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The Nuclear Materials Management Safeguards System

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2016

Annual Users Training Meeting

May 9-12, 2016 | New Orleans, LA

Mark-18A Target Material Recovery Program: Preserving Materials Critical to National Security

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Mark-18A Target Material Recovery Project

- The National Nuclear Security Administration is sponsoring a project at Savannah River National Laboratory (SRNL) to recover plutonium-244 (Pu-244)
- Pu-244 will be recovered from nuclear material assemblies known as the Mark-18A Targets currently being stored at Savannah River Site (SRS) L Basin
- Separated material will be shipped to Oak Ridge National Laboratory (ORNL) for processing (i.e. isotopic separation) at the Radiochemical Engineering Development Center (REDC)



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Invaluable Material in Mark-18A Targets

- Unprocessed targets contain world's supply of unseparated Pu-244
 - Used for high-precision material signature identification
 - Applications include detecting smuggled nuclear materials, sampling for nuclear safeguards, & nuclear forensics
 - Current supplies are being depleted
- Material economically irreplaceable
 - Targets irradiated in SRS Reactor in 1970s
 - Capabilities used to produce Pu-244 were shut down after Cold War
 - Future production of Pu-244 economically unviable

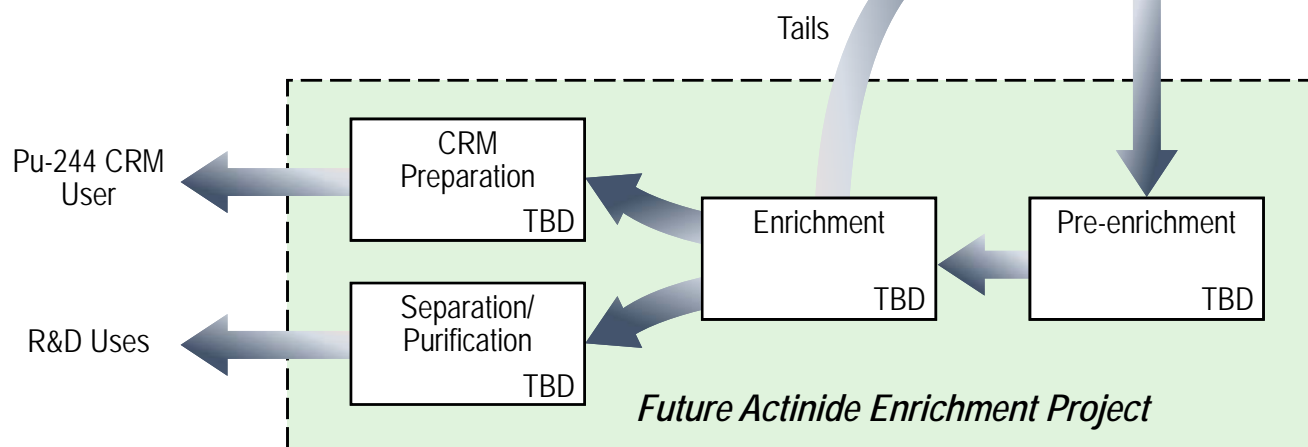
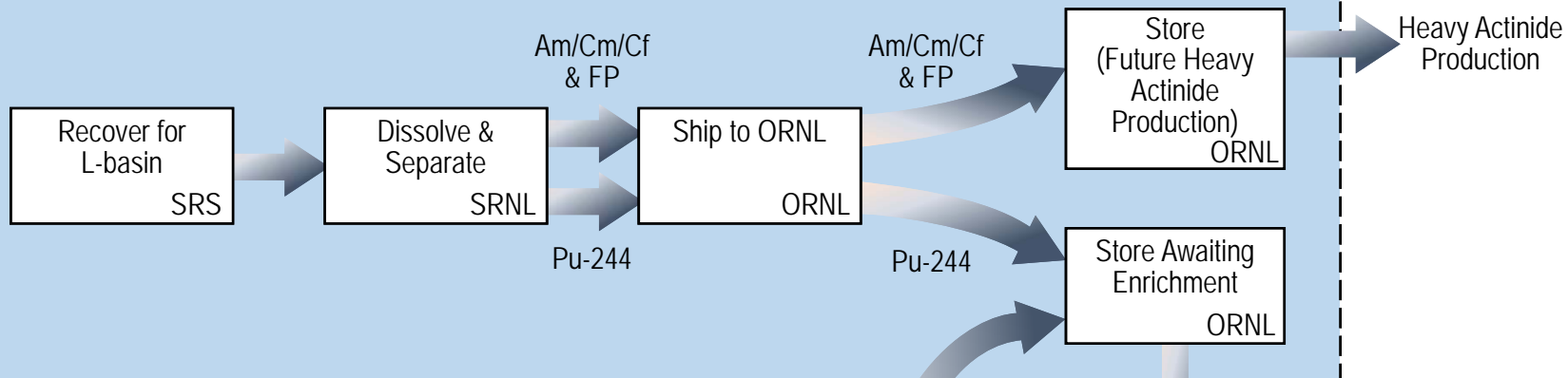


Additional Mk-18A material will never be produced since the DOE production infrastructure has been shut down



Project Scope

Mk-18A Target Material Recovery Project



Project Plan

Project Objective: Preserve Pu-244 found in the Mark-18A targets for future use.

Phase I

SRS/SRNL & ORNL Process reconfiguration & documentation to prepare for material recovery

Phase II

Retrieve targets from SRS L-Basin & transport to SRNL Shielded Cells Facility

Process targets in SRNL Shielded Cells Facility, convert to oxide

Transport recovered material to ORNL

Shipments stored in existing ORNL REDC facilities

Phase III

Package & dispose of secondary waste material

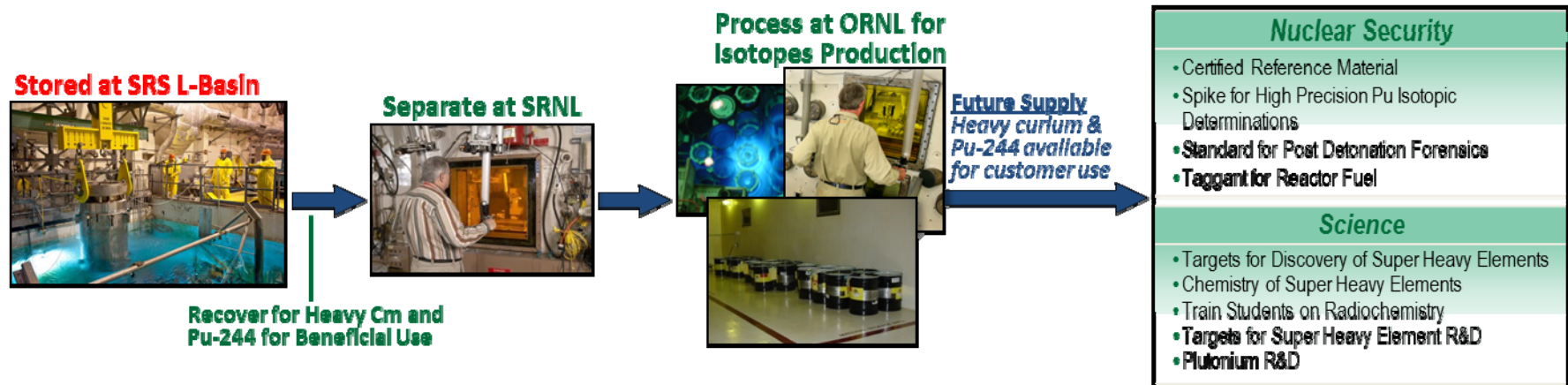
Future Actinide Enrichment



Project Plan (cont.)

■ Project Highlights

- Comprehensive Risk Register
- Design of an Onsite Transport Cask
- Development of Irradiation Model – Isotopic Content
- Nondestructive Assay of Targets
- Materials other than Pu-244 are available



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Questions?

