

MEMORANDUM

between

**THE NATIONAL SCIENCE FOUNDATION
(NSF)
of
THE UNITED STATES OF AMERICA,**

**THE MINISTRY OF EDUCATION, CULTURE, SPORTS, SCIENCE AND
TECHNOLOGY
(MEXT)
of
JAPAN,**

and

**THE MINISTRY OF EARTH SCIENCES
(MoES)
of
INDIA**

concerning PARTICIPATION

in

THE INTEGRATED OCEAN DRILLING PROGRAM (IODP)

The Integrated Ocean Drilling Program (IODP) is a multinational program of scientific research in the oceans which uses drilling and logging to carry out research on Earth system processes ranging from changes in the Earth's climate to the rifting and drifting of continents. The IODP builds on the scientific results of the Deep-Sea Drilling Project (DSDP) initiated in 1968 and the Ocean Drilling Program (ODP), which succeeded the DSDP in 1985, and the encouragement that the United Nations Convention on the Law of the Sea has provided to international cooperation in marine scientific research. The IODP seeks to expand the international sharing of intellectual and financial resources, which have been critical to the success of scientific ocean drilling. The IODP scientific program is identified in the Initial Science Plan for the IODP, *Earth, Oceans and Life*, and includes emphasis on the following research themes:

The Deep Biosphere and the Sub-Seafloor Ocean: Drilling will concentrate on defining the architecture and dynamics of the vast sub-seafloor plumbing system, where flowing water alters rock, modifies the long-term chemistry of the oceans, lubricates seismically active faults, concentrates economic mineral deposits, and controls the distribution of the deep biosphere.

The Processes and Effects of Environmental Change: Using a global array of sites, ocean sediment cores will be used to construct a detailed record of the causes, rates and severity of changes in the earth's climate system and their relation to major pulses in biologic evolution.

Solid Earth Cycles and Geodynamics: Drilling will concentrate on sampling and monitoring regions of the seafloor that currently have the highest rates of energy and mass transfer, and comparing these results to older geologic settings. A crucial initial program of deep drilling will be to study the seismogenic zone responsible for large destructive earthquakes along active plate boundaries.

The primary operations of the IODP are conducted by contractors (Implementing Organizations) responsible to the National Science Foundation of the United States of America (NSF) and the Ministry of Education, Culture, Sports, Science, and Technology of Japan (MEXT), hereafter referred to as the Agencies. The IODP drilling operations focus on a core capability provided by two scientific ocean drilling platforms. One is a riser-capable vessel provided by the MEXT and owned and operated by Japan Agency for Marine-Earth Science and Technology (JAMSTEC), and the other is a non-riser vessel provided by the NSF and operated by the Consortium for Ocean Leadership. Both vessels are available for scheduling and operations on a global basis, based on recommendations from the IODP Science Advisory Structure (SAS). Access to mission specific platforms (MSPs) (in addition to the two primary vessels) is required to meet specific objectives of the science plan for shallow water and Arctic drilling that cannot be effectively done through use of the riser-capable or non-riser vessels. The IODP seeks cooperation with other earth and ocean science programs and initiatives. The scientific and technical results of the IODP are openly available.

Based on IODP membership principles, the NSF, the MEXT, and the Ministry of Earth Sciences (MoES), hereafter referred to as the Participants, intend to cooperate in IODP activities during the period 1 October 2008 to 30 September 2013, as described in the following sections:

1 - STATUS OF THIS DOCUMENT

This Memorandum and its annexes are not legally binding, do not give rise to obligations or commitments under international law, and should have no effect as legal precedents.

2 - MEMBERSHIP IN THE IODP

The MoES has elected to be an Associate IODP Member and intends to cooperate and participate in the IODP in support of the IODP science program during the period of 1 October 2008 to 30 September 2013.

All cooperative activities described in this Memorandum, including funding arrangements and exchanges of technical information, equipment, and data, are conducted within the limits of available funds and in accordance with the national laws and regulations of each Participant, as well as with international agreements concluded by the nations in which the Participants are established.

NSF is acting pursuant to the National Science Foundation Act of 1950 as amended, 42 USC1861 *et seq.* This authorization defines the authority of the NSF to enter into this MOU to cooperate in IODP activities.

3 - SCIENTIFIC PLANNING

Scientific planning and direction of the IODP is a function of the SAS. The SAS is composed of scientists and engineers representing the Participants and other IODP members. It provides long-term guidance on the scientific planning of the IODP, and recommends annual science and engineering plans based on proposals from the international science community.

The SAS Executive Authority and the Science Planning Committee (SPC) are composed of representatives from scientific institutions or organizations in the IODP member countries/consortia that have a major interest in the study of the seafloor. The SAS Executive Authority formulates scientific and policy recommendations with respect to IODP planning and operations. The SPC carries out detailed planning and may establish panels, working groups and committees as required.

The MoES may elect to be represented on the SAS as identified in Annex B.

The Chairmanship of the SAS initially rotates between institutions in Japan and the United States, with a term of 2 years. The SAS may establish panels and/or committees as needed to address its responsibilities, including panels on platforms and on science operations.

4 - OPERATIONS PLANNING AND MANAGEMENT

The Central Management Office (CMO) develops and manages operations and implementation plans for the IODP program. The CMO receives advice and recommendations on scientific priorities and plans from the SAS, requests plans that are responsive to this advice from Implementing Organizations, and negotiates with Implementing Organizations and the SAS to produce an integrated annual IODP Program Plan. The annual IODP Program Plan contains a presentation of total program costs, which include both science operation costs and platform operations costs (see section 9). The CMO manages science operations funds that are provided under contract with the NSF.

The SAS Executive Authority reviews and approves the annual IODP Program Plan and budget prior to its consideration by the Agencies. The NSF has responsibility for contractual approval of the annual IODP Program Plan, in consultation with the MEXT. After approval by the Agencies, significant changes in the annual IODP Program Plan are to be considered and approved by the CMO and the Agencies prior to implementation, in consultation with the SAS Executive Authority and the Implementing Organizations, as appropriate.

5 – IODP COUNCIL

The MoES may elect to be represented on the IODP Council. The members of the Council are representatives of each country or entity contributing to the support of the IODP, regardless of whether it participates as an individual IODP member or as a member of a consortium. Each Participant designates its own representatives to the Council. There should ordinarily be one representative of each Participant, except that additional representation from the MEXT and the NSF may be appropriate.

The Council serves as a consultative body reviewing financial, managerial, and other matters involving the overall support of the IODP. The Council provides a forum for exchange of views among the contributing countries. No formal voting procedures are to be established. There are to be no national symbols displayed at IODP Council meetings, or as part of official IODP publications or exhibitions.

The MEXT and the NSF designate Principal Officials who have responsibility for Agency oversight of IODP implementation, operations, management, and funding issues. The Principal Officials serve as the chairs of the Council, alternating on an annual basis. A formal agenda is prepared for each meeting and written records of each meeting are kept.

The chair provides secretariat services to the Council. The Council normally meets once each year. The annual meeting includes a financial report and discussion, an audit report, a review of scientific and technical achievements for the past year, presentation of draft program plans and budgets for the coming year, and other topics of mutual interest. Liaison representatives of prime contractors, Implementing Organizations and important scientific planning entities are available to the Council.

6 – PROJECT PROPOSALS AND DATA SHARING

Scientists of the MoES and other participating institutes of the Government of India engaged in IODP activities:

- a) may make proposals to the SAS for scientific projects or technical objectives of interest to the scientific community of India:
- b) may have access to all data from geophysical and other site surveys performed in support of the program which are used for drilling planning; and
- c) may have access to engineering plans, data or other information developed under contracts supported as program costs.

7 - PARTICIPATION ON BOARD IODP DRILLING PLATFORMS

The Implementing Organizations provide science operations and services on IODP drilling platforms, and, with the advice of the SAS, select the scientific teams for each expedition or drilling program, based on nominations and applications from IODP members and associate IODP members. It is

recognized that the Agencies are to have equal participation of their country's scientists in all IODP drilling programs, and together are to have no less than two-thirds of the available scientific positions.

Scientists from India may participate in IODP drilling expeditions and programs. It is recognized that opportunities for such participation are intended to be proportional to the level of support provided by the MoES and are identified in Annex B.

It is recognized that some expeditions may be of special scientific interest to scientists from India, and increased participation by scientists from India on these expeditions may be appropriate. It is recognized that such increased participation would be expected to be offset by reduced participation in other expeditions.

Co-chief scientists for IODP drilling programs are nominated by the SAS. It is expected that at least two-thirds of the scientists invited to serve as co-chief scientists are to be Japan and U.S. scientists. It is expected that scientists from India would be invited to serve as co-chief scientists in proportion to the MoES contribution. In nominating co-chief scientists, the SAS pays due consideration to those scientists responsible for proposing drilling proposals and plans.

8 – ACCESS TO SAMPLES, DATA AND REPORTS

Scientists from India have access to IODP data and core samples. The procedures and policies for obtaining IODP samples and data are recommended by the SAS. The MoES indicates that it endeavors to ensure that scientists and institutions from India provide the scientific data resulting from site surveys and laboratory analyses in time for preparation of IODP publications, and for inclusion in IODP data bases. The MoES is expected to provide the Agencies with copies of all publications from scientists from India that are based on program material. The MoES is to receive an appropriate number of copies of all IODP publications and reports.

9 - FINANCIAL SUPPORT

The MoES intends to support the IODP with financial contributions as described in Annexes A and B. The financial contributions to the NSF of all IODP members and associate IODP members are commingled to support science operation costs of the IODP. Science operation costs are determined by the Agencies. Science operation costs provide for those activities onboard program platforms necessary to the proper conduct of the scientific research program and those shore-based activities required to properly maintain and distribute samples and data, support seagoing activities, and administer and manage the program. Such costs include, for example: (1) technical services, (2) computer capability, (3) data storage and distribution, (4) description, archiving, and distribution of data and samples, (5) deployment of a standard suite of logging tools, (6) development of new drilling tools and techniques required by IODP research, (7) program publications, (8) costs of consumables (exclusive of those identified under platform operations costs below), and, (9) costs required for administration and management, including the CMO.

Platform operations costs of the riser-capable and non-riser vessels are supported by the MEXT and the NSF, respectively and for MSPs by the IODP member or the associate IODP member electing to provide such capability. Member financial contributions are not used to support platform operations costs. Platform operations costs for these vessels and for MSPs support the basic operation of the vessel as a drillship, and include, for example: (1) costs of the drilling and ship's crew, (2) catering services, (3) fuel, vessel supplies and other related consumables, (4) berthage and port call costs, (5) disposal of wastes, (6) crew travel, (7) inspections and insurance, (8) drilling equipment, supplies, and related consumables, (9) engineering or geophysical surveys, and data acquisition and laboratory analyses required for the safety of platform and drilling operations, and, (10) administration and management costs of the platform operators.

Legal and financial responsibility, including mobilization and platform operations costs, for the riser capable-vessel resides with the MEXT, and for the non-riser vessel with the NSF. Legal and financial responsibility, including mobilization and platform operations costs, for additional platforms is to reside with the organization(s) or country(ies) which provide such capability to the IODP. Provision of such capability is not considered a contribution in lieu of annual IODP membership contribution.

Support of scientific research and development costs for shore-based analysis and research on IODP samples and data, and for non-routine downhole measurements, are not included as program costs.

Activities carried out by Participant contractors in direct support of Participant individual scientific undertakings are not program costs and are not supported from commingled funds.

10 - SALARIES, TRAVEL AND EXPENSES

Salaries, travel and expenses for participants from India are to be borne by the MoES. Costs of accommodations for scientists and members of technical parties from India aboard IODP drilling platforms are program costs and are the responsibility of the platform operator. The platform operators are to offer scientists from India assistance when going between the airport and the drillship, and NSF through its contractors is to provide assistance for the scientists from India when pursuing visas.

11 - CONSULTATION AND CONFLICT RESOLUTION

Meetings of the Agency representatives and representatives of the MoES may be held at any mutually acceptable time upon the request of any Participant to discuss this Memorandum and other matters of mutual interest.

Any questions and disputes between the Participants of this Memorandum will be resolved by designees of the Participants.

12 – CONCLUDING PROVISIONS

The Participants intend to cooperate under this Memorandum from 1 October 2008 until 30 September 2013.

This Memorandum may be modified by written consensus of the Participants.

Cooperation under this Memorandum may be discontinued at any time by any Participant. The other Participants should receive written notice at least three months in advance.

Each of the undersigned parties represents and warrants that he/she has the full authority to sign and enter into this Memorandum on behalf of the organization that each represents.

SIGNED in the English language.

SP Nayak

25-06-09

Date

Dr. Shailesh Nayak
Secretary

For
THE MINISTRY OF EARTH SCIENCES (MoES)
OF
INDIA

福谷立

6/17/2009

Date

Ryu Shionoya
Minister

For
THE MINISTRY OF EDUCATION, CULTURE, SPORTS, SCIENCE AND
TECHNOLOGY (MEXT)
OF
JAPAN

Arden L. Bement, Jr.

3/19/09

Arden L. Bement, Jr.
Director

Date

For
THE NATIONAL SCIENCE FOUNDATION (NSF)
OF
THE UNITED STATES OF AMERICA

ANNEX A

ANTICIPATED ANNUAL MEMBER CONTRIBUTIONS

A Participant's expected level of participation in the IODP is recognized to be proportional to the number of participation units represented by that Participant's contribution to the IODP.

The annual contribution of one IODP participation unit for the period 1 October 2008 to 30 September 2013 is estimated to be \$5.6 million (U.S. dollars), but this figure is subject to increase or decrease based on operating experience and projected operating costs. Identification of the annual contribution level for particular years during this period will be done by the Agencies.

Additional financial contributions as well as the long-term provision of mission specific platforms (MSPs) for shallow water and Arctic drilling may count toward additional participation units.

It is recognized that an IODP member may elect to have a representative on each committee or panel of the SAS, and two scientific participants per expedition, or equivalent, for each platform operation identified as an IODP cost, for each participation unit. Additional participants on an expedition may be acceptable, but it is expected that these would be offset by reduced participation in other expeditions.

Associate IODP members are those that contribute for an amount equivalent to at least 1/6 participation unit. Associate IODP members may elect to have scientific participation and representation on SAS service committees, panels, or working groups in proportion to their contributions. However, it is not anticipated that an associate IODP member would have representation on the SAS Executive Authority.

ANNEX B

ANTICIPATED FINANCIAL CONTRIBUTION FOR THE U.S. FISCAL YEARS 2008-2013 by THE MINISTRY OF EARTH SCIENCES (MoES) of INDIA

During the period 1 October 2008 to 30 September 2013 the MoES intends, subject to its budget processes, to support the IODP with a total contribution of U.S. \$4,666,665, at a rate of U.S. \$933,333 per fiscal year.

1 October 2008 to 30 September 2009 (US Fiscal Year 2009) = US\$933,333
1 October 2009 to 30 September 2010 (US Fiscal Year 2010) = US\$933,333
1 October 2010 to 30 September 2011 (US Fiscal Year 2011) = US\$933,333
1 October 2011 to 30 September 2012 (US Fiscal Year 2012) = US\$933,333
1 October 2012 to 30 September 2013 (US Fiscal Year 2013) = US\$933,333

TOTAL **US\$4,666,665**

As an associate IODP member at the 17% level, the MoES may send a number of scientists to participate on drilling expeditions not less than 17% of the annual expedition participation rights accorded a full member with a goal of at least 2 scientists per year. In addition the MoES may send one voting representative to each of two SAS Panels (to be determined), and may send one non-voting representative to the Science Planning Committee (SPC) and one other SAS Panel (to be determined). The MoES is welcome to send an observer to the SAS Executive Authority meetings, and may send invited observers to all other SAS Panel meetings and invited participants to all workshops.

It is recognized that, should the IODP be discontinued before 30 September of a fiscal year, the NSF intends to reimburse the MoES one-twelfth of its yearly contribution for each month of curtailment in the fiscal year. Should the MoES withdraw from the Program prior to 30 September of a fiscal year, the MoES acknowledges that the NSF does not intend to refund its contributions.