

SEALED SOURCE RECOVERY

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U.S. Department of Energy**



GTRI Mission and Program Goals

DOE STRATEGIC GOAL 2.2

Prevent the acquisition of nuclear and radiological materials for use in weapons of mass destruction and other acts of terrorism

GTRI MISSION

Reduce and protect vulnerable nuclear and radiological material located at civilian sites worldwide.

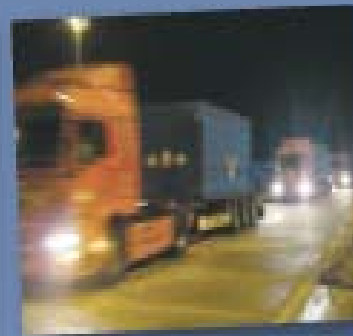
Convert



Convert research reactors from the use of highly enriched uranium (HEU) to low enriched uranium (LEU)

These efforts result in permanent threat reduction by minimizing and, to the extent possible, eliminating the need for HEU in civilian applications – each reactor converted or shut down eliminates a source of bomb material.

Remove



Remove and dispose of excess nuclear and radiological materials; and

These efforts result in permanent threat reduction by eliminating bomb material at civilian sites – each kilogram or curie of this dangerous material that is removed reduces the risk of a terrorist bomb.

Protect



Protect high priority nuclear and radiological materials from theft and sabotage

These efforts result in threat reduction by improving security on the bomb material remaining at civilian sites – each vulnerable building that is protected reduces the risk until a permanent threat reduction solution can be implemented



Off-Site Source Recovery Requirements

Pre-9/11 Source Recovery

- Late 1970's – 1999 – DOE Defense Programs begins recovering Pu-239 sources for potential reuse of the radioactive material (approximately 1,100 sources).
- 1992 - NRC and DOE agreement provides a framework for DOE/EM acceptance of sources identified by NRC as a **threat to public health and safety**
- 1999 – DOE/EM established the Offsite Source Recovery Project (OSRP) to recover and permanently dispose of excess, unwanted Greater-Than-Class-C (GTCC) sealed sources including Am-241, Cm-244, Cs-137, Pu-238, Pu-239, and Sr-90
- 1999 - DOE/EM and NRC sign MOU Concerning Management of Sealed Sources



Post-9/11 Threat Reduction

- 2002 – In response to 9/11, NRC Chairman Meserve requests DOE to “consider the acceleration of its recovery of unwanted radioactive materials through the Offsite Source Recovery Project”
- 2003 – OSRP is transferred to DOE/NNSA; and GTRI after formation in 2004



Further Expansion

- Scope expanded beyond the GTCC isotopes due to **national security concerns** (2004)
- Included four additional isotopes: Cf-252, Co-60, Ir-192, and Ra-226 as well as Class A-C quantities of Cs-137 and Sr-90
- GTRI, in coordination with NRC, has developed a recovery prioritization criteria based on threat reduction mission

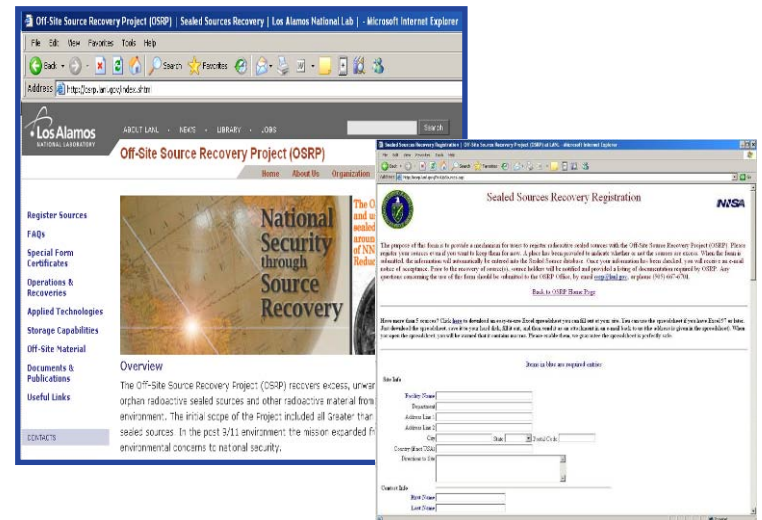


FY2009 Budget Language: **“Removing domestic radiological materials by working in cooperation with Federal, State, and local agencies, and private industry to recover and permanently dispose of excess radiological sources in the United States.”**



GTRI Source Recovery

- Basic recovery steps
 - Register via GTRI OSRP website
 - Analyze transportation and container situation
 - Package sources
 - Transport to secure storage
 - Permanent disposition
- Cumulative recoveries to date
 - 21,243 sources recovered (as of March 31, 2009)
 - 717,339 total Curies
- FY2008 recoveries
 - 3,153 sources recovered
 - 544,181 total Curies
- Current backlog of sources
 - 9,391 sources in backlog
 - 2,114,165 Total Curies





Disposal Challenges

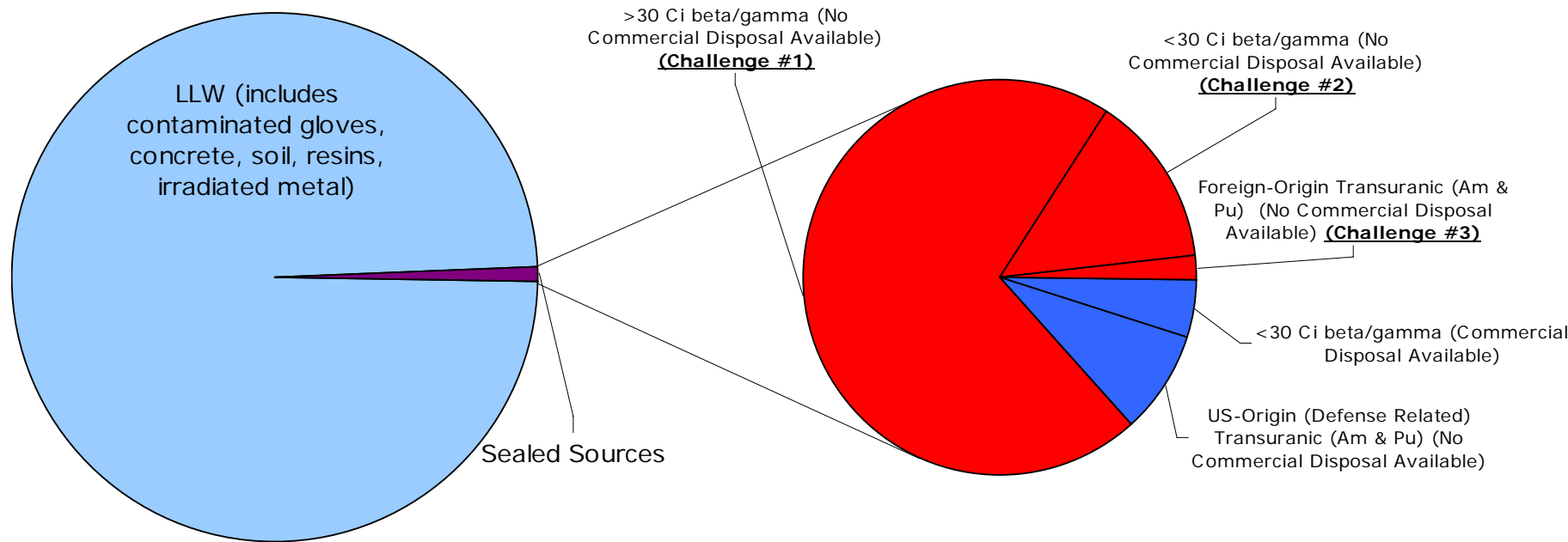
#1 - Lack of commercial disposal for high-activity beta/gamma sources (primarily Co-60, Cs-137, and Sr-90) in wide use primarily in medical and irradiation applications

#2 - Lack of disposal for lower-activity beta/gamma (Cs-137, Co-60, and Sr-90) sealed sources in 36 states

#3 - Significant increase in foreign-origin Am-241 used in the U.S.

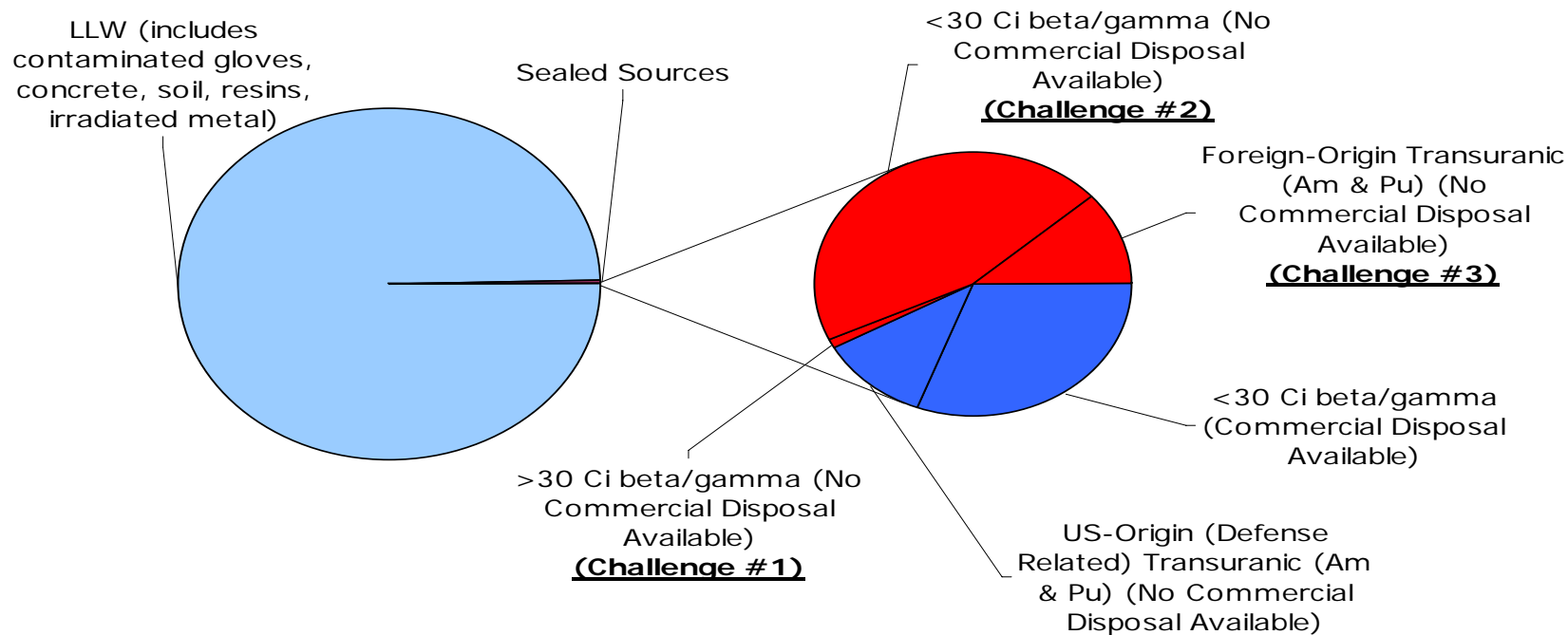


Problem Scope: Low Level Waste By Activity (Notional)





Low Level Waste By Volume (Notional)



**Total LLW
(Sealed Sources <1%)**

Sealed Sources

Focus Group on Recovery and Disposition Options for Disused Radioactive Sealed Sources:

- **Information Paper approved by DHS-led public/private-sector Government Coordinating Council/Sector Coordinating Council (GCC/SCC) in December 2008**
- **Five meetings since early February 2009**
- **Participants from Federal & State governments, Compacts, Private Sector**



Objectives

Develop a clear, concise, single message on the potential national security concerns presented by the lack of commercial disposition options for sealed sources (Problem Statement).

Convey that not all low-level radioactive waste (LLW) is a potential national security concern; only a small and manageable subset comprising sealed sources.

Investigate and recommend immediate and long-term options to address the threat (Solutions).

Develop a message delivery strategy to include target audience and the GCC participants who will deliver the message (both Problem and Solution).



Adopted 2/20/2009

The lack of disposal pathways for radioactive sealed sources (which make up less than 1% of all low level radioactive waste by volume and activity) poses a potential national security concern. During their service life, these sources have numerous critical and beneficial medical, industrial and research applications. However due to their high activity and portability they can potentially be used in radiological dispersal devices commonly referred to as "dirty bombs," resulting in economic impacts in the billions of dollars and significant social disruption. Every year, thousands of sources become disused and unwanted in the United States. While secure storage is a temporary measure, the longer sources remain disused or unwanted the chances increase that they will become unsecured or abandoned. Thus, permanent disposal is essential. However, there are significant political, statutory and regulatory challenges associated with disposal.



Conclusion

Focus Group is currently considering any and every option (new and existing facilities)

Disposal is important as both an end in and of itself and a prerequisite for storage

There is no one perfect solution

Continued Federal, State, Compact, Private-Sector engagement is critical