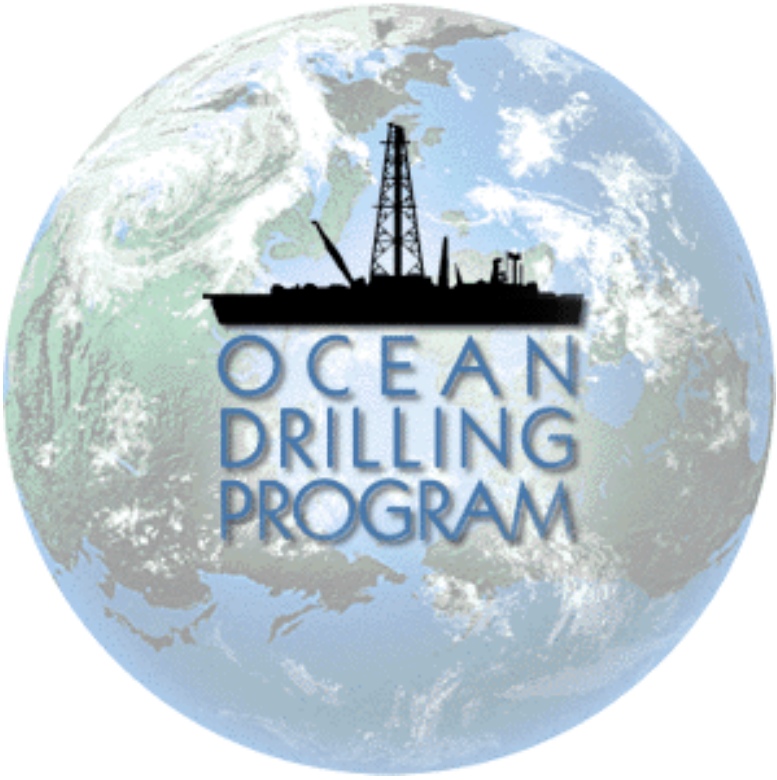
FIFTH PERFORMANCE EVALUATION OF THE OCEAN DRILLING PROGRAM WITH SUBCONTRACTOR RESPONSES



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Prepared for:

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Executive Summary

The Ocean Drilling Program in its final phase is, by most measures, an incredibly successful program. However, there are still a number of major issues facing the program during the final Phase III years, primarily related to the lack of funding to complete technological developments and capability upgrades to the vessel in order to complete the goals of the Long Range Plan.

One of the frustrations for an outside group trying to evaluate the success of the Program is that despite many reviews over the years, it is still difficult to obtain a summary of the accomplishments toward the overall goals of the program. The goals are stated in the Long Range Plan, but the summary of the accomplishments for Phase II or the progress on Phase III doesn't appear to exist for each theme or initiative – something that is an EXCOM mandate.

Program management and operations have improved significantly since the PEC-IV report was provided to JOI Inc. in 1995.

The new Advisory Structure implemented in 1998 has generally been well received and has increased the number of individuals and institutions involved in the Ocean Drilling Program. The number of people on Panels has decreased, but overall participation has increased because of the Program Planning Groups and external proposal reviewers.

The main concern of PEC-V is that current plans suggest that the implementation strategy for the Integrated Ocean Drilling Program (IODP) for the Twenty First Century (Phase IV), may result in a gap in drilling operations of as much as two years as Phase III (ODP) ends. The size of the gap will depend on the specific drilling platform requirements of the new program and the ability of the ocean drilling community to implement the current plan at a faster pace.

Also, to continue solely, with the current steady-state program management arrangement that has worked well in the past, could hinder the dynamics of the transition to the IODP.

The results of the evaluation of the Ocean Drilling Program according to the Terms of Reference provided to Performance Evaluation Committee-V by JOI are summarized below. The headings for each section relate to the chapter headings in the Ocean Drilling Program Long Range Plan document.

Implementation Strategy – Phase III (1998-2003)

Phase III achievements and goals

- Deep biosphere program well underway.
- Complete array of extremely high-resolution climate records will complete the first-pass attempt to generate global coverage.
- Hemisphere-based record of ice-sheet growth is unlikely to be achieved.
- Only one leg completed for accurate measurements of bio-geochemical cycling.
- Extreme climate objectives will not be met – Program Planning Group (PPG) established to develop an alternative plan.
- Global carbon cycling program will have completed as many as 3 legs to continue push toward a suite of latitudinal and depth transects.
- Mass balance experiments at convergent margins – one leg completed.
- Offset characterization of lower crust – leg may be scheduled.
- Reaction zones beneath large hydrothermal deposits – one leg scheduled.
- Dynamics of mantle reservoirs – 2 legs scheduled.

The ODP does not have the resources to achieve all of the Phase III goals. Innovative budget strategies focussed on science priorities are essential to the success of Phase III. Proposal pressure is strong in both shallow-water drilling and for lithosphere objectives but budget constraints will force the ODP to look for more outside funding.

Implementation Strategy – Phase IV (post-2003)

- A vision for an Integrated Ocean Drilling Program (IODP) for the 21st century is in place.
- The IODP vision involves multiple drilling platforms.
- The Japanese government has agreed to build a large riser-equipped drilling vessel that will be available for trials in late 2003.
- The question is how and when to implement the vision for the other platforms?
- It appears to PEC-V, given the present state of planning, that IODP could not begin before late 2004. Is this acceptable to the community?
- PEC-V members are concerned that the implications for society, science and existing and potential support operations have not yet been considered in ODP adequately.
- If it is decided that a gap in drilling is unacceptable, then IODP partners must enter a phase of rapid, open communication (including marketing and lobbying) and contract negotiations to ensure a successful transition to the new phase of drilling by the beginning of 2004.
- There must be a clear leadership established to effect this movement into the new phase of drilling. Someone will have to be identified as the intellectual leader with the capability of harnessing the scientific and political powers of the prospective participants in the program.
- The role of ocean drilling in accessing the memory of earth processes provides a baseline for studies of more recent global changes and provides a view of

extremes of earth processes which must be incorporated into initiatives to develop new integrated global ocean observation programs.

Program Management and Operations

- Communication and coordination among the prime contractor, subcontractor and the advisory structure appears to have improved during the past year.
- PEC-V believes that ODP-TAMU has become a more efficient and responsive organization during the past two years. In conjunction with a reduction in the number of staff, ODP-TAMU has been able to provide most scientific services to their clients.
- The rate at which project management practices are implemented can be increased.
- ODP-TAMU should look into obtaining ISO9000 certification.
- The JANUS database must now be customized to ensure that customers are able to import and utilize data efficiently in specialized software applications. Migration of existing datasets into JANUS should be completed.
- A commercial "ocean routing" service should be considered to minimize leg transit time. This will ensure that the time on site in each leg is maximized.
- Borehole Research Group – overall, ODP Logging Services have done a good job meeting their contractual responsibilities.
- It appears that the "distributed" or international model for provision of petrophysical services is cost-effective and has been successful.
- Support for the Site Survey Data Bank is adequate for the current system that involves mostly paper records, but is insufficient for developing a system that archives and distributes data in digital formats. Digital data will become vital when dealing with surveys for the new riser vessel.
- The Pressure Core Barrel (PCB) was only partially successful on Leg 164. The European HYACE might not be available in time for the planned gas hydrate legs.
- Detailed lithology-facies interpretations from borehole logging should become a routine operation either on board or within three months of the completion of a leg.

Science Advice and Coordination

- The new advisory structure is in place and is becoming increasingly efficient and effective as each issue is dealt with by JOI, the JOIDES office and the advisory structure.

- Initial problems associated with the transition to the new structure are now mostly solved.
- Participation by individuals and institutions in the advisory structure of the program has increased.
- The initiative by the SCICOM Chair to ensure that OPCOM meets during the SCICOM meeting should resolve some scheduling problems that occurred during the transition phase.
- The Scientific Measurements Panel seems to be unable to address major issues because of the scarcity of expertise required to debate and answer ODP operations questions. Greater flexibility is required to ensure that an adequate number of experts are available to properly debate and solve issues.
- Partnerships are working well in terms of major science initiatives. ODP is drilling scientific targets that meet both ODP and other Program objectives.
- Partnerships with industry have not yet been developed as well as they could. ODP has two projects: with JAMSTEC for the development of the Advanced Diamond Core Barrel and with HYACE on a new gas hydrate tool. ODP has started a small, but important partnership with DOE on gas hydrate research. More partnerships will be required to ensure that scientific objectives are met.

PEC-V Terms of Reference

Terms of Reference for the evaluation will embody the following general procedures and criteria:

- The committee membership will consist of international experts in the fields of science, engineering and management to be appointed by the President of JOI in consultation with NSF, the JOI Board of Governors, and JOIDES. The committee should be chaired by an eminent scientist, who should be knowledgeable about ODP, but not currently active in the program.

- The committee is charged with addressing the following specific issues, as well as other items considered important by the committee:

- The progress of the Program toward the achievement of the major scientific goals outlined in the ODP Long Range Plan, and the cost effectiveness and performance of JOI, and its major subcontractors, in achieving these goals. **This progress should be evaluated within the context of the budgets available to the drilling program.**

- The effectiveness of mechanisms in place for making budgetary decisions in the context of the scientific priorities of the Program and projected budgetary constraints, and the potential of current strategies for seeking additional avenues of funding for the Program.

- The operation of the new JOIDES advisory structure, including proposal evaluation and selection, short- and long-term planning, and provision of technical advice to JOI and its subcontractors.

- The progress of the present Program in preparing for a new scientific ocean drilling program beyond the year 2003.

PEC-V Committee Members

Dr. Noriyuki Nasu (Chair)
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Dr. Tom Loutit (Vice-Chair)
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Introduction

The report is presented in three sections that relate directly to the structure of the ODP Long Range Plan. The first section discusses the success/failures of the Implementation Strategy for the Long Range Plan for both Phase III (1998-2003) and Phase IV (post-2003). The second section looks at the efficiency and effectiveness of Program Management and Operations and related issues and the third evaluates Science Advice and Coordination with specific reference to the new Advisory Structure.

The committee gathered the information base for the evaluation during a series of visits to ODP institutions and panels including a visit to the COMPLEX meeting in Vancouver in May 1999. Sets of questions were prepared for each part of the ODP, including the COMPLEX attendees, and the answers were evaluated by the committee. Only the observations and recommendations of the committee are published in this report.

Visit Schedule

Date	Location
16-17 March	JOI Headquarters, Washington, DC Members present: Nasu, Loutit, Doyle, Duerbaum, Karig, Turekian
18-19 May	ODP-TAMU Headquarters, College Station, TX Members present: Nasu, Loutit, Doyle, Duerbaum, Karig, Nur, Turekian
23-25 May	Science Steering and Evaluation Panel Meetings (SSEPs), Seattle, WA Members present: Nasu, Loutit, Duerbaum, Karig, Nur
26-29 May	Conference on Multi-Platform Exploration (COMPLEX), Vancouver, BC Members present: Nasu, Loutit, Duerbaum, Karig, Nur
30 May	PEC-V Meeting in Vancouver, BC Members present: Nasu, Loutit, Doyle, Duerbaum, Nur
4 June	Logging Services Headquarters, Lamont-Doherty Earth Observatory Members present: Nur, Turekian
14 June	JOIDES Office, Kiel, Germany Member present: Duerbaum
12-14 July	JOI Headquarters, Washington, DC Members present: Nasu, Loutit, Doyle, Duerbaum, Karig, Nur, Turekian

Implementation Strategy

Phase III–Implementation Strategy

Introduction

PEC-V members asked a number of questions to understand the status of the Phase III program as outlined in the Long Range Plan (LRP) document.

General questions

- *Is the ODP on track to achieve its goals?*
- *Does the ODP have the resources to achieve its goals?*
- *Were the goals of Phase II achieved?*
- *Illustrate progress toward Phase III goals.*
- *Has the Management Improvement Plan (MIP) been successful?*
- *Is Project Management (PM) in place throughout the Ocean Drilling Program?*
- *Were the enhancements to program operations (outlined on page 72 of the LRP) completed?*

Summary

- ODP is on track to achieve most, but not all of its goals of Phase III.
- Technology or capability constraints will limit the achievements.
- "Flat" budgets have exerted a strong influence on the success of Phase III.
- The goals of the Earth's Interior community are unlikely to be realized.
- Innovative solutions to technological problems are difficult when funding is low.
- The ODP does not have the resources to achieve all of the Phase III goals.
- Innovative budget strategies are essential to the success of Phase III.

Achievements

As of July 1999, ODP is ten months into the five-year plan for Phase III.

This year is the first fully operational year that addresses scientific challenges outlined in the 1996 Long Range Plan. The areas of emphasis, and the initial scientific expeditions and operational activities that address these areas are:

- Expanding the global array of extremely high-resolution records of climate change.

  - Leg 184, South China Sea. February - April, 1999. This basin has not previously been cored by DSDP or by ODP. Excellent quality late Neogene cores were recovered and will enable detailed reconstruction of the evolution of the southeast Asian monsoon climate regime.

  - Pacific Paleoceanography. Two legs (Southeast Pacific Paleoceanographic Depth Transects (proposal 465), and A Paleogene South Pacific APC Transect:

Heat Transport and Water Column Structure during an Extreme Warm Climate (proposal 567) will be drilled in 2001 to address this topic.

- Establishing a hemisphere-by-hemisphere detailed history of ice sheet growth, distribution and decay.

  - Leg 188, Prydz Bay. January 2000. Dating the initiation of Antarctic glaciation, its evolution, and the link to Southern Ocean paleoceanography is the goal. Answers sought on Paleogene environment, and ice sheet dynamics of the Plio-Pleistocene glaciations.

  - TBD. An extant, highly-ranked proposal may be accepted and scheduled in Phase III to address this matter in the northern hemisphere.

- Accurately measuring biogeochemical cycling and fluxes within the Earth system.

  - Leg 185, Izu Mariana-Bonin. April - June, 1999. This leg successfully focused on biogeochemical cycle studies and mass balance at convergent margins by determining the net fluxes into this particular subduction zone. Special emphasis was placed on "subduction factory" objectives (results from recent workshops), and on the deep biosphere initiative. "Subduction Factory" objectives – well underway.

- Describing and documenting climate extremes (cold and warm periods) which (1) test the sensitivity of existing climate models, and (2) provide parameters for new model runs used to predict future climate change.

  - Pacific Paleoceanography. Two legs (Southeast Pacific Paleoceanographic Depth Transects (proposal 465), and A Paleogene South Pacific APC Transect: Heat Transport and Water Column Structure during an Extreme Warm Climate (proposal 567) will be drilled in 2001 to address this topic.

  - A Program Planning Group named "Extreme Climates and Environments of the Paleogene and Cretaceous" was recently established in the JOIDES advisory structure to foster and promote proposals in this vein. This PPG has identified the highest priority targets for Phase III and beyond.

- Continuing the investigation of global carbon cycling and ocean circulation patterns by drilling additional latitudinal and depth transects, and taking advantage of new stratigraphic and geochemical techniques.

  - Leg 189. Southern Gateways. March - May, 2000. Latitudinal paleoceanographic transects continue in the Southern Ocean with this leg which will focus on paleocean/climate changes related to the tectonic opening of the Tasmanian Seaway and the Drake Passage, which thermally isolated Antarctica and spawned the Circumpolar Current.

- **TBD.** Two extant, highly-ranked proposals may be scheduled at the September 1999 SCICOM meeting to address this topic in the central equatorial Pacific and in the eastern tropical Pacific. Carbon (carbonate and organic) cycling will be the focus, as will bathymetric depth transects for dissolution studies and paleo-circulation reconstructions. These will complement similar legs as part of a larger global array initiated by the former Ocean History panel.

- Investigating the microbial processes deep in the sedimentary column and links to sediment diagenesis.

  - A new microbiological laboratory was constructed in early 1999 and outfitted using Program funds designated for innovation. The van was fully functional on Leg 185 (April - June, 1999), and experiments were conducted, at the behest of the Deep Biosphere PPG to determine the extent and characterization of contamination of the cored and drilled sedimentary and rock sequences.

  - Partnering with the US Department of Energy (DOE) will result in collaboration and cost sharing. The DOE will purchase—for the ODP and ICP—AES for shipboard use for studies related to gas hydrates and the deep biosphere.

  - Dry dock plans for September - October 1999 include upgrading the microbiological lab by incorporating it into the laboratory stack and adding equipment and capabilities.

  - Legs 192 and 193 will see further scientific developments of this initiative.

- Completing mass balance experiments at a convergent margin by sampling the deeper portions of a forearc to constrain fluid and mass partitioning.

  - **Leg 185, Izu-Mariana.** Cores retrieved during this cruise provided the remaining piece of the crustal input inventory for the Mariana subduction factory. Shore-based geochemical analyses of the basement section in Hole 801C will provide the first robust estimates for subducting oceanic crust with which to compare to volcanic outputs at the Mariana backarc.

- Continuing the offset-section characterization of the lower crust, focusing on sampling long sections through the transition zones between principal components of oceanic crust.

  - **TBD.** An extant, highly-ranked proposal may be scheduled in Phase III to address this matter in the northern hemisphere.

- Examining the characteristics of reaction zones beneath large hydrothermal deposits.

  - Leg 193, Manus Basin. Goals are to understand the chemical fluxes, fluid pathways, and ore deposition in this felsic volcanic-hosted polymetallic massive sulfide hydrothermal system.

- Evaluating the dynamics of mantle reservoirs by defining geochemical domains and augmenting seismic observatory installation in drill holes.

  - Leg 187, Australia-Antarctic Discordance. November – December, 1999. To investigate relationships of crustal and mantle composition, spreading, and magma supply rates in an area suspected to have unusual mantle dynamics and profound magma supply differences.

  - Leg 191. Western Pacific ION. July-August, 2000. Scientists will place a permanent observatory (downhole seismometer) in the tectonically active Western Pacific at a high-priority area identified by the International Ocean Network (ION).

"Failures"/Incomplete Goals

Scientific themes (in the "expensive" category) likely to be impacted by budget/technology constraints during Phase III –

- Seismogenic Zone preparatory drilling and *in situ* monitoring,
- Decadal to millennial scale climate variability,
- Extreme climates,
- Gas hydrates,
- Sections of the oceanic crust, and
- Hydrogeology - Hydrothermal themes.

Expanding on this, there are two ways to view the current technology constraints:

- technology that has not been implemented because of historical precedence; and
- technology that may be beyond the resources and capabilities of the current program.

In the first category, capabilities could be added to the *JOIDES Resolution* (JR) to extend its current range of drilling. One area where proposal pressure is strong is in shallow water environments. With some additional funds, the JR could be modified and safety measures could be implemented to drill in shallower water environments. In the past year, funds were prioritized so that a microbiology facility could be added to the vessel. In a similar manner to this deep biosphere initiative, the budget could be prioritized to significantly improve the JR's capabilities to sample in shallow water.

Taking a different approach, ODP could also identify funds to lease other platforms to achieve some of these shallow water objectives. In the past this has not occurred, but could, in future, depending on annual budget constraints.

In the second category, it is clear the JR does not have the proper technology to achieve many of the lithosphere community's goals. This community has proposed significant modifications to their drilling strategies to better match them with the JR's capabilities (e.g., offset drilling techniques), but major goals in this area have not yet been realized. The Hard Rock Re-entry System (HRRS), using the hammer drill has some potential for spudding into bare rock and stabilizing difficult settings (particularly slower spreading center regions). ODP is currently targeting completion of a prototype system by the end of FY01 for potential use in FY02. This technology will help, but it is not the total solution.

ODP must clearly publicize budget and technology constraints that will impact the success of the Program and highlight the impact of not achieving the goals.

Phase IV - Implementation Strategy

The main concern that PEC-V has with ODP is the perceived lack of progress toward the establishment of a new phase of ocean drilling. The vision for an Integrated Ocean Drilling Program (IODP) for the Twenty-First Century based on two or more drilling vessels exists, but the questions of how and when this vision will be implemented are not clear. Although a number of activities are underway, it is not clear that they will be enough to ensure an uninterrupted accumulation of data and knowledge to solve a number of key scientific and related socioeconomic issues during the next decade.

The Japanese have committed significant funding to the construction of a riser-equipped drilling vessel that will be ready for sea trials in late 2003. The OD21 vessel would not be available to the international community until 2005. During 2003 the ODP will begin a year of transition culminating in the closure of the program.

Before making some comments on the preparedness of the program for post-2003 drilling it is important to establish the base from which PEC-V has formed its opinion. The following summary of events is primarily restricted to non-Japanese planning events and begins with the formation of the International Working Group (IWG) during 1998. An ad hoc US Science Advisory Committee (USSAC) committee produced a report in November 1998 on the Structure of the US Component of a Future Scientific Ocean Drilling Program. An ODP Technology and Operations Workshop was held in late 1998 to begin the planning for a new era of scientific ocean drilling. SCICOM also presented a report to EXCOM on a prioritization process for making budgetary decisions by the ODP in late 1998 – this report highlights the goals of the Long Range Plan that are unlikely to be achieved by the ODP before 2003. IWG commissioned the Integrated Ocean Drilling Program

Planning Sub-committee (IPSC) during 1999 and is establishing an office to provide secretariat support for all of the IWG and related activities. The National Oceanographic Partnership Program (NOPP) produced a report entitled "Toward a US Plan for an Integrated, Sustained Ocean Observing System" that has significant implications for IODP. In May 1999 JOIDES hosted the Conference for Multi-Platform Exploration (COMPLEX) to outline the key scientific issues facing the earth science community and to develop drilling strategies to address these issues. As of July 14, 1999 IPSC has met and developed an outline of their activities in relation to ODP's timetable, NSF budgeting schedule and the development of the Japanese vessel. JOIDES EXCOM has recently endorsed IPSC's plan and recommended to IPSC to recruit science planning, industry liaison and technology working groups to help develop the IODP implementation strategy.

It appears from the documents provided to PEC-V that it is unlikely that a new phase of ocean drilling would begin until late 2004 or later leaving a

- significant gap for operational units involved in the support of ocean drilling,
- delay in the completion of goals that were not achieved by ODP, and
- a delay in the start of the new science ventures that require multiple drilling platforms.

Is this acceptable to the community? What are the implications for society, science and support institutions if a new phase of drilling is delayed by 1-2 years? Have these issues been properly addressed? PEC-V was unable to find anyone that appears to have thought through these issues at what, to us, appears to be late in the planning phase for IODP.

Furthermore, if it is agreed that a delay in the transition to IODP is to be avoided, then all parties with a vested interest in the success of IODP must enter a phase of rapid, open communication (including marketing and lobbying) and negotiation during the next two years to ensure that the vision of IODP is realized.

The Japanese effort has been put in motion by the building of a riser capable ship to be part of the future ocean drilling enterprise. JOIDES must take this commitment as a guide and inspiration for the role of the United States and the other countries in the consortium in designing a unified drilling program for the twenty-first century.

There must be a clear leadership established to effect this movement into the new phase of drilling. Someone will have to be identified as the intellectual leader with the capability of harnessing the scientific and political powers of the prospective participants in the program.

The success of the Japanese effort to construct a new ocean drilling ship is in part built on the belief that ocean drilling and the resulting knowledge will be critical for developing strategies to reduce the effects of extreme climatic periods, particularly in countries in higher latitude regions. The survival of descendents is an important argument that has not received a lot of attention in many of the countries involved in

the ODP. Professor Noriyuki Nasu's personal belief is that there should be a fleet of drill ships operating around the world addressing a range of scientific and socio-economic issues.

Program Management and Operations

Introduction

Each of the contractors/subcontractors was asked a series of questions. The answers were documented by PEC-V but only the key observations and recommendations are reported.

Prime contractor - JOI

General Questions

- *Is the ODP on track to achieve its goals?*
- *What do the clients (present and future) of the ODP need?*
- *Who/What is going to stop/change/help form the ODP objectives?*
- *What science does ODP need to do?*
- *Does ODP have the resources to achieve its goals?*
- *When should ODP tackle projects - balancing internal and external client needs?*
- *How does ODP know when it has met the objectives in each science area?*
- *How does ODP ensure that the results get to the right people?*
- *How does ODP know when it has done a great job in each science area?*

Specific questions relating to the Long Range Plan

- *Is the implementation strategy working?*
- *Does it need to be changed?*

Science Advice and Coordination

- *Is the new structure working?*

Science Delivery

- *Phase II - were the goals of Phase II achieved?*
- *Phase III - illustrate the progress toward Phase III goals.*
- *Phase IV - Is the ODP ready for all aspects of post-2003 drilling?*

Program Management and Operations

- *Has the Management Improvement Plan (MIP) been successful? Please illustrate the successes and failures.*
- *Is Project Management (PM) in place throughout the subcontractor organizations?*
- *Please report on the success of the enhancements to program operations outlined on page 72 of the LRP.*
- *Please illustrate how the partnership program is being coordinated to ensure that success of Phase III and the preparation for post-2003 drilling requiring multiple platforms.*

- *What is the status of the investigation into drilling platform options? What progress has been made toward the aims for a 2+-ship program in Phase IV?*
- *Is funding adequate for Phase III?*
- *What are the plans for achieving the funding required for a 2+-ship program?*

Observations

- The management of the program is now more efficient and effective than prior to PEC-IV.

Recommendations

- JOI needs to maintain a more visible, up-to-date view of the status of program objectives.
- Program objectives must be presented in a form that allows the non-science community to understand the significance of the work – it is particularly important that the Program is perceived as successful by completing its objectives.
- Innovative funding strategies must be generated to ensure the success of Phase III.
- Both industry and country partnerships must be pursued more vigorously.
- The changes to the advisory structure have been successful but JOI is encouraged to ensure that the communication between EXCOM and the advisory structure is optimal for the successful completion of the Program.
- The LRP needs to be updated to reflect the success of Phase II, the successes in Phase III, and any changes to the programs – this revision will provide the document from which the success of the ODP will be judged.

Subcontractor - TAMU

General Questions

- *Please provide a brief review of the TAMU-ODP and TAMRF organizations.*
- *Please highlight any significant changes since the PEC-IV review.*
- *How has staff make up changed since PEC-IV?*
- *What significant achievements do you think TAMU has made to ODP since PEC-IV?*
- *What are the main performance indicators used to illustrate efficiency and effectiveness of ODP-TAMU operations?*
- *How have you responded to 'failures/delays" (indicating budget busts if any) since PEC-IV?*
- *Please review the communication system between TAMU and the* JOIDES Resolution *and discuss how conflicts are resolved.*

- *What improvements to the existing ODP structure would you like to make?*
- *To what extent have you implemented transition planning for post-2003?*
- *What are your thoughts/concerns on post-2003?*
- *How much emphasis do you pay to existing commercial technology versus an ODP-specific development?*
- *What is your perception of your client list?*
- *How do you manage change internally?*
- *Have you implemented a formal plan for continuous improvement?*
- *Please review your process for engineering development.*
- *What is your opinion of the effectiveness of TEDCOM?*
- *Review the interactions between TAMU engineering and subcontractors concerning third-party tool development.*
- *How do you coordinate each leg with ODL?*
- *To what extent do you ensure the veracity/quality control of data?*

Observations

Since PEC-IV, TAMU has made significant improvements to their operations by reorganizing, instituting project-based management programs and even increasing services with a reduced staff in a constant funding environment. The reorganization was based on user community input and the results of a private management group assessment. The purpose of reorganizing was to better align the group with tasks, to achieve better integration and improve communication. PEC-V believes that the perception of the community is that TAMU is more responsive and that the reorganization efforts have been successful in reducing staff and increasing their work products.

In addition to the above, several significant accomplishments have been made by TAMU since PEC-IV that are worthy of noting:

- A microbiology lab has been installed on the *JOIDES Resolution.*
- The Sedco-Forex contract was renegotiated at a rate much lower than similar industry vessels.
- The Pressure Core Sampler was only a partial success on Leg 164. The HYACE development needs to be ready for future gas hydrate legs.
- The first sea trial was conducted on the Hammer Drill System.
- Staff was reduced from 165 FTE's to a 145 (aiming for 148) while increasing services to the community.
- A new digital delivery system was implemented for reports that significantly reduced report costs.
- The JANUS data base system was installed and made available to the science community.
- Publication of IR's and SR's changed to electronic format.

Recommendations

The few suggestions for improvements include:

- Increasing the pace at which project management policies are implemented within all phases of operations,
- obtaining ISO 9000+ certification for the group,
- continually improving the JANUS data base system with enhancements such as adding new tables and modeling updates, and
- implementing a commercial "ocean routing service" to transit the ship more efficiently from location to location.

The most critical problem facing the TAMU group is the uncertainty related to a post-2003 program. Management has started planning for both a continuing program and the possibility for a possible funding hiatus. However, near-term decisions must be made in order to carry out either possibility and TAMU requires direction soon from NSF.

PEC-V believes that TAMU is serving the community well given their budget constraints. We also support their concerns that NSF needs soon to provide specific direction for implementing post-2003 plans.

Subcontractor - Logging Services Operator (Borehole Research Group)

General Questions

- *Please provide a brief review of the Borehole Research Group.*
- *Please highlight any significant changes since the PEC-IV review.*
- *What significant achievements do you think Borehole Research Group has made to ODP since PEC-IV?*
- *What are the main performance indicators used to illustrate efficiency and effectiveness of Borehole Research Group operations?*
- *Has the staff make up changed since PEC-IV?*
- *How have you responded to 'failures/delays" (indicating budget busts if any) since PEC-IV?*
- *Please review the communication system between Borehole Research Group and the* JOIDES Resolution *and discuss how conflicts are resolved.*
- *Is the distributed model for logging contractors working well?*
- *What improvements to the existing ODP structure would you like to make?*
- *To what extent have you implemented transition planning for post-2003?*
- *What are your thoughts/concerns on post-2003?*
- *How much emphasis do you pay to existing commercial technology versus an ODP-specific development?*
- *What is your perception of your client list?*
- *How do you manage change internally?*
- *Have you implemented a formal plan for continuous improvement?*

Observations

Overall the ODP Logging Services have done a good job meeting their contractual responsibilities. The services consist of the Borehole Research Group at LDEO, plus four small offices at the following institutions: CNRS (Laboratories de Mesures en Forage (LMF), France; University of Leicester, United Kingdom; University of Aachen, Germany; and the Ocean Research Institute, University of Tokyo, Japan).

It appears that distributing the responsibility for supplying seagoing logging scientists is cost effective, because it is difficult to maintain these scientists at one location—the various "parts" of logging scientists from all international offices add up to about 6 Full Time Equivalents (FTEs). The group was successful in maintaining a good level of service, and innovation despite flat overall budget and increases in Schlumberger subcontract costs. Co-chiefs and others have given logging services good reviews.

The Logging Services website has become the primary means of distributing log data and is widely used.

Significant achievements

- Logging is now a routine part of the ODP.
- Data collected on the JR is now received at LDEO via a high-speed satellite transmission, where it is edited and refined then transmitted back to the ship within five days. This procedure permits the coupling of borehole data with the actual drill core record.
- All logging data, including the historical logging data since Leg 101, is now available through the Logging Services website.
- The internationalization of logging services has been a success.

Concerns

- One concern that was raised was the possibility that logging staff at sea is duplicated-with one BRG scientist and a second one from the scientific community. This appears now to be a minor issue: BRG is obligated by contract to provide a logging specialist if only to direct the Schlumberger engineer and operation, whereas it is up to the chief scientist's discretion to bring on board a second specialist from the scientific community.
- Scientific opportunities for integrating logging and site survey data are missed because digital survey data are not routinely archived at the Site Survey Data Bank. Members of PEC-V were shown some logging-seismic integrated studies, which were only available because the PI who collected the data made them available. Digital seismic data should be routinely submitted to the Data Bank and made freely available for use by the drilling community.

- It is expensive to acquire quality seismic data, and the process involved in obtaining funds for this purpose is difficult. The problem will only grow worse because the riser vessel will require a great deal of expensive, 3D survey data.
- Significant knowledge and expertise exist in the logging services institutions and it will be important to try and retain and utilise this expertise in post-2003 drilling operations.
- Calibrated lithostratigraphic profiles are not routinely available. Good examples of lithostratigraphic profiles have been provided by the Aachen group under subcontract to the BRG. The Committee would like to see these profiles routinely generated either on the ship or within a few months of the conclusion of a leg.

Major Issues/Recommendations

Site Survey Funding & Use and Post-Cruise Science Funding

PEC-V finds that funding is especially lacking in two areas. Geophysical site surveys are now funded separately and the results are not routinely integrated into the drilling programs. As such, we recommend that the site survey data sets used to select drill sites be included as non-proprietary data within all drilling programs once the leg has been approved for drilling. In addition, the scientist(s) holding the seismic data set used for the approved leg should be included in the scientific party of that leg as a shore-based member to guarantee the full integration and interpretation of such data into the scientific process.

The resources required to store and distribute digital seismic data by the Site Survey Data Bank to the drilling community are considerable. The two-ship program will require even more resources to ensure the availability of digital seismic data.

PEC-V also recommends that more funds be available for post-cruise science funding. In addition, specific funding should also be designated for "public relations" efforts to advertise results and their anthropogenic implications to the science community, funding agencies and the general public.

Budgeting Considerations

PEC-V is concerned that the flat funding situation controlling the ODP budget will not only prevent some science from being accomplished before 2003 but it is also negatively impacting technological advances needed during the current program phase as well as for the post-2003 program. To date the situation has been tractable only because of enhanced efficiencies in operation and cost savings, but it could quickly become disastrous if inflation increases. Flat funding is also perceived as a negative in developing a post-2003 program. The committee therefore recommends ramping up funds to be used for multiple-platform research efforts and refitting or replacing the *JOIDES Resolution.*

Publications

The change to electronic format for the ODP Proceedings volumes has had a mixed reception by the scientific community but the change is supported by PEC-V. We suggest that ODP-TAMU pay careful attention to the community criticism and make modifications that will continue to improve the delivery of results to a science community that is in the throes of a revolution involving information access and delivery.

In addition, efforts should continue to increase the volume of ODP publications in the open literature, especially peer-reviewed journals. This not only alleviates the criticism concerning accessibility of information, but also raises the level of acceptance of this information.

Data Quality/Integration

Shipboard Data. PEC-V perceives a growing problem concerning the veracity of data from the several petrophysical streams (discrete measurements, pass-through data, and downhole logging) and with the integration of these data. This is a complex problem involving improvement of equipment, creation of software to improve the uneven quality of pass-through data, and "standardization" of log-core integration.

Science Advice and Coordination

Observations

The Science Advice and Coordination structure was recently changed. The new advisory structure is in place and is becoming increasingly efficient and effective as each issue (such as teething problems associated with the transition to the new structure) is dealt with by JOI, the JOIDES office and the advisory structure as a whole.

Participation by individuals and institutions has increased in the program despite a reduction in the number of panels.

The SSEPs and PPGs are now working well and are seen as a good improvement and essential for implementing the LRP. SCICOM/OPCOM mandates are good, but not functioning as well as they could – see below. The new SCIMP has a number of problems that need to be solved. The other advisory groups remained unchanged. TEDCOM's mandate is for future technology in ODP. With the short time left in ODP and the normally long-lead time for technology development, this group may be better utilized for advice in a future ocean drilling program.

Issues/Recommendations

SCICOM, OPCOM and SSEPs. PEC-V observed that conflicts have, and may continue to emerge concerning decisions on drilling locations. Some proposals ranked lower by the SSEPs have been selected for the drilling schedule, instead of more

highly ranked proposals. Also, they existed where SCICOM ranked several locations as highest priority, leaving the final selection to OPCOM, and then formally approving the decision via e-mail.

PEC-V proposes that these processes should be made fully transparent and the reasons for the decisions made known to the science community. We commend the decision to hold the OPCOM meeting in the middle of future SCICOM meetings. The ability for SCICOM to consider OPCOM's recommendations immediately after they meet is an important improvement to the process.

The most recent terms of reference for Program Planning Groups (PPG) are very concise and should ensure an improvement in their interaction with the ODP advisory system.

Scientific Measurements Panel (SCIMP)

PEC-V observed that with the integration of three service panels (Downhole Measurements, Information Handling, and Shipboard Measurements Panel) into one, the Scientific Measurements Panel (SCIMP), much expertise and engagement cannot be accessed during panel meetings. PEC-V considered whether the possibility of bringing in additional information by setting up ad hoc advisory committees (*Guide to ODP*, Appendix III, 12.4) would be sufficient. Because of the importance of these issues, and the continuous need, we recommend that two subgroups of SCIMP should be established concerning downhole measurements and information handling. These subgroups should meet just before the SCIMP meets to prepare important relevant issues and foster necessary developments.

FIFTH PERFORMANCE EVALUATION OF THE OCEAN DRILLING PROGRAM

SUBCONTRACTOR RESPONSES

FEBRUARY 2000

Prepared by:

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Introduction

This document contains ODP subcontractor responses to concerns and recommendations stated in the report of the Fifth Performance Evaluation Committee (PEC-V), dated October 1999. The report section and page number is shown, followed by the relevant text from the PEC-V report. The subcontractor response appears indented below the text from the report excerpt.

Executive Summary, page 1

- **The main concern of PEC-V is that current plans suggest that the implementation strategy for the Integrated Ocean Drilling Program (IODP) for the Twenty First Century (Phase IV), may result in a gap in drilling operations of as much as two years as Phase III (ODP) ends. The size of the gap will depend on the specific drilling platform requirements of the new program and the ability of the ocean drilling community to implement the current plan at a faster pace.**

  Since the completion of the PEC-V report, planning efforts toward the new phase of ocean drilling have accelerated. These developments have been reported to the JOIDES advisory structure and governmental funding entities. However, increased efforts must continue to ensure that a new program is funded.

  Definition of the new advisory structure, and suggested management of the new program is important for ODP as we develop the close-out plan for the current program. The next JOIDES Office will develop a transition plan for the advisory structure from ODP to the new program.

  Concerns regarding a gap in drilling have been relayed to the International Working Group (IWG), through the NSF

Program Management and Operations

Prime Contractor - JOI, page 16

- **JOI needs to maintain a more visible, up-to-date view of the status of program objectives, and**
- **Program objectives must be presented in a form that allows the non-science community to understand the significance of the work – it is particularly important that the Program is perceived as successful by completing its objectives.**

  JOI has initiated the compilation of scientific results that are published in highly-ranked peer-reviewed journals. This compilation is currently structured

under the themes of the Long Range Plan, and will be used to develop ODP "legacy" documents in the style of the U.S. Science Support Program's "ODP's Greatest Hits" document.

- **Innovative funding strategies must be generated to ensure the success of Phase III.**

  JOI has begun exploring innovative funding strategies by working with the U.S. Department of Energy to support gas hydrates research, the NSF LEXEN program to support microbiological research, and JAMSTEC in Japan to support joint engineering developments. This strategy will continue until the end of ODP.

- **Both industry and country partnerships must be pursued more vigorously**

  Industry partnerships are being pursued for both joint technology and science collaborations. A recent ODP/industry workshop held jointly with the U.S. Science Support Program has resulted in the preparation of six industry-related ODP pre-proposals.

- **The changes to the advisory structure have been successful but JOI is encouraged to ensure that the communication between EXCOM and the advisory structure is optimal for the successful completion of the Program.**

  EXCOM is part of the advisory structure. JOI will continue to assist with communications between EXCOM and its advisory committees. The winter meetings of SCICOM and EXCOM are joint meetings for the purpose of improving communications.

- **The LRP needs to be updated to reflect the success of Phase II, the successes in Phase III, and any changes to the programs – this revision will provide the document from which the success of the ODP will be judged.**

  Planning is now fully underway for the successor program. Achievements in ODP related to the Long Range Plan will be included in the new Science Plan.

Subcontractor – Texas A&M University, page 18

- **Increasing the pace at which project management policies are implemented within all phases of operations**

  Project management policies were phased into operations at ODP/TAMU starting in FY97. By the end of FY98 project management had been incorporated and was used as a management tool for all our project-directed

activities. A major achievement was the successful transition to Leg Project Management enabling us to define costs associated with the delivery of science for all highly ranked proposals. These data are available to OPCOM in August of every year when OPCOM creates the schedule for ODP operations. Following the creation of the schedule by OPCOM, the Leg Project Management team for each of the scheduled legs refines the budget in time for incorporation into ODP's yearly Program Plan. In addition to Leg Project Management, all developmental activities that involve science, engineering, data management or publications are managed on a project basis. For example, the successful transition of the Program from published books to electronic publications was successfully managed and implemented as an electronic publications project. Areas of our operation where we manage activities on a functional basis are the publication of our scientific products where our staff works on as many as 24 books at a time, and in the areas of computer network and administrative support. Given our broad and diverse requirements for science delivery, we believe that we have crafted an appropriate balance between project-based and functional departmental activities.

- **Obtaining ISO 9000+ certification for the group**

  ISO is a system that develops quality management and quality standards for the following technical fields: mechanical engineering; basic chemicals; non-metallic materials; ores and metals; information processing; graphics and photography; agriculture; building; special technologies; health and medicine; basic subjects; environment; and packaging and distribution of goods. ISO standards are market-driven and are developed on the basis of international consensus among experts from the sector which has expressed a requirement for a particular standard.

  After reviewing ISO, we do not believe that ISO 9000 is a good fit with ODP. Moreover, we achieve the outcome of an ISO process (quality control and consumer responsiveness) in another fashion that is consistent with, and an outgrowth of, JOIDES Advisory structure. The requirements for service delivery for ODP are rather unique in that the nature of the products that we produce are defined by the community we serve, and the quality of these products are all routinely reviewed by the experts that populate the JOIDES Advisory Panels. The JOIDES Advisory Panels (i.e., SCICOM, OPCOM, SCIMP, TEDCOM, PPSP) review our operations, the character of our products and the quality of performance on a routine basis. If changes are thought necessary, recommendations are made to JOI and we respond to their directives. Two recent examples of the effectiveness of this process has been the incorporation of a microbiology laboratory into our at sea operations and the incorporation of a new analytical tool, an Inductively Coupled Plasma (ICP) system, on board the *JOIDES Resolution*. Both these new analytical capabilities were identified by our customer base, recommendations about

protocol and procedures were made through the JOIDES Advisory Panels to JOI, and we were instructed to implement them. Therefore, we believe that the JOIDES Advisory structure provides a very effective mechanism that develops quality standards that then can be implemented by the ODP management team.

- **Continually improving the Janus data base system with enhancements such as adding new tables and modeling updates**

  Customization of specific task applications to allow the efficient import and export of Janus data remains a high priority. Currently 55 application tasks are identified for completion. These tasks were prioritized based on safety and science implications, as well as resources requirements. Three task application groups were identified. Group 1 applications include projects requiring further definition. Most of these projects involve new equipment developments such as, microbiology, ICP, Fusion, and Digital imaging systems. Group 2 and Group 3 applications include currently acquired data. These two groups are subdivided based on the estimated resource requirements necessary for completion. Group 2 applications require significant resources (>120 hrs.) and Group 3 applications require minimal effort to complete. An implementation strategy that combines the application tasks with available resources (both personnel and funding) is being completed for review and implementation in February.

  To date, 50 JANUS data queries have been completed including applications specific to coring summaries, physical properties, paleontology, paleomagnetics and chemistry. Specific information about applications is available on the Janus database web page (http://janusaxp.tamu.edu/predef_queries/links/links_all.shtml). In addition, an effort is underway to develop a generic upload application. This application will become the standard upload routine applicable for most task applications. Completion of this upload routine will improve efficiency in the completion (turn around, coding and debugging) of the remaining application tasks. This generic application is currently being Beta tested during Leg 188. A similar generic report routine also is under consideration for development.

  Progress in the migration of the existing datasets into the Janus database also continues, but is progressing slowly given that only one FTE is assigned to this activity. Migration of the Shipboard MST, GRAPE, and Natural Gamma data has been completed for Legs 161 through 170. Migration of most P-WAVE data sets has been also completed for Legs 162-170. Complete migration of these datasets (Legs 101-160) is expected during FY00.

- **Implementing a commercial "ocean routing service" to transit the ship more efficiently from location to location.**

Ocean routing services provide a wide range of information services focused on the marine shipping industry. Germane to ODP interests, an ocean routing service can provide weather forecasting for an area along a track. An ocean routing service employs a group of forecasters who routinely monitor numerous data sources (NOAA, National Weather Service, etc.), analyze these data sets, and provide forecasts at a frequency required by the client. The duration of the forecast is also customer-defined and can be tailored to meet a broad range of requirements (i.e. 24 hours, 48 hours, 4 days, etc.). These data are transmitted to the ship by telex or e-mail at an agreed upon frequency (e.g. multiple times per day, daily, every other day). In addition, more specialized services can be obtained like typhoon monitoring or ice sheet monitoring, but we routinely employ these services as necessary. The costs for routing vary depending on the region of operations and the variables mentioned above, but costs routinely run between 100 to 300 US dollars per day.

We believe that these kinds of data could be very beneficial to operations under a range of our operating conditions and could provide the Captain and Officers of the *JOIDES Resolution* with a very important source of data. For example, when faced with long transits between work areas that take us across large bodies of water, or when working in a region with challenging environmental conditions (i.e. typhoons), a weather forecast supplied by an ocean routing service could be very beneficial. We have asked for an example of the weather forecasting reports provided and a better definition of costs as they apply to our particular operational needs. If these examples of environmental data are meaningful and appear useful to the Officers of the *JOIDES Resolution*, we will employ the service for those appropriate selected operations.

Subcontractor - Logging Services Operator (Borehole Research Group) page 20

- **One concern that was raised was the possibility that logging staff at sea is duplicated-with one BRG scientist and a second one from the scientific community. This appears now to be a minor issue: BRG is obligated by contract to provide a logging specialist if only to direct the Schlumberger engineer and operation, whereas it is up to the chief scientist's discretion to bring on board a second specialist from the scientific community.**

  The responsibilities for scientists filling these two positions on *the JOIDES Resolution* are distinct, the Logging Staff Scientist being the contractual representative. Significant collaboration among the scientific party concerning log data acquisition and analysis does occur, especially when large efforts are needed for special logging operations (e.g. VSP, 3rd party tools, etc.) or for core-log-seismic integration (e.g., whole-round core scanning). Changes in the

JOIDES scientific positions are currently under discussion among JOI, TAMU and LDEO to more clearly represent the description of the current tasks on the *JOIDES Resolution*.

- **Scientific opportunities for integrating logging and site survey data are missed because digital survey data are not routinely archived at the Site Survey Data Bank. Members of PEC-V were shown some logging-seismic integrated studies, which were only available because the PI who collected the data made them available. Digital seismic data should be routinely submitted to the Data Bank and made freely available for use by the drilling community.**

  To date, log-seismic data integration has been undertaken on the *JOIDES Resolution* as an ad-hoc activity. That is, when a shipboard scientist or co-chief scientist is interested and provides the relevant seismic data in digital form. BRG has provided software for basic log-seismic integration capabilities (e.g. 1-D synthetics), although this has not been routine, and has done so usually by request. For certain legs, individual PI's have brought commercially-licensed software packages with them to sea for their personal use.

  In January 1999, SCIMP recommended that that BRG evaluate commercial seismic software packages to move ODP towards better integration of digital seismic data for shipboard science. Since then, commercial software that enables synthetic seismograms and time-depth profiles to be calculated has been reviewed. Among these packages, GeoQuest's IESX software offers basic functions as well as powerful seismic processing and data handling capabilities that are of broader interest. While addressing the SCIMP recommendation, this capability also brings up several questions about ODP Site Survey policy that were of concern to PEC-V, such as data storage, access, and confidentiality.

  As a start towards framing these questions for JOIDES and ODP, BRG is in the midst of planning a pilot study this year to format digital seismic data and to test the IESX software on the Resolution during Leg 188 and for 1-2 future cruises. Additional shore-based licenses for the software may be made available after the pilot study. Evaluation of the procedures and level of effort that would be needed for routine digital data access is the long-term objective.

- **It is expensive to acquire quality seismic data, and the process involved in obtaining funds for this purpose is difficult. The problem will only grow worse because the riser vessel will require a great deal of expensive, 3D survey data.**

  In the post-2003 program, data access and handling issues related to 3D seismic surveys, as well as seismic-log data integration, will also likely

increase. To anticipate these changes, the ODP site survey policy during the current program should be reviewed.

- **Significant knowledge and expertise exist in the logging services institutions and it will be important to try and retain and utilise this expertise in post-2003 drilling operations.**

  We agree that a significant amount of expertise and experience has accumulated at the ODP Logging Services institutions since 1984. However, it will be increasingly difficult to retain personnel well before the current program ends, if it is perceived that a significant hiatus in operations or a change in service providers is imminent. As noted by JOI to NSF, action should be taken as soon as possible to reduce this risk.

- **Calibrated lithostratigraphic profiles are not routinely available. Good examples of lithostratigraphic profiles have been provided by the Aachen group under subcontract to the BRG. The Committee would like to see these profiles routinely generated either on the ship or within a few months of the conclusion of a leg.**

  This topic was not discussed during the PEC visit to LDEO and their understanding that this work was performed under subcontract to BRG is not correct. Two Aachen scientists were approved as shore-based investigators to provide these profiles for two particular drilling legs. Their proposal was discussed at DMP in March 1996, then at subsequent SCIMP meetings, and trial projects were supported during Leg 173 and Leg 176. Characteristic electrofacies ("log units") were interpreted from core and log data roughly one-month post-cruise. After some discussion among the co-chiefs, scientific parties, TAMU, LDEO, DMP and SCIMP, their reports were submitted as shore-based log processing sections within the site chapters and reviewed by the Editorial Review Board for each IR volume. As of Feb 1998, SCIMP was only concerned about the manner of publication of the results, not the mechanism of including Aachen scientists as shore-based investigators for appropriate legs.

  In summary, the capability to provide lithostratigraphic profiles within a short time after the end of a leg is already in place, so long as it is approved as a shore-based contribution. It is not appropriate for this to become a contractual task of ODP Logging Services given the degree of scientific interpretation and shipboard collaboration needed to generate a useful profile. However, BRG will provide the processed logs immediately after the leg to approved shore-based scientists and can suggest similar shore-based processing to the co-chiefs of future legs during pre-cruise meetings. Providing the results to the shipboard party within a short time after completion of the leg is then the responsibility of the shore-based investigator.

Major Issues/Recommendations

Site Survey Funding and Use, page 21

- **PEC-V finds that funding is especially lacking in two areas. Geophysical site surveys are now funded separately and the results are not routinely integrated into the drilling programs. As such, we recommend that the site survey data sets used to select drill sites be included as non-proprietary data within all drilling programs once the leg has been approved for drilling. In addition, the scientist(s) holding the seismic data set used for the approved leg should be included in the scientific party of that leg as a shore-based member to guarantee the full integration and interpretation of such data into the scientific process.**

- **The resources required to store and distribute digital seismic data by the Site Survey Data Bank to the drilling community are considerable. The two-ship program will require even more resources to ensure the availability of digital seismic data.**

  The key concern regarding the Site Survey Data Bank noted in the PEC-V Report was the lack of submission and archiving of digital seismic data for proposed drill sites. As these data have only occasionally been submitted by the proponents, they are not routinely available to the shipboard scientists for integration with other data sets. The Data Bank does not discourage submission of digital data, but has not required their submission by proponents, primarily for two reasons:

  - The infrastructure to store, retrieve, display and plot-out digital seismic data is significant, and would require an increase in funding to the Data Bank to develop.

  - The ease of reproduction of these data raises security issues. Any system developed will have to have adequate safeguards built in to reassure proponents that their data will not be used outside of the scope of the drilling program. The Data Bank can guarantee this only to the point that the data is sent to the ship. Any system developed to do this routinely will need to have someone on the ship charged with controlling access to the data.

  However, to move toward the goal of archiving digital seismic data, the Data Bank has been working with the ODP Logging group to test the IESX system for seismic-log integration. This system provides an environment in which digital seismic data can be organized into projects, and which allows the display and output of both basemaps and lines. The system is to be tested with survey data on Leg 188. These data were loaded into the IESX system at LDEO and taken to the ship for use by the shipboard party. This test is being

done with no additional cost to the Data Bank through the use of the Logging Group's site license for IESX, and the use of data already in hand from a scheduled Leg. However, routine use of this system for data from 20 – 30 active proposals will require additional resources to implement. We will have a clearer view of these costs post-Leg 188.

IESX provides for password protection for the seismic data, however a program-wide rationale for access control will need to be developed as these data will traverse subcontract boundaries. Care should be taken when formulating an access control policy that the system protects the interests of those depositing data into it, or provides them with some compensation for their submission (e.g. shorebased scientist status within the science party). Insisting that all data submitted are non-proprietary may foster a reluctance to submit recently acquired survey data.

Post-cruise funding, page 21

- **PEC-V also recommends that more funds be available for post-cruise science funding.**

  The program agrees with this recommendation because it would enhance the scientific return from ODP, but this is a matter for each member country's consideration.

Budgeting Considerations, page 21

- **PEC-V is concerned that the flat funding situation controlling the ODP budget will not only prevent some science from being accomplished before 2003 but it is also negatively impacting technological advances needed during the current program phase as well as for the post-2003 program. To date the situation has been tractable only because of enhanced efficiencies in operation and cost savings, but it could quickly become disastrous if inflation increases. Flat funding is also perceived as a negative in developing a post-2003 program. The committee therefore recommends ramping up funds to be used for multiple-platform research efforts and refitting or replacing the *JOIDES Resolution*.**

  The continued pressure of flat-funding on ODP operations has been accommodated over the past five years by careful management and cost control. Flat funding through the remaining years of Phase III will almost certainly require some reduction in Program services – this is not the signature of an expanding program. Ramping up budgets in ODP would be a positive step towards IODP, particularly in innovative areas related to multi-platform operations.

Publications, page 21

- **The change to electronic format for the ODP Proceedings volumes has had a mixed reception by the scientific community but the change is supported by PEC-V. We suggest that ODP-TAMU pay careful attention to the community criticism and make modifications that will continue to improve the delivery of results to a science community that is in the throes of a revolution involving information access and delivery.**

  In addition, efforts should continue to increase the volume of ODP publications in the open literature, especially peer-reviewed journals. This not only alleviates the criticism concerning accessibility of information, but also raises the level of acceptance of this information.

  The program will continue to review electronic publications. Normally this review takes place during the annual co-chief scientists' review meeting. All agree that increasing the number of ODP publications in the open literature is important, and the program is now making an effort to track the peer-reviewed publications within the framework of the long range plan.

  An example of the numbers of peer–reviewed ODP articles that exist in the open literature from 1995 to 1999 are shown in the table below.

Total # of articles	Geology	Nature	Paleoceanography	Science
Dynamics of Earth's Environment	76	48	131	37
Dynamics of Earth's Interior	59	38	0	14
Total	130	85	131	50

  Note: totals differ because some papers address topics in both LRP themes

Data Quality/Integration, page 22

- **Shipboard Data. PEC-V perceives a growing problem concerning the veracity of data from the several petrophysical streams (discrete measurements, pass-through data, and downhole logging) and with the integration of these data. This is a complex problem involving improvement of equipment, creation of software to improve the uneven quality of pass-through data, and "standardization" of log-core integration.**

  To our knowledge, there has been no mention of problems with the veracity of logging data or log processing from co-chiefs or shipboard scientists, though

certainly log data quality varies from hole-to-hole due to drilling conditions. The integration of core and log data is now routinely available with new software released during 1999 (Sagan v1.0). Though some interpretative skill is required, simply having the capability of Sagan on the JOIDES Resolution will tend to make core-log integration more "standardized" and routine over time.

Science Advice and Coordination

- **SCICOM, OPCOM and SSEPs. PEC-V observed that conflicts have, and may continue to emerge concerning decisions on drilling locations. Some proposals ranked lower by the SSEPs have been selected for the drilling schedule, instead of more highly ranked proposals. Also, they existed where SCICOM ranked several locations as highest priority, leaving the final selection to OPCOM, and then formally approving the decision via e-mail.**

  PEC-V proposes that these processes should be made fully transparent and the reasons for the decisions made known to the science community. We commend the decision to hold the OPCOM meeting in the middle of future SCICOM meetings. The ability for SCICOM to consider OPCOM's recommendations immediately after they meet is an important improvement to the process.

  These differences arise because a) SCICOM is charged with making the selection of potential legs from a large group of candidate proposals, making an effort to ensure that the overall outcome of the program maximizes the scientific return in the context of the goals set by the Long Range Plan, and b) OPCOM is charged with ensuring the maximum scientific return on the investment of time and money. Given the different goals of these groups there will always be some differences of opinion about what should have been selected and included in the schedule for drilling.

Scientific Measurements Panel (SCIMP)

- **PEC-V observed that with the integration of three service panels (Downhole Measurements, Information Handling, and Shipboard Measurements Panel) into one, the Scientific Measurements Panel (SCIMP), much expertise and engagement cannot be accessed during panel meetings. PEC-V considered whether the possibility of bringing in additional information by setting up ad hoc advisory committees (*Guide to ODP*, Appendix III, 12.4) would be sufficient. Because of the importance of these issues, and the continuous need, we recommend that two subgroups of SCIMP should be established**

concerning downhole measurements and information handling. These subgroups should meet just before the SCIMP meets to prepare important relevant issues and foster necessary developments.

This concern has been forwarded to SCIMP for comment, but it becomes part of the more complex problem of the role of SCIMP in the ODP phase-out and the transition to IODP. This will become one of a number of matters related to the development a phase-out plan that will be discussed by EXCOM at its meeting in February, 2000.