DOE-Idaho has responsibility for approximately 290 MTHM of SNF, 11% of DOE inventory stored at the following facilities:

- Idaho Nuclear Technology and Engineering Center (INTEC)
- Platteville, CO Ft. Saint Vrain Independent Spent Fuel Storage Installation (ISFSI) NRC Regulated
- Advanced Test Reactor (ATR) canal
- Materials and Fuels Complex (MFC)

Domestic and Foreign Research Reactor (D/FRR) receipts will continue.

ATR will continue to generate SNF.

The SNF inventory includes a wide variety of fuel types with 220 “attributes” e.g. size, cladding, beryllium and carbon matrix fuels, fuel condition (intact to crushed), enrichment, and time in a reactor.
Legal Drivers

1995 Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Record of Decision – All activities in the current baseline were analyzed in the 1995 EIS.

1995 Idaho Settlement Agreement (SA) –

- All SNF in dry storage by 2023 – If not met, DOE SNF receipts suspended.
- All SNF out of Idaho by 1/1/2035 - $60K/day to Idaho if not met.
- Specified amounts of SNF including DRR/FRR and Navy receipts are permitted.
- SRS/ID Exchange is permitted if shipments received from SRS do not exceed the cumulative number of shipments sent to SRS from Idaho, measured annually.

Colorado Agreement –

- All SNF out of Colorado by 1/1/2035 - $15K/day to Colorado.
Response to Changes in SNF Management Policy

- Idaho will continue to safely store SNF in existing facilities until a new national SNF management policy is developed.

- Policy will consider the recommendations of the Blue Ribbon Commission.

- Idaho Cleanup Project (ICP) has developed several management alternatives for HQ and General Accounting Office.
  - Idaho may increase cask pad storage or add modular storage at INTEC.
Highlighted on yesterday's tour and described at the end of this package:

- **DOE Regulated**
  - CPP-603, Irradiated Fuel Storage Facility
  - CPP-666, Fuel Storage Basins
  - CPP-749, Underground Storage Vaults
  - CPP-2707, Cask Pad
  - Rail cars

- **NRC Regulated**
  - CPP-1774, Three Mile Island Independent Spent Fuel Storage Installation (TMI)

The DOE Authorization Basis for all DOE regulated SNF facilities supports use through 2035 with appropriate surveillance and maintenance.

TMI license currently extends through 2019. DOE will submit an application for license renewal.
Elements of Authorization Basis

- Description of facility – as built configuration
- Determination of hazard category – driven by material in the facility e.g. nuclear or hazardous. Attributes of the facility design executed to minimize risk to the worker, on-site, and off-site individuals.

Analyses of normal operation, abnormal and postulated accident conditions including:
  - Nuclear criticality
  - Radiation safety
  - Fire protection, etc.
  - Transportation
  - Emergency preparedness

- Analyses of natural hazards – seismic, flooding, weather related (snow load, wind including cyclonic storms, etc.)

- Permit Conditions (clean air, water, RCRA, etc.)

- Analyses of required to comply with safeguards and security requirements

- Identification of safety significant systems, structure and/or components
NRC Licensed Independent Spent Fuel Storage Installations (ISFSI)

- ICP holds 3 NRC licenses:
  - ISFSI Fort Saint Vrain (FSV),
  - Three Mile Island (TMI)
  - Idaho Spent Fuel Facility (ISFF, not constructed).

- Ft. St. Vrain ISFSI is located in CO and was designed for carbon matrix SNF. It holds ~15 MTHM.

- It was constructed in 1989; licensed in 1991. A 20-yr license renewal application was submitted to NRC on 11/10/2009.

- Surveillance and maintenance (S&M) is defined by the NRC license.
Advanced Test Reactor Canal Storage

- SNF removed from the ATR is temporarily maintained in the reactor canal.
- ATR SNF is transferred to CPP-666 (basins) for storage.
- ATR SNF is the largest piece count (~4,000 elements) of SNF managed in Idaho (low total MTHM). Potentially considered a candidate for processing at Savannah River Site H-canyon.
- 2006 ATR complex design basis reconstitution has resulted in revision to the authorization basis which should be completed this year.
Sodium-bonded SNF from the Experimental Breeder Reactor-II is stored in dry, below grade shielded steel cylinders in the Radioactive Scrap and Waste Facility.

Sodium-bonded SNF from the Hanford Fast Flux Test Facility is stored in the Hot Fuel Examination Facility shielded hot cell.

These SNF types will be treated in the electrometallurgical treatment process in the Fuel Conditioning Facility.

Electrometallurgical Treatment produces uranium product, ceramic HLW and metal HLW forms.
The current ISFF design is licensed by NRC. Regulatory strategy will be determined when the project is authorized. It has not been constructed.

Its mission is to receive Idaho SNF; examine/characterize SNF as necessary for disposition e.g. (interim storage, process facility acceptance); package and store SNF in standard canisters; and capability to load SNF into truck casks for transport off site.

Program changes could cause redesign to:

- Provide non-canisterized SNF storage.
- Accommodate SNF not currently assigned to Idaho (Oak Ridge HIFR). (Following formal evaluation of impacts).
- Provide load-out to rail transport systems.

Reuse of existing facilities is also under consideration to meet mission needs.
Idaho Spent Fuel Facility Concept

Modify Existing Facility for packaging

Transfer for packaging

DOE standardized canister

Build new dry storage

Geologic Disposal

To repository by 2035
The ICP post-2012 contract(s) SOW may include a set of life-cycle studies for all DOE-regulated SNF storage facilities.

Focus will be on defining refurbishment necessary to maintain SNF storage facilities and Idaho Site infrastructure.

Studies will be similar to the NRC license renewal required life-cycle studies.

Have identified major upgrades needed for CPP-603 for more efficient SNF handling.
INTEC SNF Storage Facilities
79,000 ft² facility operational in 1984 includes receiving area, cask receiving and decontamination, unloading pools, 6 interconnected storage pools, transfer canal and supporting functions.

Basins and canal are stainless steel-lined concrete with leak detection system. 4 basins are 31’ deep and 2 are 41’ deep.

Shares systems (ventilation) and structure with adjacent hot cell.

SNF is stored in stainless steel racks. Water chemistry is tightly controlled.

All ICP-assigned SNF has been retrieved and transferred to dry storage.

Stores ATR fuel.

EBR-II SNF (sodium-bonded) will be retrieved and transferred to MFC for electrometallurgical processing.

Naval Nuclear Propulsion Program SNF is being returned to Naval Reactors Facility under an MOA.

Authorization basis assumes operation through 2035. Routine S&M is required; future upgrade to ventilation system and water treatment system are anticipated.
CPP-666 Fuel Storage
Dry storage area was completed in 1974. It was designed to receive Ft. Saint Vrain SNF and shares structure with older, closed and grouted fuel basin.

~18 MTHM – FRR/DRR SNF receipt expected through 2019.

Authorization basis assumes operation through 2035.

SNF is remotely handled and stored in 18” diameter canisters in contact with ambient air.

Generally intact SNF is received; compromised SNF must be canned (these cans are not welded).

Mechanical systems need to be upgraded to maintain min. safe storage and to support retrieval of SNF.

Storage array relies on moderator exclusion. Roof leaked last winter and is being re-coated.
CPP-603 Storage Array
3 types of vaults constructed between 1971 and 1985 each consisting of carbon steel pipes with shield plugs. 21 vaults are 12 ¾” diameter, 197 vaults are 30” in diameter.

~79 MTHM

Authorization basis assumes operation through 2035. Routine S&M, catholic protection and corrosion monitoring is required.

Some vaults are not usable because these vaults are located in an area where water from fire-water system leaks has collected (perched water) in the past. Perched water management is an element of the CERCLA Record of Decision for INTEC.
Cask pad was constructed in 2003; authorization basis assumes operations through 2035.

Pad has space for 20 cask storage positions; 6 are in use.

SNF stored in the casks came from Test Area North fuel examination facility and includes epoxied fuel.

Rail car holds 2 rail casks from West Valley containing SNF of commercial origin.

~ 68 MTHM total for facility.
Underground Vaults and Cask Pad

Vaults

Cask Pad CPP-2707

West Valley Cask

NuPac 125B  TN-24  VSC-17  MC-10  REA  Castor V/21
The TMI ISFSI (NRC regulated) is located within the INTEC facility.

82 MTHM of TMI debris was loaded into 29 horizontal storage modules in 2000.

NRC license must be renewed by 2019.

S&M defined by license.