U.S. Nuclear Regulatory Commission Implementation Plan for the Radiation Source Protection and Security Task Force Report

February 11, 2025

Enclosure

Introduction

The Energy Policy Act of 2005 (EPAct) created the interagency task force on radiation source protection and security under the lead of the U.S. Nuclear Regulatory Commission (NRC). The Radiation Source Protection and Security Task Force (Task Force) evaluates and makes recommendations to the President and Congress relating to the security of radiation sources in the United States (U.S.) from potential terrorist threats, including acts of sabotage, theft, or use of a radiation source in a radiological dispersal device or a radiation exposure device.

The Task Force submits its reports to Congress and the President every 4 years in accordance with the EPAct. The Task Force submitted its first report on August 15, 2006, and subsequent reports were issued on August 11, 2010; August 14, 2014; October 17, 2018; and August 5, 2022. Since its inception, the Task Force has proposed 42 recommendations and actions. As of the date of issuance of this 2025 implementation plan, 36 recommendations and actions have been completed and 6 recommendations and actions remain open. Based upon the Task Force's most recent evaluation as documented in the 2022 Task Force report, the Task Force concluded that there are no significant gaps in the area of radioactive source protection and security that are not already being addressed through interagency cooperation and actions.

To facilitate the prioritization and implementation of activities related to open Task Force recommendations, the NRC staff, with input from its interagency Task Force partners, issues updates to the Task Force implementation plan every 2 years. The biennial implementation plan serves to maintain the Task Force focus on actionable strategies to advance radiological security in the United States. In addition, these updates communicate the status of recommendations and associated actions to the Commission and the public on a routine basis.

The implementation plan includes specific tasks and deliverables for implementing each of the open recommendations and actions of the Task Force. Where appropriate, the individual strategies include task breakdowns and a discussion of any known issues that could challenge implementation. The NRC Office of Nuclear Material Safety and Safeguards (NMSS); Office of Nuclear Security and Incident Response; Office of International Programs; Office of the General Counsel; and Office of Public Affairs are involved in the implementation of Task Force recommendations and actions. Other agencies involved in implementation include the U.S. Department of Homeland Security (DHS); Federal Emergency Management Agency; Transportation Security Administration; U.S. Department of State (DOS); U.S. Department of Transportation (DOT); U.S. Department of Defense (DOD); Federal Bureau of Investigation; Central Intelligence Agency; U.S. Environmental Protection Agency (EPA); U.S. Department of Commerce; U.S. Department of Energy (DOE); the National Nuclear Security Administration (NNSA), which is a separately organized agency within DOE; U.S. Department of Justice; U.S. Food and Drug Administration; U.S. Department of Health and Human Services (HHS); Office of Science and Technology Policy (OSTP); and the Office of the Director of National Intelligence .

In the sections that follow, implementation strategies are provided for the six recommendations and actions that remain ongoing. References and footnotes may be omitted or renumbered from the quotations in this document. The remaining open recommendations and actions include:

- 2006 Actions 9-1 and 10-2;
- 2010 Recommendations 4, 5, and 9; and
- 2014 Recommendation 3.

Implementation Strategies for Individual Recommendations and Actions

2006 Action 9-1	Greater-than-Class C (GTCC) Waste	Ongoing

Task: "DOE should continue its ongoing efforts to develop GTCC [Low-Level Radioactive Waste (LLRW)] disposal capability."

2022 Report Citation and Content: The following is a summary of the status from the 2022 Task Force report at Chapter 2–Status of the Recovery and Disposition of Radioactive Sealed Sources (pp. 11-12):

> [A]dvances have been made in the availability of commercial disposal pathways for sealed sources. Nonetheless, challenges remain. Many sealed source users have little incentive to dispose of their disused sources, preferring to store them potentially until facility decommissioning. Some risk-significant sealed sources commonly used in medicine and industry have no commercial disposal pathway. In particular, there are no established disposal options for sources that are classified as GTCC LLRW because of the absence of a geologic repository in the United States; on a case-by-case basis, the NRC can approve the disposal of GTCC waste at a site other than a geologic repository (such approval must be made at the Commission level) in accordance with 10 CFR Part 61…The Task Force has determined that 2006 Action 9-1 will remain ongoing while the DOE awaits action by Congress on GTCC LLRW disposal in accordance with the EPAct. After action by Congress occurs, the DOE could issue a Record of Decision on disposal of GTCC LLRW and GTCC-like waste and close 2006 Action 9-1.

Potential Issues: Legislative and/or regulatory changes may be required for DOE to implement disposal alternatives identified in the Final GTCC LLRW Environmental Impact Statement.

Agencies Involved: DOE (lead), NRC.

NRC Program Office Action: In May 2024, the NRC staff submitted to the Commission for its consideration a rulemaking package, SECY-24-0045, "*Proposed Rule - Integrated Low-Level Radioactive Waste Disposal*," which would amend NRC's regulations to revise the licensing requirements for low-level radioactive waste (LLW)[1] disposal and to add near-surface disposal requirements for GTCC in accordance with Commission direction. The proposed rule would ensure that LLW streams that are significantly different from those considered during the development of 10 *Code of Federal Regulations* (CFR) Part 61, such as depleted uranium, would continue to be disposed of safely and meet the performance objectives for land disposal of LLW. The proposed rule also integrates the ongoing Part 61 rulemaking activities related to conducting site-specific analyses for all disposed waste streams with the ongoing GTCC regulatory basis activities.

NRC Resources: The 10 CFR Part 61 rulemaking is a budgeted activity.

[1] The acronym LLRW is used for low-level radioactive waste in the Task Force report. The acronym LLW is used for low-level radioactive waste in the NRC SECY paper. There are no differences in definitions for LLRW and LLW; both acronyms are referring to the same radioactive materials.

2006 Action 9-1		
Tasked Office	**Breakdown into Subtasks**	**Due Date**
DOE	Issue Record of Decision	Unknown
NRC	Deliver proposed rule for 10 CFR Part 61 Rulemaking to Commission for decision	Complete

2006 Action 10-2	**Regulatory Impediments to the Return of Disused Sources**	**Ongoing**

Task: "The U.S. Government should encourage suppliers to provide arrangements for the return of disused sources and examine means to reduce regulatory impediments that currently make this option unavailable."

2022 Report Citation and Content: The following is a summary of the status from the Task Force report at Chapter 1–Advances in the Security and Control of Radioactive Sources (pp. 7):

> While the United States has adequate capabilities to manage disused sources, challenges remain…Task Force member agencies will continue to assess strategies for end-of-life management for risk-significant radioactive sources. The member agencies will focus on the following areas:
>
> - Addressing end-of-life management challenges through various initiatives such as IAEA technical and consultancy meetings, international conferences on radioactive waste management, and regional engagements with suppliers and non-governmental organizations.
> - Continuing to support the IAEA's process to develop technical documents on the reuse and recycling of disused radioactive sources. These documents address disposition issues that may provide technical obstacles to suppliers accepting returns of disused radioactive sources.
> - Addressing the lack of a disposition pathway for foreign-origin americium (Am)-241, plutonium (Pu)-238, and Pu-239.
> - Supporting efforts to develop guidance on "return to supplier," and initiatives to identify and document good practices to facilitate these agreements for domestic and international users.
>
> Due to continuing efforts in these areas, the Task Force has determined that 2006 Action 10-2 remains ongoing, and the Task Force will continue to proactively assess strategies for end-of-life management for risk-significant radioactive sources.

Potential Issues: In the United States, the NRC regulations allow for the return of disused sources to their suppliers without considering the sources to be radioactive waste. However, legal and technical frameworks that govern the repatriation of sources vary internationally and, in some cases, do not support source repatriation. In addition, if the return of disused sources to the initial supplier necessitates export to another country, the country of the shipping licensee must consider the existing regulatory and security infrastructure of the receiving country.

Agencies Involved: DOE/NNSA (co-lead), DOS (co-lead), NRC, and DOT.

NRC Program Office Action: The NRC collaborated with DOE, DOE/NNSA, DOS, DOT, and other federal agencies to develop "National Security Memorandum (NSM) 19 to Counter Weapons of Mass Destruction Terrorism and Advance Nuclear and Radioactive Material Security" worldwide, which was signed by the President in March 2023. NSM 19 documents a national strategy to reduce the threat of radiological terrorism by permanently disposing of or recycling disused and unwanted high-activity radioactive sources. Through regulatory oversight of radioactive materials, the NRC supports NSM 19 policies to advance radioactive material security. For example, NRC regulations ensure robust security for all high-activity radioactive sources during their lifecycle and require mitigation measures in case of physical security failures. In addition, the NRC staff also supports NSM 19 policy of promoting U.S. radioactive materials management policies and best practices internationally and encouraging adoption of analogous policies. The NRC will continue supporting the International Atomic Energy Agency (IAEA) technical and consultancy meetings, international conferences on radioactive waste management, and IAEA activities on matters related to the safe and secure use of radioactive sources.

NRC Resources: The NSM 19 and foreign origin sources is not specifically budgeted activities.

2006 Action 10-2		
Tasked Office	**Breakdown into Subtasks**	**Due Date**
DOE/NNSA	Provide the IAEA with a 435-B container, ancillary equipment, and operating tools to facilitate the repatriation of U.S. origin sources back to U.S. suppliers.	Complete
DOE/NNSA	Provide support to the IAEA as needed for training and other requirements through the completion of the first operation utilizing the 435-B container.	Complete
DOS, DOE/NNSA, NRC	Complete U.S. interagency review of the "Guidance on Management of Disused Radioactive Sources," and if appropriate, submit a letter to the IAEA expressing U.S. intent to work toward implementing the Guidance.	Complete
Task Force	Identify and assess new, innovative actions or strategies appropriate for end-of-life management of risk-significant radioactive sources within the U.S.	2025-2026
DOS, DOE/NNSA, NRC	Documenting national strategy on management of Disused Sealed Radioactive Sources.	Complete

2010 Recommendation 4	**Evaluation of Disposal Options for Disused Sources**	**Ongoing**

Task: "The Task Force recommends that the U.S. Government, regional compacts, and States continue to evaluate disposal options for disused radioactive sources, including options for handling a potentially large number of disused cesium chloride sources that may be replaced once viable alternatives are available."

2022 Report Citation and Content: The following is a summary of the status from the Task Force report at Chapter 2–Status of the Recovery and Disposition of Radioactive Sealed Sources (pp.10):

> With the completion of a second pilot disposal using the Concentration Averaging and Encapsulation Branch Technical Position (CA BTP) guidance and the operation of new Type B packaging, the Task Force can document notable progress toward increasing the availability of disposal options for high-activity Class B and C LLRW sealed sources. Notwithstanding this progress, the Task Force has determined that 2010 Recommendation 4 remains ongoing.

Potential Issues: The DOE/NNSA sponsored a study by the Low-Level Radioactive Waste Forum Disused Sources Working Group which found that while the Concentration Averaging Branch Technical Position (CA BTP) guidance has improved the process for classifying sealed sources for disposal, the revised guidance has not resulted in a significant increase in the number of sources being disposed.

Agencies Involved: NRC (lead) and contributing organizations: Organization of Agreement States , Conference of Radiation Control Program Directors (CRCPD).

> NRC Program Office Action: In May 2024, the NRC staff submitted to the Commission for its consideration a rulemaking package, SECY-24-0045, "*Proposed Rule - Integrated Low-Level Radioactive Waste Disposal*," which would amend NRC's regulations to revise the licensing requirements for LLW disposal and add near-surface disposal requirements for GTCC in accordance with Commission direction. The NRC staff held two public meetings in May 2023 and January 2024 that were attended by over 100 stakeholders to discuss preliminary regulatory concepts for the rulemaking. NRC staff is planning to hold additional public meetings after receiving Commission direction on the proposed rule package. If the Commission approves publication of the proposed rule, the NRC staff will hold additional public meetings during the comment period for the proposed rule.

All subtasks for this recommendation have been completed. The Task Force will review the status of this recommendation in the 2026 Task Force report.

NRC Resources: The Integrated LLW Disposal rulemaking for GTCC is a budgeted activity.

2010 Recommendation 4		
Tasked Office	**Breakdown into Subtasks**	**Due Date**
NRC	Issue draft regulatory basis for GTCC disposal through means other than deep geologic disposal, including near-surface disposal, and provide this regulatory basis to the Commission for information.	Complete
DOE/NNSA, NRC	Evaluate impact of the CA BTP to determine if additional actions are needed to promote its usage.	Complete
NRC	Deliver proposed rule for 10 CFR Part 61 Rulemaking to Commission for decision.	Complete

2010 Recommendation 5	**Disposal Options for Foreign-Origin Americium-241 Sources**	**Ongoing**

Task: "The Task Force recommends that Federal and State Governments investigate options such as providing short-term secured storage of sources recovered from U.S. owners that contain foreign-origin americium-241 [Am-241] radioactive material, so that these sources can be recovered now, and increase efforts to investigate options for disposal of these sources."

2022 Report Citation and Content: The following is a summary of the status from the Task Force report at Chapter 2–Status of the Recovery and Disposition of Radioactive Sealed Sources (pp. 10-11):

> The DOE/NNSA, through the OSRP, continues to remove risk-significant sources that have the potential to present public health and safety or national security concerns, if uncontrolled…These sources remain secured in storage under the control of licensees until they are transferred to the DOE/NNSA. The security requirements of 10 CFR Part 37 provide reasonable assurance against the theft or loss of disused sources; however, "the longer sources remain disused or unwanted, the chances increase that they will become unsecured or abandoned." Additionally, the CRCPD completed the "CRCPD Technical White Paper: Disposition of Foreign Origin Radioactive Material, Revision 1," issued in May 2021 (CRCPD White Paper), which outlines the disposal issues and possible solutions for sources containing foreign-origin material. Options include maintaining the sources at licensee sites, returning the sources to the manufacturer, aggregating the sources at the State radiation control program facilities or commercial waste brokers, developing a GTCC disposal facility, and developing a legislative solution allowing for disposal of foreign-origin sources at a Federal disposal facility. Task Force member agencies are currently reviewing the options offered in the CRCPD White Paper. The Task Force has determined that 2010 Recommendation 5 will remain ongoing while these and other options for management of sources containing foreign-origin radioactive material are being investigated and pursued.

Potential Issues: Sealed sources manufactured with foreign-origin Am-241, Pu-238 and Pu-239 present unique disposal challenges. DOE/NNSA has the authority to recover sealed sources under the Off-Site Source Recovery Program (OSRP); however, the OSRP is not currently recovering foreign-origin Am-241, Pu-238, and Pu-239 sources without there being an identified

path to disposal. Although disposal options under consideration may include disposal in a future GTCC LLRW disposal facility, there currently are no commercial or Federal options for disposal.

Agencies Involved: DOE/NNSA.

NRC Program Office Action: No specific NRC role.

NRC Resources: The NRC continues to monitor and support Federal activities related to disposal options for foreign-origin sources.

2010 Recommendation 5		
Tasked Office	**Breakdown into Subtasks**	**Due Date**
DOE/NNSA	Investigate options to enable recovery of foreign-origin Am-241, Pu-238, and Pu-239 sealed sources and increase efforts to investigate options for disposal of these sources.	Ongoing

2010 Recommendation 9	**Alternative Technologies Research and Development**	**Ongoing**

Task: “The Task Force recommends that the U.S. Government enhance support of short-term and long-term research and development for alternative technologies.”

2022 Report Citation and Content: The following is a summary of the status from the Task Force report at Chapter 3–Progress in the Area of Alternative Technologies (pp.15):

> Because efforts are underway to research alternative technologies and address challenges impeding the use of alternative technologies in specific applications, the Task Force determined that 2010 Recommendation 9 will remain ongoing.

Potential Issues: The feasibility of replacement technologies will depend primarily upon technical, operational, and financial factors. There may also be challenges related to disposal of the radioactive sealed sources replaced by alternatives.

Agencies Involved: DOE/NNSA (co-lead), DHS (co-lead), EPA, and NRC.

NRC Program Office Action: The NRC supports Task Force member agencies’ continued research into advances in technology and maintains awareness of the various activities, both domestic and international, regarding the conversion to alternative technologies.

NRC Resources: Alternative technology research is not a budgeted activity. The NRC will participate as appropriate.

2010 Recommendation 9		
Tasked Office	**Breakdown into Subtasks**	**Due Date**
DHS, DOE/NNSA	Publication of "Non-Isotopic Alternative Technologies White Paper" to identify advantages and disadvantages of alternative technologies for the replacement of Category 1 and 2 radioactive sources.	Complete
DOE/NNSA	Complete existing feasibility studies comparing cesium-137 (Cs-137) and cobalt-60 with X-ray technologies in biological research.	Complete
DOE/NNSA	Perform a study on the impact of different radiation sources on materials that are commonly used in sterilized medical devices.	Complete
DOE/NNSA	Perform an analysis to identify the technology gaps that prevent the adoption of alternative technologies in well logging or industrial sterilization applications.	Complete
DOE/NNSA	Complete existing Phase 1 and Phase 2 Small Business Innovative Research (SBIR)[2] projects to develop advanced particle accelerators to replace radioactive sources used in well logging and radiotherapy applications.	Complete
DOE/NNSA	Complete existing Phase 3 SBIR projects to develop alternative technologies to Cs-137-based applications for biology research, well logging, radiotherapy, and insect sterilization.	July 2025
DOE/NNSA	Develop and execute proposal requests for Alternative Technology Research, Development, Test and Evaluation in fiscal years 2023, 2024, and 2025.	October 2025
DOE/NNSA	Assess the potential impact of fiscal years 2023, 2024, and 2025 proposed studies on radioactive source security.	September 2025
DOE/NNSA	Complete any research, development, and test and evaluation projects resulting from fiscal years 2023, 2024, and 2025 proposals.	September 2028

[2] DOE/NNSA conducts research, development, testing, and evaluation of promising alternative technologies through SBIR, university, and national laboratory grants. The Congressionally mandated SBIR program supports private sector commercialization of technology, and is the program most often utilized by DOE/NNSA for alternative technologies research and development.

2014 Recommendation 3	Alternative Technologies	Ongoing

Task: "The Task Force recommends that the U.S. Government, as appropriate,[3] investigate options such as voluntary, prioritized, incentivized, programs for the replacement of Category 1 and 2 radioactive sources with effective alternatives. The Task Force further recommends that U.S. Government agencies, where appropriate, lead by example in the consideration of and transition to alternative technologies that meet technical, operational, and cost requirements."

2022 Report Citation and Content: The following is a summary of the status from the Task Force report at Chapter 3–Progress in the Area of Alternative Technologies (pp. 16):

> The Task Force agreed that an inclusive partnership among Federal and State agencies, manufacturers, industry, end users, standard-setting bodies, and technical consultants is important for the evaluation, demonstration, regulation, and promotion of innovative alternative technologies. Thus, Task Force member agencies will continue to pursue initiatives to share information related to alternative technologies with private and public partners, within each organization's statutory roles and responsibilities. These efforts may include educational workshops to facilitate common understanding of alternative technologies, along with the development of a publicly available online repository of information on alternative technologies (e.g., capabilities and limitations) across applications. The Task Force has determined that 2014 Recommendation 3 will remain ongoing as the DOE/NNSA continues to proactively close information gaps related to the capabilities and considerations for alternative technologies and incentivize their deployment, with the assistance of other Task Force member agencies.

Potential Issues: No known issues.

Agencies Involved: DOE/NNSA (lead), NRC, HHS, DHS, EPA, DOD, DOS, and OSTP.

NRC Program Office Action: As an independent regulator, the NRC does not advocate for or against alternative technologies; however, the NRC does provide national source data to DOE/NNSA in support of their Cesium Irradiator Replacement Program.

NRC Resources: Alternative technology for radioactive source replacement is not a budgeted activity. The NRC will participate as appropriate.

[3] The NRC's statutory mandate precludes it from promoting one technology over another for non-safety or security reasons. The NRC would review, in accordance with its procedures, any new license application for new technologies.

2014 Recommendation 3		
Tasked Office	**Breakdown into Subtasks**	**Due Date**
DOE/NNSA	Continue to implement voluntary program to provide Federal incentives for the replacement of Cs-137 irradiators with alternative, non-radioactive source-based devices. The Fiscal Year 2019, National Defense Authorization Act, supports the voluntary replacement of all U.S. Cs-137 blood irradiators by December 2027.	December 2027
DOE, DHS, DOD, HHS/National Institute of Health	In the case of Federal agencies procuring Category 1 and 2 sealed sources and devices or non- radioactive alternatives, provide information on their decision-making process between available source-based and alternative technology to other Federal agencies.	Complete
DOE, DOE/NNSA, HHS, DHS, DOD, DOS	In the case of Federal research grants that require procurement of Category 1 and 2 sealed sources and devices or non-radioactive alternatives, provide documentation of their assessment of available source-based and alternative technology to Federal agencies.	Complete