

**THE JOINT CONVENTION ON THE SAFETY OF SPENT FUEL MANAGEMENT
AND ON THE SAFETY OF RADIOACTIVE WASTE MANAGEMENT.**

P. Risoluti
IAEA
Via Anghillarese 301, Roma, Italy

ABSTRACT

The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (the Joint Convention) is the first international legally binding instrument to address the issue of waste and spent fuel safety on a global scale. It was drafted by a group of legal and technical experts during the period from July 1995 to March 1997, adopted by a Diplomatic Conference in September 1997 and opened for signature on 29 September 1997. The Convention entered into force on 18 June 2001, and to date has been signed by 42 States, of which 34 have formally ratified the Convention, thus becoming Contracting Parties.

A first Review Meeting of the Contracting Parties was held in November 2003 in Vienna, through which the Convention has become fully operational.

The Joint Convention applies to spent fuel and radioactive waste resulting from civilian applications of nuclear energy and radioactive materials. Spent fuel and radioactive waste from military application are covered by the Convention only when and if these materials are transferred permanently to and managed by civilian programs.

The Convention's main objective is "to achieve and maintain a high level of safety worldwide in spent fuel and waste management." The obligations of the Contracting Parties are largely based on the international safety standards developed by the IAEA, in particular on the principles contained in the IAEA Safety Fundamentals document "The Principles of Radioactive Waste Management" published in 1995.

The Convention is not only relevant for those countries having nuclear energy programs, but for any country where activities generating radioactive waste are carried out or planned, including medicine, agriculture and research.

This paper describes the origin of the Convention, its content, the potential benefits from being a party to it, and summarizes the findings of the first Review Meeting.

INTRODUCTION

The safe management of spent fuel and radioactive waste generated by nuclear power and fuel cycle plant operation is a key issue for the use of nuclear energy.

Radioactive waste is also generated whenever nuclear technology is applied in medicine, industry and research, which implies that a need of ensuring safety in dealing with radioactive material is of importance for all the countries involved in such activities, even if they do not have or plan nuclear industrial programs.

WM'05 Conference, February 27-March 3, 2005, Tucson, AZ

Recognizing this, the international community promoted a Convention directed to ensure that sound practices are planned and implemented worldwide for the safety of both spent fuel and radioactive waste management.

In March 1995 the IAEA Board of Governors first endorsed a proposal to convene a Group of Experts to draft the convention. The Group, made up of 128 representatives from 53 countries and observers from 4 international organizations, met 7 times from July 1995 to March 1997 and drafted the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (in short, the *Joint Convention*).

The Joint Convention was adopted by a Diplomatic Conference purposely convened in Vienna from 1 to 5 September 1997 and opened for signature on 29 September 1997, the first day of the 41st regular session of the IAEA's General Conference.

The Convention entered into force on 18 June 2001, i.e. ninety days after the deposit with the IAEA of the twenty-fifth instrument of ratification, as provided for by Article 40. To become Contracting Party, a country has to sign and ratify the Convention.

To date (February '05) the Convention has been signed by 42 countries and ratified by 34.

The Joint Convention is made by and belongs to the Contracting Parties. The IAEA, other than being the Depositary, provides the Secretariat and promotes the Convention, with a view to having all countries holding radioactive materials to become Contracting Parties.

Nature and Scope of the Joint Convention

The Joint Convention is the first international binding legal instrument in the area of nuclear spent fuel and radioactive waste safety. It is a sister convention to the Nuclear Safety Convention [1], which covers the safety of nuclear power plants, adopted in Vienna on 17 June 1994. It is incentive in nature, i.e. it does not invoke penalties for non-compliance by the Contracting Parties, but is solely based on their common interest to achieve and maintain a high level of safety in nuclear spent fuel and radioactive waste management.

The overall objective of the Joint Convention is to achieve and maintain a high level of safety worldwide in spent fuel and radioactive waste management, through the enhancement of national measures and international cooperation, so that at all stages of operation and in whatever condition, individuals, society and the environment will be protected from the harmful effects of ionizing radiation.

The reason why the spent fuel and radioactive waste are *jointly but separately* covered in the Convention is that spent fuel is regarded by some countries as a material to be disposed of, like radioactive waste, by others as a resource material suitable for the recovery of uranium and plutonium. As such, the management of spent fuel and radioactive waste shares several safety measures and requirements but also demands provisions that are peculiar to each of them.

The Convention applies to the safety of management of:

- Radioactive waste and spent fuel from nuclear power plants.
- Radioactive waste from fuel cycle plant operations and from research laboratories.
- Radioactive waste from the use of radionuclides in medicine and industry.
- Spent sealed sources.
- Discharges to the environment from regulated nuclear facilities.
- Waste from mining and processing of uranium ores.

The Convention does not apply to the spent fuel held at reprocessing plant for reprocessing. This provision recognizes that spent fuel awaiting reprocessing is just a transitional material within the nuclear fuel cycle, not to be specifically “managed” but mechanically and chemically processed. The spent fuel held at reprocessing plant can be included in the scope of the Convention should a Contracting Party specifically declare the reprocessing to be part of spent fuel management.

The Convention does not cover waste containing only NORM (Naturally Occurring Radioactive Materials) that does not originate from the nuclear fuel cycle, unless the Contracting Party declares it to be a radioactive waste.

Spent fuel and radioactive waste generated within military and defence programs are also outside the scope of the Convention, unless a Contracting Party declares such materials to be included in it, or when they are permanently transferred to and managed within civilian programs.

Provisions and Obligations

The obligations with respect to safety in the Convention are largely based on the principles contained in the IAEA Safety Fundamentals document “The Principles of Radioactive Waste Management” published in 1995 [2], as well as in the supporting international Safety Standards further developed by the IAEA.

The Convention contains 44 Articles. A number of them treat the legislative, regulatory and organizational framework to be established in a country in order to ensure safety, which are generally based on the requirements established in the relevant Safety Series Document of the IAEA [3-7].

Special attention is given to the transboundary movements of spent fuel and radioactive waste, in order to ensure that shipments involving two or more States take place in a manner consistent with the internationally accepted safety principles, taking into consideration the reciprocal rights of the States of origin, transit and destination. The Convention incorporates *de facto* the major provisions of the Code of Practices on the international transportation of radioactive waste, issued in 1990 by the IAEA [8].

Many of the Articles deal with technical requirements for the safety of spent fuel and radioactive waste management. They cover facilities in operation and under decommissioning, as well as the siting, design and construction of new ones, including disposal systems and their post-closure institutional and technical control.

The Joint Convention is also the first binding international instrument addressing the safety of disused sealed sources, the improper use of which has raised concern among the international community. In particular, provisions are made to facilitate the return of spent sealed sources to a competent organization for reuse, storage or disposal.

Since the Convention is solely intended to stimulate improvements in safety, the fulfillment of the obligations is not based on control mechanisms but on a procedure of mutual peer review, carried out through meetings of the Contracting Parties.

A significant obligation for a contracting Party is to go through this peer review process. It consists of:

- A Review Meeting, held every three years by the Contracting Parties.
- A National Report, to be submitted by the Contracting Parties for review at Review Meetings.

In the National Report the Contracting Party is required to explain its overall approach to the safety of spent fuel and the safety of waste management, including the existing legislative and regulatory structure, to describe policy and practices on the matter, including past practices, to provide information on spent fuel and waste management facilities in operation and under decommissioning.

Important issues to be addressed in the National Report are also the criteria used for waste categorization and the inventory of the radioactive materials covered by the Convention, including waste that has been disposed of or resulting from past practices.

Provisions are established in the Convention to protect from disclosure information that a Contracting Party identifies as confidential.

National Reports are submitted by Contracting Parties prior to the Review Meetings, and distributed to all the other Contracting Parties, in order to enable their review. The Contracting Parties may seek clarification on the circulated National Reports through a written question and answer process. This peer review process is finally completed at the Review Meeting, where the Contracting Parties have the opportunity to present and discuss their National Reports.

Some aspects of this review process at the first Review Meeting are discussed below.

Expected Impact of the Convention

There are nowadays two aspects that characterize worldwide the management of radioactive waste: the variety of safety policies and national provisions, also among countries with the same level of nuclear development; a “gray area“ of activities and practices involving two or more States – like transboundary shipments, discharges, emergency preparedness or sealed sources use – for which an enhancement of the international cooperation is desirable in order to ensure the safety at a larger scale.

In addition to the above, there is a number of less developed non-nuclear countries where radioactive waste is still generated from the applications of nuclear technology in medicine, industry or research. In these countries the lack of adequate infrastructures for the radioactive waste management, both on technical and institutional side, may lead to a non-satisfactory level of safety and radiological protection.

The Joint Convention is intended to be an instrument to effectively address the above points. Insofar as an increasing number of countries fulfill the requirements set up in the Convention, significant outcomes can be progressively achieved in waste management, in particular:

- Improved harmonization worldwide of safety policies and provisions.
- Strengthening of mutual rights and responsibilities among the involved States in dealing with activity carried out internationally.
- Homogeneity of infrastructures and practices worldwide for ensuring safety.
- Progress towards the adoption of common safety and waste classification criteria.

As it is well known, radioactive waste and its disposal are commonly perceived as one of the most delicate environmental problems of our time. Evidence of this concern is by the way seen in the difficulty encountered in selecting suitable sites for the final repository for this waste.

The Joint Convention, as part of the growing international effort for enhancing on a global scale the safe management of radioactive waste, is a constructive step to address the problem of the public confidence on radioactive waste practices and policies.

Rights and Benefits for Contracting Parties

Upon becoming Contracting Party, a country is not only subject to obligations. Thanks to the transparency of the review process established by the incentive nature of the Convention, it also acquires rights and gains benefits from it.

First of all, a Contracting Party has the right at all times to be informed about programs, policies and practices on spent fuel and radioactive waste management of any other Contracting Party whose related activity can have an impact on safety in its territory.

Benefits from joining the Convention are gained by all countries generating radioactive waste, whatever the size and the nature of their involvement in nuclear energy applications.

In particular, becoming a Contracting Party to the Convention:

- Countries with significant nuclear power programs will have benefits mainly on the political or social side. Internally, their voluntary compliance with international obligations on the safety of the management of spent fuel and radioactive waste, confirmed by a built-in international peer review, can improve the public confidence on those activities and positively affect the social acceptance of nuclear energy. Internationally, by voluntarily explaining how they meet the requirements of the Convention through the reporting process, they demonstrate at the same time the

transparency of their activities on the waste management and the reliability of their technology.

- Countries with small nuclear power and/or research programs or countries having radioactive material only from nuclear application on medicine, agriculture or conventional industry, can in addition benefit from the exchange of information and the technical knowledge gained by the reporting procedure set up by the Convention, through which the expertise of larger countries is made available. Technical assistance may then be facilitated between Contracting Parties in meeting the obligations under the Convention, in particular when less developed countries are involved.

The incentive nature of the Joint Convention makes it an *in-progress instrument* to assist in ensuring global safety. This means that the fulfillment of safety requirements is by no means a precondition for a country to be Contracting Party, but rather a consequence of it. Being part of the Convention clearly demonstrates the national commitment to safety in the management of spent fuel and radioactive waste, irrespective of the country's current situation. A country can then benefit from the mechanism of the Convention, namely from the review process, to verify whether its safety level is adequate or appropriate steps should be taken to improve it.

Status of Implementation of the Convention

Contracting Parties (CP)

The following 34 countries are currently (February 2005) the Contracting Parties, having ratified or formally approved the Convention:

<i>Argentina</i>	<i>France</i>	<i>Netherlands</i>
<i>Australia</i>	<i>Germany</i>	<i>Norway</i>
<i>Austria</i>	<i>Greece</i>	<i>Poland</i>
<i>Belarus</i>	<i>Hungary</i>	<i>Romania</i>
<i>Belgium</i>	<i>Ireland</i>	<i>Slovakia</i>
<i>Bulgaria</i>	<i>Japan</i>	<i>Slovenia</i>
<i>Canada</i>	<i>Korea</i>	<i>Spain</i>
<i>Croatia</i>	<i>Latvia</i>	<i>Sweden</i>
<i>Czech Republic</i>	<i>Lithuania</i>	<i>Ukraine</i>
<i>Denmark</i>	<i>Luxembourg</i>	<i>Switzerland</i>
<i>Finland</i>	<i>Morocco</i>	<i>United Kingdom</i>
		<i>United States of America</i>

The Preparatory Meeting

Pursuant to Article 29 of the Convention, a Preparatory Meeting was held in December 2001, attended by 27 Contracting Parties who had ratified at that date.

The Preparatory Meeting had been established to provide rules, procedures and time schedule for implementing the review process. In particular, guidelines have been agreed upon for the structure and content of the National Reports to be submitted by the Contracting Parties, and on how to conduct the Review Meetings.

Among the rules and procedures decided by consensus at the Preparatory Meeting, it is worthwhile to mention the following:

- In order to make the review of the National Reports more efficient, it has been decided to establish Country Groups for each Review Meeting, in which the National Report of each member of the Group can be considered in detail. The Groups are not made-up on a geographical base, but on a balance of nuclear power plants operated or under decommissioning in the included countries.
- An organizational meeting will be held six months before each Review Meeting in which, *inter alia*, decisions will be taken on the mechanism to establish the Country Groups and their *modus operandi*, and to elect officers for the Groups and the Review meeting.

The Review Process and the first Review Meeting

The first Review Meeting of the Contracting Parties was held from 3 to 14 November 2003 at the Headquarters of the International Atomic Energy Agency (IAEA).

Thirty-three of the 34 Contracting Parties listed above participated in the Review Meeting (one country ratified after the meeting). Pursuant to Article 32 of the Convention and the related rules agreed upon at the Preparatory Meeting, each Contracting Party had submitted its National Report to the other CP's six months prior to the meeting in order to enable them to review it and make written questions. Answers were also provided in advance of the meeting.

At the Review Meeting the Contracting Parties were assigned to one of 5 Country Groups, in which oral presentation of the National Reports and discussion on written questions and answers took place.

The following Country Groups were established at the First Review Meeting:

- Group 1: Belgium, Greece, Ireland, Latvia, Slovakia, Slovenia, United States.
- Group 2: Australia, Bulgaria, Denmark, France, Luxemburg, Romania, Spain.
- Group 3: Morocco, Croatia, The Netherlands, The United Kingdom, Sweden, Czech Republic, Japan.
- Group 4: Argentina, Belarus, Germany, Norway, Switzerland, Ukraine.
- Group 5: Austria, Canada, Finland, Hungary, Korea, Poland.

Effectiveness and findings of the Review Process

The heart of the Joint Convention is the review process. In principle, the success of the envisaged mechanism to carry it out depended upon several factors:

- To have the Contracting Parties submitting National Reports able to provide a self-assessment of their compliance with the requirements of the Convention.
- To have the Contracting Parties reviewing other countries' National Reports by seeking clarification should they identify areas of uncertainty, so making effective the peer review process.
- To have the Contracting Parties willing to respond diligently and openly to the questions made on their National Reports.
- To have the Contracting Parties actively participating at the Review Meeting in which the process is accomplished by oral presentations and further constructive discussions on the questions made and received by the Contracting Parties.

Generally, it was acknowledged by the Contracting parties that the review process at the first Review Meeting was satisfactory, even if some improvement in the process can be sought for the future meetings.

The National Reports that were produced covered adequately in most cases the subject matter and allowed an assessment of the safety of their policies and practices. Among the Contracting Parties there was a wide spectrum of size and scope of nuclear programs.

There were Contracting Parties with major nuclear power programs, others with only hospital waste and disused sealed sources. The National Reports therefore varied appreciably in size, scope and complexity. For some of them there is however room for improvement, both on the structure and points addressed - profiting from the experience gained with the first review process.

Almost all the Contracting Parties (27 out of 33) voluntarily placed their National Reports on their websites and that of IAEA. (Rasanet.iaea.org/conventions/waste-jointconvention.htm)

The participation to the written questions and answers process was successful. More than three thousand questions were made totally to the 33 Contracting Parties by the others, showing the substantial interest of all countries to seek and share information on the safety of spent fuel and waste management. Technical issues and policy matter were more or less equally queried.

The Contracting Parties agreed on a number of adjustments of the procedures and guidelines for the Review Process, to address the issues that were found to be unsatisfactory. These are detailed in the President's Report of the Meeting [9].

The meeting has also recognized that the fulfilment of the Joint Convention's objectives require the participation of all the countries which have spent fuel and/or radioactive waste, and that a

major effort has to be made to have more Member States become Contracting Parties to the Convention.

CONCLUSIONS

The Joint Convention has been recognized by the international community as an instrument to ensure the safe management of spent fuel and/or radioactive waste worldwide. With the fulfillment of this objective, a uniform and higher degree of protection of individuals, society and environment from ionizing radiation can be achieved on a global scale.

The Joint Convention is incentive in nature, which means that it is designed to be an instrument to stimulate an open self-assessment of the level safety by the countries who become Contracting Parties, through a transparent reporting and peer review mechanism allowing information and a better interaction among States on matters of safety.

By joining the Convention, a country also certifies nationally and internationally its commitment to safety of spent fuel and/or radioactive waste management, and thereby contributing to improve the public confidence on the waste management practices and policy.

The success of the Joint Convention needs a strong involvement of all potentially interested countries, both in terms of number and of "spirit" of the participation.

The Contracting Parties that attended the first Review Meeting demonstrated generally a positive and open-minded attitude in dealing with the review process, although the procedure might require a further refining.

To have more Member States become Contracting Parties is also essential for the purpose of the Convention. The IAEA Secretariat is strongly committed to this objective.

REFERENCES

1. INTERNATIONAL ATOMIC ENERGY AGENCY, Convention on Nuclear Safety, INFCIRC/449, IAEA, Vienna (1994).
2. INTERNATIONAL ATOMIC ENERGY AGENCY, The principles of Radioactive Waste Management, Safety Series No. 111-F, IAEA, Vienna (1995).
3. INTERNATIONAL ATOMIC ENERGY AGENCY, Establishing a National System for Radioactive Waste Management, Safety Series No. 111-S-1, IAEA, Vienna (1995).
4. INTERNATIONAL ATOMIC ENERGY AGENCY, Safety assessment for Spent Fuel Storage Facilities, Safety Series No. 118, IAEA, Vienna (1995).
5. FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, INTERNATIONAL ATOMIC ENERGY AGENCY, INTERNATIONAL LABOUR ORGANIZATION, OECD NUCLEAR ENERGY AGENCY, PAN AMERICAN HEALTH

ORGANIZATION, WORLD HEALTH ORGANIZATION, International Basic Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources, Safety Series No. 115, IAEA, Vienna (1996).

6. FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, INTERNATIONAL ATOMIC ENERGY AGENCY, INTERNATIONAL LABOUR ORGANIZATION, OECD NUCLEAR ENERGY AGENCY, PAN AMERICAN HEALTH ORGANIZATION, WORLD HEALTH ORGANIZATION, Radiation Protection and the Safety of Radiation Sources, Safety Series No. 20, IAEA, Vienna (1996).
7. INTERNATIONAL ATOMIC ENERGY AGENCY, The Principles of Radiation Protection and the Safety of Radiation Sources, Safety Series No. 120, IAEA, Vienna (1996).
8. INTERNATIONAL ATOMIC ENERGY AGENCY, Code of Practice on the International Transboundary Movement of Radioactive Waste, INFCIRC/386, IAEA, Vienna (1990).
9. THE JOINT CONVENTION ON THE SAFETY OF SPENT FUEL MANAGEMENT AND ON THE SAFETY OF RADIOACTIVE WASTE MANAGEMENT, First Review Meeting of the Contracting Parties, 3-14 November 2003, IAEA, Vienna.