

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

## Introduction

The Energy Policy Act of 2005 (EPAcT) created an interagency task force on radiation source protection and security under the lead of the U.S. Nuclear Regulatory Commission (NRC). The Interagency 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 from potential terrorist threats, including acts of sabotage, theft, or use of a radiation source in a radiological dispersal device (RDD) or a radiation exposure device (RED).

In particular, the Task Force evaluates and makes recommendations, which can include possible regulatory and legislative changes, on several specific topics related to the protection and security of radiation sources. For the purposes of the Task Force, the EPAcT defines a radiation source as a “Category 1 Source or a Category 2 Source as defined in the Code of Conduct<sup>1</sup> and any other material that poses a threat such that the material is subject to this section, as determined by the Commission, by regulation, other than spent nuclear fuel and special nuclear material.” Although the EPAcT refers to “radiation sources,” this implementation plan uses the more common term, “radioactive sources.”

The Task Force submits its reports to Congress and the President; it submitted its first report on August 15, 2006, and is directed to submit subsequent reports not less than once every 4 years. The Task Force submitted its second report on August 11, 2010, and its third report on August 14, 2014. The first report contained 10 recommendations and 18 actions, the second report contained 11 additional recommendations, and the third report contained 3 additional recommendations. As of the date of issuance of this 2017 Implementation Plan, 33 recommendations and actions have been completed, and 9 recommendations and actions remain open.

The EPAcT further requires that the Commission “...in accordance with the recommendations of the task force...take any action the Commission determines to be appropriate, including revising the system of the Commission for licensing radiation sources.” The Commission issued a Staff Requirements Memorandum dated August 3, 2006 (ADAMS Accession No. ML062150520, nonpublic) which directed the staff to develop a plan for Commission consideration, subsequent to finalization of the Task Force report that includes prioritization, cost estimates, and the staff’s view on how to proceed with implementation of the recommendations in the report for which NRC has responsibility. The staff uses the implementation plan, and updates thereto, to prioritize and facilitate implementation of activities and initiatives related to the Task Force recommendations and actions, and to communicate the status of recommendations and actions to the Commission and the public on a routine basis.

### Development of the Implementation Plan

The plan, as developed by the Task Force, for implementing the Task Force recommendations and actions includes a specific implementation plan for each of the open recommendations and actions. The NRC Office of Nuclear Material Safety and Safeguards (NMSS), Office of Nuclear Security and Incident Response (NSIR), Office of International Programs (OIP), Office of the General Counsel (OGC), and Office of Public Affairs (OPA) are involved in the implementation of the recommendations and actions. Other agencies involved in implementation are the U.S.

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<sup>1</sup> “Code of Conduct” refers to the “Code of Conduct on the Safety and Security of Radioactive Sources,” approved by the Board of Governors of the International Atomic Energy Agency (IAEA) and published January 2004.

Department of Homeland Security (DHS), Federal Emergency Management Agency (FEMA), Transportation Security Administration (TSA), Department of State (DOS), U.S. Department of Transportation (DOT), U.S. Department of Defense (DOD), Federal Bureau of Investigation (FBI), Central Intelligence Agency (CIA), U.S. Environmental Protection Agency (EPA), U.S. Department of Commerce (DOC), U.S. Department of Energy (DOE), the National Nuclear Security Administration (NNSA), which is a separately organized agency within DOE, Department of Justice (DOJ), U.S. Food and Drug Administration (FDA), U.S. Department of Health and Human Services (HHS), Office of Science and Technology Policy (OSTP), and Office of the Director of National Intelligence (ODNI).

#### Organization of the Implementation Plan

Each entry in the main body of the plan presents a strategy for implementing the open Task Force recommendations or actions. Where appropriate, the individual strategies include task breakdowns and a discussion of any known issues that could challenge implementation.

## Implementation Strategies for Individual Recommendations and Actions

<b>2006 Action 9-1</b>	<b>Greater-than-Class C (GTCC) Waste</b>	DOE lead
		Ongoing

Task: “DOE should continue its ongoing efforts to develop GTCC [LLRW] disposal capability.”

Most Recent Citation: 2014 Report (Chapter 2—Status of the Recovery and Disposition of Radioactive Sealed Sources)

2014 Report Context: The 2014 Report states the following (p. 40):

Pursuant to the Low-Level Radioactive Waste Policy Amendments Act (LLRWPA), DOE is responsible for disposal of GTCC low-level radioactive waste (LLRW), including sealed sources that are determined to be waste and classified as GTCC LLRW. On February 18, 2011, DOE issued the Draft Environmental Impact Statement [DEIS] for the Disposal of GTCC LLRW (DOE DEIS) for public review and comment. The DOE DEIS evaluates disposal options for GTCC LLRW, which includes many Category 1 and 2 sealed sources. DOE continues to work on the Final GTCC LLRW EIS.

Before making a final decision on the disposal alternative(s) to be implemented, DOE will submit a report to Congress regarding the disposal alternatives considered in the EIS and await Congressional action. As required by Section 631 of the EPAct, the Report to Congress will identify and describe the alternatives under consideration, the types of waste involved, the Federal and non-Federal disposal options, a process for safe disposal of the waste, and any statutory changes or new authorities required for implementation. The report will also include options for ensuring that those who benefit from the activities resulting in waste generation will bear reasonable costs for its disposal.

Potential Issues: Legislative changes may be required for DOE to implement disposal alternatives identified in the Final GTCC LLRW EIS.

Agencies Involved: DOE (lead), EPA, and NRC.

Program Office Action: No specific NRC program office action is necessary regarding the EIS.

DOE has the lead for this action. EPA is a cooperating agency on the GTCC EIS. On July 23, 2007, DOE issued a Notice of Intent to prepare the EIS (Volume 72, page 40135, of the *Federal Register*). DOE issued a Draft EIS on February 18, 2011, and issued its Final EIS on February 24, 2016. Before making a final decision on the disposal alternative(s) to be implemented, DOE will submit the report to Congress as required by Section 631 of the EPAct and will await Congressional action.

Resources: This activity is not specifically budgeted; it is part of routine activities. The NRC will participate as appropriate.

2006 Action 9-1		
<b>Tasked Office</b>	<b>Breakdown into Subtasks</b>	<b>Due Date</b>
NRC/NMSS	Comment on the Draft DOE EIS on GTCC waste— 8/5/11	Complete
DOE	Issue Final GTCC EIS— 2/24/16	Complete
DOE	Submit report to Congress	Estimated early to mid-2017, complete upon submittal of report to Congress

<b>2006 Action 10-2</b>	<b>Regulatory Impediments to the Return of Disused Sources</b>	DOS/DOE/ NNSA lead
		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.”

Most Recent Citation: 2014 Report (Chapter 1—Advances in the Security and Control of Radioactive Sources)

2014 Report Context: The 2014 Report states the following (pp. 23-24):

Since the 2010 Task Force report, some recent positive developments include:

The U.S. took an active role in assisting the IAEA with organizing the *International Conference on the Safety and Security of Radioactive Sources: Maintaining Continuous Control Throughout the Lifecycle*, October 2013 in Abu Dhabi, United Arab Emirates. The U.S. was instrumental in developing one of the key findings of the Conference: that the IAEA should develop additional guidance at the international level which may be supplementary to the Code of Conduct dedicated to end-of-life management of radioactive sources, including guidance on the return of disused sources;

On August 28, 2013, the NRC published a “Branch Technical Position (BTP) on the Import of Non-U.S. Origin Radioactive Sources” (78 FR 53020) to provide additional guidance on the application of a 2010 NRC rule on the export and import of radioactive sources. As such, the BTP facilitates the return of sources to the U.S. under a general license and, in doing so, supports U.S. policy to prevent sources from being orphaned overseas where regulatory programs may not exist or function to an optimal level;

The U.S. has continued to meet periodically with other major source exporting countries to discuss best practices associated with the repatriation of legacy sources without viable, commercially available reuse or recycle options;

Canada’s Department of Foreign Affairs, Trade, and Development and the DOE are in discussions with the Brazilian National Nuclear Energy Commission to collaborate on a tripartite project to remove Canadian- and U.S.-origin disused high-activity sources from Brazil. It is contemplated that the U.S.-origin sources would be repatriated to the U.S. and the Canadian-origin sources would be shipped to another country for recycling.

Potential Issues: In the U.S., NRC rules allow for the return of sources without considering the sources to be radioactive waste. However, the availability of Type B transportation packages designed to meet international standards could impact the ability to return these sources.

The development and approval of guidance by the IAEA depends on consensus from participating Member States. Therefore, the United States is not able to assure any particular outcome for draft guidance documents.

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

Program Office Action: NRC’s Office of International Programs will review and approve import licenses for source return and NRC’s Office of Nuclear Material Safety and Safeguards will review and approve new package designs as appropriate.

In June 2016, DOE and NRC representatives participated in the third IAEA meeting to harmonize and finalize the “Guidance on the Long-term Management of Disused Radioactive Sources,” which was created in response to recommendations made at prior Code of Conduct review meetings. As a result of the meeting, a completed draft was produced, however, participants failed to agree on publishing the document as Supplementary Guidance to the Code of Conduct. The IAEA is now conducting consultations among Member States to determine an outcome for the document. The U.S. will participate in consultations and any meetings with the intent of seeing this matter resolved by the time of the next Code of Conduct review meeting in June 2017.

In addition, during the June 2016 meeting, there was insufficient support to approve and issue the document on Good Practices for Repatriation of Disused Radioactive Sources that was developed under Canadian leadership.

Resources: This activity is not specifically budgeted; package reviews and licensing reviews are part of routine activities.

2006 Action 10-2		
Tasked Office	Breakdown into Subtasks	Due Date
NRC/OIP	Review import license applications	TBD upon submittal
NRC/NMSS	Review new package design applications	TBD upon submittal
DOS/DOE/NRC	Work with the IAEA and other Member States to finalize the Code of Conduct Disused Source Guidance	Ongoing
NRC support	Finalize document on Good Practices for Repatriation of Disused Radioactive Sources	At the June 2016 meeting of major source suppliers, there was insufficient support to approve and issue the document.  Consequently, the co-lead agency for this task (DOS) has proposed that no further action be taken regarding this subtask. This proposal will be discussed at the next Task Force meeting.

<b>2010 Recommendation 2</b>	<b>Reevaluation of Protection and Mitigation Strategies</b>	All Task Force Agencies lead
		Ongoing

Task: “The Task Force recommends that the U.S. Government agencies should reevaluate their protection and mitigation strategies to protect against significant RED or RDD attack using both potential severe immediate or short-term exposure and contamination consequences to public health, safety, and the environment as the consequences of concern. Agencies should use the Task Force-endorsed definitions, radionuclides, and thresholds for a significant RED and RDD and the associated assumptions and parameters as common guidance in the assessment of risk and management of homeland security activities.”

Most Recent Citation: 2014 Report (Chapter 1—Advances in the Security and Control of Radioactive Sources)

2014 Report Context: The 2014 Report states the following (p. 8): “Refer to Table 1-2 with respect to the individual agencies’ status in addressing the recommendation.”

Table 1-2 (p. 9) includes the following status entries for 2010 Recommendation 2:

<b>Agency/Office</b>	<b>2010 Recommendation 2</b>
NRC (and Agreement States that NRC has relinquished certain regulatory authority to)	Complete - The NRC reevaluated its protection and mitigation strategies. The NRC’s Security Assessment decision making framework designated prompt fatalities as the primary consequence of concern. Using land contamination or other economic consequences is a significant change in NRC’s underpinning assumptions for safety and security. Accordingly, the agency has completed a preliminary study of potential vulnerabilities, actions, and impacts, and evaluated the results. It was concluded that the current protection and security framework and posture is also adequately protective against the consequences in the definitions adopted in 2010 Recommendation 1, based upon current available information.
DOS	Complete - In bilateral and multilateral forums, DOS urges countries to establish and maintain effective lifecycle controls for Category 1 and 2 radionuclides, consistent with the Code of Conduct [IAEA 2004].
DOE/Office of Environment, Health, Safety and Security	Ongoing - DOE’s safeguards and security graded security protection policy framework designates prompt fatalities (lethality) as the primary consequence of concern. Using land contamination or other economic consequences for the DOE security policy framework would be a significant change for DOE’s underlying assumptions and parameters for safeguards and security policy. DOE is reevaluating its current strategy for protecting against a ‘significant RDD and RED’ event, with consideration of a broad spectrum of controls and protection

	measures afforded radioactive materials.
NNSA/GTRI (Global Threat Reduction Initiative)	Complete – NNSA/GTRI’s voluntary security enhancement program mitigates the risk of a ‘significant RDD or RED’ by working with licensees to enhance their security posture beyond regulatory requirements. NNSA/GTRI does this by addressing the risk of an insider, by installing in-device delay kits that increase the amount of time needed to access the source, and by training alarm responders.
DHS (Department of Homeland Security)/Domestic Nuclear Detection Office (DNDO)	Complete - The definitions and activity levels defined by the Task Force are used by DNDO to craft scenarios for operational models and risk analysis. They were used to specify threat objects used to build the U.S. Coast Guard Maritime Security Risk Analysis Model Radiological/Nuclear Enhancement module, and are also used in the standardization of threat objects for RDD activities for aviation pathways. Specifically, the definitions form the basis for the choice of RDD source activity level appropriate planning purposes.
DHS/Infrastructure Protection	Complete – The radionuclides and associated threshold values are used to inform discussions, decision-making, and collaborations with the interagency DHS Nuclear Government Coordinating Council (NGCC) and DHS NGCC Radioisotope Subcouncil.
FBI	Complete – The FBI’s Radiological Outreach Initiatives were implemented with the goal of mitigating the risk of one of the radionuclides of concern being used as an RDD or RED in any type of malevolent incident. This is accomplished by providing security awareness briefings and material on both domestic and international threats and establishing local points of contact to ensure information is relayed to the affected FBI field office concerning any suspicious incidents.
EPA	Complete - While the definitions of ‘significant RDD’ and significant RED’ in the 2010 Task Force report are not specifically used in EPA response policy, the agency would support, respond to, and participate in a National RDD or RED event, as appropriate.

Potential Issues: No known issues.

Agencies Involved: All Task Force agencies.

Program Office Action: Each agency, including the NRC, is to submit a brief description of its plans to reevaluate its protection and mitigation strategies to protect against a significant RED or RDD attack based on the Task Force-endorsed definitions, radionuclides, thresholds, and the associated assumptions and parameters as common guidance. In addition, each agency is to provide an appropriate breakdown of major subtasks and estimated due dates needed to incorporate these definitions and the use of the list of radioactive sources that warrant enhanced security and protection into the respective agency’s documents and planning policy guidance. Lastly, each agency should indicate if this action would require regulatory, policy, and/or legislative actions. Input for each applicable agency was provided for the 2014 Task Force

report and the report highlighted the completion and/or status of actions for this particular recommendation.

Resources: No additional resources are necessary. However, if the list of radioactive sources that warrant enhanced security and protection changes on the basis of a reevaluation, which is performed at the direction of the Task Force, this recommendation would have to be reevaluated for both strategy and resource implications.

2010 Recommendation 2		
Tasked Office	Breakdown into Subtasks	Due Date
Task Force	Agencies submit a brief description of their plans to reevaluate their protection and mitigation strategies. Agencies nominate a participant for the Task Force subgroup to consolidate agency inputs—11/9/11	Complete
NRC/NMSS, NRC/NSIR	Initiate an NRC working group to evaluate whether or not the NRC's protection and mitigation strategies need to be revised	Complete
Subgroup	Consolidate agency inputs (NRC; DOS; NNSA/GTRI; DHS/DNDO; DHS/Infrastructure Protection; FBI; EPA) with respect to this recommendation and incorporate in 2014 Task Force report	Complete
Subgroup	Consolidate the one remaining agency input (DOE/Office of Environment, Health, Safety and Security) with respect to this recommendation and incorporate in 2018 Task Force report and determine if this recommendation needs to be reevaluated or can be closed	2018

<b>2010 Recommendation 4</b>	<b>Evaluation of Disposal Options for Disused Sources</b>	DOE/NNSA/NRC /OAS Lead
		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.”

Most Recent Citation: 2014 Report (Chapter 2—Status of the Recovery and Disposition of Radioactive Sealed Sources)

2014 Report Context: The 2014 Report states the following (p. 39):

While commercial disposal options for Class A, B, and C sealed sources waste have increased since 2010, a large number of challenges remain. There are currently no disposal options for disused sealed sources, which exceed the generic radioactivity limits specified in the 1995 [Concentration Averaging and Encapsulation Branch Technical Position], or for disused sources, which are classified as GTCC LLRW. Commonly used sealed sources of these types include americium-241 (Am-241), and cesium chloride (CsCl) sources commonly used in both industry and medicine, and particularly significant from a National security, public health, and safety standpoint.

Potential Issues: In February 2015, the NRC published the revised Concentration Averaging and Encapsulation Branch Technical Position (CA BTP). This revision expands potential disposal options for commercial sealed source generators, however, the extent of its adoption by existing commercial disposal facilities remains unclear. Implementation of additional disposal options would require stakeholder acceptance and collaboration, and some options may require Congressional action. In addition, LLRW generators have expressed concerns regarding the cost to dispose of higher-activity sources.

A pending demonstration of the acceptability of the alternative approaches contained in the CA BTP is currently ongoing through a request to dispose of a device containing high activity sealed sources to a commercial disposal facility submitted by the Conference of Radiation Control Program Directors (CRCPD), to a State regulator. A technical justification for this disposal has been completed and personnel at the disposal facility are working with their State regulator to determine if the proposed justification is sufficient. The outcome, either successful disposal or identification of additional issues that need to be resolved, will determine future potential actions.

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

Program Office Action: The NRC released the revised CA BTP in February 2015. The CA BTP provides guidance for determining classification of commercial LLRW, including sealed sources. It also provides for the disposal of additional sealed sources containing radioactive quantities of concern by increasing the generic disposal limit for Cs-137 and clarifying guidance related to the

classification of Co-60 sources. The revised CA BTP also includes more detailed alternative approach provisions that could be used by regulators to review proposals for disposal of Class A, B, and C sealed sources that exceed the revised generic radioactivity limits.

Resources: This activity is not specifically budgeted; it is part of routine activities. The NRC will participate as appropriate.

2010 Recommendation 4		
Tasked Office	Breakdown into Subtasks	Due Date
DOE, NRC, DHS	Evaluate recommendations of <i>Removal and Disposition of Disused Sources Focus Group of the Radioisotopes Subcouncil of the Nuclear Government and Sector Coordinating Councils</i> including: <ol style="list-style-type: none"> <li>1. Concentration averaging of sealed sources for disposal as Class A LLRW</li> <li>2. Case-by-case exemption by existing compacts for disposal of discrete numbers of high-risk sealed sources</li> <li>3. Physical destruction and down-blending for disposal as Class A LLRW</li> <li>4. Co-disposal of foreign-origin Am-241 sources with domestic sources (see 2010 Recommendation 5)</li> </ol>	Closed, Focus Group published final document on June 30, 2010
DOE, NRC, DHS	Continue to communicate national disposal needs for disused sealed radioactive sources to Compacts and States that host LLRW disposal facilities	Ongoing
NRC	Issue final 2015 CA BTP on concentration averaging for LLRW, including commercial disposal of sealed sources— February 2015	Complete
NRC	Investigate risk-informing the regulation for the disposal of LLRW, including sealed sources. Under the draft final 10 CFR Part 61 rule, licensees are provided flexibility to better manage disposal capacity consistent with the risks of disposal of LLRW streams.	TBD upon issuance of final 10 CFR Part 61 "Licensing Requirements for Land Disposal of Radioactive Waste"
DOE/NNSA	Facilitate implementation of the revised 2015 CA BTP (working with CRCPD), including pilot disposals under the alternative approach provisions.	Ongoing

2010 Recommendation 5	Disposal Options for Foreign-Origin Americium-241 Sources	DOE/NNSA lead
		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 radioactive material, so that these sources can be recovered now, and increase efforts to investigate options for disposal of these sources.”

Most Recent Citation: 2014 Report (Chapter 2—Status of the Recovery and Disposition of Radioactive Sealed Sources)

2014 Report Context: The 2014 Report states the following (p. 41):

Since the publication of the 2010 Task Force report, DOE has continued to investigate options for disposal of certain waste for which there is currently no identified disposal path, including foreign-origin Am-241, plutonium-238 (Pu-238), and Pu-239 sealed sources recovered by NNSA/GTRI.

Potential Issues: Options for the staging and storage of sources without a disposal path, such as foreign-origin Am-241, Pu-238, and Pu-239 sources, are limited. Disposal options under consideration in the DOE EIS for GTCC LLRW may address disposal of these sources in the long term. At present, NNSA’s Off Site Source Recovery Project is not able to collect disused foreign origin Am-241 sources because a final disposition path has not been identified. As a result, thousands of disused sources containing Am-241 at sites throughout the United States can not be recovered. The majority of Am-241 sources are below the Category 2 limits (16 Ci) and as a result, are not covered by enhanced security controls (10 CFR Part 37), nor tracked in the National Source Tracking System. Potential disposal options under consideration for these sources may include disposal in a future GTCC LLRW disposal facility.

Agencies Involved: DOE/NNSA (lead), NRC, OAS, and EPA.

Program Office Action: No specific NRC role, except to monitor progress.

DOE/NNSA continues to investigate both short- and long-term options to resolve the disposal issues for foreign origin sources that currently have no disposal pathway, such as foreign-origin Am-241, Pu-238, and Pu-239 sealed sources. These options may include disposal at commercial facilities, as they become available, or potential disposal in a future GTCC LLRW disposal facility.

Resources: This activity is not specifically budgeted; it is part of routine activities. The NRC will participate as appropriate.

2010 Recommendation 5		
Tasked Office	Breakdown into Subtasks	Due Date
DOE	Investigate options to enable recovery of foreign-origin Am-241 sealed sources and increase efforts to investigate options for disposal of these sources	TBD – stated issues are still being investigated

<b>2010 Recommendation 8</b>	<b>Certified Type B Container Research and Development</b>	DOE/NNSA lead
		Ongoing

Task: “The Task Force recommends that the U.S. Government enhance support of short-term and long-term research and development of certified Type B containers for use in domestic and international source recovery efforts.”

Most Recent Citation: 2014 Report (Chapter 2—Status of the Recovery and Disposition of Radioactive Sealed Sources)

2014 Report Context: The 2014 Report states the following (p. 38):

Since the 2010 Task Force report was published, NNSA/GTRI has procured vendor services for the design, development, testing, and certification of two Type B packages to support the recovery and transportation of Category 1 and 2 sources commonly used in irradiators and cancer treatment devices. The new containers together will enable shipment of nearly 100 percent of all commercially used devices containing Cs-137 and cobalt-60 (Co-60), which are particularly significant from a National security, public health, and safety standpoint. However, designing, testing, and producing new transportation packages are a multi-year project. The regulatory approval process alone for new package designs can be up to 18 months.

The first of the NNSA/GTRI containers under development, the 435-B, is a Type B container with a design appropriate for transport of a wide range of relatively common devices requiring Type B shipment. NNSA/GTRI expects the container to be certified for use in 2014. The second container, the 380B, is currently in the early stages of design and development. It will be a more complex shielded container designed for the transportation of a wide range of less common devices. NNSA/GTRI expects the 380B to be certified for use in 2016.

To facilitate private sector utilization of these or similar Type B transport containers in the future, the NNSA/GTRI will make the new Type B container designs available without cost to companies in the U.S. and abroad interested in using or modifying them to broaden the availability of Type B containers for source recovery. The wider availability of these designs could also encourage disused sealed source disposition. This recommendation will be completed upon the submittal of the second Type B transportation container for certification, anticipated in fiscal year (FY) 2015.

Potential Issues: It remains uncertain whether provision of the designs for commercial fabrication will result in increased availability of Type-B containers for commercial use as it is left to commercial vendors to build the approved designs.

Agencies Involved: DOE/NNSA (formerly DOE/GTRI) (lead), NRC, and DOT.

Program Office Action: The NRC issued a certificate of compliance to DOE/NNSA for the Model No. 435-B container in 2014.

DOE/NNSA is supporting projects to develop source recoveries associated with the Type B containers in order to facilitate the availability of low-cost shipping containers for Off-Site Source Recovery Program. DOE/NNSA submitted an application to NRC for a second container, the 380-B, in 2016 with an anticipated certification date of 2017. The 380-B container will be a more complex shielded container designed for the transportation of a wide range of less common devices.

Resources: This activity is not specifically budgeted; it is part of routine activities. The NRC will participate as appropriate.

2010 Recommendation 8		
<b>Tasked Office</b>	<b>Breakdown into Subtasks</b>	<b>Due Date</b>
DOE/NNSA	Submit Safety Analysis Report for the 380-B to the NRC for certification	Complete
NRC/NMSS	Certify the 380-B container	2017
DOE/NNSA	Provide 435-B container to IAEA for international recoveries	2018

<b>2010 Recommendation 9</b>	<b>Alternative Technologies Research and Development</b>	DHS/DOE/ NNSA lead
		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.”

Most Recent Citation: 2014 Report (Chapter 3—Progress in the Area of Alternative Technologies)

2014 Report Context: The 2014 Report states the following (p. 48):

Despite the progress and accomplishments since 2010 in the research and development of alternative technologies, specific technical and operational challenges remain which prevent potential replacements from making the transition from research and development or prototype to implementation. DHS/DNDO continues to be interested in, and DOE/NNSA and other government and non-government partners continue to track and assess, these technical obstacles. As a result, alternative technology program and funding support is targeted to areas in which it can be used most efficiently and effectively in the overall risk-reduction effort. Continued research and development is therefore necessary to further develop technologies and system components that will be suitable to replace devices containing Category 1 and 2 sealed sources. A comprehensive approach to the replacement of devices that use Category 1 and 2 sources with alternative technologies cannot be developed or implemented until progress is made in these research and development efforts. In its 2006 and 2010 Task Force reports, the Task Force recognized that policy support mechanisms would be essential in the successful transition to alternative technologies as they become available.

Potential Issues: The feasibility of replacement technologies will depend primarily upon technical, operational, and financial factors related to replacement. 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.

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

DOE/NNSA conducts research, development, testing, and evaluation of promising alternative technologies through Small Business Innovative Research (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.

**Resources:** This activity is not specifically budgeted; it is part of routine activities. 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”	October 2017
DOE/NNSA	Complete existing Phase 1, Phase 2, and Phase 3 Small Business Innovative Research projects to develop advanced particle accelerators to replace radioactive sources used in well logging, industrial sterilization, and industrial radiography applications	October 2017
DOE/NNSA	Complete existing feasibility studies comparing Cs-137 and Co-60 with X-ray technologies in biological research and medical device sterilization applications	October 2017
DOE/NNSA	Complete existing Phase 2 and Phase 3 Small Business Innovative Research projects to develop alternative technologies to Cs-137-based blood and medical research irradiators	March 2018
DOE/NNSA	Develop and execute proposal requests for Alternative Technology Research, Development, Test and Evaluation in Fiscal Years 2018, 2019, and 2020; and assess the potential impact of the proposed studies on radiation source security	October 2019
DOE/NNSA	Perform an analysis to identify the technology gaps that prevent the adoption of alternative technologies in well logging or industrial sterilization applications	December 2020

<b>2014 Recommendation 1</b>	<b>Assessment of the Adequacy of and Strategies for Preventing and Mitigating Cybersecurity Vulnerabilities</b>	NRC
		Ongoing

Task: “The Task Force recommends that U.S. Government agencies assess the adequacy of and coordinate strategies for preventing and mitigating cybersecurity vulnerabilities related to Category 1 and 2 radioactive sources.”

Most Recent Citation: 2014 Report (Chapter 1—Advances in the Security and Control of Radioactive Sources)

2014 Report Context: The 2014 Report states the following (pp. 13-14):

With regard to Category 1 and 2 quantities of radioactive sources, current protective measures focus primarily on access control, detection, assessment, and response to unauthorized access events and work is ongoing to assess specific cybersecurity vulnerabilities. The cybersecurity landscape for these licensees varies greatly due to diversity of operating environments. An NRC-led working group, including Agreement State membership, was formed in 2013 to examine the potential threats to information systems of Category 1 and 2 radioactive source licensees’ facilities and control systems. Cybersecurity assessments focus on the following areas:

- Devices that use software-based control systems, such as irradiators and medical radiosurgery devices;
- Access control, intrusion detection, and assessment systems that may allow an adversary to gain access to material and avoid detection; and
- Computer systems that licensees use to track source inventories.

The overall goal of the working group is to assess potential vulnerabilities and identify the potential consequences that may occur from loss of control, or if the availability, integrity, or confidentiality of the data contained in the system were compromised.

The NRC will continue to coordinate this and similar NRC assessments with its Federal Government and State partners. The Task Force will leverage, as appropriate, and not be duplicative of the efforts of on-going Federal initiatives such as Executive Order (EO) 13636 and Presidential Policy Directive (PPD) 21.

Potential Issues: No known issues.

Agencies Involved: NRC (lead) and OAS.

Program Office Action: NRC/NMSS leads a materials cybersecurity working group that is currently developing an assessment matrix as part of an analysis to determine potential impacts to digital systems associated with Category 1 and 2 quantities of radioactive materials from cyber threats, and therefore need protection.

Resources: This activity is not specifically budgeted; it is part of routine activities.

2014 Recommendation 1		
<b>Tasked Office</b>	<b>Breakdown into Subtasks</b>	<b>Due Date</b>
NRC/NMSS	Distribute preliminary survey to sample group and receive responses	Complete
NRC/NMSS	Distribute survey to all Category 1 and 2 licensees and receive responses — May 2016	Complete
NRC/NMSS	Develop an initial assessment matrix as part of the analysis to determine which licensee type/group and/or devices, if any, are vulnerable to cybersecurity attacks	Ongoing
NRC/NMSS	Develop strategies to address cyber threats that could cause significant consequences	2017
NRC/NMSS	Provide recommendations for a path forward to the Commission via a Commission paper	2017

<b>2014 Recommendation 2</b>	<b>Source Disposition/Disposal Financial Planning or Other Mechanisms</b>	NRC
		Complete

Task: “The Task Force recommends that the NRC evaluate the need for sealed source licensees to address the eventual disposition/disposal costs of Category 1 and 2 quantities of radioactive sources through source disposition/disposal financial planning or other mechanisms. Disposition costs should include the cost of packaging, transport, and disposal (when available) of these sources.”

Most Recent Citation: 2014 Report (Chapter 2—Status of the Recovery and Disposition of Radioactive Sealed Sources)

2014 Report Context: The 2014 Report states the following (pp. 34-35):

A wide range of financial mechanisms are available for NRC consideration in addressing this recommendation. For example, financial assurance mechanisms acceptable to the NRC in the context of nuclear reactor or complex materials facility decommissioning may provide helpful models to determine requirements for Category 1 and 2 quantities of sealed sources. In addition, several Agreement States have instituted more stringent requirements to help cover the cost of disused and “orphan” sealed source packaging, transport and disposal unrelated to facility decommissioning.

These efforts demonstrate the potential feasibility and effectiveness of such requirements and may inform further potential NRC rulemaking activities undertaken to implement the recommendation. However, implementation of source disposition/disposal financial planning or similar requirements may have to address both Category 1 and 2 quantities of sealed sources that are new and have not yet been distributed to a licensed user, as well as those already in use.

Potential Issues: It is important to integrate stakeholder input throughout the proposed rulemaking process (discussed in the “Program Office Action” section below), if approved, to help avoid imposing any potential new requirements that may place undue burden on those affected. Furthermore, the rulemaking process would carefully consider the compatibility category assigned to the rule, recognizing the importance of Agreement States maintaining flexibility in developing a compatible requirement that meets or exceeds the NRC standard.

Agencies Involved: NRC (lead) and OAS.

Program Office Action: NRC/NMSS led a byproduct materials financial scoping working group which addressed this topic for the NRC. The NRC staff provided the results of the scoping study as well as the working group’s recommendations to the NRC Commission. The scoping study evaluated the need for sealed source licensees to address the eventual disposition/disposal costs of Category 1 and 2 quantities of radioactive material through financial planning or other mechanisms.

The results of the scoping study were used by the NRC staff to recommend rulemaking to expand the financial assurance requirements in 10 CFR 30.35, “Financial Assurance and Recordkeeping for Decommissioning.” The recommendation will be considered by the Commission, and appropriate action will be taken upon Commission direction.

Resources: This recommendation is complete.

2014 Recommendation 2		
<b>Tasked Office</b>	<b>Breakdown into Subtasks</b>	<b>Due Date</b>
NRC/NMSS	Establish a working group to perform a byproduct materials scoping study	Complete
NRC/NMSS	Provide the NRC Commission the results of, including any recommendations from, the working group’s scoping study— April 2016	Complete

<b>2014 Recommendation 3</b>	<b>Alternative Technologies</b>	DOE/NNSA
		Ongoing

Task: “The Task Force recommends that the U.S. Government, as appropriate,<sup>2</sup> 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.”

Most Recent Citation: 2014 Report (Chapter 3—Progress in the Area of Alternative Technologies)

2014 Report Context: The 2014 Report states the following (p. 49):

Government incentives for adoption of the alternative technologies can encourage potential ‘early-users’ in the transition process. Before these incentive programs can be implemented, they must be at the appropriate level of government and must balance National security concerns with cost-effectiveness and efficiency. ... As progress continues in the development of replacement technologies, the Task Force believes that it will be important for the Federal Government to lead by example. ... A range of options are available for Federal agencies to encourage the adoption of replacement technologies which meet technical, operational, and cost requirements. For example, Federal agencies procuring Category 1 and 2 sealed sources and devices could document their assessment regarding the replacement of those devices in comparison with available non-radioactive alternatives. If shared among agencies, this information could help purchasers become familiar with replacement trends and decision factors, and could also be used to assess overall progress in conversion efforts. Similar assessment requirements could also be included in Federal research grant applications. These assessments would not only encourage consideration of potential replacement technologies during purchase and funding decisions, they would also serve as an important mechanism to inform stakeholder communities with regard to alternative technology options.

Potential Issues: No known issues.

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

Program Office Action: DOE/NNSA is performing studies, providing education, and conducting outreach on alternative technologies. DOE/NNSA is also implementing a program to incentivize the replacement of high-risk sources with alternative technologies, with a focus on CsCl devices. In addition, the NRC is a co-chair of the Interagency Working Group on Alternatives to High-Activity Radioactive Sources (GARS) working with the National Science and Technology Council (NSTC) of OSTP. Other co-chairs are DOE/NNSA and HHS/National Institutes of

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<sup>2</sup> 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.

Health (NIH). This working group has developed a best practices guide for Federal agencies to use in the consideration of the conversion to non-isotopic technologies<sup>3</sup>. In addition, the Nuclear Government Coordinating Council Alternative Technologies Working group, co-chaired by DHS and DOE/NNSA, is currently developing a report to identify advantages and disadvantages of alternative technologies for the replacement of Category 1 and 2 radioactive sources.

Resources: This activity is not specifically budgeted; it is part of routine activities. The NRC will participate as appropriate.

2014 Recommendation 3		
Tasked Office	Breakdown into Subtasks	Due Date
DOE/NNSA, NRC, HHS/NIH	Publication of “Transitioning from High-Activity Radioactive Sources to Non-Radioisotopic (Alternative) Technologies: A Best Practices Guide for Federal Agencies” — December 2016	Complete
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. Meet the Nuclear Security Summit commitment to transition 34 Cs-137 irradiators in the U.S. by December 2020	December 2020
DOE, DHS, DOD, HHS/NIH	Federal agencies procuring Category 1 and 2 sealed sources and devices or non-radioactive alternatives, to provide information on their decision-making process between available source-based and alternative technology to other Federal agencies	Ongoing
DOE, DOE/NNSA, HHS, DHS, DOD, DOS	Federal research grants that require procurement of Category 1 and 2 sealed sources and devices or non-radioactive alternatives, to provide documentation of their assessment of available source-based and alternative technology to Federal agencies	December 2020

<sup>3</sup> The Best Practices Guide is available at: [https://www.whitehouse.gov/sites/default/files/microsites/ostp/ndrd-gars\\_best\\_practices\\_guide\\_final-pdf](https://www.whitehouse.gov/sites/default/files/microsites/ostp/ndrd-gars_best_practices_guide_final-pdf)