U.S. Department of Energy Nuclear Materials Disposition Guidance

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Nuclear Material Disposition Guidance

- Provides guidance for executing requirements for nuclear material disposition as outlined in DOE Orders 410.2 *Management of Nuclear Materials* and DOE Order 474.2 *Nuclear Material Control and Accountability*
- Provides roadmap for disposition process
- Provides additional guidance on Programmatic Value Determination (PVD) Request Process
- Explains the process to establish Site-Level Discard Limits (DL)
- Approves Complex-Wide Discard Limits for certain uranium & plutonium materials

NNSA Recycles Irreplaceable Heavy Isotopes Valued at $8.8 Million

- NNSA press release, dated October 17, 2011
- 40 g curium-244/246 transferred to Oak Ridge and Idaho National Laboratories from Los Alamos
- Lessons learned from this experience are foundational to our nuclear material disposition processes in use today

Material Identified for Disposition (No Defined Use)

- Disposition process is initiated with No Defined Use designation (unneeded at holding site)
  - Holding site (lab, plant)
  - DOE Field Element (i.e. site/field office)
  - Program owner
- If needed at another location, sites work details of material transfer, using the forecast and allotment process, as appropriate, to document approval of the transfer
- For assistance in determining appropriate disposition, or to request authorization to dispose as waste, Host Site notifies ONMI and Appropriate Program Office
  - Via Programmatic Value Determination (Appendix B)
  - Provides Material Characterization Information
  - Site may recommend appropriate disposition path

Programmatic Value Determination

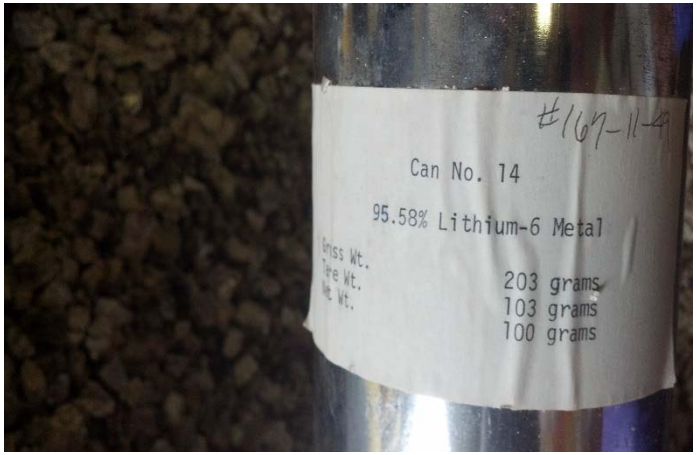
- The PVD process reviews material that a holding site determines is no longer needed & is targeted for disposition (disposition may include use at another site, recycle, or disposal as waste)
- The Office of Nuclear Materials Integration coordinates the PVD prior to any disposal. This determination should proceed before any significant degradation of the material
- If a need for material is identified within DOE, ONMI or Program Office may recommend transferring material to a more suitable location

Analyze DOE Needs

- The Guide specifies basic material characterization information that should be provided with PVD request
  - This information assists ONMI & the Program Office with determining whether material has a use at another site, or requires review by other subject matter experts
  - SMEs may request additional detail
- PVD process has proven successful, meeting needs for ongoing and emerging mission activities, and allowing disposal of tons of unneeded nuclear materials

Nuclear Material Bulletins

- Argonne identified ~500 g Lithium-6 metal excess to their needs
- Y-12 recommended disposal-due to small quantity/poor characterization information
- Nuclear Materials Bulletin issued, generating interest from three sites
- Material was split between Idaho and Savannah River National Laboratories and Y-12



Nuclear Materials Advisory Board

- Savannah River requests Programmatic Value Determination to dispose of 6 MT “non-MOXable” plutonium
- Material was previously declared Excess to National Security requirement, but . . .
  - It could have other programmatic uses
  - We can swap National Security Materials for Excess
- Because of the large number of items and classified details, a Nuclear Materials Bulletin was not a good option for coordination
- Advisory Board meeting convened to review

Material Characterization

- Material form and quantity
- NMC&A Category and Attractiveness Level
- Material composition (physical and chemical form, constituents, impurities, and assay)
- Security classification
- Potential programmatic uses
- National Asset candidacy
- Other information deemed relevant to the determination

Programmatic Value Factors

- Market and/or strategic value (replacement)
- Cost to maintain or store the material
- Cost to ship to another facility
- Population (number of items) of current and future inventory
- Cost to recover and process for reuse (e.g., capability exists or new equipment capability will be required)
- Waste facility available and waste acceptance criteria considered
- Cost to dispose
- Environmental, safety, and health concerns
- Benefits of disposal (e.g., eliminations of risks and recapture of storage space)
- MC&A/security requirements
- Other applicable factors

Transfer to Another Program or Site

- Transfers of ownership are coordinated through the annual Material Forecast and Allotment Request
  - Submitted to ONMI annually
  - Supplemental Allotment Requests processed as necessary
- Transfer of material quantities below the threshold quantity discussed in the Annual Call for Nuclear Material Forecast and Allotment Request may be transferred without notification to ONMI
- ONMI approves/denies Allotment Requests with concurrence of affected program offices
  - Shipping site and receiving site work together to ensure all requirements are met for a compliant shipment

Discard Limits (DL)

- A DL is a threshold quantity at or below which material may be discarded as waste - May be established at site or complex level
- The Guide establishes complex-wide DLs for some low-equity materials that clearly have no programmatic value
  - Outlines a process for site to request additional DLs
- This document DOES NOT CHANGE Termination of Safeguards process
- Note that DLs do not override DOT, WAC, or NCS requirements related to discard of material

Summary

- Application
  - Guidance/Clarification for sites on Disposition Process
  - Outlines a more uniform approach to the PVD Process.
  - Should result in improved information exchange, & reduced processing time for Program/ONMI reviewers & other SMEs

Questions?

Additional Slides

Complex-Wide Discard Limits

1. Depleted Uranium (DU) & Normal Uranium (NU) Forms

MATERIAL	IDES CODE	DISCARD LIMIT CONCENTRATION		MASS (kg U) Per Item or Lot
Metal[+]	M44	< 99.80% U	or	< 10
U-Mo Metal[+]	M74	< 88.00% U		
U-Nb Metal[+]	M74	< 94.00% U		
Oxide	C00	< 80.00% U		
UF_4	C28	< 98.70% UF_4		
UF_6	C28	< 99.50% UF_6		
SOLUTION	S00	< 400 gU/L	or	< 5

2. An enriched uranium material form for which the concentration of U-235 in the matrix is no more than 0.1%.
3. A weapons grade plutonium material form for which the concentration of plutonium in the matrix is no more than 0.1%.
4. The following Attractiveness Level E Materials:
   - Pu 239 – Pu 241
   - Uranium enriched >20%
5. Material expended in place in experiments (unrecoverable).