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MEASURES TO STRENGTHEN INTERNATIONAL CO-OPERATION IN NUCLEAR SAFETY, RADIOLOGICAL PROTECTION AND RADIOACTIVE WASTE MANAGEMENT

MEASURES TO RESOLVE INTERNATIONAL RADIOACTIVE WASTE MANAGEMENT ISSUES

1. Last year, in resolution GC(XXXVIII)/RES/6, the General Conference reaffirmed "the importance to the international community of ensuring that sound practices are planned and implemented for the safe management and disposal of radioactive wastes from nuclear application technologies and nuclear power generation".

2. Also in that resolution, the General Conference invited the Board of Governors and the Director General to maintain the emphasis given to radioactive waste management, especially with regard to the Agency's Radioactive Waste Safety Standards (RADWASS), and to consider what further measures should be taken to enhance international co-operation activities in the radioactive waste management field.

3. In addition, the General Conference requested the Board and the Director General to commence preparations for a convention on the safety of waste management and continue the process of collecting relevant background information (including appropriate RADWASS documents) that would be useful in drafting the convention.

4. The General Conference further requested the Board and the Director General to report to it in 1995 on the implementation of resolution GC(XXXVIII)/RES/6.

5. In June the Board considered a document prepared in response to the request referred to in paragraph 4 above and agreed that the document might be submitted - after necessary updating - to the General Conference. This is the updated version of that document.

PROGRESS AND STATUS OF THE RADIOACTIVE WASTE SAFETY STANDARDS (RADWASS) PROGRAMME

INTRODUCTION

1. The Agency's Radioactive Waste Safety Standards (RADWASS) programme was established in 1991 in response to requests by Member States that the Agency demonstrate that a harmonized approach to the safe management of radioactive waste existed at the international level. The RADWASS Safety Series constitutes a hierarchy of documents headed by a Safety Fundamentals document; the programme covers six subject areas for each of which there is to be a Safety Standards document: "Planning", "Predisposal", "Near surface disposal", "Geological disposal", "Uranium mining and milling waste" and "Decommissioning". Phase I (1991-94) of the programme consisted of the preparation of the Safety Fundamentals document, four Safety Standards, five Safety Guides and two Safety Practices. Phase II (1995-96) involves the preparation of two Safety Standards and a number of Safety Guides and Safety Practices. Phase I was scheduled to be completed by the end of 1994, with Phase II starting in 1995. In practice, however, Phase I activities have extended into 1995 and work on several Phase II documents started already in 1994.

PROGRESS AND STATUS

2. In response to requests made by some Member States, the Secretariat decided that the Safety Fundamentals document and the Safety Standards documents should be reviewed by a group of experts consisting mainly of regulators before being submitted to the Board of Governors, in order to ensure harmonization with other Agency safety-related documents and proper linkage of the Safety Standards to the Safety Fundamentals. For this purpose, the Agency's International Radioactive Waste Advisory Committee (INWAC) was extended to include a regulator from countries whose INWAC member was not a regulator (hence the references below to the "extended INWAC").

3. Preparation of the Safety Fundamentals document began in 1991. The process of reaching international consensus along the lines indicated in document GOV/INF/586 - on the development of the RADWASS documents - involved Consultant and Technical Committee Meetings, reviews by INWAC and the Secretariat's internal Safety Series Review Committee and formal reviews by Member States.

4. The draft Safety Fundamentals document "The Principles of Radioactive Waste Management" and draft Safety Standard S-1 "Establishing a National System for Radioactive Waste Management" were reviewed in September 1994 and January 1995 by the "extended INWAC". The resulting drafts of the Safety Fundamentals and Safety Standard S-1, as recommended by the "extended INWAC" in January 1995, were submitted to the March 1995 session of the Board of Governors, which took note of reservations concerning paragraph 312 of the draft Safety Fundamentals document and approved the two draft documents for publication.

5. Three draft Safety Standards documents (S-2 "Predisposal Management of Radioactive Waste", S-3 "Near Surface Disposal of Radioactive Waste" and S-6 "Decommissioning of Nuclear Facilities") were submitted to the "extended INWAC" for review at a meeting which took place late in May 1995, but none of them was finalized for submission to the Board of Governors. Further work on them is needed.

6. Three Safety Guides (on "Classification of Radioactive Waste", "Siting of Near Surface Disposal Facilities" and "Siting of Geological Disposal Facilities") and one Safety Practices document (on "Application of Exemption Principles to the Recycle and Reuse of Materials from Nuclear Facilities") prepared during Phase I have been published.

7. With the decision to establish a Department of Nuclear Safety, which will be responsible for the preparation and review of Agency safety standards, the structure and content of the RADWASS programme are undergoing an in-depth examination with a view to harmonization of the Safety Series publications.

CONVENTION ON THE SAFETY OF RADIOACTIVE WASTE

INTRODUCTION

1. In September 1994, the General Conference, in resolution GC(XXXVIII)/RES/6 on "Measures to resolve international waste management issues", invited the Board of Governors and the Director General to commence preparations for a convention on the safety of radioactive waste management. Pursuant to that resolution and as agreed by the Board of Governors at its December 1994 meetings, the Director General organized a meeting of experts from Member States with the objective of holding preliminary discussions on basic concepts and the possible scope of such a convention, and to examine working mechanisms and procedures for its preparation.

PROGRESS AND STATUS

2. A preparatory meeting took place from 20 to 22 February 1995 and was attended by 110 participants from fifty countries. The CEC, NEA/OECD and IMO were represented by observers. The Secretariat provided participants with a list of reference material and a note on conventions and other instruments that could be consulted in the preparation of a convention. The meeting heard general statements by participants and discussed the basic concepts and framework of the convention and also approaches to the preparatory process. A list of suggestions made and questions raised during the meeting was prepared by the Secretariat in the form of a paper entitled "Inventory of Issues Raised". The meeting called for the setting up of an open-ended group of legal and technical experts and suggested that it begin early in July 1995 with preparatory work on a convention.

3. A progress report entitled "Preparatory work for a convention on the safety of radioactive waste management" and summarizing the results of the February 1995 meeting was considered by the Board at its March 1995 session. The Board took note of the progress report and endorsed a proposal by the Director General that an open-ended group of technical and legal experts be convened to carry out the necessary substantive preparations for a convention.

4. The first meeting of the open-ended group of legal and technical experts took place from 3 to 6 July 1995. There were 128 participants from 53 countries and observers from

the CEC, NEA/OECD, UNEP (Secretariat of the Basel Convention) and WHO. Professor Alec Jean Baer (Switzerland) was elected Chairman.

5. The open-ended group's principal objective was to identify the main substantive elements necessary in a radioactive waste safety convention, so as to have a basis for provisions to be contained in a first draft text. It was agreed that the *Convention on Nuclear Safety* should be the model for a "sister" convention on radioactive waste safety, which would also be an "incentive convention" and provide for reporting at meetings of the Contracting Parties and for a peer review process (albeit with national responsibility for waste management activities acknowledged).

FUTURE ACTIVITIES

6. The open-ended group agreed on a procedure for the preparation of a Chairman's first draft convention text, to be discussed at a meeting to take place from 4 to 8 December 1995. It also agreed that the draft text would cover "objectives", "definitions", "scope" and "obligations". Three meetings of the open-ended group are planned for 1996.

DUMPING OF RADIOACTIVE WASTES AT SEA - AN UPDATE OF PROGRESS IN THE INTERNATIONAL ARCTIC SEAS ASSESSMENT PROJECT AND THE FAR EASTERN SEAS PROJECT

INTERNATIONAL ARCTIC SEAS ASSESSMENT PROJECT

Introduction

1. The International Arctic Seas Assessment Project (IASAP) was initiated in 1993 to address concern about the possible health and environmental impacts of radioactive wastes dumped in the shallow waters of the Arctic Seas by organizations of the former Soviet Union. The project is being executed as a part of the Agency's responsibilities under the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention 1972). The Board of Governors was informed about the IASAP shortly after its initiation in document GOV/INF/706-GC(XXXVII)/INF/320.

2. The project involves co-ordinating the technical investigations, research and analyses of Member States in order to produce an international expert assessment of the risks to human health and the environment associated with the radioactive waste dumped in the Kara Sea and the Barents Sea and of possible remedial measures and their feasibility.

Information on the dumped wastes

3. In May 1993 the Russian Federation provided information to the Agency on the high- and low-level wastes dumped in the Arctic Seas during the years 1959-92. The total amount of radioactivity dumped was reported to be more than 90 PBq*/, the main contribution to this total coming from the radioactivity associated with dumped submarine and icebreaker reactors containing fuel. The information has subsequently been revised and refined as a result of analyses by institutes in the Russian Federation working in collaboration with an IASAP expert group. The total estimated activity associated with the reactors at the time of dumping has been revised to 36 PBq. If radioactive decay since dumping is taken into account, the estimated total activity of the dumped reactors at the present time is about 5 PBq. The IASAP expert group has examined information provided on the state of the reactors and their protective containments when dumped, analysed the weak points of the containments and

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*/ (1 PBq = 1 petabecquerel = 10^{15} Bq).

made preliminary estimates of the likely future time patterns of radionuclide release to the surrounding marine environment. This is the information needed as a basis for predicting the radiological and environmental impact of the wastes.

Co-ordination

4. Co-operation and information exchange are being maintained with other programmes (international and national) relating to the Arctic dumping issue, notably the Norwegian-Russian Expert Group, the Arctic Monitoring and Assessment Programme and the US Arctic Nuclear Waste Assessment Programme.

Exploratory cruises

5. The Joint Norwegian-Russian Expert Group, formed in 1992 to investigate possible radioactive contamination due to the dumped nuclear waste in the Kara Sea and the Barents Sea, organized exploratory cruises to the dumping areas in 1992, 1993 and 1994. The Agency has worked closely with the Expert Group, and its Marine Environment Laboratory in Monaco (IAEA-MEL) was represented on each of the cruises, during which most of the dumping sites were visited. Environmental samples were taken and in situ measurements made. The IAEA-MEL results confirm Member State findings that the Barents Sea and the open part of the Kara Sea are relatively uncontaminated, the main contributions being from nuclear weapons fallout and from land-based sources. At the dumping sites in the Kara Sea, localized contamination was detected in the proximity of dumped wastes. It can be concluded that the wastes are not giving rise to any significant radiological or environmental risks at the present time.

Predictive modelling and assessment

6. While it appears that there are no significant impacts from the dumped wastes at present, the gradual deterioration of the waste containments could lead to the release of radionuclides and possible impacts in the future. Also, since much of the wastes is lying in shallow waters, the possibility of movement and transport of the waste packages by natural events (ice or storm action) or by deliberate human activities cannot be ruled out. The time scales involved are very long, and the possible impact of climatic change has therefore also to be considered. It is necessary to acquire a thorough understanding of the physical, chemical and biological characteristics of the environment surrounding the wastes and to

attempt to reproduce the behaviour of released radionuclides in this environment by means of mathematical models. As part of the IASAP, laboratories in Denmark, Japan, the Netherlands, the Russian Federation, Switzerland and the United Kingdom and also the IAEA-MEL are participating in a co-ordinated research programme entitled "Modelling of the radiological impact of radioactive waste dumping in the Arctic Seas" which aims to develop realistic and reliable models for use in assessing the impact of the dumped wastes.

Remedial measures

7. The Contracting Parties to the London Convention 1972 have requested the Agency to look into possible remedial actions and their feasibility. Some preliminary consideration has been given to the matter within the framework of the IASAP, but clearly the project can address only technical aspects such as the engineering feasibility and radiological implications of different options; it can provide the technical basis for deciding whether remediation is necessary or not, but the decision itself must be taken by relevant national authorities.

Extrabudgetary support and future work

8. Extrabudgetary support for the IASAP has been provided since its initiation by the United States of America, which has invited the Agency to participate on 6 September 1995 in a discussion regarding the formation of an intergovernmental forum on the Arctic Seas to be known as the Arctic Council. A final report with an assessment of the impact of the dumping and the need for remedial measures will be submitted in 1996 to the Contracting Parties to the London Convention 1972.

FAR EASTERN SEAS PROJECT

9. In 1994 the IAEA-MEL began participating in a joint study of radioactive waste dump sites in the Far Eastern seas along with scientists from the Russian Federation, Japan and the Republic of Korea. The reported activity of the waste dumped in this region (0.7PBq) is considerably less than that of the waste dumped in the Arctic Seas, and a joint expedition to some of the dump sites in 1994 revealed no leakages of radioactivity at those sites, the observed radionuclide levels being the result of global fallout from nuclear weapons tests. An expedition to the Far Eastern seas to study other dump sites used in the past by the former Soviet Union, Japan and the Republic of Korea is planned for later this year, again

with IAEA-MEL participation. During this expedition, a search will be made for a lost strontium-90 power source (activity 13 PBq).

10. Major extrabudgetary support for the IAEA-MEL is being received from Japan, particularly for comparative studies of worldwide marine radioactivity.

BUILDING WASTE MANAGEMENT INFRASTRUCTURES

INTRODUCTION

1. Radioactive waste is generated not only in nuclear power stations and other fuel cycle activities, but also in the use of radioisotopes in medicine, research and industry. All Member States generate radioactive waste in proportion to their use of nuclear energy and nuclear applications. Assisting developing Member States to establish and maintain an adequate infrastructure for managing radioactive wastes is an essential functional part of the Agency's activities in this area.

2. Two areas of high priority within the Agency are infrastructure building in developing countries as they begin to use nuclear techniques and in the Newly Independent States (NISs) of the former Soviet Union and in other East European countries.

OVERVIEW

3. The need for infrastructure building in developing Member States was strongly supported by the TC Policy Review Seminar in September 1994 and by the International Radioactive Waste Management Advisory Committee (INWAC) in March 1995. Waste management infrastructure building needs to be and is being co-ordinated with the radiation protection infrastructure programme and with technical assistance programmes.

4. One approach to infrastructure building is to develop implementation "packages" for use in all developing Member States that have common or similar infrastructure needs in order to expedite implementation and use Agency resources more efficiently. These standardized packages cover the legal, regulatory, administrative and technical areas that must be part of a national waste management programme.

RECENT ACTIVITIES

5. A categorization of developing Member States with similar uses of radioisotopes has been established to help identify common infrastructure needs. Using this categorization a set of minimum acceptable infrastructure criteria, according to the type and quantity of radioactive waste generated, has been developed by outside experts and Agency staff.

6. Profiles of the current waste management infrastructures in 20 developing Member States have been drafted using information from Waste Management Advisory Programme (WAMAP) and other expert missions. The development of profiles for developing Member States is a high priority as the information will assist in channelling the type of technical assistance needed to specific countries.

7. A TC Model Project on the upgrading of waste management infrastructures in selected Member States has been approved (project INT/9/144). A first group of six countries (Albania, Cameroon, Colombia, Ghana, Sri Lanka and Uganda) has been selected for the implementation of improvements in infrastructures for waste management (under project INT/9/144) and for radiation protection (under the corresponding Model Project on the upgrading of radiation protection, project INT/9/143).

8. Standard packages for upgrading different components of the waste management infrastructures in different types of developing Member States are being prepared both within the framework of the Agency's Regular Budget and under project INT/9/144. Three packages have been completed: "Reference Design for a Centralized Waste Processing and Storage Facility" (IAEA-TECDOC-776), intended for countries having waste from nuclear research reactors; "Reference Design for a Centralized Spent Sealed Sources Facility" (draft IAEA-TECDOC), intended for countries having radioactive waste from small nuclear research centres and nuclear applications; and "Sealed Radiation Sources Registry", consisting of software and supplementary documentation. Other regulatory and technical packages are being prepared.

9. Within the framework of the Agency/UNDP initiative regarding assistance to NISs, there have been fact-finding missions to most of the countries in question in order to determine their waste management needs and identify priority activities that need early attention. Owing to the fact that expected UNDP funding has not materialized, it has not been possible to proceed as planned with the waste management upgrading programme.

10. A seminar on "International Co-operation on Nuclear Waste Management in the Russian Federation" was held in Vienna in May 1995 for the purpose of identifying waste management activities in the Russian Federation warranting additional international support. Jointly sponsored by the Nordic Council and the Agency, the seminar provided - for the first time -an international forum devoted exclusively to a review of current and planned waste management activities in the Russian Federation and an overview of current and planned

bilateral and multilateral co-operation in the waste management field. It was attended by 32 representatives of the various Russian Federation ministries and organizations involved in waste management and by representatives of 15 countries and three international institutions. A comprehensive account was given of the waste management programmes currently under way in the Russian Federation and of their problems. The Agency will publish the proceedings of the seminar soon. A follow-up meeting is planned for 21-22 September 1995 in Stockholm, the aim being too work out further details of the proposed co-operative activities and define the role which the Agency might play in facilitating co-operation.

FUTURE ACTIVITIES

11. The Agency is exploring with a Member State ways of establishing, in that country, a regional training centre - based on facilities already established there through an Agency technical co-operation project - suitable for demonstrating techniques for the processing and storage of radioactive waste. Member States in Europe and West Asia will benefit from the centre. This activity is a "pilot programme" which could be expanded so that a demonstration waste processing and storage facility would be available in every region. The concept is based on using facilities that already exist in Member States to provide hands-on experience to scientists, managers and technicians involved in planning and/or conducting waste management operations in developing Member States.

12. The upgrading of radiation protection and waste management infrastructures in two NISs will be undertaken as the first step of a broad upgrading programme.

13. The individual packages needed for upgrading waste management infrastructures in countries with nuclear applications and nuclear research reactors will be completed. Also, packages for countries with uranium mining and milling activities will be developed.

14. Action plans for the six developing Member States already selected for the upgrading of waste management infrastructures (see para. 7 above) have been prepared and will be implemented. Upgrading of the infrastructures in a second group of developing Member States will start in 1996.

WASTE MANAGEMENT ASSESSMENT ADVISORY AND PEER REVIEW SERVICES

INTRODUCTION

1. The Agency provides international peer review (WATRP)*/ services and waste management advisory services to Member States on request. WATRP reviews are intended primarily for technically developed components of national waste management infrastructures, mainly in advanced countries, whereas advisory missions normally review the entire waste management programmes of developing countries.

2. For a WATRP review, the Agency convenes an international team of experts which performs an independent peer review in accordance with terms of reference established in agreement with the requesting Member State. Such a review can help to ensure that waste management systems planned, designed or in operation are performing or will perform in a safe, reliable and technically sound manner.

3. Advisory services are provided to developing Member States, normally within the framework of technical co-operation (TC) projects, in order to assist them in building or strengthening national waste management infrastructures and programmes. The Member States in question follow up on the advice given either by requesting technical assistance projects or by taking independent action at the national level.

RECENT ACTIVITIES

4. Recent WATRP activities include the peer reviews noted below:

- a review of the Czech Republic's deep geological disposal programme;
- a review of the safety assessment of the near-surface disposal facility at Mochovce, Slovak Republic.

A concise WATRP Handbook was prepared by the Secretariat in 1994 and sent to authorities and organizations in Member States in order to inform them about WATRP, its objective and scope, the review mechanism and estimate costs.

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*/ WATRP - Waste Management Assessment and Technical Review Programme.

5. In 1994 there were TC-supported advisory missions to Lebanon, the United Arab Emirates, Saudi Arabia (in conjunction with a RAPAT[*/] mission) and Uruguay. This year there has so far been one advisory mission (to Latvia).

FUTURE ACTIVITIES

6. Norway has requested WATRP services in connection with the establishment of a combined storage/repository facility for low- and intermediate-level waste; the WATRP team plans to visit Norway during the period 25-29 September 1995. France has requested a review of its short-lived radioactive waste management programme, with the focus on the disposal facility in the Département de l'Aube (Centre de Stockage de l'Aube); the mission is provisionally planned to take place in March 1996.

7. The Agency will continue to respond to requests from developing Member States for advisory missions.

[*/] RAPAT - Radiation Protection Advisory Team.