• Facility Operations Activities
  – Surveillance and Maintenance
  – LGWO Operations
  – U-233 Disposition

• Bethel Valley D&D and RA scope
  – 160 facilities
  – Isotope processing facilities with hot cells
  – Reactor facilities with reactor pools (all defueled)
  – Radioactive gas handling equipment and 250 ft stack
  – Miles of underground piping and underground tanks
  – Radioactive liquid processing equipment and facilities
  – Contaminated slabs and soils
  – BV Groundwater ROD

• Melton Valley D&D and RA scope
  – 108 facilities
  – Reactor facilities and associated soils
  – Molten Salt Reactor Experiment, contaminated salts removal and disposal
  – Tanks and contents, contaminated resins
  – Radioactive waste processing and storage facilities
  – Reactor & other facilities ROD
  – MV Final ROD
ORNL Portfolio Scope

• **Near term (through FY 2020)**
  – Complete uranium-233 direct disposition campaign
  – Begin downblending operations for remainder of uranium-233 inventory
  – Conduct groundwater investigations and modeling

• **Mid term (through FY 2024)**
  – Complete uranium-233 disposition

• **Long term (beyond FY 2024)**
  – Complete all building demolition and media remediation by FY 2045

• **Ongoing: Base Operations**
  – Waste operations
  – Surveillance and maintenance
  – Infrastructure
  – Environmental monitoring
Challenges

- Performing work in close proximity to ongoing missions
- Deteriorating Facilities

= Facilities/areas to be remediated  = Research Facilities/Government Investments

= Specialized handling and packaging of radiological material
Recent Accomplishments and Activities

- Process Waste Treatment Complex
- Gaseous Waste Stack Inspections
- MSRE Maintenance
- 3026 Pad
- Waste Disposition
- Pratt & Whitney Shield
- U-233 Disposition
- Building 3042 Pool
- Groundwater Strategy
Reconfiguration at Process Waste Treatment Complex

- Failure of dual media filters led to evaluation of filtration alternatives. Two under-utilized carbon columns now used for filtration of solids
- Carbon media from third carbon column has been replaced with Mersorb, to more efficiently remove mercury
- Installed new sulfuric acid tank, concrete pad, associated piping, pumping system, and control system
3039, 3020, and 3018 Stacks: Planned Inspections, early FY15

- Drone to be used in conducting inspection of 3039, 3018, 3020 Stacks
- Tether line for continuous power; fiber optic data link to command/receive data from three cameras
- Shutdown of stacks required to complete inspection – substantial preparations needed
- Cost ~$191K – includes development, testing, demonstration, inspections for three stacks, report

![Image of drone and stacks]
Molten Salt Reactor Experiment (MSRE) Maintenance Activities

- De-fueled salt stored in fuel drain tanks and fuel flush tank at MSRE generates off-gas (radiolytic decay produces fluorine gas) that is periodically pumped out and replaced with argon to prevent corrosion in the tanks and associated piping.
- Recent pumpdowns were performed in Nov, 2013 and May, 2014; next pumpdown in October.
- NaF trap weighing and non-destructive assay (NDA) completed to measure uranium captured during previous de-fueling efforts; indicates that de-fueling was successful; supports plan for future de-fueled salt disposal.
- Reactive Gas Removal System (RGRS) monitors and treats gases generated from de-fueled salt stored in drain and flush tanks.
- Upgrades to RGRS: replaced two infrared spectrometers (FTIR); new data acquisition hardware; software updated; planning for additional improvements.
Addressing Legacy Issues

- Building 3026 hot cells placed in safe standby; polymer fixative was applied to ramp at facility to address migration of residual contamination.

- Characterization and disposition of legacy waste from several locations around ORNL, including MSRE, and onsite storage facilities.
Pratt & Whitney Shield Relocation

- Eight ton Pratt & Whitney shield has been stored in building 7602 since 1998
- UCOR worked with UT-B to relocate the shield to a materials storage structure in SWSA-5
• Building 3019 home to uranium-233 material; requires high security
• Shipment of Consolidated Edison Uranium Solidification Project (CEUSP) material to Nevada National Security Site is pending release from DOE-HQ.
• Transfer of 17 canisters of material for re-use at ORNL completed
• Progress continues at Building 2026 to prepare for future downblending and solidification steps
3042 Oak Ridge Research Reactor
Pool Leak

- Initial leaks detected on 9/10/14 coming from circumference of the bottom flange (~100 drips per minute) located beneath pool in Sub-pile room; constant monitoring set up; leaking water is being collected and transferred to treatment system
- Liner of pool confirmed intact using underwater video
- Reactor pool water serves as shielding for activated components
3042 Reactor Pool Activities

- Lower a high dose rate meter into pool and obtain current dose rates for irradiated components and pool walls
- Use underwater cameras to visually inspect the pool contents and look for leak sources
- Evaluate potential solutions to repair the leak, such as underwater construction and self-seeking water sealant
- Determine options to remove irradiated components and allow pool to be drained and stabilized
Groundwater Strategy

- Implementation of Strategy underway on two fronts:
  - Off-site groundwater assessment
    - Remedial Site Evaluation Plan submitted and approved by EPA and TDEC
    - Contacting residents to obtain access agreements for well sampling
    - Conducting site visits
    - Informing and working with County officials
  - Developing a model of the Oak Ridge Reservation groundwater flow paths
    - Directed by technical advisory group
    - Includes regulator input
    - Based on small areas where more information is available; will grow to include the entire reservation and west to the Tennessee River
    -Projected completion date is end of FY 2016