U.S. DEPARTMENT OF ENERGY | OFFICE OF ENVIRONMENTAL MANAGEMENT

Nuclear Materials System Plan

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Presentation to Full Citizen's Advisory Board
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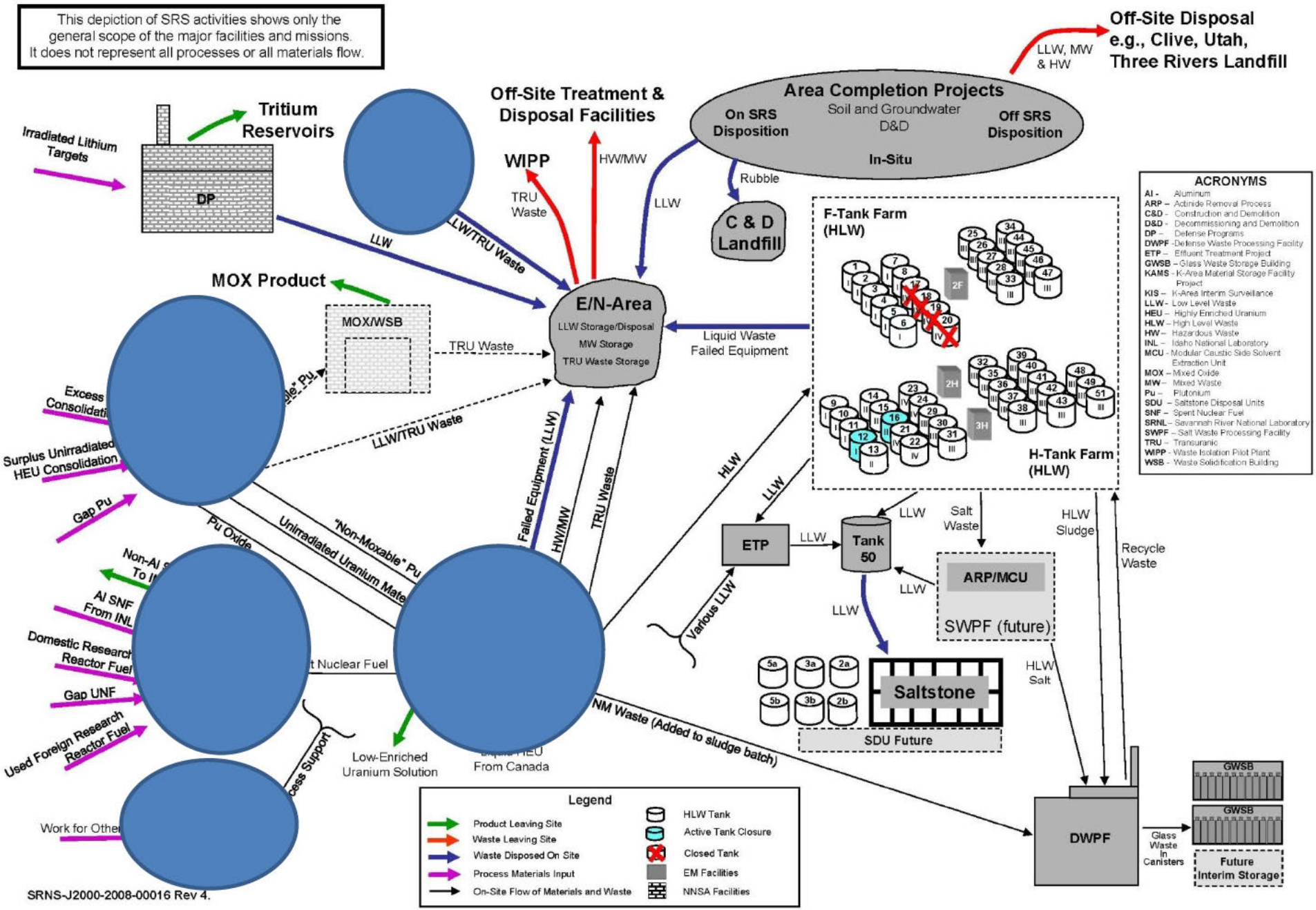
Purpose

- Satisfy Nuclear Materials Committee work plan item regarding Nuclear Materials System Plan
- Provide Citizens Advisory Board an overview of Nuclear Materials activities at the Savannah River Site

Savannah River Site
Waste and Material Flow Path

This depiction of SRS activities shows only the general scope of the major facilities and missions. It does not represent all processes or all materials flow.



SRNS-J2000-2008-00016 Rev 4.

Acronyms

DE – Destructive Examination
DRR – Domestic Research Reactor
DSA – Documented Safety Analysis
DWPF – Defense Waste Processing Facility
FRR – Foreign Research Reactor
HEU – Highly Enriched Uranium
LEU – Low Enriched Uranium
MOX – Mixed Oxide
NM – Nuclear Materials
NNSA – National Nuclear Security Administration
Np – Neptunium
NRC – Nuclear Regulatory Commission
Pu – Plutonium
RA – Readiness Assessment
R&D – Research and Development
S&S – Safeguards and Security
SRE – Sodium Reactor Experiment
TVA – Tennessee Valley Authority
U – Uranium
UNF (SNF) – Used Nuclear Fuel (also known as Spent Nuclear Fuel)
WIPP – Waste Isolation Pilot Plant

Introduction

- Savannah River Nuclear Solutions and Department of Energy – Environmental Management, are developing a System Plan for Nuclear Materials facilities similar to the Liquid Waste System Plan
- Anticipate a System Plan for release to the Public no later than October 2014
- The presentation today provides:
  - Assumptions
  - Approved Missions

Facilities In NM System Plan

Nuclear Material Operational Facilities

- H-Canyon
- HB-Line
- K-Area
- L-Area

Supporting Facilities/Interfaces

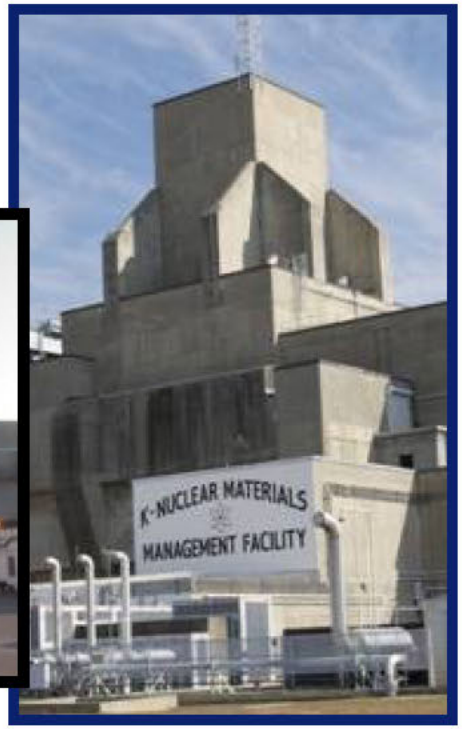
- F-Area/H-Area Analytical Laboratories (F/H Lab)
- SRNL
- Liquid Waste

Deactivated/Inactive Facilities

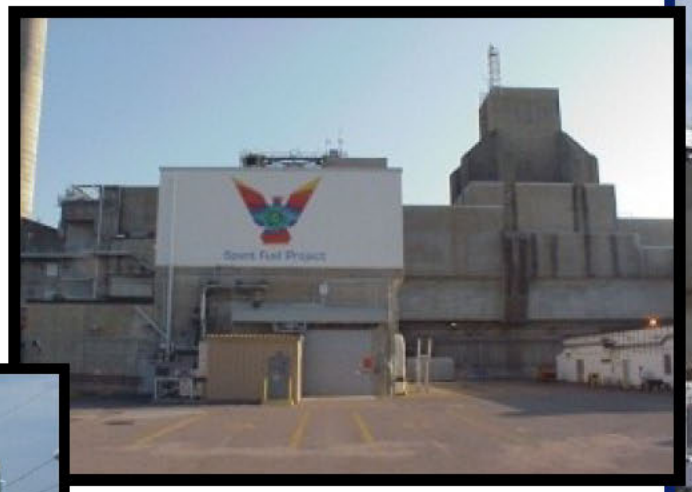
- 235-F
- F-Canyon/FB-Line
- Receiving Basin for Offsite Fuels (RBOF)
- C-Area

NM Storage and Disposition Facility Missions

K-Area safely receives and stores enriched uranium and plutonium materials awaiting disposition

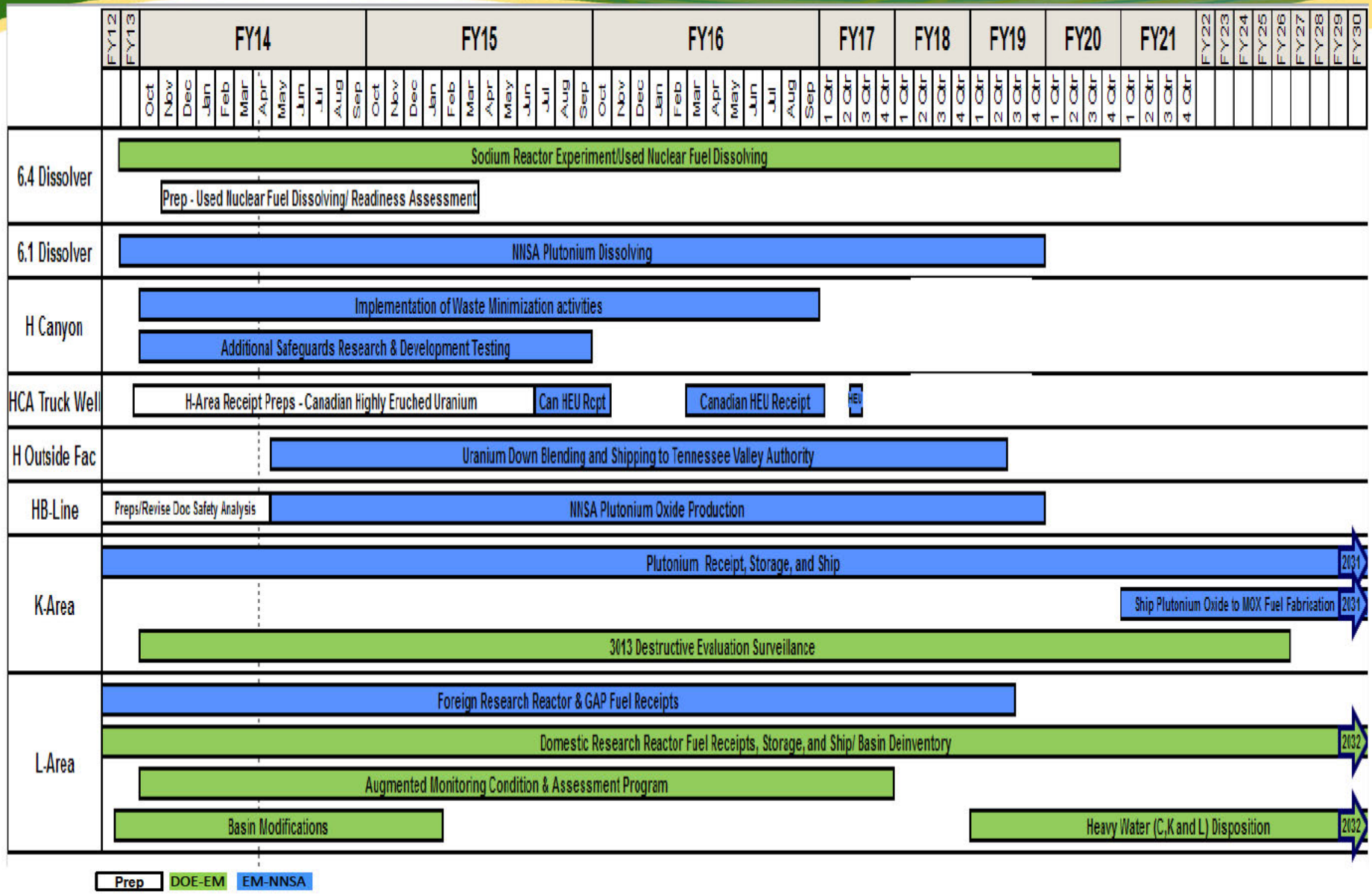


L-Area safely receives and stores Nuclear Fuel awaiting disposition



H-Area safely dispositions uranium (including fuel) and plutonium materials

Missions "Roadmap"



NM Major Planning Assumptions

- The primary assumptions made in development of this plan are contained on the following slides. The assumptions:
  - support safe and secure operation of Nuclear Material facilities to disposition uranium and plutonium
  - meet Department of Energy – Environmental Management and National Nuclear Security Administration non-proliferation missions
  - support efficient operations and minimize waste generation

H-Canyon

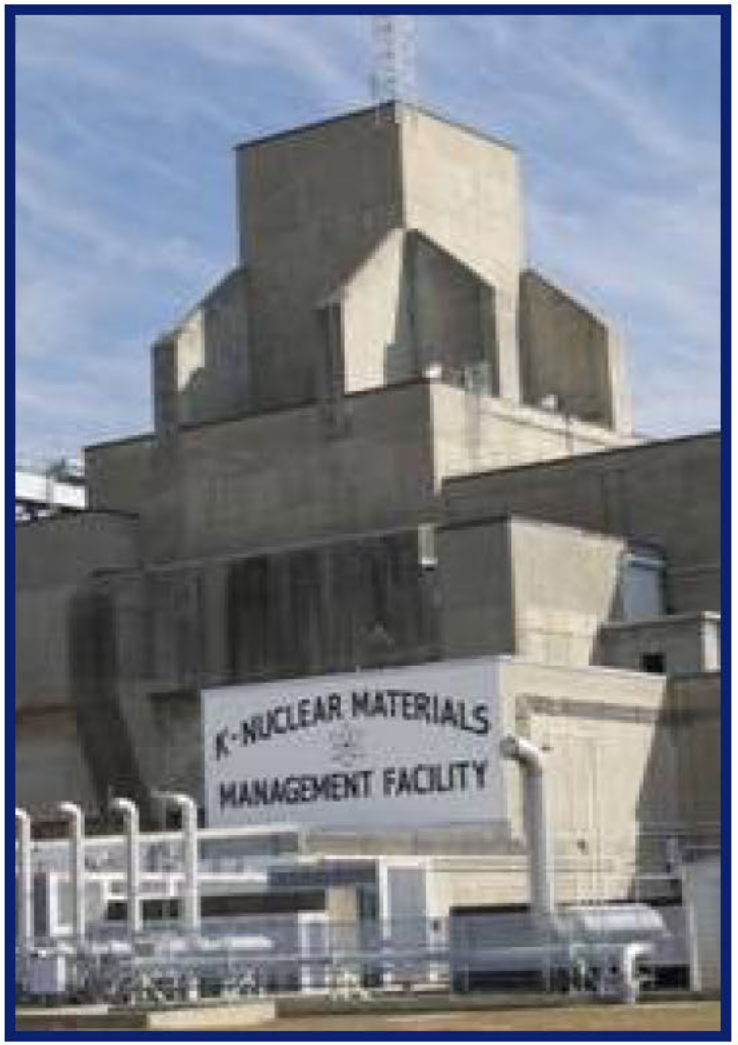
- H-Canyon is dissolving Sodium Reactor Experiment fuel for vitrification via the Defense Waste Processing Facility
- H-Canyon will dissolve Used (Spent) Nuclear Fuel, recover uranium and blend to Low Enriched Uranium for the Tennessee Valley Authority
- H-Canyon will process sufficient Used (Spent) Nuclear Fuel to allow for L-Area receipts through 2035
- H-Canyon is supporting HB-Line with the National Nuclear Security Administration plutonium processing mission (plutonium for use in the manufacture of Mixed Oxide Fuel by the Mixed Oxide Fuel Fabrication Facility)
- H-Canyon/HB-Line missions are integrated with the High Level Waste System

HB-Line

- HB-Line will begin plutonium oxide production in 2nd half of 2014 and produce oxide through 2019 to support early Mixed Oxide Fuel feed

K-Area

- K-Area will begin shipment of plutonium feed to the Mixed Oxide Fuel Fabrication Facility beginning in approximately 2020
- Continue with safe storage, receipts and shipments until approximately 2031
- Continue Destructive Examinations of plutonium oxide containers (Department of Energy Standard 3013 containers) to support continued safe storage



L-Area

- Used (Spent) Nuclear Fuel processing in H-Canyon will eliminate the need for installation of new storage capacity (racks) in L-Area
- No new Foreign Research Reactor fuel receipts past May 12, 2019 (Per a Record of Decision)
- L-Area will support Domestic Research Reactor fuel receipts through 2035
- Heavy water will continue to be safely stored in K-Area, L-Area, and C-Area until a disposition is determined

Support Facilities/Interfaces

Savannah River National Laboratory & F-Area/H-Area Laboratory

- Savannah River National Laboratory & F-Area/H-Area Laboratory will continue to support Nuclear Materials facilities with flowsheet development and analytical results, respectively, at the level necessary to support missions

Site Infrastructure

- Department of Energy – Savannah River will continue to support the infrastructure (for example: waste management, site services, medical facilities, etc.) and safeguards and security capabilities (for example: physical security, security workforce, material accountability, etc.)

Deactivated Facilities

- 235-F
  - Reduce and/or immobilize residual radiological material in Building
  - Deactivation Project Plan was approved 3rd quarter of 2013
- F-Canyon and FB-Line – partial deactivation, awaiting further deactivation
- Receiving Basin for Offsite Fuels – initial deactivation, awaiting turnover to the Deactivation and Decontamination organization (D&D)
- C-Area – some deactivation, awaiting further deactivation

235-F

Summary

- SAFETY comes first!
- Some of our Facilities are One-Of-A-Kind National Assets (for example H-Canyon)
- We Stabilize and Disposition Nuclear Materials to meet non-proliferation goals
- We Operate in a Environmentally Sound Manner