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PROJECT DESCRIPTIONS FOR THE AGENCY'S PROPOSED 2007–2008 TECHNICAL COOPERATION PROGRAMME

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INTERREGIONAL

INTERNATIONAL ATOMIC ENERGY AGENCY

Interregional 1

Interregional

Project Descriptions

1. Thematic Planning for Technical Cooperation Projects (INT/0/064) T2 Extension

CORE FINANCING

YEAR	Human Resource Components (US $)						Procurement Components (US $)			TOTAL
	Experts	Meetings/ Workshop	Fellow-ships	Scientific Visits	Training Courses	**Sub-Total**	Equipment	Sub-Contracts	**Sub-Total**	(US $)
2007	0	100 000	0	0	0	**100 000**	0	0	**0**	**100 000**
2008	0	100 000	0	0	0	**100 000**	0	0	**0**	**100 000**

First Year Approved: 1997

Objective: (i) To validate priority areas for technical cooperation based upon a clear understanding of the development problem context, the comparative advantage of specific technical packages, and the roles, responsibilities and objectives of the principal stakeholders seeking a sustainable solution, thus strengthening the social-economic impact of these programmes in Member States and (ii) to bring greater programme integration between the Regular and technical cooperation programmes.

Justification: Thematic Plans (1) support the preparation of country programmes (CPF) and implementation of central criterion; (2) create greater convergence between Technical Departments and TC programming by facilitating alignment in research and application of nuclear sciences technologies with present and emerging TCP priorities; (3) broadens IAEA programme linkages to global priorities e.g. MDGs through consultations and knowledge sharing with Member States and international partners.

Beneficiaries: IAEA Secretariat, national counterparts, national and regional scientific/technical institutions and international collaborators.

Strategy: The management approach for thematic planning is guided by the Management Principles for the Formulation and Implementation of the Technical Cooperation Programme, SEC/NOT/1790 (para. 16), which states that Officers from Technical Departments will play the leading role in the development of all Thematic Plans in collaboration with TC which will, inter alia, be responsible for managing the participation of donors and representatives of end-users. TCCPS is accountable for performance against expected outcomes of thematic plans as measured against the success criteria for realizing the stated objectives of project INT/0/064.

A 2005 review to facilitate the mainstreaming of thematic planning across the IAEA identified the following as the major steps of implementation are:

1. Submission of a concept/idea
2. Review and vetting of proposals
3. Approval of workplan by the Technical Cooperation Programme (TCP) Committee
4. Implementation of workplan
5. Preparation of plan of action and follow-up
6. Linkage to the Regular Programme and Budget

Sustainability: Thematic planning identifies more advanced national institutions with the technical and managerial capability to take the lead in the application of specific nuclear applications or packages thus enabling them to grow from technical assistance recipients to full strategic partners for the application of nuclear science and technology for sustainable development.

2. Support for Human Capacity Building in Developing Member States (INT/0/081) T2 Extension

CORE FINANCING

YEAR	Human Resource Components (US $)						Procurement Components (US $)			TOTAL
	Experts	Meetings/ Workshop	Fellow-ships	Scientific Visits	Training Courses	Sub-Total	Equipment	Sub-Contracts	Sub-Total	(US $)
2007	150 480	0	255 550	0	0	**406 030**	0	0	**0**	**406 030**
2008	100 485	35 000	269 800	0	0	**405 285**	0	0	**0**	**405 285**

First Year Approved: 2005

Objective: To contribute to improved scientific capacity in nuclear science and technology and its application for development in developing Member States through supporting participation in scientific meetings and specialized training and educational activities.

Justification: This project has been designed to support the participants of Member States in relevant technical meetings, specialized training courses and educational activities. Due to lack of funds, many professionals and scientists from developing countries are unable to attend scientific meetings, international conferences and training courses. This limits their access to knowledge and information necessary for their work. Attendance in international meetings and training activities helps national staff to build their confidence within the international scientific community. The Agency receives numerous requests to support attendance of representatives of Member States from developing countries to international events supported by the Agency.

In addition to the meetings, specialized training in scientific laboratories and other institutions is planned to be provided by the International Centre for Theoretical Physics (ICTP), with which the Agency has a long-standing relationships. Through a special IAEA-ICTP Sandwich Fellowship Programme agreement, graduate students from developing Member States can benefit from the scientific facilities of ICTP.

Beneficiaries: Professionals and scientists from Member States.

Strategy: To achieve the objective through: organization of technical meetings, international conferences, workshops and training courses.

Sustainability: The Agency will provide coordination of international conferences, workshops, expert meetings and training courses for participants from developing Member States. Participating Member States will provide facilities for planned events and make experts available to be trained and to share experience.

3. Increasing the Use of the Expertise and Training Capacities Available in Member State Resource Institutions (INT/0/082) T2 New

CORE FINANCING

YEAR	Human Resource Components (US $)						Procurement Components (US $)			TOTAL
	Experts	Meetings/ Workshop	Fellow-ships	Scientific Visits	Training Courses	Sub-Total	Equipment	Sub-Contracts	Sub-Total	(US $)
2007	79 200	42 900	0	0	0	**122 100**	0	0	**0**	**122 100**
2008	103 950	24 255	0	0	0	**128 205**	0	0	**0**	**128 205**

First Year Approved: 2007

Objective: To contribute to increasing the international recognition and use of Member States' nuclear-related institutional capacities for technical cooperation and technical cooperation among developing countries (TCDC) and encourage the further development of these capacities.

Justification: The project responds to Member States' requests and the Agency's identified need for making greater use of the available institutional capacities in all regions, in particular in developing countries and countries in transition (Member States' individual requests, GC(49)/RES/12, Standing Advisory Group on Technical Assistance and Cooperation (SAGTAC) recommendations, technical cooperation (TC) strategy, IAEA Statutes). The project will help to increase the use and enhance the capacities of Member State nuclear-related science and technology institutions, while promoting and facilitating information-sharing, technical cooperation and technical cooperation among

developing countries (TCDC) within and between regions. The existence of an institutional roster will make available reliable, systematic and validated information on the capacities of Member State institutions for providing quality services in the nuclear field. This project is interregional in nature as: (a) it responds to a need identified by both Member States and the Agency to make greater use of the institutional capacities available in all developing countries and countries in transition for providing services at a national, regional and interregional level; (b) it will foster cooperation within and between regions; (c) it will introduce a systematic approach for the assessment of available nuclear-capacities in Member State institutions; (d) the outputs (reference criteria and institutional roster) and outcome (increased use of expertise and resources of Member State institutions) will be of collective benefit for participating countries in all regions.

Beneficiaries: Agency TC staff and technical departments; users of TC Extranet: government representatives, permanent missions, national liaison officers and associates, TC project counterparts, national coordinators under regional agreements; other users in the Member States: young scientists/engineers/medical doctors/students and others interested in finding possibilities for training, etc.; other users who are interested in identifying the institutions in a specific field capable of providing them with services, expertise and training at a reasonable cost or of establishing direct cooperation mechanisms, and/or users interested in exploring other type of opportunities.

Strategy: The mapping of institutional capacities focuses on the establishment of an institutional roster of the nuclear-related science and technology capacities available for technical cooperation in the national and regional institutions of Member States. Such information will facilitate the use of the expertise and resources of these institutions and will encourage their further development. The roster will serve as a reference tool for identifying the existing nuclear-related capacities in Member State institutions. Carefully established guidelines and criteria will be used to assess capacities. The parameters are to be developed in close collaboration with technical departments and in consultation with Member States. For the construction of the roster, three main sources of information will be used: Member States (information provided by them through the national liaison officers or directly by individual institutions); regional agreements (information on regional resource centres identified by regional agreements); and Agency sources (information on institutions involved in TC activities provided by project management and technical officers and obtained from existing databases). A procedure will be developed to compile and complete the information obtained from these sources and to validate and update it on a regular basis. The roster will classify as resource institutions those institutions in developing countries and countries in transition that have available expertise and resources for providing quality services such as expertise, training, equipment and sample analyses. Those institutions that have the potential to become resource institutions would be classified as candidate institutions, while other institutions that do not fall into either of these categories will be classified as other TC-related institutions. A user-friendly search mechanism will make it possible to identify the resource institutions according to the specific needs of the user. Users will be able to identify the information in a structured format: by contact, mandate, achievements, expertise, training, services, language, facilities, equipment, quality assurance/control programmes, etc. If need be, the data published in the roster can be made available to different types of users with different degrees of restriction. The institutional roster will benefit Member States, as it will help to increase the use of their existing expertise and resources, both by the Agency and by other partners, while encouraging institutions to improve their capacities. It is clear that as the roster develops, new possibilities may arise to further improve and enlarge the services and benefits for Member States. However, it is important to start with an approach that can be easily implemented and is in line with the long-term vision of the project.

Sustainability: The reliable institutional roster will be a real asset and an efficient source of information in the new computerized environment of project management: The institutional information will be regularly updated by an automatic mechanism integrated in the system, which will be linked to the recurrent use of the institutions and to the new expert roster, i.e. every time an institution is selected the data would be updated if necessary. The roster will not duplicate the available databases in technical departments but will be complementary to them. In other words, the information placed on the institutional roster could be linked to the information placed on the existing databases from technical departments.

4. Support for Human Capacity Building in the Utilization and Operation of the Synchrotron-Light for Experimental Science and Applications for the Middle East (SESAME) (INT/1/055) D3 New

CORE FINANCING

YEAR	Human Resource Components (US $)						Procurement Components (US $)			TOTAL
	Experts	Meetings/ Workshop	Fellow-ships	Scientific Visits	Training Courses	Sub-Total	Equipment	Sub-Contracts	Sub-Total	(US $)
2007	11 220	0	193 800	9 272	0	**214 292**	0	0	**0**	**214 292**
2008	11 781	0	168 000	4 635	0	**184 416**	0	0	**0**	**184 416**
2009	12 359	0	176 400	4 860	0	**193 619**	0	0	**0**	**193 619**
2010	10 640	0	145 200	5 085	0	**160 925**	0	0	**0**	**160 925**

First Year Approved: 2007

Objective: To strengthen international cooperation among Member States participating in SESAME through the use of accelerator physics and synchrotron radiation applications.

Justification: The Synchrotron-light for Experimental Science and Applications for the Middle East (SESAME) project aims at constructing the Middle East's first major international research centre as a cooperative venture by the scientists and governments of the region. Though it was originally developed under the umbrella of UNESCO, SESAME is now an independent international organization with members from the Asia and Pacific, African and European regions. SESAME facilities are located in Allaan, Jordan. SESAME will have as its centrepiece a new 2.5 GeV compact high-performance light source foreseen for commissioning in 2010. The ring will cover a broad spectral range from the infrared to the hard X-ray parts of the electromagnetic spectrum. It will have straight sections for up to 12 wiggler and undulator insertion devices as well as up to 16 beam lines from bending magnets. It is planned to have up to six of these beam lines operational when the first electron beam is stored. SESAME will provide excellent performance for the applications now carried out at other multi-GeV rings. Specific programmes planned for SESAME include structural molecular biology, molecular environmental science, surface and interface science, micro-electromechanical devices, X-ray imaging, archaeological microanalysis, materials characterization, and clinical medical applications. As an international scientific and technological centre of excellence open to all qualified scientists from the Asia and the Pacific, Africa and Europe regions in particular, SESAME will serve as a motor for the scientific, technical and economic development of the region and strengthen international collaboration in science. The centre will be jointly operated and supported by all members with additional support from other countries interested in promoting the peaceful development of science and technology in the Middle East. However, in order to ensure its technically sound and cost-effective use and safe operations, SESAME needs Agency support to train its potential users and operators prior to the commissioning of the synchrotron and to develop and adopt the rules and regulations required for its safe operations.

Beneficiaries: (i) SESAME, which will benefit from a wide and technically sound utilization of its facilities by Member States; (ii) relevant universities/scientific institutions in Member States, which will benefit from the training in accelerator physics and synchrotron radiation applications and the facilities available at SESAME; (iii) communities at large, which could benefit from the results of applied research notably in the fields of human health, environmental sciences, new materials and information technologies through access to advanced scientific technologies.

Strategy: The strategy is to ensure that all key stakeholders (i.e. users, operators and regulators) of SESAME will be fully trained and ready in their respective fields of expertise to make immediate and full use of the SESAME facility upon its commissioning foreseen in 2010.

Sustainability: The sustainability of the use of SESAME facilities is ensured by the expected number of users. It is anticipated that the initial SESAME user community of several hundred scientists will grow to more than one thousand as more beam lines are developed. The sustainability of the SESAME project itself is ensured by the budget allocated by its members.

5. Status and Prospects of Development for and Applications of Innovative Reactor Concepts for Developing Countries (INT/4/141) A4 Extension

CORE FINANCING

YEAR	Human Resource Components (US $)						Procurement Components (US $)			TOTAL
	Experts	Meetings/ Workshop	Fellow-ships	Scientific Visits	Training Courses	Sub-Total	Equipment	Sub-Contracts	Sub-Total	(US $)
2007	0	0	17 100	0	170 000	**187 100**	0	0	**0**	**187 100**
2008	0	0	18 000	0	181 000	**199 000**	0	0	**0**	**199 000**

First Year Approved: 2003

Objective: To provide a forum for exchange of information and expertise among developing Member States actively involved in nuclear power planning or operations; to share their specific experiences on reactor operation, maintenance, and similar issues affecting the future design of reactors; and to enable experts from these countries to participate in selected International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO) Technical Meetings for information exchange.

Justification: Existing scenarios for global energy use project that demand will at least double over the next 50 years, especially due to needs of developing countries. Electricity demand is projected to grow even faster. These scenarios suggest that the use of all available generating options, including nuclear energy, will inevitably be required to meet those demands. The long-term outlook for nuclear energy should be considered in the broader perspective of future energy needs and environmental impact. In order for nuclear energy to play a meaningful role in the global energy supply in the foreseeable future, innovative approaches can help to address concerns about economic competitiveness, safety, waste, and potential proliferation risks.

Several developing countries are designing innovative reactor concepts with small power output. This project has the objective to provide a forum for information exchange between countries working on similar reactor lines and to receive input from countries, which may deploy these reactors. INPRO is currently addressing the identification of global user requirements for innovative technologies as well as the development of methodologies and guidelines for the comparison of different innovative approaches.

Beneficiaries: Firm commitment by Member States is required as a prerequisite for participation in the project. Criteria and special considerations for a selection of interested Member States will be the need for energy and particularly for electricity; the need for potable water (desalination); the need for strategic independence (need of electricity); low grid capacities; special difficulties with respect to accessibility of fossil fuels; low indigenous fissile and hydropower resources; and active national nuclear power development/utilization programmes.

Strategy: The Agency will organize a number of workshops to enable experts from participating countries to be familiarized with some of the above new reactor concepts. Technical expertise and knowledge accumulated in the Agency will provide an important basis for the implementation of this project. The Agency will pay for the cost of participation of experts from target countries in project, as well as related INPRO, activities.

Sustainability: Through INPRO activities, the project will provide the possibility for exchange of information with other international initiatives, such as the Generation-IV International Forum, for participating countries.

6. Receptor Binding Assay for Harmful Algal Toxins (INT/7/016) H2 Extension

CORE FINANCING

YEAR	Human Resource Components (US $)						Procurement Components (US $)			TOTAL
	Experts	Meetings/ Workshop	Fellow-ships	Scientific Visits	Training Courses	Sub-Total	Equipment	Sub-Contracts	Sub-Total	(US $)
2007	0	50 000	0	0	0	**50 000**	10 000	0	**10 000**	**60 000**
2008	0	40 000	0	0	0	**40 000**	5 000	0	**5 000**	**45 000**

First Year Approved: 2005

Objective: Overall Objective: To promote use of the receptor binding assay (RBA) for more efficient and widespread testing for paralytic shellfish poisoning (PSP) toxins by regulatory authorities, thus increasing consumer safety and facilitating trade by contributing to more cost-effective marine biotoxin management programmes.

Specific objective:
1. To facilitate regulatory acceptance of the RBA for PSP toxins.
2. To continue to secure a reliable, quality controlled, source of radio-labeled saxitoxin for Member States wishing to incorporate the RBA in the national shellfish toxicity monitoring programmes.
3. To make Member States aware of the benefits of including the RBA in their national shellfish toxicity monitoring programmes.
4. To facilitate networking on the RBA technology among Member States, national and international organizations.

Justification: Project INT/7/016 is being extended through rephasing.

One of the most serious and visible problems facing coastal waters is related to the phenomena commonly known as red tides and now called harmful algal blooms (HABs). HABs cause the entry of toxic substances into the human food chain, for example through consumption of toxic shellfish.

One of the most significant manifestations of HABs is that certain algal species produce toxins that can accumulate in seafood products thus posing a risk to human consumers. The effect on humans range from mild discomfort to debilitating long-term illnesses and even death. PSP has the most significant impact on human health. Because of the risk to health, many countries monitor and regulate the levels of such toxins in shellfish, just as they do with the bacterial and viral contamination to which shellfish are also subject.

The occurrence of HABs that impacts both humans and environmental health increased in both frequency and worldwide distribution during the latter third of the last century. Virtually, every coastal country worldwide is now affected, often by multiple toxic or harmful species.

Regulation usually takes three forms: closure of commercial fisheries, warning to subsistence harvesters and prohibitions on commercial trade in shellfish products. The mouse bioassay (MBA) is certified for this purpose by the association of official analytical chemists and is thus the method against which other methods are judged. While it is simple, rugged and reliable, the method is neither inexpensive, rapid nor sensitive.

Large sample loads require that mouse colonies numbering to thousands be maintained accompanied by large space requirements and maintenance costs, even when no testing is being conducted. Moreover, the use of live animals for product testing is prohibited in many countries and will be discontinued in others. Reliable, rapid, sensitive and accurate assays for toxins are a requirement for any legal regulatory framework. Standardization from country to country is needed for testing applied to goods traded in international commerce.

A key application of nuclear technologies that can circumvent the problem highlighted for the MBA is the receptor binding assay or RBA. RBA is a rapid, sensitive and high throughput technique, which ensures sustained and effective shellfish toxicity monitoring. The scope of the PSP problem ensures a significant impact of an interregional programme that encourages this change with the involvement of a number of countries worldwide.

Beneficiaries: End users are national phytoplankton monitoring programmes.
Beneficiaries are aquaculture industries and seafood consumers.

Strategy: The project is essentially to enable the securing by the Agency of a reliable supply of tritiated saxitoxin for provision to Member States with receptor binding assay (RBA)projects.

The Agency will also facilitate regulatory acceptance of the RBA technology through support to a formal AOAC trial to be conducted by the National Oceanic and Atmospheric Agency (NOAA).

Sustainability: Government will include the RBA in their phytoplankton monitoring programmes.

7. Training in Radioactive Waste Disposal Technologies in Underground Research Facilities (INT/9/173) L2 Extension

CORE FINANCING

YEAR	Human Resource Components (US $)						Procurement Components (US $)			TOTAL
	Experts	Meetings/ Workshop	Fellow-ships	Scientific Visits	Training Courses	**Sub-Total**	Equipment	Sub-Contracts	**Sub-Total**	(US $)
2007	0	0	45 600	0	185 000	**230 600**	0	0	**0**	**230 600**
2008	0	0	48 000	0	275 000	**323 000**	20 000	0	**20 000**	**343 000**

FOOTNOTE a/ FINANCING

YEAR	Human Resource Components (US $)						Procurement Components (US $)			TOTAL
	Experts	Meetings/ Workshop	Fellow-ships	Scientific Visits	Training Courses	**Sub-Total**	Equipment	Sub-Contracts	**Sub-Total**	(US $)
2007	0	0	0	0	60 000	**60 000**	0	0	**0**	**60 000**

First Year Approved: 2003

Objective: To transfer knowledge and technology from Member States with advanced research and development in underground research facilities (URFs) by training specialists from Member States with less-developed repository implementation programmes and/or having no direct access to URFs. The aim is to increase the level of competence in nuclear waste management among countries operating and having spent fuel and highly radioactive waste for disposal.

Justification: It is internationally accepted that the disposal of high-level radioactive waste (HLW), long-lived waste, and spent fuel underground in an appropriate geological environment, is the best solution for most countries. The status of waste management is very different among countries operating nuclear power plants. Countries with large nuclear programmes are generally more advanced that others with smaller inventories or with less organized structures. It is the interest of all the countries engaged in the production of nuclear energy to promote and facilitate nuclear waste management worldwide to increase safety.

The following Member States have requested training through Centres of Excellence: Argentina, Armenia, China, Croatia, Czech Republic, Hungary, India, Japan, Kazakhstan, Republic of Korea, Lithuania, Pakistan, Romania, Russia, Slovakia, Slovenia, South Africa, and Ukraine. The programme proposed for 2007-2008 was formally agreed at a technical meeting of all these Member States and Belgium, Canada, Sweden, Switzerland, the United Kingdom, and the United States in April 2006.

Beneficiaries: Member States participating in the Network of Centres of Excellence on Training in and Demonstrations of Radioactive Waste Disposal Technologies in Underground Research Facilities.

Strategy: The technical programme of the project will be established by participating Member States through a series of annual meetings of the Network of Centres of Excellence for Training and Demonstrations of Technologies for Radioactive Waste Disposal in Underground Research Facilities (URF). Training courses will be held world-wide at the URFs where fellowships will also be undertaken and for which, as necessary, equipment may be procured.

Sustainability: All of the notes and records from the training courses and the fellowships will be available for future reference. Trained personnel will be able to bring benefits to nuclear industry for the remainder of their professional careers. National programmes in geological disposal will be advanced and national competences will be enhanced. Confidence will be built in the ability to implement national and international strategies for radioactive waste disposal.