AN EXPANDING INTERNATIONAL LEGAL REGIME
ENVIRONMENTAL PROTECTION & RADIOACTIVE WASTE MANAGEMENT

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The second half of the 20th century has brought increasing awareness about the ways in which the human environment is fragile and vulnerable to damage by pollution. Because some parts of the human environment, for example, the atmosphere and the oceans, are shared by all nations, any controls or environmental protection measures must be employed globally to be effective. This notion has led to the creation of a number of international legal principles and undertakings aimed at preserving the human environment. Some of these principles and undertakings have been applied in the control of environmental pollutants including radioactive wastes.

A number of principles of international environmental law are particularly worth noting in this context:

- One established principle is that States are required to take adequate steps to control and regulate sources of serious global environmental pollution or transboundary harm within their territory or subject to their jurisdiction. This principle was first articulated in the *Trail Smelter Arbitration* of 1941 between Canada and the United States, where it was decided that Canada was responsible for damage from copper smelter fumes that transgressed the border into the USA. The principle was later confirmed during the United Nations Conference on the Human Environment, in Stockholm in 1972, where States declared that it was their responsibility to respect the environment of other States. More specifically, under section 21 of that declaration, States have a responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits. This so-called "no harm" principle has in the meantime developed beyond traditional *ex post facto* State responsibility. It is now one of diligent prevention and control, a so-called "precautionary approach".
- The second principle is that States are required to cooperate with each other in mitigating transboundary environmental risks. This principle goes back to the *Lac Lanoux Arbitration* of 1954 between France and Spain where the Tribunal held that France had complied with its obligations under a treaty and customary law to consult and negotiate in good faith before diverting a watercourse shared with Spain.
- Two further principles are important to note -- namely the "polluter pays" principle and the principle of equal access and non-discrimination in the treatment of domestic and transboundary effects of polluting activities. They are part of the increasingly significant developments in environmental law.

All these principles apply to the conduct of nuclear activities and are, in one form or another, reflected in nuclear safety-related conventions, such as the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. However, the international community has sought to protect humans and the environment from the harmful effects of radioactive wastes in a number of additional international undertakings. These undertakings further specify or even go beyond the principles established under international environmental law.

This article reviews the expanding legal framework for protection of the human environment from potential harmful effects of hazardous and radioactive wastes. It briefly describes major international and regional undertakings and looks at emerging issues and future directions that may further expand and improve the effectiveness of the regime.

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MAJOR INTERNATIONAL UNDERTAKINGS

London Convention. For many years the oceans were used for the disposal of industrial wastes, including radioactive wastes. In the 1970s, the practice became subject to an international convention which had the aim of regularizing procedures and preventing activities which could lead to marine pollution.

Following the United Nations Conference on the Human Environment in Stockholm in 1972, the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention 1972, formerly referred to as the London Dumping Convention) was established and entered into force in 1975. The London Convention prohibits and regulates the disposal of radioactive pollutants into the marine environment. Notable characteristics of the London Convention are the provision of minimum international standards and the establishing of an international forum (the London Convention Consultative Meeting) to supervise dumping.

For the regulation of materials to be disposed of in the marine environment, "black" and "grey" lists were established. The disposal of substances on the "black" list (Annex I to the Convention) was prohibited except in trace quantities. Substances on the "grey" list (Annex II to the Convention) were subject to "special care" measures to ensure that their disposal -- which had to be carried out under the provisions of a "special permit"-- would not have adverse effects on the marine environment.

High-level radioactive wastes (HLW) were included in the "black" list. The IAEA -- recognized by Contracting Parties to the London Convention as the competent international body in matters of radioactive waste disposal and radiation protection -- was entrusted with the responsibility for defining HLW unsuitable for sea dumping.

Radioactive wastes and other material not on the "black" list (low- and intermediate-level wastes) were included in the "grey" list. In issuing the special permits for the dumping of these types of radioactive wastes, countries were advised to take the recommendations of the IAEA fully into account.

By the early 1980s, there was increasing disquiet among many of the Contracting Parties to the London Convention over the continuing practice of sea dumping of low-level radioactive wastes. This led to a proposal made at the Convention's 1983 Consultative Meeting to prohibit all sea dumping of radioactive wastes. After a vote, the meeting adopted a voluntary moratorium on the sea dumping of all types of radioactive waste pending a review of the safety of the practice which was to be carried out by an independent panel of scientific experts.

The Consultative Meeting of Contracting Parties in November 1993 was characterized by an extensive debate which was inflamed by reports of the illicit dumping of liquid radioactive waste in the Sea of Japan in October 1993. The meeting adopted, by a majority vote, a decision on the prohibition of dumping of all types of radioactive waste to come into effect on 20 February 1994. The meeting also adopted a decision on the prohibition of dumping of industrial wastes to come into effect by 1 January 1996.

United Nations Convention on the Law of the Sea (UNCLOS). After the termination of solid industrial and radioactive waste disposal into the oceans, the only remaining route by which wastes can legally enter the marine environment is by effluent discharges to rivers and from coastal locations.

International law, as reflected in the provisions of UNCLOS and elsewhere, sets forth rights and obligations of States and provides the international basis upon which to pursue the protection and sustainable development of the marine and coastal environment and its resources. In accordance with general international law, while States have the sovereign right to exploit their natural resources pursuant to their environmental policies, the enjoyment of such rights shall be in accordance with *inter alia* the relevant provisions of UNCLOS.

In practice, this means that discharges of wastes into the marine environment can take place, but that States which enjoy the benefits of being granted sovereign rights over living and non-living resources within the limits of an exclusive economic zone and a continental shelf also have

been given the corresponding duty to protect and preserve the marine environment within these areas.

The Montreal Guidelines. The Montreal Guidelines for the Protection of the Marine Environment Against Pollution from Land-Based Sources (1985) is a non-binding instrument drafted by the United Nations Environment Programme (UNEP). The Guidelines are a "checklist" for the development of bilateral, regional, and multilateral agreements, and of national legislation. They are the main international documents concerned with this subject, although they also come within the scope of several regional conventions. Recognizing the potential sensitivity of coastal environments to pollutants, the Montreal Guidelines recommend that pollution -- meaning the introduction by humans of substances to the marine environment from land-based sources which are likely to cause harm to living resources and marine ecosystems and hazards to human health -- should be eliminated.

The Guidelines allow the discharge of small amounts of harmful substances provided that "pollution" is not caused by the discharge. The guidelines do not have the status of an international convention; rather they are recommendations to governments.

The Rio Declaration. In 1992, the duty of States to protect the marine environment was reaffirmed by the United Nations Conference on Environment and Development (UNCED). The Conference adopted three documents by consensus: the Rio Declaration on Environment and Development, which is a statement of 27 principles; "Agenda 21", which is an 800-page document setting out objectives and activities with 40 programme areas and which reflects a global consensus at the highest level; and the "non-legally binding authoritative statement of principles for global consensus on the management, conservation, and sustainable development of all types of forests".

Chapter 22 of Agenda 21 specifically addresses the safe and environmentally sound management of radioactive wastes. States are called upon to support efforts within the IAEA to develop and promulgate radioactive waste safety standards or guidelines and codes of practice as an internationally accepted basis for the safe and environmentally sound management and disposal of radioactive waste. Policies and practical measures should be promoted to minimize and limit, where appropriate, the generation of radioactive wastes; provision should be made for their safe processing, conditioning, transportation, and disposal; and safe practices should be promoted by facilitating the transfer of relevant technologies to developing countries and/or the return to the supplier of radiation sources after their use, in accordance with relevant international regulations or guidelines.

The Global Programme of Action (GPA). At an intergovernmental conference sponsored by UNEP in 1995, a Global Programme of Action (GPA) for the Protection of the Marine Environment from Land-based Activities was established. The GPA is designed to be a source of conceptual and practical guidance to be drawn upon by national and/or regional authorities in devising and implementing sustained action to prevent, reduce, control and/or eliminate marine degradation from land-based activities. To facilitate the implementation of the GPA, a clearinghouse mechanism was proposed for disseminating relevant information, practical experience and scientific and technical expertise relevant to developing and implementing strategies to deal with the effects of land-based activities. The IAEA has been identified as the lead international organization for developing the clearinghouse mechanism for radioactive substances.

The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. The principal international legal undertaking between States concerned with the safe management of radioactive waste, and hence the protection of individuals and the environment from its potential effects, is the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. It was adopted and opened for signature in 1997. Through July 2000, it has been signed by some 40 States, but has not yet been ratified by a sufficient number to enter into force.

The objectives of the Joint Convention are:

- to achieve and maintain a high level of safety worldwide on spent fuel management and

radioactive waste management, through the enhancement of national measures and international cooperation, including where appropriate, safety-related technical cooperation;

- to ensure that during all stages of spent fuel and radioactive waste management there are effective defenses against potential hazards so that individuals, society and the environment are protected from harmful effects of ionizing radiation, now and in the future, in such a way that the needs and aspirations of the present generation are met without compromising the ability of future generations to meet their needs and aspirations;
- to prevent accidents with radiological consequences and to mitigate their consequences should they occur during any stage of spent fuel or radioactive waste management.

The scope of the Joint Convention is defined in Article 3. The Convention applies to the safety of spent fuel management when the spent fuel results from the operation of civilian nuclear reactors. However, spent fuel held at reprocessing facilities as part of a reprocessing activity is not included in the scope unless the Contracting Party declares reprocessing to be part of spent fuel management. Moreover, the Joint Convention shall apply to the safety of radioactive waste management when the radioactive waste results from civilian applications.

However, the Joint Convention shall not apply to waste that contains only naturally occurring radioactive materials and that does not originate from the nuclear fuel cycle, unless it constitutes a disused sealed source or it is declared as radioactive waste for the purposes of the Joint Convention by the Contracting Party. Also, the Joint Convention shall not apply to the safety of management of spent fuel or radioactive waste within military or defense programmes, unless declared as spent fuel or radioactive waste for the purposes of the Joint Convention by the Contracting Party. However, the Joint Convention shall apply to the safety of management of spent fuel and radioactive waste from military or defense programmes if and when such materials are transferred permanently to, and managed within, exclusively civilian programmes. The Convention also applies to discharges.

The principal articles of the Joint Convention dealing with the safety of spent fuel management and the safety of radioactive waste management are based on the IAEA Safety Fundamentals *The Principles of Radioactive Waste Management* (1995). Articles on general safety provisions in the Joint Convention are consistent with the recommendations of the relevant IAEA Safety Standards and especially the *International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources* (1996). Requirements to ensure the safe transboundary movement of spent fuel and radioactive waste and for the safety of disused sealed sources are the subject of two articles, namely Articles 27 and 28, of the Joint Convention.

MAJOR REGIONAL AGREEMENTS

The Antarctic Treaty. Although no general international convention yet exists in this area, the Antarctic Treaty is an important regional instrument for clarifying the world's responsibility to protect the environment from the harmful effects of radioactive waste. Signed in 1959, the treaty aims at the use of Antarctica exclusively for peaceful purposes and at the promotion of international cooperation in scientific investigation in this area. Regarding radioactive wastes, it prohibits the disposal of such waste in Antarctica.

The Convention for the Protection of the Marine Environment of the North-East Atlantic (the OSPAR Convention). This regional convention, which came into force in 1998, commits its Contracting Parties to take all possible steps to prevent and eliminate pollution of the marine environment of the North-East Atlantic by applying the precautionary approach and best environmental technologies and environmental practices.

The Sintra Ministerial Statement of the Contracting Parties to the OSPAR Convention in May 1998 represents a commitment to progressive and substantial reductions of discharges, emissions and losses of radioactive substances, with the ultimate aim of concentrations in the environment near background values for naturally occurring radioactive

substances and close to zero for artificial radioactive substances. Similar objectives are stated for synthetic chemical substances of a hazardous character.

It is noted that these requirements go beyond those contained in IAEA Safety Standards documents. The IAEA requirements are based upon international radiation protection standards and require that discharges are limited so as to ensure that the radiation exposure to the most exposed group of the public is as low as reasonably achievable and within dose limits.

Other Regional Undertakings. Besides the Antarctic Treaty and the OSPAR Convention, a number of additional regional agreements exist in the field of human and environmental protection against the harmful effects of radioactive waste. Provisions for the protection of the marine environment from radioactive waste can, for example, be found in the *Convention for the Protection of the Marine Environment and Coastal Area of the South-East Pacific* and subsequent protocols of 1981; the *Convention for the Conservation of the Red Sea and of the Gulf of Aden* of 1982; the *Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region* of 1986; the *Convention for the Protection of the Natural Resources and Environment of the South Pacific Region* of 1986; the *Convention for the Protection of the Marine Environment of the Baltic Sea Area* of 1992; and the *Convention on the Protection of the Black Sea Against Pollution* of 1992.

In addition, certain regional agreements on nuclear-weapon free zones -- such as the *Treaty of Pelindaba, Treaty of Rarotonga* and the *Waigani Convention* -- contain provisions against the dumping of radioactive wastes in these areas.

OTHER RELATED CONVENTIONS

A number of other conventions, which while not applying directly to radioactive wastes, carry implications for its management. They include:

The Convention on Environmental Impact Assessment in a Transboundary Context (the Espoo Convention). This is a regional convention under auspices of the United Nations Economic Commission for Europe (UN-ECE) which came into force in 1991. Contracting Parties to the Espoo Convention commit themselves to establishing an environmental impact assessment (EIA) procedure for activities that are likely to cause significant, adverse transboundary impact. Such an EIA shall be undertaken prior to a decision to authorize or undertake a proposed activity that is likely to cause a significant, adverse transboundary impact. The party of origin shall provide an opportunity for the public in the areas likely to be affected to participate in relevant EIA procedures regarding proposed activities, whether those areas are outside or inside the territory of the party of origin. Such EIA procedures shall, as a minimum requirement, be undertaken at the project level of the proposed activity. To the extent appropriate, the parties shall endeavour to apply the principles of EIA to policies, plans and programmes.

Article 3 of the Convention lists the proposed activities for which a Contracting Party shall notify any other Contracting Party which it considers may be affected by the proposed activity. The list includes various types of nuclear installations including those established for the purpose of radioactive waste processing, storage or disposal.

The Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (the Aarhus Convention). This is another regional UN-ECE convention which came into force in 1998. Under it, Contracting Parties, *inter alia*, undertake to provide for access to information and for public participation in decision making on environmental matters. Article 6 of the Convention identifies proposed activities for which public participation in decisions shall be permitted. The list of activities includes installations designed for the processing, storage or final disposal of irradiated nuclear fuel or radioactive waste.

FUTURE ISSUES & DIRECTIONS

In assessing the effectiveness of the international instruments briefly reviewed in this article, it must be borne in mind that some of these undertakings are non-binding in nature and others, while legally binding, have no strict penalty mechanism for non-

compliance. Rather these instruments work by the application of "peer pressure", usually applied at review meetings of the Contracting Parties.

Within the group of legal instruments reviewed here, there is evidence of the effectiveness of the process. The London Convention 1972 brought about increasingly restrictive controls on the disposal at sea of potentially polluting materials culminating in the prohibition of the dumping of all types of industrial and radioactive wastes. The OSPAR Convention has established new standards for the control of coastal discharges with its requirement of environmental concentrations of naturally occurring radionuclides near to background levels and of artificial radionuclides close to zero.

At the same time, other conventions, although not applicable to radioactive waste, have set a general trend in environmental protection. Two of these are noted here: the *Basel Convention on the Control of Transboundary Movements of Hazardous Wastes*, adopted in March 1989, and the *Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade*, adopted in 1998. Both conventions establish a control mechanism for the transboundary movement of hazardous material:

The *Basel Convention*, through a mechanism which controls the transboundary movement of hazardous wastes, monitors and prevents illegal traffic, provides assistance for the environmentally sound management of hazardous wastes, promotes cooperation between parties in the field, and oversees the development of strict Technical Guidelines for the management of hazardous wastes.

The *Rotterdam Convention* is based on a "prior informed consent procedure" -- i.e., a procedure for formally obtaining and disseminating the decisions of importing countries as to whether they wish to receive future shipments of certain hazardous material -- thus extending to all countries the ability to effectively protect themselves against the risks of hazardous substances.

These issues have been discussed in various fora at the IAEA in the context of radioactive sources and, more particularly, in relation to radioactive waste. Efforts in this direction are reflected in the IAEA Code of Practice on the International Transboundary Movement of Radioactive Waste -- which, for example, requires the prior notification and consent of sending, receiving, and transit States -- and, subsequently, Article 27 of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. Discussions of whether or not to expand on this issue, however, for various reasons are presently stalled. The question, therefore, remains as to whether States consider that more needs to be done in this direction to effectively raise the global standards for protection of human health and the environment from radioactive wastes.

It is evident from this brief review that there are ongoing developments related to the control of discharges of hazardous materials into the marine environment. It remains to be seen whether the stringent control regime for coastal discharges imposed within the regional OSPAR Convention will be extended globally as it has been in relation to the dumping of hazardous materials at sea. ❐

INTERNATIONAL ORGANIZATIONS

The IAEA is one of two global organizations within the UN system having key responsibilities for environmental protection in fields of waste management.

IAEA Roles. Established in 1957, the IAEA has the objective of accelerating and enlarging the contributions of atomic energy to peace, health, and prosperity throughout the world. In the context of radioactive wastes, the IAEA has the statutory obligation to establish standards for the protection of health, *inter alia* against radiation exposure from radioactive wasts and to provide for the application of these standards. The IAEA advises the Contracting Parties to the London Convention 1972 on matters concerned with the prevention of marine pollution by the dumping of radioactive wastes. The IAEA has been identified as the lead international organization for developing the clearinghouse mechanism for radioactive substances under a number of conventions.

The United Nations Environmental Programme (UNEP). Established by a UN General Assembly resolution in 1972, UNEP is active through many programmes to monitor environmental problems of worldwide concern, and to coordinate international cooperation in dealing with these problems. Although it funds environmental protection programmes on its own, UNEP acts more as a coordinator and clearinghouse, supporting efforts of individual States to remedy most specific environmental threats. One of its major contributions to the control of radioactive waste is the Global Programme of Action (GPA).