

**Independent Oversight Review of the
Portsmouth Gaseous Diffusion Plant
Work Planning and Control Activities
Prior to Work Execution**



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**Office of Safety and Emergency Management Evaluations
Office of Enforcement and Oversight
Office of Health, Safety and Security
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Acronyms

DOE	U.S. Department of Energy
EM	Office of Environmental Management
FBP	Fluor-Babcock & Wilcox Portsmouth
HSS	Office of Health, Safety and Security
ISMS	Integrated Safety Management System
OFI	Opportunity for Improvement
PORTS	Portsmouth Gaseous Diffusion Plant
PPPO	Portsmouth/Paducah Project Office
STA	Safety Task Assignment

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1.0 PURPOSE

The Office of Enforcement and Oversight (Independent Oversight), within the Office of Health, Safety and Security (HSS), conducted a shadowing oversight activity of the U.S. Department of Energy (DOE) Portsmouth/Paducah Project Office (PPPO) oversight of selected aspects of the work planning and control process being implemented by the Portsmouth Gaseous Diffusion Plant (PORTS) contractor, Fluor-Babcock & Wilcox Portsmouth (FBP). The onsite portion of the review was performed October 22-25, 2012, by the HSS Office of Safety and Emergency Management Evaluations. The objectives of the Independent Oversight review were to evaluate selected portions of: (1) the PPPO oversight program's effectiveness in assessing the contractor's performance in work planning control; and (2) the contractor's corrective action process.

2.0 SCOPE

The Independent Oversight review focused on the requirements that support the key elements in DOE Order 226.1B, *Implementation of Department of Energy Oversight Policy*, with emphasis on the PPPO's oversight of the initial implementation of a new work control process.

3.0 BACKGROUND

Over the last 2 years, PORTS has transitioned from a cold standby mode to an active decommissioning and demolition mode. As part of this transition, FBP assumed control of the entire 2,000-person direct employee and contractor workforce at PORTS on October 1, 2011. Prior to the transition, the United States Enrichment Corporation workforce was not under an integrated safety management system (ISMS), since they were regulated by the Nuclear Regulatory Commission rather than DOE. Thus, the ISMS processes long-established in the rest of the DOE complex are new to most of the PORTS workers.

A Headquarters Office of Environmental Management (EM) review of work planning and control at PORTS in June 2012 concluded that "Workers, supervisors, and operations personnel do not apply a rigorous standard for the formality of operations, work package quality, or work execution." The report further stated that "Improvement in work performance requires a cultural change rather than a programmatic change."

During the past year, FBP developed an ISMS, and PPPO performed the phase one review of the FBP ISMS in November 2012. The ISMS phase two review (field implementation) is scheduled for April 2013. Associated with the ISMS development, FBP rolled out a new work planning and control system in September 2012 that is intended to meet ISMS requirements and expectations.

4.0 METHODOLOGY

The Independent Oversight review included an assessment of the site office oversight process by shadowing a PPPO work planning and control surveillance. The PPPO surveillance focused on contractor performance just before work execution, primarily pre-job briefs and associated documentation. The PPPO team observed several pre-job briefs, reviewed the associated work documentation and work

packages, and conducted interviews with PORTS personnel. In addition to this shadow assessment of the work planning and control surveillance, the Independent Oversight team and the PPPO Facility Representative interviewed senior management and reviewed recent incidents, reportable occurrences, near misses, and associated corrective action plans since March 2012 to gain a better perspective on the effectiveness of corrective actions taken to date to reduce the risk of recurrence of significant events.

5.0 RESULTS

The PPPO team was led by the PORTS Facility Representative and included the PPPO support service contractor's Certified Safety Professional and a Certified Industrial Hygienist. The team reviewed a sample of ongoing work by observing pre-job briefs and reviewing documentation. The PPPO team identified several issues with FBP personnel's understanding of and procedural adherence to the work planning and control program, specifically in the execution of the pre-job briefing. The PPPO surveillance observed that FBP needs to implement additional corrective actions to ensure adequate implementation of the site's work planning and control procedures. The PPPO team findings were:

- Work conducted in the X-750 Garage did not follow the established FBP Work Control Process as described in FBP-NSE-PRO-00070 Work Planning and Control Process and FBP-NSE-PRO-00016 Work Control Documents.
- The pre-job briefing for Converter Sampling 25-5-2 Stage 12 at the X-326 was not conducted in accordance with FBP-NSE-PRO-00002 Pre-Job Briefing and Post-Job Review. Examples of requirements not covered include: responsibilities were not assigned, specific hazards and controls were not discussed, anticipated alarms and unexpected situations were not presented.
- The pre-job briefing for the X-326 Louver Roof Work did not cover the use of hearing protection, as required by the Safety Task Assignment (STA). Also, the STA did not have ear protection checked in the Personal Protective Equipment Section, nor did it have barricades and working at heights checked in the Safety Concern Section.
- One FBP Vendor (Betz) was performing work without a STA or Job Hazard Analysis as required by Work Control Procedure FBP-NSE-PRO-00113 Subcontractor/Vendor Oversight Process.

The Independent Oversight team concurred with the PPPO team's findings and observations. The PPPO team was thorough and effective in identifying both strengths and deficiencies within the scope of the surveillance.

The Independent Oversight team also interviewed senior PORTS site management from both PPPO and FBP to gain a better understanding of FBP's actions in response to the significant events since March 2012. Recent reportable occurrences include:

1. Electric Cart Accident Resulting in Multiple Fractures of the Leg – March 2012
2. Bay Crane #8 Feed Rail Near Miss (Metal Tape Contacts Energized 480 Volt Bus) – August 2012
3. Spill of Nitric Acid on Decontamination Building Roof (50-75 gal) – August 2012

4. Near Miss - Excavator Arm/Boom Contacts De-energized Overhead Power Line (480 Volt Line) – September 2012
5. Near Miss - Mobile Crane Tips Forward – October 2012
6. Near Miss - Subcontractor Strikes Overhead Fiber Optics Line (13.8 kV Line on utility pole) – November 2012.

Four of the recent incidents (2, 4, 5 and 6) were classified in the Occurrence Reporting and Processing System reports as near misses. FBP has commissioned a formal investigation team to perform individual and common cause analyses of these events and develop corrective actions.

Many personnel at both FBP and PPPO shared the perspective that FBP personnel have significantly improved the formality of operations, understanding of roles and responsibilities, and overall safety over the last year. However, these recent events indicate that additional corrective actions are warranted.

Significant corrective actions taken by FBP include, but are not limited to:

1. Issuance of a Safety Performance Improvement Plan in September 2012 to address an increased trend in recordable injuries during the first full year of performance with the new workforce. The plan outlines 5 key focus areas and 24 specific initiatives within the 5 focus areas.
2. Rollout of the site ISMS and integrated procedures in October 2012.
3. Issuance of a formal safety policy addressing senior management's safety expectations for managers and supervisors.
4. Implementation of Daily Safety Sheets in October 2012.
5. Implementation of the safety work group program involving every employee.
6. Increased union involvement in management decisions affecting safety, including assignment of seven full-time union safety representatives.

The actions taken to date all have merit in improving the safety posture at PORTS; however, some cultural deficiencies may be inhibiting effectiveness. FBP management spoke candidly with the Independent Oversight team in acknowledging the challenge of obtaining buy-in from the FBP first line managers and workers. The Independent Oversight team also found indications of a lack of rigor and buy-in by "front line managers" (first line supervisors) and other FBP managers. PPPO has identified repeat instances of inadequate procedural and policy knowledge, as well as procedural adherence issues that had not been identified and corrected by FBP line and safety management. In many cases, PPPO has acted as the last barrier to preventing another serious event by stepping in when FBP management failed to recognize problems and intervene. FBP has not adequately addressed weaknesses in the organization's ability to self-identify non-compliant conditions.

During the surveillance shadowing activities, the Independent Oversight team also observed instances of first line supervisors' failure to implement parts of the work control process. For example, during the pre-job brief for the Converter Sampling in Building X-326, both PPPO and Independent Oversight personnel observed that contrary to the FBP procedure on pre-job briefs, the first line manager did not cover the following items: critical steps to be performed and who is assigned to perform each task, major hazards and error precursors, steps to control or mitigate the hazards, verification of required training and

qualifications, and past lessons learned (including good practices). The PPPO surveillance report adequately documented these issues, and FBP submitted problem reports on the issues identified during the surveillance.

The Independent Oversight team noted that FBP corrective action B.6, “Reinforce Responsibilities for Safety to All Managers and Supervisors,” in the September 2012 Safety Improvement Plan was marked as “Complete” by FBP personnel on September 30, 2012. However, based on Independent Oversight’s observations during the shadow assessment, reviews of activities in October 2012, and interviews with FBP senior site management, corrective action may not have been effective. For example, FBP developed a recovery plan to right the crane after the crane toppling event. Although that was a high risk, one-of-a-kind activity, the PPPO team observed several significant problems with the recovery effort, such as the job hazard analysis not complying with established requirements, inadequate discussion of communication strategy during the pre-job brief, violation and lack of enforcement of an established exclusion zone around the toppled crane, and the first line supervisor’s lack of understanding of a hold point in the work package. In another case, the FBP first line supervisor for a vendor activity on the X-720 elevator on October 10, 2012, allowed the vendor to perform energized electrical work without the arc-flash protective clothing required by site safety procedures and a posting on the energized equipment. In these cases, FBP management should have taken action to eliminate these deficiencies before PPPO intervened. These and other indications observed by Independent Oversight indicate that several of the site’s published safety expectations are not being met.

In light of these issues, PPPO commissioned an assessment in December 2012 to focus on the following areas:

- Safety culture at PORTS, focusing on the identification of key elements, employee feedback, completion of the five core functions of the ISMS cycle, the freedom of employees to express concerns without fear of reprisal, and the ability of contractor management to address concerns and communicate resolution of issues.
- Adequacy and effectiveness of compensatory measures to fill known gaps in the ISMS.
- FBP’s ability to ensure that employees are qualified and trained commensurate with their job responsibilities.

6.0 CONCLUSIONS

The Independent Oversight team concurred with the PPPO team’s findings and observations. The PPPO team was thorough and effective in identifying both strengths and deficiencies within the scope of the surveillance. This Independent Oversight appraisal of work planning and control at PORTS notes that the conclusions of the June 2012 EM review still apply. FBP management has developed many reasonable actions and initiatives, but has not prioritized those actions to focus on first line management buy-in for procedure compliance, ISMS, and senior FBP management expectations. Further, FBP management recognizes that a cultural change is needed, but has not specifically identified a clear path to accomplish the culture change. PPPO commissioned a safety culture assessment to evaluate and determine the implementation and effectiveness of the FBP safety culture and associated requirements ensuring work is safely planned and executed. The Independent Oversight team recognizes that a certain level of risk exists with operations of this magnitude with the inherent hazards of the demolition activities; however, increased FBP management attention is needed in the areas of ISMS, procedure compliance, and safety culture to reduce the level of risk to an acceptable level.

FBP acknowledges that the quality of investigations and the development of effective corrective actions need to be improved. FBP has appropriately taken recent actions to supplement investigation teams with more experienced and knowledgeable personnel from both FBP and Fluor Corporation. Continued FBP attention is warranted to ensure that these actions have the intended positive impact.

7.0 ITEMS FOR FOLLOW-UP

HSS will continue to monitor FBP actions during future operational awareness visits by the HSS PORTS Site Lead.

8.0 OPPORTUNITIES FOR IMPROVEMENT

This Independent Oversight review identified the following opportunities for improvement (OFIs). These potential enhancements are not intended to be prescriptive or mandatory. Rather, they are offered to the site to be reviewed and evaluated by the responsible line management organizations and accepted, rejected, or modified as appropriate, in accordance with site-specific program objectives and priorities.

OFI-1 FBP should consider prioritizing existing corrective actions and/or developing actions specifically directed at first line supervisors/managers, emphasizing buy-in on ISMS and corrective action approaches to instill ISMS practices into the workforce.

OFI-2 FBP should consider accelerated development of additional methods for emphasizing and reinforcing the importance of procedure compliance and situational awareness among the workforce.

Appendix A Supplemental Information

Dates of Review

Onsite Review: October 22-25, 2012

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Appendix B

Documents Reviewed, Interviews, and Observations

Documents Reviewed

- PPPO Surveillance Checklist PORT-13-IS-100476, October 22-26, 2012
- *Trip Report for the Environmental Management Office of Operational Safety (EM-42) and Portsmouth Paducah Project Office (PPPO) Review of Select Fluor-Babcock & Wilcox Portsmouth, LLC (FBP) Programs*, June 19-21, 2012
- EM--PPPO-FBP-PORTSDD-2012-0027, Near Miss--Mobile Crane Tips Forward, Event 10/09/2012
- EM--PPPO-FBP-PORTSDD-2012-0022, Near Miss - Excavator Arm/Boom Contacts De-energized Overhead Power Line, Event 09/13/2012, Final 10/29/2012
- EM--PPPO-FBP-PORTSDD-2012-0020, Bay Crane #8 Feed Rail Near Miss, Event 08/23/2012, Final 10/18/2012
- EM--PPPO-FBP-PORTSDD-2012-0018, Spill of Nitric Acid on Decontamination Building Roof, Event 08/15/2012, Final 10/02/2012
- EM--PPPO-FBP-FUEF-2012-0002, Electric Cart Accident Resulting in Multiple Fractures of the Leg, Event 03/14/2012, Final 06/11/2012
- EM--PPPO-FBP-PORTSDD-2012-0029, Near Miss--Subcontractor Strikes Overhead Fiber Optics Line, Event 11/08/2012, Latest Update 11/15/2012
- FBP-NSE-PRO-00002, Rev. 3, Pre-Job Briefing and Post-Job Review, 05/24/2012
- FBP-NSE-PRO-00113, Rev. 1, Subcontractor/Vendor Oversight Process, 08/16/2012
- FBP-NSE-PRO-00070, Rev. 4, Work Planning and Control Process, 09/04/2012
- FBP-PM-POL-00001, Rev. 2, Safety Expectations for Managers and Supervisors
- FBP Safety Performance Improvement Plan, Revision 0, 9/11/2012
- Daily Safety Sheet, *Change in Vehicle Procedures*, Vol. 1, Issue 13, 10/22/2013
- PORTS Plan of the Week Meeting Agenda, 10/22/2013
- Completed FBP-NSE-PRO-00002-F01, Rev. 3, Full Pre-Job Briefing and Post-Job Review Forms associated with activity observations below
- X-750 Garage work packages and associated radiation work permits
- Wise Construction Pre-Job & Work Control Documents
- X-326 Converter Sampling Pre-Job
- DOE Letter: Fluor-B&W Portsmouth, LLC, Work Planning and Control, Prior to Work Execution Surveillance (PORT-13-IS-100476), 11/ 7/12
- Portsmouth Facility Representative Weekly Report, 10/08/2012 – 10/14/2012
- Letter from D. Carr to R. Bell, "Fluor-B&W Portsmouth LLC (FBP) Corrective Action Plans for Recent Events, (FBP-12-0960)," dated 11/14/12
- Letter from R. Bell to D. Carr, "Recurring Events For Hazardous Energy, (PPPO-031700972-13)," 11/1/12
- Letter from R. Bell to M. Ashby, "Near Miss -X-326 Cut and Cap Project, (PPPO-031612725-13)," 10/ 30/12
- Letter from V. Adams to D. Carr, "Independent Assessment of the Fluor-B&W Portsmouth LLC, Safety Culture at the Portsmouth Gaseous diffusion Plant, 11/28/2012

Interviews

- PPPO Site Director
- PPPO Site Lead
- PPPO Facility Representative
- FBP Program Manager
- FBP Environment, Safety, Health, and Quality Manager
- FBP Facility Stabilization & Deactivation Manager
- FBP New Construction Project Management Manager
- FBP Site Maintenance, Infrastructure, Deactivation & Demolition Projects Manager
- United Steel Workers Site Safety Representatives Lead
- United Steel Workers Site Safety Representative
- Crane Topple Investigation Team Co-Lead

Observations

- PORTS Plan of the week, 10/22/2012
- Safety Brief to X-750 Garage workers regarding initial lessons learned from the crane topple event
- X-750 Garage Walkdown
- FBP Vendors (Betz Water Treatment Services)
- Pre-job briefing for the X-326 Louver Roof Work
- Pre-job briefing for Converter Sampling 25-5-2 Stage 12 at X-326
- Pre-job briefing for Overhead Crane Preventive Maintenance
- Pre-job briefing for Wise Construction Pre-job