

# LOW-LEVEL RADIOACTIVE WASTE FORUM, INC.

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## ***U.S. Nuclear Regulatory Commission (NRC)***

### **NRC Releases Results of Byproduct Material Financial Scoping Study**

#### ***Staff Recommends Expanding Financial Assurance Requirements to Category 1 and 2 Radioactive Sealed Sources that are Tracked in National Source Tracking System***

On April 27, 2016, the U.S. Nuclear Regulatory Commission (NRC) released SECY-16-0046, *Results of the Byproduct Material Financial Scoping Study*, to provide the Commission with the results of the staff's byproduct material financial scoping study and recommendations for next steps.

NRC also released an accompanying document titled, *Financial Planning for Radioactive Byproduct Material—Scoping Report*, that provides background information; reviews key reports and recommendations; analyzes technical considerations; discusses decommissioning financial assurance requirements and funding plans; considers financial assurance methods and funding mechanisms, disposition paths other than disposal, and establishing funding requirements for disposition; reviews life-cycle issues, orphan sources, timeliness in declaring and dispositioning disused sources, and tracking; considers applicability to General Licenses, compatibility with Agreement State requirements, and security considerations; provides an overview of disposal access, DOE/NNSA source recovery and disposal programs, and transportation considerations; and, so forth.

#### **Overview and Conclusions**

The adequacy of financial planning for disposition of disused radioactive sealed sources has been raised in a number of external reports issued over the past decade. As a result, NRC staff recently conducted a scoping study to determine whether financial planning requirements for decommissioning and end-of-life management for some radioactive byproduct material, particularly radioactive sealed sources, are necessary. The staff conducted its analysis based on a review of the NRC regulations and guidance, relevant internal and external reports, and stakeholder feedback collected through the scoping study.

Based on its analysis, NRC staff recommends that the financial assurance requirements in 10 CFR 30.35 should be expanded to include all byproduct material Category 1 and 2 radioactive sealed sources that are tracked in the National Source Tracking System (NSTS). Per recent Commission direction, the staff plans to develop a rulemaking plan SECY paper to propose initiating rulemaking, which will also include a discussion of other regulatory options. The staff plans to provide the SECY paper to the Commission in the fourth quarter of FY 2016.

#### **Background**

NRC regulations in Title 10 CFR 30.35, *Financial Assurance and Recordkeeping for Decommissioning*, require a fixed dollar amount of financial assurance or a Decommissioning Funding Plan (DFP) for licensees possessing byproduct material with a half-life greater than 120 days and at activity levels above certain thresholds. Although 10 CFR 30.35 provides activity

thresholds for both unsealed and sealed byproduct material, the thresholds that require financial assurance for sealed radioactive material are seven orders of magnitude higher than for unsealed material. As a result, many licensees that possess byproduct material radioactive sealed sources, including many Category 1 and 2 sources, are not required to provide financial assurance for decommissioning. For licensees possessing multiple radioactive sealed sources subject to the requirements in 10 CFR 30.35, the “sum of fractions” rule applies when determining whether financial assurance is required. If financial assurance is required, it is intended to support site decommissioning, not necessarily the disposition of an individual radioactive sealed source that has become disused or unwanted.

The Energy Policy Act of 2005 created the Radiation Source Protection and Security Task Force (Task Force) to evaluate the status of various factors affecting the security of Category 1 and 2 sealed sources and to provide recommendations to the President and Congress not less than every 4 years. In its 2006 report, the Task Force recommended that the NRC “...evaluate the financial assurance required for possession of Category 1 and 2 radioactive sources to assure that funding is available for final disposition of the sources.” In addition, financial assurance scoping for byproduct material was identified as one of seven high priorities in the NRC staff’s 2007 “Strategic Assessment of the U.S. Nuclear Regulatory Commission’s Low-Level Radioactive Waste Regulatory Program.”

To address the financial assurance recommendation in the 2006 Task Force Report, the NRC established an Interagency Working Group (IWG) on Financial Assurance for Disposition of Category 1, 2, and 3 Radioactive Sealed Sources in December 2008. In March 2010, the IWG issued its final report, which contained numerous recommendations including that the NRC develop risk-based financial assurance requirements and lower financial assurance thresholds in 10 CFR 30.35 to capture all Category 1, 2, and 3 radioactive sealed sources. The 2010 Task Force Report summarized the recommendations of the IWG, and further stated that the NRC would have to determine whether and when to pursue rulemaking to implement these regulatory changes.

In its 2014 report, the Task Force found that significant progress has been made to address the commercial sealed source management and disposal challenges identified in the 2006 and 2010 reports. Although disposal options for many sealed sources are now available, the 2014 report acknowledged that there are currently few incentives for licensees to dispose of their disused sealed sources in a timely fashion. The report recommended 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.” The report stated that “[d]isposition costs should include the cost of packaging, transport, and disposal (when available) of these sources.”

Recommendations for the NRC related to financial assurance were also provided in a March 2014 report issued by the Disused Sources Working Group of the Low-Level Radioactive Waste Forum (LLW Forum). The DSWG report cites numerous factors believed to have contributed to the large number of disused radioactive sources that remain in storage including, among other things, a lack of financial incentives for disused sources to be dispositioned in a timely manner, underutilization of opportunities for recycling and reuse, and the fact that the full life-cycle costs of managing and ultimately disposing of sealed sources are not reflected in the purchase price. The DSWG report recommended that the NRC, “...develop robust financial assurance requirements for all licensees with sources that pose a threat to national security (Categories 1 through 3).”

On September 18, 2014, the Commission was briefed on the management of low-level radioactive waste, high-level radioactive waste, and spent nuclear fuel. NRC staff noted that, given recent interest in financial planning for radioactive sealed source disposition as expressed in the Task Force and DSWG reports, it would be timely for the staff to revisit the issue. In response, in SRM-M140918, the Commission directed the staff to “...provide the Commission with the results of the byproduct financial scoping study and provide recommendations on next steps.”

## Stakeholder Outreach

On August 3, 2015, in order to help solicit broad stakeholder input, NRC staff issued a *Federal Register* notice (80 *Federal Register* 46057) announcing that staff was conducting a financial scoping study to determine if financial planning requirements for decommissioning and end-of-life management for some radioactive byproduct material are necessary. The *Federal Register* notice acknowledged that recent reports addressing this topic had been generated by a limited group of federal and state stakeholders, and that the views and perspectives of important external stakeholders such as industry, users groups, and current licensees were needed to fully inform the scoping study and any subsequent NRC staff recommendations. In addition, on October 7, 2015, NRC staff convened a public meeting and webinar at the agency's headquarters to obtain stakeholder input on the scoping study. Meeting participants included representatives of the U.S. Department of Energy/National Nuclear Security Administration (DOE/NNSA), the National Institutes of Health (NIH), the LLW Forum, several state regulatory agencies, the nuclear industry, public advocacy groups, members of the public, and NRC staff.

Staff also conducted targeted outreach activities to certain stakeholder groups with a known interest in this matter. For instance, on August 21, 2015, staff issued a letter to State Liaison Officers of all Agreement and Non-Agreement States to notify them of the staff's scoping study and the associated *Federal Register* notice. Throughout 2015, staff also attended meetings of the LLW Forum, the Conference of Radiation Control Program Directors (CRCPD), the Health Physics Society (HPS), and the Task Force to raise awareness of the scoping study and the *Federal Register* notice. In addition, staff reached out to other stakeholders including the Organization of Agreement States (OAS), the Nuclear Energy Institute (NEI) and other industry representatives, DOE/NNSA, radioactive materials user groups, and prior attendees of certain NRC public meetings with a related focus.

Eleven commenters responded to the *Federal Register* notice with significant sets of comments on a variety of relevant issues, which are summarized by topical area in the enclosure to SECY-16-0046 titled, *Financial Planning for Radioactive Byproduct Material—Scoping Report*. Most commenters were generally supportive of some type of increased financial planning requirements for radioactive sealed sources, although opinions differed regarding the range of sources that should be covered, the appropriate time frame for disposition of unwanted sources, whether or not generally-licensed sources should be subject to financial planning, and what types of financial planning mechanisms would be appropriate under various licensing circumstances.

To provide additional context on the current environment for radioactive sealed source disposition, the DOE/NNSA shared information with the NRC regarding its Off-Site Source Recovery Project (OSRP) and the Source Collection and Threat Reduction (SCATR) Program, which is funded by DOE/NNSA and administered by CRCPD. A summary of the information and associated recommendations from the DOE/NNSA is provided in a second enclosure to SECY-16-0046 that was not publicly released, although the OSRP and SCATR programs are described further in the enclosure that is publicly available.

## Relationship of Financial Assurance to Safety and Security

Numerous studies have noted the potential increased safety and security risks that may arise when disused sources are not promptly dispositioned. Indeed, guidance issued by the International Atomic Energy Agency (IAEA) states as follows:

*Disused sources represent the largest pool of vulnerable and potential orphan sources. History has shown that many accidents involving orphan sources come about because sources that are no longer in use are eventually forgotten, with subsequent loss of control years later. To this end, it is beneficial from both a safety and security viewpoint for all disused sources to be identified and to undergo proper disposition.*

Furthermore, Paragraph 22(b) of the IAEA's *Code of Conduct on the Safety and Security of Radioactive Sources* recommends that every State should ensure that its regulatory body "ensures that arrangements are made for the safe management and secure protection of radioactive sources, including financial provisions where appropriate, once they have become disused."

A 2005 report by the U.S. Government Accountability Office (GAO) stated that, "...[a]lthough NRC does not place time limits on the storage of radioactive materials as long as they are safe and secure, greater quantities and longer periods of storage, particularly of unwanted sealed radiological sources, will likely increase safety and security risks." The GAO report also provided an example where DOE incurred costs of approximately \$581,000 to recover and dispose of sources that had accumulated at a bankrupt firm in Pennsylvania.

The 2006 Task Force report noted that some NRC licensees "...may not have sufficient funds set aside to cover the costs of disposal or other appropriate disposition, potentially resulting in prolonged storage and possible misuse or abandonment." The report also stated that high disposal costs might prompt licensees to delay disposal either by choice or economic necessity. The 2010 Task Force report reiterated that, "...while secure storage is a temporary measure, the longer sources remain disused or unwanted the chances increase that they will become unsecured or abandoned." This position was repeated in the 2014 Task Force report, which further stated that financial assurance requirements, "...are likely to decrease the time that commercial sealed sources remain in storage because the funds necessary for source disposal will be immediately or quickly available."

Comments provided by DOE/NNSA in response to the staff's *Federal Register* notice acknowledge the safety and security concerns associated with disused sources, noting that increased government involvement in efforts to address radioactive sealed source management and disposal is not sustainable. DOE/NNSA state that additional financial planning requirements could help facilitate the use of available commercial disposal options, thereby reducing the funding required for programs such as the OSRP and SCATR. In FY 2015, the SCATR program facilitated the disposal of 6,074 radioactive sealed sources (primarily Category 3 and lower sources for which commercial disposal is available), while the OSRP recovered 2,305 radioactive sealed sources.

Based on the reports cited above, SECY-16-0046 states, "there is at least some potential for increased safety and security risks in the absence of adequate financial planning for ... [radioactive sealed source] disposition." SECY-16-0046 continues that, "[i]n any event, the current role (and associated costs) of the DOE/NNSA in providing for recovery and disposition of some ... [radioactive sealed sources], particularly those with commercial disposal options, will likely need to transition at some point to either private industry or other Federal and state entities."

### **Scoping Study Results**

In addition to considering stakeholder feedback, NRC staff reviewed current agency regulations and guidance in the area of financial assurance, relevant internal and external reports, and information obtained through discussions with subject matter experts. The publicly available Enclosure 1 to SECY-16-0046 summarizes this information and provides a discussion of numerous technical issues important to byproduct material financial planning, as well as other issues such as relevant national and international activities, compatibility with Agreement State requirements, and implementation considerations.

After initial consideration, unsealed byproduct material was not evaluated further in the NRC staff's scoping study, as staff concluded that—due to the significantly lower threshold for unsealed byproduct material financial assurance in 10 CFR 30.35—these requirements did not

need to be revisited at this time. In addition, stakeholder feedback as well as the recommendations of internal and external reports reviewed by the staff focused almost exclusively on financial assurance for radioactive sealed sources.

In SECY-16-0046, NRC staff states that end-of-life costs for byproduct material radioactive sealed sources can be significant and unpredictable. The costs associated with end-of-life disposition may include interim storage, packaging and conditioning, transportation, and costs associated with the selected disposition option. Disposition may include options such as return to the manufacturer or supplier for reuse or recycling, transfer to another licensee, disposal as low-level radioactive waste, or (for some short half-life material such as Iridium-192 sources) decay in storage for subsequent management and disposal. While the overall cost of disposition may be substantial and subject to considerable uncertainty, licensees are responsible for the safe and secure end-of-life management of their licensed material regardless of cost.

SECY-16-0046 acknowledges that NRC regulations do not require licensees to declare when radioactive sealed sources in their possession are unwanted or to provide for prompt disposition. If a licensee has not anticipated and planned for the cost of disposition, this may represent a significant financial burden. For some radioactive sealed sources, disposal may not be a viable option for a variety of reasons, including lack of access to a low-level radioactive waste disposal facility that can accept the material or a lack of a certified shipping container to transport the material. As a result, licensees may choose indefinite long-term secure storage as the most practical management option. SECY-16-0046 states that NRC “staff recognize that, while early financial planning (ideally prior to acquisition of a ... [radioactive sealed source]) is a best management practice and should facilitate timely, safe and secure disposition, long-term storage of ... [radioactive sealed sources] in accordance with applicable NRC requirements is also an acceptable management practice.”

As part of the byproduct material financial scoping study, NRC staff reviewed the current financial assurance requirements for Category 1 and 2 radioactive sealed sources that are tracked in the NSTS, which tracks more than 76,000 Category 1 and 2 radioactive sealed sources held by approximately 1,400 NRC and Agreement State licensees. According to SECY-16-0046, although more than 99 percent of radioactive sealed sources tracked in the NSTS are byproduct material, a small percentage are special nuclear material or source material. Under NRC regulations, of the 17 byproduct material radionuclides tracked in the NSTS, a fixed dollar amount financial assurance of \$113,000 would be required for 10 of these radionuclides at the threshold level for a Category 1 source. No financial assurance would be required for seven of the byproduct material radionuclides tracked in the NSTS at the threshold level for a Category 1 source (including Cobalt-60 and Cesium-137, which are two of the most widely used radioactive sealed sources), nor for any of the byproduct material radionuclides tracked in the NSTS at the threshold level for a Category 2 source.

“After conducting its scoping study, the staff agrees with the assessments of numerous state and Federal partners, organizations such as OAS and CRCPD, the Task Force, and other commenters that providing financial assurance for disposition of ... [radioactive sealed sources] supports safety and security goals, helps facilitate timely disposition of disused ... [radioactive sealed sources], and ensures that the full cost of using these ... [radioactive sealed sources] is appropriately considered by licensees.” states SECY-16-0046. “Financial assurance requirements ensure that licensees have anticipated and are prepared to address disposition costs when they arise.”

In considering whether to expand the existing financial assurance requirements in 10 CFR 30.35, SECY-16-0046 states that the staff believes it is appropriate to initially focus on the byproduct material Category 1 and 2 radioactive sealed sources tracked in the NSTS because

- Category 1 and 2 sources have the highest risk significance and are generally the most likely radioactive sealed sources to pose disposition challenges;

- as a group, disposition costs are likely to be higher for Category 1 and 2 sources compared to other source categories;
- requiring financial assurance for byproduct material Category 1 and 2 radioactive sealed sources may help reduce the use of long-term storage as a management option, supporting Commission policy that disposal is preferred to storage;
- requiring financial assurance for these sources should reduce the likelihood that some licensees will be unprepared for end-of-life disposition costs due to limited financial resources or other unforeseen circumstances; and,
- requiring financial assurance would help ensure that disposition costs related to the use of byproduct material Category 1 and 2 radioactive sealed sources are borne by those who receive the associated economic benefits, reducing the need for programs such as the OSRP to be administered by DOE/NNSA.

Based on its analysis, SECY-16-0046 states that the staff believes that the financial assurance requirements in 10 CFR 30.35 should be expanded to include all byproduct material Category 1 and 2 radioactive sealed sources tracked in the NSTS. The staff plans to develop a rulemaking plan SECY paper to propose initiating rulemaking.

SECY-16-0046 states that NRC staff considered whether to further evaluate rulemaking to expand financial assurance requirements to other categories of radioactive sealed sources such as Category 3 (and below) sources, as suggested by several stakeholders. However, staff elected to focus on byproduct material Category 1 and 2 radioactive sealed sources at this time. "If rulemaking were to be implemented, developing the necessary regulatory infrastructure to require financial assurance for all of the byproduct material Category 1 and 2 radioactive sealed sources tracked in the NSTS would be a complex and resource intensive task," states SECY-16-0046. "Staff believes that the most prudent use of Federal and state resources would be to focus on these ... [radioactive sealed sources], which present the highest risk." However, SECY-16-0046 acknowledges that experience in developing and implementing requirements for byproduct material Category 1 and 2 radioactive sealed sources could be used to more effectively and efficiently develop similar requirements for lower category sources in the future, if warranted. In addition, SECY-16-0046 notes that Agreement States could continue to implement more comprehensive financial assurance requirements for radioactive sealed sources, including Category 3 and lower sources, based on current compatibility categories with NRC financial assurance requirements.

SECY-16-0046 specifically states that any proposed expansion to the financial assurance requirements in 10 CFR 30.35 would not apply to production and utilization facility licensees which are licensed under 10 CFR Part 50. These licensees are already required to demonstrate financial assurance for construction, operation, and decommissioning, including the disposal of any byproduct material Category 1 and 2 radioactive sealed sources possessed under their license.

### **Next Steps**

SECY-16-0046 states that, based on its analysis, NRC staff believes that the financial assurance requirements in 10 CFR 30.35 should be expanded to include all byproduct material Category 1 and 2 radioactive sealed sources tracked in the NSTS. Accordingly, staff plans to develop a rulemaking plan SECY paper per the recent direction in SRM-SECY-15-0129, "Commission Involvement in Early Stages of Rulemaking," to propose initiating rulemaking.

"Per the rulemaking plan template, the SECY paper will include a discussion of the estimated schedule for rulemaking, preliminary priority, relationship to the NRC's Strategic Plan, costs and

benefits, cumulative effects of regulation, and Agreement State considerations, among other topics,” states SECY-16-0046. “The SECY paper will also include a discussion of other regulatory options.”

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