

REVCOM Meeting

IODP Expedition 301
Juan de Fuca Hydrogeology

December 9th and 10th, 2004
Washington, D.C.

REVCOM 301 PARTICIPANTS

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INTRODUCTION

IODP Expedition 301, Juan de Fuca Hydrogeology, was the first part of a multidisciplinary program designed to evaluate the formation-scale hydrogeologic properties within oceanic crust; determine how fluid pathways are distributed within an active hydrothermal system; establish linkages between fluid circulation, alteration, and microbiological processes; and determine relations between seismic and hydrologic anisotropy. The highest priority objectives of IODP Expedition 301 were achieved. Two new basement holes, Holes 1301A and 1301B, that penetrate ~110 and ~320 m into basement, respectively, were created and instrumented multi-level CORK observatories. An old CORK observatory in nearby Hole 1026B was replaced. All of the holes have multiple isolated intervals to monitor and sample pressure, temperature, chemistry, and microbiology, and will serve as observatory points for planned cross-hole experiments. Several short-term downhole experiments (logging, VSP, packer) were completed and high quality sediment and rock samples that will be used in lab-based studies of physical properties, microbiology, geochemistry, petrology, and alteration were recovered.

The REVCOM 301 met on December 9th and 10th at IODP-MI headquarters in Washington DC to review the operational aspects of Expedition 301. The review concentrated on “lessons learned” from the expedition with an emphasis on “what should be done differently in the future.”

The committee review was based upon confidential reports submitted by the US Implementing Organization (USIO) and Andrew Fisher (Expedition 301 Co-chief scientist). In addition, Adam Klaus (on behalf of the USIO) and Andrew Fisher presented summaries of these confidential reports.

Following these oral presentations, the review committee identified specific pre-cruise, syn-cruise, and post-cruise topics for discussion. The Committee spent the remainder of the first day of the meeting discussing these issues and developing specific recommendations for the USIO, for IODP-MI and for the Science Advisory Structure. On the second day of the meeting, the committee reviewed the recommendations and came to a consensus on each one. These recommendations are listed in the next section of this report.

Finally, the committee was asked by IODP-MI how this operational review could be improved for future expeditions. These suggestions are listed at the end of this report.

RECOMMENDATIONS BY REVCOM 301

REVCOM 301 identified four main areas of improvement for future operations including:

- General Science and Lead Time Planning
- Engineering Support
- Observatory Management
- Community Awareness and Education

While the primary focus of REVCOM 301 was on USIO (JOI Alliance) operations during Expedition 301 (with an eye toward future riserless operations) it became apparent to all the participants that many recommendations would be equally valuable for other IODP operators, to IODP management and to the Science Advisory Structure. As such, many recommendations are also directed to these entities.

A) General Science Planning

The REVCOM participants identified the need to (1) significantly improve the lead time for expedition preparation, (2) improve the level of communication between the IOs and co-chief scientists/proponents/3rd party tool designers, and (3) ensure that the Science Advisory Structure, the IOs, and IODP-MI are all aware of significant changes in operations as proposals move from ranking to scheduling. The following recommendations resulted:

Recommendation 301-01

Science Advisory Structure must move toward a system of ranking proposals 24 months prior to the start of a Fiscal Year to insure proper lead-time planning for all expeditions. Some drilling expeditions may require less lead time and this will allow some flexibility in scheduling (for example, if POC or SOC funding falls short of expectations), but longer-term planning will allow scientists to consider operational issues, secure external funding for developments, etc.

Recommendation 301-02

IOs need to identify funds in Annual Program Plan budget to facilitate regular meetings with 3rd Party tool designers/builders/proponents.

Recommendation 301-03

To increase the level of IO and proponent interaction during the planning process for engineering-intensive expeditions, hold multiple planning meetings utilizing the Planning/Integration/Compatibility (P.I.C.) concept. These meetings must have formal minutes. Roles and responsibilities of IOs, proponents and 3rd party tool designers/builders need to be identified, documented and communicated. A “Project Handbook” defining the planning steps for an expedition (with associated timelines for implementation) should be prepared and utilized during this planning process.

Recommendation 301-04

SPC and OPCOM should be kept aware of fundamental changes to operational plans that may occur as part of the planning process once an expedition has been scheduled. Some changes are to be expected as a result of normal planning activities, but these should not involve deviations from primary scientific objectives, as described in the proposals ranked by the SAS, scheduled by OPCOM, and forwarded to the IO for implementation.

B) Engineering

Engineering issues were a dominant theme during REVCOM 301. Based upon the Co-chief scientist and Operator reports and subsequent discussion by the REVCOM 301 participants, it became apparent that the level of engineering support for Expedition 301 was inadequate. A number of factors combined to exacerbate the problem, including limited lead time in program preparation (due to a compressed ranking and scheduling time frame) and recent turnover in TAMU engineering personnel. The following recommendations were made to address the level of engineering support for future operations:

Recommendation 301-05

For engineering intensive expeditions, IOs need to determine shipboard engineering staffing needs first and then fill in remaining berths with scientific staff. Concurrently, IODP-MI to discuss with Lead Agencies (1) integration time for maintaining country balance with respect to staffing (2) reducing country/consortia staffing levels to facilitate proper shipboard staffing of engineers on bunk-limited platforms.

Recommendation 301-06

For engineering intensive expeditions like Expedition 301 USIO should assign the appropriate level of dedicated Engineers or Engineering technicians to pre-cruise and syn-cruise activities.

Recommendation 301-07

IOs should incorporate tests of functionality and compatibility of all operational systems (e.g., casing seals, hangers, coring systems, etc.) as a standard operating procedure into two-year project management plan for expeditions. Report and documentation of tests should be part of regular planning P.I.C. meetings between IOs and co-chiefs/proponents

Recommendation 301-08

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

Recommendation 301-09

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

Recommendation 301-10

Expedition 301 Review Committee strongly encourages IOs to continue and expand interaction with drilling contractor personnel in pre-expedition planning and during shipboard operations.

Recommendation 301-11

Expedition 301 Review Committee affirms importance to IOs of documenting procedures for CORK installation, casing installation, borehole seals, etc. The REVCOM 301 participants strongly encourage cross-training among IOs for these procedures.

Recommendation 301-12

To improve ability to achieve critical objectives and investigate operational problems:

- 1) USIO to improve Rig Instrumentation System sensor reliability and data access
- 2) USIO to investigate lease/purchase of through-the-pipe TV camera system
- 3) USIO to consider replacement of current subsea camera and image capture system

Recommendation 301-13

The IOs should investigate methods to increase flexibility of technical personnel to support engineering or other non-standard operations during shipboard operations.

C) Observatory Issues

The third major area of discussion during REVCOM 301 centered on observatory management and CORK development/management plans. Participants saw the need for a more coordinated process of CORK management, data and legacy hole documentation, integration of plans with other initiatives and engineering development. The following recommendations resulted from this discussion:

Recommendation 301-14

IODP-MI should take the lead in working with other organizations/programs/initiatives (e.g., OOI) to coordinate development of legacy documentation for observatories.

Recommendation 301-15

IODP-MI to work with other science organizations, funding agencies and IOs through workshops, detailed planning groups, and task forces to (1) encourage the standardization/modular design of CORK systems and (2) ensure legacy/design documents are available for publicly funded development.

Recommendation 301-16

IODP-MI to set up a Task Force for Observatory Management, which will have an initial emphasis on CORK Management. A starting point for this Task Force would be a review of REVCOM 301 recommendations. Suggested Mandates/topics for this Task Force include:

Cork Engineering

- Development
 - Who should do this?
 - How will testing be accomplished?
- Technical Support
- Who will provide this?
 - Shorebased
 - Shipbased
 - Spare parts
- Other engineering tasks
 - Integration with 3rd party tools
 - Feasibility review of proposals
 - Standardization of designs and components
- Testing after deployment
 - When should this be done?
 - Should there be a testing plan for each deployment with a submersible?

Cork Documentation and Data

- What is documentation is required?
 - Drawings
 - Instruction manuals
 - Visits to CORK
- Data archiving
 - What is moratorium period?
 - Who will manage these data and ensure that it is delivered?
 - Who will formulate the data structure?
- Where will the repository be located?
 - Drawings
 - Data

CORK Management

- Later experimental proposals
 - Who will evaluate these
 - What will be the criteria?
 - Concern about the effect of active experiments on long-term monitoring
- Connections to the Ocean Observatories Initiative
 - Are there issues that IODP should address to facilitate this?
 - Opportunities for CORK proponents?
- Consider report of Borehole Observatory PPG

Recommendation 301-17

Evaluation of the operational success of a CORK expedition is difficult until some measurements are conducted and the results found to be satisfactory. The Observatory Task force should develop objective measures to evaluate the integrity of CORK installation.

D) Community awareness and education

During the course of the meeting, REVCOM 301 participants became aware of several areas where IODP (i.e., IODP-MI, the IOs, SAS) needs to provide the ocean drilling community with more information or provide a means to access information. The areas are broad-ranging, from specific details concerning design standards for 3rd party tools to a more general understanding the scientific priorities of individual expeditions.

The following recommendations resulted from these discussions:

Recommendation 301-18

IODP-MI and IOs to work together to create mechanisms to improve community awareness and education on:

- 1) Standardization of design of 3rd party tools
- 2) Understanding the prioritized science in prospectus
- 3) Understanding risk/benefits/costs of tool usage in order to make better informed decisions about operational tradeoffs.
- 4) Scientific needs of individual expeditions to improve staffing discipline allocations on expeditions

Recommendation 301-19

Strongly encourage IOs to respond to laboratory reviews submitted by shipboard scientific party.

REVCOM IMPROVEMENTS

REVCOM 301 participants made the following suggestions to IODP-MI regarding the logistics of future REVCOM meetings.

1) Develop a pool of engineers for the review process

To provide consistency in the review process from expedition to expedition a pool of experts (engineers, operations managers, etc) should be established. This group of experts would develop a familiarity with IODP and its operations and thus could provide more consistent review of operations as well as assist IODP-MI in assessing how well recommendations have been implemented over time. In addition, a pool of experts would allow IODP-MI to choose the expertise needed for a particular review and not overburden any two or three individuals.

2) Provide IO Operations report to committee members

The IOs should provide their detailed Operations Report to the committee. These reports typically provide the necessary details that REVCOM industry experts would find valuable in assessing operations.

3) Provide Co-chiefs with REVCOM reports

In order to provide consistent and useful input from the co-chief scientists with respect to operational reviews, the co-chiefs should be sent previous REVCOM reports. Examples of previous reports will allow co-chiefs to understand the level of detail they need to provide to REVCOM. In addition, they can make an assessment, first hand, as to how well many of the recommendations have been implemented. IODP-MI should provide a follow-up phone call and/or email to the co-chief scientists once they are at sea to encourage them to keep detailed notes on operations and suggested improvements. These procedures will be implemented beginning with Expedition 305.

4) Define committee membership

The first two REVCOM meetings consisted of IODP-MI personnel, IO representatives, outside experts and scientists knowledgeable about the particular expeditions. As many of these participants will vary from meeting to meeting it is important to identify who will be the core group (or perhaps “executive committee”) for each REVCOM. IODP-MI will determine this membership issue before the next REVCOM meeting

5) Allocate time for Executive Session

All REVCOM meetings should have an “Executive Session” without the co-chief scientist(s) and IO representatives. Recommendations from this Executive Session will be presented to all REVCOM attendees prior to the end of the meeting.

6) Create more detailed Agenda

A more specific agenda has been requested by many of the participants. For future meetings, IODP-MI will provide a more detailed agenda well in advance of the meeting.

7) Develop a Follow-up procedure

A recommendation was made for IODP-MI to establish a formal follow-up procedure to assess how well the recommendations have been implemented. IODP-MI will develop this procedure and have it in place by the next REVCOM meeting.

8) Add extra meeting day for multiple expedition REVCOM meetings

When reviewing more than one expedition (e.g., the upcoming 304/305 and 303/306 REVCOM meetings), an additional day should be allocated to the agenda.