U.S. DEPARTMENT OF ENERGY

Closeout Briefing to SRS Citizens Advisory Board on Low Assay Plutonium Campaign in HB-Line

10/20/10

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Low Assay Plutonium Campaign

Acronyms

- CAB – Citizens Advisory Board
- DSA – Documented Safety Analysis
- DNFSB – Defense Nuclear Facilities Safety Board
- DOE – Department of Energy
- EM – Office of Environmental Management
- GC – Office of General Council
- HQ – Headquarters
- INL – Idaho National Laboratory
- LAP – Low Assay Plutonium
- NE – Office of Nuclear Energy
- OST – Office of Secure Transport
- PNL – Pacific Northwest Laboratory
- RL – Richland (Hanford DOE Office)
- RTG – Radioisotope Thermoelectric Generator
- SRNS – Savannah River Nuclear Solutions
- SRS – Savannah River Site

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Purpose

- Discuss success of LAP Campaign
- Provide good example of multi-site cooperation across the DOE complex and with SRS CAB
- Highlight SRS Nuclear Materials Disposition Capability

SRS CAB Recommendation 218

- 2005
  - SRS CAB recommends using HB-Line to dissolve and process Hanford Pu 238 (Low Assay Plutonium) material
  - Notify SRS CAB whether material is to be purified and converted for programmatic need or sent to DWPF for vitrification

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LAP Campaign – History

- LAP produced in early/mid 1960's in (Old) HB-Line
- 12 Containers – Total material mass 5335 g
  - Each nominally 450 g (90% Pu oxide)
  - Predominately Pu-239 (64%) Pu-238 (14%)
  - Small amounts Pu-240, 241, 242, Am-241, U-234, Np-237
- Shipped to Pacific Northwest Lab (PNL) in 1966 for experimental use
- PNL wanted more - But no more was produced
- Experiments not conducted
- Placed in 55 gallon drums in 1980 – buried with other waste drums in "retrievable storage" at Hanford

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LAP Campaign – History

Drum conditions were noted to vary significantly when removed from retrievable storage at Hanford

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LAP Campaign – Recent History

- 11/7/03 – Letter to EM from DNFSB
  - Concerns with 12 drums at Hanford
- 2/3/04 – Initial response by EM-HQ
  - Material data, challenges and path forward planning
- 5/25/04 – Follow-up by EM-HQ
  - SRS dissolve or repackage for WIPP in HB-Line
  - Hanford repackage for WIPP in Pu Finishing Plant
- 8/18/04 – RL asked SRS to evaluate HB-Line/WIPP option
- 11/18/04 – SRS response
  - HB-Line = $4.3M to dissolve and send to waste
  - Prep for WIPP at SRS: high cost and high uncertainty
- 6/1/05 – EM-HQ responded to DNFSB with HB-Line disposition as preferred option

LAP Campaign – Recent History

- HB-Line/H-Canyon chosen by HQ:
  - Least radiation exposure to workers
  - Cost effective & efficient use of resources
  - Uses existing processes
  - Performed by personnel familiar with Pu-238
  - Little to no regulatory documentation changes
  - Fewest & most manageable uncertainties

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LAP Campaign – Recent History

- 2005
  - Twelve 55 gallon drums retrieved, radio-graphed, over-packed in 85 gal drums & placed in culverts at Hanford
  - Hanford provided $360K to SRS to begin planning
- 2006-2009
  - RTG cask base modified to accommodate 85 gal drums
  - New Certificate of Compliance issued for RTG Casks
  - NEPA confirmed
- 2009-2010
  - New estimate $2.8M
  - Hanford sent $2.5M to complete preps
  - SRS erected enclosure in H-Outside to remove drums from casks
  - Rad containment hut & equipment in HB-Line for unpackaging
  - Hazards analyses, procedures, Documented Safety Analysis

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LAP Campaign – Recent History

INL loaded drums into RTG Casks at Hanford (4 shipments of 3 drums)

Casks were transported to SRS by INL and OST

Drums were removed from RTG casks by INL

SRNS moved the drums to HB-Line for storage and processing

Shipments occurred in 2010 with excellent coordination between SRS, Hanford, OST and INL

RTG Cask in INL Transportation System Trailer

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LAP Campaign – Recent History

Removal of RTG Cask from INL Trailer

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LAP Campaign – Recent History

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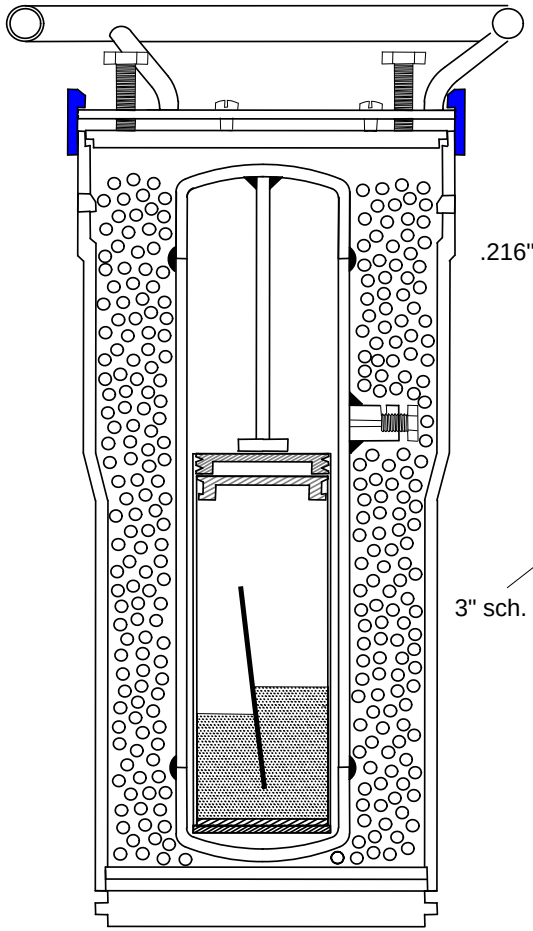
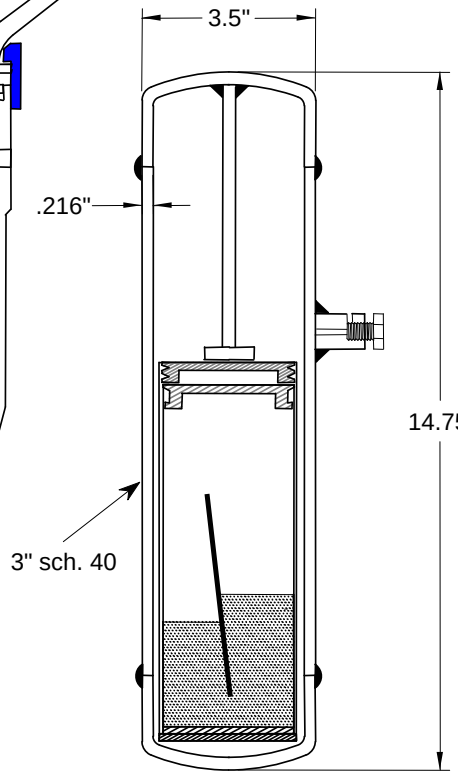
LAP Campaign – Recent History



Material: carbon steel

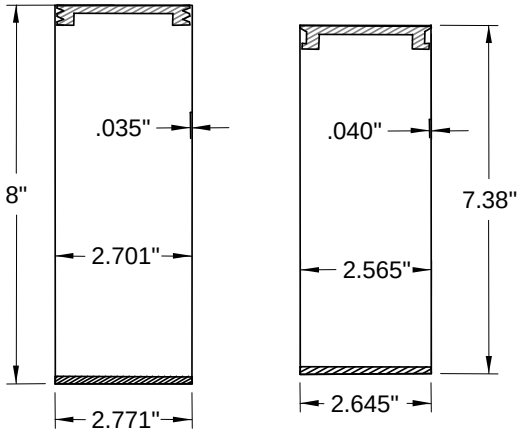
Housing Sub Assembly



Material: 304 SS

Approx. weight empty: 11 lb

Source Capsule



Material: Al

Material: Al

Approx. weight empty: < 1 lb {each}

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LAP Campaign – Status

- All 12 drums received/stored; 10 drums processed in HB-Line
- Some solution has already been sent to DWPF sludge batch for future vitrification
- No major issues encountered
- Processing scheduled to be complete this month (seven months ahead of schedule) and less than the $2.8M estimate

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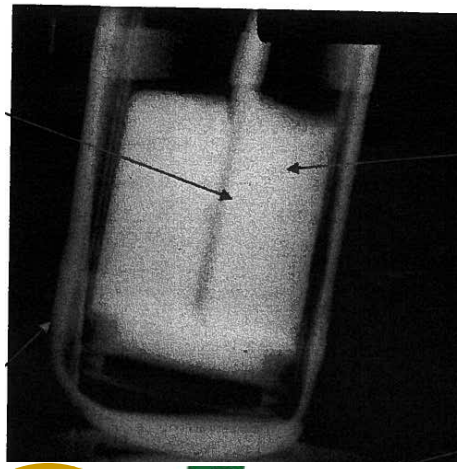
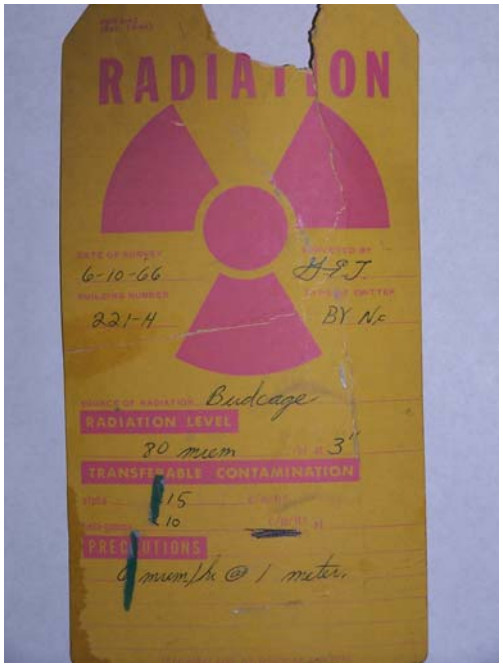
LAP Campaign

H-Canyon and HB-Line Well Suited for Dispositioning Difficult Materials from across the Complex





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