

# SUSTAINABLE TECHNOLOGIES FOR MANAGING RADIOACTIVE WASTES

(INT/4/131) B5 New

MODEL PROJECT

## CORE FINANCING

YEAR	Experts		Group Activity	Equipment	Fellowships		Scientific Visits		Group Training	Sub-Contracts	Misc. Comp.	TOTAL US \$
	m/d	US \$	US \$	US \$	m/d	US \$	m/d	US \$	US \$	US \$	US \$	
1997	15.0	198,000	85,000	10,000	0/0	0	0/0	0	0	0	0	293,000
1998	15.0	209,250	100,000	80,000	0/0	0	0/0	0	0	60,000	0	449,250
1999	16.0	236,200	90,000	80,000	0/0	0	0/0	0	0	60,000	0	465,200

First Year Approved: 1997

**OBJECTIVES:** The impetus for this project is the global objective of helping to ensure safe and appropriate use of radioactive materials. It is the specific objective of this project to transfer and establish sustainable technologies for the management of radioactive wastes in selected Member States, leading to improved radiological safety.

**BACKGROUND:** Radioactive wastes arise as an inevitable consequence of the use of nuclear technology. Virtually all IAEA Member States make beneficial use of radioactive sources in medicine, industry, agriculture and scientific research. Some States produce radioactive sources or other radioactive materials in research or power reactors. The Member State's responsibility for these materials or contaminated by-products does not end when they are removed from service and declared as waste. Rather, these items must continue to be carefully handled or stored until the radioactivity has decayed. In some cases they must be specially treated or conditioned before storage and/or disposal. To assure the safety of both radiation workers and the general public, proper management of radioactive wastes is an essential commitment that must be made by the competent authorities of any Member State embarking on the use of nuclear technology. An important component of the IAEA's technical assistance to Member States is to help safe management of their radioactive wastes. Provision of the Agency's technical assistance in waste management areas was based on (i) requests submitted by Member States and (ii) assessments made by the IAEA on needs and priorities in this area. Approved national TC-supported projects were, in principle, based on ongoing national programmes. To support the establishment or the strengthening of waste management practices, the Agency established the WAMAP programme in 1986. WAMAP missions visited 40 Member States and often identified deficiencies and gaps in waste management practices. In a large number of countries, significant improvements have been achieved as a result of the mission reports and subsequent TC projects. However, in some countries the technical capability for waste management has not yet been improved to a level considered adequate to ensure safety. In the last two years, new developments within the Agency such as the restructuring of the former Department of Nuclear Energy (1995-96), experience with implementation of the Model Project on Upgrading Radiation Protection Infrastructures (INT/9/143), and the concept of fewer but better projects, led to the identification of an opportunity to revitalize and expand the activities planned under the project INT/9/144 on Upgrading Waste Management Infrastructure, to better assist Member States. It was decided therefore to redefine INT/9/144 to focus on the transfer of sustainable technologies for managing radioactive wastes. Essential features of the redefinition are: (a) Selection of methods and procedures (and a limited amount of equipment) that are needed, and their implementation; (b) Consolidation of national requests for waste management technology, as well as previous ad hoc requests to TC for support of new waste technology initiatives (advisory missions, demonstrations, etc.), into one interregional project; (c) Developing and establishing a single (thematic) approach to the problem. Therefore, a new, improved and thematic project is proposed as replacement for INT/9/144.

**PROJECT PLAN:** This is an umbrella project that will consolidate in the future approximately 20 national requests for waste management technologies. It will also provide a means for IAEA initiatives in the area of waste technology (sealed source conditioning, establishment of regional demonstration centres, etc.) to be transferred to developing Member States. The four-year plan will be executed in two phases of two years each. The first phase will apply to countries having approved national TC requests for waste management technologies in the 1997-98 cycle or those having specific technical needs previously identified by the Agency. The second phase will include those countries requesting assistance in waste technology for 1999-2000 and provide additional assistance, follow-up and evaluation in Phase I countries. Development of technical capability to manage waste in developing Member States will meet the overall implementation target set forth in GOV/INF/777. Each participating country will have a specific objective and corresponding workplan within the overall project. Each workplan will include: (i) identification of the appropriate technology(ies) needed to manage waste arising in the Member State and that can be sustained in the Member State; (ii) matching the need with IAEA resources (e.g. technical manuals, experts to install or demonstrate equipment, provision of minor equipment, training, fellowships, etc.); (iii)

provision of these resources to implement the technology; (iv) milestone actions to be accomplished by the recipient country and/or resources to be provided by the country; (v) performance indicators for project implementation, (vi) follow-up actions to ensure sustainability. Technologies to manage radioactive wastes that will be transferred to developing Member States, according to their waste arisings and need, include, inter alia: minimization and segregation, storage, handling, conditioning and disposal of spent sealed sources; handling and treatment of aqueous wastes, treatment and conditioning of organic liquids, treatment and conditioning of solid wastes, design for a small centralized waste processing and storage facility. Highly advanced technologies and/or high cost, long term projects such as may be associated with facilities for research reactor waste, stabilization of uranium mining and milling waste, or establishment of a disposal site will continue to be handled by individual and specific national projects as requested by Member States.

**NATIONAL COMMITMENT:** A firm commitment from the recipient Member State to participate and to provide its own resources to a reasonable degree is expected, and appropriate milestones or actions to be achieved by the counterpart will be built into each workplan. Workplans will be agreed upon by both the IAEA and the recipient Member State before implementation begins. Provision of Agency resources indicated in the workplan may be suspended if the recipient fails to meet its commitment. It is also expected that a participating Member State will keep its use and/or production of radioactive materials, and hence waste arisings, under continuous review. New or expanded waste management technologies should be implemented hand in hand with the growth in use of radioactive materials. Such future expansions should be primarily supported by the country's own resources.

**AGENCY INPUT:** Expert services, technical advice and technical manuals related to the specific technology, a limited amount of equipment primarily for developmental or demonstration purposes, group training and scientific visits. Workshops, training courses and hands-on instruction may be arranged, depending on the particular technology. Expert teams may be provided to implement technologies that need to be used on a one-time or limited basis. Provision may also be made for sub-contracting a part of the work to specialized institutions.

**PROJECT IMPACT:** Technological tools are necessary to provide the capability to handle, treat, store and eventually dispose of radioactive waste. This project will provide these essential tools to developing Member States whose national requests for assistance are approved, and also for those having specific needs determined by the Agency through its fact finding missions or by other means. In countries with a small number of spent sources or contaminated facilities from past activities, transfer of technology will result in solution of the problem, for example conditioning and storage of the spent sources or decontamination of the facility. In countries that continually produce small quantities of radioactive waste, which include most developing countries that generate waste from nuclear applications, the transfer of technology will result in a sustainable capability to handle, treat, condition and store the waste. In countries that produce appreciable quantities on a regular basis, which include developing countries with nuclear research centres, transfer of technology will provide data and detailed plans for establishing the necessary centralized waste processing and storage facilities, eventually disposing of the waste, and decommissioning nuclear installations. Overall, the project will lead to quantifiable (number of sources conditioned or disposed, number and type of technologies established, etc.) improvement in the waste management and hence to improved radiological safety in developing Member States.