Addressing Deferred Maintenance, Infrastructure Costs, and Excess Facilities at Portsmouth and Paducah

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PPPO Sites

**Portsmouth (Piketon), OH**

- >100 acres under roof, built in 1950s
- Active D&D contract began in 2010
- Providing services to other site tenants and the nearby community (Fire, security, roads, waste, etc.)
- Environmental remediation and DUF6 conversion

**Paducah, KY**

- >100 acres under roof, built in 1950s
- Deactivation contract began in 2014
- Evolving from an operating plant enriching uranium to a cleanup/S&M and D&D Mission
- Environmental remediation and DUF6 conversion
“Goal: DEMOLITION READY”

GDP Nuclear Facilities Inherently Safe
- Achieve ‘Criticality Incredible’
- GDP Nuclear Facilities from CAT II to Radiological
- Fissile Deposit Removal Complete
- Fissile Loose Equipment Disposed

- Unnecessary Safety & Other Systems Deactivated
- Excess Fire Loading Removed
- Vacate facilities, isolate utilities and further reduce utility usage

Stabilization & Deactivation
- Freon/Lube Oil Removal
- Power Distribution Reconfiguration
- Boiler replacements
- Facilities Winterized
- Automated Access Controls
- Utilities Optimized
- Utility Isolation
- Lessons learned from OR, PORTS and DOE-wide

Reduction of Radiological Material
- Uranium Deposit Removal
- Tc99 Removal

- Disposition of Removed Fissile Equipment
- Hazard Material Removal

Base & Safe Operation Activities Optimized

Time
Both the Portsmouth and Paducah gaseous diffusion plants were returned to DOE with significant maintenance/repair backlogs.

As part of an EM-wide initiative (per Assessment of EM Site Infrastructure memo from Mark Whitney dated December 19, 2014), PPPO has developed:

- Deferred maintenance activities to ensure safety and protection of the workforce and the environment
- Complex-wide lessons learned with respect to missions and onsite government assets
- Critical structures, systems and components in a state of operational readiness to ensure safety.
Deferred Maintenance Approach

1. Develop a plan
   - Include previous contractor data
   - Conduct site inspections of GDP
   - Incorporate into computerized maintenance management system (CMMS and FIMS)
   - Determine needs and ROMs

2. Assess actions
   - Risk to personnel/environment
   - Safety System Class
   - System Health reporting
   - Potential Return on Investment
   - Lessons learned

3. Implement actions
   - Projects ongoing (examples follow)

4. Ensure contractor performance
   - Evaluate establishing a PBI to minimize Deferred Maintenance
   - Conduct field oversight inspection(s) to ensure timely maintenance of site systems and facilities
Benefits of Taking Actions Now

• Improves worker safety
• Reduces potential for catastrophic equipment failure (e.g., electrical equipment) and inability to continue critical activities
• Prepares facilities for demolition
• Drives down hotel costs
Maintain facilities and equipment to facilitate D&D

- Allows for bridge cranes and other critical facility systems to be utilized during deactivation and demolition.
- 1.2 million sq. ft. of roof recently repaired at Paducah.
- 750,000 sq. ft. of roof repaired at Portsmouth in the last 2 years.

Benefits of roof repairs include:
- Reduced risk of electrical failures
- Reduced risk of spread of contamination
- Reduced heating costs
- Reduced risk of facility degradation

- Lessons Learned from Oak Ridge ETTP
GDP Site Utilities oversized for Mission

1. Contractor evaluates existing site infrastructure.

2. Evaluate optimization study and recommendations.

3. Fast-track high-benefit utility activities:
   - Steam generation and distribution
   - Power distribution
   - Plant and sanitary water
   - Sewage collection and treatment
   - Nitrogen distribution
   - Dry/Compressed air generation and distribution
   - Chilled water
   - Recirculating heat system
   - Natural gas distribution

4. Implement additional activities.
   - Contract modifications for near-term actions (current contractor)
   - Integrate optimization activities into subsequent Contract PWS
   - Use PBIs to ensure time/cost-effective completion for field work
Steam Plants Replacement

General benefits:

- Facilities rightsized for the mission
- Reduction in lifecycle costs
- Improved utility efficiency
- Increased utilities flexibility
Advantages

- Enhanced safety - All feeders above ground for easier maintenance and isolation/deactivation
- New busses utilize low to no maintenance vacuum breakers
- Saves MWh switchyard losses (energy efficiency)
Paducah Power Distribution System re-configuration

Advantages
- All power re-routed from 4 to 1 switchyard
- Removes site from Bulk Electric System
On-going Projects

- Comprehensive fire water repair and right-sizing
- Stand-alone air plant and cooling tower consolidation
- Water treatment modifications using sodium hypochlorite, thereby eliminating chlorine gas cylinders
- Cost sharing and improved operations of site utilities through shared community resources
- Steam plant enclosure for reliability and energy efficiency
- Sprinkler freeze damage alternatives analysis
Perform D&D (Most cost-effective option)

- Portsmouth facilities removed to date: 36
- Paducah facilities removed to date: 32
- Eliminates radiological & chemical hazards and risks of releases
- Eliminates security vulnerabilities
- Avoids cost increases associated with facility and system degradation due to deferred D&D
- Eliminates monitoring and required S&M Costs
In summary...

An effective program to address deferred maintenance and excess facilities can promote both safety and cost savings.
Questions/Comments