



U.S. DEPARTMENT OF
ENERGY

OFFICE OF
**ENVIRONMENTAL
MANAGEMENT**

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

William E. Murphie

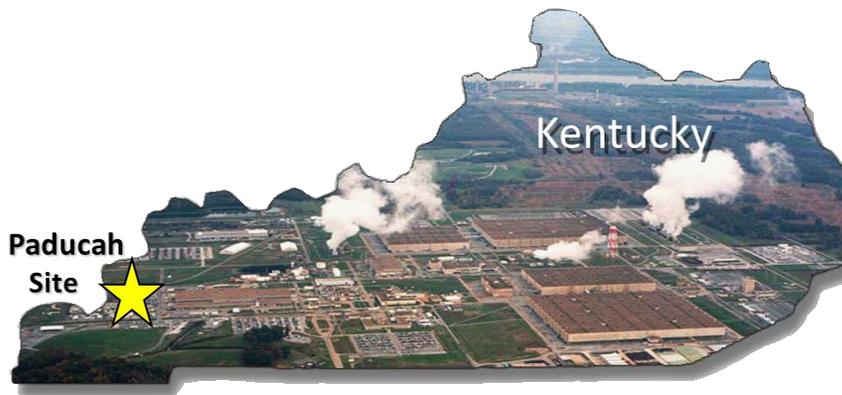
Manager

Portsmouth/Paducah Project Office (PPPO)

DOE National Cleanup Workshop, Washington, D.C.
September 30, 2015

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

Reduction of Radiological Material

- Uranium Deposit Removal
- Tc99 Removal
- Disposition of Removed Fissile Equipment
- Hazard Material Removal

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

Base & Safe Operation Activities Optimized

Cost

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.

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

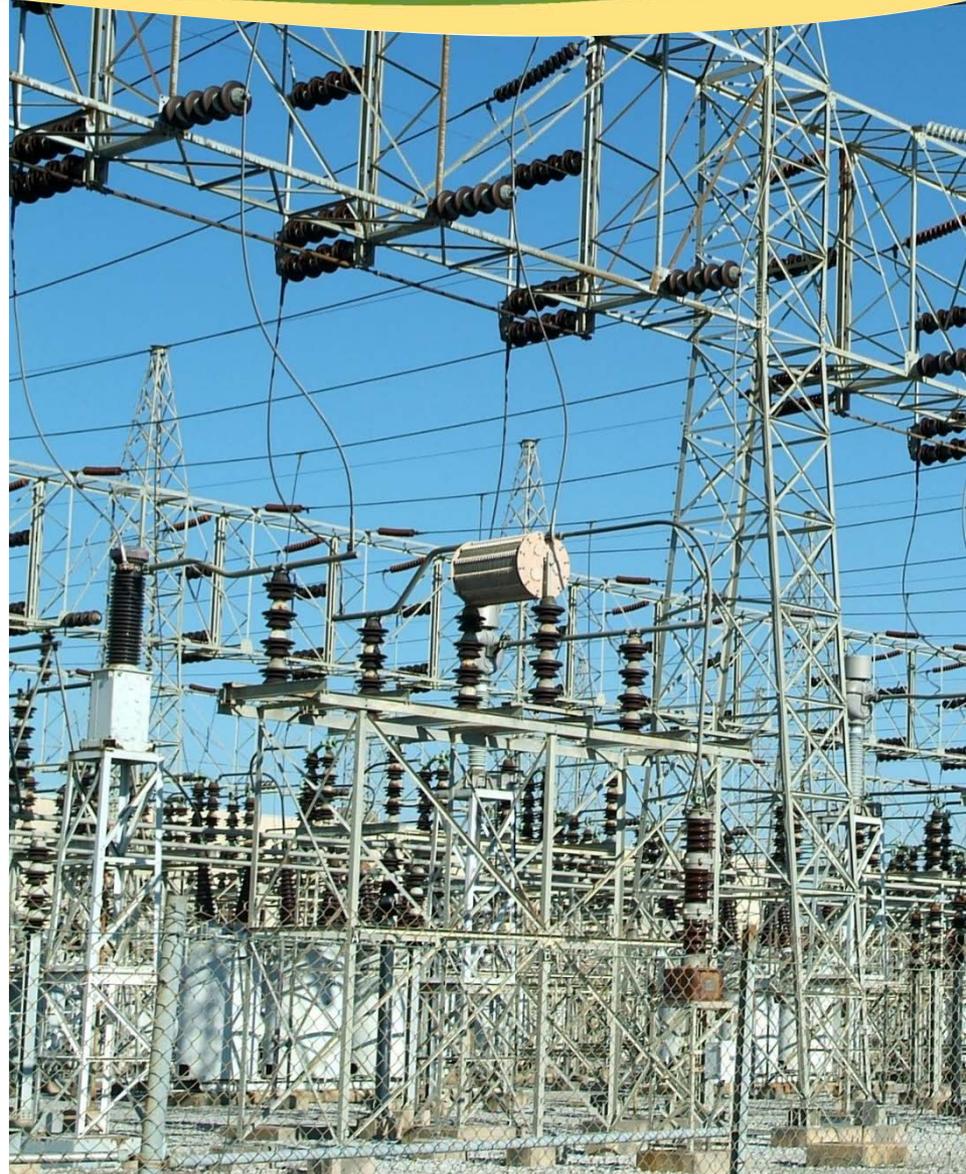
- Projects ongoing (examples follow)

PORTS SYSTEM HEALTH for the month of July-2015				
Change to: July-15		Update		
<u>Air Plant X-670 & X-330</u> 4	<u>Nitrogen Plant X-675</u> 6	<u>CAAS</u> 10	<u>Public Address</u> 8	<u>Electrical Switchyards</u> 8
<u>UF6 Cranes</u> 8	<u>Water Wells & Distrib.</u> 5	<u>X-611 Wtr. Trtmt.</u> 5	<u>Sewage Treatment</u> 5	<u>Fire Protection</u> 3
<u>UF6 Sample & Transfer</u> 8	<u>Wet Air Vent</u> 8	<u>Public Warning Sirens</u> 10	<u>Steam</u> 7	<u>X-705</u> 8
<u>Met Tower</u> 4	<u>Groundwater Treatment</u> 8			

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

- 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



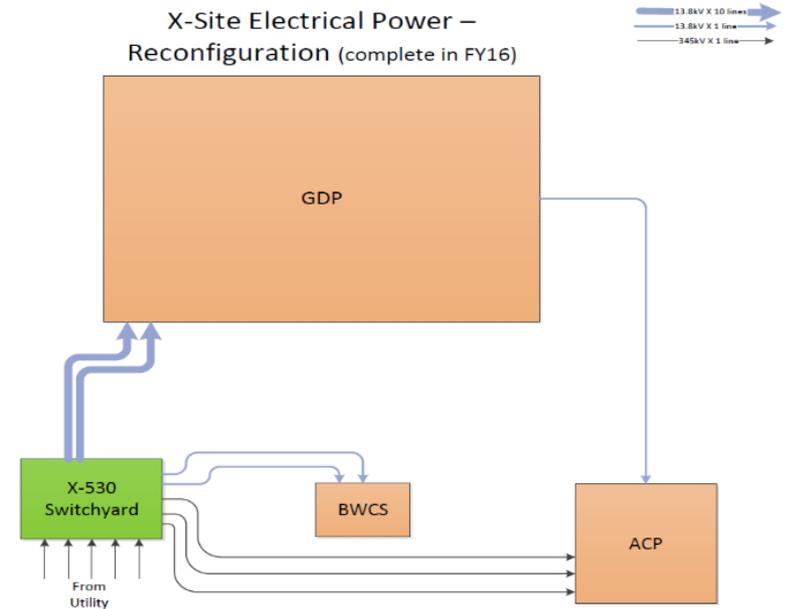
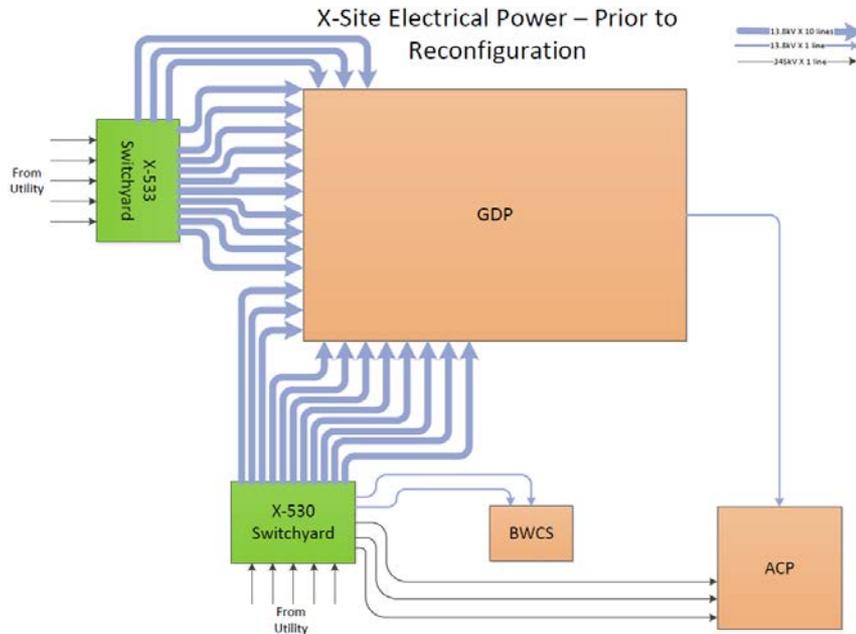
GDP Site Utilities oversized for Mission

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

General benefits:

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

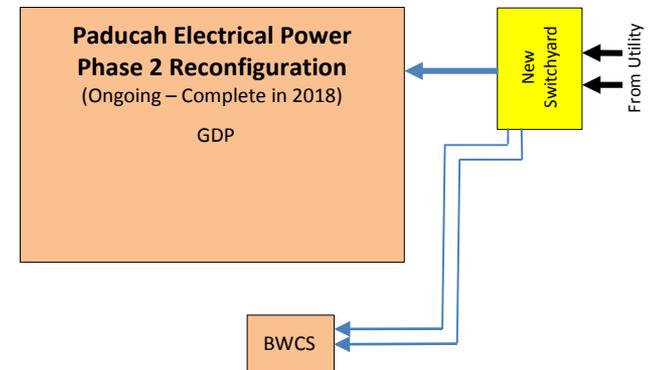
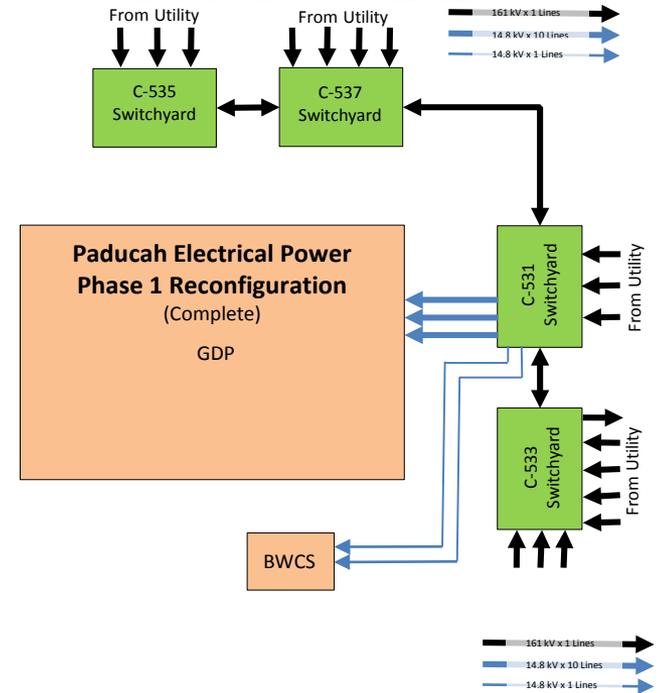
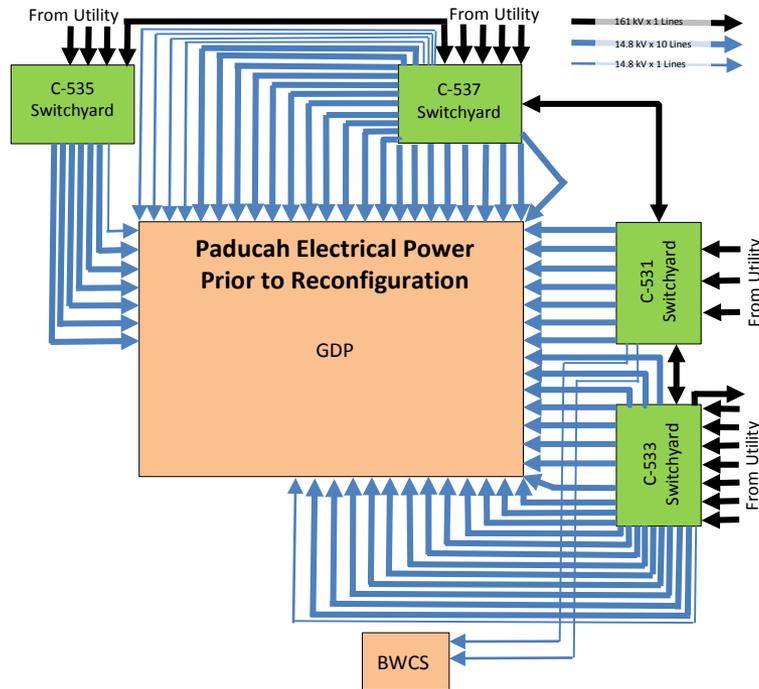




Advantages

- 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

- 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