# INTEGRATED OCEAN DRILLING PROGRAM

## United States Implementing Organization
## JOI Alliance

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

# JANUARY 2005 PROGRAM PLAN ADDENDUM

# FY05 to NSF

For Time Period
1 April 2005 through 30 September 2005

**AMOUNT PROPOSED FY05: $20,155,312 (SOC, POC, NSF/SIC)**

Respectfully Submitted to:
National Science Foundation

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# USIO FY05 PROGRAM PLAN ADDENDUM

This USIO FY05 Program Plan Addendum completes 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 Addendum. The USIO FY05 Program Plan Addendum includes all tasks and deliverables, schedules of activities, definitions of projects, and required budgets that incorporate funding allocations from the IODP central management office for science operations, and funding allocations from NSF for platform operations.

The cost breakdown for this FY05 Program Plan Addendum is a request for **$3,366,415 in SOC** expenses (submitted in this program plan addendum to NSF or IODP-MI depending on the status of a contract with IODP-MI when funding is required; which includes a request for $1,530,697 from LDEO and a request for $1,835,718 from TAMU) and a request to NSF **for $16,630,211 in POC** expenses for continued IODP-USIO Phase 1 operations ($757,786 from LDEO and $15,872,425 from TAMU), as well as **$158,686 for NSF/SIC nonprogram costs** (JOI). The total request for funding described in this IODP-USIO FY05 Program Plan Addendum is $20,155,312 (SOC + POC + NSF/SIC).

# FY05 IODP-USIO TASK-ELEMENT ADDENDUM BUDGET

| Description | JOI | TAMU | LDEO | USIO |
|---|---|---|---|---|
| **Task Element— USIO FY05 Addendum SOC** | | | | |
| Management and Administration | 0 | 118,336 | 0 | 118,336 |
| Technical, Engineering and Science Support | 0 | 1,542,353 | 66,618 | 1,608,971 |
| Core Curation | 0 | 39,335 | 0 | 39,335 |
| Data Management | 0 | 125,820 | 0 | 125,820 |
| Publications | 0 | 9,874 | 0 | 9,874 |
| Logging | 0 | 0 | 1,464,079 | 1,464,079 |
| Education and Outreach | 0 | 0 | 0 | 0 |
| **Subtotals** | **0** | **1,835,718** | **1,530,697** | **3,366,415** |
| **Task Element—USIO FY05 Addendum POC** | | | | |
| Management and Administration | 0 | 118,600 | 0 | 118,600 |
| Technical, Engineering and Science Support | 0 | 15,705,657 | 0 | 15,705,657 |
| Core Curation | 0 | 3,943 | 0 | 3,943 |
| Data Management | 0 | 44,225 | 0 | 44,225 |
| Publications | 0 | 0 | 0 | 0 |
| Logging | 0 | 0 | 757,786 | 757,786 |
| Education and Outreach | 0 | 0 | 0 | 0 |
| **Subtotals** | **0** | **15,872,425** | **757,786** | **16,630,211** |
| **Task Element—USIO Total FY05 Addendum Budget (SOC and POC requests)** | | | | |
| Management and Administration | 0 | 236,936 | 0 | 236,936 |
| Technical, Engineering and Science Support | 0 | 17,248,010 | 66,618 | 17,314,628 |
| Core Curation | 0 | 43,278 | 0 | 43,278 |
| Data Management | 0 | 170,045 | 0 | 170,045 |
| Publications | 0 | 9,874 | 0 | 9,874 |
| Logging | 0 | 0 | 2,221,865 | 2,221,865 |
| Education and Outreach | 0 | 0 | 0 | 0 |
| **Totals (SOC + POC)** | **0** | **17,708,143** | **2,288,483** | **19,996,626** |
| **Task Element— USIO FY05 Addendum NSF/SIC** | | | | |
| Management and Administration | 130,000 | 0 | 0 | 130,000 |
| Technical, Engineering and Science Support | 0 | 0 | 0 | 0 |
| Core Curation | 0 | 0 | 0 | 0 |
| Data Management | 0 | 0 | 0 | 0 |
| Publications | 0 | 0 | 0 | 0 |
| Logging | 0 | 0 | 0 | 0 |
| Education and Outreach | 28,686 | 0 | 0 | 28,686 |
| **Total (NSF/SIC)** | **158,686** | **0** | **0** | **158,686** |
| **Grand Total (SOC + POC + NSF/SIC)** | | | | **20,155,312** |

# EXPEDITION OPERATIONS

## INTRODUCTION

The extension of Integrated Ocean Drilling Program U.S. Implementing Organization (IODP-USIO) Phase 1 consists of four expeditions that constitute three complete science programs. A total of 168 operating days are proposed in the Phase 1 extension period of FY05, consisting of 42 days in transit, 21 port call days, and 105 days focused on science delivery (on site and between-site transit). The schedule is summarized below.

| | |
|---|---|
| 26 April–31 May 2005 | Expedition: Porcupine Carbonate Mounds |
| 31 May–6 July 2005 | Expedition: Gulf of Mexico Hydrogeology |
| 6 July–24 August 2005 | Expedition: Superfast Spreading 1 |
| 24 August–7 October 2005 | Expedition: Cascadia Gas Hydrates |

## OPERATIONS

### Porcupine Carbonate Mounds Expedition

This program is a multidisciplinary research program to evaluate the role of carbonate mound genesis and its significance. The primary scientific objective is to core one of a series of giant mounds on the present seabed surface southwest of Ireland (Porcupine Basin). The mounds are 200 to 250 m high and form a cluster of over a thousand buried reefs embedded in drift deposits. The "Porcupine Drilling Project" is driven by four major research projects funded under the 5$^{th}$ Framework Programme of the European Union and is thus of international, multidisciplinary interest. Major objectives include understanding (1) the role of gas seeps as a prime trigger for mound genesis, (2) the role of bacteria as main mound builders, (3) the role of reef-forming corals as a major part of the mound community and their environmental record, (4) the significance of mound "events" in the paleoenvironmental record, (5) the identification of prominent erosional surfaces as products of global oceanic turnovers, (6) the potential of mounds as a high-resolution paleoenvironmental record, (7) the value of the Porcupine-Rockall mounds as present day analogs for older reef mounds and carbonate mud mounds found in the geologic record, and (8) the potential role of fluid flow as a common source of both slope failures and mound growth.

#### *Proposed Operations*

Multiple holes will be drilled at three sites on Challenger mound in the Belgica mound province. The holes will be cored and logged to a depth of approximately 300 m below the sea floor. The emphasis of this expedition will be on sediment core recovery and analysis. Each site will be double cored with the advanced piston corer (APC) to assure recovery of the complete sediment section. Heavy use of the APC temperature (APCT) tool (also known as the Adara temperature tool), the Davis-Villinger Temperature Probe (DVTP), and the Well Seismic Tool (WST) can be expected, along with significant microbiological sampling.

#### *Environment and Safety*

The expedition falls in the optimum weather window for this region, so operations should not be hampered by bad weather. Since the mounds are believed to be fed by gas seeps from below, gassy cores can be expected.

### *Logging Operations*

Log data will provide in situ physical property measurements and depth calibration of drift sediments. The triple-combination (triple combo) tool will be used to correlate core depth with hole depth and to gain information about physical properties. Formation MicroScanner (FMS)-sonic and Ultrasonic Borehole Imager (UBI) data will be used to image brecciated facies. From the "velocity pull-up" of the seismic section, some cementation is expected in the mounds. This cementation should be picked up by the triple combo and the FMS-sonic tool strings. In addition, log data will be valuable resources for correlation with high-resolution seismic data. The standard suite of logging tools and the UBI and Well Seismic Tool (WST) are planned for each site.

- 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, and temperature.
- The FMS provides high-resolution borehole electrical images of stratigraphic sequences and boundaries. FMS images can be visually compared with core to ascertain the orientations of bedding and fracture patterns. The FMS should also be able to image the presence of corals within the mounds quite well. The Dipole Sonic Imager (DSI) will produce a full set of waveforms (*P*-, *S*-, Stoneley waves).
- The UBI provides the amplitude and transit time images with 100% borehole wall coverage, which allows detection of small-scale fractures, the shape of the borehole, and the roughness of the borehole wall. Fractures, breakouts, and lithologic variations can easily be recognized in the UBI amplitude image.
- The WST records acoustic waves generated by an air gun located near the sea surface. The tool provides a complete check shot survey, a depth-traveltime plot, and synthetic seismograms that will be essential for determining in situ velocity profiles and correlating seismic data.

### *Logistics*

The Porcupine Carbonate Mounds Expedition will require an estimated 35 days (6 days in port, 19 days in transit, and 10 on site). The scientific participants will disembark the vessel in Ponta Delgada following completion of the science program.

## Gulf of Mexico Hydrogeology Expedition

The primary objective of this expedition is to characterize overpressure and fluid flow processes in the deepwater Gulf of Mexico. Two sites will be drilled in the normally pressured Brazos-Trinity Basin in order to characterize rock and fluid properties and in situ conditions at a range of known effective stress conditions. Two sites will be occupied in the Ursa Basin to characterize rock and fluid properties in an overpressured environment. Drilling in the Ursa Basin during this expedition will be restricted to a depth above the top of the "Blue" horizon, which is a marker for the top of the overpressured zone.

### *Proposed Operations*

Each site will be multiple APC cored to assure recovery of the complete sediment section. Standard wireline logging will be conducted at each site. In situ measurements will include logging while drilling (LWD) and piezoprobe experiments. A vertical seismic profile (VSP) is planned at each site.

### *Environment and Safety*

Potential problems include hole instability and gas or fluid flows. To mitigate these, a careful independent analysis of the existing seismic data will be conducted to ensure sites are located in areas of minimal risk, and a supply of heavy mud will be available to kill any flows encountered. Clays can be expected to cause holes to swell closed, making standard logging difficult and increasing the risk of stuck pipe. The sites planned for the Gulf of Mexico Hydrogeology Expedition are close to existing oilfield installations and pipelines, requiring a careful survey of the seafloor at each site before drilling commences. The VSP work will require operating under existing IODP guidelines to mitigate potential impacts on marine mammals.

### *Logging Operations*

Successfully meeting science objectives in the targeted Gulf of Mexico rocks requires the use of both wireline and logging/measurement while drilling (LWD/MWD) logging tools. Anticipated hole stability problems will require the drilling of dedicated LWD holes at the four sites (BT4-1A, BT4-2A, URS-1B, URS-2B), which will be accomplished during a 10 day miniexpedition. Standard wireline measurements consisting of gamma, sonic, density, porosity, and resistivity imaging tools will be acquired to identify lithologic contacts. LWD measurements (porosity, gamma, resistivity imaging) will be acquired during a minicruise after coring and wireline logging operations are completed. These data will provide, most importantly, a continuous profile of density and porosity from the seafloor to total depth to accurately compute in situ overburden pressure. A wireline checkshot utilizing the single axis in-line tool or a stand-alone vertical seismic profiling (VSP) tool will to be used to provide critical information for well-to-seismic ties and define the seismic velocity gradient of the sequences drilled at each site. During the wireline logging with the standard tool strings, multiple passes will be made to acquire azimuthal data, potentially critical for identifying ties to seismic lines, identifying the presence of gas hydrates, and for understanding rock properties. We anticipate that the FMS tool will help characterizing fracture anisotropy and turbiditic sequences in the area.

### *Logistics*

Operations will require an estimated 36 days (5 days in port, 11 days in transit, and 20 on site).

## Superfast Spreading 1 Expedition

ODP Leg 206 resulted, for the first time in scientific ocean drilling, in the successful construction of the borehole infrastructure required for deep drilling into the ocean basement. The Superfast Spreading 1 (FY05) and 2 (FY06) Expeditions are the second part of a two-stage drilling strategy to deepen and log the full depth extent of Hole 1256B and recover a complete data section of the upper oceanic crust formed at a superfast spreading rate (>200 m/yr). The observed relationship between ocean ridge spreading rate and the depth to axial low-velocity zones, interpreted to be melt lenses, predicts that the dike–gabbro transition should be at its shallowest in crust formed at superfast spreading rates. Gabbros are predicted to occur at the depth range 900 to 1300 msbf. These expeditions will address important issues related to the structure of the oceanic crust, alteration processes, and geochemical budgets, as well as igneous and structural processes involved in the construction of the crust. In addition, the temperature logs will aid in studying the effects of temperature on the extent of microbial activity, as microbial alteration of volcanic glass decreases with basement depth at other sites. The temperature and depth limits to subbasement microbiological activity are not well defined.

### *Proposed Operations*

From an operational standpoint, these will be routine hard rock expeditions. During ODP Leg 206, Hole 1256B was cased into basement and cored 500 m into basement. The hole was left clean and open for further deepening. The Superfast Spreading 1 Expedition will deepen Hole 1256B by RCB coring to the maximum depth possible. The hole will be logged with standard tool strings. Significant microbiological sampling is expected as we continue to probe the depth of the deep crustal biosphere.

### *Environment and Safety*

Hole stability and slow rates of penetration may limit the achievable depth of the hole, although since Hole 1256B is cased into basement instability in the sedimentary part of the section has been minimized and during ODP Leg 206 the basement drilled cleanly and relatively rapidly.

### *Logging Operations*

The logging plans build upon the results of Ocean Drilling Program (ODP) Leg 206, in which a full sequence of high-resolution downhole logs recorded a significant amount of variation in physical properties within the massive units, lava flows, pillow lavas, and hyaloclastites recovered from Holes 1256C and 1256D. The combined measurements of FMS, UBI, and other downhole logs allowed the characterization of the lithostratigraphic sequence, flow thickness, and structural features such as fractures. For example, discrimination of magnetic subunits from the log-based stratigraphy correlated well with shipboard paleomagnetic data.

Preliminary logging operations with the triple combo tool string are proposed prior to the deepening of the hole so that equilibrium temperatures and borehole geometry information can be acquired before drilling operations perturb the thermal structure of the crust. Fluid sampling should also be considered as an important aspect of the initial downhole operations, as the results will pertain to the microbiological and geochemistry objectives of the expedition.

A full suite of wireline logging tools, similar to those used during ODP Leg 206, will be deployed after the completion of drilling operations. These tool strings should include the following (Note that UBI deployment will occur in FY06 during the second Superfast Spreading expedition.):

- Triple combo tool string: The tool string will measure standard geophysical parameters including gamma ray, porosity, density, and electrical resistivity for full lithologic characterizations of the drilled sequences. A temperature probe should be included in the suite of measurements to assess borehole temperature conditions and determine the presence of potential fluid flow zones.
- FMS-sonic tool string: Compressional, shear, and Stoneley wave data will provide information about the seismic structure of the upper oceanic crust. The FMS tool obtains high-resolution microresistivity images of the borehole wall, which are useful for identification of lithologic units and tectonic features (e.g., the presence of fractures and/or faults and their orientations).
- Three-component magnetometer: Data from the magnetometer will be used to monitor changes in the magnetic properties of the upper oceanic crust as well as changes in paleomagnetic direction that can aid in determination of the magnetic polarity. (Note: this would need to be a third-party deployment.)
- Three-component WST: The WST-3 records acoustic waves that will provide a seismic velocity gradient and a depth traveltime information for determining in situ velocity profiles.

### *Logistics*

Operations for the Superfast Spreading 1 Expedition require an estimated 49 days (5 in port, 6 in transit, and 38 on site).

## Cascadia Gas Hydrates Expedition

The Cascadia margin proposal successfully demonstrated the need for scientific ocean drilling in an accretionary prism environment to better constrain the models concerning the formation of gas hydrates. The original proposal has been adapted to accommodate a shortened coring program consisting of 22 days, with the understanding the remaining aspects of the proposal will be completed during a future expedition. The scheduled expedition will consist of completing a series of sites across the northern Cascadia accretionary prism to improving the understanding of the deep origin of methane, its upward transport, its incorporation in gas hydrate, and its subsequent loss to the seafloor. A primary focus will be documenting the widespread seafloor-parallel layer of dispersed hydrate associated with bottom seismic reflectors.

### *Proposed Operations*

A revised science plan will be developed with the lead proponents that maximizes the delivered science within the constraints of available operating days and resources. The reduced program will maintain the spirit of the original proposal, thereby focusing on completing a number of holes across the accretionary prism to examine the time-space progression of gas hydrate formation and dissociation in this environment. Primary tools will include APC and extended core barrel (XCB) coring, LWD and possible completion of a VSP. Significant sampling for gas hydrates and microbiology is anticipated. Many of the downhole experiments and monitoring originally proposed will not be possible.

### *Environment and Safety*

Potential problems include hole stability and gas or fluid flow.

### *Logging Operations*

LWD/MWD operations (porosity, gamma, resistivity imaging) will be completed as a minicruise prior to coring to maximize the efficiency of subsequent operations, especially the deployment of special tools such as the pressure core sampler (PCS). If safety concerns preclude LWD/MWD operations from being conducted prior to coring, the entire LWD operations will take place during a dedicated period during or at the end of the expedition. Additional LWD tools could be added to the tool string if additional funding is attained within an appropriate time frame, but these would not require additional rig time to deploy.

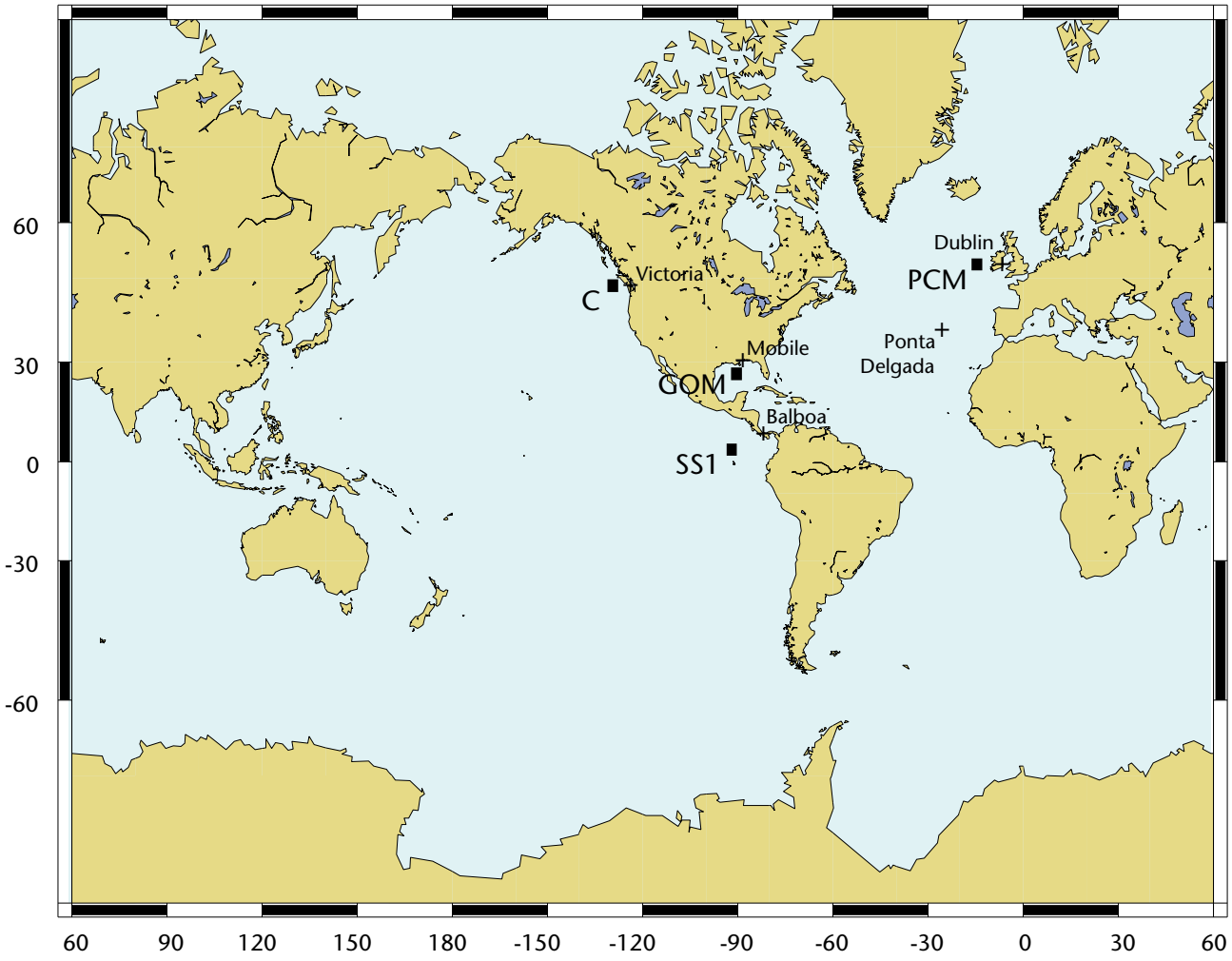
Wireline logging operations using standard tools are planned for proposed Sites CAS-01B and CAS-06A/B. Acoustic data are a primary means of estimating gas hydrate concentration. Wireline log data provide critical acoustic data, which are not currently available using LWD tools.

VSP in zero-offset and walkaway mode is planned for *P*- and *S*-waves using the three-axis well seismic tool (WST-3). The air gun operations for the zero-offset VSP will be conducted from the *JOIDES Resolution*, whereas the walkaway component will require a second ship. The walkaway VSP will be complemented by ocean-bottom seismometer (OBS) deployments.

### *Logistics*

Operations for the Cascadia Gas Hydrates Expedition require an estimated 44 days (5 in port, 17 in transit, and 22 on site).

**Figure 1.** Expedition map and proposed port call locations for IODP-USIO FY05 Phase 1 extension. PCM = Porcupine Carbonate Mounds Expedition, GOM = Gulf of Mexico Hydrogeology Expedition, SS1 = Superfast Spreading 1, C = Cascadia Gas Hydrates Expedition.



# IODP-USIO FY05 PROGRAM PLAN ADDENDUM SUMMARY EXPEDITION BUDGET

| | Porcupine | | GOM | | Superfast 1 | | Cascadia | | Long-Lead Items | |
|---|---|---|---|---|---|---|---|---|---|---|
| | SOC | POC | SOC | POC | SOC | POC | SOC | POC | SOC | POC |
| **Science Services,TAMU** | | | | | | | | | | |
| Payroll | 144,295 | 44,517 | 149,488 | 46,013 | 202,464 | 65,670 | 167,636 | 53,439 | 0 | 0 |
| Travel | 223 | 0 | 229 | 0 | 312 | 0 | 236 | 0 | 0 | 0 |
| Travel to/from Port | 30,000 | 13,410 | 30,000 | 8,460 | 54,000 | 7,625 | 49,962 | 15,672 | 46,930 | 18,139 |
| Training | 1,024 | 7,022 | 1,063 | 7,223 | 1,447 | 9,831 | 1,093 | 7,424 | 0 | 0 |
| Supplies | 40,942 | 36,448 | 41,456 | 209,522 | 32,621 | 153,479 | 47,842 | 98,736 | 66,274 | 632,699 |
| Business | 446 | 0 | 459 | 0 | 624 | 0 | 471 | 0 | 0 | 0 |
| Software | 334 | 0 | 334 | 0 | 468 | 0 | 354 | 0 | 0 | 0 |
| Library | 375 | 375 | 375 | 375 | 375 | 375 | 375 | 375 | 0 | 0 |
| Insurance | 0 | 48,645 | | 50,035 | 0 | 68,104 | 0 | 52,816 | 0 | 0 |
| Shipping | 28,100 | 20,875 | 32,250 | 32,250 | 72,501 | 25,001 | 14,275 | 13,250 | 0 | 0 |
| Professional Services | 9,140 | 13,884 | 9,401 | 14,281 | 12,796 | 19,437 | 9,662 | 14,899 | 0 | 0 |
| Recruiting | 1,226 | 1,003 | 1,261 | 1,032 | 1,717 | 1,404 | 1,296 | 1,061 | 0 | 0 |
| Maintenance and Repair | 4,904 | 10,032 | 5,045 | 10,348 | 6,866 | 14,045 | 5,185 | 10,605 | 0 | 0 |
| Equipment | 0 | 0 | 0 | 34,870 | 0 | 34,870 | 0 | 34,870 | 0 | 69,740 |
| Per Diem | 0 | 40,895 | 0 | 42,064 | 0 | 57,254 | 0 | 44,400 | 0 | 0 |
| Fuels and Lubricants | 0 | 358,528 | 0 | 368,772 | 0 | 501,940 | 0 | 389,260 | 0 | 0 |
| Day Rate | 0 | 2,470,125 | 0 | 2,540,700 | 0 | 3,458,175 | 0 | 2,681,854 | 0 | 0 |
| Port Call | 0 | 112,775 | 0 | 115,997 | 0 | 157,885 | 0 | 122,443 | 0 | 0 |
| Ship-to-Shore Communication | 0 | 12,989 | 0 | 13,360 | 0 | 18,185 | 0 | 14,103 | 0 | 0 |
| **Subtotal (TAMU)** | **261,009** | **3,191,523** | **271,361** | **3,495,302** | **386,191** | **4,593,280** | **298,387** | **3,555,207** | **113,204** | **720,578** |
| **Science Services, LDEO** | | | | | | | | | | |
| Payroll | 6,447 | 0 | 6,901 | 0 | 9,556 | 0 | 7,106 | | 0 | 0 |
| Equipment | 2,113 | 0 | 2,173 | 0 | 2,958 | 0 | 2,233 | | 0 | 0 |
| Supplies | 3,500 | 0 | 3,600 | 0 | 4,900 | 0 | 3,700 | | 0 | 0 |
| Travel | 4,606 | 0 | 4,738 | 0 | 4,448 | 0 | 4,869 | | 4,000 | 0 |
| Communications | 408 | 0 | 420 | 0 | 571 | 0 | 431 | | 200 | 0 |
| Shipping | 1,000 | 0 | 1,000 | 0 | 1,000 | 0 | 1,000 | | 0 | 0 |
| Maintenance and Repair | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 |
| Computing | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 |
| Other | 5,600 | | 5,760 | 0 | 5,840 | 0 | 5,920 | | 0 | 0 |
| Day Rate | 180,150 | 167,905 | 379,440 | 172,702 | 210,210 | 235,067 | 478,730 | 177,500 | 0 | 0 |
| Insurance | 27,528 | 1,028 | 28,314 | 1,057 | 38,539 | 1,440 | 29,101 | 1,087 | 0 | 0 |
| Indirect Costs | 11,428 | 0 | 11,882 | 0 | 13,947 | 0 | 12,203 | | 2,226 | 0 |
| **Subtotal (LDEO)** | **242,780** | **168,933** | **444,228** | **173,759** | **291,969** | **236,507** | **545,293** | **178,587** | **6,426** | **0** |
| **SOC and POC request** | **503,789** | **3,360,456** | **715,589** | **3,669,061** | **678,160** | **4,829,787** | **843,680** | **3,733,794** | **119,630** | **720,578** |
| **Total Expedition Budget** | | **3,864,245** | | **4,384,650** | | **5,507,947** | | **4,577,474** | | **840,208** |

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. Long-lead items are for equipment supplies and travel associated with proposed FY06 expedition

# 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).

***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.

***Business*** – In this category are

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

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

***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.

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

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

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

***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.

***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.

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

***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.

***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.

## 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.

***Other Direct Costs*** –This category covers all other direct 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

### Science Services
### Lamont-Doherty Earth Observatory
### of Columbia University

# JANUARY 2005 PROGRAM PLAN ADDENDUM

# FY05 for NSF

For Time Period
1 April 2005 to 30 September 2005

**ADDENDUM AMOUNT PROPOSED: $2,288,483**

Respectfully Submitted to:
Joint Oceanographic Institutions, Inc.

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

27 January 2005

# FY05 PROGRAM PLAN ADDENDUM BUDGETS

## FY05 IODP-USIO SCIENCE SERVICES, LDEO, JANUARY 2005 ADDENDUM TASK-ELEMENT SUMMARY BUDGET

| Description | FY05 PP Addendum Phase 1 Total | |
|---|---|---|
| | SOC | POC |
| Management and Administration | $0 | $0 |
| Technical, Engineering and Science Support | $66,618 | $0 |
| Core Curation | $0 | $0 |
| Data Management | $0 | $0 |
| Publications | $0 | $0 |
| Logging | $1,464,079 | $757,786 |
| Education and Outreach | $0 | $0 |
| **TOTAL** | **$1,530,697** | **$757,786** |

# JANUARY 2005 ADDENDUM BUDGET

## Science Services

| Description | FY05 PP Addendum Phase 1 Total | |
|---|---|---|
| | SOC | POC |
| Personnel | $19,154 | $0 |
| Fringe | $5,056 | $0 |
| Sea Pay | $5,800 | $0 |
| Equipment | $0 | $0 |
| Supplies | $0 | $0 |
| Travel | $13,331 | $0 |
| Communication | $200 | $0 |
| Shipping | $0 | $0 |
| Other | $0 | $0 |
| | | |
| Total Direct Cost | $43,541 | $0 |
| Modified Direct Cost | $43,541 | $0 |
| | | |
| Contracts | $0 | $0 |
| Indirect Cost | $23,077 | $0 |
| | | |
| **TOTAL** | **$66,618** | **$0** |

Funds in this cost center, which are mapped to the Technical, Engineering, and Science Support task element, are those required to fulfill the operational requirements involved with an extension of activities through 30 September 2005.

***Personnel***—Personnel expenses for logging staff scientists during cruise operations.

***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.

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

***Indirect Cost***—Indirect costs (53%) are assessed on all charges except permanent equipment, tuition remissions, Lamont-Doherty Earth Observatory (LDEO) of Columbia University computer services, and downhole tool insurance..

# JANUARY 2005 ADDENDUM BUDGET

## Logging Services

| Description | FY05 PP Addendum Phase 1 Total | |
|---|---|---|
| | SOC | POC |
| Personnel | 0 | 0 |
| Fringe | 0 | 0 |
| Sea Pay | 0 | 0 |
| Equipment | 9,477 | 0 |
| Supplies | 15,700 | 0 |
| Travel | 9,330 | 0 |
| Communication | 1,830 | 0 |
| Shipping | 4,000 | 0 |
| Other | 23,120 | 0 |
| | | |
| Total Direct Costs | 63,457 | 0 |
| Modified Direct Costs | 53,980 | 0 |
| | | |
| Contracts | 1,248,530 | 753,174 |
| Insurance | 123,482 | 4,612 |
| Indirect Costs | 28,610 | 0 |
| | | |
| **TOTAL** | **1,464,079** | **757,786** |

Funds in this cost center, which map to the Logging task element, are those required to fulfill the operational requirements involved with an extension of activities through 30 September 2005. The budget includes the subcontract to provide standard and specialty logging tools and support (Schlumberger), downhole tool insurance, and other expenses related to shipboard logging activities.

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

***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.

***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.

# ADDENDUM APPENDIX I: EXPEDITION OPERATIONS

## INTRODUCTION

The extension of Integrated Ocean Drilling Program U.S. Implementing Organization (IODP-USIO) Phase 1 consists of four expeditions that constitute three complete science programs. The logging program for the Phase 1 extension period follows.

## OPERATIONS

### Porcupine Carbonate Mounds Expedition

The objective of this expedition is to drill into a series of carbonate mounds southwest of Ireland. Porcupine Basin displays a unique association and diversity of carbonate mound provinces that may yield the key to address the question of mound genesis and its global significance from a process-oriented point of view.

#### *Logging Operations*

Log data will provide in situ physical property measurements and depth calibration of drift sediments. The triple-combination (triple combo) tool will be used to correlate core depth with hole depth and to gain information about physical properties. Formation MicroScanner (FMS)-sonic and Ultrasonic Borehole Imager (UBI) data will be used to image brecciated facies. From the "velocity pull-up" of the seismic section, some cementation is expected in the mounds. This cementation should be picked up by the triple combo and the FMS-sonic tool strings. In addition, log data will be valuable resources for correlation with high-resolution seismic data. The standard suite of logging tools and the UBI and Well Seismic Tool (WST) are planned for each site.

- 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, and temperature.
- The FMS provides high-resolution borehole electrical images of stratigraphic sequences and boundaries. FMS images can be visually compared with core to ascertain the orientations of bedding and fracture patterns. The FMS should also be able to image the presence of corals within the mounds quite well. The Dipole Sonic Imager (DSI) will produce a full set of waveforms (*P*-, *S*-, Stoneley waves).
- The UBI provides the amplitude and transit time images with 100% borehole wall coverage, which allows detection of small-scale fractures, the shape of the borehole, and the roughness of the borehole wall. Fractures, breakouts, and lithologic variations can easily be recognized in the UBI amplitude image.
- The WST records acoustic waves generated by an air gun located near the sea surface. The tool provides a complete check shot survey, a depth-traveltime plot, and synthetic seismograms that will be essential for determining in situ velocity profiles and correlating seismic data.

### Gulf of Mexico Hydrogeology Expedition

The proposed drilling sites are located on the continental slope of the Gulf of Mexico. The primary scientific objective will be to examine a normally pressured basin (Brazos-Trinity Basin 4) as a

reference location to characterize rock and fluid properties in an area of normal pressure. In addition, two sites in the Ursa Basin will be drilled to approximately 300 mbsf (i.e., about 150 m above the "Blue" horizon marking the top of the overpressured zone) to characterize rock and fluid properties. For safety reasons, drilling operations during this cruise will not penetrate the overpressured one.

### *Logging Operations*

Successfully meeting science objectives in the targeted Gulf of Mexico rocks requires the use of both wireline and logging/measurement while drilling (LWD/MWD) logging tools. Anticipated hole stability problems will require the drilling of dedicated LWD holes at the four sites (BT4-1A, BT4-2A, URS-1B, URS-2B), which will be accomplished during a 10 day miniexpedition. Standard wireline measurements consisting of gamma, sonic, density, porosity, and resistivity imaging tools will be acquired to identify lithologic contacts. LWD measurements (porosity, gamma, resistivity imaging) will be acquired during a minicruise after coring and wireline logging operations are completed. These data will provide, most importantly, a continuous profile of density and porosity from the seafloor to total depth to accurately compute in situ overburden pressure. A wireline checkshot utilizing the single axis in-line tool or a stand-alone vertical seismic profiling (VSP) tool will to be used to provide critical information for well-to-seismic ties and define the seismic velocity gradient of the sequences drilled at each site. During the wireline logging with the standard tool strings, multiple passes will be made to acquire azimuthal data, potentially critical for identifying ties to seismic lines, identifying the presence of gas hydrates, and for understanding rock properties. We anticipate that the FMS tool will help characterizing fracture anisotropy and turbiditic sequences in the area.

## Superfast Spreading 1 Expedition

This cruise is the first part of a two-stage drilling strategy to deepen and log the full depth extent of Hole 1256B and recover a complete data section of the upper oceanic crust formed at a superfast spreading rate. The observed relationship between ocean ridge spreading rate and the depth to axial low-velocity zones, interpreted to be melt lenses, predicts that the dike–gabbro transition should be at its shallowest in crust formed at superfast spreading rates. Gabbros are predicted to occur at the depth range 900 to 1300 msb.

This expedition (along with Superfast Spreading 2 in FY06) will address important issues related to the structure of the oceanic crust, alteration processes, and geochemical budgets, as well as igneous and structural processes involved in the construction of the crust. In addition, the temperature logs will aid in studying the effects of temperature on the extent of microbial activity, as microbial alteration of volcanic glass decreases with basement depth at other sites. The temperature and depth limits to subbasement microbiological activity are not well defined.

### *Logging Operations*

The logging plans build upon the results of Ocean Drilling Program (ODP) Leg 206, in which a full sequence of high-resolution downhole logs recorded a significant amount of variation in physical properties within the massive units, lava flows, pillow lavas, and hyaloclastites recovered from Holes 1256C and 1256D. The combined measurements of FMS, UBI, and other downhole logs allowed the characterization of the lithostratigraphic sequence, flow thickness, and structural features such as fractures. For example, discrimination of magnetic subunits from the log-based stratigraphy correlated well with shipboard paleomagnetic data.

Preliminary logging operations with the triple combo tool string are proposed prior to the deepening of the hole so that equilibrium temperatures and borehole geometry information can be acquired

before drilling operations perturb the thermal structure of the crust. Fluid sampling should also be considered as an important aspect of the initial downhole operations, as the results will pertain to the microbiological and geochemistry objectives of the expedition.

A full suite of wireline logging tools, similar to those used during ODP Leg 206, will be deployed after the completion of drilling operations. These tool strings should include the following (Note that UBI deployment will occur in FY06 during the second Superfast Spreading expedition.):

- Triple combo tool string: The tool string will measure standard geophysical parameters including gamma ray, porosity, density, and electrical resistivity for full lithologic characterizations of the drilled sequences. A temperature probe should be included in the suite of measurements to assess borehole temperature conditions and determine the presence of potential fluid flow zones.
- FMS-sonic tool string: Compressional, shear, and Stoneley wave data will provide information about the seismic structure of the upper oceanic crust. The FMS tool obtains high-resolution microresistivity images of the borehole wall, which are useful for identification of lithologic units and tectonic features (e.g., the presence of fractures and/or faults and their orientations).
- Three-component magnetometer: Data from the magnetometer will be used to monitor changes in the magnetic properties of the upper oceanic crust as well as changes in paleomagnetic direction that can aid in determination of the magnetic polarity. (Note: this would need to be a third-party deployment.)
- Three-component WST: The WST-3 records acoustic waves that will provide a seismic velocity gradient and a depth traveltime information for determining in situ velocity profiles.

## Cascadia Gas Hydrates Expedition

The objectives of this cruise are to address fluid flow issues on the margin scale on the Northern Cascadia Margin by

- Studying the formation of natural gas hydrate in marine sediments.
- Determining the mechanism of development, nature, magnitude, and global distribution of gas hydrate reservoirs.
- Investigating the gas transport mechanism and migration pathways through sedimentary structures, from site of origin to reservoir.
- Examining the effect of gas hydrate on the physical properties of the enclosing sediments, particularly as it relates to the potential relationship between gas hydrates and slope stability.
- Investigating the microbiology and geochemistry associated with hydrate formation and dissociation.

### *Logging Operations*

LWD/MWD operations (porosity, gamma, resistivity imaging) will be completed as a minicruise prior to coring to maximize the efficiency of subsequent operations, especially the deployment of special tools such as the pressure core sampler (PCS). If safety concerns preclude LWD/MWD operations from being conducted prior to coring, the entire LWD operations will take place during a dedicated period during or at the end of the expedition. Additional LWD tools could be added to the tool string if additional funding is attained within an appropriate time frame, but these would not require additional rig time to deploy.

Wireline logging operations using standard tools are planned for proposed Sites CAS-01B and CAS-06A/B. Acoustic data are a primary means of estimating gas hydrate concentration. Wireline log data provide critical acoustic data, which are not currently available using LWD tools.

VSP in zero-offset and walkaway mode is planned for *P*- and *S*-waves using the three-axis well seismic tool (WST-3). The air gun operations for the zero-offset VSP will be conducted from the *JOIDES Resolution*, whereas the walkaway component will require a second ship. The walkaway VSP will be complemented by ocean-bottom seismometer (OBS) deployments.

# IODP-USIO SCIENCE SERVICES, LDEO, EXPEDITION OPERATIONS BUDGET

| Description | Porcupine | | GOM | | Superfast 1 | | Cascadia | | Long-Lead Items | |
|---|---|---|---|---|---|---|---|---|---|---|
| | SOC | POC | SOC | POC | SOC | POC | SOC | POC | SOC | POC |
| Personnel | 4,270 | 0 | 4,392 | 0 | 5,978 | 0 | 4,514 | 0 | 0 | 0 |
| Fringe | 1,127 | 0 | 1,159 | 0 | 1,578 | 0 | 1,192 | 0 | 0 | 0 |
| Sea Pay | 1,050 | 0 | 1,350 | 0 | 2,000 | 0 | 1,400 | 0 | 0 | 0 |
| Equipment | 2,113 | 0 | 2,173 | 0 | 2,958 | 0 | 2,233 | 0 | 0 | 0 |
| Supplies | 3,500 | 0 | 3,600 | 0 | 4,900 | 0 | 3,700 | 0 | 0 | 0 |
| Travel | 4,606 | 0 | 4,738 | 0 | 4,448 | 0 | 4,869 | 0 | 4,000 | 0 |
| Communication | 408 | 0 | 420 | 0 | 571 | 0 | 431 | 0 | 200 | 0 |
| Shipping | 1,000 | 0 | 1,000 | 0 | 1,000 | 0 | 1,000 | 0 | 0 | 0 |
| Other | 5,600 | 0 | 5,760 | 0 | 5,840 | 0 | 5,920 | 0 | 0 | 0 |
| | | | | | | | | | | |
| Total Direct Costs | 23,674 | 0 | 24,592 | 0 | 29,273 | 0 | 25,259 | 0 | 4,200 | 0 |
| Mod. Direct Costs | 21,561 | 0 | 22,419 | 0 | 26,316 | 0 | 23,025 | 0 | 4,200 | 0 |
| | | | | | | | | | | |
| Day Rate | 180,150 | 167,905 | 379,440 | 172,702 | 210,210 | 235,067 | 478,730 | 177,500 | 0 | 0 |
| Insurance | 27,528 | 1,028 | 28,314 | 1,057 | 38,539 | 1,440 | 29,101 | 1,087 | 0 | 0 |
| | | | | | | | | | | |
| Indirect Costs | 11,428 | 0 | 11,882 | 0 | 13,947 | 0 | 12,203 | 0 | 2,226 | 0 |
| | | | | | | | | | | |
| **TOTAL** | **242,780** | **168,933** | **444,228** | **173,759** | **291,969** | **236,507** | **545,293** | **178,587** | **6,426** | **0** |

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. Long-lead items are for equipment supplies and travel associated with proposed FY06 expeditions.

# INTEGRATED OCEAN DRILLING PROGRAM

## United States Implementing Organization
## Systems Integration Contractor

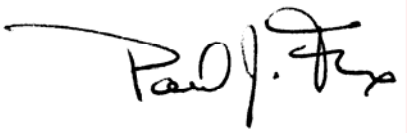
### Science Services
### Texas A&M University

# JANUARY 2005 PROGRAM PLAN ADDENDUM
# FY05 for NSF

For Time Period
1 April 2005 to 30 September 2005

**ADDENDUM AMOUNT PROPOSED FY05: $17,708,143 (SOC + POC)**

Respectfully Submitted to:
Joint Oceanographic Institutions, Inc.



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

27 January 2005

# FY05 PROGRAM PLAN ADDENDUM BUDGETS

## FY05 IODP-USIO SCIENCE SERVICES, TAMU, JANUARY 2005 ADDENDUM SUMMARY BUDGET

| Account | Description | FY05 PP Addendum Phase 1 Total | |
|---|---|---|---|
| | | SOC | POC |
| | Headquarters | | |
| 414012-01 | Office | 62,609 | 62,609 |
| | **Subtotals** | **62,609** | **62,609** |
| | | | |
| | Administrative Services | | |
| 414022-01 | Administrative Services | 54,534 | 54,534 |
| | **Subtotals** | **54,534** | **54,534** |
| | | | |
| | Science Services | | |
| 414032-01 | Office | 20,234 | 20,234 |
| 414032-02 | Technical Support | 626,016 | 158,871 |
| 414032-03 | Science Support | 10,312 | 1,467 |
| 414032-04 | Operational Support | 70,679 | 1,498,077 |
| 414032-05 | Materials Support | 235,145 | 140,198 |
| | **Subtotals** | **962,386** | **1,818,847** |
| | | | |
| | Tools and Analytical Services | | |
| 414042-01 | Office | 59,194 | 59,194 |
| 414042-02 | Analytical Services | 514,285 | 38,908 |
| 414042-03 | Engineering Services | 6,488 | 12,404 |
| | **Subtotals** | **579,967** | **110,506** |
| | | | |
| | Info.Tech. and Data Services | | |
| 414052-01 | Office | 13,236 | 13,236 |
| 414052-02 | Info. Tech. Support | 69,357 | 30,989 |
| 414052-03 | Databases and Archives | 43,227 | 0 |
| 414052-04 | Curatorial Office | 3,943 | 3,943 |
| 414052-05 | East Coast Repository | 4,010 | 0 |
| 414052-06 | West Coast Repository | 4,619 | 0 |
| 414052-07 | Gulf Coast Repository | 26,763 | 0 |
| | **Subtotals** | **165,155** | **48,168** |
| | | | |
| | Publications | | |
| 414062-01 | Publication Services | 9,874 | 0 |
| | **Subtotals** | **9,874** | **0** |
| | | | |
| | Ship Operations | | |
| 414072-01 | Subcontractor | 0 | 13,463,067 |
| 414072-02 | IODP General Support | 1,193 | 314,694 |
| | **Subtotals** | **1,193** | **13,777,761** |
| | | | |
| | **TOTAL** | **1,835,718** | **15,872,425** |

# FY05 IODP-USIO SCIENCE SERVICES, TAMU, JANUARY 2005 ADDENDUM TASK-ELEMENT SUMMARY BUDGET

| Description | TAMU |
|---|---|
| | |
| **Task Element—Phase 1 SOC FY05** | |
| Management and Administration | $118,336 |
| Technical, Engineering and Science Support | $1,542,353 |
| Core Curation | $39,335 |
| Data Management | $125,820 |
| Publications | $9,874 |
| Logging | $0 |
| Education and Outreach | $0 |
| **Subtotals** | **$1,835,718** |
| | |
| **Task Element—Phase 1 POC FY05** | |
| Management and Administration | $118,600 |
| Technical, Engineering and Science Support | $15,705,657 |
| Core Curation | $3,943 |
| Data Management | $44,225 |
| Publications | $0 |
| Logging | $0 |
| Education and Outreach | $0 |
| **Subtotals** | **$15,872,425** |
| | |
| **Task Element—Totals FY05** | |
| Management and Administration | $236,936 |
| Technical, Engineering and Science Support | $17,248,010 |
| Core Curation | $43,278 |
| Data Management | $170,045 |
| Publications | $9,874 |
| Logging | $0 |
| Education and Outreach | $0 |
| **Totals** | **$17,708,143** |

# JANUARY 2005 ADDENDUM BUDGET

## 414012-01000 Headquarters Department – Office

| Exp. Cat. | Description | FY05 PP Addendum Phase 1 Total | |
|---|---|---|---|
| | | SOC | POC |
| 2000 | Payroll | 61,809 | 61,809 |
| 4000 | Supplies | 150 | 150 |
| 4765 | Software | 150 | 150 |
| 5261 | Shipping | 100 | 100 |
| 5370 | Telecommunications | 300 | 300 |
| 5373 | Ship-to-Shore Communications | 100 | 100 |
| | | | |
| | **TOTAL** | **62,609** | **62,609** |

Funds in this cost center are those required to fulfill the operational requirements involved with an extension of activities through 30 September 2005.

***Payroll***—Salary and fringe for the Director, Deputy Director of Science Services, Deputy Director of Data Services, Health, Safety, and Environment (HSE) Coordinator, Web Administrator, Administrative Coordinator, and Administrative Assistant. A portion of the salaries of the Director and Deputy Director of Science Services is paid by Texas A&M University (TAMU).

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

***Software***—Software purchases and upgrades. Covers 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.

# JANUARY 2005 ADDENDUM BUDGET

## 414022-01000 Administrative Services Department

| Exp. Cat. | Description | FY05 PP Addendum Phase 1 Total | |
|---|---|---|---|
| | | SOC | POC |
| 2000 | Payroll | 38,709 | 38,709 |
| 3500 | Travel | 3,614 | 3,614 |
| 3580 | Travel to/from Port | 2,501 | 2,501 |
| 3720 | Business Conferences | 400 | 400 |
| 4000 | Supplies | 3,085 | 3,085 |
| 5261 | Shipping | 670 | 670 |
| 5370 | Telecommunications | 1,450 | 1,450 |
| 5373 | Ship-to-Shore Communications | 50 | 50 |
| 5550 | Services | 840 | 840 |
| 5590 | TAMU Computer Services | 2,465 | 2,465 |
| 5986 | Furniture | 350 | 350 |
| 5987 | Recruiting | 230 | 230 |
| 6820 | Maintenance and Repair | 170 | 170 |
| | | | |
| | **TOTAL** | **54,534** | **54,534** |

Funds in this cost center are those required to fulfill the operational requirements involved with an extension of activities through 30 September 2005.

***Payroll***—Salary and fringe for the department. Also includes funds to support four student workers. All personnel in the department are employees of the Texas A&M Research Foundation (TAMRF).

***Travel***—Transportation, per diem, and lodging, exclusive of travel related to port calls. Covers the costs of additional liaison trips resulting from an extension of operations.

***Travel to/from Port***—Transportation, per diem, and lodging for travel to and from port call. Covers one employee conducting a liaison visit to one of the four additional port calls involved with the extension of operations.

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

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

***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***—Covers the additional expense for satellite and regular communications 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.).

***TAMU Computing Services***—Program's share of costs associated with use of the TAMU's financial and management information system (FAMIS) in conducting the fiscal activities.

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

***Recruiting***—Employee recruitment. Provides for local advertisement of position vacancies that occur throughout the period of the extension of operations.

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

# JANUARY 2005 ADDENDUM BUDGET

## 414032-01000 Science Operations Department – Office

| Exp. Cat. | Description | FY05 PP Addendum Phase 1 Total | |
|---|---|---|---|
| | | SOC | POC |
| 2000 | Payroll | 14,196 | 14,196 |
| 3580 | Travel to/from Port | 2,038 | 2,038 |
| 5987 | Recruiting | 2,500 | 2,500 |
| 8510 | Library | 1,500 | 1,500 |
| | | | |
| | **TOTAL** | **20,234** | **20,234** |

Funds in this cost center are those required to fulfill the operational requirements involved with an extension of activities through 30 September 2005.

***Payroll***—Salary and fringe for the Manager and Administrative Assistant. Also includes funds to support one Graduate Assistant Researcher.

***Travel to/from Port***—Transportation, per diem, and lodging for travel to and from the vessel at port calls. Covers the cost of the Manager traveling to one port call during the IODP-USIO Phase 1 extension to monitor the status of the shipboard laboratories and to meet with the technical support staff on issues of concern.

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

***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 document archive.

# JANUARY 2005 ADDENDUM BUDGET

## 414032-02000 Science Operations Department – Technical Support

| Exp. Cat. | Description | FY05 PP Addendum Phase 1 Total | |
|---|---|---|---|
| | | SOC | POC |
| 2000 | Payroll | 302,721 | 95,596 |
| 3580 | Travel to/from Port | 107,160 | 18,910 |
| 3600 | Training | 3,000 | 27,000 |
| 4000 | Supplies | 204,135 | 15,365 |
| 5550 | Services | 1,000 | 0 |
| 5987 | Recruiting | 3,000 | 2,000 |
| 6820 | Maint & Repair | 5,000 | 0 |
| | | | |
| | **TOTAL** | **626,016** | **158,871** |

Funds in this cost center are those required to fulfill the operational requirements involved with an extension of activities through 30 September 2005.

***Payroll—***Salary and fringe for the Supervisor of Technical Support, Laboratory Officers (3), Assistant Laboratory Officers (4), Marine Instrumentation Specialists (4), and Marine Laboratory Specialists (9). Also includes sea pay for seven employees: the Laboratory Officers and Assistant Laboratory Officers.

***Travel to/from Port***—Transportation, per diem, and lodging for travel to and from ship at port calls. Covers seagoing personnel for four expeditions and the initial transit in FY06. 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 Alternative Sea Pay Plan (ASPP) status.

***Training***—Registration, transportation, per diem, and lodging expenses related to professional training. Some training in laboratory safety (including hazardous materials and hydrogen sulfide) and basic safety and survival skills must be repeated on an annual basis. With the extension of IODP-USIO Phase 1, we anticipate the need for additional training funds.

***Supplies***—Shipboard laboratory supplies. Covers anticipated laboratory and core handling supplies for four expeditions plus the initial expedition in FY06.

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

***Recruiting***—Employee recruitment. We anticipate some turnover in the technical support staff and will have to fill at least some of the resulting vacancies. Funds are included to cover the costs of advertising and recruiting.

***Maintenance and Repair***—Maintenance of shipboard laboratory equipment (other than analytical systems) carried out by vendors during port calls.

# JANUARY 2005 ADDENDUM BUDGET

## 414032-03000 Science Operations Department – Science Support

| Exp. Cat. | Description | FY05 PP Addendum Phase 1 Total | |
|---|---|---|---|
| | | SOC | POC |
| 3580 | Travel to/from Port | 8,312 | 1,467 |
| 3720 | Business Conferences | 2,000 | 0 |
| | | | |
| | **TOTAL** | **10,312** | **1,467** |

Funds in this cost center are those required to fulfill the operational requirements involved with an extension of activities through 30 September 2005.

***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 four expeditions. No funds are budgeted for staff scientists to sail on transits.

***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 postcruise meetings for their particular expedition. These meetings are held at IODP-USIO Science Services, TAMU. Funds are budgeted for precruise meetings associated with four expeditions.

# JANUARY 2005 ADDENDUM BUDGET

## 414032-04000 Science Operations Department – Operations Support

| Exp. Cat. | Description | FY05 PP Addendum Phase 1 Total | |
|---|---|---|---|
| | | SOC | POC |
| 2000 | Payroll | 70,179 | 104,730 |
| 3580 | Travel to/from Port | 0 | 9,779 |
| 3720 | Business Conferences | 500 | 0 |
| 4000 | Supplies | 0 | 1,105,518 |
| 5550 | Services | 0 | 27,500 |
| 5931 | Equipment Rental | 0 | 31,200 |
| 6820 | Maintenance and Repair | 0 | 45,000 |
| 8400 | Equipment | 0 | 174,350 |
| | | | |
| | **TOTAL** | **70,679** | **1,498,077** |

Funds in this cost center are those required to fulfill the operational requirements involved with an extension of activities through 30 September 2005.

***Payroll—***Salary, fringe and sea pay for the Supervisor of Operational Support, Operations Superintendents (3), and an Operations Engineer.

***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 four expeditions in FY05 and the first expedition of FY06.

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

***Supplies***—Operational supplies. Covers consumable supplies costs associated with four expeditions in FY05 and two expeditions in FY06, including bits, reentry cones, casing, bulk materials, etc., used in routine operations. (Note that the shipping date for the second, and final, expedition in FY06 falls in September 2005.) Special operational tools are budgeted in the Tools and Analytical Services Department.

***Services***—Expert assistance. Covers services for wireline severing (Kinley Cutter).

***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.

***Equipment***—Operational equipment. Covers drilling and coring hardware costs associated with four expeditions in FY05 and two expeditions in FY06, including drill pipe, coring tools, etc., used in routine operations. (Note that the shipping date for the second, and final, expedition in FY06 falls in September 2005.) Special tools are budgeted in the Tools and Analytical Services Department. Note: The amount budgeted reflects a TAMRF procedural change requiring below-the-keel property with an acquisition value of $5000 or more to be classed as equipment/reportable property. Previously, such property was classed as Supplies.

# JANUARY 2005 ADDENDUM BUDGET

## 414032-05000 Science Operations Department – Materials Support

| Exp. Cat. | Description | FY05 PP Addendum Phase 1 Total | |
|---|---|---|---|
| | | SOC | POC |
| 2000 | Payroll | 35,713 | 29,898 |
| 3500 | Travel | 1,500 | 0 |
| 3580 | Travel to/from Port | 12,806 | 674 |
| 3600 | Training | 0 | 4,500 |
| 4000 | Supplies | 8,000 | 12,000 |
| 5261 | Shipping | 147,126 | 93,126 |
| 5550 | Services | 25,000 | 0 |
| 6820 | Maintenance and Repair | 5,000 | 0 |
| | | | |
| | **TOTAL** | **235,145** | **140,198** |

Funds in this cost center are those required to fulfill the operational requirements involved with an extension of activities through 30 September 2005.

***Payroll***—Salary and fringe for the Supervisor of Materials Support, Marine Logistics Coordinators (2), Materials Technicians (2), and a 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 vesssel 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 assist with port call activities.

***Training—***Registration, transportation, per diem and lodging expenses related to professional training. Since some certifications must be renewed annually, we anticipate the need for additional funds in this area as a result of the IODP-USIO Phase 1 extension.

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

***Shipping***—Courier services and air and surface freight. Covers shipment of all drilling and coring supplies and all scientific supplies to and from the ship. Costs include funds to cover the return of cores to the appropriate repository and to ship samples to science party members following each expedition. This activity will consist of shipping to and from three expeditions and shipping to the fourth expedition that begins in FY05 and ends in FY06. Shipping costs for two expeditions include funds to allow for shipping of chilled and frozen microbiological samples.

***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.

# JANUARY 2005 ADDENDUM BUDGET

## 414042-01000 Tools and Analytical Services Department – Office

| Exp. Cat. | Description | FY05 PP Addendum Phase 1 Total | |
|---|---|---|---|
| | | SOC | POC |
| 2000 | Payroll | 59,194 | 59,194 |
| | | | |
| | **TOTAL** | **59,194** | **59,194** |

Funds in this cost center are those required to fulfill the operational requirements involved with an extension of activities through 30 September 2005.

***Payroll***—Salary and fringe for the Manager, Administrative Assistant, and Staff Researcher.

# JANUARY 2005 ADDENDUM BUDGET

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

| Exp. Cat. | Description | FY05 PP Addendum Phase 1 Total | |
|---|---|---|---|
| | | SOC | POC |
| 2000 | Payroll | 440,275 | 34,301 |
| 3580 | Travel to/from Port | 46,436 | 4,607 |
| 5550 | Services | 5,000 | 0 |
| 6820 | Maintenance and Repair | 22,574 | 0 |
| | | | |
| | **TOTAL** | **514,285** | **38,908** |

Funds in this cost center are those required to fulfill the operational requirements involved with an extension of activities through 30 September 2005.

***Payroll***—Salary and fringe for the Supervisor of Analytical Services, Senior Project Administrator, Marine Laboratory Specialists (MLSs) (6), Research Specialists (3), Senior Programmer Specialists (2), Programmer Specialist, and Programmers (3). Also includes sea pay for nine employees.

***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.

***Services***—Expert assistance. Covers expenses associated with one undefined service call to the vessel for laboratory equipment.

***Maintenance and Repair***—Covers maintenance agreements and ongoing maintenance and repair of shipboard laboratory equipment, including safety equipment, for a 5-month period.

# JANUARY 2005 ADDENDUM BUDGET

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

| Exp. Cat. | Description | FY05 PP Addendum Phase 1 Total | |
|---|---|---|---|
| | | SOC | POC |
| 2000 | Payroll | 6,488 | 1,844 |
| 3580 | Travel to/from Port | 0 | 10,560 |
| | | | |
| | **TOTAL** | **6,488** | **12,404** |

Funds in this cost center are those required to fulfill the operational requirements involved with an extension of activities through 30 September 2005.

***Payroll***—Salary and fringe for the Supervisor of Engineering Services, Engineers (4), Designers (3), and Electronics Specialist, including sea pay for engineers sailing on two expeditions.

***Travel to/from Port***—Transportation, per diem, and lodging for travel to and from the vessel at port calls. Covers the cost of an experienced engineer and a new hire sailing on two expeditions.

# JANUARY 2005 ADDENDUM BUDGET

## 414052-01000 Information Technology and Data Services Department – Office

| Exp. Cat. | Description | FY05 PP Addendum Phase 1 Total | |
|---|---|---|---|
| | | SOC | POC |
| 2000 | Payroll | 11,553 | 11,553 |
| 3580 | Travel to/from Port | 1,683 | 1,683 |
| | | | |
| | **TOTAL** | **13,236** | **13,236** |

Funds in this cost center are those required to fulfill the operational requirements involved with an extension of activities through 30 September 2005.

***Payroll***—Salary and fringe for Department Manager and Information Services Assistant.

***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 Manager attending the port calls for two expeditions.

# JANUARY 2005 ADDENDUM BUDGET

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

| Exp. Cat. | Description | FY05 PP Addendum Phase 1 Total | |
|---|---|---|---|
| | | SOC | POC |
| 2000 | Payroll | 45,669 | 22,801 |
| 3580 | Travel to/from Port | 8,188 | 8,188 |
| 5261 | Shipping | 500 | 0 |
| 5550 | Services | 15,000 | 0 |
| | | | |
| | **TOTAL** | **69,357** | **30,989** |

Funds in this cost center are those required to fulfill the operational requirements involved with an extension of activities through 30 September 2005.

***Payroll***—Salary and fringe for the 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 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 two port calls.

***Shipping***—Postage, express mail, and freight. Covers occasional shipping of equipment to or from core repositories and vendors.

***Services***—Expert assistance. Covers outside consultation and technical services needed for anticipated changes in the data networks onboard the research ship and at the IODP-USIO Science Services, TAMU, facility.

# JANUARY 2005 ADDENDUM BUDGET

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

| Exp. Cat. | Description | FY05 PP Addendum Phase 1 Total | |
|---|---|---|---|
| | | SOC | POC |
| 3500 | Travel | 3,032 | 0 |
| 3580 | Travel to/from Port | 9,259 | 0 |
| 3600 | Training | 1,636 | 0 |
| 4000 | Supplies | 20,000 | 0 |
| 4765 | Software | 3,000 | 0 |
| 5550 | Services | 3,600 | 0 |
| 6820 | Maintenance and Repair | 2,000 | 0 |
| 8400 | Equipment | 700 | 0 |
| | | | |
| | **TOTAL** | **43,227** | **0** |

Funds in this cost center are those required to fulfill the operational requirements involved with an extension of activities through 30 September 2005.

***Travel***—Transportation, per diem, and lodging, exclusive of travel related to port calls. Covers costs of the Supervisor to attend a meeting at Sapporo, Japan, the imaging specialist and data librarian to attend JIT meetings in Washington, D.C., and the Supervisor to attend a professional meeting.

***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-USIO expedition.

***Training***—Registration, transportation, per diem, and lodging expenses related to professional training. Supports 10 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 the riserless vessel and shore.

***Software***—Software purchases and upgrades. 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.

***Services***—Expert assistance. Includes the cost of image scanning of paper prime data and precision depth recorder records.

***Maintenance and Repairs***—Maintenance agreements and equipment repairs. Covers required maintenance of the digital cameras.

***Equipment***—Office, computer, scientific, and drilling equipment. Covers the cost photographic equipment for the riserless vessel and on shore (e.g., DIX battery charger, ring strobe, tripod and head, light meter, and pan head).

# JANUARY 2005 ADDENDUM BUDGET

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

| Exp. Cat. | Description | FY05 PP Addendum Phase 1 Total | |
|---|---|---|---|
| | | SOC | POC |
| 3580 | Travel to/from Port | 3,943 | 3,943 |
| | | | |
| | **TOTAL** | **3,943** | **3,943** |

Funds in this cost center are those required to fulfill the operational requirements involved with an extension of activities through 30 September 2005.

***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 shipboard curator to and from port at the beginning and end of each expedition.

# JANUARY 2005 ADDENDUM BUDGET

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

| Exp. Cat. | Description | FY05 PP Addendum Phase 1 Total | |
|---|---|---|---|
| | | SOC | POC |
| 2000 | Payroll | 4,010 | 0 |
| | | | |
| | **TOTAL** | **4,010** | **0** |

Funds in this cost center are those required to fulfill the operational requirements involved with an extension of activities through 30 September 2005.

***Payroll***—Salary and fringe for the Repository Superintendent and a part-time Curatorial Specialist. Also includes funds for one student worker to help with repository sampling, process sample requests, and maintain appropriate data files.

# JANUARY 2005 ADDENDUM BUDGET

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

| Exp. Cat. | Description | FY05 PP Addendum Phase 1 Total | |
|---|---|---|---|
| | | SOC | POC |
| 2000 | Payroll | 4,619 | 0 |
| | | | |
| | **TOTAL** | **4,619** | **0** |

Funds in this cost center are those required to fulfill the operational requirements involved with an extension of activities through 30 September 2005.

***Payroll***—Salary and fringe for the Repository Superintendent.

# JANUARY 2005 ADDENDUM BUDGET

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

| Exp. Cat. | Description | FY05 PP Addendum Phase 1 Total | |
|---|---|---|---|
| | | SOC | POC |
| 2000 | Payroll | 26,763 | 0 |
| | | | |
| | **TOTAL** | **26,763** | **0** |

Funds in this cost center are those required to fulfill the operational requirements involved with an extension of activities through 30 September 2005.

***Payroll***—Salary and fringe for the Repository Superintendent, Curatorial Specialist, and Marine Curatorial Specialist. Also includes funds for four student workers to help with repository sampling, process sample requests, and maintain appropriate data files.

# JANUARY 2005 ADDENDUM BUDGET

## 414062-01000 Publication Services Department

| Exp. Cat. | Description | FY05 PP Addendum Phase 1 Total | |
|---|---|---|---|
| | | SOC | POC |
| 3580 | Travel to/from Port | 9,874 | 0 |
| | | | |
| | **TOTAL** | **9,874** | **0** |

Funds in this cost center are those required to fulfill the operational requirements involved with an extension of activities through 30 September 2005.

***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 five expeditions.

# JANUARY 2005 ADDENDUM BUDGET

## 414072-01000 Ship Operations – Subcontractor

| Exp. Cat. | Description | FY05 PP Addendum Phase 1 Total | |
|---|---|---|---|
| | | SOC | POC |
| 3760 | Per Diem | 0 | 184,613 |
| 4750 | Fuel and Lubricants | 0 | 1,618,500 |
| 7040 | Day Rates | 0 | 11,150,854 |
| 7090 | Port Calls | 0 | 509,100 |
| | | | |
| | **TOTAL** | **0** | **13,463,067** |

Funds in this cost center are those required to fulfill the operational requirements involved with an extension of activities through 30 September 2005.

***Per Diem***—Shipboard catering. Covers shipboard catering costs for 50 cruise participants for 117 days and 30 cruise participants for 28 days (allows for scientists not onboard during transits) at a rate of $27.34/day. Also included in this category is lab stack cleaning for 122 days at $14/day.

***Fuel and Lubricants***—Fuel for the riserless vessel. Covers four refuelings—of 1200, 1000, 900, and 800 metric tons—at a price of $415/metric ton. The number of metric tons budgeted for each refueling represents the absolute minimal estimated requirements. Weather and actual operating conditions may necessitate an upward adjustment.

***Day Rates***—Vessel staffing for the sailing crew and drilling personnel. This budget is based on the total scheduled days (365) at operating ($67,150), cruising ($66,150) and standby ($65,150) less the amount originally budgeted for IODP-USIO Phase 1 operations. Based on the terms of the escalation clause in the TAMRF/Overseas Drilling, Ltd. (ODL), subcontract, it is anticipated that the current day rates will be increased by 2.26% effective 1 March 2005.

***Port Calls***—Agent expenses and freight associated with resupplying the riserless vessel. Includes port agent charges and ship subcontractor freight expenses for four 5-day port calls in Dublin, Mobile, and Balboa (2) and two 1-day port calls in Ponta Delgada and Astoria, along with the hotel and per diem costs to be incurred by the ship subcontractor for four crew changes.

# JANUARY 2005 ADDENDUM BUDGET

## 414072-02000 Ship Operations – General Support

| Exp. Cat. | Description | FY05 PP Addendum Phase 1 Total | |
|---|---|---|---|
| | | SOC | POC |
| 3580 | Travel to/from Port | 1,193 | 1,457 |
| 5070 | Insurance | 0 | 219,600 |
| 5373 | Ship-to-Shore Communications | 0 | 58,637 |
| 5550 | Services | 0 | 35,000 |
| | | | |
| | **TOTAL** | **1,193** | **314,694** |

Funds in this cost center are those required to fulfill the operational requirements involved with an extension of activities through 30 September 2005.

***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 Directors, and the HSE Coordinator to each attend one or more port calls during the IODP-USIO Phase 1 extension period.

***Insurance***—The amount budgeted is based on the quote received from the insurance underwriter for 4 additional months of coverage.

***Ship-to-Shore Communications***—Satellite and regular communication between the riserless vessel and shore-based personnel. Covers the cost of 4.5 additional months of very small aperture terminal (VSAT) service and estimated Inmarsat usage, less the $3000/month payment from the ship subcontractor for its share of VSAT service costs.

***Professional Service***—Expert assistance. Covers costs of medical evacuations and miscellaneous charges payable to the ship subcontractor during the IODP-USIO Phase 1 extension period.

# ADDENDUM APPENDIX I: EXPEDITION OPERATIONS

## INTRODUCTION

The extension of Integrated Ocean Drilling Program U.S. Implementing Organization (IODP-USIO) Phase 1 consists of four expeditions that constitute three complete science programs. A total of 168 operating days are proposed in the Phase 1 extension period of FY05, consisting of 42 days in transit, 21 port call days, and 105 days focused on science delivery (on site and between-site transit). The schedule is summarized below.

| | |
|---|---|
| 26 April–31 May 2005 | Expedition: Porcupine Carbonate Mounds |
| 31 May–6 July 2005 | Expedition: Gulf of Mexico Hydrogeology |
| 6 July–24 August 2005 | Expedition: Superfast Spreading 1 |
| 24 August–7 October 2005 | Expedition: Cascadia Gas Hydrates |

## OPERATIONS

### Porcupine Carbonate Mounds Expedition

This program is a multidisciplinary research program to evaluate the role of carbonate mound genesis and its significance. The primary scientific objective is to core one of a series of giant mounds on the present seabed surface southwest of Ireland (Porcupine Basin). The mounds are 200 to 250 m high and form a cluster of over a thousand buried reefs embedded in drift deposits. The "Porcupine Drilling Project" is driven by four major research projects funded under the 5$^{th}$ Framework Programme of the European Union and is thus of international, multidisciplinary interest. Major objectives include understanding (1) the role of gas seeps as a prime trigger for mound genesis, (2) the role of bacteria as main mound builders, (3) the role of reef-forming corals as a major part of the mound community and their environmental record, (4) the significance of mound "events" in the paleoenvironmental record, (5) the identification of prominent erosional surfaces as products of global oceanic turnovers, (6) the potential of mounds as a high-resolution paleoenvironmental record, (7) the value of the Porcupine-Rockall mounds as present day analogs for older reef mounds and carbonate mud mounds found in the geologic record, and (8) the potential role of fluid flow as a common source of both slope failures and mound growth.

#### *Proposed Operations*

Multiple holes will be drilled at three sites on Challenger mound in the Belgica mound province. The holes will be cored and logged to a depth of approximately 300 m below the sea floor. The emphasis of this expedition will be on sediment core recovery and analysis. Each site will be double cored with the advanced piston corer (APC) to assure recovery of the complete sediment section. Heavy use of the APC temperature (APCT) tool (also known as the Adara temperature tool), the Davis-Villinger Temperature Probe (DVTP), and the Well Seismic Tool (WST) can be expected, along with significant microbiological sampling.

### *Environment and Safety*

The expedition falls in the optimum weather window for this region, so operations should not be hampered by bad weather. Since the mounds are believed to be fed by gas seeps from below, gassy cores can be expected.

### *Logistics*

The Porcupine Carbonate Mounds Expedition will require an estimated 35 days (6 days in port, 19 days in transit, and 10 on site). The scientific participants will disembark the vessel in Ponta Delgada following completion of the science program.

## Gulf of Mexico Hydrogeology Expedition

The primary objective of this expedition is to characterize overpressure and fluid flow processes in the deepwater Gulf of Mexico. Two sites will be drilled in the normally pressured Brazos-Trinity Basin in order to characterize rock and fluid properties and in situ conditions at a range of known effective stress conditions. Two sites will be occupied in the Ursa Basin to characterize rock and fluid properties in an overpressured environment. Drilling in the Ursa Basin during this expedition will be restricted to a depth above the top of the "Blue" horizon, which is a marker for the top of the overpressured zone.

### *Proposed Operations*

Each site will be multiple APC cored to assure recovery of the complete sediment section. Standard wireline logging will be conducted at each site. In situ measurements will include logging while drilling (LWD) and piezoprobe experiments. A vertical seismic profile (VSP) is planned at each site.

### *Environment and Safety*

Potential problems include hole instability and gas or fluid flows. To mitigate these, a careful independent analysis of the existing seismic data will be conducted to ensure sites are located in areas of minimal risk, and a supply of heavy mud will be available to kill any flows encountered. Clays can be expected to cause holes to swell closed, making standard logging difficult and increasing the risk of stuck pipe. The sites planned for the Gulf of Mexico Hydrogeology Expedition are close to existing oilfield installations and pipelines, requiring a careful survey of the seafloor at each site before drilling commences. The VSP work will require operating under existing IODP guidelines to mitigate potential impacts on marine mammals.

### *Logistics*

Operations will require an estimated 36 days (5 days in port, 11 days in transit, and 20 on site).

## Superfast Spreading 1 Expedition

ODP Leg 206 resulted, for the first time in scientific ocean drilling, in the successful construction of the borehole infrastructure required for deep drilling into the ocean basement. The Superfast Spreading 1 and 2 Expeditions will return to Ocean Drilling Program (ODP) Hole 1256B with the objective of recovering complete a section through superfast-spreading (>200 m/yr) oceanic crust.

### *Proposed Operations*

From an operational standpoint, these will be routine hard rock expeditions. During ODP Leg 206, Hole 1256B was cased into basement and cored 500 m into basement. The hole was left clean and open for further deepening. The Superfast Spreading 1 Expedition will deepen Hole 1256B by RCB coring to the maximum depth possible. The hole will be logged with standard tool strings. Significant microbiological sampling is expected as we continue to probe the depth of the deep

crustal biosphere.

### *Environment and Safety*

Hole stability and slow rates of penetration may limit the achievable depth of the hole, although since Hole 1256B is cased into basement instability in the sedimentary part of the section has been minimized and during ODP Leg 206 the basement drilled cleanly and relatively rapidly.

### *Logistics*

Operations for the Superfast Spreading 1 Expedition require an estimated 49 days (5 in port, 6 in transit, and 38 on site).

## Cascadia Gas Hydrates Expedition

The Cascadia margin proposal successfully demonstrated the need for scientific ocean drilling in an accretionary prism environment to better constrain the models concerning the formation of gas hydrates. The original proposal has been adapted to accommodate a shortened coring program consisting of 22 days, with the understanding the remaining aspects of the proposal will be completed during a future expedition. The scheduled expedition will consist of completing a series of sites across the northern Cascadia accretionary prism to improving the understanding of the deep origin of methane, its upward transport, its incorporation in gas hydrate, and its subsequent loss to the seafloor. A primary focus will be documenting the widespread seafloor-parallel layer of dispersed hydrate associated with bottom seismic reflectors.

### *Proposed Operations*

A revised science plan will be developed with the lead proponents that maximizes the delivered science within the constraints of available operating days and resources. The reduced program will maintain the spirit of the original proposal, thereby focusing on completing a number of holes across the accretionary prism to examine the time-space progression of gas hydrate formation and dissociation in this environment. Primary tools will include APC and extended core barrel (XCB) coring, LWD and possible completion of a VSP. Significant sampling for gas hydrates and microbiology is anticipated. Many of the downhole experiments and monitoring originally proposed will not be possible.

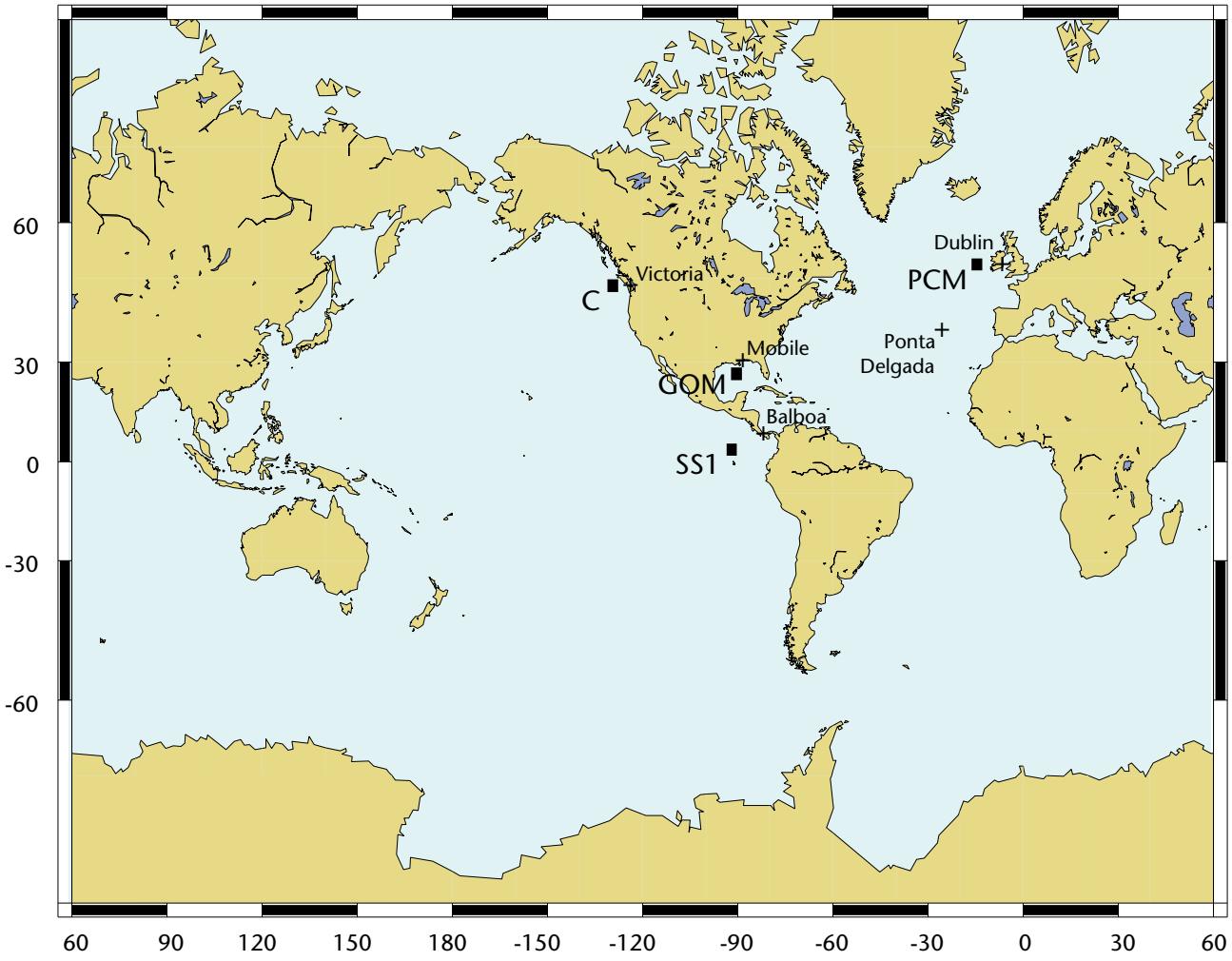
### *Environment and Safety*

Potential problems include hole stability and gas or fluid flow.

### *Logistics*

Operations for the Cascadia Gas Hydrates Expedition require an estimated 44 days (5 in port, 17 in transit, and 22 on site).

**Figure 1.** Expedition map and proposed port call locations for IODP-USIO FY05 Phase 1 extension. PCM = Porcupine Carbonate Mounds Expedition, GOM = Gulf of Mexico Hydrogeology Expedition, SS1 = Superfast Spreading 1, C = Cascadia Gas Hydrates Expedition.



# IODP-USIO SCIENCE SERVICES, TAMU AND LDEO, EXPEDITION BUDGET

| | Porcupine | | GOM | | Superfast 1 | | Cascadia | | Long-Lead Items | |
|---|---|---|---|---|---|---|---|---|---|---|
| | SOC | POC | SOC | POC | SOC | POC | SOC | POC | SOC | POC |
| **Science Services, TAMU** | | | | | | | | | | |
| Payroll | 144,295 | 44,517 | 149,488 | 46,013 | 202,464 | 65,670 | 167,636 | 53,439 | 0 | 0 |
| Travel | 223 | 0 | 229 | 0 | 312 | 0 | 236 | 0 | 0 | 0 |
| Travel to/from Port | 30,000 | 13,410 | 30,000 | 8,460 | 54,000 | 7,625 | 49,962 | 15,672 | 46,930 | 18,139 |
| Training | 1,024 | 7,022 | 1,063 | 7,223 | 1,447 | 9,831 | 1,093 | 7,424 | 0 | 0 |
| Supplies | 40,942 | 36,448 | 41,456 | 209,522 | 32,621 | 153,479 | 47,842 | 98,736 | 66,274 | 632,699 |
| Business | 446 | 0 | 459 | 0 | 624 | 0 | 471 | 0 | 0 | 0 |
| Software | 334 | 0 | 334 | 0 | 468 | 0 | 354 | 0 | 0 | 0 |
| Library | 375 | 375 | 375 | 375 | 375 | 375 | 375 | 375 | 0 | 0 |
| Insurance | 0 | 48,645 | | 50,035 | 0 | 68,104 | 0 | 52,816 | 0 | 0 |
| Shipping | 28,100 | 20,875 | 32,250 | 32,250 | 72,501 | 25,001 | 14,275 | 13,250 | 0 | 0 |
| Professional Services | 9,140 | 13,884 | 9,401 | 14,281 | 12,796 | 19,437 | 9,662 | 14,899 | 0 | 0 |
| Recuriting | 1,226 | 1,003 | 1,261 | 1,032 | 1,717 | 1,404 | 1,296 | 1,061 | 0 | 0 |
| Maintenance and | 4,904 | 10,032 | 5,045 | 10,348 | 6,866 | 14,045 | 5,185 | 10,605 | 0 | 0 |
| Equipment | 0 | 0 | 0 | 34,870 | 0 | 34,870 | 0 | 34,870 | 0 | 69,740 |
| Per Diem | 0 | 40,895 | 0 | 42,064 | 0 | 57,254 | 0 | 44,400 | 0 | 0 |
| Fuels & Lubes | 0 | 358,528 | 0 | 368,772 | 0 | 501,940 | 0 | 389,260 | 0 | 0 |
| Day Rate | 0 | 2,470,125 | 0 | 2,540,700 | 0 | 3,458,175 | 0 | 2,681,854 | 0 | 0 |
| Port Call | 0 | 112,775 | 0 | 115,997 | 0 | 157,885 | 0 | 122,443 | 0 | 0 |
| Ship-to-Shore Communication | 0 | 12,989 | 0 | 13,360 | 0 | 18,185 | 0 | 14,103 | 0 | 0 |
| **Subtotal (TAMU)** | **261,009** | **3,191,523** | **271,361** | **3,495,302** | **386,191** | **4,593,280** | **298,387** | **3,555,207** | **113,204** | **720,578** |
| **Science Services, LDEO** | | | | | | | | | | |
| Payroll | 6,447 | 0 | 6,901 | 0 | 9,556 | 0 | 7,106 | | 0 | 0 |
| Equipment | 2,113 | 0 | 2,173 | 0 | 2,958 | 0 | 2,233 | | 0 | 0 |
| Supplies | 3,500 | 0 | 3,600 | 0 | 4,900 | 0 | 3,700 | | 0 | 0 |
| Travel | 4,606 | 0 | 4,738 | 0 | 4,448 | 0 | 4,869 | | 4,000 | 0 |
| Communications | 408 | 0 | 420 | 0 | 571 | 0 | 431 | | 200 | 0 |
| Shipping | 1,000 | 0 | 1,000 | 0 | 1,000 | 0 | 1,000 | | 0 | 0 |
| Maintenance and | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 |
| Computing | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 |
| Other | 5,600 | | 5,760 | 0 | 5,840 | 0 | 5,920 | | 0 | 0 |
| Day Rate | 180,150 | 167,905 | 379,440 | 172,702 | 210,210 | 235,067 | 478,730 | 177,500 | 0 | 0 |
| Insurance | 27,528 | 1,028 | 28,314 | 1,057 | 38,539 | 1,440 | 29,101 | 1,087 | 0 | 0 |
| Indirect Costs | 11,428 | 0 | 11,882 | 0 | 13,947 | 0 | 12,203 | | 2,226 | 0 |
| **Subtotal (LDEO)** | **242,780** | **168,933** | **444,228** | **173,759** | **291,969** | **236,507** | **545,293** | **178,587** | **6,426** | **0** |
| | | | | | | | | | | |
| **SOC and POC request** | **503,789** | **3,360,456** | **715,589** | **3,669,061** | **678,160** | **4,829,787** | **843,680** | **3,733,794** | **119,630** | **720,578** |
| **Total Expedition:** | | **3,864,245** | | **4,384,650** | | **5,507,947** | | **4,577,474** | | **840,208** |

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. Long-lead items are for equipment supplies and travel associated with proposed FY06 expedition.

# INTEGRATED OCEAN DRILLING PROGRAM

## United States Implementing Organization
## Systems Integration Contractor

### Joint Oceanographic Institutions, Inc.

# JANUARY 2005 PROGRAM PLAN ADDENDUM

# FY05 for NSF

For Time Period
1 April 2005 to 30 September 2005

**AMOUNT PROPOSED FY05: $158,686 (NSF/SIC Only)**

Respectfully Submitted to:
National Science Foundation

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

27 January 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 this FY05 IODP-USIO Program Plan Addendum.

JOI requests funds to support the execution of an Environmental Assessment for the additional expeditions to be conducted in FY05, as well as funds to support a “Teacher at Sea” candidate for each of two expeditions that will take place during the summer of 2005.

# JOI OFFICE BUDGET

| Description | FY05 Addendum SOC + POC Total | FY05 Addendum NSF/SIC Total | JOI FY05 Addendum Total |
|---|---|---|---|
| **Task Element—JOI FY05 Management and Administration** | | | |
| Salaries and Fringe Benefits | 0 | 0 | 0 |
| Travel | 0 | 0 | 0 |
| Supplies | 0 | 0 | 0 |
| Shipping | 0 | 0 | 0 |
| Communications | 0 | 0 | 0 |
| Contractual Services | 0 | 100,000 | 100,000 |
| Equipment | 0 | 0 | 0 |
| Other Direct Costs | 0 | 0 | 0 |
| Subtotal (Direct Costs) | 0 | 100,000 | 100,000 |
| JOI G&A | 0 | 30,000 | 30,000 |
| **Subtotal** | **0** | **130,000** | **130,000** |
| | | | |
| **Education and Outreach** | | | |
| Salaries and Fringe Benefits | 0 | 0 | 0 |
| Travel | 0 | 12,896 | 12,896 |
| Supplies | 0 | 0 | 0 |
| Shipping | 0 | 0 | 0 |
| Communications | 0 | 0 | 0 |
| Contractual Services | 0 | 9,170 | 9,170 |
| Equipment | 0 | 0 | 0 |
| Other Direct Costs | 0 | 0 | 0 |
| Subtotal (Direct Costs) | 0 | 22,066 | 22,066 |
| JOI G&A | 0 | 6,620 | 6,620 |
| **Subtotal** | **0** | **28,686** | **28,686** |
| | | | |
| **Total JOI** | **0** | **158,686** | **158,686** |

***JOI Salaries and Fringe Benefits***—The costs for FY05 are based on salary levels proposed to NSF. The estimated JOI benefit rate is 35%.

***Travel***—The budget includes funds requested by JOI to support travel and meetings to accomplish education and outreach activities for the JOI Alliance in support of the Teacher at Sea initiative.

***Supplies***—This category includes funds requested by JOI for supplies for the JOI Alliance under this contract.

***Shipping***—Funds are requested by JOI for shipping costs (e.g., postage, courier services) for the JOI Alliance under this contract.

***Communications***—This category includes funds requested by JOI for communications costs (e.g., phone, fax, internet services) for the JOI Alliance under this contract.

***Contractual Services***—This category includes funds requested by JOI to support activities related to conducting an Environmental Assessment for the FY05 Addendum Expeditions under the M&A budget.

***Equipment***—This category includes funds requested by JOI for equipment for the JOI Alliance under this contract.

***Other Direct Cost***—This category supports other JOI direct costs for the JOI Alliance under this contract.

***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 under a particular contract.