A Collaborative Regulatory Effort for Sealed Source Disposal – 15735

Rusty Lundberg*, Daniel Shrum**
*State of Utah, Department of Environmental Quality, Division of Radiation Control
(rlundberg@utah.gov) and
**Energy*Solutions*, LLC (dshrum@energysolutions.com)

ABSTRACT

The State of Utah, Department of Environmental Quality, Division of Radiation Control (DRC), Energy*Solutions*, the Conference of Radiation Control Program Directors (CRCPD), and the Department of Energy's Global Threat Reduction Initiative (GTRI) collaborated on a truly innovative effort to expand opportunities for cost-effective sealed source disposal. These entities developed a first-of-its-kind initiative to dispose of certain sealed sources at the Energy*Solutions* disposal facility near Clive, Utah, which normally cannot accept sealed sources of any type. This creative and collaborative effort to improve radiation health, safety, and security was recognized by the Richard S. Hodes, M.D. Honor Lecture Award. This award is presented annually by the Southeast Compact Commission at the Waste Management Symposia to encourage environmental professionals and political leaders to develop innovative approaches to waste management in the United States. The participants in the collaborative initiative are honored to receive special recognition for this effort. They also recognize that the hard work remains to be done in order to ensure the continued safe management and disposal of sealed sources.

INTRODUCTION

The Source Collection and Threat Reduction Program (SCATR), administered by CRCPD and funded by the Department of Energy's Global Threat Reduction Initiative (GTRI), has provided sealed source licensees with technical and financial support for the disposal of thousands of disused sealed sources since its inception in 2007. The objective of the program is to provide a cost effective process for identifying and reducing the threat of diversion of radioactive material for misuse. Prior to July 2008, the Low-Level Radioactive Waste (LLRW) disposal facility in Barnwell, South Carolina afforded sealed source waste generators without a LLRW Compact facility and SCATR a disposal pathway for such sources. Following Barnwell's July 2008 closure to out-of-compact generators, most states and generators have not been able to dispose of their disused and unwanted sealed sources. Efforts to develop alternative pathways have been predictably and understandably challenging.

LLRW disposal in the U.S. is governed by a highly complex and unique combination of National, regional, and State policies, processes, and politics. The Low-Level Radioactive Waste Policy Amendments Act of 1985 (LLRWPAA) placed upon States and regional Compacts the

obligation to provide for the disposal of Class A, B, and C waste generated within their borders. However, the LLRWPAA also allowed that Compact and non-Compact LLRW disposal facilities could opt to accept waste from states without a Compact facility. Prior to July 2008, the Barnwell facility accepted waste from all states. The Energy*Solutions* facility near Clive, Utah, is unaffiliated with a Compact and accepts Class A LLRW from authorized generators in all 50 states. However, the Energy*Solutions* license to operate the Clive facility has not permitted it to accept sealed sources of any class or type for disposal.

INTO ACTION – Collaboration and Coordination to Enable Sealed Source Disposal at Clive

Both industry and government recognized that unprecedented collaboration and coordination would be necessary to develop new sealed source disposal options. No single entity, agency, or industry group could on its own solve the problem. Following a September 2008 workshop on sealed source security facilitated by the Department of Homeland Security (DHS) and GTRI, DHS created the Removal and Disposition of Disused Sources Focus Group ("RDDS Focus Group"), which included sealed source manufacturers, distributors, users, storage and disposal companies, regulators, other Federal and State officials, and LLRW compact members. The RDDS Focus Group, which developed two reports signed by over 40 stakeholders in December 2009 and June 2010, not only clarified and articulated the various sealed source disposal challenges and associated national security concern, but also recommended solutions and a path forward to address them.[1]

One solution from the RDDS Focus group reports that emerged as particularly relevant for SCATR and the disposal of Class A sealed sources is the possibility of a license amendment to allow sealed source disposal at the Clive, Utah disposal facility. Sealed sources have been prohibited for disposal at the facility because of site-specific factors which in the interim had changed.[2] Specifically, the Clive, Utah disposal facility was developed originally as a bulk waste disposal facility, where LLRW would be removed from the shipping container and placed in the landfill. Sealed source disposal at a bulk facility was problematic and a prohibition was placed into the license. In October, 2001, the DRC approved license amendment 12 which allowed for the disposal of containerized waste. However, this authorization for containerized waste did not automatically lead to a change in the license. A license variance or amendment would therefore be required. GTRI engaged both DRC and Energy*Solutions* to explore and encourage efforts to pursue the change. It was clear that such an initiative, which would expand the allowable waste stream to the facility, would require agreement and action by a range of stakeholders with varied equities and interests, including DRC, Energy*Solutions*, GTRI, and CRCPD.

[1] The two RDDS Focus Group reports are available at http://osrp.lanl.gov/docs.shtml.
[2] License Condition l6.A. to RML UT 2300249 prohibits disposal of sealed sources at the Clive facility.

Taking on the challenge, the four organizations collaborated on an action plan to turn the idea into reality. Bolstered by consistent GTRI encouragement and support, Energy*Solutions* worked closely with the DRC and CRCPD to determine which sealed sources might be acceptable for disposal and how to structure a license variance to meet the needs of all parties, including sealed source generators and the general public. The official process for an Energy*Solutions* license variance began with an Energy*Solutions* request for the change, centered on GTRI's threat reduction initiatives and limited to those sealed sources registered as disused with the Offsite Source Recovery Project (OSRP) administered by GTRI and Los Alamos National Laboratory (LANL) and within Class A limits. Energy*Solutions* presented its request to DRC staff in August 2011.[3] Shortly thereafter, DRC released a draft license variance followed by a thirty-day public comment period. After reviewing and incorporating the public comments it received – there were none in opposition to the change— DRC issued in April 2012 the final license variance.

For many sealed source generators, who combined possess hundreds of thousands of disused sealed sources, this effort represented the first disposal breakthrough since the Barnwell import restrictions went into effect. The coordinated action it took to achieve the success is particularly noteworthy and laudable given the relatively small volume and financial importance of sealed sources relative to non-sealed source waste. The organizations involved in the effort –DRC, Energy*Solutions*, GTRI, and CRCPD—have been and still are motivated solely by a commitment to security, health, and safety.

SCATR/Clive – A Path Successfully Forged for Past and Potential Future Opportunities

The April 2012 variance includes a range of sealed sources that meet the definition for Class A waste and will last for a period of one year from the date the first sealed source waste is received at the Energy*Solutions* Clive, UT facility. Only sealed sources recovered in coordination with the SCATR program are authorized for disposal under the variance. Among the radionuclides acceptable for disposal are several which are particularly important from a national security, health, and safety standpoint. Cobalt-60 and cesium-137, two of the most commonly used gamma-emitting radionuclides, are eligible for disposal at Clive, within the specified limits. Table 1 includes some common radionuclides eligible for disposal under the initiative, along with the activity limits required by the variance.

[3] On August 2, 2011, Energy*Solutions* submitted to the DRC variance request CDll-0216 to RML UT 2300249. In a meeting on August 18, 2011, Energy*Solutions* presented their request to DRC staff.

Table I: Commonly Used Radionuclides and Class A Limits

Isotope	Class A Limit	Isotope	Class A Limit	Isotope	Class A Limit
Co-60	25.9 MBq/cm3	I-125	25.9 MBq/cm3	Ir-192	25.9 MBq/cm3
Cs-137	37 kBq/cm3	Cd-109	25.9 MBq/cm3	Zn-65	25.9 MBq/cm3
Gd-153	25.9 MBq/cm3	Ba-133	Unlimited	Tl-204	25.9 MBq/cm3
Fe-55	25.9 MBq/cm3	Ge-68	25.9 MBq/cm3	Na-22	25.9 MBq/cm3
Co-57	25.9 MBq/cm3	Eu-152	Unlimited	Mn-54	25.9 MBq/cm3
Po-210	25.9 MBq/cm3	Pm-147	25.9 MBq/cm3	Au-195	25.9 MBq/cm3

In order to encourage generators to take advantage of this opportunity, CRCPD offered to share the cost of Class A sealed source disposal at Clive. While the ultimate support offered will depend on a variety of factors –including the cost of collection, processing, transportation, and disposal, as well as the generators' ability to pay—SCATR is targeting a 50 percent cost-share in order to take advantage of this opportunity.

However, one of the most important elements of this collaborative effort is the model it provides to other sites and states which may be able to undertake similar efforts in support of national security and public health and safety. It is never an easy decision for regulators or the citizens they serve to allow for changes in the type or amount of radioactive material disposed in their states. This effort provides other states and regulators with a precedent and a path forward for crafting similar initiatives in the future.

RESULTS

The results of this collaboration should not be solely judged by the number of sealed sources disposed. This collaborative effort should also serve as a template for how regulators and licensees can align varied interests with respect to matters supportive of national security and public health and safety. The term of the license variance was for one year, to start upon the arrival of the first shipment of sealed sources at the Clive facility. The first shipment arrived on September 30, 2013 with 23,908 sealed sources. The second and third shipments were not scheduled to arrive until after expiration of the license variance in September 2014, Energy*Solutions* applied for and the DRC granted an extension to the variance to allow for management of these two additional shipments. Shipments two and three arrived at Clive on December 23, 2014 with a total of 17,280 sealed sources. Even though the license variance has since expired, the successful collaboration has lead Energy*Solutions* to request a formal amendment to its Radioactive Material License. It is anticipated that this license amendment will allow generators an option in the continued safe management and disposal of additional sealed sources.

CONCLUSION

While the efforts by the DRC, Energy*Solutions*, GTRI, and CRCPD are a necessary and unprecedented first step, the importance of the effort can only be judged by the number of sources ultimately disposed moving forward. The opening of Waste Control Specialists (WCS) LLRW facility in Andrews County, Texas provides another outlet for sealed source disposal not available when this collaborative effort began. However, the process for generators to allocate disposal funding and initiate disposal will still be challenging. Even with such challenges, the success of this collective effort serves to exemplify the value of continued partnerships to address the future management and disposal of sealed sources. Accordingly, the LLRW Forum Disused Sources working group, as presented in a report released in March, 2014, identified many new challenges and offered several recommendations to encourage further dialogue and cooperation on areas of common interest and mutual benefit throughout the life cycle of sealed sources.