

“Cats and Dogs” Disposition at Sandia: Last of the Legacy Materials

By

Warren R. Strong and John L. Jackson

Nuclear Materials Management Team (NMMT)

Sandia National Laboratories, New Mexico

July 2000

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OSTI**Summary**

Over the past 12 months, Sandia National Laboratories, New Mexico (SNL/NM), has successfully conducted an evaluation of its nuclear material holdings. As a result, approximately 46% of these holdings (36% by mass) have been reclassified as no defined use (NDU). Reclassification as NDU allows Sandia to determine the final disposition of a significant percentage of its “legacy” nuclear material. Disposition will begin some time in mid CY2000.

This reclassification and the proposed disposition of the material has resulted in an extensive coordination effort lead by the Nuclear Materials Management Team (NMMT), which includes the nuclear material owners, the Radioactive Waste/ Nuclear Material Disposition Department (7135), and DOE's Albuquerque Operations Office. The process of identifying and reclassifying the “cats and dogs” or miscellaneous lots of nuclear material has also presented a number of important “lessons learned” for other sites in the DOE complex.

Background

Like many of her sister laboratories throughout the DOE complex, SNL/NM amassed considerable quantities of various nuclear materials during the Cold War. However, during the 1980s R&D efforts and initiatives related to the Cold War were curtailed, and in many cases, project funding was abruptly discontinued. Furthermore, final disposition of excess material was rarely, if ever, considered or funded during project planning. The resulting inventory of excess nuclear material is part of the Cold War's legacy.

For the most part, these materials were used infrequently and stored for decades in our material balance areas (MBAs) located within the Manzano Storage Complex and Technical Area V. The costs of protecting and storing these materials strained already limited and declining safeguards and security budgets.¹

Beginning in 1994, Sandia recognized this problem and regarded reducing nuclear material inventory a corporate priority.² From 1994 through 1998, surplus or NDU inventories were reduced by more than 26 metric tons. Not only did SNL

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eliminate nearly all of its surplus Category I and II targets, but it also significantly reduced the number of MBAs, reduced the number of nuclear facilities, and eliminated many radiological hazards. As a result of the reduced inventory, SNL was able to manage its holdings more easily and at a lower cost from a safeguards and security as well as nuclear materials management perspective.

After SNL's last, large shipment of more than 2 metric tons of low-enriched uranium fuel in the fall of 1998, it soon became clear that only the so-called "cats and dogs" or miscellaneous lots of surplus inventory remained.³

Motivation for Reclassification

Because the nuclear material owners did not pay for storage or help defer the safeguards and security costs of protecting, transferring, and inventorying the remaining "cats and dogs," they had little incentive to dispose of their nuclear material holdings or reclassify them as NDU. In addition, there was little or no money available to launch any credible reclassification effort

In the spring of 1999, DOE's Office of Fissile Materials provided the financial incentive to reclassify and dispose of the "cats and dogs." SNL received significant funding from DOE to reclassify the remaining legacy material as NDU⁵. The money arrived with an important caveat, only material declared as NDU and submitted for disposal on a disposal request form before October 1, 1999, would be covered by the funding. After September 30, 1999, the costs of any material submitted for disposal would be charged back to the owning department.

Reclassification Efforts Begin

The NMMT relied extensively on the nuclear material owners as well as the Radioactive Waste/Nuclear Material Disposition Department (7135) to identify those "cats and dogs" that were likely candidates for final disposition.

SNL began analyzing its nuclear material holdings using a nuclear material database that was designed and built in 1994 when the Corporate Nuclear Material Disposition program was first initiated. The database is populated by a direct download from SNL's Local Area Network Material Accounting System (LANMAS) and the national Nuclear Materials Management and Safeguards System (NMMSS).

LANMAS contains an inventory" of SNL's active MBAs for material accountability and control (MC&A) purposes. The NMMT database is revised regularly with the most current information from the LANMAS. Regular revision ensures accuracy and agreement between the NMMT database, LANMAS, and NMMSS inventory data.

Nuclear material inventory information can be sorted a number of ways including MBA location, material type, material owner, and usage designation. Common usage designations include Defined Use, Active (DA); Defined Use, Inactive (DI); No Defined Use, Usable (NU); No Defined Use, Needs Reprocessing (NP); and Waste- DOE Approved (WA). The ability to sort nuclear material holdings on different parameters at the item level affords the flexibility to perform unique, innovative inventory analyses.

Although the nuclear material database contains names of material owners associated with each accountable item of nuclear material in the inventory, many owners could not recall when they had last used the material or even if or when they had initially been assigned ownership. Thus, a series of meetings was held in which "owners of record" were identified. In some instances, ownership was transferred to more appropriate individuals. Most nuclear material owners queried about their legitimate need for their holdings replied that they did not have a current need for much of the material assigned to their projects.

Once ownership and lack of need to retain many of the "cats and dogs" were established, the reclassification effort proceeded quickly. Candidates for reclassification were identified and were sent to DOE for approval, and the necessary federal approvals were quickly obtained. The responsiveness of the DOE Operations Office has been a critical element in SNL's inventory reduction efforts. By May 1999, SNL had reclassified approximately 46% of its total nuclear material holdings (Figure 1).

Disposition Path Identification

Most of SNL's "cats and dogs" are Category III or IV pure or mixed nuclear material (i.e., radioactive materials mixed with low levels of hazardous metals). This nuclear material will probably be buried at low level nuclear waste or mixed waste disposal sites in Nevada⁴ and Utah. About 30 kg of highly enriched uranium oxide granules will be sent to ORNL's Y-12 Plant via DOE's Central Scrap Management Office (CSMO) for reuse.

To further facilitate shipment off-site, the NMMT has grouped other NDU material into several "lots" that contain nuclear material of similar isotopes (e.g., U-235, or Pu-239) or material composition (e.g., powders, filings, metal pieces).

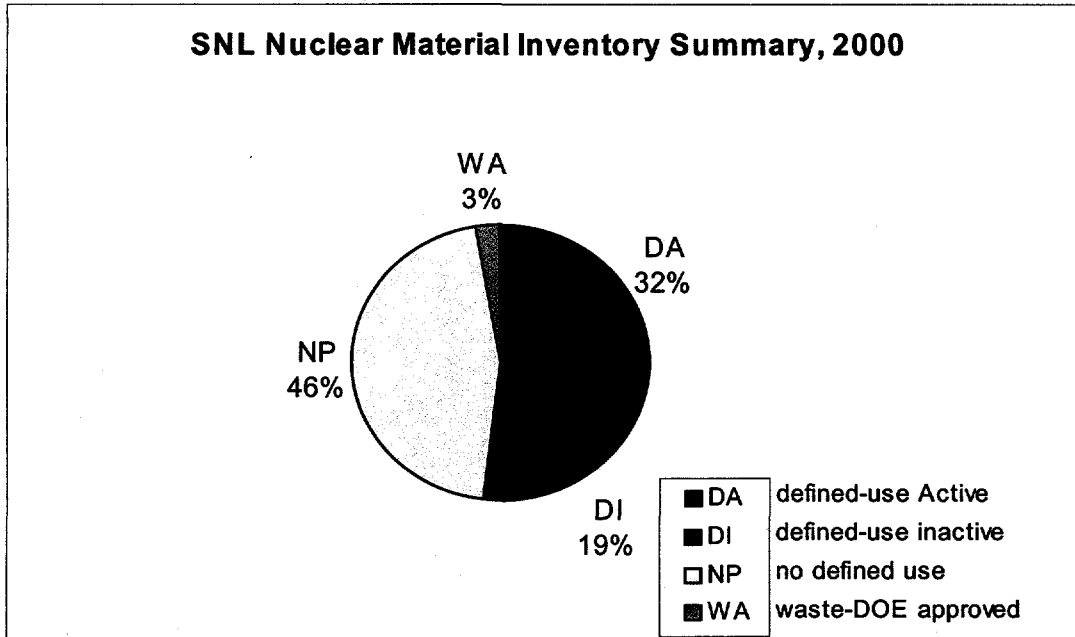


Figure 1. SNL Nuclear Material Inventory Summary, 2000

“Lessons Learned” for the DOE Complex

Based on recent experiences at SNL/NM, the NMMT identified the following “lessons learned”:

Adequate Shipping Container Expertise

The ultimate measurement of success is the actual shipment of the nuclear material off-site. Before shipment can take place,

- A site like NTS must accept the material
- “Certified” shipping containers must be procured and loaded with the materials.

Although this process appears to be a straightforward procedure, opinions as to what containers were certified were as numerous as those individuals whom we contacted at DOE as well as at SNL.

The 55- and 110-gallon DOT 6 M containers with internal 6R pipe will be used where appropriate. A number of new or slightly used containers of this sort are stored at SNL/NM and are available for use. ^{6,7}

Early Identification of Primary "Stakeholders"

Once authorized by DOE, the primary stakeholders (NMMT, nuclear material owners, and DOE/AL) held a number of coordination meetings to plan the reclassification effort.

Corporate and DOE Buy-in

The reclassification effort would not have been possible without support by our corporate officers and senior officials at DOE/AL.

Close Working Relationship with MC&A Measurements Personnel

Because many of the "cats and dogs" were not well-characterized, the cooperation of our nuclear measurements team was essential to ensure that the sites accepting the material were fully apprised of the material's characteristics. Also, many times bulk material will be combined for packaging and transportation purposes. Close coordination with the MC&A team is required to facilitate any modifications or other adjustments to the accounting system.

Acknowledgement

The authors would like to thank Messieurs Nazir Kahil and Jerry Evans of the DOE Albuquerque Operations Office for their moral and financial support of this project.

In addition, several programmatic material owners, especially Dr. Kenneth Reil, Manager, Reactor Safety Research Department, provided their knowledge of much of the excess inventory as well as valuable shipping container expertise. Finally, Mr. Earl Conway, Manager, Radioactive Waste and Nuclear Material Disposition negotiated with DOE to fund the reclassification and disposition effort and made his staff and facilities available. We believe that the concept of environmental (waste) liaison personnel working closely with the NMMT and material owners was instrumental in the success of our reclassification effort.

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Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy under contract DE-AC04-94AL85000.