Project Management System Working Group (PMSG)

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Recommendations for the Integrated Ocean Drilling Program (IODP)

Prepared for
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Executive Summary

A tentative Project Management System (PMS) has been prepared for use in IODP projects (normally drilling legs). It consists of a phased approach, with reviews at specified intervals providing the assurance that the proponents are ready to proceed further with planning. It makes maximum use of current (ODP) practices and allows for flexibility in application, depending on the platform selected for specific projects (Riser, Riser-less or Mission-specific) and the complexity of the planned activities.
The main objective of the PMS is to provide IODP management and its funding bodies with assurance that minimum acceptable standards are met with at all stages of project

planning, that value for money is achieved and that all aspects related to the operations are considered, including health, safety and environmental issues.
It is recommended that the PMS document presented here should be used as a basis for pilot application for one of the first IODP projects (eg Nantroseize). The proposal is founded to a large extent on standard industry project management practices developed in recent years, and the extent to which it can be implemented in practice in IODP needs to be confirmed with a "road-test". After a relatively short interval (say, 18 months) the PMS performance should be evaluated, and modifications proposed as appropriate.

Introduction

Over the past 35 years, DSDP and ODP have proved to be hugely successful international research programs based on worldwide ocean drilling, and have made major contributions to the scientific understanding of planet Earth. This success has been in large part due to the enthusiastic participation in the program of the scientific community in many countries and the responsiveness of the DSDP/ODP programs to their various needs. We assume that in the framework provided by the Initial Science Plan, the paramount objective of IODP will be to continue to serve the scientific needs of the international community, as prioritised by SPC.

In contrast to ODP, IODP will involve multiple platforms operating concurrently, comprising a riser and non-riser drilling ship as permanent program elements, and a variety of "mission-specific" platforms (MSPs) to be chartered according to the needs of the scientific objectives. Many IODP programs will involve issues dissimilar to those for which ODP has built up an enviable expertise, for instance drilling in pressured/potentially petroliferous environments, in shallow waters, in extreme climates, etc. This means that IODP will be much more challenging from an operational management point of view than either DSDP or ODP have been. During the past decades, the energy exploration industry has developed and made use of processes for the efficient execution of complex operations in difficult environments, and it was widely felt that (i) their expertise in this area should be accessed and (ii) a project management system (PMS), making use of experience built-in to those currently employed in industry, should be prepared for and modified for use in IODP.

With this in mind, a proposal was submitted to iPC at the meeting held in Austin, Texas in March 2003. This proposal, iTAP recommendation 03-04, was passed on 20 March 3003 as iPC Motion 4-13 (by 15 votes with 1 abstention), and mandated a small working group to prepare a proposed PMS for consideration by the IODP Central Management Organization by early June 2003. The motion, which establishes the terms of reference for the group, reads as follows:

> "The iPC accepts iTAP recommendation 03-4 and establishes an IODP working group that will develop a project-based management planning system. The group will include members from iTAP, iILP, iPPSP, iPC or SPC, the OPCOM working group, CDEX and industry project managers. The system should be developed by June 2003."

The working group sees its main objective to prepare a PMS that will enable IODP, and particularly OPCOM, to assure delivery of the scientific objectives, to the greatest extent possible given operational and fiscal constraints. We thus see the PMS as a procedure guideline to ensure safe and efficient execution of the scientific program, primarily for use by project teams, as well as by OPCOM and other IODP management groups in their supervisory roles, for the benefit of the international scientific community.

Composition of PMSG

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Tim Byrne	iSSEPs	University of Connecticut, USA
Keir Becker	SCICOM (ODP)	RSMAS, University of Miami, USA
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* = chair

Philosophy

The working group made the assumption that a PMS for IODP should accommodate the following criteria:

- It should satisfy a paramount requirement to deliver IODP science objectives as set out in the ISP, as much as possible according to SPC priorities and in a safe, cost efficient and environmentally-friendly manner
- The resulting document should be thorough, but simple, concise and intuitive.
- It should not be too prescriptive, rather sticking to “minimum acceptable needs” and allowing for flexibility in application for different platforms and by the various national authorities.
- It should satisfy the needs of (i) overall planning for synchronous operations with multiple platforms and (ii) the needs of individual well plans/design.
- It should model itself on current project management systems, as developed in industry, to the degree that such systems can be adapted to meet IODP needs.
- As much as possible, it should follow existing (ODP) processes and incorporate existing procedures (or those currently in development).
- It should include a clear process map, indicating the steps needed to be followed, including the stages at which support / review and approval should be sought.

Needs for a Project Management System in IODP

An IODP PMS is needed to ensure that all defined procedures are followed and that very close coordination between proponents, SAS and contractors is assured. As noted above, the activities of IODP will be extended to marine environments in which ODP have not operated, but where the energy industry has carried out extensive operations. Access to industry experience is likely to be crucial, both in terms of this experience, but also in

terms of management and planning of complex operations. However, as the primary goal of IODP is to pursue pure scientific objectives, industry experience must be adapted to IODP needs.

In view of the up-coming operational schedule for the multiple drilling platforms of IODP, an urgent need is seen to establish terms of reference for complex project planning. Such a foundation is needed to enable detailed planning groups (DPG's) or project groups, to define the needs for the various activities (leading to riser, non-riser and MSP legs) and commence planning for drilling. Currently, IODP needs processes to underpin:

(i) Design and maintenance of a schedule for the up-coming complex drilling programs, including the provision of advice on efficient scheduling, logistics and planning.

(ii) Design and planning for individual projects (legs or wells), including well engineering, sampling requirements and down-hole program, etc.

Some programs, especially those for the riser vessel, but also some MSP and non-riser programs, which may be part of complex drilling programs or CDPs, will require more and longer planning steps than others. The current PMS initiative is intended to provide a management framework in support of planning for all of these initiatives, and must therefore be flexible enough to accommodate all such situations.

Existing elements of the process

Existing processes have evolved during more than 2 decades of DSDP and ODP activity and work well for planning of the single, non-riser platform operations. As much as possible, the existing procedures developed by, or being developed by, each group should be integrated into the proposed IODP PMS. These procedures are as follows and, unless stated otherwise, we recommend that they continue unchanged in the PMS, each group being responsible for carrying out and reporting on its task at regular and defined intervals:

- **SAS (Science Advisory Structure) Office**: Unsolicited pre-proposals and proposals are submitted to SAS, who forward them to SSEPs panels for evaluation of their scientific objectives and merits. When ready, **SAS EA** incorporates them in the overall IODP science plan. In the future, the SPC Chair and Vice-Chair, working with the SAS panels and OPCOM, could coordinate the evaluations and advice received.
- **SSEPs (Science Steering and Evaluation panels)**: SSEPs are responsible for the scientific evaluation of submitted proposals and their evolution to a stage at which they can be incorporated in the program plan. In many cases, this involves an iterative process of concept and documentation improvement. Prior to submission to SPC, projects are grouped according to the following criteria:
  1. consistency with the Initial Science Plan
  2. quality of the scientific hypothesis or objectives
  3. breadth of scientific impact
  4. probability of success (i.e., of achieving the scientific objectives).

  When a full proposal stage has been reached, and it is considered by SSEPs to be mature and ready for operational planning, it is sent out for external review, grouped and forwarded to SPC. Eternal review must taken place, at least once,

before a proposal can be sent to SPC for ranking. Timing may vary from about 1.5 years to 3 years, but in some cases may be longer.

- **SPC (Science Planning Committee)**: Proposals forwarded from SSEPs are ranked at bi-annual SPC meetings, and forwarded to advice panels, such as PPSP and SSP for evaluation of operational requirements, e.g., safety and site-preparation.
- **PPSP (Pollution Prevention and Safety Panel)**: PPSP currently maintains a 3-tier risk-ranking framework:
  1. low risk – young ocean crust with sedimentary cover < 1 km - handled by e-mail
  2. moderate risk – handled as for current ODP legs
  3. high risk – areas of thick sediments, where subsurface fluid flow or hydrocarbons can be expected - requiring the route proposed for riser drilling (see below)

  For each expedition, PPSP nominates a "watchdog" to facilitate the evaluation process. To satisfy requirements, PPSP requests general location data, a summary of potential hazards, a detailed well prognosis, well drilling and evaluation program, planned discharges (if any), special metocean data (if appropriate), etc.

  A special process is proposed for riser sites: 3D seismic is recommended and a 3-step review process is proposed: (i) **detailed planning workshop** with broad representation from scientific and planning groups, to be held within 6 months of SPC project approval (ii) **preview by PPSP** to identify issues that may need to be addressed, to be held 6 – 18 months following (i) – the deliverable is a list of further work/data required (iii) **formal safety review by PPSP**, to be held 6 months to a year after (ii), at which a final recommendation on drill site(s) and depth(s) of penetration is given. In total, a three-year period will probably elapse between SPC approval and completion of the safety review. A **post-drilling review** is also recommended. As part of this process and at any time, PPSP may recommend adjustments to the final location or well total depth.
- **SSP (Site Survey Panel)**: Upon receipt of a proposal, SSP evaluates the readiness of the seismic and other site data for adequate scientific characterization (NOT SAFETY) of the objectives (note that SSP has a chance to look at proposals for site-survey readiness BEFORE they go to SPC for ranking). They classify the data into three categories:
  1. most or all of the required data in the IODP data bank – ready to proceed
  2. data exists, but is not yet in the data bank – probably ready for operations within 2 years
  3. essential data not accessed – probably not ready for drilling for at least 2 years
- **SciMP (Scientific Measurements Panel), TAP (Technology Advice Panel), ILP (Industry Liaison Panel):** These panels provide advice to IODP and project proponents on short term (project-specific) and longer-term (approximately 5 - 10 years) needs, primarily for scientific measurement and drilling/operations technology (down-hole services, completion techniques, etc). Technical challenges associated with anticipated future science objectives form a major area of concern. The ILP provides a link to developments in Industry
- **SPC/EA/SAS Office**: These are responsible for the development of and success of the annual science plan, which is then transmitted to the Science Planning and Policy Oversight Committee (SPPOC) for approval and finally to the CMO for

implementation. They trigger commencement of operational planning by the IOs and centralized management, through OPCOM (see below).

- **PPGs (Project Planning Groups):** These are convened on an *ad-hoc* basis to study and report on scientific or operational themes as needed
- **OPCOM:** OPCOM is responsible for recommending the optimal means to implement IODP drilling projects. Following SPC ranking, OPCOM will
  1. consider which platform(s) is(are) most suitable to execute the project
  2. indicate budgetary and logistical constraints
  3. coordinate advice from the various SAS panels on safety, environmental and technological factors
  4. develop options for the drilling schedule in the currently planned year(s) and for future years, as necessary for CDPs.
  5. monitor and, as necessary, modify the short- and long-term drilling programs.

  OPCOM thus acts as the bridge between science planning and operator and management implementation, responsible for deciding which platform(s) will carry out the project and initial scheduling recommendations based on SPC prioritisation. OPCOM plays a central role in operational planning.
- **IOs (Implementing Organizations):** These carry out the actual drilling operations and should supervise any other operational needs (e.g., sub-contracts for site-specific seismic surveys necessary for either engineering concerns or safety) during the project life. To be considered, IOs have to satisfy IODP selection criteria. IOs carry full responsibility and accountability for operational performance, and will do so according to their internal procedures. In IODP, these will include extra safety and environmental standards (however, each IO will have its own safety panel, for instance). In IODP, we recommend that the formal links between IOs and SAS panels should be strengthened (e.g., through membership of Project Management Teams and/or DPGs). In exceptional cases, for example when considering safety and pollution prevention, IOs may override recommendations from IODP advisory panels.

Recently, **CDEX** has prepared an operational planning framework for *Chikyu* (riser-drilling) operations: The component steps essentially follow the above process, but the operational planning activities have been clustered into planning phases with specific timing (total approximately 4 years), as follows:

- "pre-planning": proposal submission, consideration by SSEPs and ranking by SAS.
- Phase 0: 17 months: Planning and preparation for seismic data acquisition, followed by data acquisition, processing and interpretation/evaluation
- Phase 1: 13 months: A second and final phase of seismic data acquisition, processing and interpretation
- Phase 2: 22 months: Drilling planning and budget preparation (including project review), material/supply ordering, selection of contractors, permit acquisition, establishment of local supply base. Final HSE (health, safety and environment) audit.
- Phase 3: Drilling operations.

The above process explicitly recognizes the enhanced science and safety requirements needed to support riser-ship drilling, and the seismic acquisition that underpins it. It is

supported by a decision-making tree for operational planning, which is broken down into six phases, as follows:

(i) Pre-survey, essentially definition of objectives and desk study of existing data
(ii) Survey planning, where further seismic, seabed or Metocean data are required
(iii) Survey operations, during which such surveys are carried out
(iv) Onshore data processing
(v) Interpretation and reporting, when results are presented to operators
(vi) Drilling and post-drilling operations

The extent to which the above is proponent responsibility and how much of it is borne by the IOs may vary. Currently, only site-specific engineering and safety-related seismic surveys are IO responsibilities and a POC program expense.

Industry project management

Industry project management standard practice is designed to ensure confidence in both decisions supporting an activity and subsequent execution of a project, so that the stakeholders (including the funding bodies) are assured that risks and uncertainties are understood and acceptable and that objectives an be achieved within budget. The processes used provide a simple, but thorough means to ensure that all of the important issues that could impact a project are considered at appropriate stages, satisfactorily addressed and included in the operational plan. Movement from one phase to the next depends on approval from a review panel convened to specifically endorse "readiness to proceed". Some of the issues that need to be addressed at each stage are noted below

- Concept-building and appraisal
    - Is the project worth carrying out and is it feasible?
    - Have all reasonable alternatives been considered and evaluated?
- Selection of project (selecting the concept)
    - Are the steps in the process defined?
    - Are the data needs (e.g., for site preparation/safe drilling) adequate?
    - Are the staff needed to realize the project available and ready?
    - Are reporting relationships understood and unambiguous?
- Definition of project
    - What is the basis for design and the project specification?
    - Does the operational plan look realistic and achievable?
    - Have all the collateral issues been considered and understood?
    - Are contingency plans in place?
- Execution of planning
    - Finalize design and prepare for operations
    - Individual well and multi-well/platform operations
- Operation of the project activity
- Evaluation of the operational performance
    - Is there a context for operational learning?
    - Were the scientific objectives met, etc.?

Naturally, IODP will not be involved with several aspects of this process, as industry projects cover all aspects of E & P activities from initiation to commencement of production. Nevertheless, these generic project stages are equally applicable to IODP's areas of concern, from idea creation to successful completion of an ocean drilling expedition or project. One important element is that, in industry, the responsibility and

accountability for a project will typically remain with one group throughout its history. We recommend that as much as possible this is replicated in IODP, so that although responsibilities are spread across number of organizational groups, a single project coordination group exists (often comprising proponents and others in a DPG). This means that a high degree of clarity will be needed in an IODP PMS.

Need for independent review

In industry, the various phases of a project are separated by "milestone reviews" or "tollgates", during which objective and independent groups evaluate the actions taken by the project team and their plans for the next phase(s). The deliverable of such reviews is a statement of "Permission to proceed" (or not). The release of funds to execute the next phase depends on and follows such reviews.
The topics covered in milestone reviews are typically those specified in the previous section, comprising elements of "look-back" (what has been achieved, are the objectives clearly stated?) and "look-forward" (are you ready and prepared to accomplish the next phase efficiently?). Some review types that would be relevant to IODP are listed below:

- **Milestone reviews**: at the end of each phase, "permission to proceed" is sought to
  - ensure that elements of the project planning are fully addressed and balanced (checklists could be prepared for this)
  - define risks to the IODP community (IODP integrity, cultural, natural, operational, technical) and identify their possible mitigation
  - identify areas for improved planning / execution
- **Peer assists and workshops**
  - peer assists form essential bases for performance improvement in industry and are widely used, for instance to facilitate efficiency in well delivery
  - project kick-off workshop meetings with all staff to be involved (scientific staff, operators, contractors, etc); intensive structured workshops with expert help, to identify most efficient way to achieve objectives, optimise planning, etc.
  - the involvement of industry advisers should be considered (this is a task for ILP)
- **Ongoing advice**, *ad-hoc* or continuous, is used for
  - help in planning complex, multi-platform sequences
  - evaluation of the consequences of delays in planning/execution
  - identification of efficiency improvements

Among some of the more prominent shortcomings in project management that have been identified in industry reviews are several that could be expected to arise in IODP:

- Technical definition is often not adequate for the decisions being taken
- Contingency plans for critical areas are frequently lacking
- Cost estimates are often incomplete and/or not integrated fully
- Staff skills involved may not be sufficient to guarantee success
- Some elements of the project plan may be overworked in comparison to other, equally important, elements
- Cooperation and communication may suffer if responsibilities, reporting relationships and documentation requirements are not clear.

Initially, OPCOM should be responsible for defining the terms of reference (ToR) for reviews. In the longer term, the ToR should become standard.

Recommended process

We are convinced that the complex nature of IODP planning, involving multiple, perhaps partially dependent platforms operating concurrently, with the lead-times that this implies, means that consideration of operational feasibility should be introduced into project planning as early as possible. In order to shorten the planning process and achieve greater flexibility, we believe that at least partially this should overlap with and be integrated with the science evaluation process. This applies particularly to projects that require extra seismic data and/or technology development needs.

The Project Management System (PMS) road map we propose is enclosed as a Powerpoint file, accompanied by the objectives at each step. Up to seven distinct phases are defined, as follows:

(I) **Initiation**, during which science project proposals are received and matured
(II) **Appraisal and evaluation**, during which mature proposals are accepted and ranked
(III) **Selection**, during which the scientific proposal becomes an IODP project and operational planning commences
(IV) **Survey definition**, a phase largely contingent on the need to acquire more data
(V) **Survey execution and incorporation**, a follow-up phase to (IV), also largely contingent on the need to acquire more data
(VI) **Operation**, during which the drilling activities are carried out
(VII) **Post-operation**, during which a review of the activity is carried out

It is envisaged that at stage (III), a **project team** will be formed by SPC to manage all further activities specific to the individual project. This will form the **Drilling Planning Group** (project DPG), and may include representatives from the scientific proponents, the SAS advisory structure and the implementing organization(s). The DPG will nominate a project leader to oversee the project, and will report directly to OPCOM, who coordinate the full IODP program and the activities of the individual DPGs.
The phases indicated above include all those needed for complex, riser-type projects. For many projects (e.g., non-riser expeditions), it will be possible to pass through phases IV and V more rapidly, while phase VII may be very short if the project is routine.

At a number of stages, milestone **reviews** will be held to assess progress and approve (or not) progress to the next phase. Such reviews will be held with the following objectives:
End phase I: decide if the proposal is mature and ready for ranking. Review by SSEPs, with external review.
Phase II: ranking of proposals, review and prioritisation by SPC.
End Phase III: project / well-concept peer review by independent review body. The formation of this review body will be the responsibility of OPCOM: At the discretion of the latter, it may be OPCOM itself, with or without ex officio members as appropriate, or a largely independent group (with OPCOM representation). This will probably depend on OPCOM workload. The review team recommends whether a full or reduced project path should be followed

End phase V: Final, pre-operational review, assuming a full project path has been followed, or if further work not reviewed at end phase III is recommended. Ideally carried out by same review body.
Phase VII: post-operational review by SAS, SPC, OPCOM, TAP, IOs, etc. to capture lessons from project execution

DPGs should be fully responsible for progress of the project, and are answerable to the IODP science and operations management (SPC and OPCOM) through the review process. They must provide the review body with all relevant supporting material, including that from advice panels. As noted above, the **review panel** may be OPCOM, but may include scientific, advice panel and operation peers from within IODP and external to it. The panel should include sufficient expertise to cover the important aspects of the project. It is essential that review panel participants have no direct interest in the project(s) being reviewed.
As OPCOM is responsible for monitoring of the project schedule(s), it is responsible for ensuring that regular reviews take place.

Deliverables: Each of the advice panels will provide a simple and short written report indicating the status of project conformity with the criteria stipulated in the mandate of each panel. A status report on all active proposals should be submitted to OPCOM twice yearly and will be used as input to the end-of-phase reviews (as specified below).

Reviews, ToR and timing: It is recommended that project reviews should be convened on a regular rather than *ad-hoc* project-by-project basis. At such reviews, all active projects should be considered, irrespective of the stage they have reached. Statements per project of "permission to proceed" to the next phase (for each individual project), or instructions to carry out specified further study/work will constitute the review outcome. The review will also authorise the release of funds for study or further activity as appropriate. The project team will therefore present budgets for the anticipated expenditures in the following phase.
Reviews should be scheduled every 6 months, preferably immediately prior to SPC meetings. This is likely to minimise the review burden, to be easier to organize and cheaper to implement. Dealing with all active proposals in one review should also facilitate a formal link between project planning and the annual program plan (and therefore overall coordination of the IODP operational plan) as well as participation of external (e.g., industry) representatives on review panels, since plans for attendance can be made well in advance.

Participation of industry and other external advice: From initial contacts with industry representatives, it can be anticipated that participation in milestone and peer reviews as well as provision of specialist technical and other advice to IODP will be looked at sympathetically. ILP will act as liaison with industry in this respect, as plans are clearer. Consideration should be given to developing a standard MOU (Memorandum of Understanding) with participating companies, defining the terms of reference for IODP consultancy. If requested, ILP will prepare such a standard MOU.

References

CDEX: Decision-making tree for drilling operations (DecisionT.pdf)
CDEX: "Chikyu" IODP Operation time-tables, 2003.2.18/2002.3.4
Downhole Measurement/Monitoring working group: interim report, OD21 Advisory committee, December 2002
IODP: Earth, Oceans and Life – Scientific investigation of the Earth system using multiple drilling platforms and new technologies. Integrated Ocean Drilling Program Initial science Plan, 2003 – 2013, May 2001
iPPSP: Working document on review process, 2003, (Meeting 1 Minutes – Partial.doc)
OD21 Science Advisory Committee: Toward an understanding of Earth system evolution, Japan National science plan for IODP, January 2003
OPCOM WG members: Report of IODP OPCOM Working Group to Interim Planning Committee, 18-20 March, 2003, Austin TX (iPC_OPCOMrevised.ppt, OPCOMWGReport.Rev.doc)
Technical Advice Working Group (TAWG): Recommendations for the Integrated Ocean Drilling Program (IODP), 15.08.2001

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