K Area Overview/Update

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Nuclear Materials Committee
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To provide information on K-Area and Plutonium storage which fulfills a 2015 Nuclear Materials Programs work plan item.
DOE - Department of Energy

IAEA - International Atomic Energy Agency

LANL - Los Alamos National Laboratory

LLNL - Lawrence Livermore National Laboratory

Pu - Plutonium

RFETS - Rocky Flats Environmental Technology Site

SRS - Savannah River Site
1998 Department decided to consolidate non-pit Plutonium (Pu) from various sites to the Savannah River Site (SRS)
   - Rocky Flats Environmental Technology Site (RFETS)
   - Hanford Site
   - Los Alamos National Laboratory (LANL)
   - Lawrence Livermore National Laboratory (LLNL)

1998 the Department decided to convert the K Reactor to a plutonium storage facility.

2001 Department approved the consolidation of only RFETS Pu to SRS

2007 Department approved the consolidation of remaining non-pit Pu to SRS
   - Hanford
   - LANL
   - LLNL
Pu Under Safeguards

- SRS has approximately 3 metric tons of Pu under International Atomic Energy Agency (IAEA) safeguards

  - RFETS and Hanford each had approximately 1 metric ton of Pu under IAEA safeguards prior to consolidation

  - This material was transferred to SRS and remains under IAEA safeguards

  - The Department placed an additional metric ton of Pu under IAEA safeguards
K Area Storage in 2000
K Area Storage
K Area Storage Configuration

3013 Container
(~30 lbs.)

9975 Shipping Container
(~400 lbs.)
Cross Sectional of 9975 Shipping Container
In 2010 the Department initiated a project to expand the storage capacity of K Area.

The decision to expand K Area capacity was made prior to any discussions concerning Mixed Oxide Fuel Fabrication project future.

Phase I was completed and became operational in June 2012.

Phase II was completed and became operational in December 2014.

The expansion added an additional 2,500 storage positions.
3013 Surveillance Program

- Surveillance and Monitoring program approved 2003
- Non Destructive Examination (NDE) looks for pressurization
  » Began 3 years after packaging (2005)
  » Performing ~ 40 per year
  » Completed the NDE
- Destructive Examination (DE) looks for corrosion, gas analysis, and material characteristics
  » Began 5 years after packaging (2007)
  » Initially 15 DEs per year
  » Currently performing 9 per year
- Shelf Life Program being conducted at LANL on small scale and large scale samples. Have representative samples of all Pu in storage under 3013 program
Glove Box Operations

- Typical Glovebox operations
  - Can puncture
  - Draw 2 gas samples
  - Can cutting of outer & inner cans
  - Package 3 oxide samples
  - Package & transfer samples to SRNL
  - Package & transfer remaining oxide to 910-B
Convenience Can with Pu Oxide
Sectioned 3013 Can Lids

- Outer Can
- Inner Can Lid
- Cutter Wheel
Surveillance Results

- Maximum Pressure inside the 3013 container is less than 20 psi compared to 699 maximum theoretical pressure
- No flammable gas mixtures (hydrogen with no oxygen)
- Some corrosion seen on the convenience can, usually in the gas space or oxide can interface area
- Minimal corrosion in the inner can around the weld area
- Surveillance program has not identified any condition that would challenge the 50 year storage life
- Continue to perform Destructive examinations in K Area and shelf life program at LANL to validate storage life
• Pu is safely stored in K-Area

• SRS continues to evaluate storage conditions to ensure safe storage

• SRS has the experienced staff and facility to handle Pu