability assessment of vessel**
  - **Habitability Upgrades**

Test & Integration Facilities

- Storage of equipment removed from the JR;
- Repair and service of equipment that will return to the SODV;
- Reception and inspection of shipments;
- Setup, burn-in, and testing of equipment;
- Research / development of new software and instrumentation;
- Integration and testing of the data infrastructure with the equipment systems as they will be deployed aboard the SODV;
- Development of laboratory SOPs, and equipment/software manuals; and
- Training of staff.

Shipyard Solicitation

- RFP will be generated for delivery of vessel based on EDP design documents
- Design changes will be limited after this time
- RFP release targeted for Spring 06
- Yard selection targeted for Spring 06
- Potential yards in Asia, North America, and Europe

Sea Trials & Shakedown

Sea Trial elements to be determined

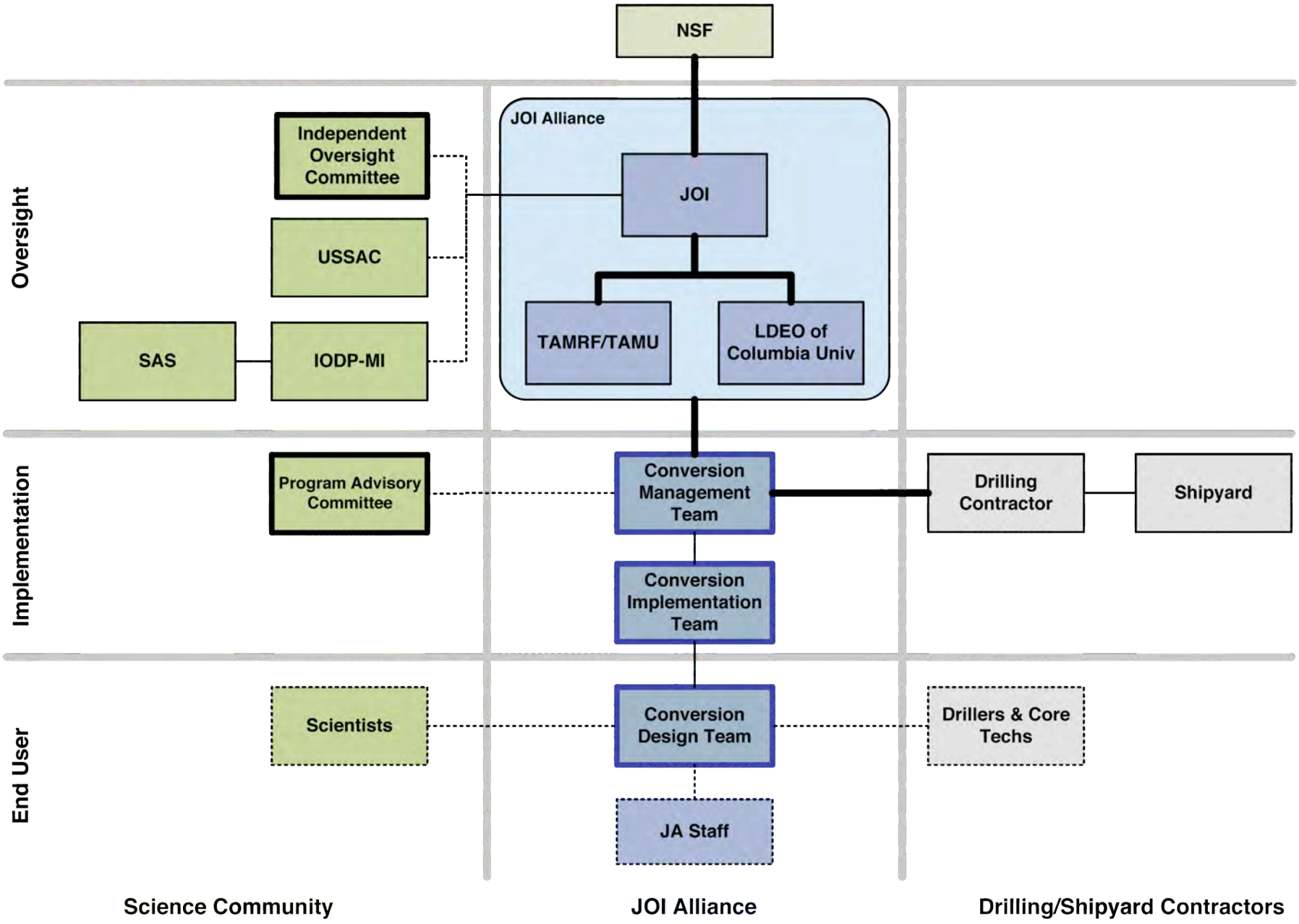
- Acceptance of vessel functionality per RFP defined requirements
- Acceptance of vessel functionality for delivery of science
- Test locations to be determined

Potential shakedown cruise(s) could be scheduled to further test science capabilities

Logging RFP

- RFP for logging subcontractor (conversion & post conversion)
  - –Intent is to have subcontractor engaged in EDP
- RFP was released: September 2
- Bids are due: minimum of 45 days later
- STP & EDP chair have endorsed RFP
- IODP-MI support RFP

IODP – SODV Organizational Chart Overview



Community Input:
SODV Independent Oversight Committee

Chair: Rannie Boyd
Members: Susan Humphris, Ken Miller, Harold Tobin, Stan Christman

The Statement of Task:

- Serves as JOI's independent review panel.
- Meet semi-annually to assess the project's progress vs the Program Execution Plan and other guidance documents.
- Serve as the independent assessment body confirming the SODV program status for NSF's required Baseline Reviews (Initial, Interim and Final).

Community Input:
SODV Program Advisory Committee

Chair: Peggy Delaney. Chair also serves as a member of the SODV Conversion Management Team.

Members: Page Chamberlain, David Christie, Juan Garcia, Christopher House, and Tom Janecek

Statement of Task: Provide analysis and advice to the SODV Project Director and Project Manager concerning all aspects of SODV activity, and provide an avenue for the science community to communicate directly with the SODV Project.

U.S. SODV

Community Input:
Conversion Design Teams

Chair: Tom Davies
JOI Alliance members: John Firth, Chieh Peng, Chris Bennight
3 Science Community members: Mark Leckie, Clive Neal, David Smith

Statement of Task:

- Provide guidance in the design and outfitting of the SODV.
- Prioritize instrument procurement lists.
- Ensure that the needs of the SODV end-user community are addressed by actively soliciting their participation, promoting open discussion and innovative thinking.

Community Input:
Other Design Teams

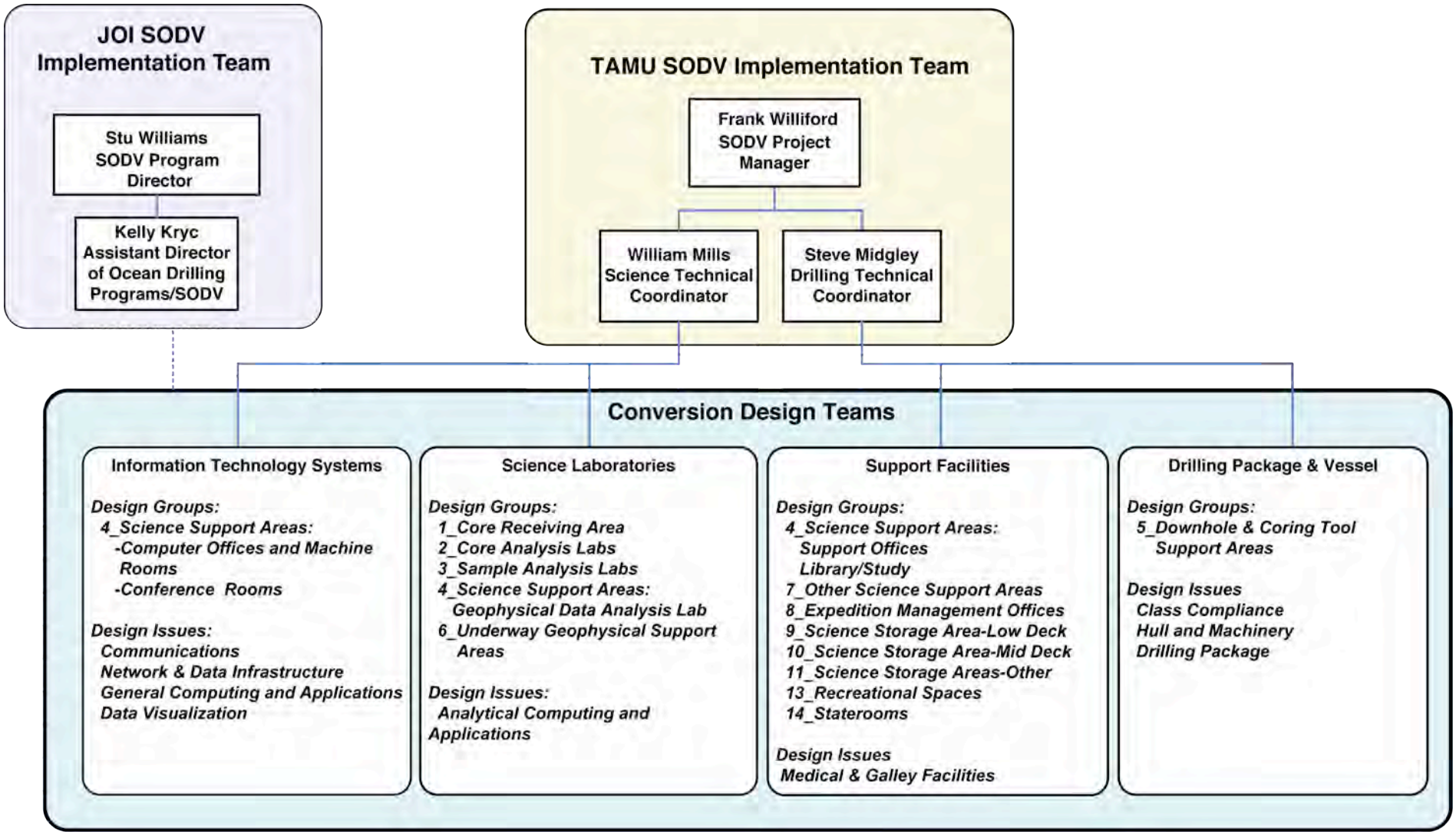
- **IT Chair**: David Becker
- **IT USIO members:** Margaret Hastedt, Cesar Flores, Adam Klaus
- **IT Community members:** Peter Knoop, Richard Oliver-Goodwin

- **Vessel Chair**: Derryl Schroeder
- **Vessel USIO members:** Mike Storms, Jay Miller, Gerry Iturrino
- **Vessel Community members:** Frank Schuh, DC TBN

- **Facilities Chair**: Lisa Crowder
- **Facilities USIO members:** Debbie Partain, Tim Bronk, Carlos Zarikian
  Leslie Peart

Key Meeting Dates

- **Support Facilities CDT**
  September 8-9: College Station, Texas
- **IT CDT**
  September 15-17: Portland, Oregon
- **Drilling and Coring CDT**
  September 17: Astoria, Oregon
- **Science Labs CDT**
  October 4-6: College Station, Texas
- **PAC**
  October 31 - November 1: Victoria, British Columbia


JOI SODV Implementation Team
Stu Williams SODV Program Director
Kelly Kryc Assistant Director of Ocean Drilling Programs/SODV
TAMU SODV Implementation Team
Frank Williford SODV Project Manager
William Mills Science Technical Coordinator
Steve Midgley Drilling Technical Coordinator
Conversion Design Teams
Information Technology Systems
Design Groups:
4_Science Support Areas:
-Computer Offices and Machine Rooms
-Conference Rooms
Design Issues:
Communications
Network & Data Infrastructure
General Computing and Applications
Data Visualization
Science Laboratories
Design Groups:
1_Core Receiving Area
2_Core Analysis Labs
3_Sample Analysis Labs
4_Science Support Areas:
Geophysical Data Analysis Lab
6_Underway Geophysical Support Areas
Design Issues:
Analytical Computing and Applications
Support Facilities
Design Groups:
4_Science Support Areas:
Support Offices
Library/Study
7_Other Science Support Areas
8_Expedition Management Offices
9_Science Storage Area-Low Deck
10_Science Storage Area-Mid Deck
11_Science Storage Areas-Other
13_Recreational Spaces
14_Staterooms
Design Issues
Medical & Galley Facilities
Drilling Package & Vessel
Design Groups:
5_Downhole & Coring Tool Support Areas
Design Issues
Class Compliance
Hull and Machinery
Drilling Package

Community Staffing Plan for the PAC and the CDT

1. **Issued a call for nominations and assessed the qualifications of the nominees (May 2005)**

2. **Ideal composition of experts on the PAC determined from IODP Initial Science Plan:**
   - **1 Environmental Change, Processes and Effects specialist**
   - **1 Solid Earth Cycles and Geodynamics specialist**
   - **1 The Deep Biosphere and the Subseafloor Ocean specialist**
   - **Plus 1 drilling expert, 1 lab expert (JR experience not required), and 1 non-voting IODP-MI representative**

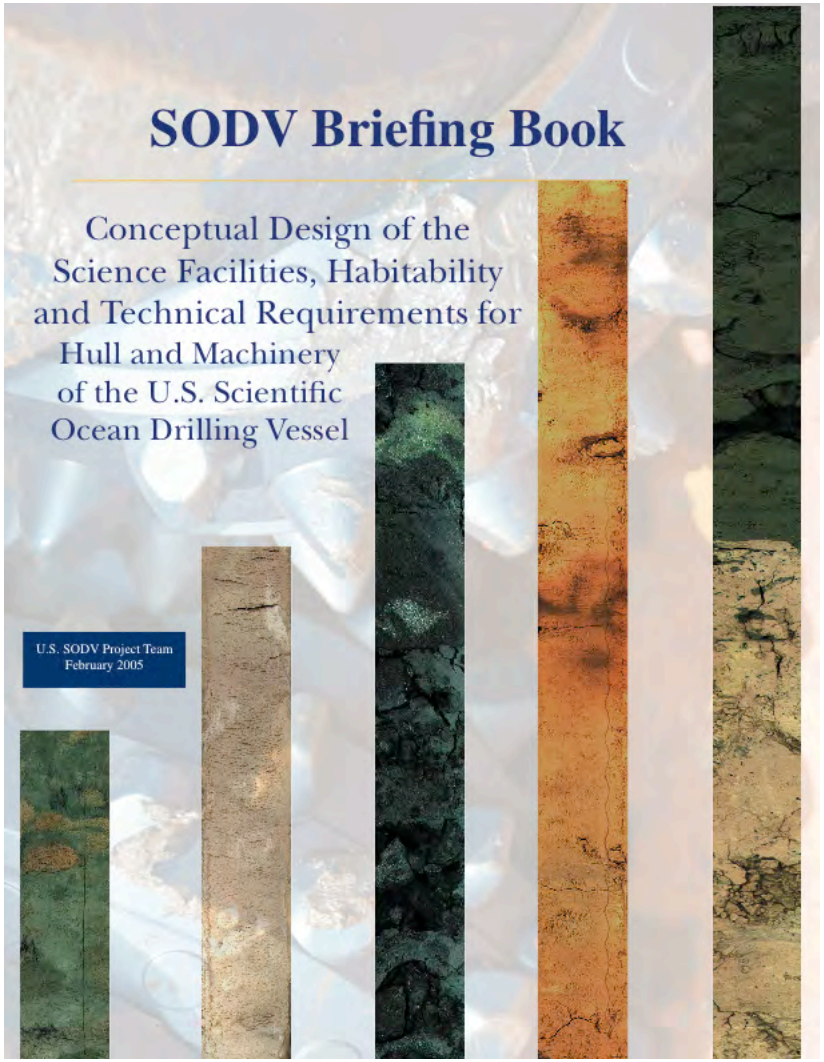
3. **The 3 CDT members were self-defined as those individuals who were able to meet to the required time commitment (July 2005)**

4. **A subset of PAC nominees were selected by the SODV Conversion team and forwarded to the USSAC nominations committee and NSF for approval (August 2005)**

U.S. SODV

Community Input:
Briefing Book

- Questionnaire responses were compiled through May 31.
- Total of 60 responses received.
- Received a final report from IODP-MI summarizing the responses of the questionnaire.
- STP also compiled an independent report on the Briefing Book.



U.S. SODV

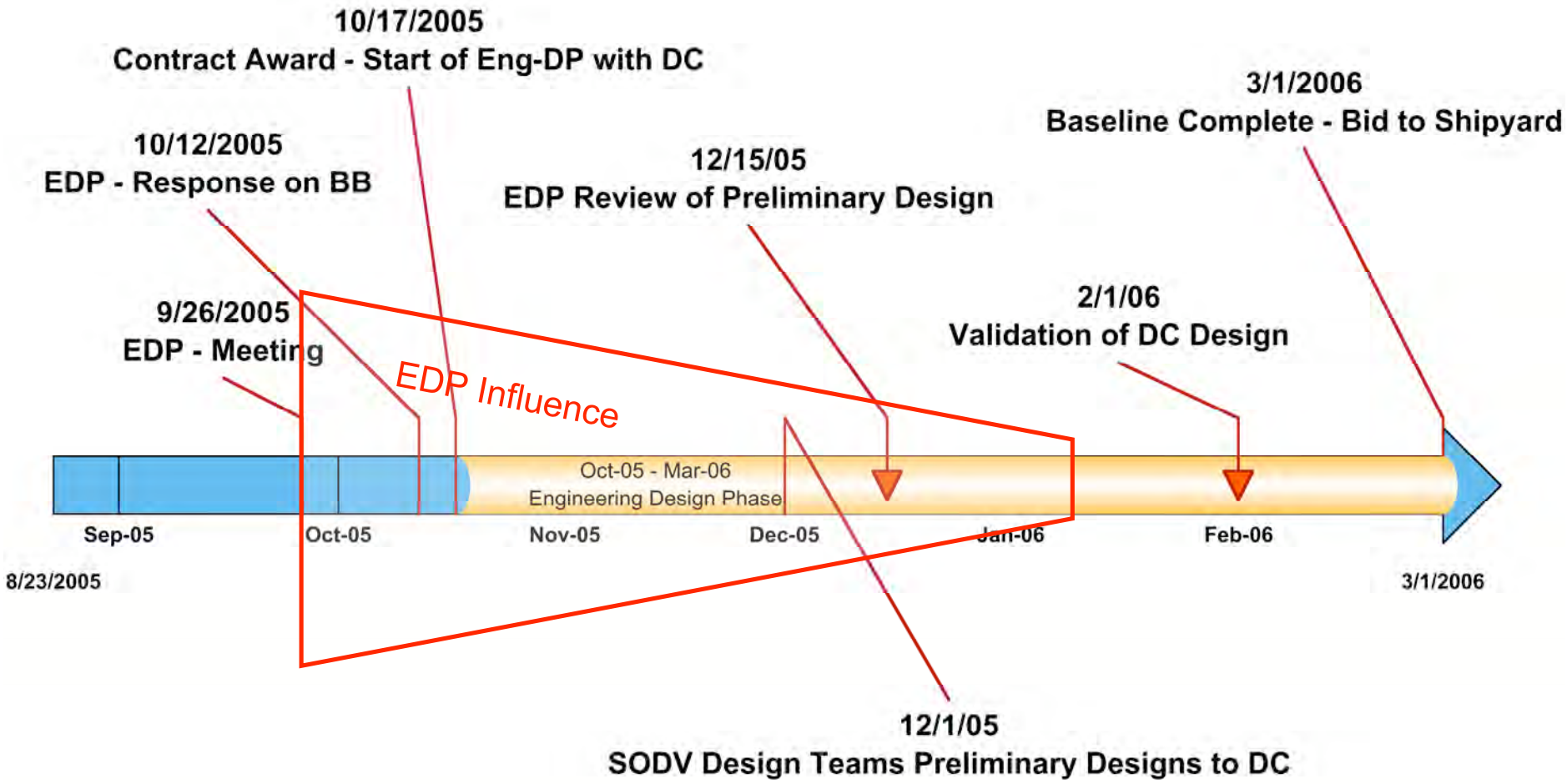
www.joialliance.org/MREFC

- **Can download all JOI Alliance preplanning documents (RFP, PEP, SODV funding profile, CDC report, Briefing Book, etc.).**
- **Can keep updated on progress of SODV Program.**

EDP Role in the SODV Project

1. Review the Briefing Book and provide a brief report summarizing EDP's response
2. SODV team will forward the Design Team's deliverables to EDP in ~6 weeks. EDP will have 2 weeks to respond to the SODV team.
3. SODV team requests that EDP formulate a list of their top 5 priorities for the new drillship with an explanation of the scientific or operational benefits.
4. SODV Point of Contact: Kelly Kryc at JOI (kkryc@joiscience.org; 202-787-1606)
5. EDP Point of Contact: TBN

2005 – 2006 EDP Time Line



WINDOW OF INFLUENCE IS SHORT!!!!

SODV – Evaluating…

- Compensation systems with regard to coring
- ROV Technology and the SODV
- CDEX modifications to IODP coring suite
- Magnetic Overprint reduction
- Drill Pipe Design
- High pressure mud system upgrade
- Increasing length of vessel (20')
- Improved Rig Instrumentation
- Subsea Camera System upgrade
- Electric Wireline for coring (real time DHM)
- Drilling Equipment upgrades – Dual Elevator system, Iron Roughneck etc.
- Intellipipe
- Slick OD Drill Pipe – in ground section only
- Streamlining hull and/or new propellers

Questions?

APPENDIX 15

Scientific Technology Panel STP

Engineering Development Panel EDP: common ground?

STP & EDP

1. STP Mandate
2. Proposal review (technology & engineering)
3. 3rd party tools

STP Mandate

- The Scientific Technology Panel (STP) …

…shall contribute information and advice with regard to handling of IODP data and information, methods and techniques of **IODP measurements** (including factors that impact measurements, such as sample handling, curation, etc.), laboratory design, portable laboratory needs, **downhole measurements and experiments, and observatories** to the SPC; through the SPC, to the Science Planning and Policy Oversight Committee (SPPOC) and IODP-MI; and, through IODP-MI, to the implementing organizations (IOs).

STP Mandate

… provide advice on scientific measurements made onboard IODP platforms, within and around boreholes, and on samples collected by the IODP and associated programs.

..develop guidelines and advice about scientific measurements, equipment, and on policies and procedures in the IODP.

…advice on databases, sample handling, curation, computers, shipboard equipment usage and needs, as well as borehole and observatory measurements, equipment, usage, **and needs**.

STP & EDP mandates

… so do we separate out development/engineering of measurements/technology between STP and EDP on the basis of:

Cost?

Physical Size?

Timescale for development?

STP & EDP mandates

And how do we ensure minimal duplication and maximum efficiency in dealing with issues?

SSEP reviews

- At the SSEP watchdog answers the question….

  Do the scientific objectives require:

  - new in situ technology or engineering, or
  - observatory monitoring, or
  - non-standard sampling procedures or measurements technology?

  If the answer is YES the proposal is referred to the STP and EDP chairs.

and STP sent a recommendation to SPC…

STP Recommendation 0507-06: Proposal review

- The STP recommends that proposals forwarded to this panel be accompanied by the SSEP review, which specifies why the proposal has been referred to STP. In addition, the proposals should be forwarded to the chair at least two weeks prior to STP meetings so that the entire panel can properly discuss them.

- *Background: This meeting was the first where proposals (3) were sent to STP by the SSEP for our input. The process was not optimal for us to give detailed input and have discussion during the meeting in Bremen. Hence the process needs to be optimized such that STP can give full consideration during its meeting of any future proposals sent to it be the SSEP.*

SSEP reviews

STP would welcome suggestions for how to work with EDP in handling SSEP reviews in a timely and efficient manner

…probably needs good routes for dialogue:
emails, phones, parallel meetings…

STP next meeting Kochi, Japan in late January

STP & EDP

1. Mandates – primarily different but with some overlap between STP and EDP, especially at similar scales of measurement, and where developments are focussed science resulting from individual proposals.

2. Proposal review (technology & engineering)
   - needs good routes for dialogue:
     emails, phones, parallel meetings…

3. IODP policy on 3rd party tools…..

... STP working on this but needs EDP input

IODP policy on 3rd party tools - SCHEDULE

- temporary policy in place

- need new long term policy
  (to include policing and insurance issues)

- STP will report to SPC October 2005

- final document at STP meeting in Jan/Feb 06

- EDP input needed