INTEGRATED OCEAN DRILLING PROGRAM

United States Implementing Organization
JOI Alliance

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

PROGRAM PLAN

FY05 to NSF

For Time Period
1 October 2004 through 30 September 2005

AMOUNT PROPOSED FY05: $34,793,893 (SOC + POC + SIC)

Respectfully Submitted to:
U.S. National Science Foundation

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USIO FY05 PROGRAM PLAN FOR IODP

This USIO FY05 Program Plan initiates the U.S. Implementing Organization (USIO) scope of work for Integrated Ocean Drilling Program (IODP) 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. [IODP-MI]), working together with the other implementing organizations and with input from IODP funding agencies (U.S. National Science Foundation [NSF], Japanese Ministry of Education, Culture, Sports, Science and Technology [MEXT], European Consortium for Ocean Drilling Research [ECORD] Management Agency [EMA], and Ministry of Science and Technology [MOST], People's Republic of China), have provided guidance and instruction to the IODP-USIO on the preparation of the USIO contribution to the IODP FY05 Program Plan. The USIO FY05 Program Plan includes a discussion of the goals of the IODP-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.

In FY04, Joint Oceanographic Institutions, Inc. (JOI), established subcontracts 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) that formally established the JOI Alliance for IODP. Under guidance from NSF and IODP-MI, a USIO FY05 Program Plan has been developed in consultation with the JOI Alliance subcontractors for inclusion in the IODP FY05 Program Plan.

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 RV *JOIDES Resolution* as currently configured for use as the riserless drilling vessel for IODP-USIO Phase 1 operations. In support of the drilling vessel and with the approval of IODP-MI, the JOI Alliance 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-USIO 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 FY05 the JOI Alliance will continue to provide integrated management using six cross-functional 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 continue to evolve during FY05 as part of the operational activities for the IODP-USIO. Two overarching teams are responsible for strategic planning, oversight of JOI Alliance mission delivery, prioritization of resources, and program plan development. The first of these teams is the JOI Alliance Systems Integration Team (JASIT), which is responsible for strategic planning and systems integration. The other overarching team is the JOI Alliance Systems

Management Team (JASMT), which is responsible for program management, resource allocation, and overall science services delivery. Four tactical teams are tasked with the planning and implementation of the JOI Alliance'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 is the prime contractor with ultimate responsibility for all contractual obligations entered into by the IODP-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 assessment (EA) for riserless drilling operations in FY05-06 and a draft environmental impact statement (EIS) for subsequent operational years.
- Lead the JOI Alliance in the long-term planning and strategy development for the IODP-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-MI (the IODP central management office), Japan Marine Science and Technology Center (JAMSTEC), EMA, and other IODP partners.
- Coordinate planning for initial drilling operations with Japanese and European implementing organizations, ensuring all operations are consistent with governmental agreements.
- Establish various performance assessment systems that will ensure quality control of key functions of the IODP-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.
- Retain primary responsibility for coordinating required publications and reports for the IODP-USIO.
- Coordinate and provide support for IODP-USIO outreach and education activities.

JOI Alliance Subcontractors

TAMU, through TAMRF, and LDEO serve as subcontractors to JOI and 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 JOI Alliance, IODP-USIO Science Services, TAMU, 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).
- Implementation of sound procedures in drilling and laboratory operations that minimize environmental impact.
- Materials and logistical support of cruise implementation.
- Support of 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.
- A Health, Safety, and Environment program for the drilling vessel and shore-based facilities.
- Identification of potential risks and provide recommendations for mitigating security risks of international travel, work in port environments, and at sea.

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 JOI Alliance, IODP-USIO Science Services, LDEO, 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.

IODP-USIO FY05 ACTIVITIES

IODP-USIO Phase 1 Activities

The scope of activities associated with preparation and execution of typical IODP expeditions will follow previous ODP experience. Numerous activities concerning IODP-USIO Phase 1 expeditions were initiated in FY04, including reviewing and assessing potential science programs, long–lead time procurement, weather, clearance, and staffing requirements; procuring, inspecting, and servicing laboratory equipment and tools; restoring inventories; investigating equipment enhancements; preparing documentation; scientific staffing for cruises; and hiring and training of technical staff. Platform operator insurance was arranged as part of the vessel day rate; 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 JOI Alliance and will be addressed by the science services organization, in coordination with the U.S. State Department.

The JOI Alliance will also deliver the following required reports and publications, as outlined in the contract with NSF:

- JOI will maintain and update the IODP-USIO Policy Manual.
- The JOI Public Affairs Director, in collaboration with members of the science party, will produce news releases and science articles relating to each scheduled cruise on the riserless vessel.
- The JOI Alliance will produce and disseminate Daily Ship Status Reports, Weekly Reports, and Site Summary Reports.
- The JOI Alliance will produce and disseminate the FY05-06 USIO Environmental Assessment, USIO Program Plan, Quarterly Operations and Management Reports, and the USIO Annual Report.
- The JOI Alliance will manage production and dissemination of the following publications: Technical Notes and Technical Reports, Expedition Scientific Prospectuses, Preliminary Reports, and Initial Scientific Reports, with guidance from IODP-MI.

Phase 2 Drillship Selection Strategy

To continue the procurement process for a U.S. riserless vessel for IODP-USIO Phase 2, in late FY04 the JOI Alliance will release a request for proposals (RFP) for procurement of a Scientific Ocean Drilling Vessel (SODV). The release of the RFP is dependent on guidelines governing the NSF Major Research Equipment and Facility Construction (MREFC) process and the authorization of this activity by the NSF. Logging services will be competitively bid in a process that involves the release of an RFP at a time to be determined in consultation with IODP-MI and NSF. The RFPs will be prepared by JOI Alliance staff, will include the full participation of NSF and IODP-MI representatives, and will include input from other stakeholders.

IODP-USIO Budget Definitions

Platform Operating Costs vs. Science Operating Costs

The development of budgets for the IODP-USIO FY05 Program Plan required certain assumptions to guide the allocation of costs into "platform operating costs" (POCs) and "science operating costs" (SOCs). This process used to define POCs for the IODP-USIO was based on a directive from the lead agencies (NSF and MEXT) received on 16 January 2004. The lead agency directive provided POC and SOC definitions for use in the development of this program plan (see below). All IODP-USIO activities that are not defined by the fundamental principles are considered to be SOCs in this program plan. These principles are described below.

Annex 1 of the Memorandum between MEXT of Japan and NSF of the United States of America (i.e., IODP lead agencies) concerning Cooperation on the Integrated Ocean Drilling Program provides definitions of what are considered POCs and SOCs. Annex 1 definitions are consistent with the interpretation that safely making and completing a hole, with installation of subseafloor hardware, are POCs, as is the management and oversight of POC items. Annex 1 definitions also

imply that when developmental tools and drilling equipment become operational, funding for these items, in principle, changes from SOC to POC. The lead agencies encourage that principles of simplicity should be followed wherever possible in the preparation of the budget. For example, personnel costs for individual positions should normally be assigned simply and wholly as either a POC or SOC; where positions pertain to mixed POC and SOC responsibilities, the position cost should be split on a 50-50 basis.

Following IODP platform and program principles, it is an expectation that platform providers will provide a fully capable drilling platform to the IODP. Functional, standard scientific equipment should be provided; the costs of providing a scientifically instrumented drilling platform are considered part of the platform mobilization costs and should not be included in the IODP program costs (SOCs and POCs).

The IODP lead agencies encourage scientific participants to contribute additional funds to IODP activities, through links and funding obtained from other scientific programs and initiatives, including national IODP programs. Third-party tool development represents an outstanding example of such additional contributions. Following the precedent of ODP, the lead agencies have made a preliminary determination that downhole instrumentation with long-term follow-up costs, such as Cork instrumentation and borehole seismometers, represents third-party contributions and so are not SOC program costs. In contrast, the lead agencies consider that the Cork bodies and casing associated with the Cork and seismometer installation are part of the cost of making a hole, and so are POC costs. It is expected that these determinations will evolve with time and experience.

POC Specific Items—Numbers in parentheses relate to MEXT-NSF Cooperative Agreement Annex 1 definitions for POCs that are also relevant for cost classification:

1. Costs of the drilling and ship's crew
   Vessel Support: Medical evacuations (10)
2. Catering services
3. Fuel, vessel supplies, and other related consumables
4. Berthage and port call costs
5. Disposal of wastes
6. Crew travel:
   Personnel: Percentage of technical crew change (does not include SOC technician costs)
7. Inspections and insurance
   Vessel Support:
   Safety-related insurance, including: control of well seepage, seepage and pollution liability, third-party property liability, cargo liability, charter's legal liability, contractor's pollution liability, worker's compensations and maritime employer's liability, comprehensive general and automobile liability, below the keel, umbrella, and other required policies (10)
   Percentage of logging insurance policy (10)
8. Drilling equipment, supplies, and related consumables
   Hardware:
   Cork body and platform
   Casing and casing hangers
   Bits, beacons, and mud
   Backoff/severing equipment
   Explosives and cabinet

Drill equipment supplies and consumables
Camera systems survey and borehole (9)
Fishing tools
Reentry cone and related hardware
H_2S system (9)

9. Engineering or geophysical surveys, and data acquisition and laboratory analyses required for the safety of platform and drilling operations

Hardware:

Logging cable and drum (8)
Natural gamma logging tool (8)
Schlumberger Maxis control system (8)
Heave-compensated logging winch (8)
Cement bond log (8)
Logging while drilling/measurement while drilling/logging while coring when required for safety (1, 8, 10)
Logging cable head and telemetry cartridge (8)
Shooting tool and casing collar locator (8)
Laboratory instrumentation for safety analysis

Vessel Support:

Safety monitoring (1, 10)
Navigation equipment
Weather forecasting
Geophysical engineering surveys for final site selection and/or other safety requirements

Personnel:

Assistant Laboratory Officer (for safety) (1, 10)
Geochemistry Technicians (for hydrocarbon safety assessment) (1)
Backoff/Severing Engineer Officer (1)
Travel to SSP, PPSP (1, 10)

10. Administration and management costs of the platform operators

Vessel Support:

Communications (9)
Clearance costs
Support vessel (1)
Logging and other measurements while coring or drilling when required for safety (1, 8, 9)
Safety and environmental compliance costs (1, 5, 8)
Shipping of POC (4, 8)
Initial computer infrastructure (mobilization cost and 9)

Personnel:

Operations Superintendent (1, 9)
Percentage of Health Safety Environment Officer (1, 5, 9)
Percentage of logistical support (3, 4, 5, 8)
Percentage of Expedition Project Manager (Staff Scientist) (1)
Safety training (1)

SOC Specific Items—Numbers in parentheses relate to MEXT-NSF Cooperative Agreement Annex 1 definitions for SOCs that are also relevant for cost classification:

1. Technical Services
   Hardware:
   Maintenance and upgrades for scientific instrumentation (including instrumentation and personnel costs) (2, 6, 8)
   Personnel:
   Science technicians handling core
2. Computer capability
   Hardware:
   Computer infrastructure upgrade and maintenance (3)
3. Data storage and distribution
4. Description, archiving, and distribution of data and samples
   Vessel support:
   Shipping of core to repository and distribution of core samples from ship to investigators
5. Deployment of a standard suite of logging tools
6. Development of new drilling tools and techniques required by IODP research
   Hardware:
   Logging and other measurements while coring or drilling
   Engineering development
   Pressure core system development
7. Program publications
8. Costs of consumables (exclusive of those identified under platform operations costs)
   Hardware:
   Science supplies and consumables (such as D-tubes, gases, etc.)
9. Costs required for administration and management, including the central management office
   Vessel Support:
   Percentage of administrative costs, including management and oversight of SOC items
   Site Survey Data Bank (large majority of costs related to SOC) (3)
   Percentage of logistics costs for SOC support (1, 8).

In addition to the guidance provided by the lead agencies, IODP-MI provided guidance to the USIO, which included (1) applying a 50% SOC and 50% POC balance for Management and Administration costs across the budgets presented herein; (2) restricting the Education and Outreach budget for SOC to $100,000 for FY05; (3) providing funds to produce, print, and distribute the ESO ACEX expedition report; and (4) eliminating costs for the Bremen repository from the USIO budget.

Following the guidance provided by the IODP lead agencies, the JOI Alliance budget request of $34,743,893 can be partitioned into two programmatic categories: (1) IODP-USIO Phase 1 science operations, which are detailed as SOCs in a budget that is submitted to IODP-MI for approval, and (2) IODP-USIO Phase 1 platform operations, which are detailed as POCs in this budget, plus (3) a SIC request of $82,500, which is submitted to NSF for approval. The SIC budget submitted to NSF is for non-program costs related to the provision of a U.S. platform for the IODP. Preparation of the JOI Alliance (IODP-USIO) Program Plan is based on the operational schedule defined by the IODP Science Planning Committee (SPC) for U.S. riserless vessel operations during FY05, which includes the costs associated with the support of four scientific expeditions.

The cost breakdown for FY05 is a request to IODP-MI for $12,831,738 in SOC expenses (submitted in the program plan to IODP-MI) and a request to NSF for $21,879,655 in POC expenses for IODP-USIO Phase 1 operations and $82,500 for additional SIC expenses ($32,500 = JOI; $50,000 = TAMU).

FY05 IODP-USIO TASK-ELEMENT SUMMARY BUDGET

Description	JOI	TAMU	LDEO	USIO
Task Element— USIO Phase 1 SOC FY05				
Management and Administration	$590,033	$1,113,321	$267,456	$1,970,810
Technical, Engineering and Science Support	$0	$3,750,032	$1,532,513	$5,282,545
Core Curation	$0	$835,592	$0	$835,592
Data Management	$0	$1,817,598	$543,046	$2,360,644
Publications	$0	$953,521	$0	$953,521
Logging	$0	$0	$1,328,626	$1,328,626
Education and Outreach	$100,000	$0	$0	$100,000
Subtotals	**$690,033**	**$8,470,064**	**$3,671,641**	**$12,831,738**
Task Element—USIO Phase 1 POC FY05				
Management and Administration	$590,035	$1,121,983	$267,456	$1,979,474
Technical, Engineering and Science Support	$0	$18,403,969	$2,980	$18,421,693
Core Curation	$0	$0	$0	$0
Data Management	$0	$316,622	$41,859	$358,481
Publications	$0	$0	$0	$0
Logging	$0	$0	$1,034,751	$1,020,007
Education and Outreach	$100,000	$0	$0	$100,000
Subtotals	**$690,035**	**$19,842,574**	**$1,347,046**	**$21,879,655**
Task Element—USIO Total FY05 Budget (SOC and POC requests)				
Management and Administration	$1,180,068	$2,235,304	$534,912	$3,950,284
Technical, Engineering and Science Support	$0	$22,154,001	$1,535,493	$23,704,238
Core Curation	$0	$835,592	$0	$835,592
Data Management	$0	$2,134,220	$584,905	$2,719,125
Publications	$0	$953,521	$0	$953,521
Logging	$0	$0	$2,363,377	$2,348,633
Education and Outreach	$200,000	$0	$0	$200,000
Totals (SOC + POC)	**$1,380,068**	**$28,312,638**	**$5,018,687**	**$34,711,393**

EXPEDITION OPERATIONS

Introduction

The FY05 Program consists of the completion of one science program initiated at the end of FY04, and three additional complete science programs (see Fig. 1 for site locations and Budget Section below for expedition costs). A total of 243 operating days are proposed in FY05, consisting of 22 days in transit, 40 port call days, and 118 days focused on science delivery (on site and between-site transit). The schedule is summarized below:

22 September–14 November 2004	Expedition 303: North Atlantic Climate 1
14 November 2004–5 January 2005	Expedition 304: Core Complex 1
5 January–27 February 2005	Expedition 305: Core Complex 2
27 February–22 April 2005	Expedition 306: North Atlantic Climate 2

Operations

IODP Expeditions 303 and 306: North Atlantic Climate 1 and 2

The objective of these two expeditions is to establish for the Late Neogene to Quaternary the intercalibration of geomagnetic paleointensity, isotope stratigraphy, and regional environmental stratigraphies to develop a millennial-scale stratigraphic template for the North Atlantic. Other objectives are (1) to better understand the relative phasing of atmospheric, cryospheric, and oceanic changes that are central to understanding the mechanisms of global climate change on orbital or millennial timescales, (2) to 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) to provide fundamental constraints for numerical models of the geodynamo. These goals will be accomplished by advanced piston corer (APC) coring nine primary sites with the objective of acquiring complete sedimentary sections appropriate for high-resolution studies. This is a two-expedition program with five sites to be occupied during IODP Expedition 303 and the remaining four sites cored during IODP Expedition 306. In addition, at the last Expedition 306 site we will investigate the feasibility of reconstructing bottom-water temperature histories at the decadal to centennial timescale by making high-precision temperature-depth measurements at a location in the Norwegian-Greenland Sea with the proposed installation of a Cork and instrument string near ODP Site 642.

Proposed Operations

With the exception of the aforementioned final site of Expedition 306, from an operational standpoint these will be routine sediment coring expeditions. Each site will consist of multiple APC-cored holes to assure recovery of the complete sediment section. APC coring, employing the drillover technique, will extend to ~300 m below seafloor (mbsf). One site will be logged with the triple combination (triple combo) and Formation MicroScanner (FMS)/Sonic tool strings. For the Norwegian-Greenland Sea site, the proposed operation is to jet in a reentry cone and deploy a thermistor string and Cork.

Experiments

The emphasis of these two expeditions will be on sediment core recovery and analysis. No downhole experiments are planned. Heavy use of the core imaging system, a magnetometer, and multisensor

track systems can be expected. No downhole experiments are anticipated for the Norwegian-Greenland Sea Cork site.

Environment and Safety

There is a high risk of losing operating time because of severe weather and ice conditions. The optimum weather window for drilling these sites is July through September. Scheduling these expeditions in the September–November and February–April time frame increases the risk of operational downtime (to about 10%) attributable to weather. To minimize risks to the safety of equipment and personnel, we will arrange for daily site-specific forecasts from a weather service experienced in North Atlantic conditions and a dedicated local weather observer will sail. Three additional operating days have been added to Expedition 303 to accommodate operating time lost because of weather. There is a low risk of encountering poor hole conditions.

Logistics

Operations for Expedition 303 will require an estimated 53 days (5 in port, 5 in transit, and 43 on site). Note that this expedition straddles the FY04/FY05 program years. Operations for Expedition 306 require an estimated 54 days (5 in port, 4 in transit, and 45 on site).

Logging

During Expedition 303, 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 will be deployed. The scientific objectives that could be addressed using logging data are the following:

- Composite depth scales: Even with 100% recovery, core expansion can affect estimates of depth by as much as 15%. Variable decompression and/or <100% recovery in different holes at the same site may have an effect on production of composite depth scales. Logging data provide the closest estimate of true depth and thus provide an excellent reference stratigraphy for producing accurate core correlations and compositing.
- Recognition of ice-rafted debris (IRD) layers: The FMS tool provides high-resolution resistivity images of the interior of the borehole and should be able to accurately determine the position of IRD layers. This has implications for both documenting ice-house history and constructing regional correlations of particular IRD intervals.
- Recognition of ash, clay, and organic layers: The Multi-Sensor Spectral Gamma Ray Tool (MGT) provides spectral gamma ray analysis that can be used to determine ash, clay, and organic layers.
- Cyclostratigraphy: The proposed sites are characterized by relatively high sedimentation rates. Given the high sedimentation rates, it should be possible to recognize precessional, obliquity, and eccentricity cycles within the standard downhole data. FMS data will be able to document millennial-scale changes in lithology.

Additionally, because of the expected high core recovery, these sites present an excellent opportunity to "cross check" composite depth scales as determined by splicing core records and a composite depth scale produced from correlating core to logging data. This would be best done using the MGT and high-resolution core gamma ray data but could also be done through a comparison of gamma ray attenuation (GRA) density with downhole density measurements. The prime target for logging will be the Orphan Knoll site.

This is the first deep drilling investigation of the sediments on the flanks of Orphan Knoll, and the collection of downhole logging data will be instrumental in fully characterizing the site. Logging at Orphan Knoll will allow the assessment of potential problems with core expansion and contraction. If significant differences are determined between composite-core depths and core-log depths, then this may have implications for the rest of the expedition. The sedimentation rates at Orphan Knoll are expected to be high, making it possible to recognize cyclicity with the logging data. This site is close to Site 111 (not previously logged) but closer to cores HU90-045-094 (P-094) and MD95-2024. Currently, there are no logs in the vicinity of Orphan Knoll. Total logging time for a hole at Orphan Knoll is estimated at approximately 18 hr.

Data generated by downhole logging will be critical for hole-to-hole correlation, core-log integration, hole-to-seismic correlation, and correlation of results from Expeditions 303 and 306. Successful core-log integration will be necessary to determine the completeness of the recovered cores and thus the accuracy of the stratigraphic framework.

Logging operations at any of the sites to be cored during Expedition 306 will take approximately 30 hr (20 for standard logging and 10 for Well Seismic Tool (WST) checkshots). If core recovery/core quality is poor at any of the other sites, the further use of downhole logging should be considered in order to accomplish the scientific objectives of the expedition.

The second part of Expedition 306 will consist of the installation of a Cork near ODP Hole 642E, located on the Voring Plateau. This Cork installation will be used to document and reconstruct bottom-water temperature (BWT) variations through time on the decadal to centennial scale by measuring thermal anomalies in the sediment pile. The area near Hole 642E, originally drilled during ODP Leg 104, is ideal for this study because it is in a climatically sensitive region with an established 50-yr time series of bottom-water temperature measurements in ~278 m of Neogene and Quaternary pelagic and hemipelagic sediments overlying a series of basalts and interbedded Eocene sediments. The full suite of standard logging tools will be available for use as needed during this second part of the expedition. Logging data may be useful in determining the initial thermal regime of the hole, as well as providing information on hole condition and characterizing the formation surrounding the Cork.

IODP Expeditions 304 and 305: Core Complex 1 and 2

This two-expedition 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:

- Deep penetration site (est. >700 m) on the Central Dome of Atlantis Massif (Site AMFW-01A) to sample the detachment fault zone and the alteration front and drill into unaltered mantle (core and logging analyses planned).
- Shallower penetration site (est. 400–500 m) through the hanging wall (Site AMHW-01A) to sample rock just above the detachment, the shallowest part of the unexposed fault, and through the fault zone (core and logging analyses planned).

Proposed Operations

Both sites will require casing to maximize the chances of achieving deep penetration. The first casing string (13-$^{3}/_{8}$ in) will be set to ~20 mbsf using the Hard Rock Reentry System (HRRS) Hammer Drill-in Casing system. Each site will then be rotary core barrel (RCB) cored to ~130 mbsf

and opened using a bicentered bit or underreamer, allowing a second (10-3/4 in) casing string to be set. Each hole will then be RCB cored to maximum depth and logged. During IODP Expedition 304, both sites will be established with the HRRS Hammer Drill reentry cone/casing system and drilled to casing depth. The supplemental 10¾-in casing strings will be set (as required). Remaining time will be devoted to drilling and coring the hanging wall hole to the maximum depth possible in the available time. IODP Expedition 305 will be devoted to deepening the hole at the footwall site to the maximum depth possible. Plans call for a limited trial (~50 m) of the advanced diamond core barrel (ADCB) coring system during Expedition 304 to further evaluate the potential of this system to achieve improved hard rock core recovery and quality over the conventional RCB system. Three days have been added to the Expedition 304 schedule for the ADCB evaluation. If successful, the ADCB may be used further during Expedition 305.

Experiments

A borehole vertical seismic profile (VSP) experiment has been proposed at the footwall site. All other operations during these two expeditions will focus on maximizing recovery and increasing depth of penetration.

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, we will be prepared to case the upper 120 m of each hole. 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 the section. 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 for Expedition 304 require an estimated 52 days (5 in port, 7 in transit, and 40 on site). For Expedition 305, operations require an estimated 53 days (5 in port, 7 in transit, and 41 on site).

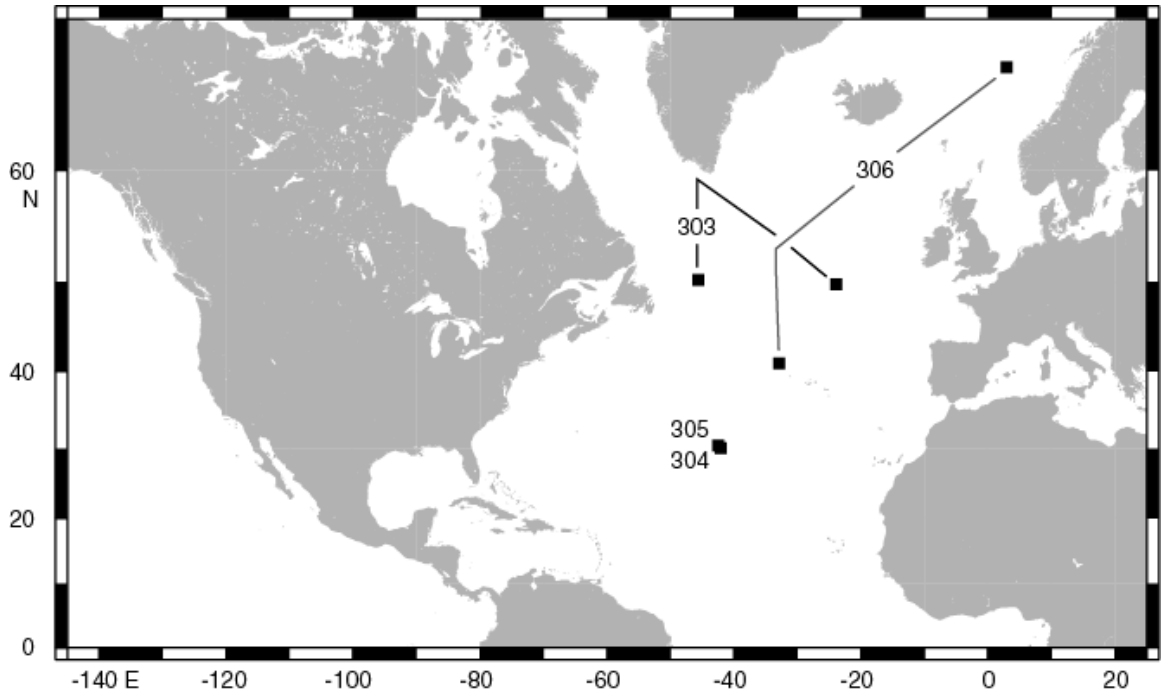
Logging Operations

Downhole logging will provide in situ information on the geophysical structure of the drilled formation. Whereas core recovery is often biased and incomplete in basement, downhole logging data are continuous and therefore provide information over intervals of low recovery. The downhole logging program is designed for logging the hanging wall and footwall holes using the triple combo tool string, FMS/sonic tool string, and WST. The Ultrasonic Borehole Imager (UBI) will also be available for Expedition 305 operations. In addition, the deployment of a third-party magnetometer (i.e., Bundesanstalt für Geowissenschaften und Rohstoffe [BGR]—German Geological Survey) is under investigation.

- The triple combo tool string consists of several probes used to determine contents of K, U, and Th, obtain formation density, and measure photoelectric effect, electrical resistivity, neutron porosity values, and temperature. These measurements will be utilized for the characterization of stratigraphic sequences, the variations in serpentinization, and the identification of oxide mineral–rich intervals. In the hanging wall hole, these measurements will be used to document detachment fault and to characterize the basalts.
- The FMS will provide high-resolution borehole images of stratigraphic sequences and boundaries, oriented fracture patterns, fracture apertures, and fracture densities. FMS images can be used to visually compare logs with core to ascertain the orientations of bedding and fracture patterns. The Dipole Shear Sonic Imager (DSI) will produce a full set of waveforms (*P*-, *S*-, and Stoneley waves); the shear-wave velocity and amplitude measured at different azimuths in the borehole may indicate preferred mineral and/or fracture orientations as well as impedance contrasts.
- The UBI measures the amplitude and transit time of an acoustic wave propagated into the formation. It provides high-resolution images with 100% borehole wall coverage, which allows detection of small-scale fractures. The amplitude depends on the reflection coefficient of the borehole fluid/rock interface, the position of the UBI tool in the borehole, the shape of the borehole, and the roughness of the borehole wall. Changes in the borehole wall roughness (e.g., at fractures intersecting the borehole) are responsible for the modulation of the reflected signal; therefore, fractures or lithologic variations can easily be recognized in the amplitude image. The General Purpose Inclinometer Tool (GPIT) is deployed with the UBI and allows orientation of the images; evaluation and orientation of fractures can provide information about the local stress field and borehole geometry.
- The Seismic Tool (WST-3) records acoustic waves generated by an air gun located near the sea surface. It provides a complete checkshot survey, a depth-traveltime plot, and synthetic seismograms that will be essential for determining insitu velocity profiles.

Site	Water Depth (mbsl)	Sediment Thickness (m)	Basement Thickness (m)	Logging Operations
AMFW-01A	1630	1	>700	Triple Combo, FMS/sonic, UBI, WST–3
AMHW-01A	2550	1–2	400–500	Triple Combo, FMS/sonic

Figure 1. IODP-USIO FY05 expedition map.



IODP-USIO EXPEDITION SUMMARY BUDGET

Description of Costs	Expedition 303		Expedition 304		Expedition 305		Expedition 306	
	SOC	POC	SOC	POC	SOC	POC	SOC	POC
Science Services, TAMU:								
Payroll	$439,017	$223,702	$518,836	$264,373	$528,816	$269,458	$548,768	$279,626
Travel	$0	$15,899	$0	$18,789	$0	$19,150	$0	$19,874
Travel To/From Port	$0	$0	$48,487	$21,809	$42,632	$17,144	$64,505	$29,863
Training	$12,995	$12,070	$14,544	$13,868	$14,738	$14,092	$15,124	$14,543
Supplies	$299	$3,300	$354	$3,354	$23,610	$303,396	$51,524	$279,553
Software	$10,000	$0	$10,000	$0	$10,000	$0	$10,000	$0
Library	$83	$84	$83	$84	$83	$84	$83	$84
Insurance	$0	$63,807	$0	$90,394	$0	$99,256	$0	$101,029
Shipping	$20,000	$30,000	$31,200	$46,800	$36,000	$54,000	$75,000	$45,900
Professional Services	$27,867	$10,441	$28,161	$11,579	$28,199	$11,721	$28,273	$12,009
Recruiting	$1,294	$863	$1,529	$1,020	$1,559	$1,039	$1,618	$1,078
Maintenance and	$27,731	$23,630	$27,731	$43,630	$27,731	$23,630	$27,732	$23,630
Equipment	$24,625	$9,375	$24,625	$9,375	$24,625	$9,375	$24,625	$9,375
Per Diem	$0	$63,600	$0	$75,163	$0	$76,609	$0	$79,500
Fuels & Lubricants	$0	$252,439	$0	$298,337	$0	$304,074	$0	$315,550
Day Rate	$0	$2,919,812	$0	$3,450,687	$0	$3,517,046	$0	$3,649,765
Port Call	$0	$0	$0	$148,596	$0	$148,596	$0	$216,287
Ship-to-Shore Communications	$31	$23,325	$31	$32,968	$31	$36,182	$32	$36,827
Subtotal (TAMU)	**$563,942**	**$3,652,347**	**$705,581**	**$4,530,826**	**$738,024**	**$4,904,852**	**$847,284**	**$5,114,493**
Science Services, LDEO:								
Payroll	$10,123	$0	$10,050	$0	$11,396	$0	$11,488	$0
Equipment	$4,259	$0	$4,179	$0	$4,259	$0	$4,339	$0
Supplies	$6,450	$0	$6,328	$0	$6,450	$0	$6,571	$0
Travel	$6,975	$0	$6,843	$0	$6,975	$0	$7,106	$0
Communications	$618	$0	$606	$0	$618	$0	$630	$0
Shipping	$1,000	$0	$9,500	$0	$5,500	$0	$2,000	$0
Maintenance and Repairs	$11,400	$0	$11,185	$0	$11,400	$0	$11,615	$0
Computing	$1,097	$0	$1,335	$0	$1,270	$0	$1,182	$0
Day Rate	$227,370	$254,256	$223,080	$249,459	$227,370	$254,256	$231,660	$259,054
Insurance	$41,685	$1,557	$40,899	$1,527	$41,686	$1,557	$42,472	$1,586
Indirect Costs	$19,380	$0	$23,592	$0	$22,440	$0	$20,887	$0
Subtotal (LDEO)	**$330,357**	**$255,813**	**$337,597**	**$250,986**	**$339,364**	**$255,813**	**$339,950**	**$260,640**
SOC and POC requests for each expedition	**$894,299**	**$3,908,160**	**$1,043,178**	**$4,781,812**	**$1,077,388**	**$5,160,665**	**$1,187,234**	**$5,375,133**
SOC+POC for each Expeditions 304-306; Partial FY05 Costs for Expedition 303 (remaining costs are in FY04 Prog. Plan)		**$4,802,459**		**$5,824,990**		**$6,238,053**		**$6,562,367**
Total FY05 Expedition Costs								**$23,427,869**

GLOSSARY OF EXPENSE CATEGORIES—EXPEDITIONS

IODP-USIO Science Services, TAMU/TAMRF, 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 and 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 Operations–General Support)—Funds in these categories involve the coverage outlined in Appendix II (e.g., IODP-USIO Science Services, 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.

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 and drilling personnel. It does not cover the cost of the IODP-USIO Science Services, TAMU, 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. Although 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-USIO, Science Services, TAMU, and paid for by IODP-USIO Science Services, TAMRF. Similarly, IODP-USIO Science Services, 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.

IODP-USIO Science Services, 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 Laboratory and for upgrades/additions to the software for this laboratory.

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

Scientific Computing Facility Cost—These funds have been budgeted to support the Lamont-Doherty Scientific Computing Facility. This facility provides the computing services needed for the research described in this proposal. This charge is not subject to indirect costs.

Day Rate—Covers the costs associated with the leasing of standard tools and the associated Schlumberger engineering support services. POCs 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. POCs 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

FY05 for NSF

For Time Period
1 October 2004 to 30 September 2005

AMOUNT PROPOSED FY05: $1,412,568 (POC + SOC + SIC)

Respectfully Submitted to:
U.S. 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

30 August 2004 (revised 1 March 2005)

INTRODUCTION

Joint Oceanographic Institutions, Inc., 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 20 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 the Ocean Drilling Program (ODP) from its inception in 1983. For nearly 20 years, through subcontracts with Lamont-Doherty Earth Observatory of Columbia University (LDEO) and Texas A&M University (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 IODP-USIO Program Office and the lead organization in the JOI Alliance (i.e., the systems integration contractor to the National Science Foundation [NSF] for IODP-USIO riserless drilling vessel operations), JOI has the principal responsibility for overseeing programmatic, contractual, and the fiscal management activities associated with the FY05 IODP-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 IODP-USIO riserless drilling operations.
- Lead the JOI Alliance in the long-term planning and strategy development for the IODP-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-USIO stakeholders including NSF, the IODP central management office, Japan Marine Science and Technology Center (JAMSTEC), European Consortium for Ocean Drilling Research [ECORD] Management Agency [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 IODP-USIO.
- Provide information on IODP and IODP-USIO 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-USIO by fostering relationships between IODP-USIO and other national and international science programs and developing proposals for work in those cases in which Program priorities are coincident.
- Retain primary responsibility for coordinating required publications and reports for the IODP-USIO.
- Coordinate and provide support for IODP-USIO outreach and education activities

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 IODP-MI and the Science Advisory Structure (SAS) panels. JOI will also maintain communications with other platform operators (JAMSTEC/CDEX and EMA/ECORD/ESO) and the international scientific community through the IODP-MI Office and the scientific advisory structure of IODP.

GENERAL OPERATIONS

JOI will manage the U.S. riserless platform operations (POCs) under the terms and conditions of the NSF IODP-USIO contract (OCE 0352500), and science services (SOCs) under the terms and conditions of a (pending) contract with IODP-MI, in accordance with this Program Plan and consistent with subsequent annual program plans until the IODP-USIO contract has been completed. JOI staff will be responsible for the overall management, planning, data dissemination, and reporting of the IODP-USIO to NSF and community stakeholders.

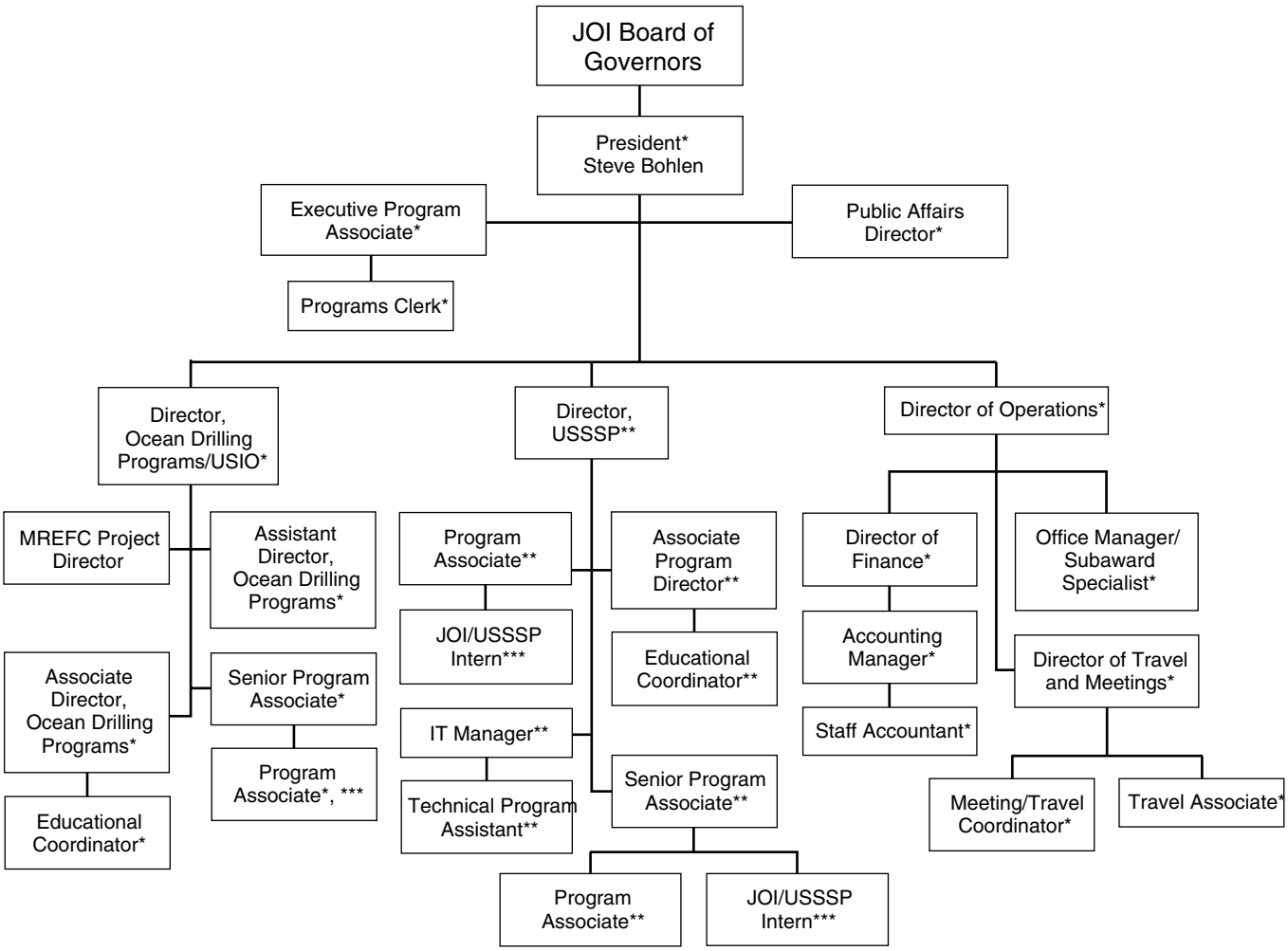
Specifically, JOI will

- Work with JOI Alliance subcontractors to conduct IODP-USIO and IODP programmatic activities.
- Select and work with other subcontractors, as required, to meet programmatic objectives.
- Develop an annual IODP-USIO Program Plan based on a mission forecast provided by NSF and incorporating input from the IODP central management office (IODP-MI). The Program Plan will:
  - Outline IODP and IODP-USIO programmatic goals and expectations.
  - Summarize IODP-USIO scheduled operational activities and other planning requirements.
  - Provide projected IODP-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 IODP-USIO.
- Present proposed IODP-USIO and IODP plans and other activities, as appropriate, to allow integration with the other IODP implementing organizations.
- Maintain an IODP-USIO policy manual that contains a clear and up-to-date summary of the policies and guidelines under which the IODP-USIO Program is managed and operates within IODP.
- Evaluate the IODP-USIO Program within IODP.
- Prepare and submit quarterly reports to NSF that summarize IODP-USIO financial, operational, and other activities.

- Conduct public affairs activities for the IODP-USIO and in support of IODP.
- Fulfill liaison responsibilities to the IODP SAS, the other implementing organizations, and IODP-MI, as appropriate.
- 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.
** Not part of IODP management.
*** Part-time position.

JOI OFFICE BUDGET

Description	FY05 Phase 1 SOC Total	FY05 Phase 1 POC Total	JOI FY05 Total*	JOI FY04 Total
Task Element—JOI FY05 Management & Administration				
Salaries and Fringe Benefits	$335,218	$335,219	$670,437	$772,956
Travel	$40,000	$40,000	$80,000	$145,000
Supplies	$15,000	$15,000	$30,000	$50,000
Shipping	$7,500	$7,500	$15,000	$20,000
Communications	$10,000	$10,000	$20,000	$20,000
Contractual Services	$0	$0	$0	$100,000
Equipment	$0	$0	$0	$0
Other Direct Costs	$0	$0	$0	$100,000
Subtotal (Direct Costs)	$407,718	$407,719	$815,437	$1,207,956
JOI G&A	$182,315	$182,316	$364,631	$362,387
Subtotal	**$590,033**	**$590,035**	**$1,180,068**	**$1,660,343**
Education and Outreach				
Salaries and Fringe Benefits	$24,806	$24,807	$49,613	$34,927
Travel	$24,000	$24,000	$48,000	$53,000
Supplies	$5,000	$5,000	$10,000	$2,000
Shipping	$4,000	$4,000	$8,000	$5,000
Communications	$4,000	$4,000	$8,000	$5,000
Contractual Services	$15,117	$15,116	$30,233	$15,000
Equipment	$0	$0	$0	$0
Other Direct Costs	$0	$0	$0	$0
Subtotal (Direct Costs)	$76,923	$76,923	$153,846	$114,927
JOI G&A	$23,077	$23,077	$46,154	$34,478
Subtotal	**$100,000**	**$100,000**	**$200,000**	**$149,405**
Total JOI	**$690,033**	**$690,035**	**$1,380,068**	**$1,809,748**

Note: Total does not reflect the additional (SIC) funds requested from NSF for HBCU Fellowships, which equal $25,000 plus $7,500 G&A, for a total request of $690,035 + 32,500 = $722,535 (POC + SIC).

The JOI budget costs are divided as SOCs and POCs according to the guidance provided by the lead agencies for FY05 and by IODP-MI, which was outlined in the summary section of this Program Plan. Only the SOC portion of the budget is requested from IODP-MI in this Program Plan.

JOI Salaries and Fringe Benefits—The costs for FY05 are based on salary levels proposed to NSF. The estimated JOI benefit rate is 35%. The total level of effort for JOI equals 10.20 full-time equivalents (FTEs), which is the total of both SOC and POC effort, as well as additional requirements of planning and implementation activities for future scientific ocean drilling efforts.

Travel—The budget includes funds requested to support travel and meetings to accomplish management and administrative activities for JOI, and education and outreach activities for the JOI Alliance. 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 IODP-MI.

Supplies—This category includes funds requested for supplies to support the management and administrative activities of the JOI office and education and outreach activities for the JOI Alliance under this contract.

Shipping—Funds are requested for shipping costs (e.g., postage, courier services) to support the management and administrative activities of the JOI office and education and outreach activities for the JOI Alliance under this contract.

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

Contractual Services—This category includes funds requested to support E&O activities.

Equipment—This category includes funds requested for equipment to support the management and administrative activities of the JOI office and education and outreach activities for the JOI Alliance under this contract.

Other Direct Cost—In the Education and Outreach budget for POC, funds are requested for a fellowship to foster and encourage the participation of students from historically black colleges and universities in IODP activities.

JOI General and Administrative Costs—The NSF-approved provisional rate of 30% was used to calculate general and administrative (G&A) costs. G&A costs are charged on all direct costs and on the first $100,000 of all subcontracts JOI administers (e.g., TAMRF and LDEO subcontracts = $60,000) under a particular contract.

INTEGRATED OCEAN DRILLING PROGRAM

United States Implementing Organization
Systems Integration Contractor

Science Services
Lamont-Doherty Earth Observatory
of Columbia University

PROGRAM PLAN

FY05 for NSF

For Time Period
1 October 2004 to 30 September 2005

AMOUNT PROPOSED FY05: $5,018,687 (POC + SOC)

Respectfully Submitted to:
Joint Oceanographic Institutions, Inc.

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

26 August 2004 (revised 1 March 2005)

INTRODUCTION

This Program Plan outlines the Integrated Ocean Drilling Program (IODP) goals of Science Services, Lamont-Doherty Earth Observatory (LDEO), in FY05. As a member of the JOI Alliance, the Lamont-Doherty Earth Observatory Borehole Research Group (LDEO-BRG) will provide log data acquisition aboard the *JOIDES Resolution* 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 FY05, we will build on our success in the Ocean Drilling Program (ODP), continuing to provide shipboard and shore-based logging capabilities and advancing the scientific potential of logging for the IODP Science Plan. The major goals of FY05 and beyond are as follows.

- Maintain state-of-the-art logging systems and high-quality data acquisition in all IODP environments.
- Assist the scientific community with access to and the use of log data.
- Provide facilities and software for enhanced core/log/seismic integration.

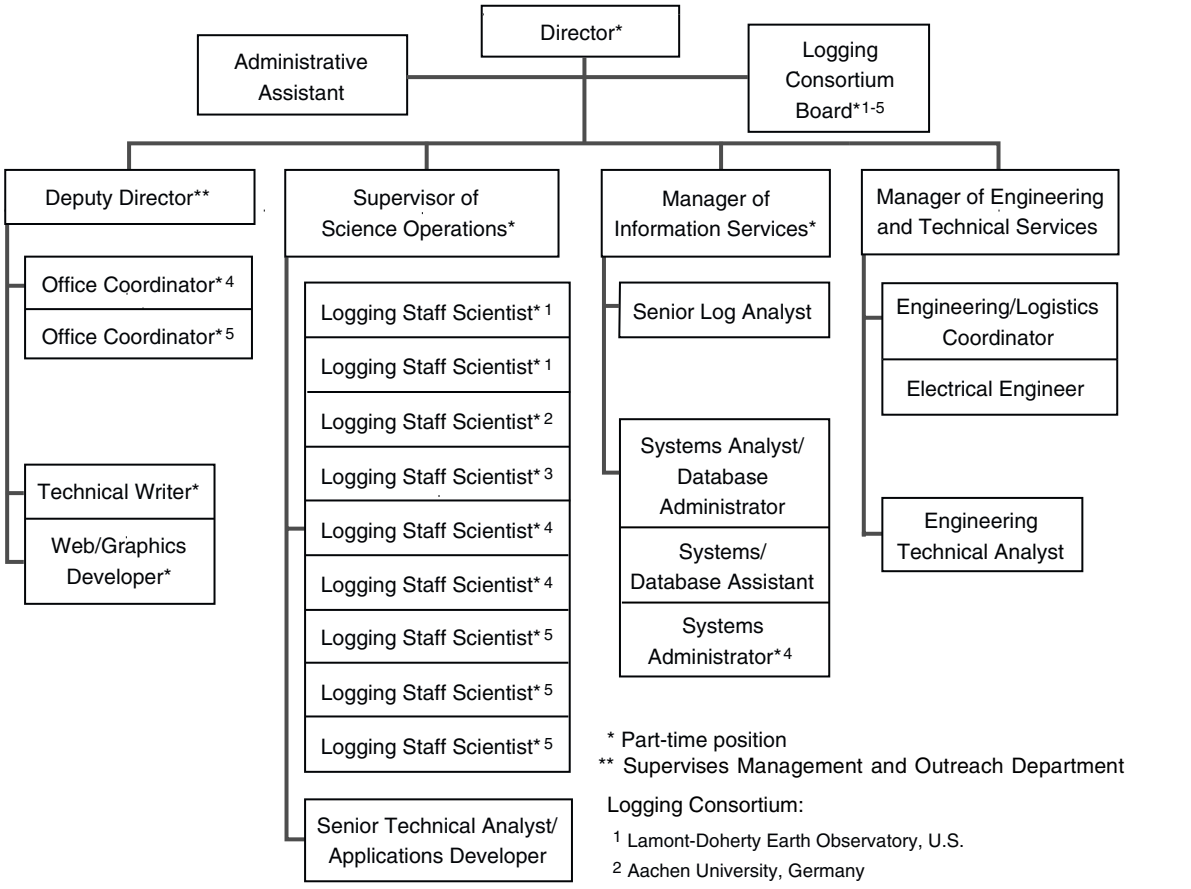
Major components of this effort in FY05 will be participation in JOI Alliance teams for overall program management, the continued support for and expansion of the GeoFrame/IESX and Splicer/Sagan data processing packages, enhancement of data access capabilities, and shipboard operations on the *JOIDES Resolution.*

FY05 IODP-USIO SCIENCE SERVICES, LDEO, TASK-ELEMENT SUMMARY BUDGET

Description	FY05 Phase 1 Total		FY04 Total	
	SOC	POC	SOC	POC
Management and Administration	$267,456	$267,456	$144,298	$0
Technical, Engineering and Science Support	$1,532,513	$2,980	$992,806	$14,557
Core Curation	$0	$0	$0	$0
Data Management	$543,046	$41,859	$288,898	$0
Publications	$0	$0	$0	$0
Logging	$1,328,626	$1,034,751	$854,562	$603,125
Education and Outreach	$0	$0	$108,018	$0
TOTAL	**$3,671,641**	**$1,347,046**	**$2,388,582**	**$617,682**

ORGANIZATIONAL CHART

IODP-USIO 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.

HEADQUARTERS AND MANAGEMENT DEPARTMENTS

DEPARTMENTAL RESPONSIBILITIES

The Director is 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. (IODP-MI), requirements. The Director is also serving as Chief Scientist; provides scientific and technical guidance and interacts with JOI Alliance teams, Science Advisory Structure (SAS) panels, and IODP-MI groups; participates in JOI Alliance strategic planning; and maintains programmatic and fiscal oversight of Science Services, LDEO, with overall responsibility for all Logging Consortium subcontractors, and heads the Logging Consortium for riserless activities.

The Headquarters and Management Departments are responsible for tasks including program management and reporting; coordination and budget control for LDEO projects; administration, personnel, procurement, and subcontract fiscal oversight; budget tracking services; and technical writing.

Management

- Provide overall program oversight. Effectively and efficiently manage all science operation deliverables and ensure that they are consistent with NSF and IODP-MI requirements.
- Provide sound fiscal and contractual management of the activities and deliverables for which LDEO-BRG is responsible.
- Ensure the use of project management techniques to effectively manage resources and provide program accountability.
- Effectively and efficiently manage the subcontract 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).
- Prepare required reports (e.g., quarterly reports, program plans).
- 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 the platforms.

Planning Activities

- Oversee execution of scheduled expeditions, including the planning, implementation, and review of each expedition.
- Liaise as needed with SAS panels (e.g., Science Planning and Policy Committee [SPPOC], Science Planning Committee [SPC], Operations Committee [OPCOM]), as well as with other implementing organizations and IODP-MI.
- Through the Laboratory for Ocean Drilling, Observation, and Sampling (LODOS), 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.

- Coordinate training opportunities for member of the IODP community. Work with the LDEO Science Operations Department to ensure adequate training of new Logging Staff Scientists.

BUDGET

Management/Administration

Description	FY05 Phase 1		FY04 Total	
	SOC	POC	SOC	POC
Personnel	$110,087	$110,087	$35,771	$0
Fringe	$29,135	$29,135	$9,438	$0
Sea Pay	$0	$0	$0	$0
Equipment	$2,735	$2,735	$8,842	$0
Supplies	$5,125	$5,125	$5,371	$0
Travel	$18,475	$18,475	$31,300	$0
Communication	$2,986	$2,986	$2,200	$0
Shipping	$2,710	$2,710	$1,851	$0
Other	$1,175	$1,175	$900	$0
Total Direct Cost	$172,428	$172,428	$95,673	$0
Modified Direct Cost	$169,693	$169,693	$86,831	$0
Computing	$5,091	$5,091	$2,605	$0
Indirect Cost	$89,937	$89,937	$46,020	$0
TOTAL	**$267,456**	**$267,456**	**$144,298**	**$0**

Management/Administration

Funds in this cost center are budgeted as follows:

Personnel—Personnel expenses for four employees in Management and Administration (38 months of employee effort).

Fringe—This category contains fringe benefits (26.4% for October–June and 26.6% for July–September) for employee effort.

Permanent Equipment—Includes costs associated with equipment having an acquisition cost of $2000 or more.

Materials/Supplies—General office supplies.

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

Communication—Telephone and fax costs.

Shipping—Postage and express mail costs.

Other—Costs for meeting support.

Scientific Computing Facility Cost—These funds have been budgeted to support the Lamont-Doherty Scientific Computing Facility. This facility provides the computing services needed for the research described in this proposal. This charge is not subject to indirect costs.

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

SCIENCE OPERATIONS DEPARTMENT

DEPARTMENTAL RESPONSIBILITIES

The LDEO Science Operations Department is responsible for providing scientific, operational, and technical support for IODP-USIO riserless vessel downhole measurement 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.

Provision of Logging Staff Scientists for FY05 IODP-USIO Operations

- Prepare 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 aboard the *JOIDES Resolution* for Expeditions 303 through 306.
- 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 postexpedition data processing.
- Present logging results and participate in postexpedition meetings.
- Ensure that the Logging Staff Scientists are kept up to date on the latest downhole tools, operational procedures, and interpretation techniques.

Planning Activities

- Review the logging tools required to complete the scientific objectives of the highly ranked riserless drilling proposals and for potential FY06 expeditions.
- Develop logging operational plans to meet these needs and ensure safe shipboard operations.
- Liaise with the Co-Chief Scientists and other expedition personnel.
- Provide liaisons for IODP advisory panels (e.g., Science Steering and Evaluation Panels [SSEPs], Science Measurements Panel [SciMP], Industry Liaison Panel [ILP]) as appropriate.

Log Analysis Centers

- Provide the capability of integrating core, log, and seismic data at the five shore-based facilities through the use of the GeoFrame/IESX and Splicer/Sagan data processing and interpretation packages.
- Provide access to the centers for data interpretation and integration pre- and postexpedition through the Logging Consortium.
- Working with Information Services personnel, Science Operations ensures that log interpretation and data integration capabilities are maintained and made available to the IODP research community.

Data Integration

- Conduct expedition-related data integration functions, accessing the services and data holdings of the IODP Data Bank to support JOI Alliance drilling operations and science.
- Use GeoFrame/IESX 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.
- Use GeoFrame/IESX projects for log-seismic integration during the expedition in collaboration with shipboard logging scientists. Postexpedition data interpretation may be conducted at the international Log Analysis Centers with on-site expertise.
- Maintain Core-Log Integration Platform (CLIP) Splicer/Sagan software and provide training support for shipboard scientists, when necessary.

Third-Party Tool Support

- Work with third-party developers for expedition-specific tool deployments.
- Ensure that the developers are aware of, and meet, all reporting and technical third-party tool requirements in IODP.

BUDGET

Science Services

Description	FY05 Phase 1 Total		FY04 Total	
	SOC	POC	SOC	POC
Personnel	$185,401	$0	$66,260	$0
Fringe	$42,695	$0	$17,469	$0
Sea Pay	$10,120	$0	$10,120	$0
Equipment	$7,914	$0	$13,842	$0
Supplies	$2,500	$0	$3,255	$0
Travel	$37,900	$0	$25,700	$0
Communication	$6,237	$0	$1,800	$0
Shipping	$1,200	$0	$692	$0
Other	$15,315	$0	$0	$0
Total Direct Cost	$309,282	$0	$139,138	$0
Modified Direct Cost	$286,053	$0	$225,296	$0
Computing	$8,582	$0	$6,759	$0
Contracts	$576,723	$0	$388,381	$0
Indirect Cost	$151,608	$0	$119,407	$0
TOTAL	**$1,046,195**	**$0**	**$653,684**	**$0**

Science Services

Funds in this cost center, which are mapped to the Technical, Engineering, and Science Support task element, are budgeted as follows:

Personnel—Personnel expenses for four employees and a graduate student (47 months of employee effort).

Fringe—This category contains fringe benefits (26.4% for October–June and 26.6% for July–September) for employee effort.

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

Permanent Equipment—Includes costs associated with equipment having an acquisition cost of $2000 or more.

Materials/Supplies—General office supplies.

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

Communication—Telephone and fax costs including JOI Alliance conference calls, calls for expedition planning details, communications with SAS panel members, and interaction with subcontractors.

Shipping—Postage and express mail costs.

Other—Tuition remission for a graduate student is included in this category.

Scientific Computing Facility Cost—These funds have been budgeted to support the Lamont-Doherty Scientific Computing Facility. This facility provides the computing services needed for the research described in this proposal. This charge is not subject to indirect costs.

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

ENGINEERING AND TECHNICAL SERVICES DEPARTMENT

DEPARTMENTAL RESPONSIBILITIES

The Engineering and Technical Services Department is responsible for oversight of major technical subcontracts for logging services providers; 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; special tool developments; and project management for a variety of engineering and technical activities. The logging services engineering team works to improve logging and drilling equipment, as needed or requested by the scientific community, while minimizing costs through efficient engineering design and manufacturing techniques.

Provision of Logging Services

- Supervise the subcontract with Schlumberger for the delivery of logging services aboard the drilling vessel.
- Provide liaisons to IODP advisory panels (e.g., Technology Advice Panel [TAP], etc.) as appropriate.
- Procure all necessary downhole tool insurance for standard logging operations, including coverage for specialty tools.

Documentation

- Create and/or refine documentation with each new development.
- Archive engineering files in both hard copy and digital file formats.
- Maintain records on tool reliability and operational efficiency for use in the annual Government Performance and Results Act (GPRA) report and operational assessments of IODP-USIO logging activities.

Technical Support of Vessel and Shore-based Operations

- Provide shipboard technical support, including expedition planning, execution, and postexpedition assessment.
- Maintain shore-based test and measurement equipment used in the support of the shipboard operations.
- Ensure that the shipboard logging workspaces, logging tools, and equipment are operational and stocked with adequate supplies for both routine and third-party operations.
- Ensure safe laboratory and workspace operations at shipboard and shore-based locations.
- Work with proponents wishing to conduct downhole experiments to ensure that appropriate space, access to equipment, and supplies are available.
- Work with third-party developers to ensure that their tools meet IODP standards for design and operation and third-party tool guidelines.

Engineering and Technology Enhancements

- Ensure the combined engineering resources of the JOI Alliance will be utilized to create development priorities, integrated development teams, and regular communications with engineering development teams at other implementing organization institutions.
- Create new measurement systems and/or technology as appropriate, within the guidelines of IODP panels, JOI Alliance priorities, and logging services needs in support of shipboard operations.
- Refine existing measurement systems as appropriate as appropriate with new technology and capabilities.

Material Support

- Provide expedition logistical support, including procurement of equipment and supplies.
- Maintain responsibility for inventory control and shipping and receiving.

DEPARTMENTAL PROJECTS

Modular High-Temperature Devices

This project will be the first step in increasing the program's measurement capabilities in high fluid temperature environments. Currently, the program maintains two high-temperature temperature-measuring devices: one for use on the core barrel and the other on the wireline. The user interfaces, power requirements, and temperature buffering techniques can be standardized to make way for the future measurements. We will combine the technologies of existing high-temperature tools to create a new modular temperature-measuring tool that can be run with the standard logging suite. In the future, additional measurements could be added either to the wireline or core barrel tool format using this modular design.

Core Barrel-Retrievable Memory Module Modification

This project continues a joint LDEO-TAMU engineering project initiated during ODP to build a bottom-hole assembly (BHA) to drillship data link using commercially available mud-pulse telemetry equipment. The data link will enable the display of drilling dynamics data from the BHA with the intent to improve drilling and coring operations. The Core Barrel-Retrievable Memory Module (CB-RMM) will be modified mechanically and electronically to receive the Pulse Telemetry Module (PTM).

BUDGET

Technical Services

Description	FY05 Phase 1		FY04 Total	
	SOC	POC	SOC	POC
Personnel	$203,442	$1,509	$75,695	$677
Fringe	$53,775	$401	$19,918	$177
Sea Pay	$0	$0	$0	$0
Equipment	$5,500	$0	$114,167	$0
Supplies	$24,300	$0	$28,310	$0
Travel	$11,700	$0	$9,800	$0
Communication	$6,000	$0	$2,574	$0
Shipping	$0	$0	$5,608	$0
Other	$9,000	$0	$1,800	$0
Total Direct Cost	$313,717	$1,910	$257,872	$854
Modified Direct Cost	$308,217	$1,910	$143,705	$25,854
Computing	$9,246	$57	$5,087	$0
Indirect Cost	$163,355	$1,013	$76,163	$13,703
TOTAL	**$486,318**	**$2,980**	**$339,122**	**$14,557**

Technical Services

The Technical Services budget includes costs for the Engineering and Technical Services Department and maps to the Technical, Engineering, and Science Support task element.

Funds in this cost center are budgeted as follows:

Personnel—Personnel expenses for the four employees in Engineering and Technical Services Department.

Fringe—This category contains fringe benefits (26.4% for October–June and 26.6% for July–September) for employee effort.

Permanent Equipment—Includes costs associated with equipment having an acquisition cost of $2000 or more. This budget includes equipment in support of logging operations including heat checking blankets ($5500).

Materials/Supplies—General office supplies.

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.

Shipping—Freight, postage and express mail service 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.

Scientific Computing Facility Cost—These funds have been budgeted to support the Lamont-Doherty Scientific Computing Facility. This facility provides the computing services needed for the research described in this proposal. This charge is not subject to indirect costs.

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

Logging Services

Description	FY05 Phase 1 Total		FY04 Total	
	SOC	POC	SOC	POC
Personnel	$0	$0	$0	$0
Fringe	$0	$0	$0	$0
Sea Pay	$0	$0	$0	$0
Equipment	$11,000	$6,037	$39,510	$0
Supplies	$22,800	$3,000	$17,812	$0
Travel	$27,900	$0	$16,350	$0
Communication	$1,972	$500	$2,400	$0
Shipping	$18,000	$0	$10,650	$0
Other	$45,600	$0	$27,000	$0
Total Direct Cost	$127,272	$9,537	$113,722	$0
Modified Direct Cost	$116,272	$3,500	$74,212	$0
Computing	$3,488	$105	$2,226	$0
Contracts	$1,136,242	$1,023,254	$699,282	$603,125
Indirect Cost	$61,624	$1,855	$39,332	$0
TOTAL	**$1,328,626**	**$1,034,751**	**$854,562**	**$603,125**

Logging Services

Funds in this cost center include the subcontract to provide standard and specialty logging tools and support (Schlumberger), downhole tool insurance, and other expenses related to shipboard logging activities. The budget maps to the Logging task element.

Funds in this cost center are budgeted as follows:

Permanent Equipment—Includes costs associated with equipment having an acquisition cost of $2000 or more. This includes costs associated with the development of downhole equipment to be deployed routinely with the Drilling Sensor Sub ($7500).

Materials/Supplies—General office and shipboard laboratory supplies.

Travel—Travel funds are to support travel to the riserless vessel for logging scientists, engineers, and other port call personnel in FY05.

Communication—Telephone and fax costs.

Shipping—Freight, postage and express mail service 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.

Scientific Computing Facility Cost—These funds have been budgeted to support the Lamont-Doherty Scientific Computing Facility. This facility provides the computing services needed for the research described in this proposal. This charge is not subject to indirect costs.

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.

Contracts—Includes the Schlumberger contract and downhole tool insurance costs. Schlumberger will provide a standard suite of tools, engineer services, software support, and logistical services. Schlumberger will also make specialty tools available for use on individual expeditions as needed. These services include a dedicated engineer on the vessel for each expedition and support from the base of operations. In addition, this Schlumberger 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). The contract also provides for the leasing of equipment needed for backoff and severing services.

The insurance contract 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.

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

INFORMATION SERVICES DEPARTMENT

DEPARTMENT RESPONSIBILITIES

The Information Services Department is 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 the JOI Alliance to plan and coordinate ship-to-shore communications to serve the needs of the logging program.

Data Processing, Management, and Distribution

- Use Schlumberger's commercial GeoFrame/IESX software package, which is specifically dedicated for log processing, display, interpretation, and data management, at four shore-based log analysis centers.
- Work with the JOI Alliance and representatives from other implementing organizations to standardize logging protocols (e.g., filenaming conventions) to the extent feasible.
- Work with the Logging Staff Scientists and Schlumberger engineers to ensure that proper quality control measures are taken during data acquisition, transfer, and storage. Also ensure that proper procedures are followed during data processing.
- Maintain the Deep Sea Drilling Project (DSDP)/ODP/IODP log database, archiving and distributing the collected data for the scientific community. Working closely with the JOI Alliance and other implementing organization and IODP-MI groups, ensure that the processed data is easily accessible online in compatible formats.

Log Analysis Centers

- 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 at five international locations.
- Provide GeoFrame/IESX and Splicer/Sagan software and scientific personnel with log analysis expertise on site to help achieve the scientific objectives of IODP expeditions and postexpedition science.
- Provide detailed training for the shipboard scientific party on the technical aspects of data acquisition and processing.
- 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.

Core-Log-Seismic Integration

- Through IESX and CLIP Splicer/Sagan software packages, provide scientists with a means of integrating core, log, and seismic data.
- Through the use of the shipboard satellite system, provide the shipboard scientific party with a comprehensive, fully processed, and quality-controlled data set that can immediately be used for comparison and integration with other data collected during each expedition.
- Prepare IESX seismic data packages from site survey data submitted to the IODP data bank.

Computer Systems and Network Support

- Support desktop workstations, servers, and network infrastructure, e-mail support services, and administrative services in support of the department.

- Provide UNIX systems management services.
- Provide software purchasing and version control services for all departments.
- Work with JOI Alliance networking staff members to ensure that shipboard computer and ship-to-shore communication systems are fully supported.
- Work with JOI Alliance teams to support and deliver new information technology systems for use by IODP scientists, including potential third-party developments and visualization systems.
- Maintain logging-related material on the IODP-USIO Web site.

BUDGET

Data Management

Description	FY05 Phase 1		FY04 Total	
	SOC	POC	SOC	POC
Personnel	$223,995	$20,767	$89,818	$0
Fringe	$59,285	$5,493	$23,660	$0
Sea Pay	$0	$0	$0	$0
Equipment	$36,407	$0	$47,480	$0
Supplies	$16,750	$0	$28,138	$0
Travel	$12,450	$0	$6,900	$0
Communication	$4,593	$573	$3,139	$0
Shipping	$4,446	$0	$3,000	$0
Other	$3,250	$0	$100	$0
Total Direct Cost	$361,176	$26,833	$202,235	$0
Modified Direct Cost	$324,768	$26,833	$154,755	$0
Computing	$9,743	$805	$4,643	$0
Indirect Cost	$172,127	$14,221	$82,020	$0
TOTAL	**$543,046**	**$41,859**	**$288,898**	**$0**

Data Management

Funds in this cost center are budgeted as follows:

Personnel—Personnel expenses for five employees in the Information Services Department (44.75 months of employee effort)

Fringe—This category contains fringe benefits (26.4% for October–June and 26.6% for July–September) for employee effort.

Permanent Equipment—Includes costs associated with equipment having an acquisition cost of $2000 or more. Covers the cost of a replacement service ($17,000) and RAID system ($12,000).

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.

Shipping—Postage and express mail service costs.

Other—Costs for reference/training materials.

Scientific Computing Facility Cost—These funds have been budgeted to support the Lamont-Doherty Scientific Computing Facility. This facility provides the computing services needed for the research described in this proposal. This charge is not subject to indirect costs.

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

APPENDIX I: EXPEDITION OPERATIONS

INTRODUCTION

The FY05 Program consists of Expeditions 303 through 306.

DELIVERABLES

Expedition 303: North Atlantic 1

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 303) and central North Atlantic (Expedition 306) through the intercalibration of geomagnetic, paleointensity, isotope and regional environmental stratigraphies. Five sites are proposed for North Atlantic Climate 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.

During Expedition 303, the standard geophysical tool string for density, porosity, resistivity and gamma ray information and the Formation MicroScanner (FMS)/sonic tool string for high-resolution resistivity logs and images and sonic velocity data will be deployed. The scientific objectives that could be addressed using logging data are the following:

- Composite depth scales: Even with 100 % recovery, core expansion can affect estimates of depth by as much as 15%. Variable decompression and/or <100% recovery in different holes at the same site may have an effect on production of composite depth scales. Logging data provides the closest estimate of true depth and thus provides an excellent reference stratigraphy for producing accurate core correlations and compositing.
- Recognition of ice-rafted debris (IRD) layers: The FMS tool provides high-resolution resistivity images of the interior of the borehole and should be able to accurately determine the position of IRD layers. This has implications for both documenting icehouse history and constructing regional correlations of particular IRD intervals.
- Recognition of ash, clay, and organic layers: The Multi-Sensor Spectral Gamma Ray Tool (MGT) provides spectral gamma-ray analysis that can be used to determine ash, clay, and organic layers.
- Cyclostratigraphy: The proposed sites are characterized by relatively high sedimentation rates. Given the high sedimentation rates, it should be possible to recognize processional, obliquity, and eccentricity cycles within the standard downhole data. FMS data will be able to document millennial-scale changes in lithology.

Additionally, because of the expected high core recovery, these sites present an excellent opportunity to “cross check” composite depth scales as determined by splicing core records and a composite depth scale produced from correlating core to log data. This would be best done using the MGT and high-resolution core gamma-ray data but could also be done through a comparison of gamma-ray attenuation (GRA) density with downhole density measurements. The prime target for logging will be the Orphan Knoll site.

This is the first deep drilling investigation of the sediments on the flanks of Orphan Knoll, and the collection of downhole log data will be instrumental in fully characterizing the site. Logging at Orphan Knoll will allow the assessment of potential problems with core expansion and contraction. If significant differences are determined between composite-core depths and core-log depths, then this may have implications for the rest of the expedition. The sedimentation rates at Orphan Knoll are expected to be high, making it possible to recognize cyclicity with the logging data. This site is close to Site 111 (not previously logged) but closer to cores HU90-045-094 (P-094) and MD95-2024. Currently, there are no logs in the vicinity of Orphan Knoll. Total logging time for a hole at Orphan Knoll is estimated at approximately 18 hr.

Data generated by downhole logging will be critical for hole-to-hole correlation, core-log integration, hole-to-seismic correlation, and correlation of results from Expeditions 303 and 306. Successful core-log integration will be necessary to determine the completeness of the recovered cores and thus the accuracy of the stratigraphic framework.

Expeditions 304 and 305: Core Complex 1 and 2

The principal objective of Expeditions 304 and 305 is to determine the conditions under which oceanic core complexes (OCCs) develop. Formation of these large, shallow seafloor features appears to be a common manifestation of plate rifting and accretion at slow spreading ridges.

The Atlantis Massif, located at the eastern intersection of the Mid-Atlantic Ridge and Atlantis transform fault, has several key features that make this site an ideal target for OCC drilling. The hanging wall is in contact with the footwall of the detachment surface, which is believed to be dominated by variably serpentinized peridotite at the surface that may grade into fresh peridotite over drillable distances. The objectives of these expeditions are to (1) characterize variation in rock type, structure, and alteration with depth at an ultramafic OCC, including the nature and deformation history of the detachment fault and (2) obtain core of essentially fresh, in situ peridotite to document composition, microstructure, evidence for melt production/migration and relationships between deformation/melt and syntectonic alteration.

To achieve these goals, two expeditions are proposed and two sites will be drilled:

- Deep drill (>700 m) on the Central Dome of Atlantis Massif (Site AMFW-01A) to sample the detachment fault zone and the alteration front and drill into unaltered mantle (core and logging analyses planned).
- Deep drill (400–500 m) through the basaltic hanging wall (Site AMHW-01A) to sample rock just above the detachment, the shallowest part of the unexposed fault, and through the fault zone (core and logging analyses planned).

Logging Operations

Downhole logging will provide in situ information on the geophysical structure of the drilled formation. Whereas core recovery is often biased and incomplete in basement, downhole logging data are continuous and therefore provide information over intervals of low recovery. The downhole logging program is designed for logging the hanging wall and footwall holes using the triple combination (triple combo) tool string, FMS/sonic tool string, and Well Seismic Tool (WST). In addition, the Ultrasonic Borehole Imager (UBI) will also be available for Expedition 305 operations. In addition, the deployment of a third-party magnetometer (i.e., Bundesanstalt für Geowissenschaften und Rohstoffe [BGR]—German Geological Survey) is under investigation.

- The triple combo tool string consists of several probes used to determine contents in K, U, and Th, obtain formation density, measure photoelectric effect, electrical resistivity, neutron porosity values, and temperature. These measurements will be utilized for the characterization of stratigraphic sequences, the variations in serpentinization, and the identification of oxide mineral–rich intervals. In the hanging wall hole, these measurements will be used to document detachment fault and to characterize the basalts.
- The FMS will provide high-resolution borehole images of stratigraphic sequences and boundaries, oriented fracture patterns, fracture apertures, and fracture densities. FMS images can be used to visually compare logs with core to ascertain the orientations of bedding and fracture patterns. The Dipole Shear Sonic Imager (DSI) will produce a full set of waveforms (*P*-, *S*-, and Stoneley waves); the shear-wave velocity and amplitude measured at different azimuths in the borehole may indicate preferred mineral and/or fracture orientations as well as impedance contrasts.
- The UBI measures the amplitude and transit time of an acoustic wave propagated into the formation. It provides high-resolution images with 100% borehole wall coverage, which allows detection of small-scale fractures. The amplitude depends on the reflection coefficient of the borehole fluid/rock interface, the position of the UBI tool in the borehole, the shape of the borehole, and the roughness of the borehole wall. Changes in the borehole wall roughness (e.g., at fractures intersecting the borehole) are responsible for the modulation of the reflected signal; therefore, fractures or lithologic variations can easily be recognized in the amplitude image. The General Purpose Inclinometer Tool (GPIT) is deployed with the UBI and allows orientation of the images; evaluation and orientation of fractures can provide information about the local stress field and borehole geometry.
- The Seismic Tool (WST-3) records acoustic waves generated by an air gun located near the sea surface. It provides a complete check shot survey, a depth-traveltime plot, and synthetic seismograms that will be essential for determining in-situ velocity profiles.

Site	Water Depth (mbsl)	Sediment Thickness (m)	Basement Thickness (m)	Logging Operations
AMFW-01A	1630	1	> 700	Triple Combo, FMS/sonic, UBI, WST3
AMHW-01A	2550	1-2	400-500	Triple Combo, FMS/sonic

Expedition 306: North Atlantic 2

The current plan is to drill four sites, namely GAR1A, GAR2A, ORPH2A, and IRD3A, that will be complementary to Expedition 303 (North Atlantic 1).

Critical to the scientific success of the paleoceanographic/paleoclimatic objectives of this expedition is high core recovery and the construction of a continuous stratigraphic section in meters composite depth (mcd). Given the inherent problems with advanced piston corer (APC) coring (stretch/squeeze flow-in, etc.) and core rebound following recovery, the composite stratigraphic section will be altered in mcd depths and physical property magnitudes. The acquisition of downhole logs is vital for assessing the "completeness" of the composite stratigraphic section, correcting the mcd depths

and physical properties (e.g., density, velocity, porosity) and correlating the point-source depth-domain core data to the spatially extensive time-domain seismic data. Further, given sufficient sedimentation rates, high-resolution log data (e.g., FMS, MGT) provide the basis for cyclostratigraphic analyses on a continuous sedimentary sequence.

The current plan is to log a minimum of two sites with the triple combo tool string and added high-resolution MGT (given suitable sediment characteristics), the FMS/sonic tool string, and the WST check shot tool. Logging of these sites will help fulfill many of the scientific objectives of the expedition including the recognition of IRD-rich layers and orbital cyclicity. Core-log integration will allow the identification of core gaps and the quantification of core expansion and contraction, which is of fundamental importance to the construction of a robust stratigraphic framework. Logging operations at any of the sites to be cored during Expedition 306 will take approximately 30 hours (20 for standard logging and 10 for WST checkshots). If core recovery/core quality is poor at any of the other sites, the further use of downhole logging should be considered in order to accomplish the scientific objectives of the expedition.

The second part of Expedition 306 will consist of the installation of a Cork near ODP Hole 642E, located on the Voring Plateau. This Cork installation will be used to document and reconstruct bottom-water temperature (BWT) variations through time on the decadal to centennial scale by measuring thermal anomalies in the sediment pile. The area near Hole 642E, originally drilled during ODP Leg 104, is ideal for this study because it is in a climatically sensitive region with an established 50-yr time series of bottom-water temperature measurements in ~278 m of Neogene and Quaternary pelagic and hemipelagic sediments overlying a series of basalts and interbedded Eocene sediments. The full suite of standard logging tools will be available for use as needed during this second part of the expedition. Log data may be useful in determining the initial thermal regime of the hole, as well as providing data on hole condition and characterizing the formation surrounding the Cork.

IODP-USIO SCIENCE SERVICES, LDEO, EXPEDITION OPERATIONS BUDGET

Description	Expedition 303		Expedition 304		Expedition 305		Expedition 306	
	SOC	POC	SOC	POC	SOC	POC	SOC	POC
Personnel	$6,466	$0	$6,448	$0	$7,473	$0	$7,506	$0
Fringe	$1,707	$0	$1,702	$0	$1,973	$0	$1,982	$0
Sea Pay	$1,950	$0	$1,900	$0	$1,950	$0	$2,000	$0
Equipment	$4,259	$0	$4,179	$0	$4,259	$0	$4,339	$0
Supplies	$6,450	$0	$6,328	$0	$6,450	$0	$6,571	$0
Travel	$6,975	$0	$6,843	$0	$6,975	$0	$7,106	$0
Communication	$618	$0	$606	$0	$618	$0	$630	$0
Shipping	$1,000	$0	$9,500	$0	$5,500	$0	$2,000	$0
Other	$11,400	$0	$11,185	$0	$11,400	$0	$11,615	$0
Total Direct Cost	$40,825	$0	$48,691	$0	$46,598	$0	$43,749	$0
Modified Direct Cost	$36,566	$0	$44,512	$0	$42,339	$0	$39,410	$0
Day Rate	$227,370	$254,256	$223,080	$249,459	$227,370	$254,256	$231,660	$259,054
Insurance	$41,685	$1,557	$40,899	$1,527	$41,686	$1,557	$42,472	$1,586
Computing	$1,097	$0	$1,335	$0	$1,270	$0	$1,182	$0
Indirect Cost	$19,380	$0	$23,592	$0	$22,440	$0	$20,887	$0
TOTAL	**$330,357**	**$255,813**	**$337,597**	**$250,986**	**$339,364**	**$255,814**	**$339,950**	**$260,640**

INTEGRATED OCEAN DRILLING PROGRAM

United States Implementing Organization
Systems Integration Contractor

Science Services
Texas A&M University

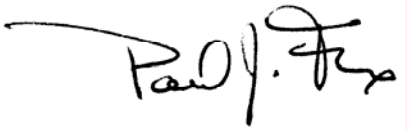
PROGRAM PLAN

FY05 for NSF

For Time Period
1 October 2004 to 30 September 2005

AMOUNT PROPOSED FY05: $28,362,638 (POC + SOC + SIC)

Respectfully Submitted to:
Joint Oceanographic Institutions, Inc.



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

26 August 2004 (revised 1 March 2005)

INTRODUCTION

In the Integrated Ocean Drilling Program (IODP), the JOI Alliance serves as the U.S. implementing organization (USIO) for the riserless scientific drilling vessel. In support of the IODP-USIO, 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 vessel. The document that follows identifies the tasks and services that Science Services, TAMU/TAMRF provides, projects a cost for these deliverables, and outlines our goals for FY05 in support of IODP. The services that we are responsible for are directly related to the scientific and engineering activities necessary to support science expeditions and the management of expedition-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, engineering operations superintendents).
- Materials and logistical support of expedition implementation.
- Support of the maintenance and enhancement 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 the 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 IODP-USIO outreach/education activities.
- Support a collaborative working relationship with IODP Management International, Inc. (IODP-MI), the Japanese and European implementing organizations, and the IODP science advisory panels.

The administrative services required to support these science service activities will be managed by TAMRF and include contractual, fiscal, property/procurement, human resources, and travel assistance support—all the services necessary to deliver the science operations conducted by IODP-USIO Science Services, TAMU.

The total budget request for our IODP-USIO science support SOC and POC activities is $28,312,638. FY05 remains a time of transition because staff members are dividing their time between tasks associated with ODP and the tasks required for the delivery of IODP-USIO activities. Only those tasks, and the time, effort, and cost associated with implementation of these IODP-USIO deliverables, are discussed in this document. Additional funds of $50,000 are requested by TAMU.

The IODP-USIO scientific deliverables for which TAMU/TAMRF are responsible are organized into three distinct functional divisions: Science Services, which supports and implements the science activities at sea and the deployment, maintenance, and enhancement of engineering tools and analytical equipment that support at sea science operations; Data Services, which supports data acquisition, management of data collections, core curation, Web administration support, reports, scientific publications, and platform-related outreach; 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; 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. The Vice President, TAMRF, who serves as the Manager of Administrative Services, also reports to the Director of Science Services for technical direction and guidance.

FY05 IODP-USIO SCIENCE SERVICES, TAMU, SUMMARY BUDGET (SOC + POC) [Note: $50,000 SIC request not included.]

Account	Description	FY05 Phase 1 Total		FY04 Total	
		SOC	POC	SOC	POC
	Headquarters				
414012-01	Office	264,301	264,302	345,540	132,860
414012-02	Education and Outreach	-	-	52,647	-
	Subtotals	**264,301**	**264,302**	**398,187**	**132,860**
	Administrative Services				
414022-01	Administrative Services	840,216	840,215	1,077,668	-
	Subtotals	**840,216**	**840,215**	**1,077,668**	**-**
	Science Services				
414032-01	Office	150,381	150,382	258,890	-
414032-02	Technical Support	948,302	255,038	796,188	528,218
414032-03	Science Support	649,674	77,998	342,414	85,040
414032-04	Operational Support	108,500	833,410	115,093	725,905
414032-05	Materials Support	434,142	368,378	413,376	229,260
	Subtotals	**2,290,999**	**1,685,206**	**1,925,961**	**1,568,423**
	Tools and Analytical Services				
414042-01	Office	112,390	112,389	251,900	-
414042-02	Analytical Services	787,738	59,438	731,391	227,289
414042-03	Engineering Services	558,905	531,062	602,345	634,920
	Subtotals	**1,459,033**	**702,889**	**1,585,636**	**862,209**
	Info.Tech. and Data Services				
414052-01	Office	109,787	109,788	221,288	-
414052-02	Info. Tech. Support	970,457	206,834	818,080	429,057
414052-03	Databases and Archives	737,354	-	377,064	21,364
414052-04	Curatorial Office	143,027	-	87,836	-
414052-05	East Coast Repository	235,568	-	-	-
414052-06	West Coast Repository	172,339	-	-	-
414052-07	Gulf Coast Repository	284,658	-	-	-
	Subtotals	**2,653,190**	**316,622**	**1,504,268**	**450,421**
	Publications				
414062-01	Publication Services	953,521	-	397,697	16,741
	Subtotals	**953,521**	**-**	**397,697**	**16,741**
	Ship Operations				
414072-01	Subcontractor	-	15,516,061	-	9,469,914
414072-02	IODP General Support	8,804	517,279	-	352,305
	Subtotals	**8,804**	**16,033,340**	**-**	**9,822,219**
	TOTAL	**$ 8,470,064**	**$ 19,842,574**	**$ 6,889,417**	**$ 12,852,873**

FY05 IODP-USIO SCIENCE SERVICES, TAMU, TASK-ELEMENT SUMMARY BUDGET (SOC + POC)

Description	TAMU
Task Element—Phase 1 SOC FY05	
Management and Administration	$1,113,321
Technical, Engineering and Science Support	$3,750,032
Core Curation	$835,592
Data Management	$1,817,598
Publications	$953,521
Logging	$0
Education and Outreach	$0
Subtotals	**$8,470,064**
Task Element—Phase 1 POC FY05	
Management and Administration	$1,121,983
Technical, Engineering and Science Support	$18,403,969
Core Curation	$0
Data Management	$316,622
Publications	$0
Logging	$0
Education and Outreach	$0
Subtotals	**$19,842,574**
Task Element—Totals FY05	
Management and Administration	$2,235,304
Technical, Engineering and Science Support	$22,154,001
Core Curation	$835,592
Data Management	$2,134,220
Publications	$953,521
Logging	$0
Education and Outreach	$0
Totals	**$28,312,638**

HEADQUARTERS DEPARTMENT

DEPARTMENTAL RESPONSIBILITIES

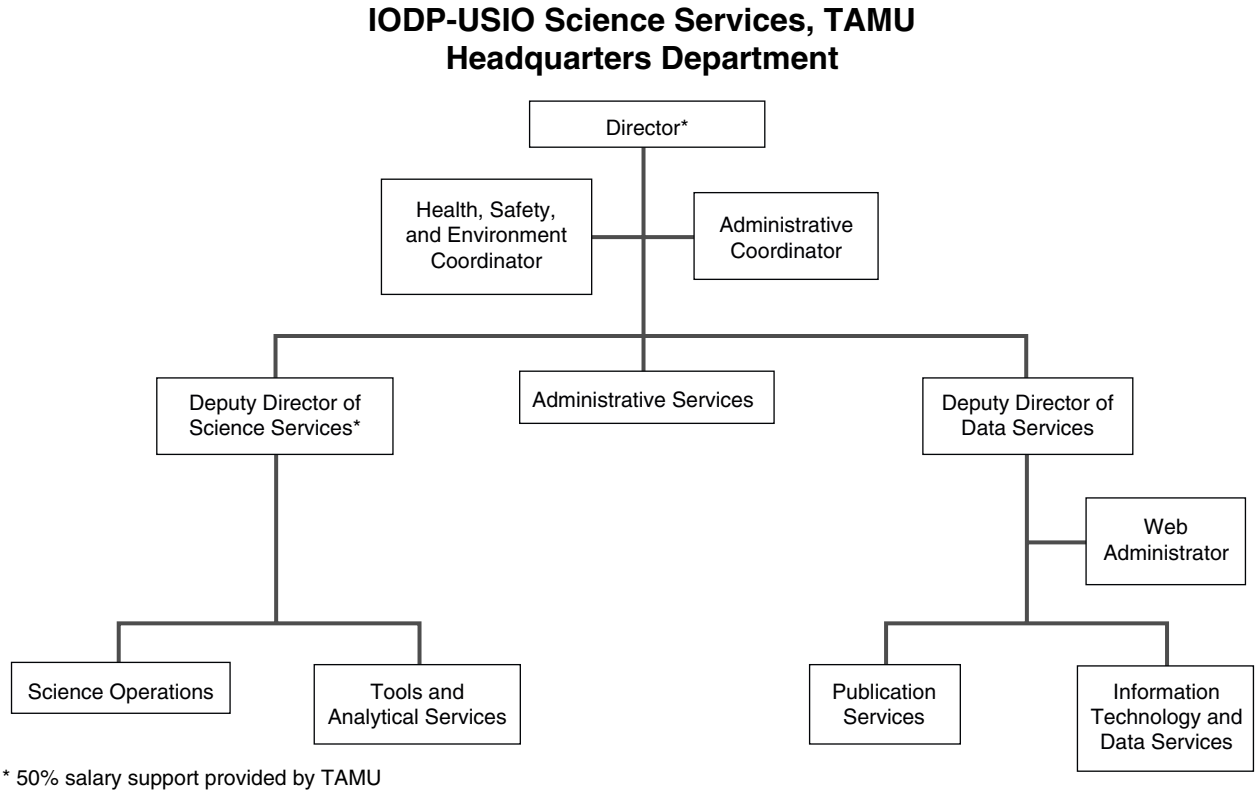
The IODP-USIO Science Services, TAMU, Headquarters Department oversees the management of all science operations and data management tasks to ensure that deliverables are met in accordance with National Science Foundation (NSF) requirements and direction provided by IODP-MI; provides technical guidance and oversight of the vessel subcontractor(s) consistent with guidance provided by NSF; 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 IODP-USIO Science Services, TAMU, on JOI Alliance teams working with other IODP implementing organizations, IODP-MI offices, and Science Advisory Structure (SAS) panels; provides Web administration support for the science operator; and contributes to the fulfillment of the platform-related outreach goals of the JOI Alliance.

To fulfill its responsibilities and to optimize programmatic efficiencies, the Headquarters Department is organized with two technical divisions (Science Services and Data Services) and an administrative component. These are managed by the Director of Science Services and two Deputy Directors. The Headquarters Department conducts the following tasks:

- Oversees and delivers all IODP-USIO Science Services, TAMU, activities and deliverables and ensures they are consistent with NSF and IODP-MI requirements.
- Develops a sound fiscal program plan for science operations and data services that is consistent with the guidance of NSF and IODP-MI.
- Provides resource overview and direction that is consistent with the annual IODP-USIO Program Plan as defined by NSF and IODP-MI.
- Provides sound fiscal and contractual management of the activities and deliverables for which IODP-USIO Science Services, TAMU/TAMRF, are responsible.
- Ensures that the IODP-MI–endorsed HSE standards are rigorously followed and geological hazard reviews and international permitting adhere to local, state, federal, and international regulations.
- Assures and monitors coordination with other JOI Alliance institutions, IODP-MI, and other IODP implementing organizations.
- Interfaces, as appropriate, with SAS panels (i.e., Science Planning and Policy Oversight Committee [SPPOC], the IODP-MI Operations Committee [OPCOM]), the TAMU safety panel, and other representatives of the science community. Ensures engaged and constructive participation by IODP-USIO Science Services, TAMU, representatives on all relevant IODP committees.
- Represents IODP-USIO interests at appropriate meetings.
- Manages the Science Services Division of IODP-USIO Science Services, TAMU:
  - Oversees two departments that are focused on the successful implementation of science at sea (Science Operations Department) and the technological development of analytical and engineering tools in support of science (Tools and Analytical Services Department).
  - Oversees planning, implementation, and review of each expedition.

    - Coordinates the review of geological hazard assessments.
    - Ensure that the vessel subcontractor for IODP-USIO Phase 1 provides a vessel that is safe and efficient and meets the requirements defined in the NSF request for proposals (RFP).
- Manages the Data Services Division:
    - Oversees two departments that are focused on the successful management of the program's scientific legacy, including core collections, core images, and databases, and the information technology systems used to facilitate all Science Operator activities (Information Technology and Data Services Department) and the production of required reports and publications (Publication Services Department).
    - Oversees planning and implementation of curation, database, and publication legacy activities.
    - Oversees network and computer infrastructure for IODP-USIO Science Services, TAMU.
    - Provides Web administrations support for the JOI Alliance and manages the IODP-USIO Science Services, TAMU, Web site.
    - Facilitates outreach/education activities for the IODP-USIO in coordination with other JOI Alliance institutions, IODP-MI, SAS panels, IODP implementing organizations, IODP member/consortia funding agencies, and members of the education community and other representatives of the science community.
- Works 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-USIO Phase 2 riserless vessel.

ORGANIZATIONAL CHART



* 50% salary support provided by TAMU
All other positions funded by both ODP and IODP in FY05.

BUDGET

414012-01000 Headquarters Department – Office

Exp. Cat.	Description	FY05 Phase 1 Total		FY04 Total	
		SOC	POC	SOC	POC
2000	Payroll	$ 182,945	$ 182,946	$ 276,054	$ 76,221
3500	Travel	73,713	73,712	41,014	56,639
3600	Training	937	938	1,100	-
3720	Business Conferences	-	-	1,872	-
4000	Supplies	900	900	1,500	-
4765	Software	850	850	500	-
5261	Shipping	600	600	1,100	-
5280	Publications/Printing	-	-	1,200	-
5370	Telecommunications	2,106	2,106	3,000	-
5373	Ship–to–Shore Communication	300	300	500	-
5550	Services	600	600	12,000	-
5986	Furniture	450	450	4,000	-
8510	Library	900	900	1,700	-
	TOTAL	**$ 264,301**	**$ 264,302**	**$ 345,540**	**$ 132,860**

414012-01000 Headquarters Department – Office

Funds in this cost center are budgeted as follows:

Payroll—Salary and fringe for 6 employees (4.25 FTEs), including an anticipated 3% state-mandated salary increase: the Director, Deputy Director of Science Services, Deputy Director of Data Services, HSE Coordinator, Web Administrator, and Administrative Coordinator. A portion of the salaries of the Director and Deputy Director of Science Services is paid by TAMU. Temporary clerical assistance will be used as needed.

Travel—Transportation, per diem, and lodging, exclusive of travel related to port calls. The meeting schedule (locations and dates) for the IODP advisory panels has not been well established, but generic plans, based on historical costs, have been made for the Director and Deputy Directors to attend IODP SAS panel meetings (e.g., SPPOC [2], Science Planning Committee [SPC] [6], Science Measurements Panel [SciMP] [2], and Environmental Protection and Safety Panel [EPSP] [2]) as appropriate. We anticipate that there will be three meetings of the implementing organizations: the Director and Deputy Director of Science Services will participate in these meetings; the Deputy Director of Data Services will attend one. Three members of the management team will also attend three other IO meetings. The JOI Alliance will host four meetings at Alliance institutions to review issues pertinent to the U.S. systems integration contractors [SIC] and to review plans pertinent to the acquisition and conversion of the IODP-USIO Phase 2 drillship. Funds have also been allocated for the Deputy Director of Data Services to visit each core repository to discuss curatorial issues common to IODP. Registration and travel costs will cover attendance at four professional conferences to represent IODP-USIO Science Services, TAMU. In addition, there are travel funds to support the three members of the TAMU EPSP committee to attend two IODP EPSP meetings.

Travel to/from Port—Transportation, per diem, and lodging for travel to and from the riserless vessel at port calls. Covers travel of the Director or the Deputy Director of Science Services to each port call and of the HSE Coordinator to three port calls.

Training—Registration, transportation, per diem, and lodging expenses related to professional training. Covers expenses for one staff member to attend a technical training course.

Supplies—Office and operational supplies. General conference supplies, office supplies, electronic media and other computer supplies, printer and copier supplies, paper, and phone books.

Software—Software purchases and upgrades. New software or software upgrades pertinent to the implementation of management activities.

Shipping—Postage, express mail, and freight. Covers postage for regular correspondence and the cost of shipping overnight or on a priority basis.

Telecommunications—Telephone and fax charges.

Ship-to-Shore Communications—Satellite and regular communication between the riserless vessel and shore-based personnel. Covers long-distance charges incurred when Headquarters Department personnel are required to contact the riserless vessel from a location other than College Station.

Services—Expert assistance. Covers printing costs of material that keeps the scientific community informed of significant program features, activities, and/or events.

Furniture—Bookshelves, work tables, and file cabinets to outfit Headquarters Department offices.

Library—Books, journals, and other resources. Covers the purchase of key journal subscriptions for the IODP-USIO Science Services, TAMU (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, environment, and clearances.

ADMINISTRATIVE SERVICES DEPARTMENT

DEPARTMENTAL RESPONSIBILITIES

The TAMRF Administrative Services Department is responsible for oversight and administration of all business affairs of IODP-USIO Science Services, TAMU. Through mutual agreement, TAMU and TAMRF have waived indirect cost, and TAMRF has agreed to administer the business affairs of IODP-USIO Science Services, TAMU, for a small corporate administrative fee and direct charge costs associated with TAMRF employees assigned to the project. The corporate administrative fee reimburses TAMRF for administrative activities (i.e., vendor check preparation, verification, and distribution; postage; management activities; document scanning; storage; audit (local and external) liaison and preparation, university coordination activities, etc.) in support of IODP. 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.

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

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

Contracts, Property, and Procurement Section

- Manage the IODP-USIO Science Services, TAMU, procurement/property and contract activities to assist the IODP-USIO Science Services, 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.

Fiscal Affairs Section

- 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 effective and auditable administrative services at a reasonable cost.
- Establish more detailed reporting capability of vessel operational costs such as day rates, catering, and port call expenses through Microsoft Access.
- Implement results of expense coding system analysis.
- Work with the IODP-USIO Science Services, TAMU, Human Resources Section to revise employee files to comply with TAMU's new privacy policies.

Human Resources and Insurance Services Section

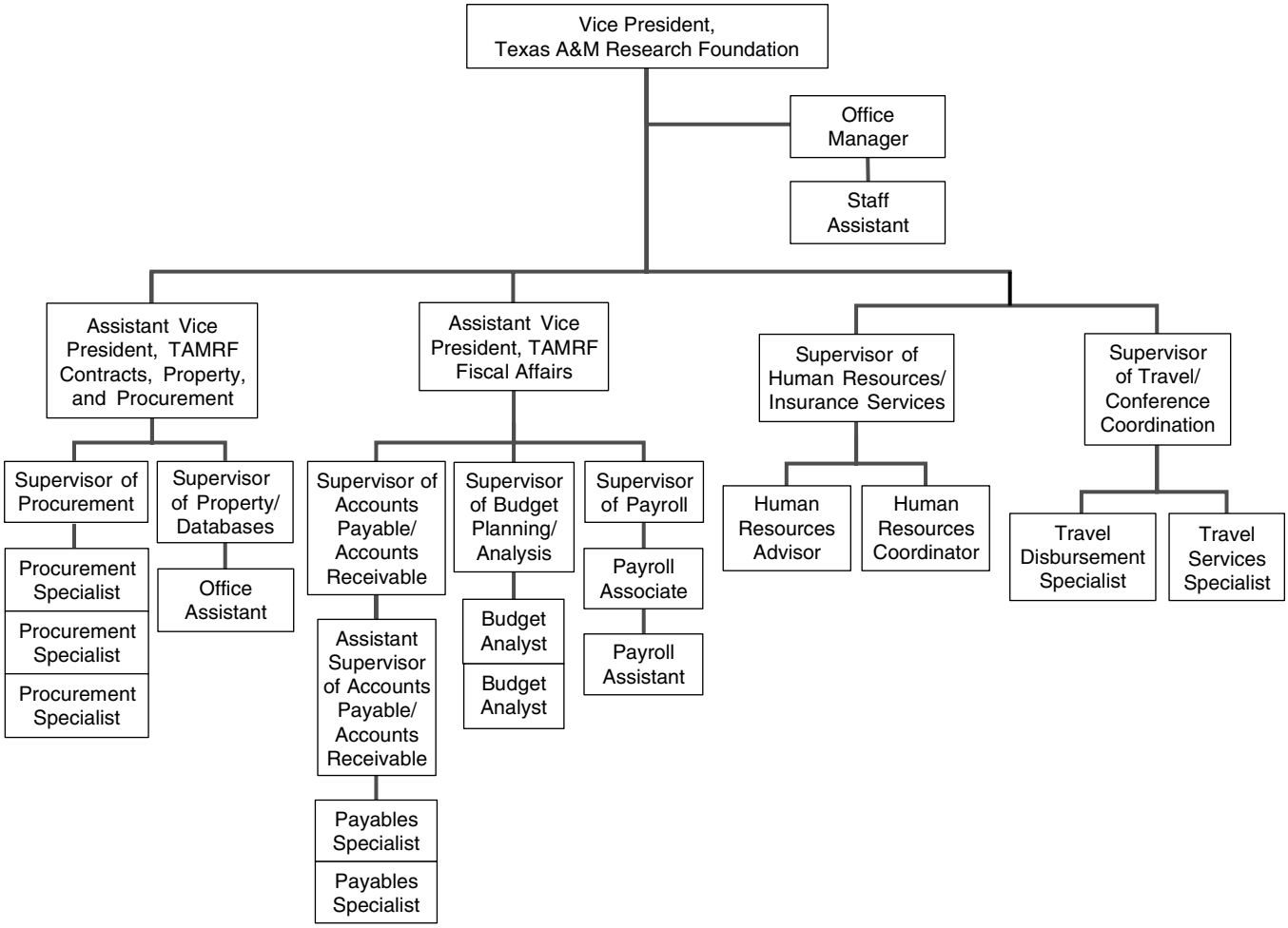
- Provide administrative service functions including human resource (HR) administration, insurance and risk management. These services include screening, interviewing, counseling employees, assisting employees with compensation and fringe benefit matters, providing training information, maintaining personnel databases, and immigration activities
- Continue to review and develop specialized policies and procedures to better serve the requirements of program participants.
- Have 100% on-time return of performance appraisal and position descriptions during the annual performance review period.
- Review and evaluate the Human Resources link to the IODP-USIO Science Services, TAMU, main Web page, which provides information to employees on policies, insurance, retirement, and training and includes forms that can be completed online, to better serve IODP-USIO Science Services, TAMU, employees.
- Continue to implement mechanisms to increase employee awareness of retirement, insurance, and employee assistance programs.
- Review and identify the needs of the Program or individual departments and provide the necessary individual or programwide training to accomplish the mission of IODP-USIO Science Services, TAMU/TAMRF.
- Work with the Fiscal Section and the Information Technology and Data Services Department to develop a new and efficient personnel database.

Travel/Conference Coordination Section

- Accommodate IODP-USIO Science Services, TAMU, travel needs and travelers in an efficient and cost-effective manner in accordance with approved policies and procedures.
- Provide cost-effective and efficient travel services for all IODP-USIO Phase 1 activities.
- Make reservations via an in-house airline computerized reservation system, negotiating with consulate offices on visa-related issues, and coordinate continental United States and international meetings.

ORGANIZATIONAL CHART

IODP-USIO Science Services, TAMU/TAMRF
Administrative Services Department*



* All personnel employed by Texas A&M Research Foundation.
All positions funded by both ODP and IODP in FY05.

BUDGET

414022-01000 Administrative Services Department

Exp. Cat.	Description	FY05 Phase 1 Total		FY04 Total	
		SOC	POC	SOC	POC
2000	Payroll	$ 602,472	$ 602,472	$ 688,950	$ -
3500	Travel	5,611	5,611	11,025	-
3580	Travel to/from Port	1,330	1,330	10,283	-
3600	Training	13,798	13,797	10,400	-
3720	Business Conferences	1,000	1,000	2,000	-
4000	Supplies	9,250	9,250	10,185	-
4765	Software	200	200	400	-
5070	Insurance	2,800	2,800	1,900	-
5261	Shipping	2,000	2,000	1,600	-
5370	Telecommunications	9,600	9,600	13,450	-
5373	Ship–to–Shore Communication	125	125	-	-
5550	Services	2,530	2,530	3,800	-
5569	Computer Services–Other	250	250	-	-
5590	TAMU Computer Services	7,400	7,400	16,575	-
5931	Equipment Rental	400	400	400	-
5986	Furniture	1,000	1,000	750	-
5987	Recruiting	700	700	1,200	-
6820	Maintenance & Repair	500	500	3,000	-
8400	Equipment	-	-	1,000	-
8510	Library	500	500	750	-
9683	Admininistrative Allowance	178,750	178,750	300,000	-
	TOTAL	**$ 840,216**	**$ 840,215**	**$ 1,077,668**	**$ -**

414022-01000 Administrative Services Department

Funds in this cost center are budgeted as follows:

Payroll—Salary and fringe for 27 employees (24.27 FTEs) (see organizational chart), including an anticipated 3% state-mandated salary increase. Also includes funds to support five student workers. All employees in this department are TAMRF employees. TAMRF provides a full range of business and compliance services to IODP-USIO Science Services, TAMU.

Travel—Transportation, per diem, and lodging, exclusive of travel related to port calls. Covers the cost of liaison visits to JOI and IODP-MI.

Travel to/from Port—Transportation, per diem, and lodging for travel to and from the vessel at port calls. Covers one employee conducting a liaison visit to one of the Ponta Delgada port calls.

Training—Registration, transportation, per diem, and lodging expenses related to professional training. Covers expenses associated with attendance at 17 professional courses by 26 participants. Examples of training include certification of professional procurement and human resource specialists. Training courses also include, but are not limited to, courses in property management for universities, databases, contracts training, budget estimating using Excel, office organization and management and leadership, standard operating procedure writing and organization, new supervisor management and leadership, an educational institution conference on payroll, small business conferences, national travel conferences, National Council of Research Administrators (NCURA) and classes for office assistants. To the extent possible, local classes will be used.

Business Conferences—Costs associated with Program-wide meetings or conferences in or near College Station.

Supplies—Office and operational supplies. Conference supplies, copy paper, computer supplies of less than $1000, miscellaneous supplies (e.g., toner, pens, paper, folders, tape, labels, tablets, pencils, etc.), material to print IODP-USIO business cards and IODP-USIO letterhead, and phone books. Funding is 80% of the total requirement for supplies, with the remaining 20% in the ODP budget request. (Note: This cost center provides supplies for Program-wide activities, not just Administrative Services.)

Software—Software purchases and upgrades. Covers procurement of four licenses for Adobe software programs that support administration of IODP-USIO Science Services, TAMU/TAMRF.

Insurance—Program's portion of Directors and Officers corporate insurance. The request reflects 80% the total requirement and is an increase based on the number of officers at IODP-USIO Science Services, TAMRF (3), when compared to the TAMRF corporate officer total.

Shipping—Postage, express mail, and freight. Includes overnight delivery and is 80% of the total requirement.

Telecommunications—Telephone and fax charges. Covers 80% of standard long-distance and line charges for the department, along with sending and receiving fax transmissions for Administrative Services.

Ship-to-Shore Communications—Satellite and regular communication between the riserless vessel and shore-based personnel.

Services—Expert assistance. Covers miscellaneous services (e.g., physical plant maintenance, temporary labor, storage space, CompuServe accounts, library binding, etc.).

Other Computing Services—Use of noncampus computing services.

TAMU Computing Service—Program's share of costs associated with use of the TAMU's financial and management information system (FAMIS) in conducting the fiscal activities of IODP-USIO Science Services, TAMU. Covers 80% of the total requirement.

Equipment Rental—Rental of equipment for conferences when it is more economical to rent than purchase.

Furniture—Office furniture and storage cabinet for use internally and at external storage facilities.

Recruiting—Employee recruitment. Provides for local advertisements of job vacancies that occur throughout the year.

Maintenance and Repair—Maintenance agreements and equipment repairs. Covers service agreements on business machines (copiers, fax machines, calculators, typewriters, etc.) and parts replacement.

Library—Books, journals, and other resources. Covers subscriptions to professional material (e.g., Small and Small and Disadvantaged Businesses, contractual publications [Federal Acquisition Regulations (FAR), Office of Management and Budgets (OMB), etc.], human resources, etc.) used in the day-to-day operations of the department.

Equipment—Office equipment. Provides for the replacement of office machines (i.e., laminating, typewriters, adding machines, etc.) that are 7 to 10 years old.

Administrative Costs—Fee paid for corporate administration of the program, as established by the JOI/TAMRF contract. TAMRF and TAMU have waived overhead and indirect recovery in lieu of this minimal charge. The corporate fee reimburses TAMRF for activities in support of IODP-USIO Science Services, TAMU, that are not performed by staff direct charged to the Program. Examples of these services include, but are not limited to, vendor activities (i.e., payment for goods and services such as check processing, verification, and distribution); 1099 preparation and distribution, audit liaison, document scanning and storage; postage; management activities; university/vendor liaison and payroll preparation and distribution. The use of corporate resources eliminates redundancy and reduces costs.

SCIENCE OPERATIONS DEPARTMENT

DEPARTMENTAL RESPONSIBILITIES

The Science Operations Department is responsible for scientific, technical, and operational support of all IODP riserless platform activities, including operations planning, estimating time and costs for each expedition; overseeing drilling, coring, and completion operations to ensure that the scientific goals are achieved; operating the shipboard laboratories; and supporting the shipboard scientific party.

To fulfill these responsibilities, the department is divided into four sections, with tasks assigned as follows.

Technical Support Section

- Provide shipboard technical support, including expedition planning, execution, and postexpedition assessment.
- Ensure that technical staff receive appropriate training in laboratory safety and basic safety and survival skills.
- Ensure that the shipboard laboratories are operational and stocked with adequate supplies.
- Ensure safe laboratory operations.
- Work with members of the expedition scientific parties wishing to conduct special analyses or experiments to ensure that appropriate space, services, and supplies are available.

Science Support Section

- Select and invite Co-Chief Scientists for each scheduled expedition.
- Complete staffing the Science Support Section.
- Provide shipboard science support, including expedition planning, execution, and postexpedition assessment for Expeditions 304–306.
- Lead IODP-USIO expedition project management.
- In consultation with Co-Chief Scientists, select and invite members of the scientific party for each IODP-USIO expedition.

Operational Support Section

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

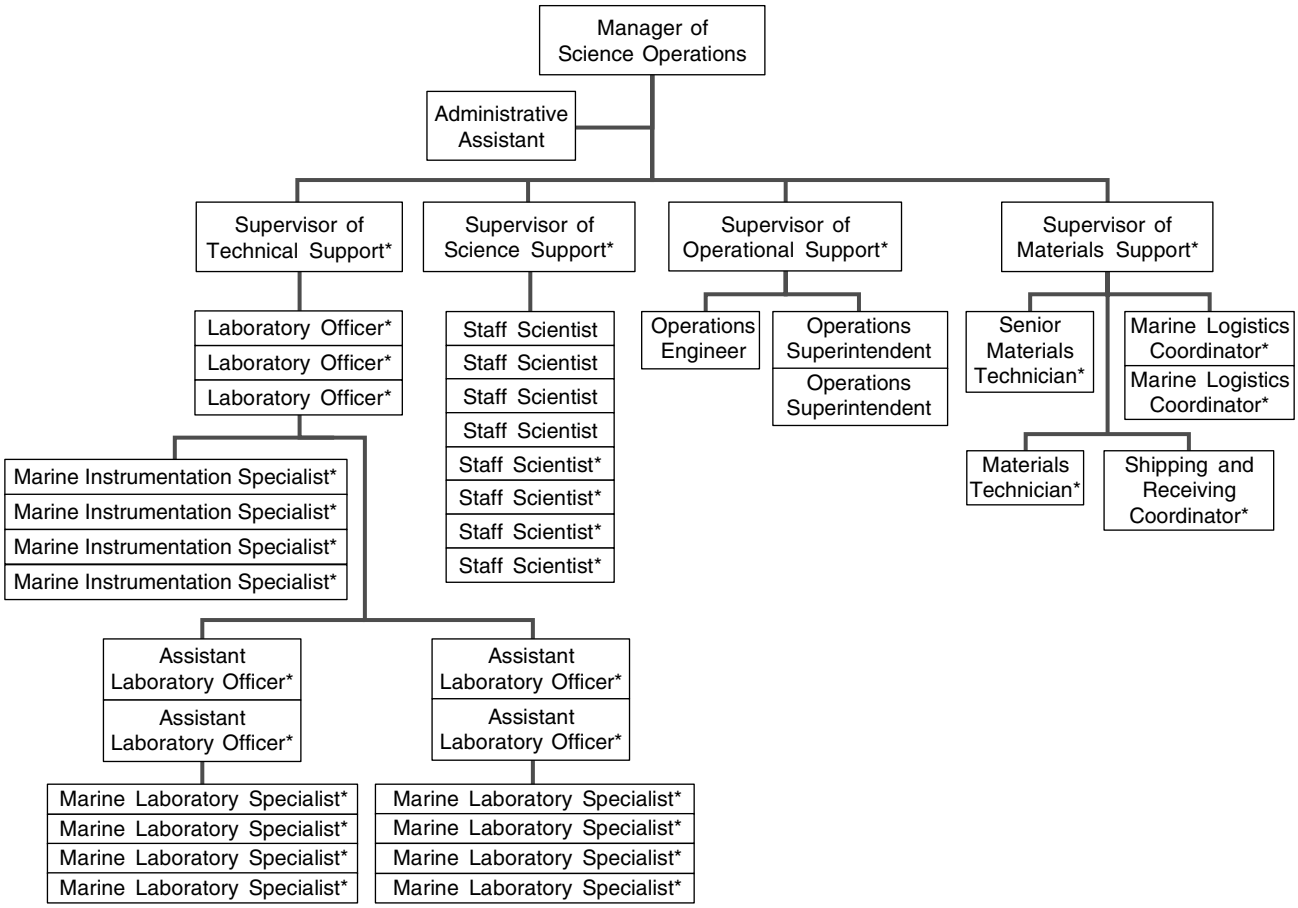
Materials Support Section

- Provide expedition logistical support, including procurement of equipment and supplies.
- Maintain responsibility for inventory control and shipping and receiving.
- Operate and maintain IODP-USIO shore-based warehouse and shop facilities.

- Coordinate with the vessel's agents to ensure efficient handling of shipments to and from the vessel and other IODP-USIO port call activities.

ORGANIZATIONAL CHART

IODP-USIO Science Services, TAMU
Science Operations Department



* IODP funded in FY05.
All other positions funded by both ODP and IODP in FY05.

BUDGET

414032-01000 Science Operations Department – Office

Exp. Cat.	Description	FY05 Phase 1 Total		FY04 Total	
		SOC	POC	SOC	POC
2000	Payroll	$ 84,842	$ 84,843	$ 145,179	$ -
3500	Travel	13,645	13,645	28,609	-
3551	Relocation	15,000	15,000	20,000	-
3580	Travel to/from Port	2,894	2,894	2,602	-
3600	Training	3,000	3,000	-	-
3720	Business Conferences	750	750	1,500	-
4000	Supplies	8,250	8,250	15,000	-
4765	Software	2,500	2,500	5,000	-
5261	Shipping	2,500	2,500	5,000	-
5370	Telecommunications	7,500	7,500	15,000	-
5550	Services	1,000	1,000	2,000	-
5987	Recruiting	5,000	5,000	10,000	-
6820	Maintenance & Repair	2,000	2,000	4,000	-
8400	Equipment	-	-	500	-
8510	Library	1,500	1,500	4,500	-
	TOTAL	**$ 150,381**	**$ 150,382**	**$ 258,890**	**$ -**

414032-01000 Science Operations Department – Office

Funds in this cost center are budgeted as follows:

Payroll—Salary and fringe for 2 employees (1.90 FTEs), including an anticipated 3% state-mandated salary increase: Manager and Administrative Assistant. Also includes funds to support two Graduate Assistants Researchers.

Travel—Transportation, per diem, and lodging exclusive of travel related to port calls. Supports the Manager attending a professional meeting and a series of coordinating meetings: two JOI Alliance meetings, three IODP implementing organization meetings, a meeting in Japan and in Europe to coordinate and discuss operations issues with IODP implementing organizations, and a meeting relating to expedition staffing and environmental safety issues.

Relocation—Relocation costs for three professional positions (Staff Scientists) to be filled in FY05.

Travel to/from Port—Transportation, per diem, and lodging for travel to and from the vessel at port calls. Covers travel of the Manager to attend port calls at the beginning of Expeditions 304 and 306, monitor the status of the shipboard laboratories, and to meet with the technical support staff on issues of concern. (Note: many of the technical support staff are on Alternative Sea Pay Plan [ASPP] status and thus never return to IODP-USIO Science Services, TAMU.)

Training—Registration and expenses related to professional training. Covers the fee to bring an instructor to College Station to provide training in personnel management for supervisors, staff scientists, and operations superintendents.

Business Conferences—Incidental expenses associated with meetings hosted at ODP/TAMU.

Supplies—Office supplies. Covers all office consumables for the department.

Software—Software purchases and upgrades. Funds upgrades of word-processing, spreadsheet, and graphics software used in the department.

Shipping—Postage, express mail, and courier service. Covers all Science Operations Department shipping costs except shipping to and from port calls.

Telecommunications—Telephone and fax charges. Covers all Science Operations Department onshore communications costs.

Services—Covers the cost of TAMU physical plant services and expert assistance.

Recruiting—Employee recruitment. Covers the costs of advertising to fill vacant positions and the cost of bringing candidates to College Station for interviews.

Maintenance and Repair—Maintenance agreements and equipment repairs. Covers routine service to copiers and other department office equipment.

Library—Books, journals and other resources. We anticipate limited library facilities on the vessel during IODP-USIO Phase 1 but plan to have online access to libraries and journals. Includes funds to purchase a limited number of books to replace critical worn or outdated volumes with new editions and for some online journal subscriptions for which the TAMU libraries may not have an online institutional subscription. Funds are also included to maintain the joint Science Operations/Tools and Analytical Services Department document archive.

414032-02000 Science Operations Department – Technical Support

Exp. Cat.	Description	FY05 Phase 1 Total		FY04 Total	
		SOC	POC	SOC	POC
2000	Payroll	$ 777,122	$ 200,412	$ 549,796	$ 287,103
3500	Travel	525	-	-	-
3580	Travel to/from Port	70,812	12,496	45,790	55,091
3600	Training	3,443	32,530	40,602	96,024
4000	Supplies	74,400	5,600	135,000	80,000
4765	Software	10,000	-	10,000	-
5550	Services	6,000	-	6,000	4,000
5931	Equipment Rental	-	-	-	-
5987	Recruiting	6,000	4,000	9,000	6,000
	TOTAL	**$ 948,302**	**$ 255,038**	**$ 796,188**	**$ 528,218**

414032-02000 Science Operations Department – Technical Support

Funds in this cost center are budgeted as follows:

Payroll—Salary and fringe for 20 employees (20 FTEs), including an anticipated 3% state-mandated salary increase: Supervisor of Technical Support, Laboratory Officers (3), Assistant Laboratory Officers (4), Marine Instrumentation Specialists (4) and Marine Laboratory Specialists (8). Also includes sea pay for seven employees: the Laboratory Officers and Assistant Laboratory Officers.

Travel—Transportation, per diem, and lodging, exclusive of travel related to port calls. Covers the cost of staff members attending the annual Gulf Coast Analytical Conference in Houston to learn about the latest developments in analytical tools and techniques.

Travel to/from Port—Transportation, per diem, and lodging for travel to and from the vessel at port calls. Covers seagoing personnel for Expeditions 304–306. Also includes funds to allow the Supervisor of Technical Support to attend each of the port calls. This 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.

Training—Registration, transportation, per diem and lodging expenses related to professional training. Although most training will occur in FY04, we anticipate some turnover in the technical support staff; hence, funds have been budgeted for as many as five people to receive necessary training in laboratory safety (including hazardous materials and hydrogen sulfide) and basic safety and survival skills. Funds are also included for one technician to receive specialist training in maintenance and operation of complex laboratory equipment either from an equipment vendor or by visiting other laboratories.

Supplies—Shipboard laboratory supplies. Covers anticipated laboratory and core handling supplies for Expeditions 305 and 306.

Software—Software purchases and upgrades. Covers essential upgrades or modifications to vendor-specific shipboard laboratory instrumentation software (e.g., inductively coupled plasma spectroscopy, ChemStation).

Services—Expert assistance. Covers the cost of annual physical examinations for seagoing personnel.

Recruiting—Employee recruitment. Funds are included to cover the costs of advertising and recruiting.

414032-03000 Science Operations Department – Science Support

Exp. Cat.	Description	FY05 Phase 1 Total		FY04 Total	
		SOC	POC	SOC	POC
2000	Payroll	$ 604,536	$ 73,208	$ 326,859	$ 78,240
3500	Travel	36,471	3,614	10,342	4,658
3580	Travel to/from Port	6,667	1,176	3,213	2,142
3720	Business Conferences	2,000	-	2,000	-
	TOTAL	**$ 649,674**	**$ 77,998**	**$ 342,414**	**$ 85,040**

414032-03000 Science Operations Department – Science Support

Funds in this cost center are budgeted as follows:

Payroll—Salary and fringe for 9 employees (8.65 FTEs), including an anticipated 3% state-mandated salary increase: Supervisor of Science Operations and Staff Scientists (8). Includes sea pay for four employees.

Travel—Transportation, per diem, and lodging, exclusive of travel related to port calls. Science Operations staff liaise with the SAS panels. Supports one liaison representative traveling to each of 10 such meetings. These include two Site Survey Panel (one domestic, one international), two SciMP (one domestic, one international), four Science Steering and Evaluation panel (two domestic, two international) meetings, two EPSP meetings (one domestic, one international) and one (IODP-MI) OPCOM meeting (domestic). Funds are also included for all Staff Scientists and the Supervisor to attend one professional meeting each to represent IODP-USIO Science Services, TAMU, and for professional development.

Travel to/from Port—Transportation, per diem, and lodging for travel to and from the vessel at port calls. Covers the travel costs of staff scientists sailing on Expeditions 304–306.

Business Conferences—Incidental expenses associated with meetings hosted at IODP-USIO Science Services, TAMU. One of the key responsibilities of the Staff Scientists is to oversee the pre- and postexpedition meetings for their particular expedition. These meetings are held at IODP-USIO Science Services, TAMU. All the pre-expedition meetings for IODP-USIO Phase 1 were budgeted in FY04. Postexpedition meetings normally occur 3 to 5 months after the expedition. Hence, funds are budgeted in FY05 to cover incidental costs associated with postexpedition meetings for Expeditions 301 and 303–306.

414032-04000 Science Operations Department – Operations Support

Exp. Cat.	Description	FY05 Phase 1 Total		FY04 Total	
		SOC	POC	SOC	POC
2000	Payroll	$ 104,688	$ 236,359	$ 108,629	$ 147,954
3500	Travel	3,312	-	5,964	5,364
3580	Travel to/from Port	-	7,843	-	5,355
3720	Business Conferences	500	-	500	-
4000	Supplies	-	541,708	-	494,732
5550	Services	-	27,500	-	27,500
5931	Equipment Rental	-	-	-	25,000
6820	Maintenance & Repair	-	20,000	-	20,000
	TOTAL	**$ 108,500**	**$ 833,410**	**$ 115,093**	**$ 725,905**

414032-04000 Science Operations Department – Operations Support

Funds in this cost center are budgeted as follows:

Payroll—Salary and fringe for 4 employees (3.3 FTEs), including an anticipated 3% state-mandated salary increase: Supervisor of Operational Support, seagoing Operations Superintendents (2), and an Operations Engineer. Also includes sea pay for three employees.

Travel—Transportation, per diem, and lodging, exclusive of travel related to port calls. Covers the cost of each member of the Operations Support Section attending one professional meeting to maintain awareness of the latest drilling and coring technology and procedures.

Travel to/from Port—Transportation, per diem, and lodging for travel to and from the vessel at port calls. Covers port call travel of the Operations Superintendents sailing on Expeditions 304–306.

Business Conferences—Incidental expenses associated with operational planning meetings held at IODP-USIO Science Services, TAMU.

Supplies—Operational supplies. Covers drilling and coring hardware costs associated with Expeditions 305 and 306, including bits, drill pipe, reentry cone, casing, coring tools, etc., used in routine operations. Special tools (e.g., Cork hardware, hammer drill, ADCB) are budgeted in the Tools and Analytical Services Department.

Services—Expert assistance. Covers services for wireline severing (Kinley Cutter), as well as the cost of weather services that will be required for Expedition 306.

Maintenance and Repair—Maintenance agreements and equipment repairs. Covers service agreements and the repair of mud motors, underreamers, a cementing manifold/swivel, and bicentered bits.

414032-05000 Science Operations Department – Materials Support

Exp. Cat.	Description	FY05 Phase 1 Total		FY04 Total	
		SOC	POC	SOC	POC
2000	Payroll	$ 218,094	$ 168,846	$ 322,226	$ 8,495
3500	Travel	1,500	-	1,500	-
3580	Travel to/from Port	8,248	434	9,050	3,949
3600	Training	-	8,748	-	19,916
4000	Supplies	8,000	12,000	8,000	12,000
4765	Software	5,000	-	5,000	-
5070	Insurance	1,100	1,650	1,000	1,500
5261	Shipping	162,200	176,700	36,600	183,400
5550	Services	25,000	-	25,000	-
6820	Maintenance & Repair	5,000	-	5,000	-
	TOTAL	**$ 434,142**	**$ 368,378**	**$ 413,376**	**$ 229,260**

414032-05000 Science Operations Department – Materials Support

Funds in this cost center are budgeted as follows:

Payroll—Salary and fringe for 6 employees (6.0 FTEs), including an anticipated 3% state-mandated salary increase: Supervisor of Materials Support, Marine Logistics Coordinators (2), Materials Technicians (2), and Shipping and Receiving Coordinator. Also includes funds to support six student workers.

Travel—Transportation for local travel (e.g., quality control visits to vendors).

Travel to/from Port—Transportation, per diem, and lodging for travel to and from the vessel at port calls. Covers one Logistics Coordinator attending each port call to work with the agent to coordinate oncoming and offgoing shipments of supplies and equipment and assisting with port call activities. Transit travel is budgeted for a Logistics Coordinator to attend the port call at the end of Expedition 306.

Training—Registration, transportation, per diem, and lodging expenses related to professional training. Covers expenses of two staff members receiving training in multimodal shipping regulations and procedures, and radioactive materials handling to update and maintain skills and certifications.

Supplies—Operational supplies. Covers all packing and crating materials, inspections, and shop consumables.

Software—Software purchases and upgrades. Covers upgrades and purchase new software used in the Operations and Materials Section (e.g., AutoCAD, FoxPro, Labview).

Insurance—Insurance on IODP-USIO Science Services, TAMU, vehicles. The cost reflects a 10% increase over FY04 in anticipation of rate increases.

Shipping—Courier services and air and surface freight. Covers the shipment of all drilling and coring supplies and all scientific supplies to and from the vessel. Costs include funds to cover the return of cores to the appropriate repository and to vessel samples to science party members following each expedition. This activity will consist of return shipping from Expedition 303 and shipments to and from Expeditions 304–306. The estimated shipping costs for Expedition 306 have been increased to allow for possible inclusion of a microbiological component to the expedition, which would substantially increase shipping costs (e.g., ODP Leg 201 resulted in shipping costs for microbiological samples of $92,500).

Services—Expert assistance. Covers boat and helicopter transfers of personnel and material to the riserless vessel.

Maintenance and Repair—Equipment repairs. Covers maintenance of the IODP-USIO Science Services, TAMU, vehicle fleet as well as maintenance and repair of equipment in the warehouse. Provides funds for repairs to overhead cranes, scales, and other loading dock equipment.

TOOLS AND ANALYTICAL SERVICES DEPARTMENT

DEPARTMENTAL RESPONSIBILITIES

The Tools and Analytical Services Department is responsible for laboratory, analytical, and engineering development support of all IODP-USIO riserless platform activities. These activities include 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; maintenance and support of laboratory and downhole equipment and associated software interfaces with the Janus database; maintenance and operational support of the shore-based laboratories; and interface with industry, government, and academia.

To fulfill these responsibilities, the department is divided into two sections, with tasks assigned as follows.

Analytical Services Section

- Establish and maintain infrastructure for an analytical service center to meet the science and technology needs of the IODP scientific ocean drilling community.
- Define requirements for, manage planning activities of, and maintain implementation controls on current and potential future enhancement activities for the shipboard and shore-based laboratories and analytical services.
- Provide relevant laboratory information for short- and long-term planning to the JOI Alliance, the SAS and IODP-MI.
- Manage laboratory working groups and continue standardization of laboratory systems through review of current equipment, software applications, and laboratory procedures and through the creation of an efficient developmental infrastructure.
- Maintain, upgrade, and operate shore-based laboratories in support of IODP science requirements.
- Create, adopt, and maintain technical documentation associated with laboratory instrumentation, software, and scientific analysis programs.
- Maintain and repair shipboard and shore-based laboratory equipment and software and interface with vendors.
- Maintain a liaison with relevant JOI Alliance management teams, the SAS, IODP-MI, IODP implementing organizations, and other appropriate stakeholders.

Engineering Services Section

- Provide legacy hole completion equipment for IODP-USIO expeditions.
- Maintain the short-range project plan for improvements to drilling and coring systems, complex completions, downhole tools, and vessel and surface systems.
- Prioritize development projects.
- Maintain project controls on engineering enhancements.
- Maintain technical documentation associated with coring and drilling equipment, legacy completions, and technology.

- Implement design improvements and adopt new technology to coring and drilling operations.
- Provide engineering support for platform services.
- Provide service center support for engineering to support coring, downhole tools, and platform equipment.
- Participate in engineering meetings with the implementing organizations, IODP-MI, and the SAS, as appropriate.
- Identify and implement tool enhancements required to meet the increasing engineering needs of the IODP scientific ocean drilling community.

ANALYTICAL SERVICES SECTION ACTIVITIES

Shipboard Technical Support

The Analytical Services Section will sail three Marine Laboratory Specialists, one Research Specialist, and one Programmer Specialist on each expedition to support shipboard laboratory activities. These staff members will sail in addition to other technical support personnel, such as the Laboratory Officer, Assistant Laboratory Officers, seagoing-only MLSs from the Science Operations Department, and the Marine Computer Specialists from the Information Technology and Data Services Department. Costs will be incurred for safety training and professional development courses.

Laboratory Systems Support

General Maintenance

The Analytical Services Section will coordinate all maintenance of the shipboard laboratory systems using new communications and response protocols. Routine maintenance will include repairs, and in rare cases replacement, of malfunctioning equipment; professional service calls; upgrades for application authoring tools; applications upgrade to the latest version or migration to a new application platform, etc.

Digital Image Data Management

Scientists take hundreds of digital photomicrographs during many expeditions. At present, no unified process for acquiring, managing, and archiving these data exists. Members of the shipboard scientific party keep track of the photomicrographs using customized Microsoft Excel worksheets that are different for each expedition and lack metadata quality control. Neither these tracking sheets nor the actual images are systematically added to the database. In collaboration with the JOI Alliance teams and the other service sections, the Analytical Services Section will identify and purchase a suitable off-the-shelf digital image data management system for managing digital photomicrographs. Data archives and data access will be developed in collaboration with the Databases and Archives Section.

Visual Core Description

The collection and archiving of visual core description (VCD) data was accomplished during the past 6 years using the AppleCore program, which generated the "barrel sheets" included in the *Initial Reports* of the *Proceedings of the Ocean Drilling Program.* However, VCD data has not been kept in a relational database and cannot be retrieved online like other types of data. Furthermore, the use of different nomenclature schemes by various shipboard science parties over the years makes it difficult, if not impossible, to create a global database of VCDs. In addition, AppleCore is written

for a small window display and cannot effectively take advantage of the wealth of core logging data and digital imagery. As coordinated with JOI Alliance teams, the proposed VCD application upgrade will combine a more functional digital database, data entry application, and data access tools for VCD. For example, the digital database will allow collection of quantitative data (i.e., relative abundances of generally recognized lithologic and textural components) instead of being limited to the collection of lithologic names. The data entry application will support the collection of macroscopic as well as microscopic observations and provide assistance to the user for condensing the observations into core summaries (barrel sheets), hole summaries, and site summaries. Large-format displays will permit images and other data from previously described intervals from the same hole or from a different hole or site to be displayed side by side with data that is being newly described. The data entry application will also be configured to allow for the addition of digital sketches to the database using electronic notepads or other technology.

Graphical Data Reports

ODP shipboard scientific parties spent a significant amount of time preparing standard data plots for analysis and reporting. The science support staff also spent a significant amount of time during each expedition teaching the use of shipboard graphics program to the scientists so they could prepare standard multipane layouts that are needed on each expedition. After each expedition, in-house graphics specialists repeatedly corrected layouts, labels, units, and tick marks for similar types of plots. The Analytical Services Section will alleviate this situation by customizing and implementing off-the-shelf browser-based software or by designing such a program that creates standard multipanel graphical data reports in addition to tabular reports, directly from the database without the need to download the data and to plot them in a separate graphics program. Chemistry and core logging data applications will be targeted first as those plots have been most time-consuming to generate and edit.

Shipboard Age Models

For any drill site that has chronostratigraphic objectives, the scientific party attempts to establish a preliminary age-depth model for shipboard geological interpretations and for guiding the investigators' sampling program and research proposals. At present, tools for generating accurate (albeit low resolution) age models in a rigorous and efficient manner do not exist. Analytical Services will complete the implementation of age control data, create an age-depth modeling application to assist the iterative process of creating a shipboard age-depth function, and complete the necessary database entities to capture age models and convert depth to age for any data report. Part of this effort may be developed in collaboration with other IODP implementing organizations, particularly with Japan's IODP implementing organization, which has undertaken efforts with similar goals.

Laboratory Information Management

The Analytical Services Section will continue to integrate and make accessible all information related to the IODP-USIO, Science Services, TAMU laboratories. Inventories of all laboratory systems and associated equipment, and documentation of these systems at multiple levels of detail will be added to the current Oracle database and linked to the relevant science data. That information will be available online. Descriptions of ongoing enhancement activities will be made easily available to IODP management entities. Many of the documents have to be created, updated, integrated, edited, and formatted.

Shore-based Instrument Facilities

The Analytical Services Section will establish a shore-based laboratory designed to support the analytical capabilities aboard the riserless vessel. The Section Project Administrator for the Analytical Services Section will be responsible for the day-to-day operation of the shore-based laboratories. The activities that will be conducted out in this shore-based facility are the design, development, testing, and acceptance of analytical systems before deployment on the vessel, and the training of new marine technical staff regarding the procedures and operation of analytical equipment used aboard the ship..

ENGINEERING SERVICES SECTION ACTIVITIES

Shipboard Engineering Support

The Engineering Services Section will sail engineers and/or designers to support operations in achieving the science objectives where engineering support is required (i.e., installing borehole observatories, running special drilling or completion equipment, supporting heavy downhole tool usage). Engineers and/or designers may also sail for the purpose of testing new or upgraded downhole tools or new or upgraded rig instrumentation equipment.

Engineering Systems Support

The Engineering Service Section provides engineering support for science expeditions, downhole instrumentation, in situ measurement tools, coring and drilling tools, rig instrumentation and special rig equipment (e.g., Active Heave Compensator). On shore, the Engineering Service Section is responsible for the repair, maintenance, calibration, and upgrade of all in situ measurement tools. In addition, the Engineering Service Section serves as the technical liaison for integrating third-party downhole technology for use aboard the IODP-USIO riserless vessel.

In Situ Measurement Tools and Rig Instrumentation

The Engineering Service Section supports a number of downhole tools for the collection of temperature and pressure data and formation fluids, as well as rig instrumentation electronics and hardware, with spare parts, repair, testing, and calibration.

Third-Party Support

Peter Flemings (Penn State University) and Jack Germaine (Massachusetts Institute of Technology) are funded for the development of a Dual Pressure-Temperature Tapered Probe (DPTTP). The Engineering Services Section will support this development by providing integration, laboratory testing, and shipboard testing. Andy Fisher (University of California, Santa Cruz) and Heiner Villinger (Universitat Bremen) are funded for the development of an advanced piston corer (APC) temperature tool with two thermistors offset ~0.5 m. The Engineering Services Section will support this development by providing integration, laboratory testing, and shipboard testing.

Upgraded APC Temperature Tool

The APC temperature (APCT) tool (also known as the Adara temperature tool) contains obsolete electronic components and is no longer supported by the vendor. The APCT2 is being developed to replace the APCT electronics. Three new prototype boards that integrate modifications and are hardened for downhole operation were fabricated in FY04. These tools are targeted for deployment during Expedition 303. After a sea trial, development of the APCT2 requires additional shore testing in the Simulated Borehole Test Facility (SBTF). The target for a second sea trial is Expedition 306.

Instrumented Water Sampler

The Instrumented Water Sampler (IWS) is the next-generation replacement for the Water Sampling Temperature Probe (WSTP). The design goal of the IWS is to control the fluid extraction rate via software feedback from a differential pressure sensor across the intake port or from the amperage draw of the motor. The project was planned as a two-phase development. During Phase 1, a prototype was deployed during ODP Leg 208 for sea trials. The Leg 208 version did not have the feedback features. Phase 2 development of the WSTP tool will implement the software feedback control based on the data from Leg 208 as well as incorporate design changes from ODP Leg 208. The target for deploying the Phase 2 WSTP prototype is Expedition 306.

Hydraulic Piston Delivery System for the Temperature-Pressure Probe

Recent ODP expedition operations with the Davis-Villinger Temperature Probe (DVTP) and the Davis-Villinger Temperature-Pressure Probe (DVTPP) showed significant improvement in the quality of the temperature measurements when the probe tool was inserted into the sediments via rapid insertion (semi–free fall) versus the driller pushing in the tool. A new delivery system, called Hydraulic Piston Delivery System (HPDS), will provide the means to effect the rapid insertion. The HPDS hydraulic mechanism will operate much like the APC system for coring and require relatively little design effort to implement. A "speed" pin concept, in which the hydraulic insertion force is set by the shear strength of a series of shear pins, will be used in the HPDS design. Much of the CDS hardware will be integrated into the design. The target for deploying the HPDS is Expedition 306.

Hard Rock Orientation

The Hard Rock Orientation (HRO)/Sonic Core Monitor (SCM) was an ODP project that produced a prototype but was suspended because of shifting priorities and personnel. The primary purpose of the system is to magnetically orient hard rock cores where recovery is poor. The purpose of the SCM is to track the core position in the core barrel as the core is cut. The ultimate target for a fully tested system is for the first hard rock expedition in IODP-USIO Phase 2. A prototype for land testing would be ready by the fourth quarter of FY05.

Pulsed Telemetry Module (PTM)

The IODP-USIO's only measurement-while-drilling (MWD) tool, the Drilling Sensor Sub (DSS), has internal memory that can be transmitted to a receiver antenna located on the Retrievable Memory Module (RMM). The RMM can be retrieved by coreline and its data downloaded aboard vessel. The data can be viewed and analyzed in near time (in ~1 hr) after an interval is drilled or cored. This oil exploration technology was transitioned to scientific ocean drilling in ODP with initial testing of the tool during ODP Legs 208 and 210. The next step to make the DSS more valuable is to integrate a commercial Pulsed Telemetry Module (PTM) with the RMM to transmit downhole data (weight on bit, torque on bit, pressure, temperature) to the surface in real time during drilling and coring operations. The PTM can also be integrated with the SCM to transmit core recovery to the surface in real time. Application of this technology to the DSS and SCM will bring real-time information to the driller and scientists that would allow on-the-spot adjustments to improve core recovery. The acquisition of a commercial PTM would require custom integration. This project is a joint effort with Lamont-Doherty Earth Observatory (LDEO). The target for a sea trial evaluation is Expedition 306.

Nonmagnetic Core Barrels

Design compatibility and the cost of using nonmagnetic core barrels with the three coring systems will be evaluated. We will assess the cost impact of partial implementation as well as full

implementation with replacement of the current magnetic core barrels. The study has no hardware costs associated with it.

Common Bottom-Hole Assembly

The Engineering Services Section will conduct a feasibility study for the development of a common bottom-hole assembly (BHA) for rotary core barrel (RCB), extended core barrel (XCB), and APC coring. This study will include a design review of the current systems and the development of multiple concepts. Costs and implementation strategy of the different concepts will be compared, and a final recommendation will be presented. The study has no hardware costs associated with it.

Engineering Information Management

The Engineering Service Section provides the centralized documentation control of all downhole tools, drilling and coring hardware, and rig instrumentation equipment. This includes drawings, schematics, specifications, assembly manuals, operations manuals, and calibration records. The Engineering Service Section also maintains confidential information provided by vendors.

Shore-based Drilling Tool-Support Facility

The Engineering Service Section is responsible for the shore-based laboratory and the instruments and test facilities to provide reliable calibrated tools for use on the riserless vessel.

Service Center Laboratory

The shore laboratory requires an annual supply of electronic components, batteries, and chemicals. IODP-USIO Science Services, TAMU, maintains temperature calibrations for six different in situ downhole tools (20 tools total). For calibration tracking and verification of each tool, a temperature bath setup is needed for recording the full range temperature profile of each tool.

Dynamometer

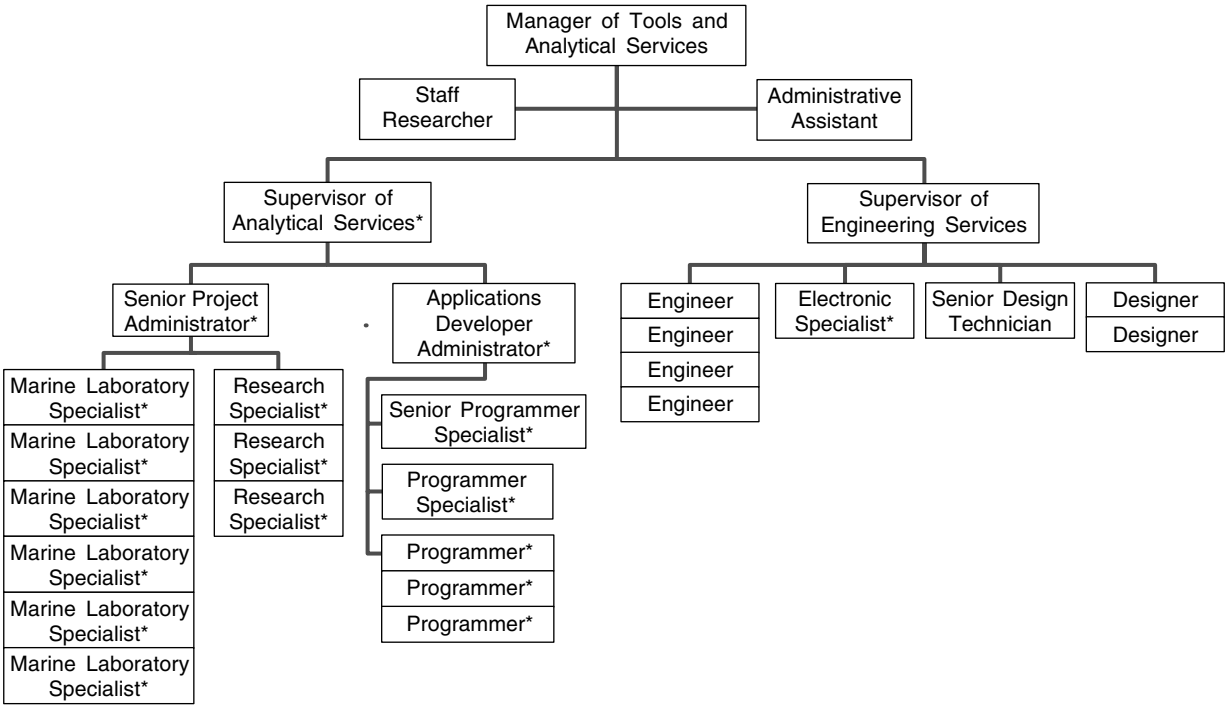
Whenever possible, prototype tools should be put through simulated functional tests on shore prior to sea trials. Not only does land testing reduce the design cycle, but it will also save costs od components and vessel time. During ODP, equipment tests were conducted in commercial facilities but scheduling and logistic problems often resulted in significant delays. Moreover, costs for these tests were often prohibitive. IODP-USIO Science Services, TAMU, is working on an agreement with Schlumberger for access to the company's excellent test facilities in Sugar Land, Texas. However, Schlumberger does not have a dynamometer that can test the DSS in the operating ranges required. IODP-USIO Science Services, TAMU, has acquired a surplus dynamometer module from Maurer Technology. The additional hardware needed to create a functional dynamometer facility are a frame, a motor, swivel, load cells, and data acquisition electronics. An on-site dynamometer facility will verify the DSS weight-on-bit (WOB) and torque-on-bit (TOB) measurements, and the control and acquisition system will also simultaneously record the dynamometer input for WOB and TOB. The RMM will be tested with the DSS for shock and vibration to simulate the downhole dynamic conditions. The target for an operational dynamometer is the second quarter of FY05.

Riverside Test Facilities

The SBTF and the dynamometer are located at the TAMU Riverside Campus. A shelter is needed to partially protect the equipment from the elements.

ORGANIZATIONAL CHART

IODP-USIO Science Services, TAMU
Tools and Analytical Services Department



* IODP funded in FY05.
All other positions funded by both ODP and IODP in FY05.

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BUDGET

414042-01000 Tools and Analytical Services Department – Office

Exp. Cat.	Description	FY05 Phase 1 Total		FY04 Total	
		SOC	POC	SOC	POC
2000	Payroll	$ 37,823	$ 37,823	$ 116,487	$ -
3500	Travel	8,610	8,610	15,000	-
3551	Relocation	10,000	10,000	10,000	-
3600	Training	24,457	24,456	22,413	-
3720	Business Conferences	750	750	1,500	-
4000	Supplies	4,500	4,500	9,000	-
4765	Software	7,500	7,500	15,000	-
5261	Shipping	2,500	2,500	5,000	-
5370	Telecommunications	7,000	7,000	14,000	-
5550	Services	1,500	1,500	3,000	-
5570	Consultant Services	-	-	25,000	-
5986	Furniture	1,000	1,000	2,000	-
5987	Recruiting	3,000	3,000	6,000	-
6820	Maintenance & Repair	2,500	2,500	5,000	-
8510	Library	1,250	1,250	2,500	-
	TOTAL	**$ 112,390**	**$ 112,389**	**$ 251,900**	**$ -**

414042-01000 Tools and Analytical Services Department – Office

Funds in this cost center are budgeted as follows:

Payroll—Salary and fringe for 3 employees (2.3 FTEs), including an anticipated 3% state-mandated salary increase: Manager, Administrative Assistant, and Staff Researcher.

Travel—Transportation, per diem, and lodging, exclusive of travel related to port calls. Covers the cost of the Manager attending four domestic IODP coordination meetings addressing JOI Alliance working teams, professional meetings, and an international meeting with Japanese and European IODP implementing organizations on joint operational and engineering interfaces.

Relocation—Relocation costs for new positions. We expect that the candidates (domestic or overseas) will need assistance in relocation to a maximum of $10,000 each.

Training—Registration and expenses related to professional training. Covers expenses of on-campus software courses for all department staff members along with training for employees in communication, team building, project management, and supervision.

Business Conferences—Incidental expenses associated with five 1-day liaison meetings with vendors at the IODP-USIO Science Services, TAMU, College Station facilities.

Supplies—Office and operational supplies.

Software—Software purchases and upgrades. Covers project management software for 15 workstations.

Shipping—Postage, overnight delivery, and courier services.

Telecommunications—Telephone and fax charges.

Services—Expert assistance. Covers the cost of annual physical examinations for seagoing personnel and external copying requirements.

Furniture—Office furniture for new staff members.

Recruiting—Employee recruitment. The department will be searching for three new Research Specialists with specialized skills and experience in physics, chemistry, microbiology, earth sciences (e.g., geology or paleomagnetism), or related fields, along with an Electronic Specialist. Covers the cost of advertisements in science journals and trade journals.

Maintenance and Repair—Maintenance agreements and equipment repairs. Covers the department's office equipment and a portion of the cost of IODP-USIO Science Services, TAMU, copier maintenance agreements.

Library—Books, journals, and other resources.

414042-02000 Tools and Analytical Services Department – Analytical Services Section

Exp. Cat.	Description	FY05 Phase 1 Total		FY04 Total	
		SOC	POC	SOC	POC
2000	Payroll	$ 454,386	$ 42,963	$ 483,985	$ 152,506
3500	Travel	106,460	-	59,287	-
3580	Travel to/from Port	27,030	3,180	16,786	22,450
3600	Training	36,062	13,295	51,833	51,833
3720	Business Conferences	1,500	-	1,500	-
4765	Software	25,000	-	11,100	-
5550	Services	80,000	-	31,900	-
5986	Furniture	-	-	3,500	-
6820	Maintenance & Repair	37,300	-	19,000	500
8400	Equipment	20,000	-	52,500	-
	TOTAL	**$ 787,738**	**$ 59,438**	**$ 731,391**	**$ 227,289**

414042-02000 Tools and Analytical Services Department – Analytical Services Section

Funds in this cost center are budgeted as follows:

Payroll—Salary and fringe for 17 employees (17 FTEs), including an anticipated 3% state-mandated salary increase: Supervisor of Analytical Services, Senior Project Administrator, Marine Laboratory Specialists (MLSs) (6), Research Specialists (3), Senior Programmer Specialists (2), a Programmer Specialist, and Programmers (3). Also includes sea pay for nine employees.

Travel—Transportation, per diem, and lodging, exclusive of travel related to port calls. Covers the cost of the Supervisor attending a domestic and an international meeting of SciMP, two meetings (with participation from four Science Services staff members) in Japan with the Japanese and European implementing organization staffs to continue development on various laboratory and analytical software development projects, and six vendors visits in Houston.

Travel to/from Port—Transportation, per diem, and lodging for travel to and from the vessel at port calls. Covers the travel costs of three MLSs, a Research Specialist, and a Programmer sailing on each expedition.

Training—Registration, transportation, per diem, and lodging expenses related to professional training. Covers the cost of 5 out of 17 Analytical Services staff members taking safety training (HAZWOPER, STWC, and H_2S). In addition, six MLSs are budgeted to attend a professional conference or workshop, and each programmer is budgeted to attend two courses or workshops.

Business Conferences—Incidental expenses associated with five 1-day liaison meetings with a Japanese and European IODP implementing organization laboratory services team at the IODP-USIO Science Services, TAMU, College Station facilities.

Software—Software purchases and upgrades. Covers software upgrades and $20,000 to purchase an imaging management software package for microimages.

Services—Expert assistance. Covers expenses associated with one undefined service call to the vessel for laboratory equipment and for a technical writer to assist in defining a template for laboratory operations manuals and produce content for as many as seven laboratory manuals that will document laboratory equipment and associated equipment specifications, data quality, standard operating procedures and maintenance procedures, and critical spares in a standard format for ease of updating and referencing. These manuals will serve as legacy material for IODP.

Maintenance and Repair—Maintenance agreements and equipment repairs. Covers ongoing maintenance, repair, and upgrades of shipboard laboratory equipment, including safety equipment, for a 7-month operational period and $10,000 to support shore-based laboratory equipment.

Equipment—Covers the cost of procuring a large data image display for use with the visual core description activity.

414042-03000 Tools and Analytical Services Department – Engineering Services Section

Exp. Cat.	Description	FY05 Phase 1 Total		FY04 Total	
		SOC	POC	SOC	POC
2000	Payroll	$ 361,239	$ 172,780	$ 387,547	$ 21,897
3500	Travel	10,770	-	5,119	-
3580	Travel to/from Port	-	6,042	-	8,261
3600	Training	17,896	-	16,334	-
3720	Business Conferences	1,500	-	1,500	-
4000	Supplies	-	28,907	-	604,762
4765	Software	-	31,100	47,845	-
5550	Services	-	197,713	12,500	-
6820	Maintenance & Repair	-	94,520	60,500	-
8400	Equipment	167,500	-	71,000	-
	TOTAL	**$ 558,905**	**$ 531,062**	**$ 602,345**	**$ 634,920**

414042-03000 Tools and Analytical Services Department – Engineering Services Section

Funds in this cost center are budgeted as follows:

Payroll—Salary and fringe for 9 employees (7.5 FTEs), including an anticipated 3% state-mandated salary increase: Supervisor of Engineering Services, Engineers (4), Designers (3), and Electronics Specialist. Includes sea pay for five employees. Also includes funds for two Graduate Assistant Researchers to assist with tool analysis, tool design, general drafting, and data analysis.

Travel—Transportation, per diem, and lodging, exclusive of travel related to port calls. Covers travel costs related to two IODP implementing organization engineering coordination meetings, eight vendor meetings in Houston, an engineering coordination meeting on downhole tools with Japanese and European IODP implementing organizations in Japan, and seven staff members attending professional conferences such as the Offshore Technology Conference.

Travel to/from Port—Transportation, per diem, and lodging for travel to and from the vessel at port calls. Covers the travel cost of an Engineer or Designer sailing on Expedition 305 to support hammer operations and on Expedition 306 to support a Cork-II installation.

Training—Registration, transportation, per diem, and lodging expenses related to professional training. Covers expenses associated with seven staff members taking either a geometric dimensioning and tolerancing course or a Solid Works seminar or an equivalent conference.

Business Conferences—Incidental expenses associated with five 1-day liaison meetings with JOI Alliance members and vendors at the IODP-USIO Science Services, TAMU, College Station facilities.

Supplies—Operational supplies. Covers procurement of a simple Cork-II legacy hole completion for Expedition 306.

Software—Software purchases and upgrades. Covers software required for Labview modules, Diadem, and Matlab/Simulink.

Services—Hammer rental and the services of an SDS service engineer for Expedition 305.

Maintenance and Repair—Maintenance agreements and equipment repairs. Covers ongoing maintenance, repair, and upgrades of the three APCT tools, the DVTP and DVTPP tools, the APC-Methane tools, the DSS-RMM tools, rig instrumentation spares, third-party tool development, laboratory supplies, instruments and equipment, a temperature bath, and installation of test equipment at the TAMU Riverside Campus. The budget also includes the cost of a service agreement for an Engineering Services Section laser printer.

Equipment—In order to maintain state-of-the-art capabilities, efforts will focus on fabrication and enhancement of the APCT2, the IWS, and the Hydraulic Piston Delivery System. In addition, efforts will include the prototype development of a Hard Rock Orientation and SCM System and a Pulsed Telemetry System for use with the DSS and SCM.

INFORMATION TECHNOLOGY AND DATA SERVICES DEPARTMENT

DEPARTMENTAL RESPONSIBILITIES

The Information Technology and Data Services Department is responsible for providing state-of-the-art computing facilities on board the riserless drillship and on shore; ensuring data quality collected on the riserless vessel; archiving data; providing data and samples to the community; managing the DSDP, ODP, and IODP-USIO core collections; and interacting with the SAS committees, the JOI Alliance Joint Information Team (JIT), and other implementing organizations to integrate the department's information technology (IT) and data handling efforts across the entire IODP, with coordination by IODP-MI.

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

Information Technology Support Section

- Provide IT services to support riserless drilling operations aboard the IODP-USIO Phase 1 vessel as well as in the IODP-USIO Science Services, TAMU, office and repositories.
- Continue reviewing the IT security situation and maintain a forward compliance with guidelines as set forth by the TAMU College of Geosciences and other applicable regulatory agencies; annually assess and review physical and network security; and install new physical security devices at the IODP-USIO Science Services, TAMU, facility, as may be required.
- Seek opportunities for greater IT industry involvement through user group participation, conferences, and trade shows.

Databases and Archives Section

- Perform the beginning-of-expedition and end-of-expedition maintenance procedures to set up the Janus database at the start of each expedition and to merge vessel data with the master database on shore. Provide general Oracle database maintenance.
- Coordinate the Janus data model and the Janus database with JAMSTEC's OD21 database by periodically meeting with the representatives of JAMSTEC and IODP-MI. Add new data types to the Janus data model and the database.
- Assist IODP-MI with its implementation plan to integrate IODP-USIO data.
- Archive and maintain IODP-USIO riserless vessel data by receiving the data from the vessel and cataloging it; microfilming and/or imaging the data received in paper form; processing seismic and underway data; conducting data validation for quality assurance; and processing data requests.
- Provide photography/imaging support, including support on the riserless vessel; maintain microscopes; process photo requests; and provide scanning services.
- Maintain departmental nonscience database applications for IODP-USIO Science Services, TAMU.

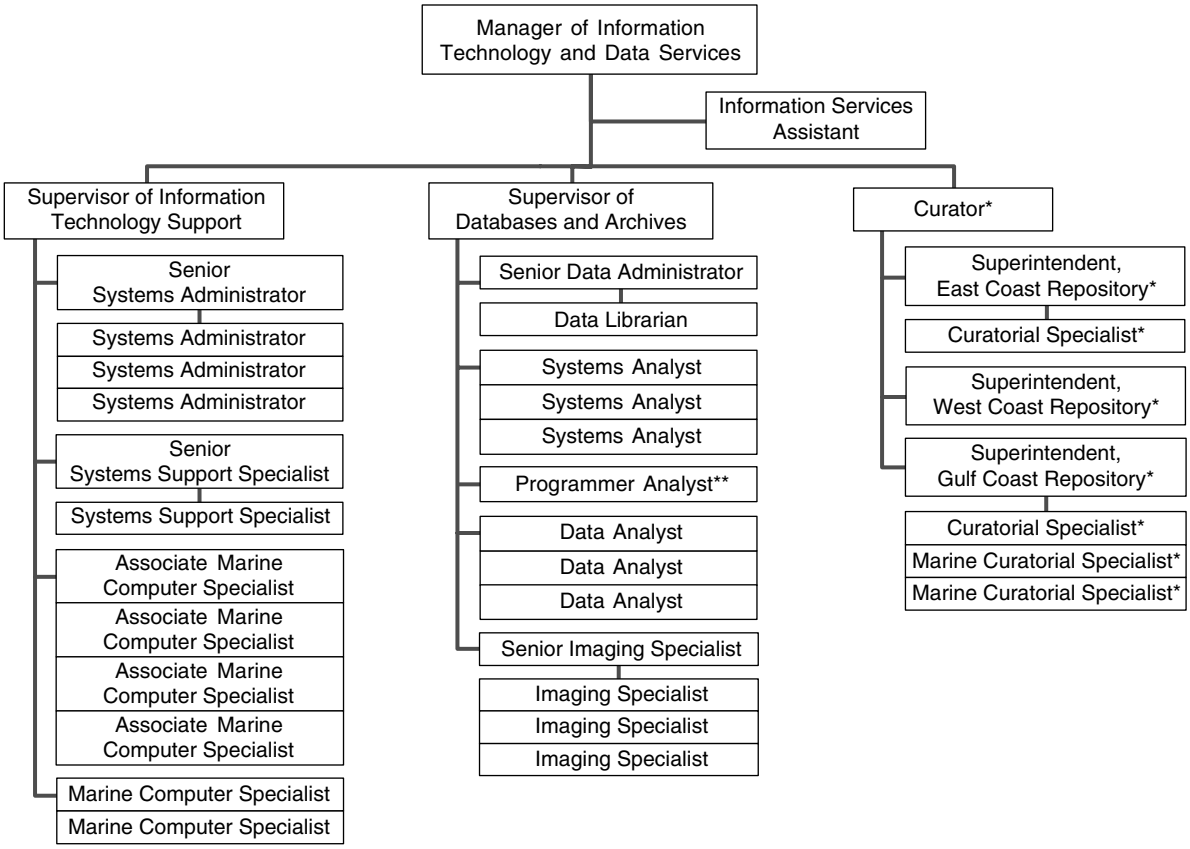
Curatorial Section

- Provide services in support of drilling program core sampling, analysis, and education.

- Conduct all responsibilities associated with curation of the core collection.
- Provide planning and implementation strategies for core sampling and curation. Working with other implementing organizations, the SAS, and IODP-MI, develop a policy for IODP-USIO curation. Plan sample and curation strategies for upcoming expeditions and review all shipboard and moratorium-related requests in coordination with each IODP-USIO expedition's Staff Scientist and Co-Chief Scientists.
- Promote the educational use of the core collection in collaboration with the IODP-USIO, other implementing organizations, and IODP-MI educational personnel by providing materials for display at meetings or museums, as well as conducting tours and facilitating educational activities.

ORGANIZATIONAL CHART

IODP-USIO Science Services, TAMU
Information Technology and Data Services Department



* IODP funded in FY05.
** ODP funded in FY05.
All other positions funded by both ODP and IODP in FY05.

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BUDGET

414052-01000 Information Technology and Data Services Department – Office

Exp. Cat.	Description	FY05 Phase 1 Total		FY04 Total	
		SOC	POC	SOC	POC
2000	Payroll	$ 63,835	$ 63,835	$ 105,131	$ -
3500	Travel	12,820	12,820	10,910	-
3551	Relocation	3,000	3,000	30,000	-
3580	Travel to/from Port	3,097	3,096	-	-
3600	Training	1,136	1,136	2,620	-
3720	Business Conferences	125	125	-	-
4000	Supplies	1,372	1,373	2,885	-
5261	Shipping	75	75	200	-
5370	Telecommunications	10,180	10,180	22,872	-
5373	Ship–to–Shore Communications	-	-	1,020	-
5550	Services	13,664	13,665	24,800	-
5569	Other Computer Services	174	174	-	-
5590	TAMU Computing Services	-	-	1,000	-
5986	Furniture	-	-	15,000	-
5987	Recruiting	-	-	4,650	-
6820	Maintenance & Repair	250	250		-
8510	Library	59	59	200	-
	TOTAL	**$ 109,787**	**$ 109,788**	**$ 221,288**	**$ -**

414052-01000 Information Technology and Data Services Department – Office

Funds in this cost center are budgeted as follows:

Payroll—Salary and fringe for 2 employees (1.7 FTEs), including an anticipated 3% state-mandated salary increase: Department Manager and Information Services Assistant.

Travel—Transportation, per diem, and lodging, exclusive of travel related to port calls. Covers travel cost of the manager attending two SciMP meetings, two JIT meetings, one IO meeting, two IODP-MI database meetings, and one professional/technical symposium and visits to each of the IODP core repositories.

Relocation—Relocation costs for one professional staff member. Funds needed to fill a position vacancy.

Travel to/from Port—Transportation, per diem, and lodging for travel to and from the vessel at port calls. Covers the travel cost of the department Manager attending the port calls for Expeditions 304 and 306.

Training—Registration, transportation, per diem, and lodging expenses related to professional training. Covers the cost of the Information Services Assistant attending a software license management training course.

Business Conferences—Incidental expenses associated with various business meetings at IODP-USIO Science Services, TAMU.

Supplies—Office and operational supplies. Covers general office supplies, electronic media and other computer supplies, printer and copier supplies, and paper.

Shipping—Postage, express mail, and freight. Covers postage for regular correspondence and small packages.

Telecommunications—Telephone and fax charges. Covers all departmental telephones, cell phones, long-distance calls, and faxes.

Services—Expert assistance. Covers printing services, university physical plant services, safe deposit box rentals, physical examinations for seagoing personnel, and IT consulting services.

Maintenance and Repairs—Maintenance agreements and equipment repairs. Covers a portion of the cost of IODP-USIO Science Services, TAMU, copier maintenance agreements.

Library—Books, journals, and other resources. Covers the cost of various professional books and materials purchased for Manager and Information Services Assistant.

414052-02000 Information Technology and Data Services Department – Information Technology Support Section

Exp. Cat.	Description	FY05 Phase 1 Total		FY04 Total	
		SOC	POC	SOC	POC
2000	Payroll	$ 443,186	$ 192,645	$ 351,589	$ 154,591
3500	Travel	14,022	-	13,896	-
3580	Travel to/from Port	14,188	14,189	7,810	22,716
3600	Training	102,576	-	29,520	-
3720	Business Conferences	300	-	-	-
4000	Supplies	32,000	-	30,000	-
4765	Software	94,000	-	63,070	-
5261	Shipping	-	-	514	-
5550	Services	-	-	2,061	-
6820	Maintenance & Repair	73,625	-	111,220	-
8400	Equipment	165,600	-	207,200	251,750
8450	Non Inventory Control	28,400	-	-	-
8510	Library	2,560	-	1,200	-
	TOTAL	**$ 970,457**	**$ 206,834**	**$ 818,080**	**$ 429,057**

414052-02000 Information Technology and Data Services Department – Information Technology Support Section

Funds in this cost center are budgeted as follows:

Payroll—Salary and fringe for 13 employees (10.8 FTEs), including an anticipated 3% state-mandated salary increase: Supervisor of Information Technology Support, Senior Systems Administrator, Systems Administrators (3), Senior Systems Support Specialist, Systems Support Specialist, Associate Marine Computer Specialists (4), and Marine Computer Specialists (2). Includes sea pay for six employees. Also includes funds for two student workers to assist with help desk activities.

Travel—Transportation, per diem, and lodging, exclusive of travel related to port calls. Covers technical support visits to three core repositories, attendance at the annual AGU conference, and attendance at two professional conferences related to network and file storage.

Travel to/from Port—Transportation, per diem, and lodging for travel to and from the vessel at port calls. Covers the cost of transporting two Marine Computer Specialists to and from port at the beginning and end of each IODP-USIO expedition. Also includes funds for the supervisor to attend the Expedition 305 port call.

Training—Registration, transportation, per diem, and lodging expenses related to professional training. Provides for two specialized technical training trips for each of 12 staff members in support of IT on shore and on the drillship.

Business Conferences—Incidental expenses associated with various business meetings at IODP-USIO Science Services, TAMU.

Supplies—Office and operational supplies. Covers general office supplies, electronic media and other computer supplies, printer supplies, and media necessary for safe transport of data to and from the drillship.

Software—Software purchases and upgrades. Covers computer software available for concurrent license use, FTE-based subscription agreements, network operating system and applications software, and specialty software for systems and network monitoring.

Maintenance and Repairs—Maintenance agreements and equipment repairs. Covers contract-based maintenance services to ensure continued operation of critical equipment, including uninterrupted power systems, network equipment, servers, and a copy machine. Also includes seven software maintenance contracts.

Equipment—Office, computer, scientific, and drilling equipment. Covers the replacement of computer servers on shore and on the riserless vessel since existing equipment will have reached its end of life. The servers support the Janus database system, the IODP-USIO Science Services, TAMU, Web sites, file services, and network print services. New tape backup systems and disk storage systems will be purchased.

Equipment–Non-Inventory Controlled—Small computer peripherals. Along with the purchase of servers, tape, and disk subsystems, a number of smaller pieces of computer equipment (e.g., cables, keyboards, mice, connectors, external storage devices, etc.) will be purchased.

Library—Books, journals, and other resources. Covers IT professional and reference materials such as books, CD-ROM/DVD-ROM, and journal subscriptions.

414052-03000 Information Technology and Data Services Department – Databases and Archives Section

Exp. Cat.	Description	FY05 Phase 1 Total		FY04 Total	
		SOC	POC	SOC	POC
2000	Payroll	$ 396,057	$ -	$ 293,151	$ 16,843
3500	Travel	7,468	-	13,265	-
3580	Travel to/from Port	7,695	-	3,964	4,521
3600	Training	36,584	-	31,984	-
4000	Supplies	10,000	-	4,000	-
4765	Software	103,950	-	5,800	-
5261	Shipping	1,000	-	1,000	-
5550	Services	157,200	-	2,500	-
6820	Maintenance & Repair	-	-	20,600	-
8400	Equipment	16,200	-	-	-
8510	Library	1,200	-	800	-
	TOTAL	**$ 737,354**	**$ -**	**$ 377,064**	**$ 21,364**

414052-03000 Information Technology and Data Services Department – Databases and Archives Section

Funds in this cost center are budgeted as follows:

Payroll—Salary and fringe for 13 employees (6.6 FTEs), including an anticipated 3% state-mandated salary increase: Supervisor of Databases and Archives, Senior Data Administrator, Data Librarian, Systems Analysts (3), Data Analysts (3), Senior Imaging Specialist, and Imaging Specialists (3). Includes sea pay for three employees. Also includes funds for four Graduate Assistant Researchers to assist with various database activities .

Travel—Transportation, per diem, and lodging, exclusive of travel related to port calls. Covers costs of the Supervisor and a Systems Analyst attending a meeting at JAMSTEC.

Travel to/from Port—Transportation, per diem, and lodging for travel to and from the vessel at port calls. Covers the cost of transporting one Imaging Specialist to and from port at the beginning and end of each IODP expedition. Also includes funds for the supervisor to attend Expedition 305 port call.

Training—Registration, transportation, per diem, and lodging expenses related to professional training. Supports eight staff members attending technical training courses and on-campus computer training courses.

Supplies—Office and operational supplies. Covers general office supplies, electronic media and other computer supplies, printer supplies, and photo supplies on vessel and shore.

Software—Software purchases and upgrades. Funds are budgeted for a software package for a new IODP Asset Management System. To help enhance the digital imaging capabilities of the photographers/imaging specialists, funds are provided for editing software for both digital video and digital still cameras.

Shipping—Postage, express mail, and freight. Covers postage for regular correspondence and distribution of data and photo requests to scientists and shipping prime data for microfilming/imaging.

Services—Expert assistance. Covers customization of the software package for an IODP Asset Management System. Includes the cost of image scanning of paper prime data and PDR records.

Library—Books, journals, and other resources. Covers professional books related to database management, photographic processes, and digital imaging technology.

414052-04000 Information Technology and Data Services Department – Curatorial Office

Exp. Cat.	Description	FY05 Phase 1 Total		FY04 Total	
		SOC	POC	SOC	POC
2000	Payroll	$ 119,759	$ -	$ 44,816	$ -
3500	Travel	18,973	-	5,571	-
3600	Training	4,295	-	-	-
8400	Equipment	-	-	37,449	-
	TOTAL	**$ 143,027**	**$ -**	**$ 87,836**	**$ -**

414052-04000 Information Technology and Data Services Department – Curatorial Office

Funds in this cost center are budgeted as follows:

Payroll—Salary and fringe for 1 employee (1.0 FTE), including an anticipated 3% state-mandated salary increase: Curator, who coordinates and supervises curatorial activities at four repositories. Also includes funds for two Graduate Assistant Researchers to help process sample requests, enter and correct curation-related records in the database, and maintain files.

Travel—Transportation, per diem, and lodging, exclusive of travel related to port calls. Provides funds for the Curator to make 3-day site visits to the East Coast Repository (ECR), West Coast Repository (WCR), for the Curator and Gulf Coast Repository (GCR) Superintendent to make a 3-day site visit to the Kochi Repository, and for a staff member from one of the U.S. repositories to make a 1-week visit to the Bremen Core Repository (BCR) to assist at the first core analysis and sampling party of the Arctic Drilling Expedition. Also includes funds for the Curator to attend one professional conference.

Training—Registration, transportation, per diem, and lodging expenses related to professional training. Covers the cost of the Curator and one repository staff member attending management or curatorial training. Funds also cover course fees for IT/software training offered at TAMU.

414052-05000 Information Technology and Data Services Department – East Coast Repository

Exp. Cat.	Description	FY05 Phase 1 Total		FY04 Total	
		SOC	POC	SOC	POC
2000	Payroll	$ 89,668	$ -	$ -	$ -
4000	Supplies	1,500	-	-	-
5261	Shipping	3,500	-	-	-
5370	Telecommunications	3,450	-	-	-
5550	Services	135,450	-	-	-
6820	Maintenance & Repair	2,000	-	-	-
	TOTAL	**$ 235,568**	**$ -**	**$ -**	**$ -**

414052-05000 Information Technology and Data Services Department – East Cost Repository

Funds in this cost center are budgeted as follows:

Payroll—Salary and fringe for 2 employees (1.5 FTEs), including an anticipated 3% state-mandated salary increase: Repository Superintendent and a Curatorial Specialist (0.5 FTE). Also includes funds for one student worker to help with repository sampling, process sample requests, and maintain appropriate data files.

Supplies—Office and laboratory supplies. Covers general supplies to fulfill sampling and curatorial responsibilities.

Shipping—Postage, express mail, and freight. Covers costs of regular correspondence and shipping samples to scientists.

Telecommunications—Telephone and fax charges. Includes a base monthly cost for phone services provided by LDEO/Columbia, which makes up more than two-thirds of the amount budgeted. The remaining amount is for long-distance calls and faxes.

Services—Expert assistance. Covers the lease and utility costs (power, refrigeration) associated with the operation of the ECR. Also includes funds to cover a purchase order with Columbia University for indirect costs and services associated with charges incurred through LDEO/Columbia University, such as phone service, shipping and supplies. We assumed that the lease and utility costs will continue to rise at 3% annually, using the FY04 Program Plan as a base.

Maintenance and Repairs—Maintenance agreements and equipment repairs. Provides funds for the repair of sampling and office equipment.

414052-06000 Information Technology and Data Services Department – West Coast Repository

Exp. Cat.	Description	FY05 Phase 1 Total		FY04 Total	
		SOC	POC	SOC	POC
2000	Payroll	$ 92,389	$ -	$ -	$ -
4000	Supplies	1,000	-	-	-
5261	Shipping	1,900	-	-	-
5370	Telecommunications	1,000	-	-	-
5550	Services	67,750	-	-	-
6820	Maintenance & Repair	8,300	-	-	-
	TOTAL	**$ 172,339**	**$ -**	**$ -**	**$ -**

414052-06000 Information Technology and Data Services Department – West Coast Repository

Funds in this cost center are budgeted as follows:

Payroll—Salary and fringe for 1 employee (1.0 FTE), including an anticipated 3% state-mandated salary increase: Repository Superintendent. Includes sea pay for Expeditions 304 and 306.

Supplies—Office and laboratory supplies. Includes general supplies to fulfill sampling and curatorial responsibilities.

Shipping—Postage, express mail, and freight. Covers costs of regular correspondence and for shipping samples to scientists.

Telecommunications—Telephone and fax charges. Funds are included for telephones and long-distance calls and faxes.

Services—This category provides for the lease payments and utility costs associated with the operation of the WCR. We assume that these costs will rise at 3% annually, using the FY04 Program Plan as a base. Also covers student support and other services through University of California, San Diego.

Maintenance and Repairs—Maintenance agreements and equipment repairs. Covers building, refrigeration units, lab and office equipment, and forklift repairs and maintenance.

414052-07000 Information Technology and Data Services Department – Gulf Coast Repository

Exp. Cat.	Description	FY05 Phase 1 Total		FY04 Total	
		SOC	POC	SOC	POC
2000	Payroll	$ 195,658	$ -	$ -	$ -
4000	Supplies	51,000	-	-	-
5261	Shipping	31,500	-	-	-
6820	Maintenance & Repair	6,500	-	-	-
	TOTAL	**$ 284,658**	**$ -**	**$ -**	**$ -**

414052-07000 Information Technology and Data Services Department – Gulf Coast Repository

Funds in this cost center are budgeted as follows:

Payroll—Salary and fringe for 4 employees (4.0 FTEs), including an anticipated 3% state-mandated salary increase: Repository Superintendent, Curatorial Specialist, and Marine Curatorial Specialists (2). Also includes funds for four student workers to help with repository sampling, process sample requests, and maintain appropriate data files.

Supplies—Office and laboratory supplies. The GCR orders all sample supplies that come from a mold or single vendor for all repositories (ECR, WCR, GCR, and BCR); therefore, funds for these are concentrated in the GCR budget. Also includes general supplies to fulfill sampling and curatorial tasks at the GCR. Cost for refilling liquid N_2 for frozen hydrate samples**.**

Shipping—Postage, express mail, and freight. Covers costs of regular correspondence and for shipping samples to scientists.

Maintenance and Repairs—Maintenance agreements and equipment repairs. Covers the shrink-wrap machine, laboratory equipment, and the hazardous materials storage building that houses pressured hydrate cores.

PUBLICATION SERVICES DEPARTMENT

DEPARTMENTAL RESPONSIBILITIES

The Publications Services Department is responsible for developing, producing, delivering, and archiving all required reports and publications for the IODP-USIO in support of the riserless drilling vessel. In addition, the department will produce and publish the ECORD Expedition 302 initial shipboard publication. The department also serves as a publications liaison to IODP-MI, other IODP implementing organizations, and SAS panels to ensure communication and collaboration within the international ocean drilling community.

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

Editorial Section

- Edit all reports and publications handled by IODP-USIO Science Services, TAMU.
- Set/administer IODP style.
- Manage postexpedition publication citations and related statistics.

Production Section

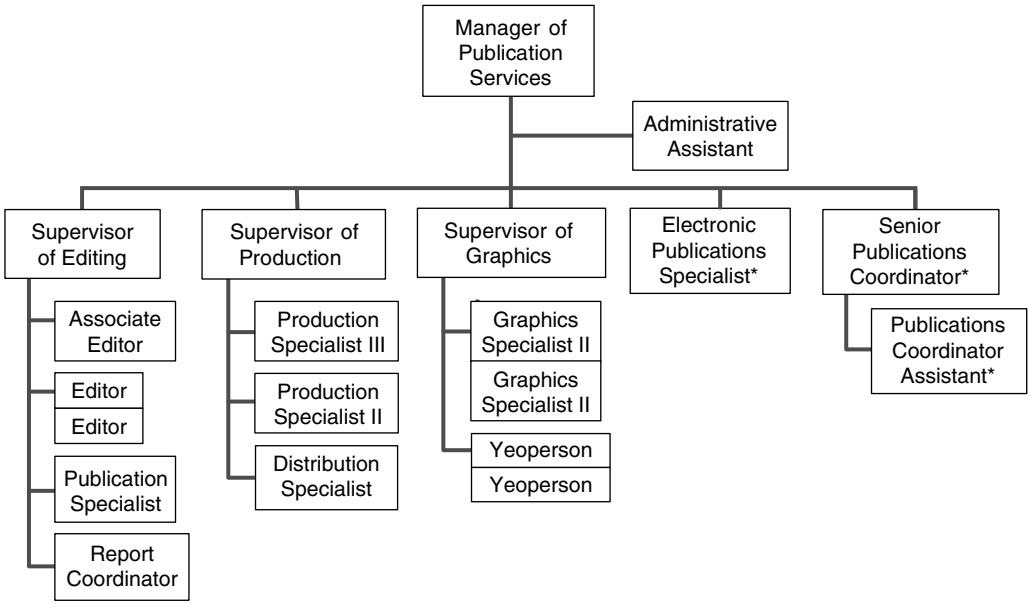
- Produce publications (and some reports) handled by IODP-USIO Science Services, TAMU, for print, Web, and/or CD-ROM.
- Serve as liaison with publishing subcontractors.
- Manage volume distribution and warehousing.

Graphics Section

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

ORGANIZATIONAL CHART

IODP-USIO Science Services, TAMU
Publication Services Department



* ODP funded in FY05.
All other positions funded by both ODP and IODP in FY05.

BUDGET

414062-01000 Publication Services Department

Exp. Cat.	Description	FY05 Phase 1 Total		FY04 Total	
		SOC	POC	SOC	POC
2000	Payroll	$ 727,748	$ -	$ 369,299	$ 8,702
3500	Travel	42,772	-	4,402	-
3551	Relocation	1,000	-	2,000	-
3580	Travel to/from Port	6,189	-	2,174	8,039
3600	Training	2,337	-	3,822	-
4000	Supplies	16,835	-	3,495	-
4765	Software	11,600	-	3,000	-
5261	Shipping	26,970	-	2,750	-
5370	Telecommunications	3,500	-	540	-
5550	Services	17,830	-	5,615	-
6509	Subcontracts	94,800	-	-	-
6820	Maintenance & Repair	1,310	-	600	-
8510	Library	630	-	-	-
	TOTAL	**$ 953,521**	**$ -**	**$ 397,697**	**$ 16,741**

414062-01000 Publication Services Department

Funds in this cost center are budgeted as follows:

Payroll—Salary and fringe for 17 employees (11.75 FTEs) (see organizational chart), including an anticipated 3% state-mandated salary increase. The two yeoperson positions are the department's only seagoing positions and include sea pay. Funding is also included for up to 1.76 FTEs for additional editing, graphics, and production support on an as-needed basis.

Relocation—Relocation costs for new staff members filling vacant positions.

Travel to/from Port—Transportation, per diem, and lodging for travel to and from the vessel at port calls. Covers Yeoperson travel costs related to Expeditions 304 through 306.

Travel—Transportation, per diem, and lodging, exclusive of travel related to port calls. Covers travel to one JREPORT meeting, two implementing organization meetings, one IODP-SAS panel meeting, and three professional meetings or conferences. Travel costs are included to bring two off-site IODP-USIO Science Services, TAMU, employees to College Station to staff the first postexpedition meetings for Expeditions 301 and 303–306 and to send six employees to Europe to staff the ECORD postexpedition meeting for Expedition 302. In addition, one staff member will attend AGU to represent IODP-USIO Science Services, TAMU, network with the IODP scientific community and staff, and provide updates on publication plans for IODP.

Training—Registration, transportation, per diem, and lodging expenses related to professional training. Covers the cost of two staff members attending technical training courses (e.g., scientific proofreading, software) and for staff members to attend on-campus software training courses.

Supplies—Office and operational supplies. Covers general office supplies, electronic media and other computer supplies, toner cartridges, and paper for printers and copiers.

Software—Software purchases and upgrades. Covers software packages needed by the Publication Services Department, such as word processing, page layout, CD- and DVD-authoring, Web publishing, and spreadsheet programs.

Shipping—Postage, express mail, and freight. Covers postage for regular correspondence and IODP-USIO reports.

Telecommunications—Telephone and fax charges. Covers departmental phone charge costs.

Services—Expert assistance. Covers the costs of letterhead and envelopes, printing the FY06 Annual Program Plan, photocopying services, microform costs for Expedition Scientific Prospectus and Preliminary Report issues, and safe deposit box rental fee for off-site storage of microform copies.

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

Subcontracts—Funds for subcontractors to index, print, and distribute initial shipboard publications for Expeditions 301–303. Costs for each volume are based on five hundred 800-page books.

Maintenance and Repair—Maintenance agreements and equipment repairs. Covers a portion of the cost of IODP-USIO Science Services, TAMU, copier maintenance agreements.

SHIP OPERATIONS

The major portion of the Ship Operations budget represents operational costs reimbursed directly to the vessel'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 vessel, including the marine crew, drilling personnel, and catering personnel. It does not cover the cost of the IODP-USIO Science Services, TAMU crew or the scientists aboard the riserless vessel. The day rate varies according to the operational mode of the vessel, which is generally operating, standing by, or cruising. Although 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-USIO Science Services, TAMU crew and scientists sailing on each expedition. 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 vessel contractor's crew is included in the day rate.

Locations have a definite effect on port call costs, which cover agents' expenses and freight associated with resupplying the vessel. During each port call, cores and equipment are off-loaded from the previous expedition 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-USIO Science Services, TAMU and paid for by IODP-USIO Science Services, TAMU/TAMRF. Similarly, IODP-USIO Science Services, TAMU/TAMRF purchases all drilling equipment and laboratory supplies necessary for meeting the objectives of the expedition. These costs are covered in other cost centers, not Ship Operations.

The fuel needed to operate the vessel also falls under Ship Operations. The amount of fuel taken depends on the amount of fuel consumed during the expedition 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 vessel include insurance, communications (e.g., very small aperature terminal [VSAT]), observers, supplies, services, and medivacs. These items are tracked separately. The Ship Operations – IODP General Support cost center shows all vessel-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 expedition and for obtaining drilling clearances is shown in this budget. Safety-related costs are also included in this cost center.

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BUDGET

414072-01000 Ship Operations – Subcontractor

Exp. Cat.	Description	FY05 Phase 1 Total		FY04 Total	
		SOC	POC	SOC	POC
3760	Per Diem	$ -	$ 294,872	$ -	$ 141,147
4750	Fuel & Lubricants	-	1,170,400	-	1,004,400
7040	Day Rates	-	13,537,310	-	7,969,900
7090	Port Calls	-	513,479	-	354,467
	TOTAL	**$ -**	**$ 15,516,061**	**$ -**	**$ 9,469,914**

414072-01000 Ship Operations – Subcontractor

Funds in this cost center are budgeted as follows:

Per Diem—Shipboard catering. Covers shipboard catering costs for 45 people per expedition. Also included in this category are lab stack cleaning costs at $14.00/day and a fixed charge of $325 per port call for extra meals served at the four full port calls.

Fuel and Lubricants—Fuel for the riserless vessel. Covers three refuelings in Ponta Delgada. We estimate that 1200 metric tons of fuel will be purchased at each refueling at an estimated price of $380/metric ton.

Day Rates—Vessel staffing for the sailing crew and drilling personnel. Amounts indicated are based on the total scheduled days of IODP-USIO Phase 1 operations at the initial day rates for operating ($67,000), cruising ($66,000), and standby ($65,000) through February 2005. An estimated increase of 2.26% in the rates is expected to take effect 1 March 2005, based on the projected movement of the CPI-U and the ECI for privately owned companies in the services industries.

Port Calls—Agent expenses and freight associated with resupplying the riserless vessel. Includes port call expenses billed through the vessel's agent and subcontractor's freight costs for three 4- to 5-day port calls in Ponta Delgada, and one 3-day port call in Reykjavik. Funds are also budgeted for hotel and per diem charges associated with four crew changes by the vessel subcontractor.

414072-02000 Ship Operations – General Support

Exp. Cat.	Description	FY05 Phase 1 Total		FY04 Total	
		SOC	POC	SOC	POC
3580	Travel to/from Port	$ 8,804	$ 17,466	$ -	$ 39,718
5070	Insurance	-	354,486	-	212,165
5373	Ship–to–Shore Communication	-	128,577	-	80,422
5550	Services	-	16,750	-	20,000
	TOTAL	**$ 8,804**	**$ 517,279**	**$ -**	**$ 352,305**

414072-02000 Ship Operations – General Support

Funds in this cost center are budgeted as follows:

Travel to/from Port—Transportation, per diem, and lodging for travel to and from the vessel at port calls. Covers travel of the Director, Deputy Director of Science Services, and HSE Coordinator to each attend one or more port calls scheduled in the fiscal year.

Insurance—Annual insurance premiums for coverage as described elsewhere in this program plan. Funds requested in FY05 represent an estimated 8 months of premiums, with the first 4 months of the fiscal year budgeted in FY04, and assumes NSF indemnification.

Ship-to-Shore Communications—Satellite and regular communication between the riserless vessel and shore-based personnel. This budget is based on the 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, and estimated usage of Inmarsat B as a backup system.

Services—Expert assistance. Covers costs of medical evacuations to be invoiced through the vessel's agent.

APPENDIX I: EXPEDITION OPERATIONS

INTRODUCTION

The FY05 Program consists of completion of a science program initiated at the end of FY04, and three complete science programs. A total of 212 operating days are proposed in FY05, consisting of 23 days in transit, 20 port call days, and 169 days focused on science delivery (on site and between-site transit). The schedule is summarized below.

22 September–14 November 2004	Expedition 303: North Atlantic Climate 1
14 November 2004–5 January 2005	Expedition 304: Core Complex 1
5 January–27 February 2005	Expedition 305: Core Complex 2
27 February–22 April 2005	Expedition 306: North Atlantic Climate 2

OPERATIONS

Expeditions 303 and 306: North Atlantic Climate 1 and 2

The objective of these two expeditions is to establish for the Late Neogene to Quaternary the intercalibration of geomagnetic paleointensity, isotope stratigraphy, and regional environmental stratigraphies to develop a millennial-scale stratigraphic template for the North Atlantic. Other objectives are (1) to better understand the relative phasing of atmospheric, cryospheric, and oceanic changes that are central to understanding the mechanisms of global climate change on orbital or millennial timescales, (2) to 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) to provide fundamental constraints for numerical models of the geodynamo. These goals 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 two-expedition program with five sites to be occupied during Expedition 303 and the remaining four sites cored during Expedition 306. In addition, at the last Expedition 306 site we will investigate the feasibility of reconstructing bottom-water temperature histories at the decadal to centennial timescale by making high-precision temperature-depth measurements at a location in the Norwegian-Greenland Sea with the proposed installation of a Cork and instrument string near ODP Site 642.

Proposed Operations

With the exception of the aforementioned final site of Expedition 306, from an operational standpoint these will be routine sediment coring expeditions. Each site will consist of multiple APC-cored holes to assure recovery of the complete sediment section. APC coring, employing the drillover technique, will extend to ~300 m below seafloor (mbsf). One site will be logged with the triple-combination tool and Formation MicroScanner/sonic tool strings. For the Norwegian-Greenland Sea site, the proposed operation is to jet in a reentry cone and deploy a thermistor string and Cork.

Experiments

The emphasis of these two expeditions will be on sediment core recovery and analysis. No downhole experiments are planned. Heavy use of the core imaging system, a magnetometer, and multisensor

track systems can be expected. No downhole experiments are anticipated for the Norwegian-Greenland Sea Cork site.

Environment and Safety

There is a high risk of losing operating time because of severe weather and ice conditions. The optimum weather window for drilling these sites is July through September. Scheduling these expeditions in the September–November and February–April time frame increases the risk of operational downtime (to about 10%) attributable to weather. To minimize risks to the safety of equipment and personnel, we will arrange for daily site-specific forecasts from a weather service experienced in North Atlantic conditions and a dedicated local weather observer will sail. Three additional operating days have been added to Expedition 303 to accommodate operating time lost because of weather. There is a low risk of encountering poor hole conditions.

Logistics

Operations for Expedition 303 will require an estimated 53 days (5 in port, 5 in transit, and 43 on site). Note that this expedition straddles the FY04/FY05 program years. Operations for Expedition 306 require an estimated 54 days (5 in port, 4 in transit, and 45 on site).

Expeditions 304 and 305: Core Complex 1 and 2

This two-expedition 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 penetration site on the Atlantis Massif to sample through the detachment fault zone and the alteration front and to drill into unaltered mantle rocks, and a shallower penetration 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 to maximize the chances of achieving deep penetration. The first casing string (13-3/8 in) will be set to ~20 mbsf using the HRRS Hammer Drill-in Casing system. Each site will then be RCB cored to ~130 mbsf and opened using a bicentered bit or underreamer, allowing a second (10¾ in) casing string to be set. Each hole will then be RCB cored to maximum depth and logged. During Expedition 304, both sites will be established with the HRRS Hammer Drill reentry cone/casing system and drilled to casing depth. The supplemental 10¾-in casing strings will be set (as required). Remaining time will be devoted to drilling and coring the hanging wall hole to the maximum depth possible in the available time. Expedition 305 will be devoted to deepening the hole at the footwall site to the maximum depth possible. Plans call for a limited trial (~50 m) of the Advanced Diamond Core Barrel (ADCB) coring system during Expedition 304 to further evaluate the potential of this system to achieve improved hard rock core recovery and quality over the conventional RCB system. Three days have been added to the Expedition 304 schedule for the ADCB evaluation. If successful, the ADCB may be used further during Expedition 305.

Experiments

A borehole vertical seismic profile (VSP) experiment has been proposed at the footwall site. All other operations during these two expeditions will focus on maximizing recovery and increasing depth of penetration.

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, we will be prepared to case the upper 120 m of each hole. 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 the section. 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.

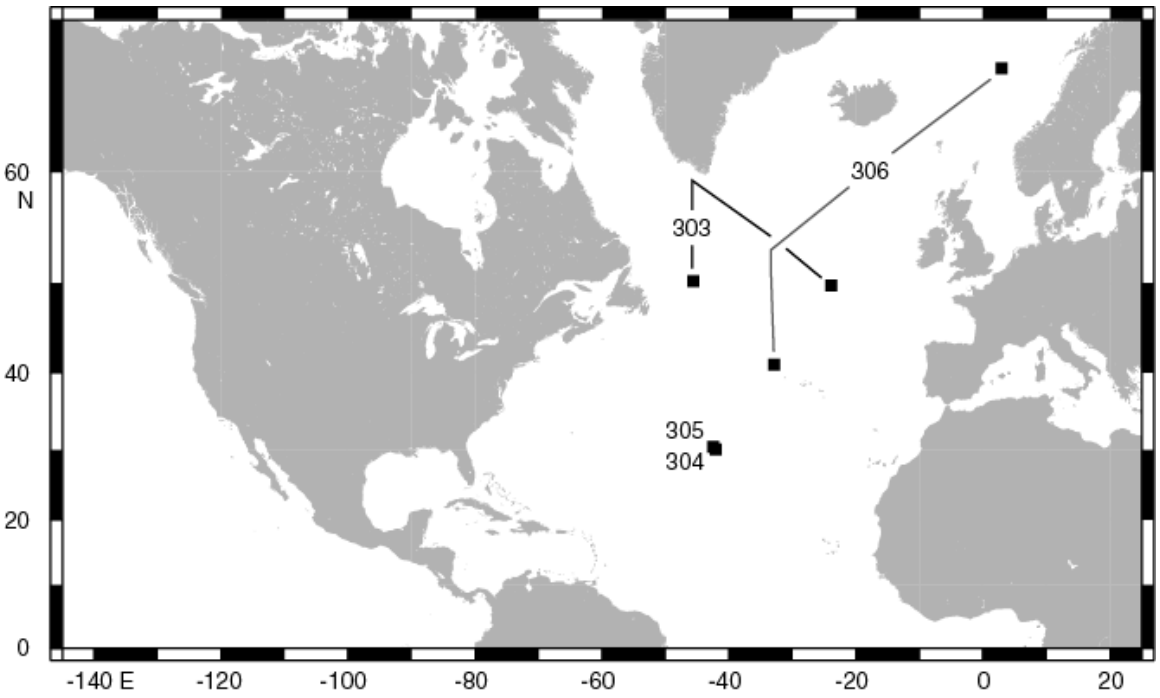
Weather conditions should not be a limiting factor, even though this expedition is scheduled for late fall 2004.

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 for Expedition 304 require an estimated 52 days (5 in port, 7 in transit, and 40 on site). For Expedition 305, operations require an estimated 53 days (5 in port, 7 in transit, and 41 on site).

Figure 1. IODP-USIO FY05 expedition map.



IODP-USIO SCIENCE SERVICES, TAMU, EXPEDITION OPERATIONS BUDGET

Description	Expedition 303	Expedition 304	Expedition 305	Expedition 306
Payroll	$662,719	$783,209	$798,274	$828,394
Travel	$15,899	$18,789	$19,150	$19,874
Travel to/from Port	$0	$70,296	$59,776	$94,368
Training	$25,065	$28,412	$28,830	$29,667
Supplies	$3,599	$3,708	$327,006	$331,077
Software	$10,000	$10,000	$10,000	$10,000
Library	$167	$167	$167	$167
Insurance	$63,807	$90,394	$99,256	$101,029
Shipping	$50,000	$78,000	$90,000	$120,900
Professional Services	$38,308	$39,740	$39,920	$40,282
Recruiting	$2,157	$2,549	$2,598	$2,696
Maintenance & Repair	$51,361	$71,361	$51,361	$51,362
Equipment	$34,000	$34,000	$34,000	$34,000
Per Diem	$63,600	$75,163	$76,609	$79,500
Fuel & Lubricants	$252,439	$298,337	$304,074	$315,550
Day Rates	$2,919,812	$3,450,687	$3,517,046	$3,649,765
Port Calls	$0	$148,596	$148,596	$216,287
Ship-to-Shore Communications	$23,356	$32,999	$36,213	$36,859
Total	**$4,216,289**	**$5,236,407**	**$5,642,876**	**$5,961,777**

Note: The above budget is based on best estimates of expenses to be incurred in direct or indirect support of expeditions, applying various methods of distribution. However, the software required to track the actual costs of consumables used during each expedition is not expected to be in place until the beginning of Phase 2 operations. Therefore, amounts displayed contain a +/- percentage of error and are not subject to audit.

APPENDIX II: RECOMMENDED IODP-USIO PROGRAM OF INSURANCE

TAMRF will provide full-service insurance services to the IODP-USIO. This will include insurance policy monitoring, ongoing risk assessments, marine insurance negotiations, and claims settlement. 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, we have been able to obtain the most cost-effective premiums, considering market. 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, premiums have averaged less than the market average. 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-USIO operations, 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 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. 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 IODP-USIO Phase 1 drilling operations but could be required for high-latitude operations.

TAMRF recommends Option One, with government indemnification, as the risks associated with IODP-USIO operations are considered moderate. This course of action will allow IODP-USIO to spend less on insurance and more on accomplishing its science mission.

Program of Insurance with Government Indemnification	**Coverage Limits**	**Deductible**	**Estimated Premiums**
Control of Well	$25,000,000	$50,000	$72,000
Seepage & Pollution Liability[1]	$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[2]	$10,000,000	$1,000,000	$55,000
Workers' Compensation & Maritime Employer's Liability[3]	$1,000,000	None	$86,000
Comprehensive General & Automobile Liability[4]	$1,000,000	None	$29,000
Subtotal			$636,500
Additional Insurance Recommended without Government Indemnification			
Control of Well	$25,000,000	Per underlying limits	$60,000
Umbrella	$100,000,000		$230,000
Contractor's Pollution Liability–Gradual	$50,000,000		$69,000
Subtotal			$359,000
Total			$995,500

[1] Seepage & Pollution coverage and premium included in Control of Well Policy.

[2] Deductible is coverage limit for Seepage & Pollution Liability.

[3] Workers' Compensation & Maritime Employer's Liability premium rate is $3.80 per $100 of payroll.

[4] Comprehensive General & Automobile Liability premium rate is $1.28 per $100 of payroll.

APPENDIX III: TAMU/TAMRF SIC REQUEST

414032-05000 Science Operations Department – Materials Support

8400 Equipment = $50,000 (SIC)

Equipment—Materials-handling equipment. Covers the purchase of two replacement forklifts for use in warehouse areas: one electrically powered forklift to be used indoors in the loading dock staging area of the IODP-USIO Science Services, TAMU, building and a gasoline-powered forklift to be used in the storage area at the Riverside Campus several miles away. The forklifts these will replace were acquired 20 years ago, at the beginning of ODP, and have become increasingly costly and difficult to maintain. Reliability has become an issue, raising the potential of missed shipping deadlines and safety hazards (e.g., hydraulic hose breakage). Purchase of new forklifts will reduce the time and expense devoted to maintenance and would allow the IODP-USIO to continue to provide reliable service. (In FY03, $4,700 was spent on maintenance and one vehicle was out of service for 5 weeks while a series of technicians tried to repair it.)