Title: OFF-SITE SOURCE RECOVERY PROJECT HISTORY AND CURRENT STATUS


Submitted to: American Nuclear Society
Radiation Protection & Shielding Division
Year 2000 Topical Meeting

Los Alamos
NATIONAL LABORATORY

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ABSTRACT

Beginning in the 1950's the federal government, through the Atomic Energy Commission, began providing limited quantities of special nuclear material to industry and research institutions to stimulate advances in nuclear science and technology. By the early 1960s the identified beneficial uses of radioactive material had added Am-241, Cs-137, Co-60, and Sr-90 to the list of common isotopes which were distributed in significant numbers as high-energy sealed sources for industry, medicine and research. By the mid 1980s many of these sealed radioactive sources were thirty years old and the changing priorities of research and industry had rendered many of them excess. Unfortunately, many of these sources exceeded activity limits established for Low-Level Waste (LLW) disposal and the owners were left with no viable options to rid themselves of unwanted material. In 1985, Congress attempted to address this concern by assigning responsibility for disposal of radioactive material which exceeded the Class-C LLW limits to the US Department of Energy (DOE) in the Low-Level Waste Policy Amendments Act of 1985 (PL 99-240). As with other attempts for disposal facility development however, the years passed and the facilities were not forthcoming.

This paper briefly describes the history of government efforts to effect retrieval of these sources and provides projections on availability of retrieval services by Los Alamos National Laboratory (LANL). A summary of eligible materials, points of contact at LANL, and recommended actions by current source owners are included.

I. HISTORY

Until early in Fiscal Year 1999, Los Alamos National Laboratory (LANL) operated three separate, but related programs on behalf of the US Department of Energy (DOE) Headquarters. Each of these programs, in a limited way, attempted to address the problem of unwanted actinide-bearing sealed sources. However, following assignment of program responsibilities to DOE Albuquerque Waste Management Division (DOE-AL/WMD), these programs were amalgamated into a single effort called Off-Site Source Recovery (OSR) Project which refocused its priorities to accelerate acceptance by DOE of excess and unwanted sealed sources in advance of available disposal.

A. Plutonium-239/Beryllium (Pu-239/Be) Neutron Source Recovery Project

Operated at LANL from 1979 until 1999, this program was funded by DOE Defense Programs as a viable means of both recovering unwanted sources and the plutonium used in the construction of these sources.

- The sources were destroyed, the isotopes chemically recovered, and the recovered materials were stored as plutonium oxide
- Over 1,100 sources were recovered
- The program was limited by obvious factors such as cost per source (> $20,000 each) and limited reprocessing capabilities (80-100 per year)
• Additional limitations included difficulties and expense associated with:
  - Creation of process wastes
  - Segregation of defense and non-defense wastes
  - High worker exposures in program operations

B. Off-Site Waste (OSW) Program

Assigned responsibility for responding to requests from other agencies for the return of DOE-owned materials, and all other issues dealing with waste management problems not on a DOE site.

- Operated from 1993 until 1999
- Responded primarily to requests for return of DOE-owned materials in the hands of colleges, universities and other entities, most of which were part of loan-lease programs
- By 1993, had responded to more than 15 requests from the Nuclear Regulatory Commission (NRC)
- Was not tasked with issues involving GTCC waste, which were the responsibility of the National Low-Level Waste Program
- Started looking at solutions to GTCC sealed sources due to difficulties associated with response to NRC requests for retrieval – no long term solution

C. Radioactive Source Recovery Program (RSRP)

During the time frame in which the OSW Program operated, considerable concern arose over the risks presented by GTCC sealed sources and the lack of a disposal path for GTCC wastes. The results were assignment of off-site waste issues from DOE HQ to field offices and the creation of the RSRP with the responsibility for creating and effecting the DOE capability to:

- accept GTCC sealed sources prior to disposal capability being in place
- manage the GTCC sealed sources, including storage, treatment, packaging and transportation
- assess appropriate fees for the management services

Although the program was targeted towards sealed sources, which are GTCC, it was not limited to just those items. During its operations, the RSRP:

- Identified options and developed plans for efficient retrieval mechanisms and transport from owners to LANL
- Coordinated and completed a Pilot Program to evaluate effectiveness of plans for recovery
- Recovered 16 sealed sources

D. Off-Site Source Recovery Project

At the beginning of FY 1999, DOE-AL/WMD assumed management of these programs, all of which were operated by LANL, and was tasked by DOE HQ to reevaluate the existing programs and examine alternative management strategies to effect compliance with PL-99-240.

Using information obtained from operations of the three related programs, WMD determined that some of the original assumptions were now invalid and that operations could be performed that previously were considered unacceptable. The resulting conclusions indicated that changing the management approach to one of aggressive source recovery for storage until disposal is made available would reduce risk to the public, reduce liability to DOE and expedite compliance with PL99-20 for sealed sources.

The results anticipated from changing the strategy on all existing source recovery and off-site waste efforts argued for a total reconfiguration of these programs into a single project, which was named the Off-Site Source Recovery (OSR) Project.

In January 1999, DOE-AL assigned LANL management of this project to the Waste Management Program Office within E Division with three immediate objectives:

- Mobilize to recover 41 sealed sources that DOE-AL had directed be recovered based on a request from the NRC.
- Develop a scope for the newly organized project, and begin the process of reconfiguring the operational structure at LANL to shift from source processing to source recovery and storage
- Prepare existing LANL transuranic (TRU) waste storage facility to receive and manage recovered actinide bearing source inventory in a safe and cost effective manner
II. CURRENT STATUS AND ACHIEVEMENTS – OSR PROJECT

Since January of 1999, the Off-Site Recovery Project has made considerable progress in establishing the Project team and LANL infrastructure required to reach full scale operations.

Team members include the project leader, two project engineers, one each for on and off-site activities, an operations coordinator, an information management specialist and a disposal engineer who concentrates primarily on developing long term GTCC disposal capability.

Accomplishments have included:

A. On-Site

- Team staffing
- Development and implementation of team operational documents required for work within LANL and DOE authorization basis, safety, quality and other operational requirements
- Creation of work agreements and “contracts” within LANL to make available personnel and facilities for receipt, inspection, packaging and storage of retrieved materials
- Progress towards obtaining WIPP certification for disposal of eligible materials
- Development of containers for shipment, storage, and disposal
- Development of “Special Form” capsules
- Identification and implementation of programmatic plans for assessment of long term disposal issues/options

B. Off-Site

- Recovery of 92 sources
- Established contracts with multiple commercial operations for collection, consolidation and transport of sources to LANL
- Established contracts for a mobile retrieval capability
- Established contracts for removal and consolidation of sources from certain instruments
- LANL team retrieval of sources at several locations and assistance visits to owners as required
- Site visits to owners of large quantities of sources, (pacemakers, well-logging, etc.)

C. Disposal

- Assembled a team to pursue analysis of disposal options
- Prepared a plan for achieving licensed disposal capability by 2006.

III. Contacting the OSR Project Team

Owners of GTCC sealed sources that are no longer needed, and for which no disposal pathway exists may contact the OSR Project Team for an initial evaluation of source eligibility sending an e-mail to osr@lanl.gov.

A project web site is currently being constructed which will allow electronic inquiries, registration and submission of information needed to determine both source eligibility and management under the project.

REFERENCES

2. Leonard, L. E., et. al., The Off-Site Source Recovery Project at Los Alamos, LA-UR-99-6218, Los Alamos National Laboratory, Los Alamos, NM.