Off-Site Source Recovery Project Operations

for NNSA Office of Global Threat Reduction

Dwaine Brown
Off-Site Source Recovery Project
Los Alamos National Laboratory

September 2010
LA-UR-08-06830
Overview

- Introduction to OSRP and Sealed Source Problem
- Capabilities Including Packaging
- Highlights/Accomplishments
- Am-241 “Recycle”
- International Expansion
What is the Off-Site Source Recovery Project (OSRP)?

- Begun in 1999 at Los Alamos National Laboratory as part of DOE-EM
- Recovers and permanently dispositions excess, unwanted sealed sources
- Manages ten primary isotopes, including: Am-241, Cf-252, Cm-244, Co-60, Cs-137, Ir-192, Ra-226, Pu-238, Pu-239, and Sr-90
- Other source types managed as needed.
DOE Source “Recovery” History

• Late 1970s – 1999: LANL destroys old Pu-239 sources – about 1,100 total
• 1992 - agreement with NRC - DOE to accept sources identified as threat to public health, safety or loss of control - 15 responses from 1992-2000
• 1999 – DOE EM consolidated 2 programs into the OSR Project
• 2003 - Transferred to NNSA Defense Nuclear Nonproliferation, now Global Threat Reduction
• 2004 – Scope expansion beyond three GTCC isotopes
Who Uses Radioactive Sealed Sources?

50+ Years of Isotope Distribution in the U.S.

Oil and Gas Service Companies

Colleges and Universities

Manufacturing

Medical Facilities

Military Installations

Construction Industry

DOE and Government Sites

LA-UR-08-06830
The OSRP Mission for NNSA’s Radiological Threat Reduction Program

Remove to secure storage or disposal disused radiological sources that present a potential risk to health, safety, or security (priority agreed between NNSA and U.S. NRC)

LA-UR-08-06830
Current Isotopes Managed

A Gammator containing Cesium 137 recovered from a school district in Texas

<table>
<thead>
<tr>
<th>Nuclides Originally Managed</th>
<th>Additional Nuclides Currently Managed</th>
</tr>
</thead>
<tbody>
<tr>
<td>²⁴¹Am</td>
<td>²⁴⁴Cm</td>
</tr>
<tr>
<td>²³⁹Pu</td>
<td>²²⁶Ra</td>
</tr>
<tr>
<td>²³⁸Pu</td>
<td>⁹⁰Sr</td>
</tr>
<tr>
<td>²⁵²Cf</td>
<td>⁶⁰Co</td>
</tr>
</tbody>
</table>

All nuclides currently found in sealed sources of concern to IAEA

LA-UR-08-06830
NNSA Office of Global Threat Reduction

• Reorganized in 2006, now NA-21
• Three major activities: Convert, Protect, Remove
• Organized geographically: North and South America; Europe and Africa; and Former Soviet Union and Asia
Why Recover/Remove Sources?

- Bad things happen due to no disposal pathway – accidental exposures, inappropriate burial, loss of control and identification
- One of NNSA’s 3 options – remove makes sense for materials not in use
- Allows the ultimate sustainability – IF there is a permanent disposal pathway
- Often relatively inexpensive, uncomplicated
Locating Sources for Management

- Individual Source Owners
- OSRP Website
- Regulators (NRC, States, CRCPD)
- Emergency Responders
- Professional Organizations
OSRP Web Site: http://osrp.lanl.gov

The Off-Site Source Recovery Project (OSRP) recovers excess, unwanted, abandoned, orphan-radioactive sealed sources and other radioactive material from the environment. The initial scope of the Project included all Greater than Class C (GTCC) sealed sources. In the post-9/11 environment the mission expanded from environmental concerns to national security.

In October 2003, the Project moved from the Department of Energy's (DOE) Office of Environmental Management to the National Nuclear Security Administration (NNSA) under the Radiological Threat Reduction Program (NA-211). The expanded OSRP mission includes beta-and-gamma emitting sources, which are of concern to both the U.S. government and the International Atomic Energy Agency (IAEA). Read more on the OSRP mission expansion and register sources.

To date, the Project has recovered more than 11,000 radioactive sources, more than two-thirds of the actinide sources known to be excess and unwanted. The OSRP expects to recover a total of 18,000 actinide sources by decade's end.

Watch a video of sources being loaded for packaging and transport to the Waste Isolation Pilot Plant (WIPP).

See our U.S. recoveries to date
Any site having unwanted or excess radioactive sealed sources should register as soon as possible.
For registration, questions, and comments, please e-mail osrp@lanl.gov or call 1-877-670-1749.

Los Alamos National Laboratory
The World's Greatest Science Protecting America
Capabilities: What is Required for Successful Source Recovery?

• First - a **Team** of qualified people that work together well.
• Second - **Tools**.
• Third - a **Place** to put down what you pick up.
• Last - a **Plan** for the Future.
Los Alamos Source Recovery Team

- Fully trained team for field recovery
  - Certified Health Physicists
  - Qualified RAM Shippers
  - Radiological Control Technicians
  - WIPP-Qualified Packagers
  - MC&A Custodians
  - TRU and LLW Disposal Experts
  - TRU Characterization Capability

LA-UR-08-06830
Other Major OSRP Activities

- Source and manufacturer research
- Source registration website and management database
- Outreach, work with manufacturing/using industries
- Contamination control
- Container research and certification
- Transportation
- Storage and Disposal
- Support to IAEA
Tools and Equipment

TRU sealed sources – special form capsules, shielded Type A fissile-certified transportation containers – domestic and international use
Capabilities

• Perform special form encapsulation for sealed sources (off-site) to simplify transportation

• Package sealed sources in accordance with DOT/NRC regulations and, for TRU sources, to WIPP waste acceptance criteria

• Hot cells for removal from devices, consolidation
Packaging Capabilities

- Field-sealable special form capsules for material exceeding $A_2$ limit with lapsed or lost special form certificate
- CoCA from DOT for Model II and III special form capsules
- Also C of C and CoCA from DOT for Type A fissile pipe overpack drum – the S300
- Developed lead inserts for special form capsules to be used with Ra-226 sources
Secure Storage - Recovered Sources

- Storage for recovered actinide sealed sources at LANL – about 600 drums.
- Storage under safeguards for Pu-239 sources
- Offsite storage for beta-gamma emitting isotopes
Recovered Sources – A Plan for the Future

- WIPP disposal for US-origin TRU sources
- Pu-239 defense determination and permission to discard
- NTS disposal of DOE owned LLW (Sr-90, Co-60)
- Commercial disposition of beta-gamma sources – recycle, storage, and disposal
OSRP Recovery Summary

OSRP has recovered > 23,000 sources from 841 sites as of May 2010, as summarized below:

<table>
<thead>
<tr>
<th>Isotope</th>
<th>Sources Recovered</th>
<th>Ci Recovered</th>
</tr>
</thead>
<tbody>
<tr>
<td>60Co</td>
<td>884</td>
<td>75,585</td>
</tr>
<tr>
<td>90Sr</td>
<td>169</td>
<td>640,562</td>
</tr>
<tr>
<td>137Cs</td>
<td>2,663</td>
<td>26,003</td>
</tr>
<tr>
<td>238Pu</td>
<td>2,412</td>
<td>13,447</td>
</tr>
<tr>
<td>239Pu</td>
<td>653</td>
<td>939</td>
</tr>
<tr>
<td>241Am</td>
<td>14,510</td>
<td>14,978</td>
</tr>
<tr>
<td>Others</td>
<td>2,026</td>
<td>68</td>
</tr>
<tr>
<td>Total</td>
<td>23,317</td>
<td>771,582</td>
</tr>
</tbody>
</table>
OSRP Sources Recovered

Total U.S. Sources: 22,384 (769,937 Ci)
Total International Sources: 933 (1,645 Ci)

As of June 18, 2010
Major Accomplishments in FY 08

- Successfully disposed of Ra-226 at US Ecology
- Successfully disposed of DOE owned Co-60 and Sr-90 at the NTS
- Recovered over 450 sources of US origin from 8 countries.
- Completed or working recovery actions in Latin America, South America, Northern and Central Europe, Middle East, Africa and Asia
- Cooperative Efforts in China
Am-241 Source Status

• Lack of Am-241 domestic production potentially inhibiting petroleum exploration
• About 400 drums (~8,000 Curies) of larger recovered AmBe sealed sources still stored at LANL
• NNSA NA-21 and NE are in the process of deciding whether material can be recycled to source manufacturers
• LANL will implement based on direction from NA-21
Support to IAEA

- Repatriation of US origin sources from Africa, 1st round complete, another approved
- Participated in operations in Brazil, Uruguay, Africa, Australia and Singapore
- Latin American Partnership – IAEA, US State Department, GTRI, CNEN Brazil
- Spent High Activity Radioactive Source (SHARS) conditioning facility – hot testing successful
- Staff Augmentation and Consultancies
Bilateral International Efforts

- Work in support of NA-21 search & secure
- NA-21 responds to written requests from countries for repatriation of US-origin sealed sources
- Bilateral recoveries complete or underway in Sweden, Denmark, Chile, Ecuador, Italy, Switzerland, Austria and Israel, requests or registrations from Germany, Morocco, Lebanon and Japan
- Search and Secure
Other Future Work

• NA-21 providing voluntary site vulnerability assessments – domestic and international
• Seeking device manufacturer assistance in moving material back to the US for recovery

Questions??