

U.S. Continuing Involvement with the Joint Convention – 9169

L. Stewart, D. Tonkay, E. Regnier
U. S. Department of Energy
Washington, DC, 20585, U.S.A

D. Schultheisz
U.S. Environmental Protection Agency
Washington, DC, 20460, U.S.A

G. Gnugnoli
U.S. Nuclear Regulatory Commission
Washington DC, 20555, U.S.A.

ABSTRACT

The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (Joint Convention) is an international convention, under the auspices of the International Atomic Energy Agency (IAEA). It is a companion to a suite of international conventions on nuclear safety and physical security, which serve to promote a global culture for the safe use of radioactive materials. The Joint Convention is an official international treaty, and as such, there are obligations on the part of the United States. Those nations having ratified the Joint Convention are designated as “Contracting Parties.” Nations that are not IAEA Member States may also become Contracting Parties to the Joint Convention, although none has done so.

The primary obligations are threefold. The first is to prepare a national report, which addresses the national safety program in radioactive waste management, spent nuclear fuel management, and disused sealed sources. As the U.S. prepares a national report, other Contracting Parties to the Joint Convention also prepare their national reports, which leads to the second obligation on the part of the Contracting Parties. This is the obligation to review other countries’ national reports. The last specific obligation is to actively participate in the triennial peer review meeting, referred to as the Review Meeting of the Contracting Parties.

The U.S. ratified the Joint Convention in 2003, just prior to the First Review Meeting of the Contracting Parties, and has participated fully therein in the ensuing Review Meetings. Because of the benefits in active participation, it is important for the U.S. to maintain its leadership role in promoting its ratification in the global setting, as well as in more focused regions. Because of the important benefits associated with active participation, the U.S. has strongly supported a Regional Conference Initiative outreach program to increase membership. To launch the Initiative, the U.S. provided Extra-Budgetary contributions to fund conferences in Africa, the Americas, Asia and Europe. We also provided an expert for each of the conferences to assist in advancing the message to non-Member States, in particular developing nations considering ratification.

The peer review process has resulted in the identification of good practices and future challenges that all Contracting Parties should consider in the evolution of use of radioactive materials and care for the exposed individuals and the environment in which such materials are used, stored and disposed.

The Joint Convention process also provides opportunities to identify future areas of bilateral and multilateral technical and regulatory cooperation with other Parties. Furthermore, the Joint Convention is

consistent with U.S. foreign policy considerations to support, as a priority, the strengthening of the worldwide safety culture in the use of nuclear energy.

INTRODUCTION

The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (Joint Convention) is an international convention, under the auspices of the International Atomic Energy Agency (IAEA). It is a companion to a suite of international conventions on nuclear safety and physical security, which serve to promote a global culture for the safe use of radioactive materials, in particular the Convention on Nuclear Safety (CNS).

The general obligation on the Contracting Parties is to take appropriate steps to ensure that health, safety, and the environment are adequately protected throughout all stages of management of spent fuel, radioactive waste and disused sealed sources. Contracting Parties are required to document their national programs in reports, which are to be updated on three-year cycles.

The Joint Convention has been in force since June 2001 and two cycles of review of the national reports prepared by Contracting Parties have taken place. See Table I for a listing of the Contracting Parties participating in the third Joint Convention Review Meeting. Contracting Parties have made progress in improving the safety of management of radioactive waste, spent fuel and disused sealed sources. However, many challenges remain to the completion of the goals and objectives of the Joint Convention.

The United States' report provides a convenient reference for summary level information on the spent fuel management and radioactive waste management programs and regulatory processes in the United States. For example, the report includes:

- A description of legislative and regulatory systems.
- A discussion of waste classification systems.
- Tables of spent fuel and radioactive waste management facilities, their location, purpose, and features (an example is provided in Table II).
- Tables of uranium mill tailings and related sites.
- Tables of nuclear facilities being decommissioned and the status of the decontamination and decommissioning activities
- Tables of available Nuclear Regulatory Commission (NRC) and Environmental Protection Agency (EPA) guidance documents related to spent fuel and radioactive waste management and radiation protection, and
- A list of internet sites with relevant information available.

Table I. Contracting Parties for the Third Cycle of the Joint Convention

Argentina	Croatia	Hungary	Luxembourg	Slovenia	Uruguay
Australia	Czech Republic	Iceland	Morocco	South Africa	
Austria	Denmark	Ireland	Netherlands	Spain	
Belarus	Estonia	Italy	Nigeria	Sweden	
Belgium	Euratom ¹	Japan	Norway	Switzerland	
Brazil	Finland	Korea	Poland	Tajikistan	
Bulgaria	France	Kyrgyzstan	Romania	Ukraine	
Canada	Germany	Latvia	Russian Federation	United Kingdom	
China	Greece	Lithuania	Slovakia	USA	

The Contracting Parties' and their submitted National Reports can be accessed at the IAEA Joint Convention web site at: <http://www-ns.iaea.org/conventions/waste-jointconvention.htm>.

Table II. Radioactive Waste Disposal Facilities

Sector	Facility Type	Waste Type	Number	Inventory
Government/ Commercial	Geologic Repository (Yucca Mountain in licensing)	HLW (and Spent Fuel)	1	0
Government	Geologic Repository (WIPP)	TRU	1	56,000 m ³
	Closed NTS Greater Confinement Disposal (boreholes)	TRU	1	200 m ³
	Near Surface Disposal	LLW ²	19	6,800,000 m ³
Commercial	Operating Near Surface Disposal	LLW (Class A, B, C)	3	3,920,000 m ³
		11e.(2) ³	1	1,230,000 m ³
	Closed Near Surface Disposal	LLW	4	438,000 m ³
Government/ Commercial	Title I UMTRCA Disposal	Residual Radioactive Material (tailings)	20	243,000,000 Metric Tons
Commercial	Title II UMTRCA Disposal	11e.(2)	41	

¹ Euratom is the European Atomic Energy Community; they have observer status at the Joint Convention Review Meetings of the Contracting Parties.

² Includes Mixed LLW.

³ 11e.(2) designates byproduct material including uranium mill tailings; these are included in the regulatory scheme under the AEA, Section 11e.(2).

Sector	Facility Type	Waste Type	Number	Inventory
Government	Other Closed Disposal Cells (Weldon Spring Site and Monticello)	Residual Radioactive Material (tailings)	2	3,120,000 m ³

PARTICIPATION & RESPONSIBILITIES OF THE CONTRACTING PARTIES

Obligations of the Joint Convention

The specific obligations of the Joint Convention are three-fold. The first is to prepare a National Report addressing the reporting requirements, as detailed in Article 32 of the Joint Convention. This article lays out the elements of each Contracting Party's National Report, which must include text that summarizes laws, regulations, types and amounts of waste, and practices in each country. In the first two cycles, the national reports varied from fairly broad descriptions of these items with significant reliance on references to other documents to extremely detailed, self-contained reports which occasionally went well beyond the scope of the Joint Convention. In the second meeting, held in May 2006, the Contracting Parties requested the IAEA Secretariat to develop a synopsis of guidance on the use of relevant IAEA Safety Standards -- for those Contracting Parties who rely on them -- to assist those Contracting Parties in the preparation of the third cycle national reports. The U.S. does not routinely incorporate these standards into its regulatory framework, but recognizes that these standards serve as a useful point of reference for a number of IAEA Member States.

The second specific obligation is to review other Contracting Parties' national reports, especially those countries in the same country review group at the review meetings.⁴ This review is done prior to the meeting date, and in fact, there is an opportunity to respond to the questions and comments raised with regard to the national report. The submission of responses to these questions and comments marks the final action before the formal review meeting of the Contracting Parties. These interactions, even before the formal review meeting, should not be underestimated; the availability of all the responses to all the questions and comments raised constitutes a wealth of information that can be brought up during the individual country review group sessions and even in the plenary sessions. During these country group reviews, attendees can raise additional questions to a Contracting Party and even ask for clarification of the submitted responses. The IAEA installed a dedicated website for submittal of national reports, questions and comments and responses, as well as other support documentation. The relative ease with which delegations can navigate to relevant interactive display screens and download-ready documents is invaluable in preparing for the review meetings.

The third obligation is active participation in the review meetings. This consists of a formal presentation of the Contracting Party's national safety program in the areas covered in the Joint Convention. The formal presentation allows for a Contracting Party to bring the program up to current status, as the

⁴ To facilitate review, the Contracting Parties are broken up into groups that comprise approximately the same number of countries. Countries are distributed among the groups based on the number of operating nuclear power plants, so that each country review group includes both highly developed and relatively undeveloped countries. The U.S. country group for the Third Review Meeting includes Spain, Belgium, Netherlands, South Africa, Croatia, and Denmark. Specific details on the selection, composition, and formulation of the country groups can be obtained from the IAEA website at URL: <http://www.iaea.org/Publications/Documents/Infocircs/20060infocirc603r3.pdf>.

National Report is submitted 7 months before the review meeting. This also allows the Contracting Party to focus on selected classes of questions raised by the other Country Group Members with respect to its national safety program. Following each presentation, the country-review group rapporteur summarizes the good practices and those areas needing improvement. The findings are generalized for the closing plenary meetings and form the potential topics of focus for the next 3-year review cycle.

At the time that the National Reports are submitted, there is an Organizational Meeting, which elects officers and identified topics for the review meeting. This meeting also deals with format changes, identifying special topics, and revisions to guidance and of procedures. Significant changes to the Joint Convention itself require an extraordinary meeting or else resolution at the review meeting of the contracting parties. In the case that consensus fails to be achieved, a new diplomatic conference would need to be held. This has not occurred, and could be very problematic to the extent that there would need to be a repeat of each of the Contracting Parties' ratification process.

Scope Limitations

The Joint Convention specifies 3 areas of exclusion, unless the individual Contracting Party voluntarily discloses information in these 3 areas. The first is naturally occurring radioactive material (NORM). The U.S. does not uniformly regulate NORM under the provisions of the Atomic Energy Act, as a radioactive material. There are provisions for doing so in specific cases. For example, the Energy Policy Act of 2005 provides for regulation of discrete sources of ²²⁶Ra as radioactive byproduct material. Information on these materials is subject to the provisions of the Joint Convention. However, these types of sources are not considered radioactive waste for classification purposes. The second exclusion relates to management of reprocessing spent fuel. The final exclusion is of management of waste within the national defense program; i.e., military waste, unless it has been designated for permanent disposal.

U.S. PERSPECTIVES

The U.S. has actively participated in the Joint Convention from the diplomatic conference through the current activity in preparation for the third review meeting of the Contracting Parties. The Department of Energy (DOE) is designated as the lead agency for preparing the U.S. national report. The NRC and EPA also participate in preparing the U.S. national report and in the review process. The U.S. has maintained a leadership role throughout the Joint Convention process. Consistent with U.S. foreign policy, the agencies believe it is important to take a leadership role in the Joint Convention Review Meeting of the Contracting Parties and in promoting ratification of the Joint Convention in the global setting, as well as in more focused regions. In the Second Review Meeting of the Contracting Parties in May 2006, the United States was elected to serve as one of two Vice Presidents and as the Vice Chair of a Country Group. The U.S. candidate (DOE) was also elected to serve as President of the Joint Convention Organizational Meeting in December 2005. For the upcoming review meeting in May 2009, the U.S. was again elected to serve as one of the 2 Vice Presidents.

Benefits of Active Participation

In general terms, participation in the Joint Convention process provides a benefit from harmonizing international approaches and in influencing the development of nuclear safety programs in developing countries, which strengthens the nuclear safety environment worldwide.

In more specific terms, participating in the Joint Convention process provides many benefits to U.S. programs and activities. First is the opportunity to review the national spent fuel and radioactive waste-management safety programs of other Contracting Parties and to benefit from their experience in

situations similar to those faced by the U.S. Another specific benefit is the opportunity to learn about advances and innovations by other countries in radioactive waste disposal and spent fuel management. One example is the observation that life cycle cost efficiencies can be achieved by spending resources up front to deactivate facilities and remove nuclear safety hazards, while experienced personnel are still available. Although the U.S. has a wealth of experience, it is always looking for ways to enhance its programs.

Finally, one of the main benefits from active participation in the Joint Convention is the opportunity to measure and compare the progress in the national program from one meeting to the next. This self-assessment provides the U.S. with a context in which to better understand its progress in light of similar programs in other countries. For example, the NRC has a performance-based inspection program, consisting of in-process inspections, which are more efficient than a one-time confirmatory survey. It is a more effective way of implementing the provisions of the Joint Convention and provides a self-evaluation example of how the United States has improved its program.

Oddly, there is reluctance on the part of some IAEA Member States to ratify the Joint Convention, until their programs are sufficiently developed to comply in great part with the provisions of the Joint Convention. Many Contracting Parties have noted that if all Member States were to satisfy the provisions of the Joint Convention, there would be no need to have a Joint Convention. Despite this clear conclusion, there is a concern that a first-timer would be harassed, however this has not been observed at the previous meetings. In fact, the review meeting discussions have consistently discouraged confrontational and judgmental cross-examinations, and the reviews have been cordial and constructive.

Promotion of Ratification

The U.S. has been very active in promoting the enlargement of the Joint Convention family of Contracting Parties. By allocating funding, providing expertise, and creating audio-visual aids and tools, the U.S. has invested in the push for a wider acknowledgement and commitment to the safety provisions in the Joint Convention.

To promote ratification of the Joint Convention, the United States proposed initiating a Regional Conference Initiative outreach. To launch the Initiative, the U.S. provided \$170,000 in Extra-Budgetary contributions to fund conferences in Africa, the Americas and Asia. In addition, drawing on its ratification and participation experience, the U.S. sent an expert for each of the conferences to assist in advancing the message to non-Member States, in particular developing nations. The U.S. also produced an electronic Guide and Tutorial on the ratification process and national report writing to distribute at each Regional Conference. This initiative continued with the IAEA Technical Workshop on the Joint Convention: Benefits and Expected Results for Ibero-American Member States; held in Buenos Aires, Argentina on 27-28 October 2008.

COUNTRY GROUP REVIEW PROCESS

The Review Meeting of the Contracting Parties consists of plenary sessions and individual country-group review sessions, which run in parallel. The Country Group is a peer review group with a chair, vice chair, rapporteur and a coordinator. The reviews in the country groups focus on a Contracting Party's good practices and remaining challenges in terms of the national safety program for radioactive waste, spent fuel and sealed sources. As was alluded to earlier, no Contracting Party's program is perfect, and so there are still improvements to be made. In fact, the national reports have a section dedicated to planned

improvements to safety; these remain as benchmarks for following cycles to determine the progress being made by Contracting Parties. Some of the challenges that remain include⁵:

- implementation of national policies for the long-term management of spent fuel,
- disposal of high level wastes,
- management of historic wastes,
- recovery of orphan sources,
- knowledge management and human resources, and
- assurance that financial commitments are consistent with the extent of liabilities.

The U.S. has maintained that the Joint Convention process also provides opportunities to identify future areas of bilateral and multilateral technical and regulatory cooperation with other Parties. The U.S. has also promoted a “buddy system” whereby more experienced Contracting Parties assist those less experienced countries in the various aspects of full participation in the Joint Convention Process; e.g., assistance in preparation of National Reports.

The Joint Convention is a companion to a suite of international conventions on nuclear safety and physical security, which serve to promote a global culture for the safe use of radioactive materials. The U.S. has had to balance the safety objectives in the Joint Convention with the legislative priorities dominated by concerns for national security and threats from terrorism after September 11, 2001.⁶ Furthermore, the Joint Convention is consistent with U.S. foreign policy considerations to support, as a priority, the strengthening of the worldwide safety culture in the use of nuclear energy. This comprises a balanced approach for safety and security in the use and management of these materials and activities on a global basis.

As part of this international approach, the Global Nuclear Energy Partnership (GNEP) was announced by DOE in 2006. The DOE GNEP Program is intended to support a safe, secure, sustainable expansion of nuclear energy, both domestically and internationally. The U.S. made the GNEP initiative a central theme in its participation in the Second Review Meeting of the Contracting Parties. This emphasis was well received by the participating delegations.

GENERAL OBSERVATIONS FROM SECOND REVIEW MEETING

National Strategies for spent fuel and radioactive waste management

The Contracting Parties to the Joint Convention have affirmed their commitment to address spent fuel and waste management in a comprehensive manner. Many have already developed, or are currently developing, spent fuel and waste management strategies based on increasingly comprehensive inventories, including spent fuel and waste arising, or to arise, from decommissioning. In some cases, some Contracting Parties have made clear progress with the implementation of their strategic plans.

⁵ International Atomic Energy Agency, Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (Joint Convention), Summary Report of the First Review Meeting. Vienna, Austria. (2004). 21 p.

⁶ *U.S. Perspectives on the Joint Convention*. J. Strosnider, et al. WM'06 Conference, February 26–March 2, 2006, Tucson, AZ.

Some Contracting Parties reported on progress with siting of near-surface disposal facilities, even if this remains a difficult issue to solve. The subject of geological repositories is still more difficult to handle. However, some Contracting Parties reported on progress in siting such repositories.

Engagement with stakeholders and the public

Another challenge for many of the Contracting Parties has been the increasing importance of non-technical aspects of management of safety. These include public consultation, the need for public acceptance and defining funding strategies for managing their spent fuel and wastes in accordance with their strategic plans, although some Contracting Parties started collecting the funds only quite recently. The absence of a truly separate private, commercial industry puts a different twist on the concept of the “polluter pays” consideration, especially when the operator is actually another governmental entity.

Control of Disused Sealed Sources

A number of Contracting Parties have already established registries for sealed sources, as well as requiring enforced return of disused sealed sources to the supplier. Some have not yet defined a long-term policy. Many Contracting Parties have set up funding schemes for the recovery of orphan sources. The disposal of disused sealed sources, especially long-lived ones, was recognized as an issue still to be solved. The Contracting Parties noted the importance of implementing the IAEA Code of Conduct on the Safety and Security of Radioactive Sources.⁷ It is also clear from news reports that loss of control of radioactive sources remains an issue of primary concern.

MAY 2009 THIRD REVIEW MEETING

U.S. National Report

The U.S. submitted its National Report to the other Contracting Parties in October 2008, as did most of the current Contracting Parties, which consist of 46 Member States or other relevant Non-Governmental Organizations (e.g., European Commission). Progress from the previous cycle includes:

- DOE submitted a license application to the NRC in June 2008, for authorization to begin construction of a proposed repository at Yucca Mountain, Nevada. In September 2008, NRC formally docketed the Yucca Mountain license application, based on the NRC's conclusion that the application was sufficiently complete for it to begin its full technical review.
- In September 2008, EPA issued amended public health and safety standards for Yucca Mountain that maintain the 0.15 mSv/a (15 mrem/yr) standard for the first 10,000 years and establish a 1 mSv/a (100 mrem/yr) standard for the period after the initial 10,000 years out to one million years. (73 FR 61256, October 15, 2008)
- Industry and regulators in the U.S. are increasing efforts in new and expanded nuclear fuel cycle activities. New enrichment plants are also planned or under construction. NRC received its first new license applications for uranium recovery facilities in 2007. These were the first such requests in nearly 20 years.
- DOE received approval from EPA and a modified hazardous waste facility permit from the State of New Mexico to dispose of remote-handled transuranic (RH-TRU) waste at the Waste Isolation

⁷ International Atomic Energy Agency. *Code of Conduct on the Safety and Security of Radioactive Sources*. IAEA/CODEOC/2004. January 2004.

Pilot Plant (WIPP). DOE has now increased RH-TRU shipments to WIPP to as many as four shipments per week.

- DOE began preparing an Environmental Impact Statement (EIS) in 2007, to dispose of Greater-than-Class-C (GTCC) LLW and other DOE GTCC-like waste. The Low-Level Radioactive Waste Policy Amendments Act of 1985 (LLRWPA) directs that GTCC waste resulting from NRC-licensed activities must be disposed of in an NRC-licensed facility, and gives DOE responsibility for developing such a disposal facility. This EIS will consider alternatives for disposal in a geologic repository, intermediate depth boreholes, and enhanced near-surface facilities.
- The Atlantic Compact restricted access in July 2008 to the commercial LLW disposal site in Barnwell, South Carolina by all waste generators except those generators within three states composing the Atlantic Compact (South Carolina, Connecticut, and New Jersey).
- NRC is examining whether the disposal of large quantities of depleted uranium (DU) from enrichment plants warrants amending current regulations. DU is either categorized as a “resource,” for variety of applications and uses, in which case it is a source (nuclear) material, or may be designated as a “waste” requiring disposal.
- NRC published regulations in November 2006 (Federal Register, 71 FR 65685) to implement the National Source Tracking System (NSTS). The purpose is to enhance control of radioactive materials considered to be of the greatest concern from a safety and security standpoint. The NSTS involves other Federal and state agencies and international partners. All Category 1 and Category 2 (consistent with IAEA definition) sealed sources to which the regulations apply will be reported through the NSTS by January 2009.

Challenges are addressed in the national report, as well as current status, as shown in the table below.⁸

Table III. Challenges for the U.S. in the Safety of Spent Fuel and Radioactive Waste Management

Challenges	Current Status
The potential shortage of LLW disposal capacity requiring additional storage solutions.	A strategic assessment of the commercial LLW program resulted in a range of activities to improve the LLW regulatory framework, such as better guidance on extended storage, reconsideration of waste classification to include depleted uranium, and other alternatives for disposal. Furthermore, a license application for LLW disposal (excluding GTCC LLW) is under review by the State of Texas.
The lack of a repository for Greater-than-Class-C LLW.	Preparation began in 2007 on an Environmental Impact Statement (EIS) to dispose of GTCC LLW and other DOE GTCC-like waste.
The lack of a national clearance standard and the impact to public confidence.	Although a national clearance standard would have regulatory benefits, it has been deferred because of

⁸ U.S. Third National Report for the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. DOE/EM-0654, Rev. 2, (2008). 204 p
<http://www.em.doe.gov/pdfs/3rd%20US%20Rpt%20on%20SNF%20JC--%20COMPLETE%20REPORT%20-%2010%2013%2008.pdf>.

	higher priority tasks and limited resources. The current case-by-case decision process is fully protective of human health and safety.
The sustained funding required to build the repository at Yucca Mountain will be well above current and historic levels.	Legislation has been proposed to facilitate the necessary funding for the construction and operation of the repository.

CONCLUSION

For the United States, participation as a Contracting Party to the Joint Convention provides many benefits, both general and specific. These range from working with other Parties to harmonize international approaches to achieve strong and effective nuclear safety programs on a global scale, to stimulating initiatives to improve safety systems within domestic programs, to learning about technical innovations by other Parties that can be useful to U.S. licensees, utilities, and industry in managing safety and its associated costs in waste management activities. The Joint Convention process is a continuous improvement process, through which all Contracting Parties cooperate to improve the safety of management of these materials, both domestically and globally.

Consistent with U.S. foreign policy considerations to support safety as a top priority in the use of nuclear energy worldwide, it is important to participate as a Contracting Party, to take a leadership role in the Review Meeting of the Contracting Parties, and in promoting ratification of the Joint Convention in the global setting, as well as in more focused regions. With worldwide nuclear safety a top foreign policy priority, the United States continues to welcome future promotional opportunities and opportunities for bilateral and multilateral technical and regulatory cooperation with those nations who are not yet Contracting Parties.