

Low-Level Radioactive Waste Forum

Disused Sources Working Group Highlights and Talking Points

Overview

- While society derives many benefits from the use of sealed sources, the current paradigm for the management of sealed sources does not fully reflect the reality of the post-9/11 threat environment.
- There are approximately two million sealed sources and tens of thousands of disused sources in the United States. Although two federal agencies maintain sealed source databases, the exact number and location of disused sources are unknown.
- Users are reluctant to declare their sources as disused or to reuse, recycle, or dispose of their sources for a variety of reasons such as disposal cost, transportation restrictions, potential future use, and the relative ease and low cost of long-term storage.
- Some disused sources pose a threat to national security as they could be used individually or in aggregate in radiological dispersal devices (RDD or dirty bombs) or radiation exposure devices (RED). The U.S. Environmental Protection Agency (EPA) has estimated that an RDD incident in a major metropolitan area could result in 39 million cubic feet and 10 billion gallons of radioactively contaminated waste requiring disposal.
- Most licensees manage their disused sources in a responsible manner; however, despite the best intentions of licensees, the large number of disused sources presents a risk to national security.
- The NRC considers only Category 1 and Category 2 sealed sources to present a national security risk, whereas NNSA believes that some Category 3 sealed sources pose a threat to national security. The U.S. Government should reach an agreement across agencies regarding which sealed sources pose a threat to national security.
- The regulatory framework is quite effective in protecting human health and regulators are doing a good job at implementing the system as it now exists. However, the system can and should be enhanced to address waste management and national security concerns regarding the potential for malevolent use of disused sources.
- The Disused Sources Working Group (DSWG) acknowledges that some of its recommendations may pose additional resource demands on the Agreement States. As such, the DSWG encourages federal government to examine potential ways to address financial needs of the Agreement States when national security concerns are at issue.
- The DSWG is not trying to prevent people from getting sources that they need, but rather to encourage stakeholders to think about the entire life-cycle from purchase through disposition.

Acquisition and Accumulation

- Sources are easy to obtain, but difficult to manage at disposition. As a result, once used for their original purpose, many sources are stored indefinitely.
- When considering the purchase of a new sealed source, the buyer is not required to consider the overall life-cycle cost of properly managing the source—which can sometimes be in the

hundreds of thousands of dollars—and most do not budget for its ultimate disposal. Thus, as currently configured, the economics of sealed source ownership do not motivate owners toward prompt end-of-life disposition, resulting in thousands of sealed sources being stored indefinitely.

- The system promotes the manufacture of sources. Opportunities for reuse, recycling and disposition are being underutilized.
- The reuse and recycling of sealed sources should be promoted. A study on measures to promote the reuse and recycling of sealed sources should be conducted by an agency such as the EPA. A sealed source “exchange” program should be established to facilitate the transfer of sources between those no longer needing sources and those looking to acquire sources.
- Given the potential national security implications, the DSWG agrees with the 2010 Radiation Source Protection and Security Task Force Report (Task Force Report) recommendation calling for the federal government to enhance support of research and development of alternative technologies to replace the use of risk-significant sources, as well as its recommendation for a government-incentivized program for the replacement of risk-significant devices with effective alternatives. According to the 2010 Task Force Report, three types of alternative technologies could serve as replacements for certain risk-significant radioactive sources: (1) technologies that use the same radionuclide with a different chemical or physical form (e.g., replacing cesium-137 salt with less dispersible cesium-137 ceramic), (2) technologies that use a different radionuclide (e.g., replacement of cesium-137 salt with cobalt-60 metal), and (3) technologies that do not use a radionuclide (e.g., x-ray technology).

Regulatory Controls

- The fundamental purpose of the current regulatory system is to reduce people’s exposure to radiation. Although the system is working well overall from a healthperspective, at various points, we have tried to back-fit security into the system.
- Regulators are doing their jobs within the existing framework; however, after the events of 9/11, we need to continue to enhance the system to address outstanding security threats.
- By creating a regulatory framework that promotes the reuse and recycle of disused sources, as well as encourages advanced planning and budgeting for the high costs of disposal, regulators will effectively reduce long-term storage and promote prompt disposition of disused sources.
- Regulators have indicated that they do not have the authority to require users to disposition disused sources. The U.S. Nuclear Regulatory Commission (NRC) and the Agreement States should develop comprehensive regulations that limit the storage of disused sources to two years and authorize regulators to require the disposition of sources in storage for more than two years unless there is a demonstrated future use.
- Financial assurance should be required for all sources that pose a national security risk, should be specifically-licensed, and adequately tracked.
- The development of more stringent financial assurance requirements by the NRC and the Agreement States is crucial to ensuring that life-cycle costs are internalized and encouraging licensees to properly manage and promptly reuse, recycle, or dispose of disused sources.
- There are significant problems with the current tracking system that need to be addressed to assist regulators in reducing potential threats. Once the existing problems are resolved, the

tracking system should be enhanced to identify and track all sources that pose a threat to national security.

- Regulators should revisit and address potential concerns to national security that are posed by certain Category 3 sources. For instance, well logging Category 3 sources may present a significant concern as they are highly mobile, used all around the country, and have high amounts of radioactivity. Americium may also be a significant problem as it is widely distributed in Category 3 sources.
- A previous NRC-Agreement State Working Group (NRC-AS Working Group) determined that there is a lack of oversight of GL licensees. The NRC-AS Working Group also found that regulators have not taken an active role in ensuring that GL licensees maintain control over and accountability for GL sources and in ensuring that licensees possess, use, and transfer GL devices in accordance with the regulations. This has led to a loss of control and sometimes to improper disposal or even to orphaned and abandoned sources.
- In 2010, the Organization of Agreement States (OAS) petitioned NRC to increase the regulatory control over certain GL sources. When this came before the Commission, the additional controls failed upon a tie vote, resulting in no increased controls. However, the NRC did authorize Agreement States to increase controls on GL sources at their own discretion. Few states have enacted increased controls, however, at least in part due to compatibility issues.
- The DSWG understands that Agreement States are concerned about more resource intensive regulatory commitments; however, it appears that there are only a small number of Category 3 GL sources of concern -- i.e., NRC states that they only have 13 Category 3 GL sources.
- The return of sources to manufacturers and suppliers reduces the security threat because it results in fewer storage locations and increases the likelihood of beneficial reuse or recycle. In addition, manufacturers and suppliers often have greater knowledge of the product, more comprehensive oversight, and increased physical security in place. However, some source and device manufacturers and suppliers are accumulating large numbers of disused sources in storage. Additional regulatory oversight is needed to minimize manufacturers' and suppliers' inventories.
- Several Agreement States have developed more stringent and comprehensive regulations that should be considered as guides/models for others to follow including:
 - Oregon's comprehensive General License (GL) requirements and possession fees for each source in a licensee's possession;
 - Texas' fees on licensees to cover the cost of orphaned and abandoned source recovery;
 - Illinois' financial assurance requirement for most sources;
 - Florida's radiation protection trust fund covering costs associated with licensee bankruptcy and orphaned sources; and,
 - Colorado's comprehensive GL registration and annual self-certification program and requirement for Specific Licenses (SLs) for certain Category 3 sources that are normally generally licensed.

Reuse, Recycle and Disposal

- Devices in long-term storage are more likely to be subject to loss of control and accountability; however, users have little or no incentive to dispose of disused sealed

sources. Most sources are small and require very little space to store, so users incur very little cost in storing disused sources. By comparison, disposal can be very costly. As disposal was not available for many states for some years, users are also not accustomed to including funds for disposal in their annual budgets.

- Disposal options are currently available for most disused sources manufactured and used within the U.S. In most cases, however, disposal access has not translated into actual disposal.
- Those who benefit from the use of the source should be the ones to pay for its disposition.
- Federal and private research funding organizations should require grantees to budget for the disposal of sealed sources when they no longer are needed by the grantee.
- States with disposal facilities licensed to accept Class B and Class C low-level radioactive waste should examine their waste acceptance criteria and policies, including the alternative approaches provision in the revised Branch Technical Position on Concentration Averaging and Encapsulation (CA BTP) to facilitate the disposal of certain high activity sealed sources.
- Type B shipping containers needed to transport certain high activity sealed sources are in short supply and very expensive. NNSA should undertake a market analysis of the demand for Type B shipping containers and take additional steps to encourage the private sector to increase the supply of commercially available Type B shipping containers. NNSA should also identify several internationally-certified Type B shipping containers that would have widespread applicability to disused sources in the U.S. and submit applications to have these packages certified by NRC for domestic use. The NRC should continue to expeditiously review applications for Type B shipping containers. The NRC should aggressively notify licensees and the Agreement States well in advance of the expiration of shipping container certifications.
- The Source Collection and Threat Reduction (SCATR) program and Off-Site Source Recovery Program (OSRP) have provided and continue to provide significant contributions, including the disposition of a number of sources to the benefit of society. At times, however, these programs also create unintended incentives for users to not disposition disused sources until the government contributes toward costs that need to be addressed. There will always be a need for a program to disposition orphaned or abandoned sources, and they should continue to be adequately funded to do so, but they should eventually be transitioned more toward education and other initiatives. The Conference of Radiation Control Program Directors (CRCPD) and National Nuclear Security Administration/Global Threat Reduction Initiative (NNSA/GTRI) are important stakeholders that should provide input on how to transition SCATR and OSRP.

For additional information, please contact DSWG Project Director Todd Lovinger at (754) 779-7551 or at LLWForumInc@aol.com.