U.S. DEPARTMENT OF ENERGY

SRS

Nuclear Materials Overview for NAS Program Management Review

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Nuclear Materials (NM) Program

- **Responsible for the safe storage, management and disposition of Special Nuclear Materials (e.g., Surplus Plutonium, Spent Nuclear Fuel, Heavy Water) and surveillance and maintenance of non-operational NM facilities not turned over for decommissioning)**

Falls under Risk Management Operation (RMO) budget line and consists of two Program Baseline Summaries (PBS):

- PBS 11C, Nuclear Material Stabilization (operating facilities), and
- PBS 41 Deactivation (non-operational NM facilities)

K-Area Plutonium Storage

L-Basin Spent Nuclear Fuel racks

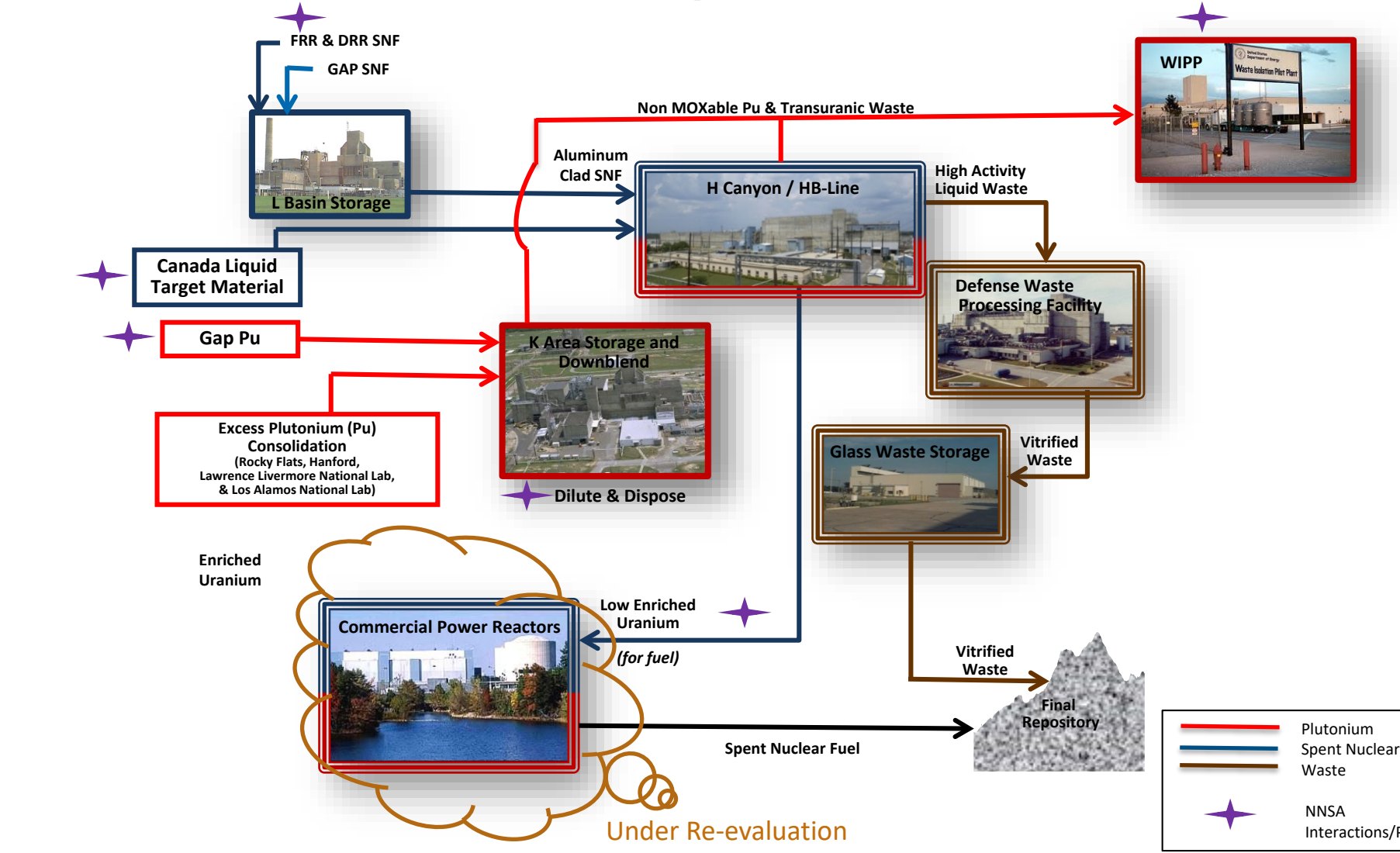
Program Management Approaches

- **Contractor Performance Baselines**
  - Developed yearly with 5 year look ahead
  - Includes Scope, Cost and Schedules
  - Only First year is approved by DOE and baseline controlled using Baseline Change Proposals (BCPs) for any changes
  - Typically, there are multiple changes in the year involving final Congressional Budget Funding, scope changes in specific projects, Policy change in direction, etc.

- **EM Liability**
  - Identifies the entire EM scope for the site
  - Each PBS responsible for the lifecycle assumptions, scope, costs and schedules for their missions
  - Updated yearly and audited yearly by KPMG (outside company)
  - Also baseline controlled

- **Nuclear Materials System Plan**
  - Used to assist in EM liability assumptions
  - Periodically updated

SRS Nuclear Materials Disposition Process



EM/NNSA Overlapping Missions

Individual material returns (H and L-Areas)

Examples: Foreign Research Reactor, GAP Plutonium, Canadian Liquid Target Materials

- **Each has an individual contract between NNSA and the Foreign Entity, EM has concurrence on the contract**
- **Handled as a transfer of responsibility from NNSA to EM (typically at the SRS site boundary)**

Downblending or Dilute and Dispose Program (K-Area)

- **Extensive Program Integration Effort**
- **Activities conducted in EM owned K-Area facility with EM staff**
- **Joint Mission driver – Removal of Plutonium from the State of SC**
  - SC lawsuit required removal of 1MT from SC by January 2019 **Completed**
  - SC Settlement Agreement requires removal of 9.5MT from SC by 2036 with established fines/penalties if not met **Ongoing**
  - Requires integration with EM owned Waste Isolation Pilot Plant (WIPP)

Plutonium Storage Arrangement

Storage in K-Area

3013 Container
(~30 lbs.)

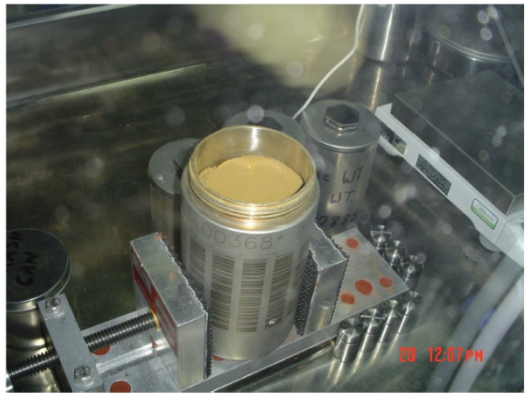
10”

5”

Convenience Container

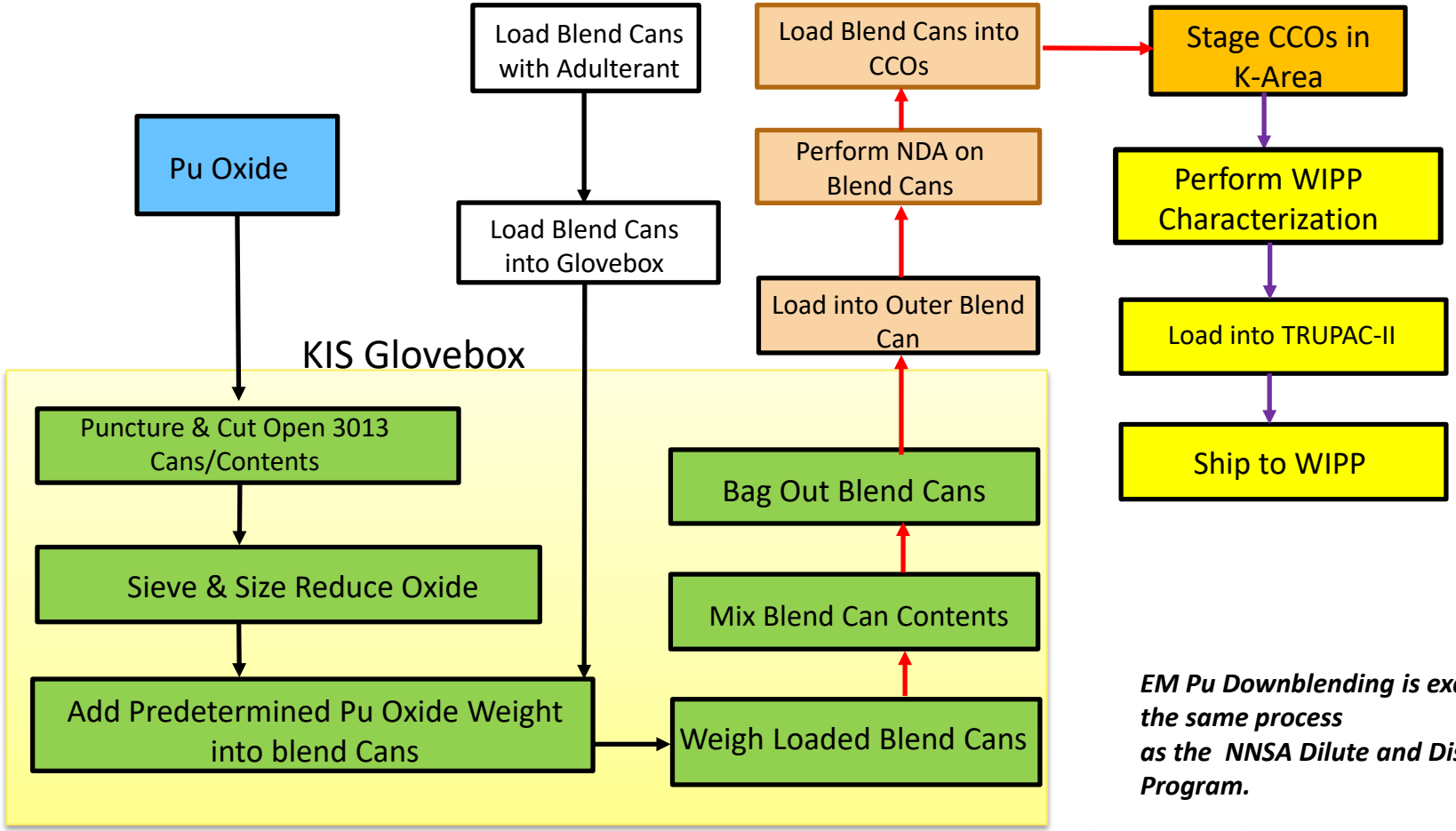
Inner Container

Type B - 9975 Plutonium Shipping container
(~400 pounds)



Opened 3013 Container

K-Area Plutonium Downblending Flowsheet



EM Pu Downblending is exactly the same process as the NNSA Dilute and Dispose Program.

Pictures of the process

KIS Glovebox

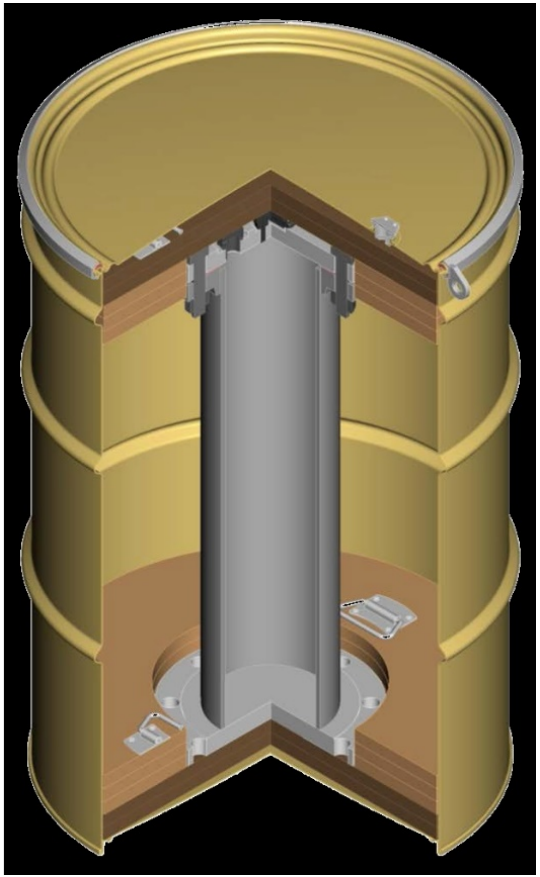
Pu Oxide

Blend Can

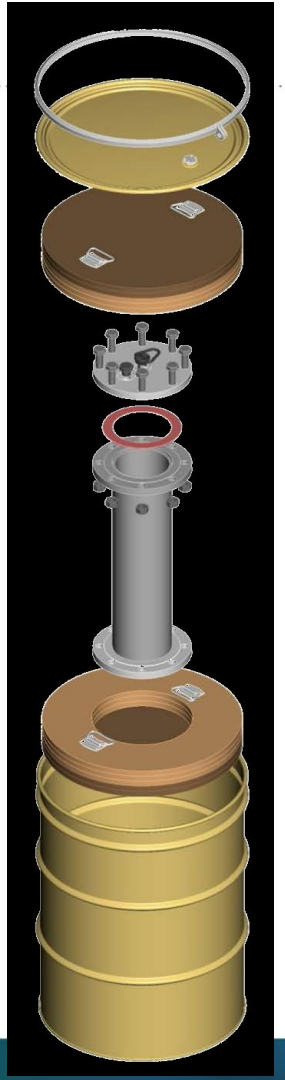
Blend Can bagged out of Glovebox

Bagged Blend Can in outer blend can

Criticality Control Over-pack (CCO)



- Each CCO can hold 2 outer Blend Cans
- Each Blend Can holds up to 150 grams of Pu fissile gram equivalents



Summary Regarding NNSA and EM Pu collaboration efforts

EM Lifecycle for Disposition of the 6 MT of Surplus Plutonium:

- Assumes the 6MT is dispositioned by FY2049 with all materials being shipped to WIPP
- Required additional EM funding for additional shifts and oxidation capabilities to meet the end date

Collaboration with NNSA allows:

- Expedited downblending/dilute and dispose of all Surplus Pu Oxide (40 MT = 34MT NNSA + 6MT EM)
- Establishment of WIPP characterization and storage capabilities within K-Area for more efficient operations
- Funding to support additional shifts needed by EM for K-Area Interim Surveillance (KIS) Glovebox
- Establishing 3 additional gloveboxes within K-Area along with the required shifts
- Security enhancements supporting increase operations staff and construction activities