



POLICY ISSUE **(Information)**

January 31, 2019

SECY-19-0014

FOR: The Commissioners

FROM: Marc L. Dapas, Director
Office of Nuclear Material Safety
and Safeguards

SUBJECT: THE U.S. NUCLEAR REGULATORY COMMISSION IMPLEMENTATION
PLAN FOR THE RADIATION SOURCE PROTECTION AND SECURITY
TASK FORCE REPORT

PURPOSE:

The purpose of this paper is to provide the Commission with a summary of the enclosed biennial update of the "U.S. Nuclear Regulatory Commission (NRC) Implementation Plan for the Radiation Source Protection and Security Task Force Report," in accordance with the Staff Requirements Memorandum (SRM) for SECY-06-0231, "NRC Implementation Plan for the Radiation Source Protection and Security Task Force Report," dated January 16, 2007 (Agencywide Document Access and Management System [ADAMS] Accession No. ML070170056). This plan highlights interagency efforts in the area of radiation source protection and security, including updates on progress toward a comprehensive approach to improve the security of cesium-137 chloride (CsCl) sources, consistent with the direction in the SRM for SECY-08-0184, "Strategy for the Security and Use of Cesium-137 Chloride Sources," dated April 15, 2009 (ADAMS Accession No. ML091050314). This paper does not address any new commitments or resource implications.

CONTACT: Adelaide Giantelli, NMSS/MSST
301-415-3521

SUMMARY:

The Energy Policy Act of 2005 (EPAc) created an interagency task force on radiation source protection and security under the lead of the NRC. This task force, known as the Radiation Source Protection and Security Task Force (Task Force), provided its first draft report to the Commission in June 2006 in COMSECY-06-0032, "Draft Report to the President and the U.S. Congress on the Radiation Source Protection and Security Task Force" (ADAMS Accession No. ML061770130, nonpublic). After receiving the first draft report, on August 3, 2006, the Commission directed the staff in the SRM for COMSECY-06-0032 (ADAMS Accession No. ML062150520, nonpublic) to prepare correspondence for the Chairman's signature to transmit the report to the President and the Congress (ADAMS Accession No. ML062080366). The SRM also directed the staff to develop a plan for Commission consideration, subsequent to finalization of the Task Force report, that included prioritization, cost estimates, and the staff's view on how to proceed with implementation of the recommendations in the report for which the NRC has responsibility.

The staff submitted the first implementation plan to the Commission in SECY-06-0231, "NRC Implementation Plan for the Radiation Source Protection and Security Task Force Report," dated November 22, 2006 (ADAMS Accession No. ML062430024), and continues to provide the Commission with biennial updates to the implementation plan. This plan as well as all the other updates to the plan, are publicly available in ADAMS and are accessible from the NRC Web site (<https://www.nrc.gov/security/byproduct/task-force.html>). The implementation plan and its updates are used to prioritize and facilitate implementation of efforts 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.

BACKGROUND:

The EPAc mandated that not later than 1 year after the date of the legislative enactment of the Act, and not less than once every 4 years thereafter, the Task Force shall submit to the President and Congress a report and recommendations relating to the security of radiation sources in the United States from potential terrorist threats, including acts of sabotage, theft, or use of a radiological source in a radiological dispersal device. In 2006, the NRC submitted the first Task Force report to the President and Congress (ADAMS Accession No. ML062190349). The report contained 10 recommendations and 18 actions that addressed security and control of radioactive sources. In accordance with the EPAc, the Task Force also submitted its second, third, and fourth reports to the President and Congress on August 11, 2010, August 14, 2014, and October 17, 2018 (ADAMS Accession Nos. ML102230141, ML14219A642, and ML18309A202), respectively. The 2010, 2014, and 2018 reports presented the status of previous reports' open recommendations and actions and any new recommendations. The 2010 report presented 11 new recommendations, several of which included actions related to CsCl sources, and closed 14 recommendations and actions.¹ The 2014 report presented three

¹ CsCl sources with activity levels associated with Categories 1 and 2 thresholds established by the International Atomic Energy Agency in its *Code of Conduct on the Safety and Security of Radioactive Sources* (i.e., above 27 curies) are widely used in self-shielded irradiators in three major modes of application: blood sterilization, bio-medical research, and calibration. CsCl is used because of the properties of cesium-137, including its desirable energy spectrum, long half-life, low cost, and moderate shielding requirements relative to other nuclides. In irradiators, CsCl is found in a compressed powder form that is double-encapsulated in a stainless steel capsule. This physical form is used because of its high specific activity (gamma emission per unit volume) and manufacturability. However, because it is highly soluble in water and is dispersible in aerosol form, it also presents security concerns. As such, the use and security of CsCl sources has been a matter of concern for the NRC and a subject of focus for the Task Force. Significant progress has been made in adequately securing and finding alternatives to these sources, as evidenced in Task Force reports and the Policy Statement issued by the NRC on this subject (76 FR 44378).

new recommendations and closed 17 recommendations and actions. The 2018 report closed four recommendations and actions, and did not propose any new recommendations.

As of the date of issuance of this 2019 Implementation Plan, 35 recommendations and actions have been completed, and seven recommendations and actions remain open. Of the open recommendations, two remain from the 2006 Task Force report, three remain from the 2010 Task Force report (two of which involve CsCl), and two remain from the 2014 Task Force report (one of which involves CsCl).

The implementation plan tracks the open recommendations and actions and defines specific tasks to be completed by appropriate agency leads in order to accomplish the recommended activity.

DISCUSSION:

Since the last update submitted to the Commission in SECY-17-0020, "U.S. Nuclear Regulatory Commission Implementation Plan for the Radiation Source Protection and Security Task Force Report," dated February 1, 2017 (ADAMS Accession No. ML16363A075), the Task Force has continued its efforts to engage in discussions with the lead agencies/organizations on progress being made with respect to the remaining open recommendations and actions from the 2006, 2010, and 2014 reports. It is the responsibility of the agencies and organizations assigned the lead to determine how to disseminate those responsibilities within their respective agencies and organizations as well as to coordinate with agencies and organizations who have a supporting role for the recommendations and actions. The updated implementation plan presents a strategy for implementing open Task Force recommendations and actions; identifies issues that could complicate implementation; and identifies lead agencies, supporting agencies, resource estimates where appropriate, and detailed tasks necessary to implement the open recommendations and actions. While the NRC has the responsibility of serving as the overall lead for the Task Force, some of the recommendations and actions contained in the Task Force reports have no specific actions assigned to the NRC. As recommendations are closed, and the closure is discussed in an Implementation Plan update, they are removed from the next Implementation Plan update.

The following provides a description of progress made on recommendations and actions from the 2006, 2010, and 2014 Task Force reports. The enclosed implementation plan update reflects progress through December 2018. Since the last update submitted to the Commission in SECY-17-0020, two recommendations have been closed and seven remain open. Of the seven remaining recommendations, significant progress has been made on two of the recommendations, whereas limited progress has been made with respect to two of the five other recommendations. In addition, a description of the progress on specific initiatives related to CsCl is provided. These account for three other recommendations and actions that remain open.

ACCOMPLISHMENTS:

The following Task Force recommendations and actions were completed since the last update provided to the Commission:

1. 2010 Recommendation 2:

"The Task Force recommends that the U.S. Government agencies should reevaluate their protection and mitigation strategies to protect against [a] significant [radiation exposure device] RED or [radiological dispersal device] 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."

Status: Complete. After developing definitions of "significant RED" and "significant RDD" in accordance with 2010 Recommendation 1, Task Force agencies were then asked to determine how best to apply those definitions in the context of their respective missions. In 2014, all agencies reported the completion of the incorporation of 2010 Recommendation 1, i.e., the definitions of "significant RED" and "significant RDD," into their missions as appropriate, and the majority of agencies reported the completion of 2010 Recommendation 2, including any necessary reevaluation of their protection and mitigation strategies, consistent with the Task Force definitions.

Input from the U.S. Department of Energy's (DOE's) Office of Environment, Health, Safety, and Security was incorporated in the 2018 Task Force report. DOE reevaluated its protection and mitigation strategies for nuclear and radioactive materials against malevolent acts, including RDD and RED events, as part of its revision to the Department's Graded Security Protection policy. As part of this effort, DOE defined physical protection strategies for DOE assets, including radioactive materials, in its 2016 Design Basis Threat policy, which was issued on November 23, 2016, and considered a broad spectrum of control and protection measures. With these actions, 2010 Recommendation 2 is complete.

2. 2010 Recommendation 8:

"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."

Status: Complete. Within the 2014 Task Force report, it was noted that the DOE/National Nuclear Security Administration (DOE/NNSA) procured vendor services for the design, development, testing, and certification of two new Type B packages to support the recovery and transportation of Category 1 and 2 sources commonly used in commercial applications. The containers, Models 435-B and 380-B, were certified by the NRC in 2014 and 2017, respectively. The Model 435-B container is designed to transport a wide range of relatively common shielded devices, such as disused cobalt-60 (Co-60) teletherapy sources and irradiators that use high-activity Co-60 and Cs-137 sources. The Model 380-B container is designed for the transportation of a wide range of devices. As a shielded container, the Model 380-B can also be used for devices where the integrity of the device shielding or device exposure mechanism is not known or is suspect.

The new containers will enable shipment of nearly all commercially used devices containing high-activity Co-60 and Cs-137, which are particularly significant from a national security and public safety standpoint. With the completion of development, testing, and certification of these containers, the actions associated with 2010 Recommendation 8 are complete.

SIGNIFICANT DEVELOPMENTS:

Since the last update to the Commission in SECY-17-0020 (February 1, 2017), the following significant developments occurred related to Task Force recommendations and actions which still remain open:

1. 2006 Action 9-1:

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

Status: As noted in SECY-17-0020, in February 2016, DOE issued its Final Environmental Impact Statement (EIS) for the disposal of greater-than-Class C (GTCC) low-level radioactive waste (LLRW) and GTCC-like waste; which included an evaluation of the potential environmental impacts associated with the development, operation, and management of a facility for disposal of GTCC LLRW and GTCC-like waste in DOE's inventory. In November 2017, DOE submitted its Report to Congress describing the alternatives it considered in the Final EIS and other related information, as required by Section 631 of the EPAct. While the Final EIS and Report to Congress do not constitute a final decision on GTCC LLRW disposal, their completion represents a major accomplishment in progress toward establishing a disposal pathway for certain risk-significant radioactive sources. DOE will await Congressional action before issuing a Record of Decision. Issuance of the Record of Decision will close this action.

2. 2014 Recommendation 1:

“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.”

Status: In 2017, the NRC completed its evaluation of cybersecurity for risk-significant radioactive materials. From this evaluation, the NRC concluded that risk-significant radioactive materials licensees do not rely solely on digital systems to ensure either safety or physical protection. Rather, these licensees generally employ a suite of measures, such as doors, locks, barriers, human resources, and operational processes, to ensure security, reflecting a defense-in-depth approach to physical protection. The NRC determined that additional regulatory changes were not warranted in order to provide reasonable assurance of adequate protection of risk-significant quantities of radioactive material against cybersecurity threats. Notwithstanding, the NRC concluded it was prudent to communicate effective cybersecurity practices for the benefit of licensees, and as such, is developing a generic communication to inform licensees of effective cybersecurity practices for their consideration.

DOE/NNSA/Office of Radiological Security (DOE/NNSA/ORS) is conducting cybersecurity assessments of DOE/NNSA/ORS-deployed equipment such as the Sentry Remote Monitoring System, the In-Device Delay kit with detection capability, and the

Mobile Source Transit Security system, to ensure that cybersecurity vulnerabilities are not introduced to partner sites and to determine appropriate risk reduction strategies. In addition, DOE/NNSA/ORS is conducting pilot cybersecurity reviews to obtain valuable insights to enable the issuance of a best practices guide.

This recommendation will remain open pending completion of the above-described activities. The NRC and DOE/NNSA/ORS, as well as other partner agencies, will continue to coordinate cybersecurity strategies and actions such as the sharing of best practices and training materials, as well as the coordination of outreach efforts with Federal and State partners and stakeholders.

RECOMMENDATIONS RELATED TO CESIUM CHLORIDE:

The SRM for SECY-08-0184 directed the staff to “report back to the Commission on the interagency efforts of the Radiation Source Protection and Security Task Force as progress is made towards a comprehensive approach to improve the security of Cs-Cl sources, which includes physical security upgrades, the development of a government-facilitated disposal pathway, short-term and long-term research and development of alternative technologies, and the development of a government-incentivized program for the replacement of existing sources with effective alternatives.” Consistent with this direction, the following three Task Force recommendations remain open and are relevant to interagency efforts toward a comprehensive approach to improve security of Cs-Cl sources:

1. 2010 Recommendation 4:

“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.”

2. 2010 Recommendation 9:

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

3. 2014 Recommendation 3:

“The Task Force recommends that the U.S. Government, as appropriate², 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.”

Progress has been made in regard to commercial disposal options for Class A, B, and C sealed sources, e.g., with the issuance of the 2015 Concentration Averaging and Encapsulation Branch Technical Position (CA BTP), which expands potential commercial disposal options. DOE/NNSA, in partnership with the Conference of Radiation Control Program Directors,

² 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 license application for new technologies.

completed a pilot demonstration of the “alternative approaches for averaging” contained in the 2015 CA BTP. The device selected for the pilot was a relatively common irradiator model licensed in a state with access to the U.S. Ecology commercial LLRW disposal facility in the State of Washington. The device contained two Cs-137 source capsules with a combined activity of 563 curies (Ci), which significantly exceeds the 2015 CA BTP’s generic Class C limit for Cs-137 sources of 130 Ci, but is below the 10 CFR Part 61, “Licensing Requirements for Land Disposal of Radioactive Waste,” Class C limit of 957 Ci. The alternative approach justification, developed in coordination with U.S. Ecology, was based on relatively standard features of the device and packaging configuration, as well as relevant disposal facility features, such as depth to disposal and emplacement of the irradiator within an engineered concrete barrier. The LLRW disposal facility regulator, the Washington State Department of Health, approved the disposal, and the device was transported to and disposed of at the disposal facility in September 2017.

Progress has been made in amending 10 CFR Part 61, which governs LLRW land disposal facilities, to risk-inform the regulation and provide a mechanism to ensure that LLRW streams can be disposed of safely. On October 17, 2017, the NRC published in the *Federal Register* a notice requesting comment on the draft regulatory analysis, “Draft Regulatory Analysis for Final Rule: Low-Level Radioactive Waste Disposal,” and seeking specific cost and benefit information to better inform the updated draft regulatory analysis. A public meeting was held on October 19, 2017, to facilitate public involvement.

The Task Force agencies continue to focus efforts on evaluating alternative technologies and performing research and development pertaining to new technologies. DOE/NNSA has piloted a program (the Cesium Irradiator Replacement Project), involving the replacement of Cs-137 irradiators, with an initial focus on blood irradiator replacements. The success of DOE’s Cesium Irradiator Replacement Project and subsequent stakeholder engagements have led to wider implementation of this program. As of July 2018, the transition to an alternative technology, i.e., x-ray devices, has been completed at three facilities. Approximately 70 individual sites nationwide are in the queue for replacement of their Cs-137 irradiators, or are in the process of enlisting in the program. Efforts to transition Cs-137 based irradiators to x-ray devices will continue for the coming years. In its National Progress Report for the 2016 Nuclear Security Summit, the United States noted its objective to facilitate the replacement of 34 Cs-137 irradiators with nonradioisotopic alternatives by 2020, a goal that has already been exceeded.

Other initiatives pertaining to alternative technologies include an Interagency Working Group on Alternatives to High-Activity Radioactive Sources, co-led by DOE/NNSA and the National Institutes of Health. In addition, the U.S. Department of Homeland Security has initiated the Alternative Technology Working Group, a public-private stakeholder engagement, to inform stakeholders about potential replacements of radioactive sources with alternative technologies, including identification of technical and nontechnical challenges related to various applications. The NRC staff, in partnership with the Agreement States, will continue to monitor progress being made by groups such as those referenced above, any new developments in the area of

alternative technologies, and any changes in the threat environment regarding CsCl radioactive sources that may necessitate a recommendation to the Commission for regulatory action.

COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objection.

A handwritten signature in black ink, appearing to read "Marc L. Dapas", with a stylized flourish extending from the end.

Marc L. Dapas, Director
Office of Nuclear Material Safety
and Safeguards

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

SUBJECT: THE U.S. NUCLEAR REGULATORY COMMISSION IMPLEMENTATION PLAN
FOR THE RADIATION SOURCE PROTECTION AND SECURITY TASK FORCE REPORT

ADAMS Accession No. ML19002A559

Package No. ML19002A544

OFC	NMSS/MSST	NMSS/MSST	NMSS/MSST	NSIR/DPCP	OGC
NAME	AGiantelli	SAtack w/ comments	AKock w/comments	DCurtis for Shelton	ACoggins NLO
DATE	1/7/2019	1/15/2019	1/22/2019	1/17/2019	1/18/2019
OFC	TechEd	NMSS			
NAME	CGoode	MDapas			
DATE	1/28/2019	1/31/2019			

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