

# **INTEGRATED OCEAN DRILLING PROGRAM**

**United States Implementing Organization  
JOI Alliance**

**Joint Oceanographic Institutions, Inc.  
Lamont-Doherty Earth Observatory  
Texas A&M University**

## **PROGRAM PLAN**

**FY04**

CONTRACT OCE-0352500

For Time Period

1 October 2003 through 30 September 2004

**AMOUNT PROPOSED FY04: \$24,589,310**

Respectfully Submitted to:  
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# USIO FY04 PROGRAM PLAN FOR IODP

This USIO FY04 Program Plan initiates the U.S. Implementing Organization (USIO) scope of work for Integrated Ocean Drilling Program (IODP) program activities and deliverables for the current fiscal year. It is based on the current mission forecast and recognizes that the complex nature of IODP operations will require multiyear program plans to establish priorities and to allow the procurement of long-lead time equipment and services. The IODP Science Advisory Structure (SAS) has reviewed and prioritized science proposals to recommend an operations schedule that reflects the requirements of the IODP for the near term (1–2 years).

The IODP central management office (IODP Management International, Inc. [IMI]), working together with the other implementing organizations and with input from IODP funding agencies (National Science Foundation [NSF], MEXT, European, and other national funding agencies) have provided guidance and instruction to the USIO on the preparation of the USIO contribution to the IODP FY04 Program Plan. The USIO FY04 Program Plan includes a discussion of the goals of the USIO, all tasks and deliverables, schedules of activities, definitions of projects, and required budgets that incorporate funding allocations from the IODP central management office for science operations, and funding allocations from NSF for platform operations.

The Joint Oceanographic Institutions, Inc. (JOI) contract negotiations with the College of Geosciences at Texas A&M University (TAMU), through the Texas A&M Research Foundation (TAMRF), and Lamont-Doherty Earth Observatory of Columbia University (LDEO) have resulted in the establishment of subcontracts that formally establish the JOI Alliance (JA) for IODP. Under guidance from NSF, a USIO FY04 Program Plan has been developed in consultation with the JOI Alliance subcontractors for inclusion in the IODP FY04 Program Plan. The goal of having the drillship leave port for its first IODP cruise in June 2004 places immediate demands on the JA that are reflected in this document.

On behalf of the JOI Alliance and as outlined in this Program Plan, TAMRF has contracted with Overseas Drilling Limited (ODL) for the services of the DV *JOIDES Resolution* as currently configured for use as the riserless drilling vessel for Phase 1 activities in IODP. In support of the drilling vessel, the JA will provide the full array of science, operations, logging, engineering, information technology, technical, and publications services; laboratory facilities; core repositories; and administrative services. In addition, LDEO has contracted with Schlumberger for the provision of downhole logging equipment and engineering support during IODP Phase 1. Schlumberger will provide a set of services comparable to those provided for the Ocean Drilling Program (ODP).

## JOI ALLIANCE TOTAL SYSTEMS INTEGRATION

In FY04 the JOI Alliance will establish six management teams, each charged with a different set of responsibilities that must be successfully administered and fulfilled if the science support for operations of a riserless ship is to be successful. These responsibilities will be organized and partitioned during FY04 as part of the startup activities for the USIO. Two overarching teams will be responsible for strategic planning, oversight of JA mission delivery, prioritization of resources, and program plan development. The first of these teams is the JOI Alliance Systems Integration Team (JASIT), which will be responsible for strategic planning and systems integration. The other team is the JOI Alliance Systems Management Team (JASMT), which will be responsible for program management, resource allocation, and overall science services delivery. Four tactical teams will be created and tasked with the planning and implementation of the JA's deliverables: (1) scientific

drilling operations, (2) technical development, (3) information, and (4) publications, reports and outreach/education.

## **JOI ALLIANCE CONTRACTUAL RELATIONSHIPS**

### **JOI Alliance Prime Contractor**

JOI will be the prime contractor with ultimate responsibility for all contractual obligations entered into by the USIO. JOI's responsibilities will include the following:

- Oversee and assure the performance of management, administrative, financial, and information systems that support the U.S. riserless vessel and vessel operations in IODP.
- Exercise management and financial controls to ensure compliance with contract provisions and to encourage creative, effective, and efficient delivery of services.
- Oversee the development of an Environmental Impact Statement (EIS) for riserless drilling operations.
- Lead the JA in the long-term planning and strategy development for the USIO.
- Retain primary responsibility for representation of the U.S. component of IODP and the Program as a whole, when appropriate.
- Retain primary responsibility for clear and effective communication and coordinate linkages with IODP stakeholders including NSF, IODP central management office, JAMSTEC, EMA, and other IODP partners.
- Coordinate planning for initial drilling operations with Japanese and European organizations, ensuring all operations are consistent with governmental agreements.
- Establish various performance assessment systems that will ensure quality control of key functions of the USIO.
- Provide information on IODP to other federal agencies and the U.S. Congress and be generally responsible for program outreach, interactions with the news media, and oversight of programmatic science and outreach efforts.
- Lead efforts to augment NSF resources for IODP by fostering relationships between IODP and other national and international science programs and developing proposals for work in those cases in which Program priorities are coincident.
- Provide the primary lead for coordinating required publications and reports.

### **JOI Alliance Subcontractors**

TAMU, through TAMRF, and LDEO will serve as subcontractors to JOI and will contribute distinct but complementary capabilities that, collectively, support the full range of activities necessary for implementation of a riserless ship scientific drilling program by the JOI Alliance. These activities are summarized below and are presented in more detail in subsequent sections of this document.

For the JA, TAMU Science Services will provide services that are directly related to the scientific and engineering activities necessary to support science cruises, as well as the management of cruise-related shore-based functions (data management, core curation, and publications). Specifically, these service deliverables will include the following:

- Support of science operations (i.e., technical staffing of shipboard laboratories, staff scientists, and engineering operations superintendents).

- Implement sound procedures in drilling and laboratory operations that minimize environmental impact.
- Materials and logistical support of cruise implementation.
- Support development of analytical equipment and engineering tools necessary to achieve the scientific goals of riserless drilling.
- Support of information technology and services.
- Management of the archival data produced by the riserless vessel.
- Curation of cores collected during Deep Sea Drilling Project, ODP, and IODP riserless operations.
- Production of required reports.
- Publication of the scientific and technical results produced as a result of riserless drilling.
- Ensure a Health, Safety, and Environment program for the drilling vessel and shore-based facilities.
- Identify potential risks and provide recommendations for mitigating security risks of international travel, work in port environments, and at sea.
- Support of USIO outreach/education activities.

In addition, the administrative services in support of TAMU activities will be managed by TAMRF, which will provide/manage all administrative services (contractual, fiscal, property/procurement, human resources assistance, and travel assistance) to support the science operations carried out by TAMU.

For the JA, LDEO Science Services will provide the following:

- Logging services in cooperation with an international logging consortium for the riserless platform.
- Shipboard and shore-based logging data analysis and information systems management.
- Engineering and technological services.
- Support of USIO outreach/education activities.

## **USIO FY04 ACTIVITIES**

### **Phase 1 Start-up Activities**

The scope of activities associated with preparation and execution of typical IODP cruises will follow previous ODP experience. IODP Phase 1 operations are expected to begin in June 2004. Numerous activities concerning IODP Phase 1 cruises will be initiated in early FY04, including review and assessment of potential science programs, long-lead time procurement, weather, clearance, and staffing requirements; procurement, inspection, and service of laboratory equipment and tools; restoration of inventories; equipment enhancements; documentation preparation; scientific staffing for cruises; and hiring and training of technical staff. Platform operator insurance will be part of the vessel day rate, and its adequacy and currency will be verified annually by receipt of insurance cover pages. Among other coverage, operational insurance will provide drilling-peculiar coverage (e.g., control of well, seepage and pollution, third-party property, etc.) utilizing an umbrella, followed by government indemnification should that threshold be reached. Platform operator permits will be a dual responsibility. Permits required for the riserless platform (e.g., American Bureau of Shipping,

communication licenses) are the responsibility of the platform operator, with verification of adequacy done by inclusion of the requirements in the contract and enforcement of the appropriate provisions. Drilling clearances are the responsibility of the JA and will be addressed by the science services organization, in coordination with the U.S. State Department.

The JA will also deliver the following required reports and publications, as outlined in the Request for Proposals (RFP):

- JOI will produce and submit the USIO Policy Manual for the IODP.
- The JOI Public Affairs Director, in collaboration with members of the science party, will produce press releases and science articles relating to each scheduled cruise on the riserless vessel.
- The JA will produce and disseminate Daily Ship Status Reports, Weekly Reports, and Site Summary Reports.
- The JA will produce and disseminate the Project Execution Plan (PEP), Environmental Assessment, Draft Environmental Impact Statement, USIO Program Plan, Quarterly Operations and Management Report, and the USIO Annual Report.
- The JA will manage production and dissemination of the following publications: Technical Notes and Technical Reports, Expedition Scientific Prospectuses, Preliminary Reports, and Initial Scientific Reports.

## **Phase 2 Drillship Selection Strategy**

To engage drilling contractors as early as possible in the procurement process for a U.S. riserless vessel for IODP Phase 2, the JA has proposed a two-stage approach in FY04. An initial “Invitation to Tender” (ITT) will be issued to drilling contractors by the JA, following NSF approval, to obtain accurate, first-order information about the availability of drillships for IODP Phase 2. The second stage will involve the release of an RFP for procurement of a drillship. The proposed release of an RFP in FY04 is dependent on the guidelines governing the NSF Major Research Equipment and Facility Construction (MRE-FC) process and the authorization of this activity by the NSF. Logging services will be competitively bid in a parallel process with the drillship RFP. The RFP will be prepared by JOI Alliance staff and will include the full participation of NSF representatives with input from other stakeholders.

## **USIO BUDGET DEFINITIONS**

### **Platform Operating Costs vs. Science Operating Costs**

The development of budgets for the USIO FY04 Program Plan required certain assumptions to guide the allocation of costs into “platform operating costs” (POC) and “science operating costs” (SOC). This process used to define “platform operating costs” for the USIO was based on a small number of (proposed) fundamental principles, which are

- all activities required for the safe drilling and completion of a hole;
- all activities required for the safe installation of subseafloor hardware; and
- all activities required for the safe delivery of core to the core laboratory.

During the course of this evaluation it was determined that a fourth principle would be required to account for the management and administration of the platform in support of the first three

principles; however, only the JOI budget has incorporated this principle for the current submission. In addition, in response to a request for guidance, on 15 January 2004 NSF provide POC and SOC definitions for use in the development of this program plan. All USIO activities that are not defined by the fundamental principles are considered to be “science operating costs” in this program plan.

## USIO SUMMARY BUDGETS

### Task – Element Summary Budget

Description	JOI	TAMU	LDEO	USIO
<b>Task - Element - SOC FY04</b>				
Management & Administration	\$655,171	\$1,423,208	\$144,298	\$2,222,677
Science Services	\$0	\$3,511,597	\$653,684	\$4,165,281
Logging Services	\$0	\$0	\$966,104	\$966,104
Data Management	\$0	\$1,416,432	\$288,898	\$1,705,330
Curation	\$0	\$87,836	\$0	\$87,836
Publication Services	\$0	\$397,697	\$0	\$397,697
Education & Outreach	\$74,704	\$52,647	\$108,018	\$235,369
Platform Services	\$0	\$0	\$205,740	\$205,740
<b>Subtotals</b>	<b>\$729,875</b>	<b>\$6,889,417</b>	<b>\$2,366,742</b>	<b>\$9,986,034</b>
<b>Task - Element - POC FY04</b>				
Management & Administration	\$1,005,170	\$155,986	\$0	\$1,161,156
Science Services	\$0	\$875,493	\$0	\$875,493
Logging Services	\$0	\$0	\$614,982	\$614,982
Data Management	\$0	\$155,381	\$0	\$155,381
Curation	\$0	\$0	\$0	\$0
Publication Services	\$0	\$12,374	\$0	\$12,374
Education & Outreach	\$74,703	\$0	\$0	\$74,703
Platform Services	\$0	\$9,577,972	\$2,700	\$9,580,672
<b>Subtotals</b>	<b>\$1,079,873</b>	<b>\$10,777,206</b>	<b>\$617,682</b>	<b>\$12,474,761</b>
<b>Task - Element - MOB FY04</b>				
Management & Administration	\$0	\$16,592	\$0	\$16,592
Science Services	\$0	\$128,767	\$0	\$128,767
Logging Services	\$0	\$0	\$31,008	\$31,008
Data Management	\$0	\$295,040	\$0	\$295,040
Curation	\$0	\$0	\$0	\$0
Publication Services	\$0	\$4,367	\$0	\$4,367
Education & Outreach	\$0	\$0	\$0	\$0
Platform Services	\$0	\$1,630,901	\$21,840	\$1,652,741
<b>Subtotals</b>	<b>\$0</b>	<b>\$2,075,667</b>	<b>\$52,848</b>	<b>\$2,128,515</b>
<b>Task - Element - Totals FY04</b>				
Management & Administration	\$1,660,343	\$1,595,786	\$144,298	\$3,400,427
Science Services	\$0	\$4,515,857	\$653,684	\$5,169,541
Logging Services	\$0	\$0	\$1,612,094	\$1,612,094
Data Management	\$0	\$1,866,853	\$288,898	\$2,155,751
Curation	\$0	\$87,836	\$0	\$87,836
Publication Services	\$0	\$414,438	\$0	\$414,438
Education & Outreach	\$149,405	\$52,647	\$108,018	\$310,070
Platform Services	\$0	\$11,208,873	\$230,280	\$11,439,153
<b>Totals</b>	<b>\$1,809,748</b>	<b>\$19,742,290</b>	<b>\$3,037,272</b>	<b>\$24,589,310</b>

# EXPEDITION OPERATIONS

## Introduction

The FY04 Program consists of two transits and one complete science program. A second science program will be partially completed in FY04 with the remainder of the program completed in FY05 (see Fig. 1 for site locations and Budget Section below for expedition costs). Preparations will begin in FY04 for a third expedition that will take place in early FY05. A total of 121 operating days are proposed in FY04, consisting of 50 days in transit, 11 port call days, and 60 days focused on science delivery (on site and between-site transit). The schedule is summarized below:

- |                                 |   |
|---------------------------------|---|
| 1. 1 June–21 June 2004          | Transit (Pusan–Astoria)                     |
| 2. 21 June–29 August 2004       | Expedition 1: Juan de Fuca Hydrogeology     |
| 3. 29 August–13 September 2004  | Transit (Acapulco–Bermuda)                  |
| 4. 13 September–30 October 2004 | Expedition 2: North Atlantic 1–Late Neogene |
| 5. 30 October–18 December 2004  | Expedition 3: Core Complex 1                |

## Operations

### Transit (Pusan–Astoria)

The inaugural voyage of the IODP riserless vessel will be an estimated 17-day transit from Pusan, Korea, to Astoria, Oregon. This transit will be used to ensure complete functionality of the laboratory equipment on board the *JOIDES Resolution*, including instrumentation, networks, and telecommunications, as well as data acquisition verification and storage. In addition, the technical staff will be trained on policies and procedures and on ship and laboratory safety. This transit will also be used to prepare the downhole logging capabilities of the *JOIDES Resolution*. This includes installing instrumentation, computer networks, telecommunications, third party tool support areas, data acquisition systems, data verification and storage, and all laboratory/office equipment. The ODP logging winch will be disassembled during the transit in preparation for the new heavy compensated logging winch to be installed in Astoria. Laboratory operational manuals and procedures will be reviewed and modified as necessary.

### Expedition 1: Juan de Fuca Hydrogeology

This is a multidisciplinary research program to evaluate the formation-scale hydrologic properties (transmission, storage) within oceanic crust; determine how fluid flow pathways are distributed within an active hydrothermal system; establish linkages between fluid circulation, alteration, and geochemical processes, and determine relations between seismic and hydrologic anisotropy. These goals will be accomplished through the replacement of two existing subseafloor observatories penetrating the upper crust (ODP Sites 1026 and 1027) and through drilling two new holes (600 and 200 m into the crust) that will be cored, logged, sampled, instrumented, and sealed. This will be the location of the first multidimensional cross-hole experiment, including hydrological, microbiological, seismic, and tracer components. The work is proposed where (1) thick sediment cover isolates permeable basement, allowing small pressure transients to travel long lateral distances, (2) outstanding coverage of seismic, heat flow, coring, geochemical, and observatory data allow detailed hypotheses to be posed and tested, (3) existing ODP drill holes and long-term observatories provide critical monitoring points for pre- and post-drilling experiments, (4) the formation is naturally overpressured so as to drive multiyear, cross-hole experiments, and (5) a

planned cabled seafloor observatory network will facilitate long-term experiments, data access, and instrument control. Alternate sites are proposed within a shallow hydrothermal upflow zone, and in deeper basement areas where the crust is more mature. Other scientific objectives are to (1) understand the nature of permeable pathways in the crust, the depth extent of circulation, the importance of permeability anisotropy, and the significance of hydrogeologic barriers in the crust; (2) learn where viable microbiological communities live, and how these communities cycle carbon, alter rocks, and are influenced by flow paths; (3) quantify lateral scales over which solute transport occurs, the extent of flow channeling and mixing in the crust, and how these processes relate to rock structure and fabric; and (4) learn how to relate seismic velocities and velocity anisotropy to hydrogeologic properties. This science program will require multiple expeditions to complete. The two replacement CORKs, and one 600-m borehole, are scheduled to be completed and instrumented during the first expedition. A subsequent expedition will return to the region to complete the second borehole and installation of a borehole instrument hanger (CORK) system. The cross-hole experiment will be completed during the second expedition.

### ***Proposed Operations***

One new site (proposed Site SR-1) will be cored to 900 mbsf, and existing CORKs at previously instrumented ODP Sites 1026 and 1027 will be replaced. The highest priority objective is completion of Site SR-1 on Second Ridge in the Juan de Fuca region. Site SR-1 is located on 3.5-Ma crust over a buried basement ridge. Experiments at this site are intended to resolve the distribution and properties of distinct hydrothermal systems within the crust and reveal how hydrological compartmentalization relates to constructional, tectonic, alteration, microbial, and seismic processes and properties. Proposed Site SR-1A will be located about 1000 m south-southwest of Site 1026, where sediment thickness is 260 to 275 m. A reentry cone will be installed, and continuous rotary core barrel (RCB) coring will commence. Temperature will be measured, and sediments will be sampled for microbes and fluid chemistry, with the highest resolution sampling completed near the sediment/basement interface. RCB coring will continue 20 to 100 m into basement, and the hole will be reamed to allow installation of casing into the uppermost basement. RCB coring will continue to about 600 m into basement. The nature and extent of alteration within the upper crust will be documented. The hole will be logged using conventional tools (density, resistivity, sonic, formation micro scanner, borehole televiewer) to delineate fine-scale lithostratigraphy, alteration patterns, and fracture distribution. An Ultrasonic Borehole Imager (UBI) will also be deployed if funds become available. This is a two-expedition proposal and only the logging operations pertaining to IODP Expedition 1 are discussed. Packer experiments will be run in straddle mode to evaluate near-hole permeability distribution within distinct crustal intervals, and a multilevel CORK-II will be installed to isolate three to four crustal intervals housing independent sensors and fluid samplers.

The wireline logging program will consist of four deployments (pending available funding for the UBI deployment and permitting for the check-shot experiment). A thermistor will be placed on the cable head to allow monitoring and recording borehole temperatures in real time similar to the procedure used during Leg 193. This will give advance warning if temperatures become a problem for the wireline tools and can be used as a “rough” temperature log. The estimated total time required for logging would be approximately 37 hours, with longer times needed for increased resolution of the televiewer data. Additional information about specific experiments and operational plans are contained in the appropriate expedition planning sections of the Appendices for TAMU and LDEO.

## ***Environment and Safety***

Potential major risks that could affect the successful achievement of expedition objectives are twofold. First, reentry cones and casing hangers are long lead-time items—typically casing hangers require 14 months to fabricate. Orders will be placed as soon as requirements are clearly specified to minimize this risk. Second, hole stability problems may be encountered at Sites SR-1 and SR-2 over the long sections of basement required for CORK installation and packer work. We will attempt to mitigate this difficulty by using a long bottom-hole assembly. Other minor risks include the presence of gas hydrates in the sediment section, operational time limitations, and special shipping arrangements required for microbiological samples.

Procedures will be adopted to minimize risk to marine mammals from the proposed seismic experiments, including posting observers while experiments are in progress to record the presence and proximity of marine mammals, gradually increasing the amplitude of the sound sources to allow animals time to move away, and suspending operations if animals approach within 800 yards.

## ***Logistics***

Operations will require an estimated 69 days (6 days in port, 11 in transit, and 52 on site). Drill pipe, other hardware, and science supplies will be loaded in Astoria.

## **Transit (Acapulco–Bermuda)**

An estimated 14-day transit will be required to relocate the vessel from the Pacific to the Atlantic operating theater. We will take advantage of the transit to remedy any problems in the laboratories or with the shipboard computer networks that may have emerged during the initial expedition, to install new equipment that was not installed at the beginning of the initial expedition, and to continue training new Marine Laboratory Specialists.

## **Expedition 2: North Atlantic 1–Late Neogene**

The primary objective of this expedition is to establish for the Late Neogene to Quaternary the intercalibration of geomagnetic paleointensity, isotope stratigraphy, and regional environmental stratigraphies in order to develop a millennial-scale stratigraphic template for the North Atlantic. Other objectives are to (1) better understand the relative phasing of atmospheric, cryospheric, and oceanic changes that are central to understanding the mechanisms of global climate change on orbital to millennial timescales, (2) improve our knowledge of the temporal and spatial behavior of the geomagnetic field through high-resolution records of directional secular variation and geomagnetic paleointensity, and (3) provide fundamental constraints for numerical models of the geodynamo. These objectives will be accomplished by APC coring nine primary sites, with the objective of acquiring complete sedimentary sections appropriate for high-resolution studies. This is a science program that will require multiple expeditions to complete. Occupation of the first five of the program's nine sites is scheduled for this expedition. We plan to core the four remaining sites during the fourth IODP expedition.

## ***Proposed Operations***

From an operational standpoint this will be a routine sediment coring expedition. Each site will be quadruple APC cored to assure recovery of the complete sediment section. APC coring will extend to a minimum depth of approximately 150 m below seafloor, and one hole at each site will be deepened to 350–400 m. The expedition plan has been to log two sites with the triple-combination tool and the Formation MicroScanner/sonic tool strings. Data generated with these tools will be critical for hole-to-hole correlation, core-log integration and hole-to-seismic correlation, and correlation of results from Expeditions 2 and 5. Furthermore, given sufficient sedimentation rates, it

should be possible to investigate cyclostratigraphy in the downhole geophysical data. Successful core-log integration will be necessary to determine the completeness of the recovered cores and thus the accuracy of the stratigraphic framework. Costs for Expedition 2 and 5 logging operations will be incurred in FY05 and, therefore, are not included in the FY04 Program Plan budget.

### ***Experiments***

The emphasis of this expedition will be on sediment core recovery and analysis. No downhole experiments are planned. Heavy use of the core imaging system, magnetometer, and MST systems can be expected.

### ***Environment and Safety***

There is a high risk of losing operating time due to severe weather and ice conditions. The optimum weather window for drilling these sites is July through September. Given the scheduling constraints for FY04, scheduling this expedition in the September to November time frame is unavoidable and increases the risk of operational downtime (to about 10%) as a result of weather. To minimize risks to the safety of personnel and equipment, we will arrange for daily site-specific forecasts from a weather service experienced in North Atlantic conditions. Three additional operating days have been added to this program to accommodate operating time lost because of weather. The risk of encountering poor hole conditions is low.

### ***Logistics***

Operations will require an estimated 47 days (2 days in port, 14 in transit, and 31 on site [2 days in port, 7 in transit, and 8 on site in FY04]).

## **Expedition 3: Core Complex 1**

This FY05 program is aimed at documenting the conditions under which oceanic core complexes (OCCs) develop. These large shallow seafloor features appear to be related to rifting and accretion at slow-spreading mid-ocean ridges. However, currently available data are inadequate to characterize the magmatic/tectonic/metamorphic history so that we can better understand the mechanisms of uplift and emplacement of OCCs. The purpose of the drilling is to characterize the structure and the composition of an oceanic core complex located near the intersection of the Mid-Atlantic Ridge with the Atlantis Fracture Zone in the north central Atlantic Ocean. One deep hole (>700 mbsf) on the Central Dome of the Atlantis Massif is aimed at sampling the detachment fault zone, alteration front, and in unaltered mantle. A second intermediate to deep hole (400-500 mbsf) will attempt to penetrate the basaltic hanging wall to sample rocks just above the detachment, the shallowest part of the unexposed fault, and through the fault. The sites will address questions of whether the Moho is a hydration front in this location and whether expansion associated with serpentinization contributes to the uplift of core material. These tectonic and structural objectives will particularly benefit from logging data.

### ***Proposed Operations***

Both sites will require casing into basement in order to maximize the chances of achieving deep penetration. The first casing string would be set in basement using the HRRS Hammer Drill-in Casing system. Each site would then be RCB cored to about 130 m then opened using the bi-centered bit and underreamer, which would allow a second casing string to be set. Each hole would then be RCB cored to maximum depth and logged. This is a two-expedition program. During the first expedition, both sites will be drilled to casing depth and casing will be set. The remaining time will then be devoted to drilling and coring the first (deep) hole to the maximum depth possible. The second expedition of this program will be devoted to further deepening both holes.

Recording of in situ physical properties data is essential to core-log integration studies and a continuous lithologic and acoustic characterization of penetrated structures, allowing the linkage of seismic velocity, lithology, and degree of alteration, and the distribution of fractures at each site. Image data will provide high resolution (centimeter scale) for an accurate description of tectonic and structural features. Standard geophysical should be run on each hole, VSP, as well as the Formation MicroScanner (FMS) and the Ultrasonic Borehole Imager (UBI). Collecting standard logs and VSP information during Expedition 3 will provide accurate calibration of the sites to seismic surveys (limited amounts of legacy data are available at this location) and prior to completion of the drilling and logging program, including two-ship offset VSP experiments, during Expedition 4. All VSP experiments will occur pending environmental clearances. Costs for both Expedition 3 and 4 logging operations will be incurred in FY05 and, therefore, are not included in the FY04 Program Plan budget.

### ***Experiments***

An offset VSP is planned at both sites. This experiment will require seismic sources mounted on a second ship and will therefore require appropriate permits and clearances.

### ***Environment and Safety***

The principal risks to the program are the difficulty of starting a hole in bare rock and the possibility of encountering unstable hole conditions. The difficulty of starting a hole on bare rock will be mitigated through use of the HRRS Hammer Drill-in-Casing system. Experience has shown that in hard rock drilling the upper part of the hole is most prone to instability; hence, the upper 120 m of each hole will be cased off. Below that depth, we expect to encounter competent rock that will provide stable conditions and allow deep penetration, although it is possible that the shallower (hanging wall) site will exhibit unstable hole conditions throughout. Sufficient supplies and hardware will be carried to allow a third hole to be started in the event that one of the primary holes is lost through instability. Weather conditions should not be a limiting factor, even though this expedition is scheduled for late fall 2004. Procedures will be adopted to minimize risk to marine mammals from the proposed seismic experiments, including posting observers while experiments are in progress to record the presence and proximity of marine mammals, gradually increasing the amplitude of the sound sources to allow animals time to move away, and suspending operations if animals approach within 800 yards.

### ***Logistics***

Operations will require an estimated 49 days (4 days in port, 8 in transit, and 37 on site).

## Expedition Summary Budget

Description	Expedition 1		Transit		Expedition 2		Expedition 3	
	SOC	POC	SOC	POC	SOC	POC	SOC	POC
<b>TAMU Costs:</b>								
Payroll	\$925,517	\$627,142	\$214,613	\$145,424	\$228,026	\$154,513	\$0	\$0
Travel	\$12,988	\$38,315	\$1,188	\$8,885	\$3,763	\$9,440	\$0	\$0
Travel To/From Port	\$59,059	\$33,739	\$0	\$0	\$56,457	\$33,739	\$0	\$0
Training	\$31,466	\$109,979	\$6,369	\$23,193	\$10,767	\$34,601	\$0	\$0
Per Diem	\$0	\$87,536	\$0	\$20,298	\$0	\$21,567	\$0	\$0
Supplies	\$76,015	\$777,086	\$235	\$0	\$40,250	\$88,227	\$20,000	\$261,181
Fuels & Lubricants	\$0	\$689,594	\$0	\$159,906	\$0	\$169,900	\$0	\$0
Software	\$7,500	\$0	\$0	\$0	\$7,500	\$0	\$0	\$0
Insurance	\$0	\$121,995	\$0	\$28,289	\$0	\$30,057	\$0	\$0
Shipping	\$25,800	\$38,700	\$0	\$0	\$10,800	\$16,200	\$0	\$0
Telecommunications	\$15,472	\$0	\$3,588	\$0	\$3,812	\$0	\$0	\$0
Ship-to-Shore Communications	\$0	\$48,133	\$0	\$11,103	\$0	\$12,047	\$0	\$0
Professional Services	\$51,582	\$16,088	\$4,784	\$1,412	\$36,033	\$11,500	\$0	\$0
Recruiting	\$6,088	\$4,059	\$1,412	\$941	\$1,500	\$1,000	\$0	\$0
Maintenance and Repairs	\$59,750	\$250	\$0	\$0	\$59,750	\$250	\$0	\$20,000
Day Rate	\$0	\$4,514,021	\$0	\$1,046,729	\$0	\$1,112,150	\$0	\$0
Port Call	\$0	\$139,734	\$0	\$0	\$0	\$139,734	\$0	\$0
Equipment	\$0	\$125,875	\$0	\$0	\$0	\$125,875	\$0	\$25,000
Library	\$250	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>Subtotal (TAMU)</b>	<b>\$1,271,487</b>	<b>\$7,372,246</b>	<b>\$232,189</b>	<b>\$1,446,180</b>	<b>\$458,658</b>	<b>\$1,960,800</b>	<b>\$20,000</b>	<b>\$306,181</b>
<b>LDEO Costs:</b>								
Payroll	\$0	\$15,176						
Equipment	\$0	\$1,800						
Supplies	\$0	\$3,500						
Travel	\$0	\$2,500						
Communications	\$0	\$534						
Shipping	\$0	\$2,000						
Maintenance and Repairs	\$0	\$3,000						
Total Direct Costs	\$0	\$28,510						
Modified Direct Costs	\$0	\$26,710						
Computing	\$0	\$801						
Schlumberger	\$267,286	\$173,307						
Insurance	\$1,202	\$32,185						
Indirect Costs	\$0	\$14,156						
<b>Subtotal (LDEO)</b>	<b>\$268,488</b>	<b>\$248,959</b>						
<b>Total Cost per expedition (POC+SOC)</b>		<b>\$9,161,180</b>		<b>\$1,678,369</b>		<b>\$2,419,458</b>		<b>\$326,181</b>
<b>Total Cost for Expedition 1; Plus Partial Costs, as shown, for the Transit and Expeditions 2 and 3)</b>								<b>\$13,585,188</b>

# GLOSSARY OF EXPENSE CATEGORIES – EXPEDITIONS

## TAMU Costs

**Payroll**—This category contains salary, fringe, and sea pay directly associated with specific expeditions, along with pro rata amounts of the same items for employee efforts in support of expedition activities.

**Travel**—Travel in support of expedition activities (e.g., postcruise travel), exclusive of port call travel, are contained in this expense category.

**Travel to/from Port**—Funds in this category support travel to and from the ship at port calls for all seagoing personnel and other Program employees attending port call. All funds are expedition-specific.

**Training**—This category contains funds for training of the shipboard staff and other Program employees who receive specific training (e.g., Labview, Novell, etc.) that supports shipboard activities. The costs are both expedition specific and pro rata (i.e., multiple expedition support).

**Per Diem**—This category reflects catering charges for 45 personnel per month based on the most recent averages of shipboard participants. This category does not include ODL, SOS, or Catermar personnel, as they are accounted for in the day rate.

**Supplies**—In this category are expedition-specific supplies (e.g., drilling supplies, laboratory supplies, core liners, etc.), safety equipment for the ship, and personnel and departmental pro rata expenses associated with the annual cost of supporting the science plan at sea.

**Fuel & Lubricants**—Fuel and lubricants are budgeted for refuelings at an average cost per metric ton and associated costs.

**Software**—Funds used to support upgrades to existing software.

**Insurance (Ship Ops–General Support)**—Funds in these categories involve the coverage outlined in Appendix II (e.g., IODP/TAMRF Marine Package, Workers’ Compensation, and Maritime Employer’s Liability, etc.)

**Shipping**—The majority of costs contained in this category are expedition-specific costs and involve shipment of equipment and supplies to and from the ship. There are funds associated with shipment/ mailing of items in support of expedition-specific activities throughout the year.

**Telecommunications**—This expense is associated with shore-based cost incurred in support of expedition activities. Some costs are expedition specific, while others are incurred in support of multiple expeditions.

**Ship-to-Shore Communications**—Satellite and regular communications charges between the *JOIDES Resolution* and shore-based personnel are included in this category.

**Professional Services**—In this category are costs associated with temporary employees hired through companies/corporations, drill pipe maintenance, wireline severing charges, shipboard maintenance service calls, transfer fees, weather reports, and physical examinations for seagoing personnel.

**Recruiting**—Funds for recruitment of seagoing personnel.

**Maintenance and Repairs**—Funds contained in this category are for repairing drilling, coring, operations, and laboratory equipment for the ship.

**Day Rates**—Covers the cost of staffing the ship to include the sailing crew, drilling personnel, and catering personnel. It does not cover the cost of IODP/TAMU’s crew or the scientists on board the ship. The day rate varies according to the mode of the ship, which is generally operating, standby, or cruising. While it is a fixed rate per day, the day rate is adjusted for changes in the Consumer Price Index-Urban (CPI-U) and Employment Cost Index (ECI). When the cumulative change in the CPI-U and ECI (since the last increase) equals or exceeds 2%, the day rates will be adjusted by the percentage change. The adjustment takes effect at the beginning of the month following the increase and cannot occur more frequently than every 6 months.

**Port Calls**—Locations have a definite effect on the cost of port calls, which covers agents’ expenses and freight associated with resupplying the ship. During each port call, cores and equipment are off-loaded from the previous cruise and supplies are loaded for the upcoming expedition. ODL is reimbursed for port agent charges and the shipment of food and related supplies. Shipment of cores, drilling equipment, and laboratory supplies is arranged by IODP/TAMU and paid for by IODP/TAMRF. Similarly, IODP/TAMRF purchases all drilling equipment and laboratory supplies necessary for meeting the objectives of the expedition. These costs are covered in other areas, not Ship Operations.

**Equipment**—Includes costs associated directly with equipment (computer, scientific, and drilling) intended solely for use on the ship over a period of time greater than one expedition, equipment purchased for a specific expedition and pro-rata cost of shore-based equipment used partially to support expedition activities.

**Library**—Funds for books, journals, and other scientific resources.

## **LDEO Costs**

**Payroll**—Expedition-based salaries include fringe and sea pay for logging scientists during the cruise. Salaries for pre- and postcruise work are not included. Salaries for shore-based processing and other technical support are also not included.

**Equipment**—Prorated costs of computer, scientific, and engineering equipment for use on the ship over a period of time greater than one expedition.

**Supplies**—The cost of replenishing supplies for the Downhole Measurements Lab and for upgrades/additions to the software for this lab.

**Travel**—Travel of sea-going personnel to and from the drillship. It does not cover pre- and postcruise travel associated with the cruise (e.g., pre-cruise meetings).

**Communications**—The costs for phone and fax communication to the ship, as well as satellite transmission of data.

**Shipping**—The costs for routine shipments to and from the ship.

**Maintenance and Repairs**—Upgrade, modifications, and repair of non-Schlumberger tools and data acquisition systems.

**Computing**—The LDEO Computer Group provides computer maintenance, system backup, and Internet access. Repair, upgrade, and backup of Sun Microsystems hardware and software will be

covered under the LDEO network subscription. Calculations for this category are based on a charge of 3% of the Modified Direct Costs.

***Schlumberger***—Covers the costs associated with the leasing of standard tools and the associated engineering support services. POC costs are for equipment needed for backoff and severing services, including the Schlumberger engineer day rate.

***Insurance***—Insurance for standard and specialty logging tools during below-the-keel deployments. POC costs are for equipment needed for backoff and severing services.

***Indirect Costs***—Indirect costs (53%) are assessed on all charges except permanent equipment, tuition remissions, LDEO computer services, and downhole tool insurance.

**INTEGRATED OCEAN DRILLING PROGRAM**  
**United States Implementing Organization**  
**Systems Integration Contractor**  
**Joint Oceanographic Institutions, Inc.**

**PROGRAM PLAN**  
**FY04**

CONTRACT OCE-0352500  
For Time Period  
1 October 2003 through 30 September 2004

**AMOUNT PROPOSED FY04: \$1,809,748**

Respectfully Submitted to:  
National Science Foundation



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Steven R. Bohlen  
President, Joint Oceanographic Institutions  
Executive Director, Ocean Drilling Programs  
Joint Oceanographic Institutions  
Washington DC 20005

21 January 2004



# INTRODUCTION

JOI is a nonprofit (501(c)3) organization whose mission is to lead and manage large national and international science programs for the ocean sciences community. JOI members are drawn from 18 of the largest and most productive research institutions in the areas of marine geology, geophysics, and oceanography in the United States. JOI was created more than 25 years ago to help lead the U.S. effort in scientific ocean drilling. JOI managed the international phase of the Deep Sea Drilling Project and has been the prime (systems integration) contractor for ODP from its inception in 1983. For nearly 20 years, through subcontracts with LDEO and TAMU, JOI has provided central management and, through subcontractors, the full array of services at sea and on land for ODP. In addition, JOI has managed or supported a number of related activities including the Joint Oceanographic Institutions for Deep Earth Sampling (JOIDES) Advisory Structure for ODP through the JOIDES office and the U.S. Science Support Program (USSSP), which supports U.S. participation in ODP.

In its role as the USIO Program Office and the lead organization in the JOI Alliance (i.e., the systems integration contractor to NSF for IODP riserless drilling vessel operations), JOI has the principal responsibility for overseeing programmatic, contractual, and the fiscal management activities associated with the FY04 USIO Program Plan.

The key elements of JOI's responsibilities under this plan include the following:

- Oversee and assure the performance of management, administrative, financial, and information systems that support the U.S. vessel and vessel operations in IODP.
- Exercise management and financial controls to ensure compliance with contract provisions and to encourage creative, effective, and efficient delivery of services.
- Oversee the development of an Environmental Impact Statement (EIS) for riserless drilling operations.
- Lead the JA in the long-term planning and strategy development for the USIO.
- Retain primary responsibility for representation of the U.S. component of IODP and the Program as a whole, when appropriate.
- Retain primary responsibility for clear and effective communication and coordinate linkages with IODP stakeholders including NSF, the IODP central management office, JAMSTEC, EMA, and other IODP partners.
- Coordinate planning for initial drilling operations with Japanese and European organizations, ensuring that all operations are consistent with governmental agreements.
- Establish various performance assessment systems that will ensure quality control of key functions of the USIO.
- Provide information on IODP to other federal agencies and the U.S. Congress and be generally responsible for program outreach, interactions with the news media, and oversight of programmatic science and outreach efforts.
- Lead efforts to augment NSF resources for IODP by fostering relationships between IODP and other national and international science programs and developing proposals for work in those cases in which Program priorities are coincident.
- Provide the primary lead for coordinating required publications and reports.

JOI will work with its subcontractors to ensure that all of these primary tasks are carried out in a responsible and professional manner and in keeping with the directives of NSF and guidance provided by IMI and the SAS panels. JOI will also maintain communications with other platform operators (JAMSTEC/CDEX and EMA/BGS) and the international scientific community through the IMI Office and the scientific advisory structure of IODP.

## **General Operations**

JOI will manage the Program under the terms and conditions of the NSF USIO contract (OCE 0352500), in accordance with this Program Plan and consistent with subsequent annual program plans until the USIO contract has been completed. JOI staff will be responsible for the overall management, planning, data dissemination, and reporting of the USIO to NSF and community stakeholders.

Specifically, JOI will

- Work with JA subcontractors to conduct USIO and IODP programmatic activities.
- Select and work with other subcontractors, as required, to meet programmatic objectives.
- Develop an annual USIO Program Plan based on a mission forecast provided by NSF and incorporating input from the IODP central management office. The Program Plan will
  - Outline IODP and USIO programmatic goals and expectations.
  - Summarize USIO scheduled operational activities and other planning requirements.
  - Provide projected USIO budgets for POC and SOC, as well as total costs, based on staffing and organizational plans.
  - Review programmatic accomplishments from the previous year's activities.
  - Highlight recent scientific results and report on the distribution of samples, data, and program publications overseen by the USIO.
  - Present proposed IODP plans and other activities, as appropriate, to allow integration with the other IODP implementing organizations.
- Maintain a USIO policy manual that contains a clear and up-to-date summary of the policies and guidelines under which the USIO Program is managed and operates within the IODP.
- Evaluate the USIO Program within IODP.
- Prepare and submit quarterly reports to NSF that summarize the USIO financial, operational, and other activities.
- Conduct public affairs activities for the USIO and in support of IODP.
- Fulfill liaison responsibilities to the IODP SAS, the other implementing organizations, and IMI, as appropriate.

## **Other Activities**

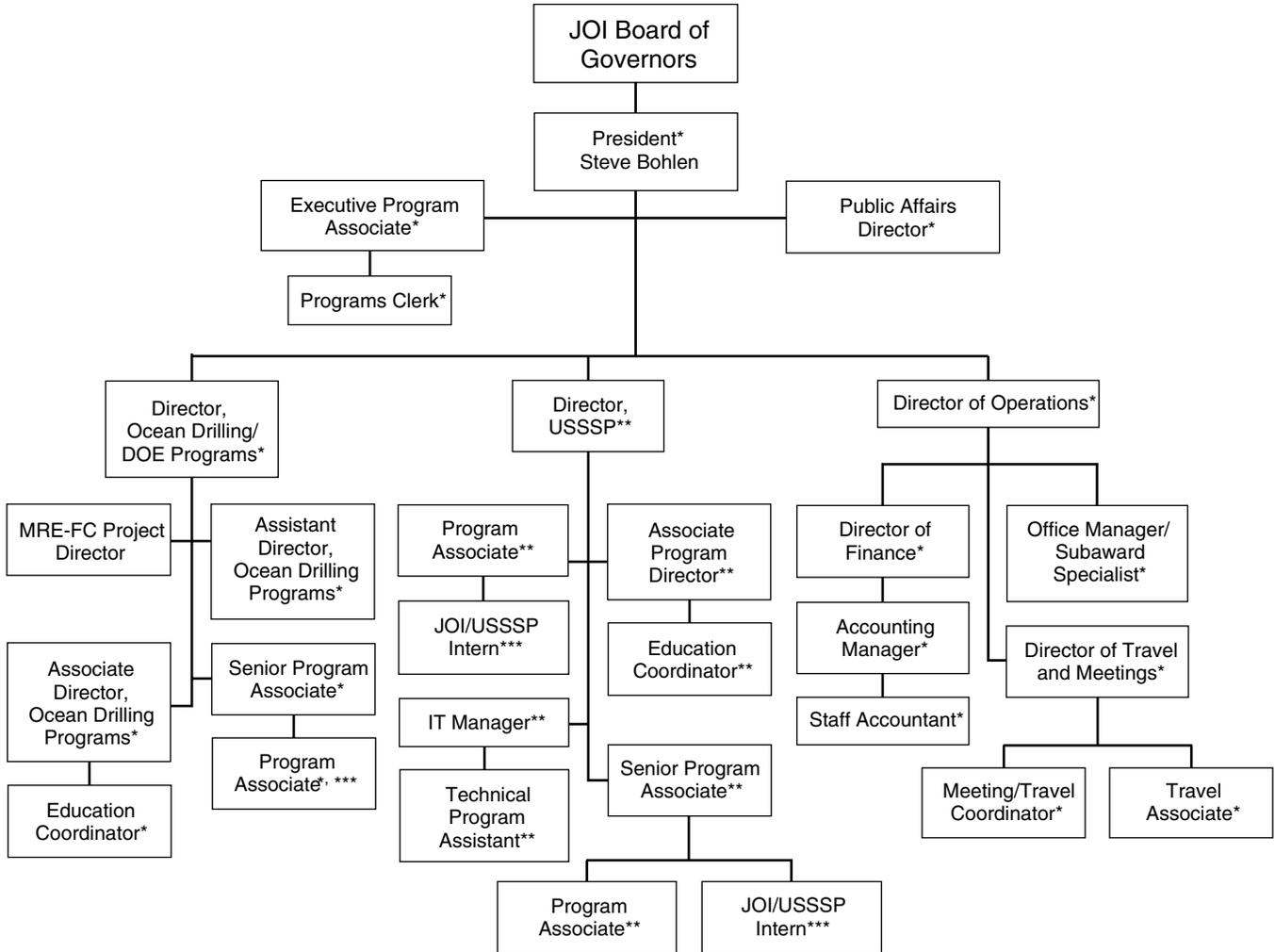
In addition to conducting the general operations outlined above, JOI will also carry out the following tasks and activities in FY04:

- Implement a selection process to secure an environmental firm to deliver the Provisional Environmental Impact Statement for Phase 1 IODP riserless vessel operations and initiate the process for Phase 2 vessel operations.

- Develop a draft Project Execution Plan for the MRE-FC process to define the Phase 2 vessel selection and conversion process, with NSF participation and stakeholder input.
- Secure subcontracts for required services required by the Program.

# ORGANIZATIONAL CHART

## Joint Oceanographic Institutions



\* The percentage of effort for IODP is less than 100% for these positions. Total FTEs for IODP = 7.62.

\*\* Not part of the IODP management.

\*\*\* Part-time position.

# JOI OFFICE BUDGET

Description	FY04 Program Plan SOC Budget	FY04 Program Plan POC Budget	FY04 Program Plan Mobilization Budget *	FY04 Program Plan NSF Total
<b>Management &amp; Administration</b>				
Salaries and Fringe Benefits	\$386,478	\$386,478	\$0	\$772,956
Travel	\$72,500	\$72,500	\$0	\$145,000
Supplies	\$25,000	\$25,000	\$0	\$50,000
Shipping	\$10,000	\$10,000	\$0	\$20,000
Communications	\$10,000	\$10,000	\$0	\$20,000
Contractual Services	\$0	\$100,000	\$0	\$100,000
Equipment	\$0	\$0	\$0	\$0
Other Direct Costs	\$0	\$100,000	\$0	\$100,000
Subtotal (Direct Costs)	\$503,978	\$703,978	\$0	\$1,207,956
JOI G&A	\$151,193	\$301,192	\$0	\$452,387
<b>Subtotal</b>	<b>\$655,171</b>	<b>\$1,005,170</b>	<b>\$0</b>	<b>\$1,660,343</b>
<b>Education and Outreach</b>				
Salaries and Fringe Benefits	\$17,463	\$17,464	\$0	\$34,927
Travel	\$1,000	\$1,000	\$0	\$2,000
Supplies	\$26,500	\$26,500	\$0	\$53,000
Shipping	\$2,500	\$2,500	\$0	\$5,000
Communications	\$2,500	\$2,500	\$0	\$5,000
Contractual Services	\$7,500	\$7,500	\$0	\$15,000
Equipment	\$0	\$0	\$0	\$0
Other Direct Costs	\$0	\$0	\$0	\$0
Subtotal (Direct Costs)	\$57,465	\$57,464	\$0	\$114,927
JOI G&A	\$17,239	\$17,239	\$0	\$34,478
<b>Subtotal</b>	<b>\$74,704</b>	<b>\$74,703</b>	<b>\$0</b>	<b>\$149,405</b>
<b>Total JOI</b>	<b>\$729,875</b>	<b>\$1,079,873</b>	<b>\$0</b>	<b>\$1,809,748</b>

\* All POC.

The JOI budget costs are divided as POC and SOC according to the four principles (including management and administrative requirements to support the platform).

**JOI Salaries and Fringe Benefits**—The costs for FY04 are based on salary levels proposed to NSF. The estimated JOI benefit rate is 31%. The total level of effort for JOI equals 7.62 full-time equivalent (FTEs).

**Travel**—The budget includes funds requested to support travel and meetings to accomplish management and administrative activities, and education/outreach activities. In addition, funds are requested to support JOI staff attendance at IODP SAS panel meetings, as well as integrative activities with the other implementing organizations and IMI.

**Supplies**—This category includes funds requested for supplies to support the activities of the JOI office under this contract.

**Shipping**—Funds are requested for shipping costs (e.g., postage, courier services) to support the activities of the JOI office under this contract.

**Communications**—This category includes funds requested for communications costs (e.g., phone, fax, internet services) to support the activities of the JOI office under this contract.

**Contractual Services**—In the Management and Administration budget, funds are requested for subcontracts related to the preparation of the USIO Environmental Impact Statement for IODP. In the Education and Outreach budget, funds are requested for a fellowship to foster and encourage the participation of HBCU-MI students in IODP activities.

**Equipment**—This category includes funds requested for equipment to support the activities of the JOI office under this contract.

**Other Direct Cost**—Includes funds requested for services and other expenses related to the preparation of the USIO Project Execution Plan for Phase 2.

**JOI General and Administrative Costs**—The NSF-approved provisional rate of 30% was used to calculate G&A costs. G&A is charged on all direct costs and on the first \$100,000 of all subcontracts JOI administers (e.g., TAMRF, LDEO, EIS subcontracts = \$90,000).

# **INTEGRATED OCEAN DRILLING PROGRAM**

**United States Implementing Organization  
Systems Integration Contractor**

**Science Services Operator  
Lamont-Doherty Earth Observatory  
of Columbia University**

## **PROGRAM PLAN**

**FY04**

CONTRACT 4-03

For Time Period

1 October 2003 to 30 September 2004

**AMOUNT PROPOSED FY04: \$3,037,272**

Respectfully Submitted to:  
Joint Oceanographic Institutions Inc.



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David Goldberg  
Director, Science Operations, IODP  
Lamont-Doherty Earth Observatory of  
Columbia University  
Palisades, NY 10964

21 January 2004



# INTRODUCTION

Working with the other members of the JOI Alliance (JA), LDEO Science Services is committed to the collection of scientifically valuable, high-quality log data. Our vision is to maintain technological preeminence, increase distribution and use of log data, and provide expertise to maximize its scientific potential.

The Deep Sea Drilling Project (DSDP) and the Ocean Drilling Program (ODP) progressively expanded the role of downhole measurements in marine geology and geophysics. Exploration of the structure, deformation, and stresses in the Earth's interior that are accessible by drilling has often been supplemented by downhole measurements and proven to be critical in understanding subsurface phenomena. The Earth's environment likewise has been investigated by scientific drilling and downhole measurements to discern details of the deep-sea sediment record over time. During DSDP, downhole measurements were conducted in fewer than 14% of all marine holes drilled, whereas they were made in more than 56% of the holes drilled by ODP. This dramatic increase in the use of logging is due to several causes, including permanent shipboard systems for routine operations, vast improvements in downhole instrumentation technology and drilling methods, and new measurements made on core samples that allow for one-to-one correlation with similar measurements made downhole. LDEO and Schlumberger have provided for these improvements in Logging Services for ODP since its inception. The JA will continue enhancing downhole measurements in IODP, thus promoting research on topics related to the Earth's environment and Earth's interior.

This Program Plan outlines the IODP goals of Science Services, LDEO, in FY04. As part of the JA, LDEO's Borehole Research Group (LDEO-BRG) will provide log data acquisition via a subcontract to Schlumberger Offshore Services and through staffing shipboard scientific and technical personnel. LDEO-BRG oversees subcontracts with Leicester University (LUBR), Laboratoire de Géophysique et Hydrodynamique en Forage (LGHF), University of Aachen, and Ocean Research Institute (ORI) to provide shipboard scientific personnel and special projects.

During FY04, we will build on our success in ODP, continuing to provide shipboard and shore-based logging capabilities and advancing the scientific potential of logging for the IODP Science Plan. Our major goals in FY04 and beyond are to

- focus on logging science,
- provide efficient and accurate data access,
- assist the scientific community on the use of log data,
- provide facilities and software for enhanced core/log/seismic integration,
- maintain state-of-the-art logging systems, and
- enhance our general education and outreach activities.

Major components of this effort in FY04 will be overall program management through the JA, the continued support for and expansion of the GeoFrame/IESX data processing package, enhancement of data access capabilities, and continued shipboard operations through Schlumberger.

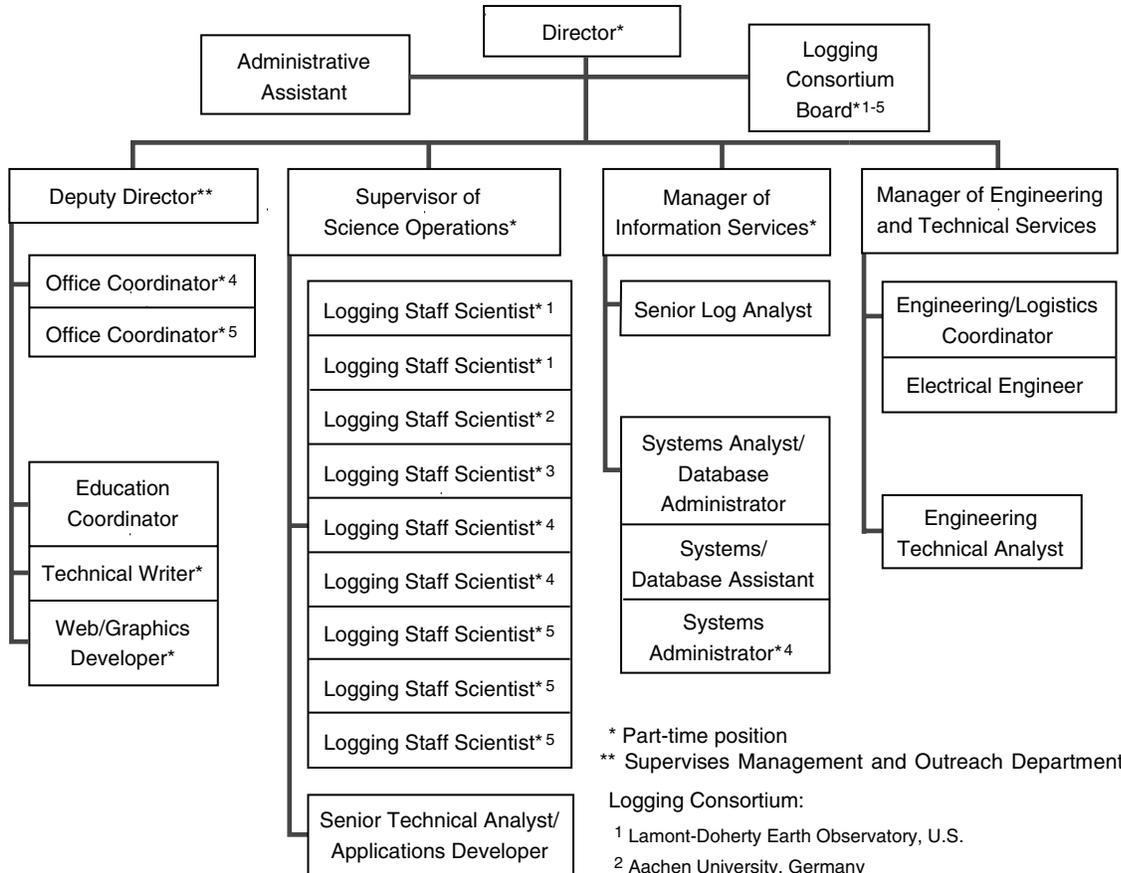
# FY04 BUDGET SUMMARY

Description	FY04 Program Plan SOC Budget	FY04 Program Plan POC Budget	FY04 Program Plan Mobilization Budget *	FY04 Program Plan NSF Total
Management/ Administration	\$144,298	\$0	\$0	\$144,298
Education/Outreach	\$108,018	\$0	\$0	\$108,018
Science Services	\$653,684	\$0	\$0	\$653,684
Logging Services	\$966,104	\$614,982	\$31,008	\$1,612,094
Platform Services	\$205,740	\$2,700	\$21,840	\$230,280
Data Management	\$288,898	\$0	\$0	\$288,898
<b>TOTAL</b>	<b>\$2,366,742</b>	<b>\$617,682</b>	<b>\$52,848</b>	<b>\$3,037,272</b>

\* All POC.

# ORGANIZATIONAL CHART

## Science Services, LDEO



\* Part-time position  
 \*\* Supervises Management and Outreach Department

- Logging Consortium:
- 1 Lamont-Doherty Earth Observatory, U.S.
  - 2 Aachen University, Germany
  - 3 Ocean Research Institute, Japan
  - 4 Laboratoire de Geophysique et Hydrodynamique en Forage, France
  - 5 University of Leicester Borehole Research, U.K.

Science Services, LDEO, is organized to ensure the successful implementation of each scheduled cruise. Four operational departments support expedition-related activities, including technology development, data processing, and information services, and provide scientific support for logging operations.

# HEADQUARTERS AND MANAGEMENT DEPARTMENTS

## DEPARTMENTAL RESPONSIBILITIES

The Director will be responsible for overseeing the management of all tasks to ensure that deliverables are met in accordance with National Science Foundation (NSF) and IODP Management International, Inc., (IMI) requirements. The Director will serve as Chief Scientist; provide scientific and technical guidance and interact with the JA, Science Advisory Structure (SAS) panels, and IMI groups; participate in JA strategic planning; and maintain programmatic and fiscal oversight of Science Services, LDEO, with overall responsibility for all Logging Consortium subcontractors, and head the Logging Consortium for riserless activities.

The Headquarters and Management Departments will be responsible for tasks including program management and reporting; coordination and budget control for LDEO projects; administration, personnel, general procurement, and subcontract fiscal oversight; budget tracking services; technical writing; graphic services and outreach/education activities, including Web development and administration.

## GOALS

**Provide overall program oversight.** Effectively and efficiently manage all science operation deliverables and ensure that they are consistent with NSF and IMI requirements.

**Budget Management.** Provide sound fiscal and contractual management of the activities and deliverables for which LDEO-BRG is responsible.

**Program Management.** Ensure the use of project management techniques to effectively manage resources and provide program accountability. Oversee execution of scheduled expeditions, including the planning, implementation, and review of each cruise.

**Subcontract Management.** Effectively and efficiently manage the subcontracts with Schlumberger and international subcontracts to Logging Consortium institutions (University of Leicester, Laboratoire de Géophysique et Hydrodynamique en Forage, University of Aachen, and Ocean Research Institute).

**Panel Liaison.** Provide liaisons as needed to SAS panels (e.g., SPC, OPCOM), as well as with other implementing organizations (IOs) and IMI.

**Reporting.** Preparation of required reports (e.g., quarterly reports, program plans).

**Information Distribution.** Maintain logging-related material on the U.S. IODP Web site.

**Phase 2 Vessel.** Work in collaboration with the JOI Alliance and NSF to ensure that an effective and efficient process is implemented to enable the timely acquisition of a IODP Phase 2 riserless vessel and logging services provider.

**Logging Consortium.** The Director will head the Logging Consortium for riserless activities and work with the members of the consortium to coordinate cross-platform logging activities and ensure the highest degree of compatibility among IODP IOs.

**Laboratory for Ocean Drilling, Observation, and Sampling (LODOS).** The JA will work collaboratively with LDEO scientists on drilling program-specific projects to optimize the scientific and technical capabilities available at LDEO for scientific drilling. The Director will participate in LODOS on behalf of the contracted riserless drilling operations. LODOS will be formed at LDEO in FY04 to initiate these activities.

**Training.** Coordinate training opportunities for members of the IODP community. Work with Science Operations Department to ensure adequate training of new Logging Staff Scientists.

**Outreach/Education Projects.** Coordinate, facilitate, and implement outreach/education projects involving the use of shipboard and shore-based laboratories. Work collaboratively with other JA education staff members to disseminate USIO-produced IODP outreach/education content to the international IODP community, national science education programs, and outside institutions such as museums. Develop Web-based and hands-on resources for teachers and students, including a series of “Science and Research Briefs” and online virtual tours that focus on specific areas of ocean drilling research.

# BUDGET

## Management/Administration

Description	FY04 Program Plan SOC Budget	FY04 Program Plan POC Budget	FY04 Program Plan Mobilization Budget *	FY04 Program Plan NSF Total
Personnel	\$35,771	\$0	\$0	\$35,771
Fringe	\$9,438	\$0	\$0	\$9,438
Sea Pay	\$0	\$0	\$0	\$0
Permanent Equipment	\$8,842	\$0	\$0	\$8,842
Materials/Supplies	\$5,371	\$0	\$0	\$5,371
Foreign Travel	\$8,200	\$0	\$0	\$8,200
Domestic Travel	\$23,100	\$0	\$0	\$23,100
Communication	\$2,200	\$0	\$0	\$2,200
Shipping	\$1,851	\$0	\$0	\$1,851
Other	\$900	\$0	\$0	\$900
Total Direct Cost	\$95,673	\$0	\$0	\$95,673
Modified Direct Cost	\$86,831	\$0	\$0	\$86,831
Computing	\$2,605	\$0	\$0	\$2,605
Indirect Cost	\$46,020	\$0	\$0	\$46,020
<b>TOTAL</b>	<b>\$144,298</b>	<b>\$0</b>	<b>\$0</b>	<b>\$144,298</b>

\* All POC.

The Management/Administration budget includes costs associated with Headquarters and Management activities.

**Personnel**—Personnel expenses for two employees in Management and Administration (5.0 months of employee effort).

**Fringe**—This category contains fringe benefits (26.2%) for employee effort.

**Permanent Equipment**—Includes costs associated with equipment having an acquisition cost of \$2,000 or more.

**Materials/Supplies**—General office supplies. This figure is based on historical costs.

**Travel**—Travel costs are budgeted for panel meetings, contractor meetings, scientific and technical meetings, and port call visits.

**Communication**—Telephone and fax costs. This figure is based on historical costs.

**Shipping**—Postage and express mail costs. This figure is based on historical costs.

**Other**—Costs for meeting support. This figure is based on historical costs.

**Computing**—In order to support the Lamont-Doherty computer network expense, an assessment of 3% of the modified total direct cost, not subject to overhead, is requested.

***Indirect Costs***—Indirect costs (53%) are assessed on all charges except permanent equipment, tuition remissions, LDEO computer services, and downhole tool insurance. Subcontracts are charged indirect costs on the first \$25,000 of each subcontract.

## Education/Outreach

Description	FY04 Program Plan SOC Budget	FY04 Program Plan POC Budget	FY04 Program Plan Mobilization Budget *	FY04 Program Plan NSF Total
Personnel	\$40,753	\$0	\$0	\$40,753
Fringe	\$10,752	\$0	\$0	\$10,752
Sea Pay	\$0	\$0	\$0	\$0
Permanent Equipment	\$9,247	\$0	\$0	\$9,247
Materials/Supplies	\$3,255	\$0	\$0	\$3,255
Foreign Travel	\$0	\$0	\$0	\$0
Domestic Travel	\$6,000	\$0	\$0	\$6,000
Communication	\$1,287	\$0	\$0	\$1,287
Shipping	\$1,168	\$0	\$0	\$1,168
Other	\$100	\$0	\$0	\$100
Total Direct Cost	\$72,562	\$0	\$0	\$72,562
Modified Direct Cost	\$63,315	\$0	\$0	\$63,315
Computing	\$1,899	\$0	\$0	\$1,899
Indirect Cost	\$33,557	\$0	\$0	\$33,557
<b>TOTAL</b>	<b>\$108,018</b>	<b>\$0</b>	<b>\$0</b>	<b>\$108,018</b>

\* All POC.

The Education and Outreach budget includes costs associated with the education and outreach activities of the Management/Outreach Department.

**Personnel**—Personnel expenses for three employees in Education and Outreach (10 months of employee effort) including an LDEO Education Coordinator.

**Fringe**—This category contains fringe benefits (26.2%) for employee effort.

**Permanent Equipment**—Includes costs associated with equipment having an acquisition cost of \$2,000 or more.

**Materials/Supplies**—General office supplies. This figure is based on historical costs.

**Travel**—Travel costs are budgeted for panel meetings, contractor meetings, scientific and technical meetings, and port call visits.

**Communication**—Telephone and fax costs. This figure is based on historical costs.

**Shipping**—Postage and express mail costs. This figure is based on historical costs.

**Other**—Costs for meeting support. This figure is based on historical costs.

**Computing**—In order to support the Lamont-Doherty computer network expense, an assessment of 3% of the modified total direct cost, not subject to overhead, is requested.

***Indirect Costs***—Indirect costs (53%) are assessed on all charges except permanent equipment, tuition remissions, LDEO computer services, and downhole tool insurance. Subcontracts are charged indirect costs on the first \$25,000 of each subcontract.

# SCIENCE OPERATIONS DEPARTMENT

## DEPARTMENTAL RESPONSIBILITIES

The Science Operations Department will be responsible for providing scientific, operational, and technical support for IODP riserless vessel downhole measurements activities, including planning, overseeing, and reviewing day-to-day logging science operations; offering scientific advice during early expedition planning stages; providing shipboard scientific, operational, and technical support through the Logging Staff Scientist; and developing integrated data packages for U.S. platform expeditions. Major subcontracts with University of Leicester, Laboratoire de Géophysique et Hydrodynamique en Forage, University of Aachen, and Ocean Research Institute will provide this department access to world-class logging scientists for shipboard participation and shore-based projects. The balance of scientific personnel support (including sea pay and fringe) is distributed among the partner institutions for shipboard participation and other logging-related activities.

## GOALS

**Provision of Logging Staff Scientists for FY04 IODP operations.** During FY04 one full expedition will be conducted and a second will have just begun. Logging Staff Scientists are responsible for preparing operational plans, with time and cost estimates, that achieve the scientific objectives of each expedition, ensure logging equipment is available for shipboard operations, and supervise safe and efficient logging operations onboard the *JOIDES Resolution*. Logging Staff Scientists also coordinate port call activities among LDEO and Texas A&M University (TAMU) logistics personnel, work with science party members wishing to conduct special downhole measurements as needed, and following each expedition, provide assistance for postcruise data processing. The Logging Scientist presents logging results and participates in postcruise meetings.

**Planning Activities.** Precruise preparations involve reviewing the logging tools required to complete the scientific objectives of the highly ranked riserless drilling proposals, as well as for scheduled FY05 expeditions. Logging operational plans are developed to meet these needs and ensure safe shipboard operations. Logging Staff Scientists are assigned as early as possible in order to effectively liaise with the Co-Chief Scientists and other cruise personnel.

**Assist with Preparations for Remobilization of the Drillship.** Preparations will be made to ensure that equipment in the Downhole Measurements Lab and communications with the Schlumberger units are properly set up, and that processing and interpretation software is working. The department will participate in shipboard training on tool deployment and safety procedures.

**Panel Liaison.** Science Operations will provide liaisons for IODP advisory panels (e.g., SSEPs, SciMP) as appropriate.

**Review of manuals and reference materials.** The Science Operations staff will review existing ODP documentation to determine usefulness to IODP and will prepare new materials as necessary.

**Log Analysis Centers.** Having the means to integrate core, log, and seismic data is a critical function associated with IODP scientific research. The GeoFrame/IESX data processing and interpretation package provides this capability at the five shore-based facilities. The Logging Consortium provides access to the centers for data interpretation and integration pre- and post-expedition. Borehole image log interpretation, in particular, requires this specialized software to take

full advantage of the data. Working with Information Services personnel, Science Operations will ensure that these capabilities are maintained and made available to the IODP research community.

**Data Integration.** LDEO Science Services personnel will carry out data cruise-related integration functions, accessing the services and data holdings of the IMI Data Bank to support JA drilling operations and science. GeoFrame/IESX will be used to produce digital seismic projects for each expedition and to create maps and graphics in support of the site location needs of the riserless vessel. These projects will also be used for log-seismic integration during the cruise in collaboration with shipboard logging scientists. Postcruise data interpretation may be conducted at the international Log Analysis Centers with on-site expertise.

**Training.** Science Operations will ensure that the Logging Staff Scientists are kept up to date on the latest downhole tools, operational procedures, and interpretation techniques.

**Educational Activities.** Science Operations will work closely with the LDEO Education Coordinator, providing scientific guidance and content for educational projects.

**Third-Party Tool Support.** Science Operations personnel will work with third-party developers for expedition-specific tool deployments. They will ensure that the developers are aware of, and meet, all reporting and technical third-party tool requirements in IODP.

**Core-Log Integration Platform (CLIP).** Science Operations will maintain CLIP software and provide training support for shipboard scientists, when necessary.

**Preparations for Phase 2.** The JA, SAS, and scientific community will refine the logging measurement needs for the Phase 2 vessel. In particular, LDEO-BRG will prepare the request for proposals for a Phase 2 logging service provider.

# BUDGET

## Science Services

Description	FY04 Program Plan SOC Budget	FY04 Program Plan POC Budget	FY04 Program Plan Mobilization Budget *	FY04 Program Plan NSF Total
Personnel	\$66,260	\$0	\$0	\$66,260
Fringe	\$17,469	\$0	\$0	\$17,469
Sea Pay	\$10,120	\$0	\$0	\$10,120
Permanent Equipment	\$13,842	\$0	\$0	\$13,842
Materials/Supplies	\$3,255	\$0	\$0	\$3,255
Foreign Travel	\$7,100	\$0	\$0	\$7,100
Domestic Travel	\$18,600	\$0	\$0	\$18,600
Communication	\$1,800	\$0	\$0	\$1,800
Shipping	\$692	\$0	\$0	\$692
Other	\$0	\$0	\$0	\$0
Total Direct Cost	\$139,138	\$0	\$0	\$139,138
Modified Direct Cost	\$225,296	\$0	\$0	\$225,296
Computing	\$6,759	\$0	\$0	\$6,759
Contracts	\$388,381	\$0	\$0	\$388,381
Indirect Cost	\$119,407	\$0	\$0	\$119,407
<b>TOTAL</b>	<b>\$653,684</b>	<b>\$0</b>	<b>\$0</b>	<b>\$653,684</b>

\* All POC.

The Science Services budget includes costs associated with shipboard staffing, cruise planning, and postcruise activities, including costs incurred through international subcontracts to Logging Consortium institutions.

**Personnel**—Personnel expenses for four employees (15.25 months of employee effort).

**Fringe**—This category contains fringe benefits (26.2%) for employee effort.

**Sea Pay**—Columbia University policy has been followed in accounting for sea pay (\$30/day first 35 days; \$50/day after 35 days) for all seagoing personnel.

**Permanent Equipment**—Includes costs associated with equipment having an acquisition cost of \$2,000 or more.

**Materials/Supplies**—General office supplies. This figure is based on historical costs.

**Travel**—Provides funds for travel in support of shore-based activities (e.g., travel in connection with professional meetings, pre-/postcruise meetings, cruise project management, panel meetings, etc). Travel costs to the *JOIDES Resolution* are included in the Platform Services budget.

**Communication**—Telephone and fax costs. This figure is based on historical costs.

**Shipping**—Postage and express mail costs. This figure is based on historical costs.

**Computing**—In order to support the Lamont-Doherty computer network expense, an assessment of 3% of the modified total direct cost, not subject to overhead, is requested.

**Contracts**—The members of the Logging Consortium (University of Montpellier, France; University of Leicester, United Kingdom; University of Aachen, Germany; and Ocean Research Institute, Japan) will provide shipboard participation of logging scientists, liaisons to selected panels as needed, and scientific support for program planning and logging-related projects. A total of 4.6 FTEs are supported on these subcontracts. Participation of all Logging Consortium personnel is supported at the 50% level or less.

**Indirect Costs**—Indirect costs (53%) are assessed on all charges except permanent equipment, tuition remissions, LDEO computer services, and downhole tool insurance. Subcontracts are charged indirect costs on the first \$25,000 of each subcontract. (Note: The first \$25,000 from each of the four subcontracts is included in the Modified Direct Costs line for purpose of calculating indirect costs).

# ENGINEERING AND TECHNICAL SERVICES DEPARTMENT

## DEPARTMENTAL RESPONSIBILITIES

The Engineering and Technical Services Department will be responsible for third-party and specialty tool support, logistics, and riserless platform engineering and development; oversight of shipboard and shore-based logging laboratories and equipment; provision and coordination of engineering and logistics issues; oversight of major technical subcontracts; special tool developments; and project management for a variety of engineering and technical activities.

## GOALS

The LDEO-BRG Engineering and Technical Services Department will work to improve logging and drilling equipment, as desired or requested by the scientific community, while minimizing costs through efficient engineering design and rapid prototyping technology that reduce the iterative development process. Using off-the-shelf components where possible, and recycling components when appropriate, the JA will produce new, robust technologies inexpensively.

**Mobilization.** The first technical priority for FY04 is to prepare the logging capabilities of the *JOIDES Resolution*. This includes installing instrumentation, computer networks, telecommunications, third-party tool support areas, data acquisition systems, data verification and storage, and all laboratory/office equipment. A new heave-compensated logging winch will be installed prior to Expedition 1, following testing in early FY04. In addition, during the mobilization period, shipboard laboratory operational manuals and procedures will be reviewed and modified as necessary.

**Shipboard Operations Support.** The department is tasked with supporting shipboard logging operations, including engineering support of LDEO data acquisition systems, downhole tools, third-party tools, laboratory equipment, and data linkages with the logging subcontractor.

**Subcontract Management.** The Manager of Engineering and Technical Services supervises the subcontract with Schlumberger for the delivery of logging services on the *JOIDES Resolution*.

**Cross-Institution Engineering Integration.** The combined resources of TAMU and LDEO's engineering departments will be utilized to create integrated development teams and regularly communicate with engineering development groups at the other IO institutions.

**Data Acquisition System.** The digital data acquisition system used for both LDEO and third-party tool deployments will be upgraded to LabView version 7. New equipment will be purchased and configured, and tools will be reprogrammed for use prior to the start of IODP Expedition 1.

**Testing and Calibration.** The access and maintenance of testing facilities at both TAMU and LDEO will enable equipment calibration and environmental control tests prior to deployment at sea during IODP. The facility will include equipment that can heat, chill, pressurize, and shock tools to simulate ocean or borehole conditions. Establishment of this capability at LDEO will be in place by the end of FY04.

**Logging While Coring.** This technology requires refinement of coring technologies in FY04 in preparation for work in FY05 and during Phase 2.

**Panel Liaison.** Engineering personnel will provide liaisons to IODP advisory panels (e.g., TAP) as appropriate.

**Technical Notes.** The department will prepare technical notes for all new procedure or tool developments and will review existing documentation for applicability to IODP operations.

**Equipment Procurement and Inventory.** The department will be responsible for procuring all engineering-related equipment needed for ship and shore-based operations and for maintaining an inventory of all equipment.

**Tool Reliability.** The department will maintain statistics on tool reliability and operational efficiency for use in the annual GPRA report and operational assessments of IODP logging activities.

**Third-Party Tool Support.** The department will work with third-party developers to ensure that their tools meet IODP standards for design and operation and third-party tool guidelines.

**Phase 2 Logging Contractor.** The logging system design guidelines for the Phase 2 vessel will be developed to issue a bid request document, accommodating the recommendations of the CDC report to the extent possible. Prospective vendor responses will be reviewed in late FY04 to match service requirements, deliverables, and to quantify the intangible attributes required for a long-term client/vendor relationship. Vendor selection should be completed in time for a meaningful contribution to the engineering phase of vessel layout for Phase 2.

**Logistics.** The department will coordinate with the Logging Staff Scientists, TAMU, ship operator personnel, and ship's agents to ensure efficient handling of shipments to and from the ship and other port call activities.

**Insurance.** The department will procure all necessary downhole tool insurance for standard logging operations, including coverage for specialty tools.

**Wireline Heave Compensation System.** The department will monitor the new wireline heave compensation system construction and testing milestones prior to deployment in Astoria, Oregon, prior to Expedition 1. The department will establish a backup strategy for wireline compensation capabilities on the riserless vessel for Phases 1 and 2.

# BUDGET

## Logging Services

Description	FY04 Program Plan SOC Budget	FY04 Program Plan POC Budget	FY04 Program Plan Mobilization Budget *	FY04 Program Plan NSF Total
Personnel	\$75,695	\$677	\$3,560	\$79,932
Fringe	\$19,918	\$177	\$933	\$21,028
Sea Pay	\$0	\$0	\$0	\$0
Permanent Equipment	\$114,167	\$0	\$0	\$114,167
Materials/Supplies	\$28,310	\$0	\$0	\$28,310
Foreign Travel	\$2,000	\$0	\$0	\$2,000
Domestic Travel	\$7,800	\$0	\$0	\$7,800
Communication	\$2,574	\$0	\$0	\$2,574
Shipping	\$5,608	\$0	\$0	\$5,608
Other	\$1,800	\$0	\$0	\$1,800
Total Direct Cost	\$257,872	\$854	\$4,493	\$263,219
Modified Direct Cost	\$143,705	\$25,854	\$4,493	\$174,052
Computing	\$4,311	\$776	\$135	\$5,222
Schlumberger	\$626,982	\$600,425	\$24,000	\$1,251,407
Indirect Cost	\$76,163	\$13,703	\$2,380	\$92,247
<b>TOTAL</b>	<b>\$966,104</b>	<b>\$614,982</b>	<b>\$31,008</b>	<b>\$1,612,094</b>

\* All POC.

The Logging Services budget includes costs for the Engineering and Technical Services Department and the subcontract to provide standard and specialty logging tools and engineering support (Schlumberger).

**Personnel**—Personnel expenses for the four employees in Engineering and Technical Services Department (20 months of employee effort). Funds associated with the management of that portion of the Schlumberger dealing with equipment associated with backoff and severing are included in the POC budget.

**Fringe**—This category contains fringe benefits (26.2%) for employee effort.

**Permanent Equipment**—Includes costs associated with equipment having an acquisition cost of \$2,000 or more. This budget includes equipment in support of logging operations including tool benches (\$40,000), rapid prototyping equipment (\$40,000), and an environmental control chamber (\$20,000). Additional items in this budget involve computer and safety equipment.

**Materials/Supplies**—General office supplies. This figure is based on historical costs.

**Travel**—Travel costs in the Logging Services budget support the shore-based travel of engineers in support of logging operations, including panel, technical, and subcontractor meetings.

**Communication**—Telephone and fax costs. This figure is based on historical costs.

**Shipping**—Postage and express mail service costs. This figure is based on historical costs.

**Other**—Includes repair and maintenance expenses for office equipment based on existing maintenance agreements and previous expenses for general repair and maintenance. Logging equipment maintenance includes upgrade, modification, and repair of tools and data acquisition systems.

**Computing**—In order to support the Lamont-Doherty computer network expense, an assessment of 3% of the modified total direct cost, not subject to overhead, is requested.

**Schlumberger**—Schlumberger will provide a standard suite of tools, engineer services, software support, and mobilization services. Schlumberger will also make available specialty tools for use on individual expeditions as needed. These services include a dedicated engineer on the ship for each expedition and support from the base of operations. In addition, this contract includes the services of a district engineer, staff engineer, electronics technician, and special services engineer on an as-needed basis (part-time to nearly full-time support).

Costs related to the leasing of equipment needed for backoff and severing services, as well as the day rate and travel expenses for the Schlumberger engineer are included in the POC budget.

**Indirect Costs**—Indirect costs (53%) are assessed on all charges except permanent equipment, tuition remissions, LDEO computer services, and downhole tool insurance. Subcontracts are charged indirect costs on the first \$25,000 of each subcontract. (Note: The first \$25,000 of the Schlumberger contract is included in the Modified Direct Cost line for purposes of calculating indirect cost).

## Platform Services

Description	FY04 Program Plan SOC Budget	FY04 Program Plan POC Budget	FY04 Program Plan Mobilization Budget *	FY04 Program Plan NSF Total
Personnel	\$0	\$0	\$0	\$0
Fringe	\$0	\$0	\$0	\$0
Sea Pay	\$0	\$0	\$0	\$0
Permanent Equipment	\$39,510	\$0	\$0	\$39,510
Materials/Supplies	\$17,812	\$0	\$0	\$17,812
Foreign Travel	\$6,850	\$0	\$7,500	\$14,350
Domestic Travel	\$2,000	\$0	\$0	\$2,000
Communication	\$2,400	\$0	\$0	\$2,400
Shipping	\$4,150	\$0	\$6,500	\$10,650
Other	\$27,000	\$0	\$0	\$27,000
Total Direct Cost	\$99,722	\$0	\$14,000	\$113,722
Modified Direct Cost	\$60,212	\$0	\$14,000	\$74,212
Computing	\$1,806	\$0	\$420	\$2,226
Insurance	\$72,300	\$2,700	\$0	\$75,000
Indirect Cost	\$31,912	\$0	\$7,420	\$39,332
<b>TOTAL</b>	<b>\$205,740</b>	<b>\$2,700</b>	<b>\$21,840</b>	<b>\$230,280</b>

\* All POC.

The Platform Services budget includes costs for the shipboard downhole measurements lab and associated equipment/supplies, travel for sailing scientists, travel associated with equipment maintenance, communications and shipping costs, services associated with tool maintenance, and downhole tool insurance. No personnel costs are included in Platform Services.

**Permanent Equipment**—Includes costs associated with equipment having an acquisition cost of \$2,000 or more.

**Materials/Supplies**—General office and shipboard lab supplies. This figure is based on historical costs.

**Travel**—Travel funds support travel to the platform for logging scientists, engineers, and other port call personnel in FY04.

**Communication**—Telephone and fax costs. This figure is based on historical costs.

**Shipping**—Postage and express mail service costs. This figure is based on historical costs.

**Other**—Includes repair and maintenance expenses for office equipment based on existing maintenance agreements and previous expenses for general repair and maintenance. Logging equipment maintenance includes upgrade, modification, and repair of tools and data acquisition systems.

**Computing**—In order to support the Lamont-Doherty computer network expense, an assessment of 3% of the modified total direct cost, not subject to overhead, is requested.

**Insurance**—Supports tool insurance for the deployment of downhole logging tools and is based on anticipated rates of 17.5% of total equipment value. LDEO will waive the indirect cost associated with this category. Insurance on equipment needed for backoff and severing services is included in the POC budget.

**Indirect Costs**—Indirect costs (53%) are assessed on all charges except permanent equipment, tuition remissions, LDEO computer services, and downhole tool insurance. Subcontracts are charged indirect costs on the first \$25,000 of each subcontract.

# INFORMATION SERVICES DEPARTMENT

## DEPARTMENTAL RESPONSIBILITIES

The Information Services Department will be responsible for the provision of computer and network systems support services; logging software development projects, data processing, and data analysis; database network support and access; and collaboration with JA to plan and coordinate ship-to-shore communications to serve the needs of the logging program.

## GOALS

**Provide Data Processing, Management, and Distribution services.** Modern well logs are becoming increasingly complex, in particular with the widespread use of borehole images and logging-while-drilling technologies, and dedicated software packages and trained personnel are routinely required. The IS Department will use Schlumberger's commercial GeoFrame/IESX software package, which is specifically dedicated for log processing, display, interpretation, and data management, at five shore-based log analysis centers.

**Staffing and Support of Log Analysis Centers for Community Use and Training.** The main purpose of these centers is to provide a place for IODP scientists to receive training on log usage and have access to state-of-the-art software for log processing, analysis, and interpretation. The five international log analysis centers will provide GeoFrame/IESX software and scientific personnel with log analysis expertise on site to help achieve the scientific objectives of IODP expeditions and postcruise science. In addition to serving as educational and training centers for the IODP community, the log analysis centers also provide detailed training for JOIDES logging scientists on the technical aspects of data acquisition and processing. The log analysis centers provide an environment in which data from an individual expedition (and related expeditions) can be accessed easily and quickly for log processing, analysis, and interpretation.

**Review of Processing Manuals and Reference Materials.** The Information Services Department will review existing ODP documentation to determine usefulness to IODP and prepare new materials as necessary.

**Assist in the Preparations for Remobilization of the Drillship.** The department will ensure that processing and related computer equipment in Downhole Measurements Lab is properly set up and that processing and interpretation software is working.

**Logging Protocols.** The department will work with the JA and representatives from other IOs to standardize logging protocols (e.g., filenaming conventions) to the extent feasible.

**Quality Control.** The department will work with the Logging Staff Scientists and Schlumberger engineers to ensure that proper quality control measures are taken during data acquisition, transfer, and storage. The department also will ensure that proper procedures are followed during data processing.

**Online Log Database.** The department will be responsible for the historical DSDP/ODP and the IODP log databases, archiving and distributing the collected data for the scientific community. Working closely with the JA and other IO and IMI groups, Information Services will ensure that the processed data is easily accessible online in compatible formats.

**Core-Log-Seismic Integration.** IESX provides scientists with a means of integrating core, log, and seismic data. Through the use of the shipboard satellite system, the department will provide the shipboard scientific party on the riserless vessel (*JOIDES Resolution*) with a comprehensive, fully processed, and quality-controlled dataset that can immediately be used for comparison and integration with other data collected during each expedition.

**Daily Computer Systems and Network Support**—The following shore-based and shipboard computer and network support services will be provided:

- Support of desktop workstations, servers, and network infrastructure, e-mail support services, and administrative services in support of the department.
- UNIX systems management.
- Software purchasing and version control for all departments.
- Coordination with JA networking staff to ensure that shipboard computer and ship-to-shore communication systems are properly supported.

# BUDGET

## Data Management

Description	FY04 Program Plan SOC Budget	FY04 Program Plan POC Budget	FY04 Program Plan Mobilization Budget *	FY04 Program Plan NSF Total
Personnel	\$89,818	\$0	\$0	\$89,818
Fringe	\$23,660	\$0	\$0	\$23,660
Sea Pay	\$0	\$0	\$0	\$0
Permanent Equipment	\$47,480	\$0	\$0	\$47,480
Materials/Supplies	\$28,138	\$0	\$0	\$28,138
Foreign Travel	\$0	\$0	\$0	\$0
Domestic Travel	\$6,900	\$0	\$0	\$6,900
Communication	\$3,139	\$0	\$0	\$3,139
Shipping	\$3,000	\$0	\$0	\$3,000
Other	\$100	\$0	\$0	\$100
Total Direct Cost	\$202,235	\$0	\$0	\$202,235
Modified Direct Cost	\$154,755	\$0	\$0	\$154,755
Computing	\$4,643	\$0	\$0	\$4,643
Indirect Cost	\$82,020	\$0	\$0	\$82,020
<b>TOTAL</b>	<b>\$288,898</b>	<b>\$0</b>	<b>\$0</b>	<b>\$288,898</b>

\* All POC.

This budget includes costs associated with the Information Services Department, including the majority of software costs for all departments.

**Personnel**—Personnel expenses for the four employees in the Information Services Department (16 months of employee effort).

**Fringe**—This category contains fringe benefits (26.2%) for employee effort.

**Permanent Equipment**—Includes costs associated with equipment having an acquisition cost of \$2,000 or more.

**Materials/Supplies**—General office supplies for the Information Services Department, as well as computer software for the all Science Services, LDEO, personnel.

**Travel**—Travel costs are budgeted for panel meetings, contractor meetings, scientific meetings, and port call visits.

**Communication**—Telephone and fax costs. This figure is based on historical costs.

**Shipping**—Postage and express mail service costs. This figure is based on historical costs.

**Other**—Costs for reference/training materials.

**Computing**—In order to support the Lamont-Doherty computer network expense, an assessment of 3% of the modified total direct cost, not subject to overhead, is requested.

***Indirect Costs***—Indirect costs (53%) are assessed on all charges except permanent equipment, tuition remissions, LDEO computer services, and downhole tool insurance. Subcontracts are charged indirect costs on the first \$25,000 of each subcontract.

# APPENDIX I: EXPEDITION OPERATIONS

## INTRODUCTION

The FY04 Program consists of two transits and one complete science program. Expenses for the second and third science programs will be included in the FY05 Program Plan.

## DELIVERABLES

### Transit (Pusan–Astoria)

The inaugural voyage of IODP will be an estimated 17-day transit from Pusan, Korea, to Astoria, Oregon. This transit will be used to prepare the downhole logging capabilities of the *JOIDES Resolution*. This includes installing instrumentation, computer networks, telecommunications, third-party tool support areas, data acquisition systems, data verification and storage, and all laboratory/office equipment. The ODP logging winch will be disassembled during the transit in preparation for the new heave-compensated logging winch to be installed in Astoria. Laboratory operational manuals and procedures will be reviewed and modified as necessary.

### Expedition 1: Juan de Fuca Hydrogeology

This is a multidisciplinary research program to evaluate the formation-scale hydrogeologic properties (transmission, storage) within oceanic crust; determine how fluid pathways are distributed within an active hydrothermal system; establish linkages between fluid circulation, alteration, and geomicrobial processes, and determine relations between seismic and hydrologic anisotropy. These goals will be accomplished through replacement of two existing seafloor observatories penetrating the upper crust and through drilling two new holes (600 m and 200 m into the crust) that will be cored, logged, sampled, instrumented, and sealed. This will be the location of the first multidimensional cross-hole experiments attempted in the oceanic crust, including hydrologic, microbiological, seismic, and tracer components. The work is proposed where (1) thick sediment cover isolates permeable basement, allowing small pressure transients to travel long lateral distances, (2) outstanding coverage of seismic, heat flow, coring, geochemical, and observatory data allow detailed hypotheses to be posed and tested, (3) existing ODP drill holes and long-term observatories provide critical monitoring points for pre- and post-drilling experiments, (4) the formation is naturally overpressured so as to drive multiyear, cross-hole experiments, and (5) a planned cabled seafloor observatory network will facilitate long-term experiments, data access, and instrument control. Alternate sites are proposed within a shallow hydrothermal upflow zone, and in deeper basement areas where the crust is more mature. Other scientific objectives are to (1) understand the nature of permeable pathways in the crust, the depth extent of circulation, the importance of permeability anisotropy, and the significance of hydrogeologic barriers in the crust; (2) learn where viable microbiological communities live and how these communities cycle carbon, alter rocks, and are influenced by flow paths; (3) quantify lateral scales over which solute transport occurs, the extent of flow channeling and mixing in the crust, and how these processes relate to rock structure and fabric; and (4) learn how to relate seismic velocities and velocity anisotropy to hydrogeologic properties.

### Logging Operations

This is a two-expedition proposal, and only the logging operations pertaining to IODP Expedition 1 are discussed below. The entire first expedition will be devoted to drilling a new hole to a depth of ~900 m (Proposed Site SR-1A), and replacing two CORKs from preexisting holes. Logging

operations will be take place in Hole SR-1A. The sedimentary section and likely the uppermost unstable basement section of this hole will be cased before any logging operations take place.

**Number of holes, targets depths, and proposed logging plans:**

Site	Sediment (m)	Basement (m)	Downhole Measurements	Special Experiments
SR-1A	275	600	Triple Combo FMS/Sonic UBI (televiewer) WST-3 Temperature Cement Bond Log	CORK

Assumption for Hole SR-1A:

Water depth = 2600 m

Casing depth = 375 mbsf

Hole depth = 900 mbsf

Open hole interval logged = 525 m

The wireline logging program will consist of four deployments (pending available funding for the UBI deployment). A thermistor will be placed on the cable head to allow monitoring and recording borehole temperatures in real time similar to the procedure used during Leg 193. This will give advance warning if temperatures become a problem for the wireline tools and can be used as a “rough” temperature log. The estimated total time required for logging would be approximately 37 hours, with longer times needed for increased resolution of the televiewer data.

# BUDGET

## Expedition 1: Juan de Fuca

Description	FY04 Program Plan SOC Budget	FY04 Program Plan POC Budget	FY04 Program Plan NSF Total
Personnel	\$9,791	\$0	\$9,791
Fringe	\$2,585	\$0	\$2,585
Sea Pay	\$2,800	\$0	\$2,800
Permanent Equipment	\$1,800	\$0	\$1,800
Materials/Supplies	\$3,500	\$0	\$3,500
Foreign Travel	\$0	\$0	\$0
Domestic Travel	\$2,500	\$0	\$2,500
Communication	\$534	\$0	\$534
Shipping	\$2,000	\$0	\$2,000
Other	\$3,000	\$0	\$3,000
Total Direct Cost	\$28,510	\$0	\$28,510
Modified Direct Cost	\$26,710	\$0	\$26,710
Computing	\$801	\$0	\$801
Schlumberger	\$173,307	\$267,286	\$440,593
Insurance	\$32,185	\$1,202	\$33,387
Indirect Cost	\$14,156	\$0	\$14,156
<b>TOTAL</b>	<b>\$248,959</b>	<b>\$268,488</b>	<b>\$517,447</b>

**Personnel, Fringe, and Sea Pay**—Expedition-based salaries include fringe and sea pay for logging scientists during the cruise. Salaries for pre- and postcruise work are not included. Salaries for shore-based processing and other technical support are also not included.

**Permanent Equipment**—Prorated costs of computer, scientific, and engineering equipment for use on the ship over a period of time greater than one expedition.

**Supplies**—The cost of replenishing supplies for the Downhole Measurements Lab and for upgrades/additions to the software for this lab.

**Travel**—Travel of seagoing personnel to and from the drillship. It does not cover pre- and postcruise travel associated with the cruise (e.g., precruise meetings).

**Communication**—The costs for phone and fax communication to the ship, as well as satellite transmission of data.

**Shipping**—The costs for routine shipments to and from the ship.

**Other**—Upgrade, modifications, and repair of non-Schlumberger tools and data acquisition systems.

**Computing**—In order to support the Lamont-Doherty computer network expense, an assessment of 3% of the modified total direct cost, not subject to overhead, is requested.

**Schlumberger**—Covers the costs associated with the leasing of standard tools and the associated engineering support services. POC costs are for equipment needed for backoff and severing services, including the Schlumberger engineer day rate.

**Insurance**—Insurance for standard logging tools during below-the-keel deployments. POC costs are for equipment needed for backoff and severing services.

**Indirect Costs**—Indirect costs (53%) are assessed on all charges except permanent equipment, tuition remissions, LDEO computer services, and downhole tool insurance.

## **Expedition 2: North Atlantic 1–Late Neogene**

The principal objective of this expedition is to develop a millennial-scale stratigraphic template for the Late Neogene–Quaternary of the western North Atlantic (Expedition 2) and central (Expedition 3) North Atlantic through the intercalibration of geomagnetic, paleointensity, isotope and regional environmental stratigraphies. Five sites are proposed for North Atlantic 1 that target locations known from previous ODP/DSDP drilling and piston core studies to have sedimentary sequences that (1) record millennial-scale environmental change, (2) are suitable for geomagnetic and geochemical analysis on a millennial scale, and (3) document the details of geomagnetic field variability. These sites will complement previous ODP legs in the North Atlantic, specifically Legs 162 and 172. During Expedition 2, two of these sites may be logged with the standard geophysical tool string for density, porosity, resistivity and gamma ray information and the FMS/Sonic tool string for high-resolution resistivity logs and images and sonic velocity data. The table below summarizes the planned logging operations, and total logging time is estimated to be 38 hr. Data generated with these tools will be critical for hole-to-hole correlation, core-log integration, and hole-to-seismic correlation, and correlation of results from Expeditions 2 and 5. Furthermore, given sufficient sedimentation rates, it should be possible to investigate cyclostratigraphy in the downhole geophysical data. Successful core-log integration will be necessary to determine the completeness of the recovered cores and thus the accuracy of the stratigraphic framework. Costs for Expedition 2 and 5 logging operations will be incurred in FY05 and, therefore, are not included in the FY04 Program Plan budget.

Site	Water Depth (mbsl)	Hole Depth (mbsf)	Logging Operations
IRM3A	2600	400	Standard, FMS/sonic
LAB3A	3350	400	Standard, FMS/sonic

## **Expedition 3: Core Complex 1**

The purpose of this drilling proposal is to characterize the structure and the composition of an oceanic core complex located near the intersection of the Mid-Atlantic Ridge with the Atlantis Fracture Zone in the north central Atlantic Ocean. One deep hole (>700 mbsf) on the Central Dome of the Atlantis Massif is aimed at sampling the detachment fault zone, alteration front, and in unaltered mantle. A second intermediate to deep hole (400–500 mbsf) will attempt to penetrate the basaltic hanging wall to sample rocks just above the detachment, the shallowest part of the unexposed fault, and through the fault. The sites will address questions of whether the Moho is a hydration front in this location and whether expansion associated with serpentinization contributes to the uplift of core material. These tectonic and structural objectives will particularly benefit from logging data. Drilling and logging at both sites will start during Expedition 3 and be completed during Expedition 4. Recording of in situ physical properties data is essential to core-log integration

studies and a continuous lithologic and acoustic characterization of penetrated structures, allowing the linkage of seismic velocity, lithology, and degree of alteration, and the distribution of fractures at each site. Image data will provide high resolution (centimeter scale) for an accurate description of tectonic and structural features. Standard geophysical should be run on each hole, VSP, as well as the Formation MicroScanner (FMS) and the Ultrasonic Borehole Imager (UBI), as outlined in the table below. Collecting standard logs and VSP information during Expedition 3 will provide accurate calibration of the sites to seismic surveys (limited amounts of legacy data are available at this location) and prior to completion of the drilling and logging program, including two-ship offset VSP experiments, during Expedition 4. All VSP experiments will occur pending environmental clearances. Costs for both Expedition 3 and 4 logging operations will be incurred in FY05 and, therefore, are not included in the FY04 Program Plan budget.

<b>Site</b>	<b>Water Depth (m)</b>	<b>Sediment Thickness (m)</b>	<b>Basement Thickness (m)</b>	<b>Logging Operations</b>
AMFW-01A	1630	1	>700	Standard, UBI, WST3, Mag Susc (DLL if fresh gabbros encountered)
AMHW-01A	2550	1–2	400–500	Standard, UBI, Mag Susc (DLL if fresh gabbros encountered)

# **INTEGRATED OCEAN DRILLING PROGRAM**

**United States Implementing Organization**

**Systems Integration Contractor**

**Science Services Operator**

**Texas A&M University**

## **PROGRAM PLAN**

**FY04**

CONTRACT JCS-4-02

For Time Period

1 October 2003 to 30 September 2004

**AMOUNT PROPOSED FY04: \$19,742,290**

Respectfully Submitted to:  
Joint Oceanographic Institutions Inc.



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Paul J. Fox  
Director, Science Operations, IODP  
Texas A&M University  
College Station, Texas 77845

21 January 2004



# INTRODUCTION

In the Integrated Ocean Drilling Program (IODP), the JOI Alliance serves as the U.S. implementing organization for the riserless scientific drilling vessel. In support of the Alliance, Texas A&M University (TAMU), working in partnership with the Texas A&M Research Foundation (TAMRF), is responsible for providing the science services that are closely linked with the operation of a riserless drilling ship. The document that follows identifies the tasks and services that TAMU/TAMRF provides, projects a cost for these deliverables, and outlines our goals for FY04 in support of IODP. The services that we are responsible for are directly related to the scientific and engineering activities necessary to support science cruises, the management of cruise-related shore-based functions (data management, core curation, and publications), as well as our contributions to the process to procure and prepare a riserless drilling vessel for IODP Phase 2 operations.

Specifically, these service deliverables will include the following:

- Support of science operations (i.e., technical staffing of shipboard laboratories, staff scientists, and engineering operations superintendents).
- Materials and logistical support of cruise implementation.
- Support development of analytical equipment and engineering tools necessary to achieve the scientific goals of riserless drilling.
- Support of information technology.
- Management of the archival data produced by the riserless vessel.
- Curation of cores collected during Deep Sea Drilling Project (DSDP), Ocean Drilling Program (ODP), and IODP riserless operations.
- Production of required reports.
- Publication of the scientific and technical results produced as a result of riserless drilling.
- Support of United States Implementing Organization (USIO) outreach/education activities.

In addition, the administrative services required to support TAMU activities will be managed by TAMRF, which will deliver all administrative services (contractual, fiscal, property/procurement, human resources, and travel assistance) necessary to support the science operations carried out by TAMU.

The total budget request for our IODP science support activities is \$19,742,290. FY04 is a time of transition at TAMU/TAMRF because staff members are dividing their time between tasks associated with ODP and the tasks required for the phase in of IODP. Only those tasks, and the time, effort, and cost associated with implementation of these IODP deliverables, are discussed in this document.

In late May–early June 2004, a mobilization team will arrive at the dry dock location (Korea or Japan) to load property and supplies. The team will reestablish the laboratories and computer network on the vessel during its transit to Astoria, Oregon. Once in Astoria, final mobilization activities will be completed and a fully operational science support system will be available for the initial expedition.

The scientific deliverables for which TAMU/TAMRF is responsible are organized into three distinct functional divisions: Science Services, which supports and implements the science activities at sea and the development of engineering tools and analytical equipment that support at sea science operations; Data Services, which supports data acquisition, management of data collections, core

curation, scientific publications, and outreach/education; and Administrative Services which provides services in contracts, purchasing, fiscal, travel, conference support, personnel guidance, and risk management. To assure a focusing of tasking and responsibility, the Science Services and Data Services divisions each incorporate two departments: the Science Services division is defined by the Science Operations and the Tools and Analytical Services Departments, and the Data Services division is defined by the Information Technology and Data Services and the Publication Services Departments. To assure programmatic integration, Deputy Directors oversee and manage the Science Services and Data Services divisions. The Deputy Directors report to the Director of Science Services as does the Vice President, TAMRF, who serves as the Manager of Administrative Services and who reports to the Director for technical direction and guidance.

Following guidance provided by the lead IODP agencies, NSF and MEXT, our budget request of \$19,741,290 can be partitioned into one of two programmatic categories: platform operating costs (POC) or science operating costs (SOC). When analyzed in this way, 54.6% (\$10,777,206) is POC, 34.9% (\$6,889,417) is SOC, and 10.5% (\$2,075,667) is mobilization. Please note that the distribution of resources between POC and SOC will change as we more fully understand what defines a POC and SOC and just how to accurately forecast time and effort. For example, in this budget projection, we did not allocate any of the Administrative Services payroll to POC. Based on recent discussions with NSF, time and effort spent by Administrative Services staff in support of POC activities will be treated as POC in the future.

A schedule for Phase 1 riserless scientific drilling has been defined by the Science Advisory Structure (SAS). The first expedition will commence in June 2004, and Phase 1 drilling activities will continue for approximately 12 months. Two drilling expeditions are scheduled for the last four months of FY04, and consequently, a significant amount of time, effort, and resources in FY04 will be committed in support of these two expeditions. The first expedition, Juan de Fuca Hydrogeology, is scheduled to begin 21 June 2004 in Astoria, Oregon, and end in Acapulco, Mexico. This expedition is challenging because it requires advanced engineering and technical support, and cruise-related costs are projected to be \$8,643,733 (\$7,372,246 is POC; \$1,271,487 is SOC). Following Acapulco, there is a 15-day transit to Bermuda that is required to link the expeditions. The projected budget for the transit is \$1,678,369 (\$1,446,180 is POC; \$232,189 is SOC). The second expedition, North Atlantic 1–Late Neogene, commences 13 September 2004 in Bermuda. This expedition will use the standard advanced piston coring (APC) system and, as such, is not as demanding in terms of time or material and is projected to cost \$2,419,458 (\$1,960,800 is POC; \$458,658 is SOC). Although scheduled to start in FY05, the third expedition, Core Complex 1, requires critical supplies (e.g., casing, casing hangers) that have to be purchased in early FY04 in order to be ready for a field program at the start of FY05. These FY04 costs, in support of FY05 activities, are projected to be \$326,181 (\$306,181 is POC; \$20,000 is SOC). A summation of all our projected FY04 costs that directly support expeditionary activities is equal to \$13,067,741, or 66% of our total FY04 request.

# FY04 IODP SUMMARY

Account	Description	FY04 Program Plan SOC Budget	FY04 Program Plan POC Budget	FY04 Program Plan Mobilization*	FY04 Program Plan Total
	<b>Headquarters</b>				
414011-01	Headquarters - Office	\$ 345,540	\$ 132,860	\$ -	\$ 478,400
414011-02	Education and Outreach	52,647	-	-	52,647
	<b>Subtotals</b>	<b>398,187</b>	<b>132,860</b>	<b>-</b>	<b>531,047</b>
	<b>Administrative Services</b>				
414021-01	Administrative Services	1,077,668	-	-	1,077,668
	<b>Subtotals</b>	<b>1,077,668</b>	<b>-</b>	<b>-</b>	<b>1,077,668</b>
	<b>Science Operations</b>				
414031-01	Science Operations Office	258,890	-	-	258,890
414031-02	Technical Support	796,188	426,179	102,039	1,324,406
414031-03	Science Support	342,414	85,040	-	427,454
414031-04	Operational Support	115,093	725,905	-	840,998
414031-05	Materials Support	413,376	97,287	131,973	642,636
	<b>Subtotals</b>	<b>1,925,961</b>	<b>1,334,411</b>	<b>234,012</b>	<b>3,494,384</b>
	<b>Tools and Analytical Services</b>				
414041-01	Tools and Analytical Services - Office	251,900	-	-	251,900
414041-02	Analytical Services	731,391	206,286	21,003	958,680
414041-03	Engineering Services	602,345	632,668	2,252	1,237,265
	<b>Subtotals</b>	<b>1,585,636</b>	<b>838,954</b>	<b>23,255</b>	<b>2,447,845</b>
	<b>Information Technology &amp; Data Services</b>				
414051-01	Info Technology & Data Services-Office	221,288	-	-	221,288
414051-02	Information Technology Support	818,080	144,583	284,474	1,247,137
414051-03	Databases and Archives	377,064	10,798	10,566	398,428
414051-04	Curatorial Office	87,836	-	-	87,836
	<b>Subtotals</b>	<b>1,504,268</b>	<b>155,381</b>	<b>295,040</b>	<b>1,954,689</b>
	<b>Publication Services</b>				
414061-01	Publication Services	397,697	12,374	4,367	414,438
	<b>Subtotals</b>	<b>397,697</b>	<b>12,374</b>	<b>4,367</b>	<b>414,438</b>
	<b>Ship Operations</b>				
414071-01	Ship Operations - Subcontractor	-	8,008,976	1,460,938	9,469,914
414071-02	Ship Operations - IODP General Support	-	294,250	58,055	352,305
	<b>Subtotals</b>	<b>-</b>	<b>8,303,226</b>	<b>1,518,993</b>	<b>9,822,219</b>
	<b>TOTAL</b>	<b>\$ 6,889,417</b>	<b>\$ 10,777,206</b>	<b>\$ 2,075,667</b>	<b>\$ 19,742,290</b>

\* All POC.

# HEADQUARTERS

*Headquarters is committed to providing oversight for all JOI Alliance Science Operator responsibilities and tasks and working with other IODP implementing organizations, IODP Management International, Inc., (IMI) offices, and SAS panels.*

## DEPARTMENTAL RESPONSIBILITIES

Headquarters oversees the management of all science operations and data management tasks to ensure deliverables are met in accordance with NSF requirements and direction provided by IMI; coordinates the Health, Safety and Environment (HSE) Program and shipboard operations, geological hazard reviews, international permitting, and strategic planning; provides fiscal oversight and management and scientific and technical guidance; represents TAMU on JOI Alliance teams and SAS panels; provides Web administration support for the science operator; and provides technical guidance and oversight of the ship subcontractor(s) consistent with the guidance provided by NSF and IMI.

The department includes seven employee positions<sup>1</sup>. The Director of Science Operations is responsible for oversight and delivery of all Science Services activities and deliverables at TAMU; is responsible for resource overview and direction that is consistent with the annual U.S. Implementing Organization Program Plan as defined by NSF and IMI; ensures that the IMI-endorsed standards of HSE are rigorously followed; assures and monitors coordination with other Alliance institutions, IMI, SAS panels, JAMSTEC, EMA, and other representatives of the science community; and represents IODP interests at appropriate meetings within TAMU. The Director supervises the Deputy Director of Science Services, the Deputy Director of Data Services, the department's administrative assistant, and the HSE Coordinator.

Headquarters coordinates services for the Alliance in three key areas: science operations, data services, and HSE. The two essential science operations activities will be the successful implementation of science at sea (Science Operations) and the technological development of analytical and engineering tools in support of science (Tools and Analytical Services). The Deputy Director of Science Services is responsible for oversight of these activities. Specifically, this position oversees planning, implementation, and review of each cruise; coordinates the review of geological hazard assessments; and interfaces, as appropriate, with SAS panels (i.e., SPC, OPCOM, and Pollution Prevention Safety Panel [PPSP]), the TAMU safety panel, other Alliance institutions, IMI, JAMSTEC, EMA, and other representatives of the science community.

The four essential data services activities are the management of the program's scientific legacy (including core collections, core images, and databases), the production of required reports and publications, outreach/education activities, and the information technology systems used to facilitate all Science Operator activities. The Deputy Director of Data Services is responsible for oversight of these activities. Specifically, the position oversees planning and implementation of curation, database, and publication legacy activities, oversight of network and computer infrastructure for TAMU, direction of IODP outreach/education initiatives carried out by TAMU, and, as appropriate, coordination of these activities with all Alliance institutions, IMI, SAS panels (i.e., SCICOM),

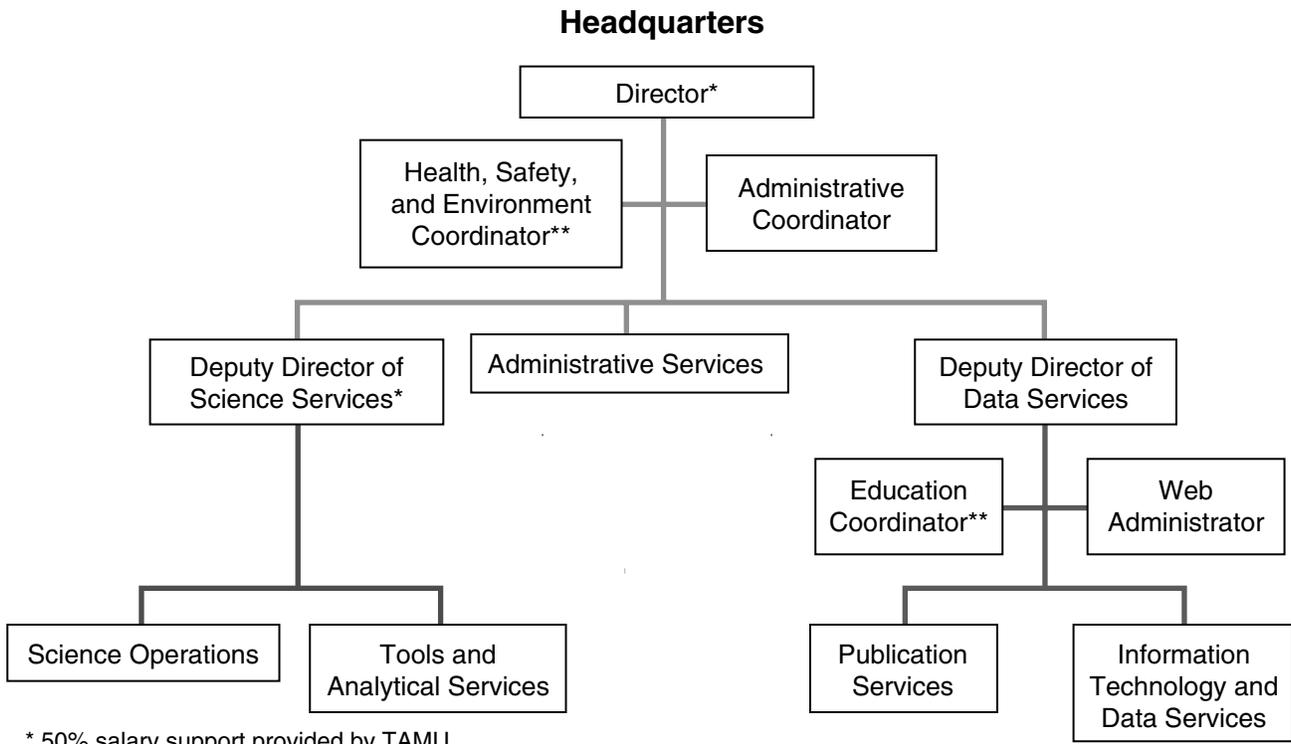
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<sup>1</sup> In support of IODP, TAMU supports 50% of the salaries of the Director of Science Operations and Deputy Director of Science Services.

JAMSTEC, members of the education community and other representatives of the science community.

Under the guidance of the Deputy Director for Data Services, the Web Administrator manages the TAMU Web site, and the Education Coordinator works in collaboration with Alliance members to contribute to the education and outreach goals established by IMI.

# ORGANIZATIONAL CHART



\* 50% salary support provided by TAMU

\*\* IODP funded in FY04.

All other positions funded by both ODP and IODP in FY04.

## GOALS

- Effectively and efficiently manage all science operation deliverables and ensure that they are consistent with NSF and IMI requirements.
- Ensure that the HSE program, geological hazard reviews, and international permitting adhere to local, state, federal and international regulations.
- Provide sound fiscal and contractual management of the activities and deliverables for which TAMU/TAMRF are responsible.
- Provide Web administrative services for the JOI Alliance Science Operator.
- Facilitate outreach/education activities handled by the JOI Alliance Science Operator, including development of Web-based resources for teachers and students and establishment of a “Teacher-at-Sea Program.”
- Ensure the support and contributions of the shore-based and shipboard educational infrastructure at TAMU for the JOI Alliance’s education and outreach goals as defined by IMI.
- Ensure engaged and constructive participation by IODP/TAMU representatives on all relevant IODP committees.
- Provide Web administration support for all aspects of the JOI Alliance and manage the IODP/TAMU Web site.
- Ensure that the ship subcontractor for Phase 1 provides a vessel that is safe and efficient and meets the requirements defined in the NSF RFP.
- Work in collaboration with the JOI Alliance and NSF to ensure that an effective and efficient process is implemented to enable the timely acquisition of an IODP Phase 2 riserless vessel.
- Develop a sound FY05 program plan for science operations and data services that is consistent with the guidance of NSF and IMI.

# BUDGET

## 414011-01000 Headquarters – Office

Exp. Cat.	Description	FY04 Program Plan SOC Budget	FY04 Program Plan POC Budget	FY04 Program Plan Mobilization Budget *	FY04 Program Plan NSF Total
2000	Payroll	\$ 276,054	\$ 76,221	\$ -	\$ 352,275
3500	Travel	41,014	56,639	-	97,653
3600	Training	1,100	-	-	1,100
3720	Business Conferences	1,872	-	-	1,872
4000	Supplies	1,500	-	-	1,500
4765	Software	500	-	-	500
8510	Library	1,700	-	-	1,700
5261	Shipping	1,100	-	-	1,100
5280	Publications/Printing	1,200	-	-	1,200
5370	Telecommunications	3,000	-	-	3,000
5373	Ship-to-Shore Communications	500	-	-	500
5550	Professional Service	12,000	-	-	12,000
5986	Furniture	4,000	-	-	4,000
	<b>TOTAL</b>	<b>\$ 345,540</b>	<b>\$ 132,860</b>	<b>\$ -</b>	<b>\$ 478,400</b>

\* All POC.

This cost center covers the activities to oversee the management of all science operations, data management services, and administrative tasks to ensure that deliverables will be met in accordance with IODP requirements.

**Payroll**—Covers the salary and fringe for six full-time equivalents (FTEs): Director, Deputy Director of Operations, Deputy Director of Data Services, the Health, Safety and Environment (HSE) Coordinator (anticipated start: March 1, 2004), an Administrative Coordinator, and Web Administrator. In addition, there is support for one undergraduate student worker to assist the Administrative Coordinator. The salary support for these tasks is partitioned between SOC and POC with the majority (78%) committed to SOC costs. The remaining 22% reflects the time that the Director, Deputy Director of Science Operations, and the Health, Safety and Environment Coordinator will spend on platform-related activities (e.g., safety oversight, clearance preparation, technical oversight of the ship’s operator, etc.). A portion of the Director and Deputy Director for Operations are paid by TAMU.

**Travel**—To maximize integration in IODP, there will be requirements to attend meetings associated with IODP science and implementation planning. The meeting schedule for the IODP advisory panels, regarding time and place, has not been well established, but generic plans, based on historical costs, have been made for the Director and Deputy Directors to attend IODP panel meetings (e.g., SPPOC, SPC, SCIMP and PPSP) as appropriate. It is also anticipated that there will be two meetings of the three implementing organizations (Edinburgh and Yokosuka), and the Director and Deputy Director of Operations will participate in these meetings. Moreover, the JOI Alliance will host four meetings in Washington, D.C., to review issues pertinent to the U.S. systems

integration contractors and to review plans pertinent to the acquisition and conversion of the Phase 2 ship. Funds have also been set aside for unscheduled visits to the core repositories in Kochi, Japan, and Bremen, Germany, to discuss curatorial issues common to IODP. In addition, there are travel funds in this budget to support the three members of the TAMU Pollution Prevention Safety Committee to attend two PPSP meetings per year. The travel budget is partitioned into SOC (42%) and POC (58%).

**Training**—Funds are provided for the HSE Coordinator to attend program and safety related courses.

**Business Conferences**—This category funds Program-wide meetings/conferences in, or in close proximity to, College Station.

**Supplies**—The budget covers the cost of conference supplies, copy paper, computer supplies of less than \$1,000, miscellaneous supplies (e.g., toner, pens, paper, folders, tape, labels, tablets, pencils, etc.) and phone books.

**Software**—Included in this cost are upgrades to programs that support Headquarters, including the acquisition of new software pertinent to the management and monitoring of health, safety, and environmental issues.

**Library**—Included in this cost are the purchase of key journal subscriptions for the IODP library (i.e., *Journal of Geophysical Research*, *Tectonics*, *Bulletin Geological Society America*, *Geology*, *Science* and *Nature*) as well as resource material pertinent to law of the sea, health, safety, and environment, and clearances.

**Shipping**—Included in this category are the cost of postage for regular correspondence and the cost of shipping overnight or priority charges.

**Publications/Printing**—Funds in this category are used in the printing of material used to disseminate program activities locally at conferences or external to keep the community informed of significant program features, activities and/or events.

**Telecommunications**—These funds pay for local and long distance services, along with the monthly charge per instrument.

**Ship-to-Shore Communications**—Long distance charges incurred when the Headquarters personnel are required to contact the vessel and are at a location other than College Station are included in this expense category.

**Professional Service**—With the creation of a second Deputy Director position, it is necessary to reconfigure the area proximal to Headquarters to create an additional office; a modification that involves the building of a permanent wall and associated alterations of the existing space.

**Furniture**—This budget funds the purchase of a desk, five bookshelves, an office chair, and several file cabinets to outfit the Director's office.

## 414011-02000 Headquarters – Education/Outreach

Exp. Cat.	Description	FY04 Program Plan SOC Budget	FY04 Program Plan POC Budget	FY04 Program Plan Mobilization Budget *	FY04 Program Plan NSF Total
2000	Payroll	\$ 37,641	\$ -	\$ -	\$ 37,641
3500	Travel	6,960	-	-	6,960
3551	Relocation	1,000	-	-	1,000
3580	Travel to/from Port	2,174	-	-	2,174
3600	Training	2,108	-	-	2,108
4765	Software	2,000	-	-	2,000
5370	Telecommunications	300	-	-	300
5987	Recruiting	464	-	-	464
	<b>TOTAL</b>	<b>\$ 52,647</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 52,647</b>

\* All POC.

This cost center covers the education activities of the Science Operator, including support for the Education Coordinator, supplies, communications, and necessary travel.

**Payroll**—Covers salary for the Education Coordinator (1 FTE) beginning in approximately January 2004.

**Travel**—This budget covers the travel to one JREPORT meeting and one SAS panel meeting, and registration and travel costs for attendance at two science education conferences to represent IODP/TAMU and network with science educators.

**Relocation**—Funds are budgeted to cover some relocation costs for the new position.

**Travel to/from Port**—Funds cover the cost for Education Coordinator to attend one port call (Astoria) to tour the ship and interact with scientists and staff.

**Training**—Funds are budgeted for the Education Coordinator to participate in technical training courses (e.g., scientific proofreading, software).

**Software**—Funds are budgeted to support the software packages needed by the Education Coordinator, such as system word-processing, page layout, CD-authoring, Web publishing, and spreadsheet programs.

**Telecommunications**—Rates for phone charge costs are based on FY03 actual rates; costs cover Education Coordinator position.

**Recruiting**—Funds cover costs for advertising position.

# ADMINISTRATIVE SERVICES DEPARTMENT

*TAMRF-IODP, as part of the Texas A&M Research Foundation, is committed to providing high-quality administrative services and resources in support of IODP/TAMU. TAMRF-IODP supplies quality services in contracts, purchasing, fiscal, travel, and conference support, and personnel and risk management. These are administered in a cost-effective, timely manner in compliance with applicable policies, procedures, and regulations.*

## DEPARTMENTAL RESPONSIBILITIES

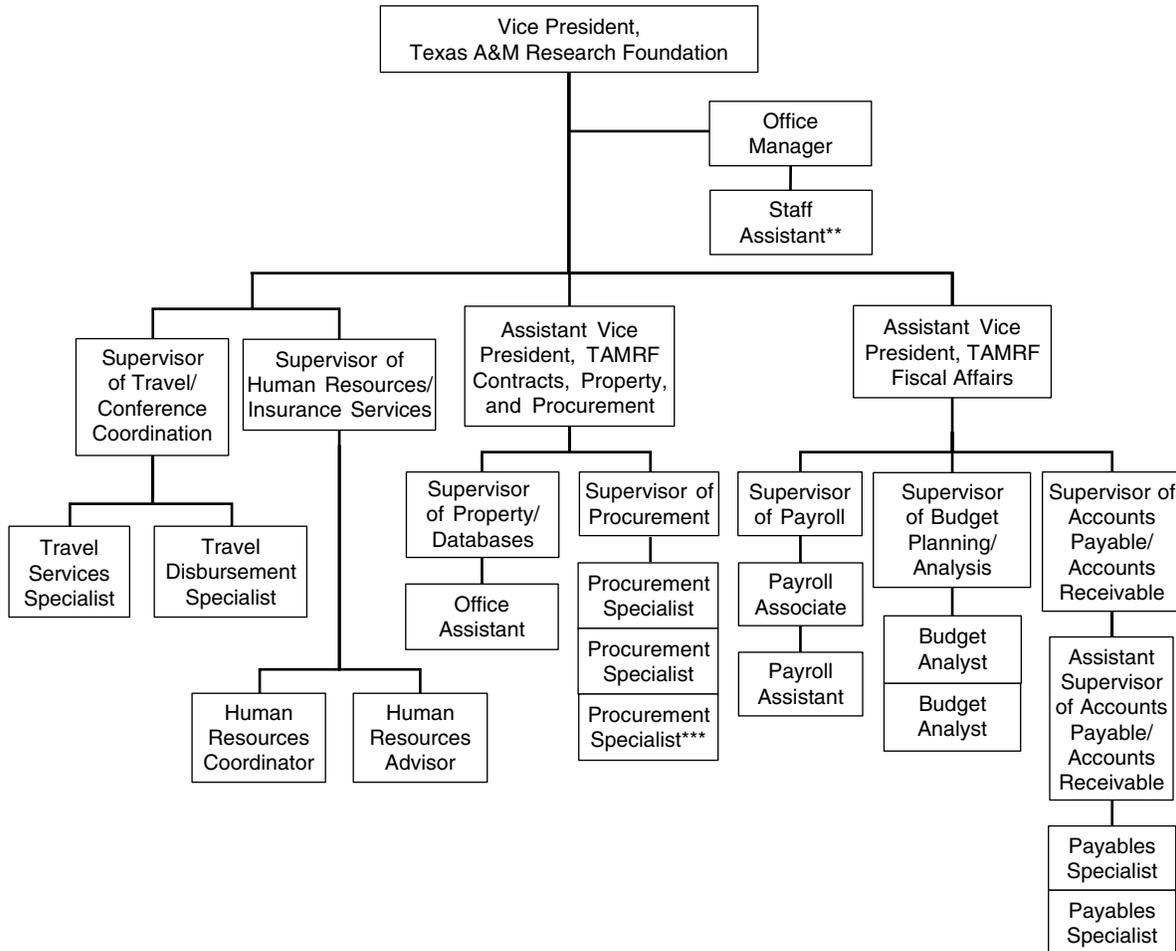
TAMRF administrative staff are responsible for oversight and administration of all business affairs of IODP/TAMU. Through mutual agreement, TAMU and TAMRF have waived indirect cost, and TAMRF has agreed to administer the business affairs of IODP/TAMU for a small administrative fee and direct charge costs associated with TAMRF employees assigned to the project. This action on behalf of the institution and the Foundation results in the vast majority (95%) of funds provided being applied to science operations activities.

TAMRF Administration's primary function is to provide the following administrative support services to the IODP/TAMU Science Services Operator to enable the organization to accomplish its technical objectives within the subcontract terms, applicable federal and state regulations, and sound business practices:

- Coordinate business functions of IODP/TAMU activities to ensure implementation of JOI advice/direction. Provide effective and auditable administrative services at a reasonable cost.
- Manage the IODP/TAMU procurement/property and contract activities through the Contracts, Property, and Procurement Section to assist the IODP/TAMU staff in meeting their objectives and assure compliance with the specific terms of the contract and applicable government regulations. This includes subcontract negotiations; issuing and monitoring solicitations; advising staff on allowability, regulations, and JOI approval requirements; drillship subcontract activities; administration of explosive licensing; issuing purchase orders, including applicable special terms and conditions; writing and processing subcontract documents; and establishing government property records and coordinating physical inventories.
- Manage all fiscal activities of the subcontract through the Fiscal Affairs Section, consisting of Accounts Payable/Accounts Receivable, Budget Planning/Analysis, and Payroll. This includes budget monitoring, forecasting, and reporting for 22 separate budgets or cost centers, conducting budget reviews, processing payroll for all employees, maintaining two separate payroll reporting systems, performing all payable and receivable functions, and overseeing external audit activities.
- Provide other administrative service functions including human resource (HR) administration, insurance and risk management, and travel and conference arrangements. These services include screening, interviewing, counseling employees, assisting employees with compensation and fringe benefit matters, providing training information, maintaining personnel databases, immigration activities, making reservations via an in-house airline computerized reservation system, negotiating with consulate offices, and coordinating continental United States and international meetings.

# ORGANIZATIONAL CHART

## Administrative Services Department\*



\* All personnel employed by Texas A&M Research Foundation.

\*\* ODP funded in FY04.

\*\*\* IODP funded in FY04.

## **GOALS**

The principal goal for Administrative Services, from which all department and section goals flow, involves providing the most efficient business and compliance services to the Science Services Operator that permit the unencumbered accomplishment of the Program's objective—delivery of science within the framework of the community's requirements.

### **Contracts, Property, and Procurement Section**

- Complete a review of all current procurement and property policies and procedures, developing recommendations, written policies and an implementation plan to improve customer service efficiency and address IODP requirements.
- Provide the necessary training and establishing individual goals for implementation of new small business subcontracting requirements.

### **Fiscal Affairs Section**

- Develop and implement an IODP specific accounting structure, providing the Science Services operator with the necessary information to budget costs and correctly report time and effort activities.
- Update all Fiscal Affairs-related standard operating procedures to comply with IODP requirements.
- Provide the necessary assistance to develop and implement a new Alliance fiscal reporting format.

### **Human Resources and Insurance Services Section**

- Develop internal procedures (e.g., employee database system, employee awareness system, updated standard operating procedures specific to IODP, cross-training, performance appraisal training, phase in/transition, etc.) adapted to IODP and service to our customers (i.e., TAMU/TAMRF employees, science community).
- Bind coverage for Phase 1 drilling-peculiar drilling risks while working with JOI and NSF to secure Program indemnification.

### **Travel/Conference Coordination Section**

- Establish cost-effective and efficient procedures for procurement and distribution of travel related items.
- Develop standardized, simplified travel forms/policies accessible via the Web.
- In concert with other departments, develop a shared database for use Program-wide and by our customers, consolidating necessary information in to a single, usable application.

# BUDGET

## 414021-01000 Administrative Services

Exp. Cat.	Description	FY04 Program Plan SOC Budget	FY04 Program Plan POC Budget	FY04 Program Plan Mobilization Budget *	FY04 Program Plan NSF Total
2000	Payroll	\$ 688,950	\$ -	\$ -	\$ 688,950
3500	Travel	11,025	-	-	11,025
3580	Travel to/from Port	10,283	-	-	10,283
3600	Training	10,400	-	-	10,400
3720	Business Conferences	2,000	-	-	2,000
4000	Supplies	10,185	-	-	10,185
4765	Software	400	-	-	400
8510	Library	750	-	-	750
5070	Insurance	1,900	-	-	1,900
5261	Shipping	1,600	-	-	1,600
5370	Telecommunications	13,450	-	-	13,450
5550	Professional Service	3,800	-	-	3,800
5590	TAMU Computing Services	16,575	-	-	16,575
5931	Equipment Rental	400	-	-	400
5986	Furniture	750	-	-	750
5987	Recruiting	1,200	-	-	1,200
6820	Maintenance & Repair	3,000	-	-	3,000
8400	Equipment	1,000	-	-	1,000
9683	Admin. Cost Allowance	300,000	-	-	300,000
	<b>TOTAL</b>	<b>\$ 1,077,668</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 1,077,668</b>

\* All POC.

TAMRF Administration is responsible for oversight and administration of all business affairs of IODP/TAMU.

**Payroll**—At the beginning of the fiscal year, funds in this expense category support 15 FTEs, or 26 staff members. Because of the transition from ODP to IODP, percentages of effort will increase as ODP phaseout activities are completed. Payroll includes salary and fringe for all employees of Administrative Services. All employees in this department are employees of TAMRF. TAMRF provides a full range of business and compliance services to the science services operator of IODP.

**Travel**—Travel involving liaison visits to JOI, IMI, training locations, vendors, and to the London market for risk presentations are included in this expense category.

**Travel to/from Port**—Funds for two employees to travel to the first and one employee to travel to the second port call are included. This category includes travel costs for the Property Administrator to verify shipboard inventory and location at the initial port call during and following the reload of property. Reload participation will be a principal activity during the initial port call, along with meetings with TAMU staff on the selection of benefit options.

**Training**—Training requirements include courses for two new supervisors and three new staff members and refresher/new training involved in contractually required activities (e.g., Small and Small and Disadvantaged Business reporting). Funds support registration fees, subsistence, travel, and miscellaneous costs. To the maximum extent possible, local classes will be used when available.

**Business Conferences**—This category funds Program-wide meetings/conferences in, or in close proximity to, College Station.

**Supplies**—Included in this category is the cost of conference supplies, copy paper, computer supplies of less than \$1,000, miscellaneous supplies (e.g., toner, pens, paper, folders, tape, labels, tablets, pencils, etc.) and phone books. (Note: This cost center provides supplies for Program-wide activities, not just Administration.)

**Software**—Included in these cost are upgrades to local software programs that support administration of IODP/TAMU/TAMRF.

**Insurance**—The request reflects the Program's portion of Directors and Officers corporate insurance and is an increase based on the percentage of officers at IODP/TAMRF (3) when compared to the TAMRF corporate officer total.

**Shipping**—Covers general postage costs and overnight delivery.

**Telecommunications**—Standard long distance and line charges, sending and receiving fax transmissions for Administration and cellular are included in this category.

**Professional Services**—These funds provide for miscellaneous services (e.g., business cards, letterhead printing, physical plant maintenance, etc.), temporary labor, storage space, CompuServe accounts, library, and binding.

**TAMU Computing Service**—This category is the program's share of costs associated with use of the TAMU's financial and management information system (FAMIS) used in conducting the fiscal activities of IODP.

**Equipment Rental**—This category provides for requirements associated with the rental of equipment for conferences when it is more economical to rent than purchase.

**Furniture**—These funds are to purchase office furniture for the payroll assistant position.

**Recruiting**—Provides for local advertisements, soliciting interest in vacant positions that occur throughout the year.

**Maintenance and Repair**—Funds for service agreements on business machines (copiers, fax machines, calculators, typewriters, etc.) and parts replacement are contained in this category.

**Library**—These funds provide for subscriptions to professional material (e.g., Small and Small and Disadvantaged Businesses, contractual publications [FAR, OMB, etc.], human resources, etc.) used in the day-to-day operations of the department.

**Equipment**—Provides for the replacement of office machines (i.e., laminating, typewriters, adding, etc.) that are seven to ten years old.

**Administrative Costs**—This fee is paid for corporate administration of the program. TAMRF and TAMU have waived overhead and indirect recovery in lieu of this minimal charge.

# SCIENCE OPERATIONS DEPARTMENT

*The Science Operations Department is committed to providing technical, scientific, operational, and logistical support for the successful execution of scheduled IODP riserless platform operations. The department is committed to a team environment that fosters a cooperative, service-oriented approach to fulfilling its responsibilities.*

## DEPARTMENTAL RESPONSIBILITIES

The Science Operations Department is responsible for scientific, technical, and operational support of all IODP riserless platform activities, including operations planning, time and cost estimates for each expedition, overseeing drilling, coring, and completion operations to ensure that the scientific goals are achieved, operation of the shipboard laboratories and support of the shipboard scientific party. To fulfill these responsibilities, the department is divided into five sections with tasks assigned as follows.

### Science Operations Office

- Provide support for the Manager.
- Prepare budget and control expenditures to keep within approved budgetary limits.
- Oversee all Science Operations Department activities.
- Select and invite Co-Chief Scientists for each scheduled expedition.

### Technical Support Section

- Provide shipboard technical support, including expedition planning, execution, and postcruise assessment.
- Ensure that the shipboard laboratories are operational and stocked with adequate supplies.
- Ensure safe laboratory operations.
- Work with members of the scientific party wishing to conduct special analyses or experiments to ensure that appropriate space, services, and supplies are available.

### Science Support Section

- Provide shipboard science support, including expedition planning, execution, and postcruise assessment.
- Lead expedition project management.
- In consultation with Co-Chief Scientists, select and invite members of the scientific party for each expedition.

### Operational Support Section

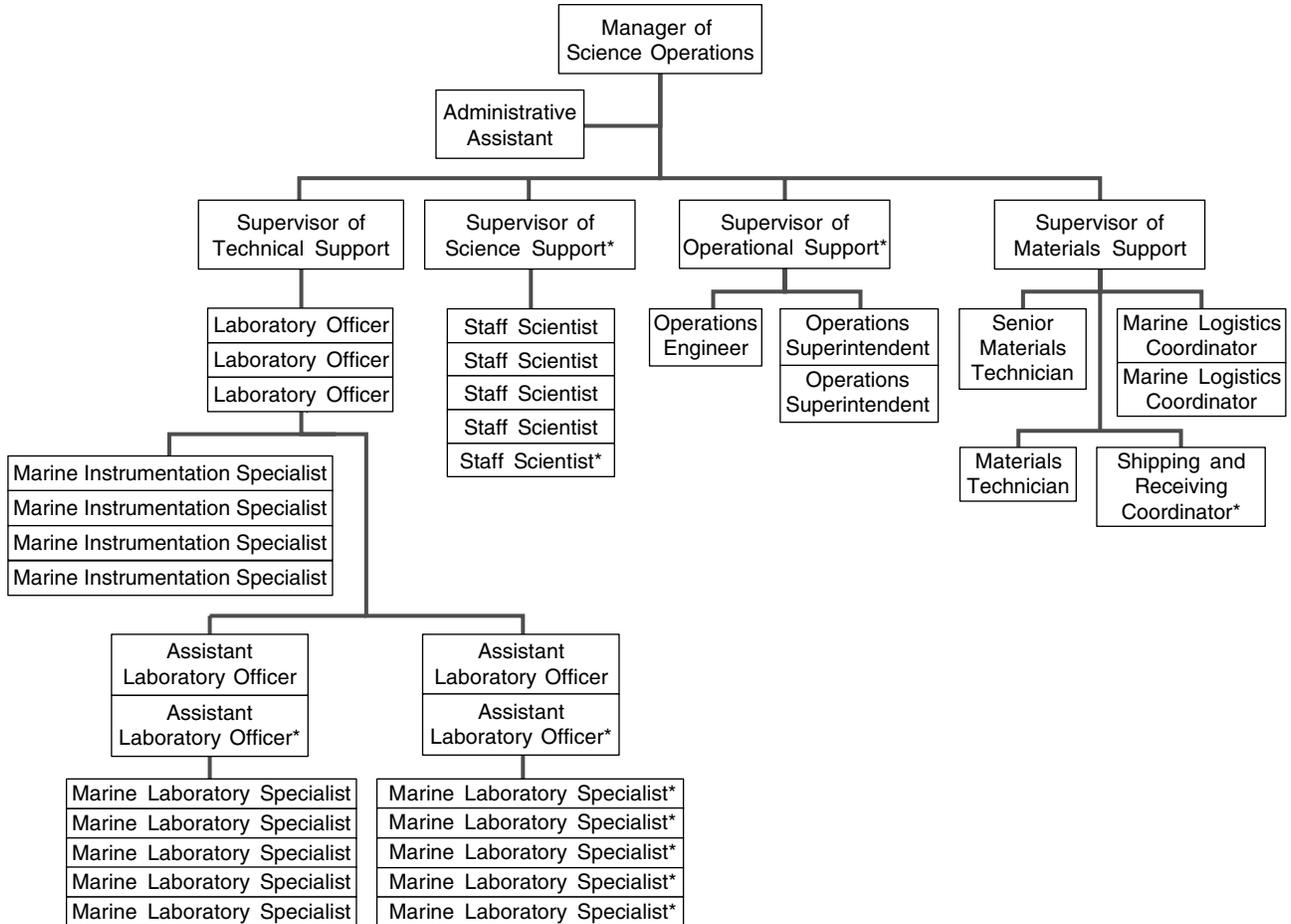
- Prepare operational plans, with time and cost estimates, to achieve the scientific objectives of each expedition.
- Ensure that necessary drilling and coring equipment is available for shipboard operations.
- Optimize shipboard drilling operations.
- Ensure safe engineering operations.

## **Materials Support Section**

- Provide expedition logistical support, including procurement of equipment and supplies.
- Maintain responsibility for inventory control and shipping and receiving.
- Operate and maintain IODP shore-based warehouse and shop facilities.
- Coordinate with the ship's agents to ensure efficient handling of shipments to and from the ship and other port call activities.

# ORGANIZATIONAL CHART

## Science Operations Department



\* IODP funded in FY04.  
 All other positions funded by both ODP and IODP in FY04.

# GOALS

## Departmental Staffing

At present, three key positions are vacant, including two supervisory positions and one staff scientist position. Until these positions are filled the department will have difficulty adequately meeting its obligations. It will be the responsibility of the Manager (in consultation with the Deputy Director of Science Services) to solicit candidates, interview, and select appropriate individuals to fill these positions. This process should commence without delay and be completed by the end of the second quarter of FY04.

It will also be necessary to hire several people to fill vacant Marine Laboratory Specialist positions. This will be the responsibility of the Supervisor of Technical Support and will occur during the third quarter of FY04.

## Safety Training

The safety of personnel and equipment is paramount. Since we will be hiring a number of new seagoing technicians and restarting operations following a 9-month hiatus, it will be necessary for the entire technical support staff to receive appropriate training in laboratory safety (including radiation safety, hazardous materials, and hydrogen sulfide) and basic safety and survival skills. This task will be the responsibility of all staff in the Technical Support Section and must be completed prior to 1 June 2004 for staff sailing on the initial transit and for all seagoing staff prior to the start of Expedition 1 (21 June 2004).

## Replacement of Equipment

We anticipate funds from other FY04 funding sources will be available to replace the Rock-Eval and X-ray diffraction instruments with modern, more reliable instruments and to purchase a second generation-injector gun. Although these are basically off-the-shelf items, it will require staff effort to define specifications, locate and interact with vendors, and supervise installation aboard the ship during mobilization. Orders must be placed in the second quarter of FY04 in order to ensure delivery and testing prior to shipping to Pusan for installation on the Phase 1 vessel in May 2004. This task will be the responsibility of Technical Support Section, specifically the Laboratory Officers.

## Mobilization

The *JOIDES Resolution* is expected to become available for IODP Phase 1 operations on about 1 June 2004. At that time, we are assuming that the ship will be in Pusan, Korea, and will transit from there to Astoria, Oregon, to begin Expedition 1 on about 21 June. During the transit, laboratory equipment will be installed and tested to ensure that the laboratories are fully operational. Drill pipe will be loaded in Astoria.

Shipment of equipment and supplies to Pusan and to Astoria will be the responsibility of the Materials Support Section. One Logistics Coordinator will attend each port call and will work with the ship's agent to ensure smooth handling of shipments and assist with port call activities.

Reinstalling and testing laboratory equipment during the transit will be the responsibility of Marine Laboratory Specialists from the Technical Support Section, working under the leadership of a Laboratory Officer and Assistant Laboratory Officers. We expect the laboratories to be fully operational by the time the ship sails on Expedition 1.

## **Execution of Riserless Vessel Expeditions**

One expedition will be completed in FY04. Expedition 2 will extend into FY05 and Expedition 3 will begin in early FY05, so preparations will have to begin in FY04. The first three IODP expeditions are described in Appendix I (Expedition Operations). The principal tasks necessary for successful execution of an expedition are listed below, followed in parentheses by the responsible individual:

1. Designate a Staff Scientist who will serve as Expedition Project Manager and sail as Staff Scientist (Supervisor of Science Support).
2. Designate an Operations Superintendent who will be responsible for planning operations and sail as Operations Superintendent (Supervisor of Operational Support).
3. Select and invite Co-Chief Scientists (Manager).
4. Begin procurement of long-lead time engineering items (Senior Materials Technician).
5. Hold a precruise meeting to brief the Co-Chief Scientists on IODP policies and procedures, and develop operational plans (Expedition Project Manager).
6. In consultation with the Co-Chief Scientists and Expedition Project Manager, select and invite members of the shipboard scientific party (Supervisor of Science Support).
7. Prepare and distribute a prospectus for the expedition (Expedition Project Manager).
8. Ensure that all necessary supplies and equipment are secured and shipped to the departure port (Supervisor of Materials Support).
9. Ensure that adequate and appropriate technical support staff are assigned to the expedition (Supervisor of Technical Support).
10. At the departure port, conduct a briefing for all technical support staff (Supervisor of Technical Support).
11. Ensure efficient loading/off-loading of all shipments and forwarding of off-loaded shipments (Marine Logistics Coordinator).
12. Sail and execute the plans set out in the prospectus (Expedition Project Manager).
13. Following the expedition, complete a Preliminary Report summarizing the principal results (Expedition Project Manager).
14. Conduct a post-expedition review and evaluation.

For Expeditions 1, 2, and 3, tasks 1 through 4 should occur immediately. Tasks 5 through 7 should occur in January 2004 for Expedition 1, February 2004 for Expedition 2, and March 2004 for Expedition 3. For each expedition, task 8 will occur shortly before the expedition, with the timing dependent on shipping deadlines. Task 9 is ongoing. Tasks 10 and 11 are accomplished at the departure port. Tasks 13 and 14 must be completed within a month after the end of the expedition.

## **Preparations for IODP Phase 2**

During FY04, IODP/TAMU will interact with other members of the JOI Alliance and with the community represented by the SAS in order to gather information and develop preliminary plans for the shipboard laboratories on the IODP Phase 2 riserless vessel. Detailed plans cannot be developed until a decision has been made regarding selection of a specific vessel. However, clarification of needs and expectations and identification of important design criteria must proceed without delay. Planning for Phase 2 will be a major effort involving all members of the JOI Alliance. Primary

responsibility for TAMU's contribution to this task will fall to the Tools and Analytical Services Department. However, we expect the Science Operations Department to participate also. To some degree, this will involve all the staff of the Technical Support and Science Support Sections. This will be an ongoing task that will extend up to the time vessel conversion begins.

# BUDGET

## 414031-01000 Science Operations – Office

Exp. Cat.	Description	FY04 Program Plan SOC Budget	FY04 Program Plan POC Budget	FY04 Program Plan Mobilization Budget *	FY04 Program Plan NSF Total
2000	Payroll	\$ 145,179	\$ -	\$ -	\$ 145,179
3500	Travel	28,609	-	-	28,609
3551	Relocation	20,000	-	-	20,000
3580	Travel to/from Port	2,602	-	-	2,602
3720	Business Conferences	1,500	-	-	1,500
4000	Supplies	15,000	-	-	15,000
4765	Software	5,000	-	-	5,000
8510	Library	4,500	-	-	4,500
5261	Shipping	5,000	-	-	5,000
5370	Telecommunications	15,000	-	-	15,000
5550	Professional Service	2,000	-	-	2,000
5987	Recruiting	10,000	-	-	10,000
6820	Maintenance & Repair	4,000	-	-	4,000
8400	Equipment	500	-	-	500
	<b>TOTAL</b>	<b>\$ 258,890</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 258,890</b>

\* All POC.

This cost center covers the shore-based activities of the Science Operations Department, including support for the Manager and administrative staff, office expenses for the whole department, and the Manager's travel to and from the ship, to USSAC meetings and IODP coordination meetings, and to professional meetings. All costs in this cost center are considered to be SOC.

**Payroll**—This includes salary for 2 employees (1.5 FTEs), the Manager and Administrative Assistant and two Graduate Student Assistants for the department.

**Travel**—Funds are budgeted for the Manager to attend USSAC meetings, a professional meeting, and a series of coordinating meetings: JOI Alliance meetings, IODP Phase 2 planning meetings, IODP implementing organization meetings, meetings with JAMSTEC to coordinate and discuss operations issues, a similar meeting to coordinate with the European implementing organization, and meetings relating to cruise staffing and environmental safety issues.

**Relocation**—Funds are budgeted to cover relocation costs for two employees (Staff Scientists or Supervisors) who will be hired prior to the start of IODP seagoing operations.

**Travel to/from Port**—Travel is budgeted for the Manager to attend the port call at the beginning of Expedition 1. This will provide an opportunity to monitor the status of the shipboard labs as they are put back into service and to meet with the technical support staff on issues of concern. (Note: Many technical support staff members are on Alternate Sea Pay Policy (ASPP) status and thus never return to IODP/TAMU.).

**Business Conferences**—This expense category covers incidental expenses associated with meetings hosted at IODP/TAMU.

**Supplies**—The supplies category includes all office consumables for the department. The figure is based on historical costs.

**Software**—Funds are budgeted for upgrades of word-processing, spreadsheet, and graphics software used in the department.

**Library**—We anticipate limited library facilities on the ship during Phase 1 of IODP but plan to have online access to libraries and journals. Funds are included to purchase a limited number of books to replace critical worn or outdated volumes with new editions and for some online subscriptions for journals for which the TAMU libraries may not have an online institutional subscription.

**Shipping**—This category covers general postage costs and overnight delivery.

**Telecommunications**—The telecommunications budget covers communications costs for all Science Operations staff at IODP/TAMU. This figure is based on historical costs.

**Professional Service**—This category covers the departmental share of copier charges, the cost of TAMU physical plant services, vendor representative service calls for office equipment, etc.

**Recruiting**—This category covers the costs of advertising (nationally and internationally) to fill vacant positions, and the costs of bringing candidates in for interviews.

**Maintenance and Repair**—This covers routine service to copiers and other office equipment.

**Equipment**—Provides funds to replace the fax machine.

## 414031-02000 Technical Support

Exp. Cat.	Description	FY04 Program Plan SOC Budget	FY04 Program Plan POC Budget	FY04 Program Plan Mobilization Budget *	FY04 Program Plan NSF Total
2000	Payroll	\$ 549,796	\$ 274,629	\$ 12,474	\$ 836,899
3580	Travel to/from Port	45,790	30,526	24,565	100,881
3600	Training	40,602	96,024	-	136,626
4000	Supplies	135,000	15,000	65,000	215,000
4765	Software	10,000	-	-	10,000
5550	Professional Service	6,000	4,000	-	10,000
5987	Recruiting	9,000	6,000	-	15,000
	<b>TOTAL</b>	<b>\$ 796,188</b>	<b>\$ 426,179</b>	<b>\$ 102,039</b>	<b>\$ 1,324,406</b>

\* All POC.

This section is responsible for technical support of the scientific party aboard the *JOIDES Resolution*. Responsibilities include the calibration and operation of the instruments, overall guidance in the purchase and inventory of the scientific supplies for the laboratories, and the hiring, training and scheduling of the technical staff to run the laboratories. The technical support section will play a central role in scientific operations on the *JOIDES Resolution*.

**Payroll**—Payroll costs cover the Supervisor of Technical Support, Laboratory Officers and the seagoing technician staff or 22 employees (14.1 FTEs). Sea pay for the Laboratory Officers and Assistant Laboratory Officers is included in the payroll figure. However, the seagoing technicians in this department are all ASPP employees, so additional funds for sea pay are not required for those positions. Thirty-three percent of total payroll costs, exclusive of mobilization, in this cost center are considered POC. POC cost represents 20% of the Supervisor and Laboratory Officer, 30% of the Assistant Laboratory Officer, 100% of the geochemistry technician, and 40% of the remaining technical support staff. This represents the portion of their time devoted to safety-related activities and delivery of the core to the shipboard laboratory. The remaining payroll costs are considered SOC.

**Travel to/from Port**—Funds are budgeted for the normal rotation of seagoing personnel for each expedition, including the initial transit to the starting port for Expedition 1, during which laboratory equipment will be reinstalled and the laboratories will be reactivated, and for Expeditions 1 and 2. Funds are also included to allow the Supervisor of Technical Support to attend each of the port calls. This expense is necessary because port calls provide the only opportunity for the Supervisor to interact directly and exchange information with technical support staff who are on ASPP status. The travel costs are considered 40% POC and 60% SOC.

**Training**—Since we will be restarting operations following a 9-month hiatus, funds have been budgeted for the entire technical support staff in this department to receive necessary training in laboratory safety (including radiation safety, hazardous materials, and hydrogen sulfide) and basic safety and survival skills. Funds are also included for approximately half the technical staff to receive specialist training in the maintenance and operation of complex laboratory equipment either from equipment vendors or by visits to other laboratories. The cost of safety training is regarded as POC; other training, as SOC.

**Supplies**—Funds for supplies cover the costs of rebuilding inventory to operational levels during startup and anticipated laboratory and core handling supplies for Expeditions 1, 2, and 3. Expedition 3 is scheduled to begin in early FY05. However, in order to meet shipping deadlines it will be necessary to purchase supplies for this expedition in FY04. Approximately 7% of total supplies costs are for safety-related items and are considered POC.

**Software**—Funds are budgeted for essential upgrades or modifications to vendor-specific instrumentation software (e.g., ICP, ChemStation).

**Professional Service**—This category covers the cost of annual physical examinations for seagoing personnel. Based on the allocation of technician payroll (above), 40% of these costs are considered POC.

**Recruiting**—We anticipate having to fill at least five vacant technician positions. Funds are included to cover the costs of advertising and recruiting staff to fill these vacancies. Based on the allocation of technician payroll (above), 40% of these costs are considered POC.

## 414031-03000 Science Support

Exp. Cat.	Description	FY04 Program Plan SOC Budget	FY04 Program Plan POC Budget	FY04 Program Plan Mobilization Budget *	FY04 Program Plan NSF Total
2000	Payroll	\$ 326,859	\$ 78,240	\$ -	\$ 405,099
3500	Travel	10,342	4,658	-	15,000
3580	Travel to/from Port	3,213	2,142	-	5,355
3720	Business Conferences	2,000	-	-	2,000
	<b>TOTAL</b>	<b>\$ 342,414</b>	<b>\$ 85,040</b>	<b>\$ -</b>	<b>\$ 427,454</b>

\* All POC.

This cost center covers salary and travel for staff scientists, and costs of pre- and postcruise meetings held at IODP/TAMU.

**Payroll**—The payroll budget covers salary for the Supervisor of Science Support and all Staff Scientists (6 employees/5.5 FTEs).

Sea pay for sailing Staff Scientists on Expeditions 1 and 2 is also included in the payroll figure.

Approximately 18% of payroll costs in this cost center is considered POC. This represents 20% of the Supervisor and 40% of the Staff Scientists assigned as Expedition Project Managers for Expeditions 1 and 2. These percentages represent the portion of their time devoted to operational or safety-related issues.

**Travel**—As part of their routine assignments, Science Support staff must liaise with the Science Advisory Structure (SAS) panels. Funds are budgeted for one liaison representative to travel to each of eight such meetings. These include two SSP (one domestic, one international), two Science Measurements Panel (SCIMP) (one domestic, one international), and four Science Steering and Evaluation panel (two domestic, two international) meetings. The travel costs are composed of airfare, 3 days per diem, ground transportation, and miscellaneous costs. Travel to the Pollution Prevention and Safety Panels is considered POC. All other travel in this cost center is regarded as SOC.

**Travel to/from Port**—Travel is budgeted for staff scientists sailing on Expeditions 1 and 2. This cost is estimated assuming 2 days per diem during the port call before the expedition and 2 days per diem during the port call after the expedition to facilitate crossover and lab working group activities. No funds are budgeted for staff scientists to sail on the initial transit or the transit between Expeditions 1 and 2. On the basis of the allocation of payroll costs, port call travel is considered 40% POC.

**Business Conferences**—One of the key responsibilities of the Staff Scientists is to oversee the pre- and postcruise meetings for their particular expedition. These meetings are held at IODP/TAMU. Precruise meetings normally occur 6 to 9 months prior to the expedition. Hence, funds are budgeted in FY04 to cover incidental costs associated with precruise meetings for all five IODP Phase 1 expeditions. No funds are budgeted for postcruise meetings, as these will not occur until FY05. These costs are considered SOC.

## 414031-04000 Operations Support

Exp. Cat.	Description	FY04 Program Plan SOC Budget	FY04 Program Plan POC Budget	FY04 Program Plan Mobilization Budget *	FY04 Program Plan NSF Total
2000	Payroll	\$ 108,629	\$ 147,954	\$ -	\$ 256,583
3500	Travel	5,964	5,364	-	11,328
3580	Travel to/from Port	-	5,355	-	5,355
3720	Business Conferences	500	-	-	500
4000	Supplies	-	494,732	-	494,732
5550	Professional Service	-	27,500	-	27,500
5931	Equipment Rental	-	25,000	-	25,000
6820	Maintenance & Repair	-	20,000	-	20,000
	<b>TOTAL</b>	<b>\$ 115,093</b>	<b>\$ 725,905</b>	<b>\$ -</b>	<b>\$ 840,998</b>

\* All POC.

This section provides operational support for IODP riserless drilling and coring operations.

**Payroll**—The payroll budget covers salary and sea pay for 4 employees (2 FTEs) involving the Supervisor of Operational Support, seagoing Operations Superintendents, and an Operations Engineer.

Approximately 58% of payroll costs in this cost center is considered POC. This represents 20% of the Supervisor and 100% of the Operations Superintendents, whose entire effort is related to the planning and execution of platform operations. The remaining payroll costs are considered SOC.

**Travel**—Funds are budgeted to allow each member of the Operations Support Section to attend one professional meeting. Attendance is necessary in order to maintain awareness of the latest drilling and coring technology and procedures. These costs are considered SOC.

Funds are also included to cover the cost of bringing proponents of Proposal 545 (Juan de Fuca), which will be the basis of the science program for Expedition 1, to IODP/TAMU for an intensive planning meeting to develop the operational requirements for that expedition. Because the focus of this meeting is on operational planning, rather than the science program, these costs are considered POC.

**Travel to/from Port**—Travel is budgeted for Operations Superintendents sailing on Expeditions 1 and 2. This cost is estimated assuming 2 days per diem during the port call before the expedition and 2 days per diem during the port call after the expedition to facilitate crossover activities. No funds are budgeted for Operations Superintendents to sail on the initial transit or the transit between Expeditions 1 and 2. Port call travel in this cost center is considered 100% POC.

**Business Conferences**—This item covers incidental expenses associated with meetings held at IODP/TAMU (e.g., the Expedition 1 planning meeting referred to above).

**Supplies**—Funds are budgeted to cover the drilling and coring hardware costs associated with Expeditions 1, 2, and 3. This covers bits, drill pipe, casing, coring tools, etc., used in routine operations. Special tools (e.g., CORK hardware, hammer drill) are budgeted in the Tools and Analytical Services Department. No funds are included in FY04 to maintain hardware inventories.

(In fact, hardware costs have been reduced by more than \$300,000 by utilizing items from remaining ODP inventory.) All of these costs are considered POC.

**Professional Service**—This includes the cost of weather services that will be required for Expedition 2. Because these costs relate to operations, they are budgeted as POC.

**Equipment Rental**—This category covers rental of casing handling tools, long-lead time items, required for Expedition 3. This cost is a POC.

**Maintenance and Repair**—These funds are for maintenance and repair of mud motors and bi-centered bits. These costs are considered POC.

## 414031-05000 Materials Support

Exp. Cat.	Description	FY04 Program Plan SOC Budget	FY04 Program Plan POC Budget	FY04 Program Plan Mobilization Budget *	FY04 Program Plan NSF Total
2000	Payroll	\$ 322,226	\$ 8,495	\$ -	\$ 330,721
3500	Travel	1,500		-	1,500
3580	Travel to/from Port	9,050	476	3,473	12,999
3600	Training		19,916	-	19,916
4000	Supplies	8,000	12,000	-	20,000
4765	Software	5,000	-	-	5,000
5070	Insurance	1,000	1,500	-	2,500
5261	Shipping	36,600	54,900	128,500	220,000
5550	Professional Service	25,000	-	-	25,000
6820	Maintenance & Repair	5,000	-	-	5,000
	<b>TOTAL</b>	<b>\$ 413,376</b>	<b>\$ 97,287</b>	<b>\$ 131,973</b>	<b>\$ 642,636</b>

\* All POC.

This section provides logistical support, shipping and receiving, warehousing, etc., in support of IODP riserless platform operations.

**Payroll**—The payroll budget covers salary for the Supervisor of Materials Support, Marine Logistics Coordinators, and Materials Technicians (6 employees/4.75 FTEs). Funds are included to cover an anticipated 3% salary increase.

Approximately 2.5% of payroll costs in this cost center is considered POC. This represents 5% of the Supervisor and each of the Marine Logistics Coordinators' salary. Since the majority of their effort relates to shipping cores and scientific supplies and equipment, the remaining payroll costs are considered SOC.

**Travel**—Funds have been budgeted to allow for local travel (e.g., quality control visits to vendors).

**Travel to/from Port**—Travel is budgeted for one Logistics Coordinator to attend each port call to work with the agent to coordinate oncoming and off-going shipments of supplies and equipment, and assist with port call activities. Costs are based on the draft FY04 ship's schedule. Five percent of these costs are considered POC.

**Training**—Funds are budgeted to allow the Supervisor, Logistics Coordinators, and Materials Technician to receive training in multimodal shipping regulations and procedures and radioactive materials handling in order to update and maintain skills and certifications. Because these costs relate to safety in shipping material and supplies to and from the ship, they are considered POC.

**Supplies**—Funds are budgeted for all packing and crating materials, inspections, and shop consumables. Sixty percent of these costs are considered operations related and shown as POC. The balance relates to shipping cores, samples, and laboratory supplies and is shown as SOC.

**Software**—These funds are to provide upgrades and purchase new software used in the Operations and Materials Sections (e.g., AutoCAD, FoxPro, LabView). This cost is considered SOC.

**Insurance**—This category covers insurance on IODP vehicles. Sixty percent of this cost is considered POC and 40% SOC.

**Shipping**—Funds are budgeted for shipping all drilling and coring supplies and all scientific supplies to and from the ship during IODP operations. Funds are also included to cover the return of cores to the appropriate repository and to ship samples to science party members following each expedition. Sixty percent of these costs are considered POC and 40% SOC.

These costs include the cost of transporting the drill pipe removed from the ship during demobilization to the port call at the beginning of Expedition 1 (expected to be Astoria, Oregon) and the cost of shipping to Pusan laboratory equipment to be reinstalled during the transit.

**Professional Service**—Funds are budgeted for repair of forklifts and for crane service to load and offload equipment. Boat and helicopter transfers of personnel and material to the vessel are also charged here. These costs are all considered SOC.

**Maintenance and Repair**—These funds cover maintenance of the IODP vehicle fleet, as well as maintenance and repair of equipment in the warehouse. Funds are also budgeted for repairs to overhead cranes, scales and other loading dock equipment. These costs are considered SOC.

# TOOLS AND ANALYTICAL SERVICES DEPARTMENT

*The Tools and Analytical Services (TAS) Department is committed to integrating the capabilities of marine laboratory specialists, research specialists, programmers, and engineers to provide enhancements, maintenance, and documentation to shipboard and shore-based laboratories; associated operational and analytical software; legacy hole completion; and drilling, coring, and downhole tools.*

## DEPARTMENTAL RESPONSIBILITIES

TAS is responsible for laboratory, analytical, and engineering development support of all IODP riserless platform activities. This includes development planning and support for drilling, coring, and downhole tools; design and procurement of complex legacy hole completions; development planning and support of laboratory instrumentation; development and support of scientific analysis programs; and maintenance and support of laboratory and downhole equipment and associated software interfaces with the JANUS database. The department is also responsible for the maintenance and operational support of the shore-based laboratories. The department maintains liaison interfaces with industry, government, and academia.

To fulfill its responsibilities, the department is divided into three sections with tasks assigned as follows:

### Tools and Analytical Services Office

- Implement strategic planning for technology (science and engineering) enhancements.
- Prioritize improvements to existing analytical, laboratory, and engineering hardware and software.
- Approve project budgets and timelines.
- Implement project management.
- Develop science and engineering interfaces with IODP implementing organizations.
- Liaise with TAMU College of Engineering.
- Develop industry, academia, and government liaisons.
- Coordinate laboratory working groups.
- Develop a project plan and budget for conversion of a drillship for IODP Phase 2 riserless operations.
- Maintain and operate shore-based laboratories.

### Analytical Services Section

- Define strategic plan for improvements to shipboard and shore-based laboratories and for scientific analysis of data.
- Prioritize development projects for laboratory enhancements.
- Maintain project controls on laboratory and analytical enhancements.
- Provide Service Center support for laboratory instrumentation, scientific analysis programs and software maintenance.

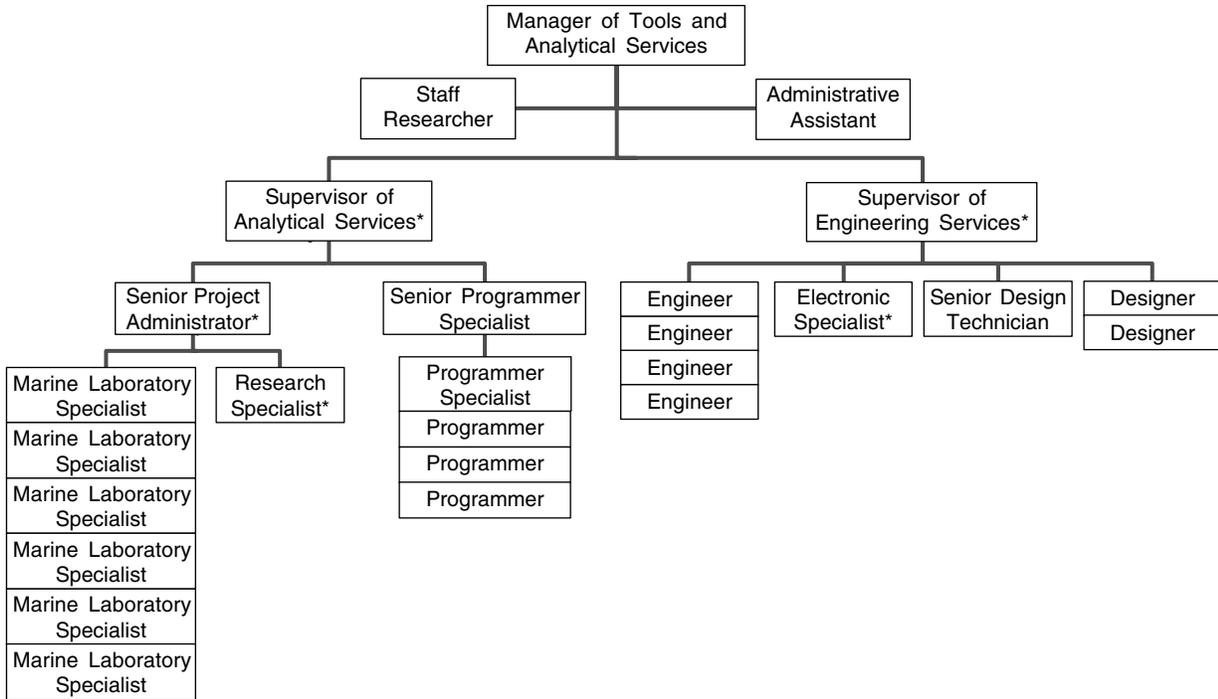
- Manage laboratory-working groups.
- Maintain and operate shore-based laboratories.
- Maintain a liaison with the implementing organizations, IMI, and the SAS, as appropriate, and government laboratory teams.

### **Engineering Services Section**

- Provide legacy hole completion equipment for expeditions.
- Define strategic plan for improvements to drilling and coring systems, complex completions, downhole tools, and ship and surface systems.
- Prioritize development projects.
- Maintain project controls on engineering enhancements.
- Implement design improvements and adopt new technology to coring and drilling operations.
- Provide engineering support for platform services.
- Provide Service Center support to coring, downhole tools, and platform equipment.
- Participate in engineering meetings with the implementing organizations, IMI, and the SAS, as appropriate.

# ORGANIZATIONAL CHART

## Tools and Analytical Services Department



\* IODP funded in FY04.

All other positions funded by both ODP and IODP in FY04.

# GOALS

## Primary Departmental Goals

TAS has six primary goals for FY04. These are as follows:

### **1. Organizational Tasks**

#### **Implement Project Management**

The operational hiatus provides an opportunity to review project and process management methodologies used in industry. The goal is to select a standard method of project and process management that is scalable to the project and yet ensures that the project stakeholders' requirements are met within the allocated fiscal resources and in a timely manner. Project management needs to be implemented to meet the needs of the implementing organization based on a set of common policies, procedures, and processes.

#### **Cooperative Interface with Implementing Organizations**

The department plans to work with IMI and the IODP Implementing Organizations to establish a cooperative infrastructure for joint development of engineering, laboratory instrumentation, and scientific analysis projects.

#### **Standardize Laboratory Systems**

TAS plans to review current analytical systems and applications in the shipboard laboratories to look for common functionality in analytical hardware, computing hardware, operating systems, applications, and development tools. From this review, we will create an efficient developmental infrastructure within the department and in the shipboard laboratories. The goals of this review are to

- Reduce "expertise" overhead and failure risk due to staff turnover.
- Standardize instrumentation packages and software applications where feasible.
- Reduce software and instrument development time.
- Reduce shipboard spare parts inventory and overall maintenance costs.

#### **Establish Service Center Functions within TAS**

A service center was created by the Drilling Services Department within ODP. This concept will be carried over to IODP and expanded for the other two project categories (laboratory instrumentation, and scientific analysis) in collaboration with the Science Operations and Information Technology and Data Services Departments. The Engineering and Lab Instrumentation Service Centers will maintain, upgrade, and repair equipment. They will also provide technical support and interface with vendors when required. The programmers provide similar services in terms of software for instrumentation, scientific analyses, and database support.

Support and maintenance for direct instrument replacements will be provided by the Service Centers. For example, both the X-ray diffraction and the Rock-Eval systems are being replaced/upgraded with ODP transitional funds, and TAS will provide support and maintenance. Both instrument upgrades will be transferred to Vessel 2.

### **2. Mobilization of Phase 1 Vessel**

The department will assist the marine technical staff in preparing shipboard laboratories for Phase 1 in June 2004. We will maintain and support the existing analytical systems (in their current functional state) that will not transfer to the Phase 2 platform. For existing analytical systems that

will transfer to the Phase 2 platform, we will begin the process of upgrading applications to the new standards and hardware infrastructure.

### ***3. Implement Project Execution Plan for Phase 2 Vessel***

#### **Laboratory Facilities**

TAS will develop design guidelines for the Phase 2 riserless coring platform under the coordination of the JOI Alliance Major Research Equipment and Facility Construction Director. Science and drilling technical facilitators from IODP/TAMU will meet with the various interest groups and solicit design requirements for the Phase 2 science and drilling facilities/equipment during spring 2004. The design requirements will be analyzed and organized into a laboratory design guideline document, and a set of preliminary floor plans will be developed in summer 2004. The design documents and plans must be ready to begin the engineering design phase as soon as the drilling contractor has been selected.

#### **Drillship and Drilling Facilities**

The department will develop marine and drilling equipment guidelines for the Phase 2 riserless drillship. This includes issuing a market survey to vendors on drilling equipment and issuing an invitation to tender (ITT) to drilling contractors to submit a proposal to provide, operate, and maintain a scientific coring drillship for use by IODP.

#### **Drilling Contractor Bid and Evaluation Process**

TAS will issue a request for proposals to drilling contractors for a riserless scientific coring drillship for the U.S. implementing organization. The department, working with the JOI Alliance and NSF, will develop an evaluation process to review the drilling contractor bids to select a riserless drillship for the U.S. implementing organization.

### ***4. Set up Shore-Based Analytical Laboratories***

TAMU will invest \$1.4 million in enhancing the shore-based laboratories at the Gulf Coast Repository (GCR) that support teaching, research, and training. The department will select laboratory equipment that is compatible with the goals of the IODP science advisory panels. We will modify the existing laboratory infrastructure to accommodate the selected equipment and purchase equipment starting in FY04.

### ***5. Develop IMI/SAS/Industrial/Government Liaisons***

Liaison development will assure coordinated engineering initiatives within IMI and will increase the utilization of field-tested equipment and the adaptation of cutting edge technology to scientific coring, measurement, and analysis.

### ***6. Identify and Implement Projects***

Development projects represent the innovative component of IODP and are essential to meet the increasing science and technology needs of the deep sea drilling community. The emphasis of development projects is to utilize and modify, as necessary, existing industry technology to improve IODP's ability to meet the scientific objectives of an expedition. Many projects are linked and interdependent in terms of providing drilling and science support to IODP expeditions and related measurement and analysis activities.

#### **Project Categories**

TAS has categorized development projects into three groups: "engineering projects," "laboratory instrumentation projects," and "scientific analysis projects." To assist in defining a development

project, any task that exceeds either \$100,000 or 2 months of employee effort will be defined as a project.

### ***Engineering Projects***

These projects cover the spectrum of enhancing hole penetration and stability as well as core recovery, creating or improving downhole measurement tools, long-term borehole instrumentation, platform instrumentation, instrumentation analysis, complex legacy hole completions, etc. These projects generally require significant hardware, are therefore more expensive, and often are directly related to the objectives and success of a particular expedition or a programmatic science theme.

### ***Laboratory Instrumentation Projects***

These projects enhance the shipboard measurement capabilities by improving efficiency of standard data acquisition, enhancing data quality for existing measurements, and adding new measurement capabilities as well as the applications to run them according to IODP protocols. Significant overlap with the first project category exists when downhole measurements and laboratory measurements have similar objectives, use similar methodologies and technologies, or need to be integrated. Some overlap may exist with the third group of projects when post-acquisition data processing is required.

### ***Scientific Analysis Projects***

This category encompasses all scientific analyses of data, including complex data acquisition projects such as macroscopic and microscopic visual core description, applications for data visualization and analysis, data integration, data mining, and automated reporting and publication technology. Many of the projects in this category are computer applications that acquire, process, analyze, integrate, and visualize data acquired on the ship and postcruise. Development of scientific analysis systems requires careful design, vigorous and consistent interaction with experts in the relevant scientific communities, excellent communication of project scopes and progress to the SAS to maintain support, and adequately trained programmers in-house.

## **FY04 Projects**

The following is a list of the highly ranked and/or funded projects:

### ***1. Engineering Projects***

#### **IODP Expedition 1, Proposal 545 Full3, Juan de Fuca Ridge (Cost: \$426,552)**

The budgeted cost has been reduced to \$351,552 by utilizing existing borehole instrument hangers in inventory from ODP. The operations planned for this expedition are discussed in Appendix I. TAS will be responsible for designing and manufacturing the multilevel borehole instrument hanger systems. These hangers will be installed in the holes to isolate, measure, and sample pressure, temperature, and fluids at distinct basement levels.

#### **IODP Expedition 3, Proposal 512-Full3, Oceanic Core Complex 1 (Cost: \$510,065)**

The budgeted cost has been reduced to \$253,210 by utilizing existing hard rock reentry system (HRRS) and casing equipment in inventory from ODP. TAS is responsible for design and procurement of the equipment, which includes the use of the HRRS to install casing at two sites along with the installation of a second 10-3/4-in casing string in each hole. Development of an implementation strategy will require an engineering review of the HRRS design, drawings, and components. In addition, technical discussions and negotiations will be required with the hammer vendor (SDS Corporation Limited in Australia). The first expedition will complete coring at Site AMHW-01A, which is >400-m penetration in the hanging wall in 2550 m water depth.

## **IODP Expedition 4, Proposal 512-Full3, Oceanic Core Complex 2 (Cost: Covered in Expedition 3 cost)**

The second expedition from Proposal 512-Full3 will complete coring at Site AMFW-01A, which is a >700-m penetration in the dome (peridotite) in 1630 m water depth. The HRRS installation of ~24–36 m of 13-3/8 in casing will be set during Expedition 3. The 10-3/4 in casing string will be set if hole conditions require the casing string (estimated ~120 m).

### **Simulated Borehole Test Facility (SBTF) (Cost: \$57,000)**

Sea trials of the Davis-Villinger Temperature-Pressure Probe (DVTPP) and Instrumented Water Sampler (IWS) during Leg 208 made it obvious that to expedite development of these tools, a shore-based facility was required to test the penetration mechanics of different probe geometries and the effectiveness of filtering schemes for fluid sampling and pore pressure measurements. A simulated borehole test facility (SBTF) was designed to simulate dynamic tool insertion in sediments under lithostatic pressure and hydrostatic pressure up to 3000 psi. The SBTF is designed to be modular to accommodate the IWS, Davis-Villinger Temperature Probe (DVTP), DVTPP, Advanced Piston Corer Temperature Tool (APCT), and Pressure Core Sampler (PCS). The insertion is accomplished using the APC “speed” pin concept, in which the hydraulic insertion force is set by the shear strength of a series of shear pins. The overriding purpose of the SBTF is to shorten the development cycle of downhole tools by testing prototypes under operational conditions without having to go to sea.

The fabrication drawings and the bill of materials are complete. The cost of the pressure vessel assembly is estimated at \$51,000. The portable test stand is estimated at \$3,000. The test electronics (including pressure transducers, thermistors, and linear encoder) is estimated at \$3,000.

### **Dead Weight Test (Pressure Transducer Calibration) (Cost: \$14,000)**

The increased use of pressure transducers in tools (PCS, APC-Methane, DVTPP, IWS, Downhole Sensor Sub [DSS]) and test hardware for the PCS and IWS requires the capability to calibrate pressure sensors in-house. A fully instrumented dead weight tester, including software, is estimated at \$14,000.

## **2. Laboratory Instrument Project**

### **Core Splitting System**

The current saw will be replaced with a core splitting system for deployment in Phase 1 and designed to meet Phase 2 objectives for H<sub>2</sub>S containment, variable core diameter, and anaerobic environment.

## **3. Scientific Analysis Projects**

### **Gas Safety Report**

The gas safety report is an analytical aid in the safety procedures that ensure the riserless platform does not strike an oil or gas reservoir. The current application is functional in the context of a shipboard safety consultant. Newer operational models propose the option of a remote safety officer. In this model, data and visual reports need to be communicated to an external third party with reliability. The reports may be readily made available on the Web in graphic form. The transport of data to shore in a reliable, cost-effective manner will be revisited.

### **Visual Core Description**

Creating applications and a database for the collection, archiving, and retrieval of visual core description (VCD) data has been the objective of a series of ODP projects and remains a top priority task for the IODP. The AppleCore program has been used on board the *JOIDES Resolution* for the

past 6 years to create “barrel sheets” for the *Initial Reports* volumes of the *Proceedings of the Ocean Drilling Program*. However, the data are not kept in a relational database and cannot be retrieved online like other data. OD21 has developed a prototype VCD program using the latest application technology, but little information is public about its scope, data model, or how it fits into a scientific coring working environment. To implement a modern core description application, an all-out IODP collaborative effort will be required. The objectives for a VCD program include the following:

- Define and implement a database model that is as simple as possible while flexible enough to accommodate the entire gamut of features encountered in ODP/IODP cores at the macroscopic and microscopic level. The data model should be based on generally accepted categories of features and allow the application of specific classifications and nomenclature of the data. The data should be integrated in the Oracle database that exists for all other data.
- Select/build/customize a data input interface featuring
  - Real-time display directly from the database of physical stratigraphic data (core logging data), samples taken for microscopic and other analyses, lithology logs of previously described holes, and other relevant data.
  - Core section interval-based logging of features observed macroscopically and microscopically (sedimentary, igneous, biogenic, deformational, diagenetic, hydrothermal, etc.), using standard menus for feature selection and the option to add “other” features.
  - Fully functional links to the database depth map system to display observations at any of the calculated depth scales (e.g., composite depth, such that correlation of features from multiple holes can be exploited).
  - Data entry assistants, such as an electronic depth ruler, tablet PCs, multiple/large monitors, etc. (desirable and can be added later in a separate project).

A number of avenues should be evaluated to make the best long-term commitment:

- AppleCore (used by ODP during the past 6 years).
- OD21-VCD (prototype, untested).
- Both high-end (e.g., WINLOG) and low-end commercial packages.
- Other options.
- Design and implement data access tools. The following abilities are highly desirable:
  - Functions that create the lithology names from the observed features, based on a selected classification scheme (and allow an “override” name).
  - Graphical symbol and pattern generation for the features and lithologies.
  - Functions that summarize the information into a summary graphical presentation.
  - A versatile search function that finds sites with sets of features, features for a depth interval, etc.
  - Adequate visualization and printing capabilities that support publication-ready products for the cruise report.

A significant planning phase should involve a small, effective team including at least one science advisor and one programmer/analyst each from IODP/TAMU and OD21. The group would meet at least twice over the first 2 months, once in Japan and once in College Station (budget as many as 100 person days of effort and four trips to Japan).

The project team would define a user feedback group consisting of IODP scientists who represent all relevant core description disciplines and who can contribute effectively to the task of making strategic decisions and finalizing the requirements.

The final application would most likely be built in cooperation. For example, OD21 may complete the data entry module, whereas IODP/TAMU may build the database and special access components. Alternatively, the tasks of customizing a commercial product may be split between IODP/TAMU and OD21.

# BUDGET

## 414041-01000 Tools and Analytical Services – Office

Exp. Cat.	Description	FY04 Program Plan SOC Budget	FY04 Program Plan POC Budget	FY04 Program Plan Mobilization Budget *	FY04 Program Plan NSF Total
2000	Payroll	\$ 116,487	\$ -	\$ -	116,487
3500	Travel	15,000	-	-	15,000
3551	Relocation	10,000	-	-	10,000
3600	Training	22,413	-	-	22,413
3720	Business Conferences	1,500	-	-	1,500
4000	Supplies	9,000	-	-	9,000
4765	Software	15,000	-	-	15,000
8510	Library	2,500	-	-	2,500
5261	Shipping	5,000	-	-	5,000
5370	Telecommunications	14,000	-	-	14,000
5550	Professional Service	3,000	-	-	3,000
5570	Consultant Services	25,000	-	-	25,000
5986	Furniture	2,000	-	-	2,000
5987	Recruiting	6,000	-	-	6,000
6820	Maintenance & Repair	5,000	-	-	5,000
	<b>TOTAL</b>	<b>\$ 251,900</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 251,900</b>

\* All POC.

This cost center covers the shore-based activities of the Tools and Analytical Services Department, including the Manager, an Administrative Assistant, and a Staff Researcher. All expenses in this cost center are categorized as SOC.

**Payroll**—This includes 1.5 FTEs for the salaries of the Manager, the Administrative Assistant, and the Staff Researcher, whose activities are divided between the duties for the Tools and Analytical Services Department and finalizing ODP legacy documents.

**Travel**—Funds are budgeted for the Manager to attend an international and domestic meeting of TAP, four domestic IODP coordination meetings addressing JOI Alliance working teams and Phase 2 planning, attendance at the Offshore Technology Conference (OTC), an international meeting with JAMSTEC to explore joint operational and engineering interfaces, and liaison meetings in Houston with oil and gas vendors.

**Relocation**—The department will be searching for one new Research Specialist (RS) with unique experience in microbiology, physical properties, chemistry, or paleomagnetism. There are also new positions for Marine Laboratory Specialists (MLSs). It is expected that one candidate could come from outside of Texas or overseas and will need relocation assistance to a maximum of \$10,000.

**Training**—The training budget covers on-campus software courses for five out of 28 staff members and local personnel training for six employees in communication, team building, and supervision. The major element of the budget is for initial project management programmatic training for IODP staff. The trainer would come to the IODP facility in College Station to teach the first class (\$10,000

per course) of 15 students in the principles of project management for 3 days, and a class (\$6750 per course) of 15 students in the application of project management software for 2 days.

**Business Conferences**—The budget will allow for five 1-day liaison meetings with oil and gas vendors. IODP will supply coffee break refreshments and lunch at these meetings at the College Station facilities.

**Supplies**—Based on ODP historical records, funds are budgeted for the department's office supplies for the year.

**Software**—Funds are budgeted to license 15 client users for use of project management server software.

**Shipping**—Funds are budgeted for postage, overnight delivery, and the courier requirements of the department.

**Telecommunications**—Funds are budgeted for departmental telephone services based on ODP historical records.

**Professional Service**—Funds are budgeted for the department's seagoing physicals, letterhead and business cards, and external copying requirements.

**Consultant Services**—Funds are budgeted for a project management consultant to conduct on-site interviews and to develop a framework of content, standards, and processes for implementation of project management, to tailor the project management courses to the needs of IODP, and to help with the installation and configuration of the project management software.

**Furniture**—Funds have been budgeted for office furniture for new staff being hired by the department.

**Recruiting**—The search for new personnel will require ads to be placed in science journals and trade journals to attract the best candidates. This budget also provides funds to bring candidates to College Station for interviews.

**Maintenance and Repairs**—This category covers the department's office equipment and its share of large-volume photocopiers.

## 414041-02000 Analytical Services

Exp. Cat.	Description	FY04 Program Plan SOC Budget	FY04 Program Plan POC Budget	FY04 Program Plan Mobilization Budget *	FY04 Program Plan NSF Total
2000	Payroll	\$ 483,985	\$ 142,763	\$ 9,743	\$ 636,491
3500	Travel	59,287	-	-	59,287
3580	Travel to/from Port	16,786	11,190	11,260	39,236
3600	Training	51,833	51,833	-	103,666
3720	Business Conferences	1,500	-	-	1,500
4765	Software	11,100	-	-	11,100
5550	Professional Service	31,900	-	-	31,900
5986	Furniture	3,500	-	-	3,500
6820	Maintenance & Repair	19,000	500	-	19,500
8400	Equipment	52,500	-	-	52,500
	<b>TOTAL</b>	<b>\$ 731,391</b>	<b>\$ 206,286</b>	<b>\$ 21,003</b>	<b>\$ 958,680</b>

\* All POC.

This cost center covers the seagoing and shore-based activities of the Analytical Services section, which is focused on providing enhancements to shipboard and shore-based laboratories and associated software, including analytical packages and service center support to the shipboard laboratories. It also manages the shore-based laboratories in College Station.

**Payroll**—This budget includes 9.1 FTEs for the salaries of the Supervisor, a Senior Project Administrator, six marine laboratory specialists, one research specialist, two senior programmers, and three programmer specialists. This staff is being phased in to reflect the growing requirements for IODP Phase 1 activities as FY04 progresses and the staff required for the Phase 2 IODP riserless vessel. Funds are included for sea pay. Twenty-four percent of payroll involves POC funds for seagoing MLSs (40%) who handle cores on the core catwalk prior to laboratory processing.

**Travel**—Funds are budgeted for the Supervisor to attend a domestic and international meeting of SCIMP, for two meetings with JAMSTEC staff in Japan to develop and follow up on various laboratory and analytical software development projects. Four Analytical Services staff members will participate in these meetings. The focus of the JAMSTEC meetings will be to develop a close and joint working relationship between the implementing organizations on laboratory instrumentation and scientific analysis development projects linked to a common format database. The initial work with JAMSTEC will focus on creating a visual core description application.

**Travel to/from Port**—Funds are budgeted for two MLSs, an RS, and two programmers to sail the transit from Pusan to Astoria during installation and startup of the laboratory equipment for Phase 1 on the *JOIDES Resolution*. For Expedition 1, this is reduced to a complement of three MLSs and one programmer. For Expedition 2, staffing is increased to the normal sailing complement of three MLSs, one RS, and one programmer. POC funding for the MLS and RS is budgeted at \$11,190. No Analytical Services staff are budgeted to sail the transit from Acapulco to Bermuda.

**Training**—Eight out of seventeen Analytical Services staff are budgeted to take Hazardous Waste Operations and Emergency Response Standard (HAZWOPER), STWC, and H<sub>2</sub>S safety training. The

POC costs for the safety training (hazardous materials, H<sub>2</sub>S, marine safety training) are budgeted at \$51,833. In addition, two programmers are assumed to require entry level programming skill (four courses) to meet IODP standards, and each programmer is scheduled to take one upgrade course in LabVIEW, Oracle9i database, or Java programming.

**Business Conferences**—The budget will allow for five 1-day liaison meetings with a visiting JAMSTEC laboratory services team. IODP will supply coffee break refreshments and lunch at these meetings at the College Station facilities. It is assumed that hardware and software development project meetings will alternate every 6 months between College Station and Japan and Europe, as appropriate.

**Software**—The budget covers six licenses for each of LabView 7 and Multi-Edit, two licenses for Visual Studio, three licenses for XP-Office Developer, and four licenses for XML Writer.

**Professional Service**—The budget covers a microscope service call in College Station, a chemistry ICP service call in Astoria, and a paleomagnetic service call and recharge with helium in Pusan.

**Furniture**—This budget will allow a project room to be set up containing the PXI development system hardware, associated software, and large plasma display to allow an analytical services team approach during development of the new laboratory instrumentation and scientific analysis software.

**Maintenance and Repair**—The budget covers startup and ongoing maintenance, repair, and upgrades of laboratory equipment budgeted for a 5-month operational period. Funding includes safety equipment in the laboratories.

**Equipment**—The budget is for a PXI Development System and a large-format plasma display to be utilized for laboratory developments in a project room.

## 414041-03000 Engineering Services

Exp. Cat.	Description	FY04 Program Plan SOC Budget	FY04 Program Plan POC Budget	FY04 Program Plan Mobilization Budget *	FY04 Program Plan NSF Total
2000	Payroll	\$ 387,547	\$ 21,897	\$ -	\$ 409,444
3500	Travel	5,119	-	-	5,119
3580	Travel to/from Port	-	6,009	2,252	8,261
3600	Training	16,334	-	-	16,334
3720	Business Conferences	1,500	-	-	1,500
4000	Supplies	-	604,762	-	604,762
4765	Software	47,845	-	-	47,845
5550	Professional Service	12,500	-	-	12,500
6820	Maintenance & Repair	60,500	-	-	60,500
8400	Equipment	71,000	-	-	71,000
	<b>TOTAL</b>	<b>\$ 602,345</b>	<b>\$ 632,668</b>	<b>\$ 2,252</b>	<b>\$ 1,237,265</b>

\* All POC.

This cost center covers the activities of the Engineering Services section, which is focused on (1) providing legacy hole completion equipment for expeditions along with design improvements and adoption of new technology to coring and drilling operations, (2) engineering and support of platform services, and (3) a service center to support the deployment of coring, downhole tools, and platform equipment.

**Payroll**—This budget includes 5.8 FTEs for the salaries of the Supervisor at 100%, eight engineers and designers, and an electronics specialist, whose activities are divided between the duties for the Tools and Analytical Services Department and finalizing ODP legacy documents. Included are POC costs for sailing engineers/designers to support legacy hole completions and coring operations on Expeditions 1 and 2. Funds are included for sea pay.

**Travel**—Funds are budgeted for two IODP engineering coordination meetings of the implementing organizations, for design review meetings with vendors, and for six staff members to attend the OTC.

**Travel to/from Port**—Funds are budgeted for a designer to sail the transit to service rig systems and for an engineer and a designer to sail on Expedition 1 to support borehole instrument hangar installations and for an engineer to sail to support coring operations on Expedition 2.

**Training**—Four out of eight professional staff will take a geometric dimensioning and tolerancing course or an OrCAD or LabVIEW course, and three professional staff members will take a course in SolidWorks.

**Business Conferences**—The budget will allow for five 1-day liaison meetings with JOI Alliance members and vendors.

**Supplies**—The POC budget of \$351,552 is for three borehole instrument hangar legacy hole completions for Expedition 1, and \$253,210 is for the long-lead procurement of three hard rock reentry systems and hammer rental for Expedition 3.

**Software**—The budget covers six upgrades to AutoCAD 2004 from 2000, three licenses for SolidWorks, two OrCAD Capture packages, an OrCAD PSPLC package, and two OrCad Layout packages.

**Professional Services**—Funds are budgeted to open a doorway between the two electronics laboratories at College Station to improve flexibility in the ET shop. Also included in this budget is calibration of load pins and of an active heave compensator motion reference unit.

**Maintenance and Repair**—The budget covers ongoing maintenance, repair, and upgrades for new electronics in three APCT tools, thermistor string upgrades in two DVTP tools, recalibration, probe tips and thermistor string upgrades in two DVTPP tools, component improvements in six APCM tools, land testing of two DSS-RMM, as well as hardened electronics for the weight on bit filter (WOBF) and rig instrumentation on the drilling platform. Funding is also included for a service agreement on an engineering laser printer.

**Equipment**—The budget includes the fabrication of an instrumented simulated borehole test facility (SBTF) that has been designed to simulate the dynamic insertion of various downhole tools into sediments under lithostatic pressure and hydrostatic pressures up to 3000 psi. The SBTF is modular to accommodate the IWS, DVTP, DVTPP, APCT, and PCS. The overriding purpose of the SBTF is to shorten the development cycle of downhole tools by testing prototypes under operational conditions without having to go to sea. In particular, the SBTF will expedite the evaluation of penetration mechanics of different probe geometries and the filtering schemes for fluid sampling and pore pressure measurements. The budget also includes the procurement of a dead weight tester for calibrating the pressure sensors on the PCS, APCM, DVTPP, IWS, and DSS downhole tools.

# INFORMATION TECHNOLOGY AND DATA SERVICES DEPARTMENT

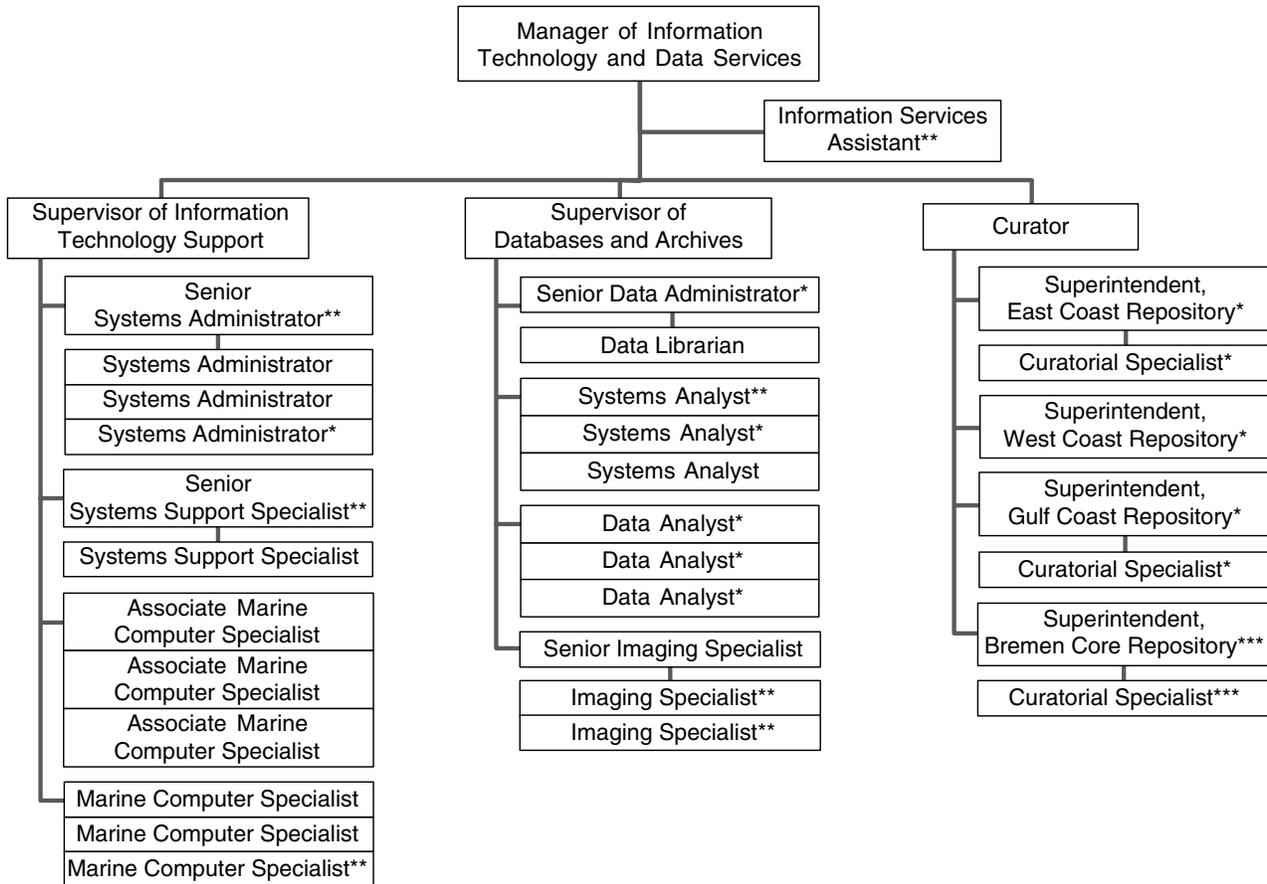
*The Information Technology and Data Services Department is committed to providing the scientific community with the most accurate, complete, and reliable geological and geophysical data through quality assurance and data verification procedures; to maintaining archives of the cores for use by scientists from around the world; and to designing, implementing, operating, and safeguarding all IODP computing technologies and facilities.*

## **DEPARTMENTAL RESPONSIBILITIES**

The department is responsible for providing state-of-the-art computing facilities on board the riserless drillship and on shore; managing and providing ODP and IODP data over the Web; ensuring data quality collected on the riserless vessel; archiving data; managing the core collections from DSDP, ODP, and IODP; and interacting with the SAS committees, the JOI Alliance/JIT, and other implementing organizations to integrate the department's information technology (IT) and data handling efforts across IODP.

# ORGANIZATION CHART

## Information Technology and Data Services Department



\* ODP funded in FY04.

\*\* IODP funded in FY04.

All other positions funded by both ODP and IODP in FY04.

\*\*\* University of Bremen employees

## GOALS

To carry out these responsibilities, the department is organized into four sections: Information Technology and Data Services Office, Information Technology Support Section, Databases and Archives Section, and Curatorial Section. Each section has identified primary goals and tasks as a road map to fulfilling its and the department's responsibilities to IODP.

### Departmental Goals

- Ensure that the goals of each section in the department are met:
  - Provide appropriate resources and administrative support to each section to facilitate reaching their stated goals.
  - Interact with the SAS committees, the JOI Alliance/JIT, and other implementing organizations to integrate the department's information technology (IT) and data handling efforts across IODP.
  - Provide strategic planning for the department and program that focuses on each section's goals, the department's goals, and the Program's goals.

### System Services Section

- Fully equip the Phase 1 vessel in time for the first expedition:
  - Inspect the equipment left aboard the *JOIDES Resolution* at the end of ODP cruises for damage and purchase new computer and network equipment (Quarter 2).
  - Ship new and old equipment to the mobilization port and install and test the equipment during the port call and transit to Oregon (Quarter 3).
- Equip IODP staff and facilities with the necessary IT infrastructure to meet the objectives of IODP:
  - Complete IT hardware and software needs assessment (Quarter 1).
  - Acquire and install all necessary hardware and software (Quarter 3).
- Implement and maintain a proper inventory of IODP/TAMU software installations:
  - Perform a census of currently installed software and inventory all current software licenses (Quarter 1).
  - Reconcile and maintain the license database (Quarter 2).
- Review the IT current security situation and maintain a forward compliance with guidelines as set forth by the TAMU College of Geosciences and other applicable regulatory agencies:
  - Assess and review physical and network security.
  - Install new physical security devices at the IODP/TAMU facility (Quarter 2).

### Databases and Archives Section

- Ready the Janus database for Expedition 1:
  - Upgrade the Oracle relational database management system and the Janus database to Oracle 9i (Quarter 3).
  - Setup the Janus database for Expedition 1 (Quarter 3).
- Janus database maintenance:

- Perform the beginning-of-expedition and end-of-expedition procedures to set up the Janus database at the start of each expedition and to merge ship data with the master database on shore (Ongoing; needed for each expedition).
- Provide general Oracle database maintenance.
- Coordinate the Janus database with the evolution of JAMSTEC's OD21 database:
  - Coordinate the Janus data model and the database with JAMSTEC by periodically meeting with representatives of JAMSTEC and the IMI Information Service Center.
  - Add new data types to the Janus data model and the database.
- Maintain IODP riserless vessel data:
  - Receive and catalog IODP data (Ongoing; needed for each expedition).
  - Process seismic and underway data (Ongoing; needed for each expedition).
  - Data validation for quality assurance (Ongoing; needed for each expedition).
  - Process data requests.
- Provide photography/imaging support:
  - Provide photography/imaging support on the riserless ship (Ongoing; needed for each expedition).
  - Maintain microscopes and digital imaging system on ship (Ongoing; needed for each expedition).
  - Process photo requests.
  - Provide scanning services.
- Maintain departmental applications:
  - Maintain departmental nonscience database applications for IODP/TAMU.
- Develop a new IODP inventory management system:
  - Replace existing inventory systems with a new system (Before Phase 2 begins pending adequate funding).
- Develop a new IODP address database management system:
  - Replace existing mailing lists and personnel databases with a single new system (Before Phase 2 begins pending adequate funding).

## **Curatorial Section**

- Provide support for IODP riserless core sampling, analysis, and education:
  - Support shipboard curation and sampling by sailing repository personnel as needed.
  - Promote the educational use of the core collection in collaboration with IODP educational personnel.
- Provide planning and implementation strategies for core sampling and curation:
  - Working with other implementing organizations, the SAS, and IMI, develop a policy for IODP curation (Quarters 1–3).
  - Plan sample and curation strategies for upcoming expeditions and review all shipboard and moratorium-related requests in coordination with each expedition's IODP Staff Scientist and Co-Chief Scientists.

- Refine the repository consolidation plan and, if endorsed by the scientific community, begin implementation plan to consolidate the West Coast Repository and the East Coast Repository core collections into the Gulf Coast and Bremen Core Repository collections. (The ECR consolidation is expected to be completed by the end of FY05, whereas consolidation of the WCR is expected to be completed near the end of FY07.)

# BUDGET

## 414051-01000 Information Technology and Data Services – Office

Exp. Cat.	Description	FY04 Program Plan SOC Budget	FY04 Program Plan POC Budget	FY04 Program Plan Mobilization Budget *	FY04 Program Plan NSF Total
2000	Payroll	\$ 105,131	\$ -	\$ -	\$ 105,131
3500	Travel	10,910	-	-	10,910
3551	Relocation	30,000	-	-	30,000
3600	Training	2,620	-	-	2,620
4000	Supplies	2,885	-	-	2,885
8510	Library	200	-	-	200
5261	Shipping	200	-	-	200
5370	Telecommunications	22,872	-	-	22,872
5373	Ship-to-Shore Communications	1,020	-	-	1,020
5550	Professional Service	24,800	-	-	24,800
5590	TAMU Computing Services	1,000	-	-	1,000
5986	Furniture	15,000	-	-	15,000
5987	Recruiting	4,650	-	-	4,650
	<b>TOTAL</b>	<b>\$ 221,288</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 221,288</b>

\* All POC.

The Information Technology and Data Services Office provides overall administration for the department and oversees compliance with various rules, regulations, procedures, and applicable laws. The office works with the IODP/TAMU Deputy Director of Data Services and the JIT to provide for coordination, collaboration, innovation, and technology transfer in all approved information technology projects that are proposed through the IODP SAS, IMI, and other implementing organizations. The office ensures that appropriate departmental representation exists on the various IT committees and at various SAS committee meetings, as may be appropriate.

The following expense categories cover all sections in the department: relocation, telecommunications, ship-to-shore telecommunications, professional service, TAMU computing services, and recruiting. Where special needs exist, additional costs in these categories are included in each department section described in specific budgets.

**Payroll**—The department has a total of 14.45 FTEs, or 25 employees in FY04 while this office has a manager (0.5 FTE) and an administrative assistant (1.0 FTE).

**Travel**—Funds are available for travel to two professional meetings (AGU and Gartner Symposium) and to interact/coordinate with JOI Alliance teams, science advisory committees (SCIMP), and IMI, as needed.

**Relocation**—With the start of a new program, three position vacancies are projected. This budget category includes funds for helping defray moving costs for certain newly hired staff.

**Training**—Funds are budgeted for training for the department manager in Oracle database portal and collaborative development and implementation.

**Supplies**—This budget covers the purchase of general office supplies (e.g., paper, pens, tape, paper clips, folders, envelopes, etc.).

**Library**—These funds are to buy technical books related to managing information technology projects and departments.

**Shipping**—This category covers the cost of mailing letters and shipping equipment under general office usage.

**Telecommunications**—Telephone, modem, pager, and fax charges for the department are covered under this category.

**Ship-to-Shore Communications**—This category covers backup satellite communications (Inmarsat B) when VSAT services fail.

**Professional Service**—Funds in this category cover charges for a number of general services for the department, including utility charges for a storage vault at the Riverside Campus, monthly copier charges, letterhead paper, physical exams for seagoing staff, and membership in an information technology consulting service.

**TAMU Computing Services**—These funds are to purchase special support services from the TAMU central computing department.

**Furniture**—Funds budgeted are to replace old and broken office furniture from ODP and to purchase furniture for new positions, as needed.

**Recruiting**—This category provides funds to advertise and recruit new staff to fill departmental vacancies expected over the next year.

## 414051-02000 Information Technology Support

Exp. Cat.	Description	FY04 Program Plan SOC Budget	FY04 Program Plan POC Budget	FY04 Program Plan Mobilization Budget *	FY04 Program Plan NSF Total
2000	Payroll	\$ 351,589	\$ 139,377	\$ 15,214	\$ 506,180
3533	Drilling Clearances	-	-	-	-
3500	Travel	13,896	-	-	13,896
3580	Travel to/from Port	7,810	5,206	17,510	30,526
3600	Training	29,520	-	-	29,520
4000	Supplies	30,000	-	-	30,000
4765	Software	63,070	-	-	63,070
8510	Library	1,200	-	-	1,200
5261	Shipping	514	-	-	514
5550	Professional Service	2,061	-	-	2,061
6820	Maintenance & Repair	111,220	-	-	111,220
8400	Equipment	207,200	-	251,750	458,950
	<b>TOTAL</b>	<b>\$ 818,080</b>	<b>\$ 144,583</b>	<b>\$ 284,474</b>	<b>\$ 1,247,137</b>

\* All POC.

The Information Technology Support Section will provide management, staffing, and support for TAMU/Lamont-Doherty Earth Observatory (LDEO) shipboard facilities and TAMU shore-based facilities, including computer and network systems support; user-oriented computer services, including internet access and e-mail; 24/7 ship/shore satellite connectivity; help desk services; and community access to Program information.

**Payroll**—There are 6.45 FTE (13 staff members) in this section of the department. Sailing Marine Computer Specialists are projected to spend 60% of their time in SOC activities and the remaining portion in POC activities because of job duties devoted to safety-related tasks and core handling activities. Included in the budget are funds for two student workers who assist the help desk with desktop computer support.

**Travel**—These funds cover staff business (two trips to core repositories at LDEO and Scripps Institution of Oceanography), JIT meetings (three trips planned), and travel to one professional conference.

**Travel to/from Port**—These funds are for the cost of transporting Marine Computer Specialists to and from ports at the beginning and end of each IODP expedition. Sixty percent of payroll costs in this cost center are considered SOC and 40% as POC. As part of the mobilization effort, six technical staff members are scheduled to reinstall computer/network equipment and software during the initial transit in preparation for full support of drilling and science activities during Expedition 1.

**Training**—This category covers local, state, and national training to ensure that the Information Technology Support staff has a useful and consistent common body of skills and knowledge.

**Supplies**—These funds will be used to replace some internal parts (or upgrade same as necessary) in microcomputers, supply backup media, and general office supplies for use on shore and on the drillship.

**Software**—These funds will be used to ensure that IODP has a current array of software tools with which to accomplish its goals. Software inventory and licensure will be kept current. Occasionally, new software tools will be evaluated.

**Library**—A small collection of pertinent reference material will be kept current for use by Information Technology Support staff both on the vessel and at headquarters.

**Shipping**—Funds are needed to send equipment to and from repair depots and the repositories.

**Professional Service**—In certain circumstances, work is required that draws on skills not normally needed by IODP. In those cases, expert assistance will be employed.

**Maintenance and Repair**—This category includes costs associated with various maintenance agreements required for equipment on the ship, certain key equipment on shore, and some software products.

**Equipment**—Equipment in this category will include Windows workstations, Mac workstations, UNIX/LINUX workstations, monitors, printers, plotters, network devices, and copy machines (shipboard). Obsolete equipment will be replaced for the entire IODP/TAMU/TAMRF organization, both on ship and shore, following a 4-year equipment replacement cycle strategy. All computer/network equipment purchased for the drillship for Phase 1 is categorized as a mobilization cost.

## 414051-03000 Databases and Archives

Exp. Cat.	Description	FY04 Program Plan SOC Budget	FY04 Program Plan POC Budget	FY04 Program Plan Mobilization Budget *	FY04 Program Plan NSF Total
2000	Payroll	\$ 293,151	\$ 10,357	\$ 6,486	\$ 309,994
3533	Drilling Clearances	-	-	-	-
3500	Travel	13,265	-	-	13,265
3580	Travel to/from Port	3,964	441	4,080	8,485
3600	Training	31,984	-	-	31,984
4000	Supplies	4,000	-	-	4,000
4765	Software	5,800	-	-	5,800
8510	Library	800	-	-	800
5261	Shipping	1,000	-	-	1,000
5550	Professional Service	2,500	-	-	2,500
6820	Maintenance & Repair	20,600	-	-	20,600
	<b>TOTAL</b>	<b>\$ 377,064</b>	<b>\$ 10,798</b>	<b>\$ 10,566</b>	<b>\$ 398,428</b>

\* All POC.

The Databases and Archives Section will provide database management services for all numerical and digital core data and underway-geophysical data, photographs, and images collected on the drillship. It will initialize the Janus database and transmit it to the ship before each expedition and bring back the data collected during the cruise to the shore facility. The section will merge the data with the cumulative database on shore, ensuring that the data are quality checked for accuracy and completeness. The Databases and Archives Section also provides access to all data via the Internet while maintaining the 1-year moratorium.

**Payroll**—The Database Section has 6 FTEs representing nine staff members. Ten percent of two imaging specialists' payroll costs is considered POC; all other payroll is included as SOC. An imaging specialist sails on each expedition and is expected to spend time on safety-related tasks and core handling. Also included in the budget are funds for three Graduate Assistant Researchers (GARs) to assist in data quality checking.

**Travel**—Funds are for travel to JAMSTEC, IMI, etc. (three trips), to synchronize and/or integrate database activities and products with JAMSTEC and to coordinate with IMI Data Center. This budget also provides funds for one person to attend a professional conference.

**Travel to/from Port**—This cost is for two employees who will sail on the initial transit before Expedition 1. The Database Administrator will set up the Janus database and the Senior Imaging Specialist will set up the digital imaging system and the microscopes and calibrate monitors. In addition, one Imaging Specialist will sail on each expedition to support photography/imaging activities on the ship. Ten-percent effort (\$441) of the digital imaging specialists' travel during port calls is considered safety related and part of POC.

**Training**—One training course is budgeted for 10 of the 13 staff members in the Databases and Archives Section.

**Supplies**—This cost is for the purchase of supplies (e.g., backup tapes, plotting paper, CDs, etc.).

**Software**—Funds are budgeted for the purchase of one license of the Data Modeling software “Erwin” for business administration applications and one license of “Model Manager” software.

**Library**—This budget category includes funds to purchase technical books that are related to database management and imaging systems.

**Shipping**—This budget covers the cost of shipping data requested by scientists and for shipping paper prime data for microfilming/imaging.

**Professional Service**—This category covers microfilming or imaging and cataloging of the paper prime data in order to maintain the paleontology data from Expedition 1.

**Maintenance and Repair**—This is the cost for annual maintenance of the “Oracle RDBMS,” “Erwin,” and “Model Manager” vendor program applications.

## 414051-04000 Curatorial Office

Exp. Cat.	Description	FY04 Program Plan SOC Budget	FY04 Program Plan POC Budget	FY04 Program Plan Mobilization Budget *	FY04 Program Plan NSF Total
2000	Payroll	\$ 44,816	\$ -	\$ -	\$ 44,816
3533	Drilling Clearances	-	-	-	-
3500	Travel	5,571	-	-	5,571
8400	Equipment	37,449	-	-	37,449
	<b>TOTAL</b>	<b>\$ 87,836</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 87,836</b>

\* All POC.

The office of the Curator oversees the operation of all four Core Repositories. Currently the repositories hold almost 320 km of core. Approximately 4-6 km of new IODP core will be recovered in FY04 during the first two IODP expeditions and will be stored in both the Gulf Coast and Bremen Core Repositories. The Curator will be involved in precruise planning of curation/sampling needs and sample request review for the two expeditions scheduled in this fiscal year. In addition, the Curator will be working with the implementing organizations in Europe and Japan to plan and develop a common IODP curation management strategy and policy to consolidate the East Coast Repository cores with the BCR and GCR cores (if the plan is approved by the scientific community).

**Payroll**—Payroll consists of funds for a Curator (0.5 FTE). The Curator’s funding is considered as SOC.

**Travel**—Funds are budgeted for the Curator to attend one SCIMP meeting and for a visit the Kochi repository in Japan to promote integration of core management, policies, and procedures.

**Equipment**—This category includes \$12,000 to purchase a mold for obtaining cubic samples for paleomagnetic measurements. The design of the mold is intended to fit the needs of scientists and the curatorial staff (equidimensional cubes, predrilled air holes, embossed directional arrows). Purchase of the mold will help avoid using very costly cubes and unreliable shipments of cubes. Also, the budget includes \$25,499 for a combination sample bag machine and printer needed to increase staff efficiency and productivity and reduce packaging errors.

# PUBLICATION SERVICES DEPARTMENT

*The Publication Services Department is committed to developing, producing, delivering, and archiving all required reports and publications for IODP's riserless drilling program. As part of its mission, Publication Services serves as a publications liaison to IMI, other IODP implementing organizations, and SAS panels to ensure communication and collaboration within the international ocean drilling community.*

## **DEPARTMENTAL RESPONSIBILITIES**

The department is composed of four sections: Editorial, Production, Graphics, and Publication Coordination. The duties handled by each department section are as follows.

### **Editorial Section**

- Edit all reports and publications handled by IODP/TAMU.
- Set/administer IODP style.
- Manage postcruise publication citations and related statistics.

### **Production Section**

- Produce NSF-required publications (and some reports) for print, Web, and/or CD-ROM.
- Serve as liaison with publishing subcontractors.
- Manage volume distribution and warehousing.

### **Graphics Section**

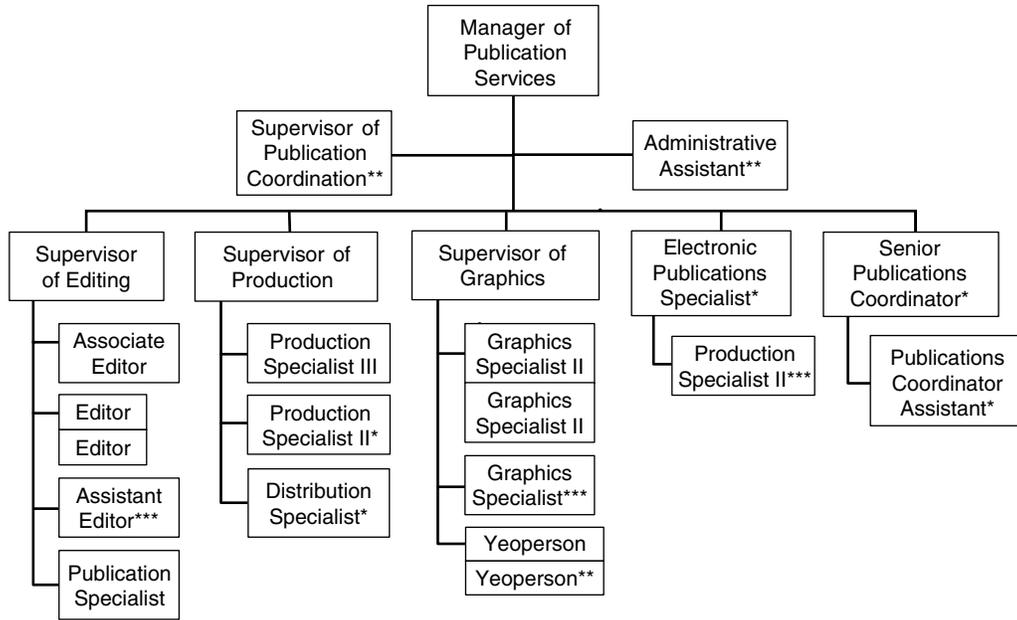
- Produce graphics for all reports and publications handled by IODP/TAMU.
- Produce some reports for Web distribution.
- Provide support for the production of IODP graphics, presentations, papers, and other scientific reports.
- Provide yeoperson support on the riserless drilling vessel.

### **Publication Coordination Section**

- Create and produce NSF-required reports.

# ORGANIZATIONAL CHART

## Publication Services Department



\* ODP Funded in FY04.  
 \*\* IODP Funded in FY04.  
 All other positions funded by both ODP and IODP in FY04.  
 \*\*\* Part-time as needed.

## **GOALS**

In FY04, the Publication Services Department will:

- Produce and distribute four Expedition Scientific Prospectus issues (Expeditions 1–4).
- Produce and distribute one Preliminary Report issue (Expedition 1).
- Begin production on one Initial Scientific Reports volume (Expedition 1).
- Produce three quarterly reports (Quarters 1–3).
- Produce and distribute two Annual Program Plans (FY04 and FY05).
- Assist with production of JOI Alliance reports.
- Provide support for the production of IODP graphics, presentations, papers, and other scientific reports.

# BUDGET

## 414061-01000 Publication Services

Exp. Cat.	Description	FY04 Program Plan SOC Budget	FY04 Program Plan POC Budget	FY04 Program Plan Mobilization Budget *	FY04 Program Plan NSF Total
2000	Payroll	\$ 369,299	\$ 6,242	\$ 2,460	\$ 378,001
3500	Travel	4,402	-	-	4,402
3551	Relocation	2,000	-	-	2,000
3580	Travel to/from Port	2,174	6,132	1,907	10,213
3600	Training	3,822	-	-	3,822
4000	Supplies	3,495	-	-	3,495
4765	Software	3,000	-	-	3,000
5261	Shipping	2,750	-	-	2,750
5370	Telecommunications	540	-	-	540
5550	Professional Service	5,615	-	-	5,615
6820	Maintenance & Repair	600	-	-	600
	<b>TOTAL</b>	<b>\$ 397,697</b>	<b>\$ 12,374</b>	<b>\$ 4,367</b>	<b>\$ 414,438</b>

\* All POC.

This cost center covers the activities of the Publication Services Department, which is responsible for production and dissemination of required reports and publications for IODP's riserless drilling program.

**Payroll**—In FY04, payroll costs support salaries for 6.84 full-time equivalents (FTEs), or 15 positions. Of these positions, ODP and IODP funds support 11 for FY04 and 4 are supported solely by IODP funds for FY04. Two positions are seagoing and include sea pay. Funds are included to cover anticipated salary increases of 3%. Of the overall Publication Services payroll budget, less than 2% is considered POC; the rest is SOC.

**Travel**—This budget covers the travel to two JREPORT meetings and one SAS panel meeting. One staff member will attend GSA and AGU to represent IODP/TAMU, network with the IODP scientific community and staff, and provide updates on publication plans for IODP. These costs are regarded as SOC.

**Relocation**—Funds are budgeted to help defray moving costs for new staff members filling vacant positions.

**Travel to/from Port**—Funds cover the cost for one nonsailing staff member to attend the Astoria (Expedition 1) port call to train and cross over with both Yeopersons. This expense is considered SOC. Funds are also budgeted for travel required for the Yeoperson sailing on the initial transit (Pusan to Astoria), Expedition 1 (Astoria to San Diego), transit (San Diego to Bermuda), and Expedition 2 (Bermuda to Ponta Delgado). Except for the initial transit, all Yeoperson travel expenses are considered POC.

**Training**—Funds are budgeted for two staff members to attend technical training courses (e.g., scientific proofreading, software) and for staff to attend on-campus software training courses. These expenses are regarded as SOC.

**Supplies**—Items budgeted in the supplies category support the needs of the day-to-day operations of the department. This includes general office supplies (binders, pens, folders, envelopes, staples, tape, mailing labels, etc.); electronic media and other computer supplies (CD-ROMs, tapes and disks, replacement parts for computers, etc.); toner cartridges; and paper for printers and copiers. All supply costs are SOC.

**Software**—Funds are budgeted to support the software packages needed by the new Publication Services Department positions, such as system, word processing, page layout, CD-authoring, Web publishing, and spreadsheet programs. These expenses are considered SOC.

**Shipping**—Shipping costs cover postage for regular correspondence and for the distribution of reports. These costs are regarded as SOC.

**Telecommunications**—Rates for phone charge costs are based on FY03 actual rates; costs cover new Publication Services Department positions. All communications costs are SOC.

**Professional Service**—Funds cover costs for letterhead and envelopes; printing the FY04 and FY05 Annual Program Plans; photocopying services; AGI Citation Database new citations fee for inclusion of IODP citations; microform costs for Cruise Scientific Prospectus and Preliminary Report issues; safe deposit box rental fee for off-site storage of microform copies. Expenses in this category are considered SOC.

**Maintenance/Repair**—Costs cover a portion of the cost for copier maintenance agreements. All maintenance/repair costs are regarded as SOC.

# SHIP OPERATIONS

*Ship Operations provides for the basic operation of the JOIDES Resolution, including day rates, fuel, per diem, travel for the ship's crew, port calls, safety items, ship-to-shore communications, insurance coverage, and other ship-related costs.*

The major portion of the Ship Operations budget represents operational costs reimbursed directly to the ship's contractor, Overseas Drilling, Ltd. These costs are described in more detail below.

Day rate cost covers contractor management of the vessel, hull and machinery insurance required by the contract, waste disposal, drilling contractor travel, maintenance and spares for contractor equipment, and staffing the ship, including the marine crew, drilling personnel, and catering personnel. It does not cover the cost of IODP/TAMU's crew or the scientists onboard the ship. The day rate varies according to the operational mode of the ship, which is generally operating, standing by, or cruising. While it is a fixed rate per day, the day rate is adjusted for changes in the Consumer Price Index-Urban (CPI-U) and Employment Cost Index (ECI). A cumulative change in the CPI-U and ECI (since the last increase) equal to or exceeding 2% triggers an increase or decrease in the day rates. The adjustment takes effect at the beginning of the month following the increase or decrease and cannot occur more frequently than every 6 months.

Per diem provides room and board for the IODP/TAMU crew and scientists sailing on each cruise. A fixed daily rate is charged for each person, and TAMRF reimburses an average of 45 people per day. Per diem is also adjusted by the CPI-U/ECI in the same manner as the day rates. Catering for the ship contractor's crew is included in the day rate.

Locations have a definite effect on port call costs, which covers agents' expenses and freight associated with resupplying the ship. During each port call, cores and equipment are off-loaded from the previous cruise and supplies are loaded for the upcoming cruise. ODL is reimbursed for port agent charges and the shipment of food and related supplies. Shipment of cores, drilling equipment, and laboratory supplies is arranged by IODP/TAMU and paid for by IODP/TAMRF. Similarly, IODP/TAMRF purchases all drilling equipment and laboratory supplies necessary for meeting the objectives of the cruise. These costs are covered in other cost centers, not Ship Operations.

The fuel needed to operate the ship also falls under Ship Operations. The amount of fuel taken depends on the amount of fuel consumed during the cruise and the price of fuel at the port call location. Due to budgetary constraints, a policy of purchasing only enough fuel to maintain the minimum safety level has been adopted when prices are high.

Other costs associated with the operation of the ship include insurance, communications (e.g., VSAT), observers, supplies, services, and medivacs. These items are tracked separately. The cost center shows all ship-related expenses paid to vendors other than ODL and also houses nonroutine costs paid to ODL. Medical evacuations are an example of a nonroutine cost incurred. In addition, travel for observers to participate on the cruise and for obtaining drilling clearances is shown in this budget. Safety-related costs are also included in this cost center.

# BUDGET

## 414071-01000 Ship Operations – Subcontractor

Exp. Cat.	Description	FY04 Program Plan SOC Budget	FY04 Program Plan POC Budget	FY04 Program Plan Mobilization Budget *	FY04 Program Plan NSF Total
3760	Per Diem	-	129,401	11,746	141,147
4750	Fuel & Lubricants	-	912,208	92,192	1,004,400
7040	Day Rates	-	6,672,900	1,297,000	7,969,900
7090	Port Calls	-	294,467	60,000	354,467
	<b>TOTAL</b>	<b>\$ -</b>	<b>\$ 8,008,976</b>	<b>\$ 1,460,938</b>	<b>\$ 9,469,914</b>

\* All POC.

**Per Diem**—This budget is based on shipboard catering costs for 50 people per cruise and 21 people per transit at a rate of \$27.30/person. Also included in this category are lab stack cleaning costs at \$14.00/day and a fixed charge of \$618 for extra meals served during the Astoria port call.

**Fuel**—Fuel is budgeted for two refuelings. The first refueling will take place in Pusan, where it is estimated that 2550 metric tons will be purchased at \$268/metric ton. The second refueling is scheduled to occur in Panama, where 1,200 metric tons will be loaded on at an estimated price of \$267.50/metric ton.

**Day Rates**—This budget is based on the total scheduled days (122) of operating (\$65,950/day), cruising (\$64,950), and standby (\$63,950) in FY04.

**Port Calls**—The costs for one 6-day full port call in Astoria and four 1- to 2-day port calls in Pusan, Acapulco, Panama, and Bermuda are included in this budget, along with the hotel and per diem costs in port call associated with two crew changes by the ship subcontractor.

## 414071-02000 Ship Operations – IODP General Support

Exp. Cat.	Description	FY04 Program Plan SOC Budget	FY04 Program Plan POC Budget	FY04 Program Plan Mobilization Budget *	FY04 Program Plan NSF Total
3580	Travel to/from Port	-	23,126	16,592	39,718
5070	Insurance	-	180,340	31,825	212,165
5373	Ship-to-Shore Communications	-	70,784	9,638	80,422
5550	Professional Service	-	20,000	-	20,000
	<b>TOTAL</b>	<b>\$ -</b>	<b>\$ 294,250</b>	<b>\$ 58,055</b>	<b>\$ 352,305</b>

\* All POC.

***Travel to/from Port***—Funds are budgeted for the Director, two Deputy Directors, and the HSE Coordinator to each attend one or more port calls scheduled during the fiscal year.

***Insurance***—The amount budgeted is based on the annual insurance premiums for coverage as described elsewhere in this program plan. Funds in FY04 represent an estimated 4 months premium, with the remaining 8 months to be paid in FY05, and assumes NSF indemnification. Without indemnification, the annual costs will increase more than \$350,000, with an additional \$120,000 required in FY04.

***Ship-to-Shore Communications***—This budget is based on the installation costs and monthly service charges incurred to lease the VSAT communication system for ODP operations in FY03 upgraded to a higher space segment that will allow transfer of larger data files.

***Professional Service***—This category covers costs for medivacs and supply boats needed to make deliveries while the ship is at sea.

# APPENDIX I: EXPEDITION OPERATIONS

## INTRODUCTION

The FY04 Program consists of two transits and one complete science program. A second science program will be partially completed in FY04 with the remainder of the program completed in FY05 (see Fig. 1 for site locations and Budget Section below for expedition costs). Preparations will begin in FY04 for a third expedition that will take place in early FY05. A total of 121 operating days are proposed in FY04, consisting of 50 days in transit, 11 port call days, and 60 days focused on science delivery (on site and between-site transit). The schedule is summarized below:

- |                                 |   |
|---------------------------------|---|
| 1. 1 June–21 June 2004          | Transit (Pusan–Astoria)                     |
| 2. 21 June–29 August 2004       | Expedition 1: Juan de Fuca Hydrogeology     |
| 3. 29 August–13 September 2004  | Transit (Acapulco–Bermuda)                  |
| 4. 13 September–30 October 2004 | Expedition 2: North Atlantic 1–Late Neogene |
| 5. 30 October–18 December 2004  | Expedition 3: Core Complex 1                |

## OPERATIONS

### Transit (Pusan–Astoria)

The inaugural voyage of the IODP riserless vessel will be an estimated 17-day transit from Pusan, Korea, to Astoria, Oregon. This transit will be used to ensure complete functionality of the laboratory equipment on board the *JOIDES Resolution*, including instrumentation, networks, and telecommunications, as well as data acquisition verification and storage. In addition, the technical staff will be trained on policies and procedures and on ship and laboratory safety. Laboratory operational manuals and procedures will be reviewed and modified as necessary.

### Expedition 1: Juan de Fuca Hydrogeology

This program is a multidisciplinary research program to evaluate the formation-scale hydrologic properties within oceanic crust; determine how fluid flow pathways are distributed within an active hydrothermal system; establish linkages between fluid circulation, alteration, and geochemical processes, and determine relations between seismic and hydrologic anisotropy. These goals will be accomplished through the replacement of two existing seafloor observatories penetrating the upper crust (ODP Sites 1026 and 1027) and through drilling two new holes (600 and 200 m into the crust) that will be cored, logged, sampled, instrumented, and sealed. This will be the location of the first multidimensional cross-hole experiment, including hydrological, microbiological, seismic, and tracer components. This science program will require multiple expeditions to complete. The two replacement CORKs and one 600-m borehole are scheduled to be completed and instrumented during the first expedition. A subsequent expedition will return to the region to complete the second borehole and installation of a borehole instrument hanger (CORK-II) system. The cross-hole experiment will be completed during the second expedition.

### Proposed Operations

One new site (proposed Site SR-1) will be cored to 900 mbsf, and existing CORKs at previously instrumented ODP Sites 1026 and 1027 will be replaced. The highest priority objective is completion of Site SR-1 on Second Ridge in the Juan de Fuca region. Site SR-1 is located on 3.5-Ma crust over a buried basement ridge. Experiments at this site are intended to resolve the distribution

and properties of distinct hydrothermal systems within the crust and reveal how hydrological compartmentalization relates to constructional, tectonic, alteration, microbial, and seismic processes and properties. Proposed Site SR-1A will be located about 1000 m south-southwest of Site 1026, where sediment thickness is 260 to 275 m. A reentry cone will be installed, and continuous rotary core barrel (RCB) coring will commence. Temperature will be measured, and sediments will be sampled for microbes and fluid chemistry, with the highest resolution sampling completed near the sediment/basement interface. RCB coring will continue 20 to 100 m into basement, and the hole will be reamed to allow installation of casing into the uppermost basement. RCB coring will continue to about 600 m into basement. The nature and extent of alteration within the upper crust will be documented. The hole will be logged using conventional tools (density, resistivity, sonic, formation micro scanner, borehole televiewer) to delineate fine-scale lithostratigraphy, alteration patterns, and fracture distribution. An Ultrasonic Borehole Imager (UBI) will also be deployed if funds become available. Packer experiments will be run in straddle mode to evaluate near-hole permeability distribution within distinct crustal intervals, and a multilevel CORK-II will be installed to isolate three to four crustal intervals housing independent sensors and fluid samplers.

## ***Experiments***

### **1. Multidimensional Hydrological Experiments**

On a yet-to-be scheduled expedition, after completion of the coring programs (Sites SR-1 [Expedition 1] and SR-2 [a future expedition]) and the setting of packers in basement, fluid will be injected into a hole at Site SR-2. CORK-IIs installed in holes at nearby Sites 1026B, 1027C, and SR-1A will allow the first controlled, multidirectional, cross-hole hydrological test in oceanic crust. Fluids will be spiked with inert tracers, allowing single-hole and cross-hole geochemical tracer testing.

### **2. Microbiological Experiments**

The proposed drilling, experimental, and postdrilling plan includes three stages of biological and biogeochemical study: (1) biological sampling and analysis of the sediment column, (2) sampling and analysis of basement, and (3) time series analyses of biological communities and formation fluids. These experiments will require collection of co-located biological and pore fluid samples, and temperature measurements. Sample studies may include molecular analyses (nucleic acids, organic biomarkers), cultivation experiments, and activity experiments (radiotracer, FISH).

### **3. Borehole VSP Experiments**

The conventional basement-logging program will be augmented with vertical and offset seismic profile (VSP) experiments at Site SR-1. The VSP requires one or more geophones clamped within an open or cased hole and a seismic source at the surface. These experiments will require a three-component Array Seismic Imager and, for the vertical experiments, standard air gun or water gun sources run from the drilling ship. The offset experiments will require seismic sources mounted on a second ship.

### **4. Tracer Tests**

These experiments will help improve understanding of porosity, permeability, and dispersivity to better understand water mixing and water-rock interaction with an aquifer deposit. Tracer experiments will help to quantify rates of fluid transport in basement.

## ***Environment and Safety***

Potential major risks that could affect the successful achievement of expedition objectives are twofold. First, reentry cones and casing hangers are long lead-time items—typically casing hangers require 14 months to fabricate. Orders will be placed as soon as requirements are clearly specified to minimize this risk. Second, hole stability problems may be encountered at Sites SR-1 and SR-2 over

the long sections of basement required for CORK-II installation and packer work. We will attempt to mitigate this difficulty by using a long bottom-hole assembly. Other minor risks include the presence of gas hydrates in the sediment section, operational time limitations, and special shipping arrangements required for microbiological samples.

Procedures will be adopted to minimize risk to marine mammals from the proposed seismic experiments, including posting observers while experiments are in progress to record the presence and proximity of marine mammals, gradually increasing the amplitude of the sound sources to allow animals time to move away, and suspending operations if animals approach within 800 yards.

### ***Logistics***

Operations will require an estimated 69 days (6 days in port, 11 in transit, and 52 on site). Drill pipe, other hardware, and science supplies will be loaded in Astoria.

### **Transit (Acapulco–Bermuda)**

An estimated 14-day transit will be required to relocate the vessel from the Pacific to the Atlantic operating theater. We will take advantage of the transit to remedy any problems in the laboratories or with the shipboard computer networks that may have emerged during the initial expedition, to install new equipment that was not installed at the beginning of the initial expedition, and to continue training new Marine Laboratory Specialists.

### **Expedition 2: North Atlantic 1–Late Neogene**

The primary objective of this expedition is to establish for the Late Neogene to Quaternary the intercalibration of geomagnetic paleointensity, isotope stratigraphy, and regional environmental stratigraphies in order to develop a millennial-scale stratigraphic template for the North Atlantic. Other objectives are to (1) better understand the relative phasing of atmospheric, cryospheric, and oceanic changes that are central to understanding the mechanisms of global climate change on orbital to millennial timescales, (2) improve our knowledge of the temporal and spatial behavior of the geomagnetic field through high-resolution records of directional secular variation and geomagnetic paleointensity, and (3) provide fundamental constraints for numerical models of the geodynamo. These objectives will be accomplished by APC coring nine primary sites, with the objective of acquiring complete sedimentary sections appropriate for high-resolution studies. This is a science program that will require multiple expeditions to complete. Occupation of the first five of the program's nine sites is scheduled for this expedition. We plan to core the four remaining sites during the fourth IODP expedition.

### ***Proposed Operations***

From an operational standpoint this will be a routine sediment coring expedition. Each site will be quadruple APC cored to assure recovery of the complete sediment section. APC coring will extend to a minimum depth of approximately 150 m below seafloor. The expedition plan has been to log two sites with the triple-combination tool and the Formation MicroScanner/sonic tool strings.

### ***Experiments***

The emphasis of this expedition will be on sediment core recovery and analysis. No downhole experiments are planned. Heavy use of the core imaging system, magnetometer, and MST systems can be expected.

### ***Environment and Safety***

There is a high risk of losing operating time due to severe weather and ice conditions. The optimum weather window for drilling these sites is July through September. Given the scheduling constraints

for FY04, scheduling this expedition in the September to November time frame is unavoidable and increases the risk of operational downtime (to about 10%) as a result of weather. To minimize risks to the safety of personnel and equipment, we will arrange for daily site-specific forecasts from a weather service experienced in North Atlantic conditions. Three additional operating days have been added to this program to accommodate operating time lost because of weather. The risk of encountering poor hole conditions is low.

### ***Logistics***

Operations will require an estimated 47 days (2 days in port, 14 in transit, and 31 on site [2 days in port, 7 in transit, and 8 on site in FY04]).

### **Expedition 3: Core Complex 1**

This FY05 program is aimed at documenting the conditions under which oceanic core complexes (OCCs) develop. These large shallow seafloor features appear to be related to rifting and accretion at slow-spreading mid-ocean ridges. However, currently available data are inadequate to characterize the magmatic/tectonic/metamorphic history so that we can better understand the mechanisms of uplift and emplacement of OCCs. Two sites will be drilled: a deep site on the Atlantis Massif to sample the detachment fault zone and the alteration front, and to drill into unaltered mantle rocks, and a shallower site to drill through the hanging wall to sample rock just above the detachment, the shallowest part of the exposed fault, and through a portion of the fault zone.

### ***Proposed Operations***

Both sites will require casing into basement in order to maximize the chances of achieving deep penetration. The first casing string would be set in basement using the HRRS Hammer Drill-in Casing system. Each site would then be RCB cored to about 130 m then opened using the bi-centered bit and underreamer, which would allow a second casing string to be set. Each hole would then be RCB cored to maximum depth and logged. This is a two-expedition program. During the first expedition, both sites will be drilled to casing depth and casing will be set. The remaining time will then be devoted to drilling and coring the first (deep) hole to the maximum depth possible. The second expedition of this program will be devoted to further deepening both holes.

### ***Experiments***

An offset VSP is planned at both sites. This experiment will require seismic sources mounted on a second ship.

### ***Environment and Safety***

The principal risks to the program are the difficulty of starting a hole in bare rock and the possibility of encountering unstable hole conditions. The difficulty of starting a hole on bare rock will be mitigated through use of the HRRS Hammer Drill-in-Casing system. Experience has shown that in hard rock drilling the upper part of the hole is most prone to instability; hence, the upper 120 m of each hole will be cased off. Below that depth, we expect to encounter competent rock that will provide stable conditions and allow deep penetration, although it is possible that the shallower (hanging wall) site will exhibit unstable hole conditions throughout. Sufficient supplies and hardware will be carried to allow a third hole to be started in the event that one of the primary holes is lost through instability.

Weather conditions should not be a limiting factor, even though this expedition is scheduled for late fall 2004.

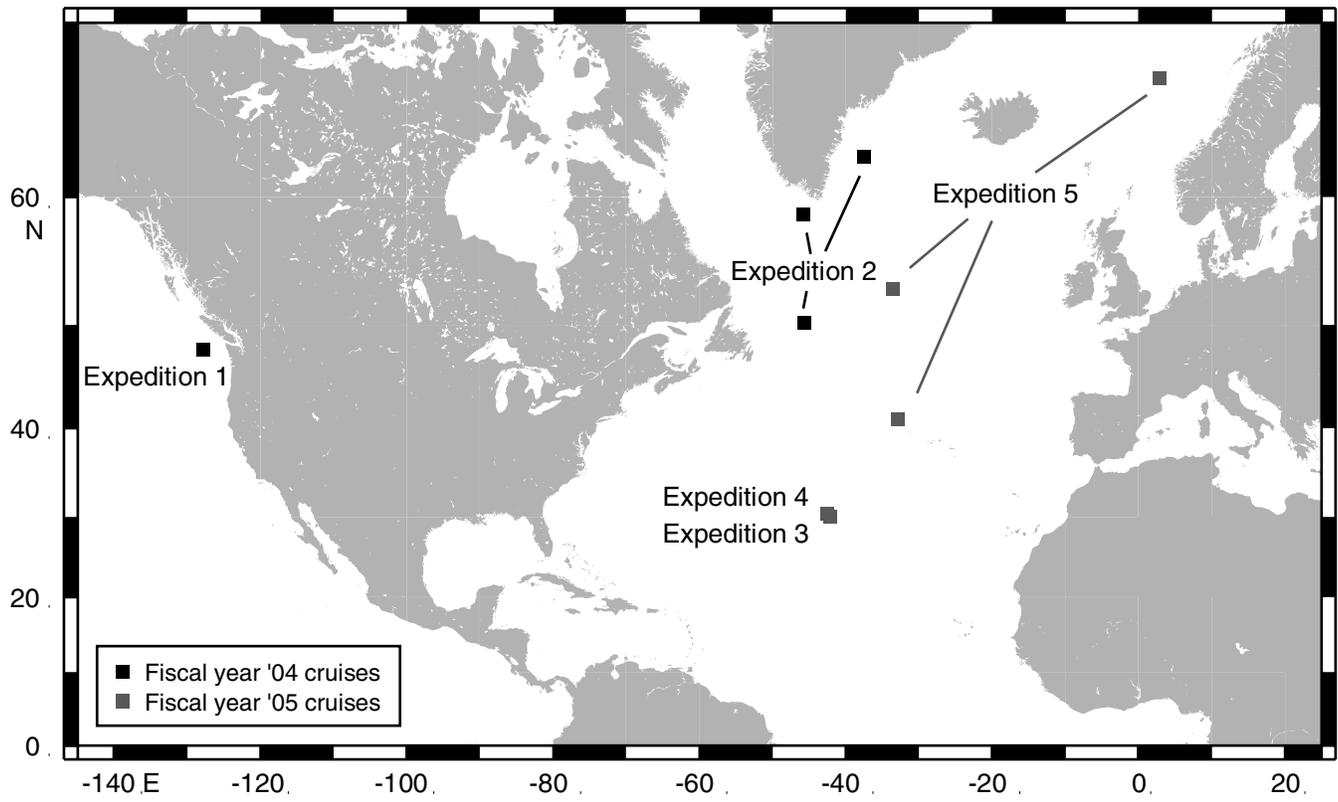
Procedures will be adopted to minimize risk to marine mammals from the proposed seismic experiments, including posting observers while experiments are in progress to record the presence

and proximity of marine mammals, gradually increasing the amplitude of the sound sources to allow animals time to move away, and suspending operations if animals approach within 800 yards.

***Logistics***

Operations will require an estimated 49 days (4 days in port, 8 in transit, and 37 on site).

Figure 1. IODP FY04–FY05 expedition site map.



# EXPEDITION OPERATIONS BUDGET

Exp. Cat.	Description	Expedition 1		Transit		Expedition 2		Expedition 3	
		POC	SOC	POC	SOC	POC	SOC	POC	SOC
2000	Payroll	\$627,142	\$925,517	\$145,424	\$214,613	\$154,513	\$228,026	\$0	\$0
3500	Travel	\$38,315	\$12,988	\$8,885	\$1,188	\$9,440	\$3,763	\$0	\$0
3580	Travel to/from Port	\$33,739	\$59,059	\$0	\$0	\$33,739	\$56,457	\$0	\$0
3600	Training	\$109,979	\$31,466	\$23,193	\$6,369	\$34,601	\$10,767	\$0	\$0
3760	Per Diem	\$87,536	\$0	\$20,298	\$0	\$21,567	\$0	\$0	\$0
4000	Supplies	\$777,086	\$76,015	\$0	\$235	\$88,227	\$40,250	\$261,181	\$20,000
4765	Software	\$0	\$7,500	\$0	\$0	\$0	\$7,500	\$0	\$0
4750	Fuel & Lubricants	\$689,594	\$0	\$159,906	\$0	\$169,900	\$0	\$0	\$0
5070	Insurance	\$121,995	\$0	\$28,289	\$0	\$30,057	\$0	\$0	\$0
5373	Ship-to-Shore Communications	\$48,133	\$0	\$11,103	\$0	\$12,047	\$0	\$0	\$0
5370	Telecommunications	\$0	\$15,472	\$0	\$3,588	\$0	\$3,812	\$0	\$0
5550	Professional Services	\$16,088	\$51,582	\$1,412	\$4,784	\$11,500	\$36,033	\$0	\$0
5987	Recruiting	\$4,059	\$6,088	\$941	\$1,412	\$1,000	\$1,500	\$0	\$0
5261	Shipping	\$38,700	\$25,800	\$0	\$0	\$16,200	\$10,800	\$0	\$0
8400	Equipment	\$125,875	\$0	\$0	\$0	\$125,875	\$0	\$25,000	\$0
6820	Maintenance & Repair	\$250	\$59,750	\$0	\$0	\$250	\$59,750	\$20,000	\$0
7040	Day Rates	\$4,514,021	\$0	\$1,046,729	\$0	\$1,112,150	\$0	\$0	\$0
7090	Port Calls	\$139,734	\$0	\$0	\$0	\$139,734	\$0	\$0	\$0
8510	Library	\$0	\$250	\$0	\$0	\$0	\$250	\$0	\$0
	<b>Total</b>	\$7,372,246	\$1,271,487	\$1,446,180	\$232,189	\$1,960,800	\$458,658	\$306,181	\$20,000
	<b>Total cost per expedition</b>	\$8,643,733		\$1,678,369		\$2,419,458		\$326,181	
	<b>Total cost</b>	<b>\$13,067,741</b>							

The expedition/transit cost reflects the costs necessary to complete the specific shipboard scientific tasks. Excluded from these costs are the costs for the majority of postcruise activities, such as database and repository management, and publications. Each expedition/transit cost is derived from the departmental information provided elsewhere in the program plan. The information contained in this appendix is provided as information and is to be used as a management tool only. The data should not be construed as auditable for the purpose of establishing or recording costs incurred or paid out for expenses associated with IODP.

The expedition/transit costs commence with the Astoria port call and continue through the remainder of FY04. This results in a total of 102 operating days consisting of 69 days for Expedition 1, 16 transit days, and 17 days for Expedition 2. Because Expedition 2 crosses the FY04 and FY05 program plan years, costs for this cruise reflect only a small portion of the total cruise cost. Expedition 3 costs include long-lead time items such as casing hangers and CORK-IIs, as well as laboratory items.

**Payroll**—Cost estimates are based on a determination of an estimated percentage of effort for each shipboard and shore-based position in the organization. This percentage was estimated based on the level of effort the position contributes to delivery of the shipboard scientific tasks, such as, precruise planning, cruise implementation, and postcruise review. The actual contribution ranges from 0 percent to 100 percent. For example, Marine Laboratory Specialists on an Alternate Sea Pay Policy schedule, spend 100 percent of their effort completing shipboard tasks. In comparison, the non-ASPP Marine Laboratory Specialists are estimated to spend 65 percent of their effort completing shipboard tasks during FY04. The overall payroll cost was prorated using this estimated percent of effort and the total number of operating days for each expedition/transit.

**Travel**—Funds include travel to Pollution Prevention and Safety Panel and TAMU Pollution Prevention and Safety Panel meetings and to expedition planning meetings.

**Travel to/from Port**—Travel is budgeted for the normal seagoing personnel for each expedition/transit. This typically includes the Staff Scientist, Operations Superintendent, Laboratory Officer, and the Marine Laboratory Specialists. These costs are considered as POC. Funds are also included for the Director, Deputy Directors, Managers, and Marine Logistics Coordinator to participate in the port calls as necessary. These costs are considered as SOC.

**Training**—Funds are included for safety training (see narratives in the Technical Support and Analytical Services sections) and training necessary to maintain necessary certificates (see narrative in the Materials Support section).

**Per Diem**—Funds are required for shipboard catering and cleaning (see narrative in the Ship Operations – Subcontractor section).

**Supplies**—Funds include supplies for the shipboard laboratories (see narrative in the Technical Support section), drilling and coring hardware (see narrative in Operations Support), and shipping material for transportation of items to and from the ship (see narrative in the Materials Support section). In addition, funds are included for three borehole instrument hangers (Expedition 1), and long-lead time procurement of three hard rock reentry systems and hammer rental for Expedition 3.

**Software**—Funds are included for upgrades to existing software (see narratives in the Science Operations – Office, Technical Support, and Materials Support sections).

**Library**—Funds are budgeted for minimal maintenance of the shipboard library (see narrative in the Science Operations – Office section).

**Fuel & Lubrication**—Costs are included for two refuelings (see narrative in the Ship Operations – Subcontractor section).

**Insurance**—The amount budgeted is based on the annual insurance premiums for necessary coverages (see narrative in the Ship Operations – IODP General Support section).

**Ship-to-Shore Communications**—This budget includes lease costs for 24/7 VSAT coverage for the vessel (see narrative in the Ship Operations – IODP General Support) and for costs in headquarters for off-site communication with the vessel to resolve operational issues.

**Telecommunications**—Funds cover a portion of communication costs (see narratives in the Science Operations – Office and Tools and Analytical Services – Office sections).

**Professional Service**—Funds cover the estimated cost associated with annual physical examinations for seagoing personnel (see narratives in the Technical Support and Tools and Analytical Services – Office sections). Funds include weather services during Expedition 2 (see narrative in the Operations Support section), the costs for transferring items to and from the vessel (see narrative in the Materials Support section), and microscope cleaning (see narrative in the Analytical Services section).

**Recruiting**—Funds are budgeted to fill a minimum of five Marine Laboratory Specialist positions (see narrative in the Technical Support section).

**Shipping**—Funds are included for shipping all equipment to and from the ship, as well as for the transfer of cores and samples from the ship to repositories or research laboratories (see narrative in the Materials Support section).

**Equipment**—Funds include equipment cost for completion of Engineering Services and Analytical Services projects (see narratives in the Engineering Services and Analytical Services sections). Funds also cover replacement of shipboard computers following a 4-year equipment replacement cycle (see narrative in the Information Technology Support section).

**Maintenance & Repair**—Funds cover maintenance of coring tools, drilling equipment, and science instruments (see narratives in the Operations Support, Analytical Services, and Engineering Services sections).

**Day Rate**—Funds include cost of vessel operating time (see narrative in the Ship Operations – Subcontractor section).

**Port Calls**—Funds cover the cost associated with port calls (see narrative in the Ship Operations – Subcontractor section).

## APPENDIX II: RECOMMENDED IODP PROGRAM OF INSURANCE

TAMRF will provide full-service insurance services to IODP. This will include insurance policy monitoring, ongoing risk assessments, marine insurance negotiations, and claims settlement. As a result of our 19 years of experience providing similar services, we offer IODP experience and knowledge in understanding the risks associated with a unique deep ocean–coring program. Furthermore, ODP was able to obtain the most cost-effective premiums, considering market conditions, due to TAMRF’s established relationships with the London insurance market and a history of safety unmatched by any other international deep ocean scientific coring program. Market relationships were fostered to educate insurers (i.e., brokers and underwriters) on the specific risks involved with deep ocean coring and how these risks differ from, and are considerably lower than, those of energy-related drilling operations. As a result of our proactive approach over the last 19 years, premiums were reduced by hundreds of thousands of dollars.

TAMRF recommends the program of insurance depicted in the chart below for drilling-peculiar risks and marine employer’s liability. The program of insurance reflects changes/upgrades appropriate for IODP and our understanding of the risks and requirements gained from years of experience. The first option (i.e., the initial \$200 million umbrella and associated coverage) assumes NSF indemnification under 10 U.S.C. 2354 is available to NSF pursuant to Public Law 98-371. Associated coverage includes \$25 million Control of Well, \$1 million Seepage & Pollution Liability, \$2 million in Third-Party Property, \$2 million Cargo, \$1 million Charterer’s Legal Liability, \$10 million Contractor’s Pollution Liability – Gradual, \$60 million Hull and Machinery, and \$50 million Removal of Wreck. Workers’ Compensation & Maritime Employer’s Liability and Comprehensive General & Automobile Liability coverage limits are set at required limits. The umbrella policy provides additional coverage for Workers’ Compensation & Maritime Employer’s Liability, Comprehensive General & Automobile Liability, and Charterer’s Legal Liability.

The rationale for each of the coverage limits follows:

- \$25 million Control of Well coverage is being proposed as historically; Control of Well claims are large, and it is prudent to obtain a high level of coverage when loss is unlikely but could be substantial if a loss occurs.
- \$1 million Seepage and Pollution coverage, which is part of the Control of Well coverage, has proven to be an adequate level of coverage. The \$1 million coverage limit serves as the deductible for the Contractor’s Pollution Liability – Gradual.
- Contractor’s Pollution Liability – Gradual is proposed at \$10 million compared to the \$50 million coverage limit in ODP, as current market forces make obtaining \$50 million in coverage cost prohibitive.
- Third-Party Property and Cargo Coverage have previously been in the amount of \$5 million, which has been excessive, and assessment of risks associated with these coverages indicates that \$2 million is a more appropriate level of coverage, resulting in a one-third reduction in premiums.
- Charterer’s Legal Liability is being proposed in the amount of \$1 million compared to \$500,000 in ODP, as this is the prudent course of action considering that there is only a slight premium increase for double the coverage; umbrella coverage is being proposed in the amount of \$200 million, which proved to be an appropriate coverage level throughout ODP.

Option Two, the initial coverage plus an additional \$25 million Control of Well, \$200 million umbrella, and \$50 million Contractor’s Pollution Liability – Gradual, is proposed if the indemnification is not available. The Option Two proposal is based on a review of risks and recent insurance payouts associated with energy drilling and exploration activities. There are no equivalent nonenergy drilling payout statistics.

In addition to the proposed program of insurance, TAMRF will assess specialty risks (i.e., drilling in depths under 1000 ft, drilling above or below the 40° Parallel, and use of specialty tools including mud motors, underreamers, etc.) and procure insurance if the associated risks and cost for the coverage are determined to be the appropriate action in regard to the amount of potential loss the program could incur if insurance is not secured. No specialty risks have been identified for proposed Phase 1 drilling operations.

TAMRF recommends Option One, with government indemnification, as the risks associated with IODP operations are considered moderate. This course of action will allow IODP to spend less on insurance and more on accomplishing its science mission. This coverage can be reimbursable or part of the day rate, whichever is most advantageous to the government.

<b>Program of Insurance with Government Indemnification</b>	<b>Coverage Limits</b>	<b>Deductible</b>	<b>Estimated Premiums</b>
Control of Well	\$25,000,000	\$50,000	\$72,000
Seepage & Pollution Liability <sup>1</sup>	\$1,000,000	\$50,000	
Third-Party Property	\$2,000,000	\$25,000	\$14,000
Cargo	\$2,000,000	\$25,000	\$17,500
Charterer’s Legal Liability	\$1,000,000	\$10,000	\$16,000
Umbrella	\$200,000,000	Per underlying limits	\$347,000
Contractor’s Pollution Liability – Gradual <sup>2</sup>	\$10,000,000	\$1,000,000	\$55,000
Workers’ Compensation & Maritime Employer’s Liability <sup>3</sup>	\$1,000,000	None	\$86,000
Comprehensive General & Automobile Liability <sup>4</sup>	\$1,000,000	None	\$29,000
Subtotal			<u>\$636,500</u>
<b>Additional Insurance Recommended without Government Indemnification</b>			
Control of Well	\$25,000,000		\$60,000
Umbrella	\$100,000,000	Per underlying limits	\$230,000
Contractor’s Pollution Liability – Gradual	\$50,000,000		\$69,000
Subtotal			<u>\$359,000</u>
Total			<u>\$995,500</u>

<sup>1</sup> Seepage & Pollution coverage and premium included in Control of Well Policy.

<sup>2</sup> Deductible is coverage limit for Seepage & Pollution Liability.

<sup>3</sup> Workers’ Compensation & Maritime Employer’s Liability premium rate is \$3.80 per \$100 of payroll.

<sup>4</sup> Comprehensive General & Automobile Liability premium rate is \$1.28 per \$100 of payroll.