

REVCOM Meeting

Arctic Coring Expedition
IODP Expedition 302

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Washington, DC

REVCOM 302 PARTICIPANTS

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INTRODUCTION

The Arctic Coring Expedition (ACEX) was the first mission specific platform (MSP) expedition led by the ECORD Science Operator (ESO) in the context of IODP. This complex operation was the first attempt to drill ice-covered areas in the region and required an armada of three ships: the drillship (Vidar Viking) was protected by a conventional icebreaker (Oden) and a nuclear icebreaker (Sovetskyi Soyouz) from drifting ice. A total of 495.5 m was drilled in 5 holes, with an average recovery of 68%, representing a composite section of the 57 Ma old sediment sequence deposited on the Lomonosov ridge.

The REVCOM 302 met on October 23rd and 24th at IODP-MI headquarters in Washington DC to review the operational aspects of Expedition 302. 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 ESO and the Expedition 302 Co-chief scientists (Jan Backman and Kate Moran). In addition, confidential statements from eight ACEX scientists were reviewed and taken under consideration by the REVCOM 302 participants.

The meeting began with oral presentations by Kate Moran and Dan Evans summarizing the Co-Chief Scientist and ESO 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 ESO, 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.

RECOMMENDATIONS BY REVCOM 302

REVCOM 302 identified several main areas of improvement for future operations including:

- General Science Planning
- General Operational Planning
- Roles and Responsibilities
- Procedures and Policies

While the primary focus of REVCOM 302 was on ESO MSP operations during Expedition 302 (with an eye toward future MSP 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. The recommendations in this document are made with an eye toward standardization of the planning and execution of MSP operations. MSP operations by their very nature have many unique aspects, but the development of a “standard” process and “standard” personnel roles and an understanding how each MSP operation deviates from those standards provides valuable information to proponents, operators, management and the scientific community

A) General Science Planning

REVCOM participants came to a clear consensus that the pre-cruise planning process for MSP operations needs to be considerably improved by ESO, the SAS, and IODP management (IODP-MI). A more rigorous prospectus process is required, one that defines a timeline for implementation of tasks including bidding, contracting, staffing, pre-cruise and post-cruise meetings. The recommendations detailed below provide a mechanism that can be utilized to improve this process.

Recommendation 302-01

The prospectus is the single IODP plan that specifically describes the science goals of the expedition and how these goals will operationally be achieved. Prospectus development of an MSP expedition should follow the traditions of scientific ocean drilling. Major elements of this process are outlined below:

- 1) The proposal or Complex Drilling Proposal (CDP) planning documents should form the basis for the scientific portion of the prospectus.
- 2) The Co-Chief scientists represent the proponent group, science party, and the IODP science community. Co-Chief scientists should be selected as soon as possible after expedition has been scheduled.
- 3) The Co-Chief scientists and Staff Scientist are co-authors of the Prospectus. The Co-Chief scientists lead the scientific portion of the prospectus, obtaining input from the proponents of the proposal or CDP members, the scientific panel structure, OPCOM, and the operators and their subcontractors. This recognizes the fact that the operator has fiduciary responsibility for producing a prospectus, but it is the scientists who have the responsibility for defining the science of an expedition. The scientific portion of the prospectus should also outline shipboard and shore based sampling strategies that are within the purview of the scientific party.
- 4) The Staff Scientist leads the operational portions of the prospectus in consultation with its subcontractors, the funding agency, OPCOM, the panel structure, the co-chief scientists, and the proponents/CDP members. This includes all aspects of shakedown, equipment/development and pre-cruise logistics.
- 5) Shipboard and downhole measurements will be outlined in the prospectus, recognizing the wide range of measurements possible on varying MSP operations. The operator is responsible for providing these measurements through Science Operations Costs (SOC), but should do so in close consultation with the Co-Chief scientists, the science planning structure (specifically SciMP reporting through the SPC), and OPCOM. It is recognized that planning and implementation of shipboard and downhole measurements on MSP operations are particularly difficult tasks that should be approached with close interaction and flexibility on the part of the operator and co-chief scientists.
- 6) The prospectus must:
 - include drilling strategies, with time estimated for all components of operations (and the level of confidence of the time estimates).
 - include optional (alternate) downhole measurement strategies with associated time estimates.
- 7) The following aspects of cruise preparation/planning need to be adequately conveyed to OPCOM and the co-chief scientists:
 - a timeline for implementation tasks including bidding, contracting, staffing, pre-cruise and post-cruise meetings.

- a schedule for all aspects of the expedition, including shakedown (should one be required), tool development schedules and test dates, and equipment acquisition plans.
- roles and responsibilities of the operations team.
- approximate costs (or relative costs, if absolute numbers cannot be shared) for various operational components.

Recommendation 302-02

The Operators need to maintain flexibility in the development of the laboratory environment for each MSP operation. Proponent and SCIMP proposals regarding alternate approaches to obtaining a minimum set of measurements should be incorporated at early stage in the pre-cruise process.

B) General Operational Planning

The REVCOM participants came to a consensus that many of the operational difficulties resulted from the lack of time/funding for adequate testing and subsequent modification of equipment. Proper technical and environmental/safety feedback between the operators, OPCOM/IODP-MI, and the proponents/Co-Chief scientists was inadequate during the lead-up to the ACEX operation. The following recommendations were made to improve operational planning for future MSP operations.

Recommendation 302-03

The MSP Operators should incorporate adequate shakedown time (with associated costs) into operational plans forwarded to OPCOM. The decision to forego a shakedown exercise should be relayed to OPCOM for a discussion of operational ramifications of this decision.

Recommendation 302-04

The MSP Operators (in conjunction with IODP-MI/OPCOM) need to develop a timeline for responding to safety and environmental issues raised by EPSP and the operator's safety panel. The MSP Operator must prepare a written response (submitted to OPCOM and EPSP) for operator variations from EPSP protocols.

Recommendation 302-05

OPCOM should routinely evaluate the operator's state of readiness with respect to equipment procurement, development or modifications. MSP Operators must demonstrate to OPCOM (or its designated scoping group) that sufficient expertise is available to operate drilling, coring, and scientific tools.

Recommendation 302-06

The MSP Operator should investigate alternate pipe severing capabilities to explosives. A report on these alternate capabilities should be forwarded to OPCOM.

Recommendation 302-07

The MSP Operator needs to improve Offshore Database cross-platform functionality to supply basic drilling and coring information (e.g., depth, core, section, etc) and output of standard core logging equipment (e.g., multisensor track) to the science party. The MSP Operator should utilize knowledgeable members of scientific community to test functionality of these systems.

C) Roles and Responsibilities

The REVCOM 302 participants came to the clear consensus that certain roles (and responsibilities) need better definition for future MSP operations. Clarification of duties and communication pathways will help to resolve many pre-cruise and syn-cruise issues.

Recommendation 302-08

The MSP Operator should develop a standardized MSP personnel document with generic roles and responsibilities defined for personnel such as the Drilling Superintendent, Operations Superintendent, and drilling crew. This document should be customized for each expedition.

Recommendation 302-09

The role and responsibilities of the MSP Staff Scientist need to be more clearly defined. This person historically has multiple roles including that as (1) a representative of the Operator, (2) a representative of the drilling program, and (3) a integral member of the science party. The MSP Operator should develop an exchange program with the other Implementing Organizations (IOs) to increase their level of understanding of the role and develop standards for the role.

D) Procedures and Protocols

The ACEX expedition was developed and planned during a time when IODP was just starting and a Central Management Organization (IODP-MI) was not fully operational during most of this planning. As a result, many procedures and processes were not standardized and/or properly codified, leading to confusion and miscommunication between the operator and scientific community. The following recommendations were made to increase the standardization of processes in several pre-cruise, syn-cruise and post-cruise areas so that all parties better understand the expectations placed upon them.

Recommendation 302-10

The level of communication between MSP Operators and scientists can be improved by instituting regular meetings between the Drilling Superintendent, Operations Superintendent, Co-chief scientists, Staff Scientists, logging operator, and curator.

Meeting times should include:

- Port-call meeting to discuss overall plan for expedition, roles and responsibilities, modifications to plan, etc.
- pre-site meetings to outline the expected operations, safety issues, sampling, downhole operations and optional drilling scenarios.
- Post-site meeting to review operations and discuss new operational plans if necessary.
- Daily briefings should be held if it is logistically feasible for all parties to meet.

Recommendation 302-11

IODP-MI should work with operators and SCIMP to develop curatorial guidelines that incorporate issues specific to MSP operations.

Recommendation 302-12

MSP Operators should utilize protocols and procedures developed by IODP-MI Education and Outreach Task force for pre-, syn-, and post-cruise outreach to the media, scientific community, and general public.

Recommendation 302-13

IODP-MI should directly send out and receive expedition evaluation questionnaires from scientific party. IODP-MI should compile questionnaire results, distribute results to Operator, and respond to scientists.

E) Overarching Recommendations

Several recommendations made by the REVCOM 302 participants did not fit into specific categories and/or are overarching in nature. These recommendations are presented below:

Recommendation 302-14

IODP-MI, as the CMO, is the overall manager of operations and conducts this management with the advice and consent of the relevant funding agencies, the IOs and the scientific advisory structure.

Recommendation 302-15

To provide a consistent basis for expedition evaluation, IODP-MI needs to develop specific review/evaluation goals with a focus on time period of evaluation, expectations of science community, limitations of operator, and risk factors. Technological difficulty of an expedition must be taken into account.

Recommendation 302-16

The MSP Operators should maintain a cooperative attitude of communication and interaction with the scientific community.