POLICY ISSUE
(Information)

February 1, 2017 SECY-17-0020

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: Anita Gray, NMSS/MSTR
(301) 415-7036

SUMMARY:

The Energy Policy Act of 2005 (EPAct) 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 Report," dated August 3, 2006 (ADAMS Accession No. ML061770130, nonpublic). In response, the Commission issued an SRM dated August 3, 2006 (ADAMS Accession No. ML062150520, nonpublic) directing the staff 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 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 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 (http://www.nrc.gov/security/byproduct/task-force.html). The staff uses the implementation plan, and updates thereto, 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 EPAct 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 EPAct, the Task Force also submitted its second and third reports to the President and Congress on August 11, 2010, and August 14, 2014 (ADAMS Accession Nos. ML102230141 and ML14219A642), respectively. The 2010 and 2014 reports presented the status of previous reports' open recommendations and actions, including the resolution of a number of significant recommendations and actions. The 2010 report presented 11 new recommendations, several of which included actions related to CsCl

sources[1]. The 2014 report presented three new 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: 2 from the 2006 Task Force Report, 5 from the 2010 Task Force Report (2 of which involve CsCl), and 2 from the 2014 Task Force Report (one of which involves CsCl).

The implementation plan tracks the open recommendations and actions and defines them as tasks to be completed by appropriate agency leads within the framework of their upcoming activities.

DISCUSSION:

Since the last update to the Commission in SECY-15-0020, "U.S. Nuclear Regulatory Commission Implementation Plan for the Radiation Source Protection and Security Task Force Report," dated February 6, 2015 (ADAMS Accession No. ML14352A348), the Task Force has continued its efforts to assign lead responsibilities to various Task Force agencies and organizations for the new recommendations from the 2014 report, and engage in discussions with the lead agencies/organizations on progress being made with respect to the remaining open recommendations and actions from both the 2006 and 2010 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 as well as the supporting agencies involved, resource estimates, and task breakdowns. 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.

The staff has updated the implementation plan to reflect progress through December 2016. The implementation plan is updated on a biennial basis to reflect the addition of new recommendations from Task Force reports and the closure of open recommendations. The following provides a description of progress made on recommendations and actions from the 2006, 2010, and 2014 Task Force reports. Specifically, one recommendation has been closed, and significant progress has been made on three of the nine recommendations and actions that remain open. In addition, a description of the progress on specific initiatives related to CsCl is provided. These account for three of the nine recommendations and actions that remain open.

[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 the irradiators, the CsCl in a compressed powder form is doubly-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).

ACCOMPLISHMENTS:

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

1. 2014 Recommendation 2:

   "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."

   Status: Complete. The NRC staff completed the scoping study to determine whether additional financial planning requirements are necessary for end-of-life management of byproduct material, particularly radioactive sealed sources. The scoping study is documented in SECY-16-0046, "Results of the Byproduct Material Financial Scoping Study," dated April 7, 2016 (ADAMS Accession No. ML16067A367). As a result of the scoping study, the NRC staff recommended to the Commission that the financial assurance requirements in 10 CFR 30.35, "Financial Assurance and Recordkeeping for Decommissioning," be expanded to include all Category 1 and 2 byproduct material radioactive sealed sources tracked in the National Source Tracking System. Consistent with the scoping study results, the NRC staff submitted a rulemaking plan to the Commission in October 2016 to recommend potential regulatory changes to Part 30 (SECY-16-0115, "Rulemaking Plan on Financial Assurance for Disposition of Category 1 and 2 Byproduct Material Radioactive Sealed Sources," dated October 7, 2016 (ADAMS Accession No. ML16200A185, nonpublic). The Commission will decide whether to approve the staff's recommendation to initiate rulemaking after reviewing the rulemaking plan.

SIGNIFICANT DEVELOPMENTS:

Since the last update to the Commission in SECY-15-0020 (February 6, 2015), 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: The U.S. Department of Energy (DOE) issued its final Environmental Impact Statement (EIS) providing disposal options for greater-than-Class C (GTCC) low-level radioactive waste (LLRW) on February 24, 2016. DOE will submit a report to Congress as required by Section 631 of the EPAct and will await Congressional action before issuing a Record of Decision. The submittal of the report to Congress will complete 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: An NRC-led cybersecurity working group distributed surveys on April 29, 2016, to Category 1 and 2 radioactive materials licensees to identify what key digital systems and devices exist at facilities associated with each type of licensee; how those systems and devices are connected to internal/external networks and the internet; and what technical and procedural security measures are in place for protection and operation of these systems and devices. The working group is currently analyzing results from the surveys and performing a consequence analysis to evaluate the potential for onsite and offsite consequences that may occur if the availability, integrity, or confidentiality of data or systems associated with radioactive materials were compromised by a cyber-attack. Future working group activities include finalizing the working group's analysis and developing recommendations for a path forward to the Commission, which will complete this recommendation.

3. 2014 Recommendation 3:

   "The Task Force recommends that the U.S. Government, as appropriate,[2] 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."

   Status: The Interagency Working Group on Alternatives to High Activity Radioactive Sources (GARS), co-chaired by NRC, DOE/National Nuclear Security Administration (NNSA), and National Institutes of Health (NIH), completed a best practices guide, "Transitioning from High-Activity Radioactive Sources to Non-Radioisotopic (Alternative) Technologies: A Best Practices Guide for Federal Agencies," on August 15, 2016[3]. The guide, which focuses on alternatives to high activity sources used in medical applications – including blood irradiation, sterilization irradiators, research irradiators, and radiotherapy devices, makes recommendations in the following areas: (1) Federal Procurement or Grant-making, (2) Agency Priorities; (3) Education and Outreach; and (4) Research and Development. Future activities associated with this recommendation include: DOE/NNSA implementation of a voluntary program to provide Federal incentives for the replacement of Cs-137 irradiators with alternative, non-radioactive source-based devices; and efforts to obtain information from Federal agencies as well as from Federal research grant applicants regarding the decision-making process between existing source-based technologies involving the use of Category 1 and 2 sealed sources and alternative technologies.

---

[2] 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.
[3] The Best Practices Guide is available at: https://www.whitehouse.gov/sites/default/files/microsites/ostp/ndrd-gars_best_practices_guide_final-.pdf

RECOMMENDATIONS RELATED TO CESIUM CHLORIDE:

The SRM for SECY-08-0184 directed the NRC 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 staff continues to provide a status on CsCl issues in the biennial updates of the implementation plan.

In general, the Task Force's previous recommendations that focused on the replacement of CsCl radioactive sources with alternatives (2010 Recommendations 3, 10, and 11) were closed with the publication of the "Policy Statement of the U.S. Nuclear Regulatory Commission on the Protection of Cesium-137 Chloride Sources" on July 25, 2011 (76 FR 44378), that sets forth NRC's policy on the secure use of sealed sources containing CsCl. As noted in the Policy Statement, the NRC recognizes that near-term replacement of devices or CsCl sources in existing blood, research, and calibration irradiators is not practicable or necessary due to implementation of the additional security requirements and lack of a disposal capacity.

Certain efforts supporting the development and implementation of a comprehensive approach to improve the security of Cs-Cl sources continue to be addressed by the Task Force in ongoing recommendations and actions. The following three recommendations are relevant to this effort and remain open.

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 (previously discussed in above section):

   "The Task Force recommends that the U.S. Government, as appropriate, 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."

With respect to the progress made toward closure of these recommendations, DOE is continuing its efforts, as documented in its final GTCC LLRW EIS, to give special consideration for disposal options for CsCl sources (relevant to 2006 Action 9-1). DOE/NNSA is leading efforts in 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 irradiators and cancer treatment devices (relevant to 2010 Recommendation 8). Efforts are also focused on initiating the evaluation of existing alternative technologies and needed research and development that could reduce security risks. DOE/NNSA and U.S. Department of Homeland Security (DHS) are leading efforts in this area through the Nuclear Government Coordinating Council (GCC), which is supported by Federal, State, and industry stakeholders. The GCC working group on Alternative Technologies, co-chaired by DOE/NNSA and DHS, is currently developing a report to identify advantages and disadvantages of alternative technologies for replacement of Category 1 and 2 radioactive sources. The report will include a discussion on Cs-137 radioactive sources used for research irradiation.

Other efforts pertaining to the alternative technology initiative include the GARS working group, chartered on June 8, 2015, by the National Science and Technology Council Committee on Homeland and National Security, Subcommittee on Nuclear Defense Research and Development. As previously mentioned, the GARS working group completed a Best Practices Guide to provide Federal agencies with background information and recommendations on best practices for transitioning to non-radioactive technologies in medical applications.

The NRC staff, in partnership with the Agreement States, will monitor any new developments in the area of alternative technologies, as well as continue to monitor any changes in the threat environment regarding CsCl radioactive sources, that may necessitate a recommendation to the Commission for regulatory action.

In addition to the CsCl-related activities discussed above, the NRC continues to maintain awareness of the DOE/NNSA voluntary program to retrofit existing CsCl irradiators with additional physical security enhancements and to incorporate these improvements into the designs of newly manufactured units.

COORDINATION:

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

/RA/

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

COORDINATION:

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

/RA/

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

ML16363A074

OFC	MSTR	MSTR	MSTR	NSIR
NAME	AGray	SAtack	PHenderson for DCollins	RFelts
DATE	12/14/2016	12/23/2016	1/04/2017	1/10/2017
OFC	OGC	TechEd	NMSS	
NAME	ACoggins	CRajapakse for W. Moore	MDapas	
DATE	1/13/2017	1/17/17	2/1/17	

OFFICIAL RECORD COPY