



Independent Assessment of Work Planning and Control at the Paducah Gaseous Diffusion Plant

June 2023

Office of Enterprise Assessments
U.S. Department of Energy

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Acronyms

ALWCD	Activity-level Work Control Document
CAP	Corrective Action Plan
CAS	Contractor Assurance System
CFR	Code of Federal Regulations
CPAP	Contractor Performance Assurance Program
CRAD	Criteria and Review Approach Document
DOE	U.S. Department of Energy
EA	Office of Enterprise Assessments
ECP	Employee Concerns Program
ETAS	Enterprise Technical Assistance Services
FR	Facility Representative
FRNP	Four Rivers Nuclear Partnership, LLC
FY	Fiscal Year
HIC	Hazard Identification Checklist
IH	Industrial Hygiene
IHWP	Industrial Hygiene Work Permit
IS	Industrial Safety
ISM	Integrated Safety Management
ISMS	Integrated Safety Management System
JHA	Job Hazard Analysis
LL	Lesson Learned
MTS	Management Tracking System
OFI	Opportunity for Improvement
POMC	Performance Objectives, Measures, and Commitments
PPE	Personal Protective Equipment
PPPO	Portsmouth/Paducah Project Office
RP	Radiation Protection
RWP	Radiological Work Permit
SME	Subject Matter Expert
SOTW	Skill of the Worker
TQP	Technical Qualification Program
WI	Work Instruction
WP&C	Work Planning and Control

INDEPENDENT ASSESSMENT OF WORK PLANNING AND CONTROL AT THE PADUCAH GASEOUS DIFFUSION PLANT

Executive Summary

The U.S. Department of Energy (DOE) Office of Enterprise Assessments (EA) conducted an independent assessment of work planning and control (WP&C) at the Paducah Gaseous Diffusion Plant in March 2023. Specifically, this assessment evaluated the Four Rivers Nuclear Partnership, LLC (FRNP) WP&C processes for deactivation work, elements of the FRNP industrial hygiene and contractor assurance system (CAS), and the DOE Portsmouth/Paducah Project Office (PPPO) oversight processes of WP&C.

EA identified the following strengths, including one best practice:

- FRNP has made significant improvements to the WP&C institutional programs to address the findings from the previous 2021 EA assessment, *Independent Assessment of Work Planning and Control at the Paducah Gaseous Diffusion Plant, November 2021*. Additionally, FRNP has a noteworthy process for ensuring that all “skill of the worker” (SOTW) work is appropriately analyzed for hazards and appropriate controls are identified. CP5-SM-1001, *Excluded Work Activities*, addresses work activities that can be accomplished as “skill of the worker”; “Excluded Work” is SOTW work that is low complexity, low risk work that can be “excluded” from the WP&C work package planning processes (i.e., can be performed without developing a work package). (Best Practice)
- The FRNP industrial safety, industrial hygiene, and radiation protection programs are comprehensive and well aligned with the WP&C framework. The safety and health and radiation protection staff provide appropriate support to the planning and conduct of work.
- FRNP’s CAS provides a comprehensive system for planning and conducting assessments, issues management, and the development and use of metrics.
- PPPO provides generally effective Federal oversight through formal assessments and operational awareness activities.

EA also identified weaknesses, including one finding, as summarized below:

- PPPO has not conducted an accurate Facility Representative (FR) staffing analysis or conducted a triennial self-assessment of the FR program, as required per DOE-STD-1063-2021, *Facility Representatives*. (Finding)
- FRNP did not identify all hazards associated with some specific work activities.
- FRNP did not ensure that pre-job briefings were conducted as required. Specifically, the pre-job briefing checklist was not consistently used, and lessons learned were not always discussed.
- The FRNP issues management process did not result in the correct categorization of a previous EA finding.
- FRNP does not effectively collect, analyze, or trend feedback from the WP&C processes.
- PPPO has not identified site-specific training for support service contractor personnel performing safety oversight of site operational activities.

In summary, FRNP has developed and implemented a satisfactory WP&C framework for deactivation work at the Paducah Gaseous Diffusion Plant, and PPPO implements generally effective Federal oversight. Significant improvements have been made to the WP&C institutional programs. However, the FRNP hazards analysis process is not being adequately applied to all work activities, and some aspects of performing work need improvement. While the CAS is generally effective, the issues management process did not result in the correct categorization of a finding from the 2021 EA assessment. In addition, PPPO is not meeting all requirements for the FR program. As FRNP continues to mature with the

implementation of the revised WP&C institutional programs, additional focus is needed on hazard identification and pre-job briefings.

INDEPENDENT ASSESSMENT OF WORK PLANNING AND CONTROL AT THE PADUCAH GASEOUS DIFFUSION PLANT

1.0 INTRODUCTION

The U.S. Department of Energy (DOE) Office of Worker Safety and Health Assessments, within the independent Office of Enterprise Assessments (EA), conducted an assessment of work planning and control (WP&C) for deactivation work at the Paducah Gaseous Diffusion Plant, which is managed by Four Rivers Nuclear Partnership, LLC (FRNP). This assessment was conducted on site from March 13-16, 2023.

Consistent with the *Plan for the Independent Assessment of Work Planning and Control for Cleanup Operations at the Paducah Gaseous Diffusion Plant, March 2023*, this assessment evaluated the effectiveness of the implementation of the integrated safety management (ISM) core functions. The five ISM core functions are: defining the scope of work, identifying and analyzing hazards, developing and implementing hazard controls, performing work safely within controls, and providing feedback and making improvements. The assessment evaluated activity-level work involving process building deactivation efforts. This assessment also evaluated elements of the industrial hygiene (IH) program, the contractor assurance system (CAS), and the DOE Portsmouth/Paducah Project Office (PPPO) oversight of WP&C. DOE Headquarters Office of Environmental Management (EM) provides direction and oversight of the DOE PPPO.

2.0 METHODOLOGY

The DOE independent oversight program is described in and governed by DOE Order 227.1A, *Independent Oversight Program*, which EA implements through a comprehensive set of internal protocols, operating practices, assessment guides, and process guides. This report uses the terms “best practices, deficiencies, findings, and opportunities for improvement (OFIs)” as defined in the order.

As identified in the assessment plan, this assessment considered objectives and criteria from DOE Guide 226.1-2A, *Federal Line Management Oversight of Department of Energy Nuclear Facilities*, app. D, *Activity Level Work Planning and Control Criterion Review and Approach Documents with Lines of Inquiry*. EA used elements of Criteria and Review Approach Document (CRAD) EA-30-07, Rev. 0, *Federal Line Management Oversight Processes*, to collect and analyze data on PPPO oversight activities related to WP&C. In addition, EA used selected objectives and criteria from the following CRADs:

- EA CRAD 30-01, Rev. 1, *Contractor Assurance System*
- EA CRAD 30-09, Rev. 0, *Occupational Radiation Protection Program*
- EA CRAD 32-10, Rev. 0, *Construction Safety*
- EA CRAD 32-03, Rev. 1, *Industrial Hygiene Program*.

EA observed the planning and implementation of 27 onsite work activities associated with the deactivation of gaseous diffusion plant process buildings. EA examined key activity-level work control documents (ALWCDs), such as WP&C plans and procedures, job hazard analyses (JHAs), work instructions (WIs) and work orders, manuals, analyses, and policies. EA also interviewed key personnel responsible for developing and executing the associated programs and walked down a former uranium processing building. The members of the assessment team, the Quality Review Board, and the management responsible for this assessment are listed in appendix A.

EA conducted a previous assessment of WP&C at the Paducah Gaseous Diffusion Plant in 2021, as documented in EA report *Independent Assessment of Work Planning and Control at the Paducah Gaseous Diffusion Plant, November 2021*. This current EA assessment examined the completion and effectiveness of corrective actions for the findings described in the previous assessment to evaluate the implementation of hazard control and implementation for deactivation work. Results of the corrective action assessments are included in section 3.5 of this report.

3.0 RESULTS

3.1 Work Planning and Control Institutional Programs

This portion of the assessment evaluated whether FRNP has established WP&C programs and processes at the institutional level that flow down worker safety and health program (WSHP) requirements into work control procedures and enable the safe performance of work.

CP2-HS-2000, *Worker Safety and Health Program*, adequately establishes the flowdown of applicable regulations into site safety, health, and work control documents. CP2-HS-2000, *WSHP – Implementation Matrix*, adequately demonstrates how FRNP implements 10 CFR 851, *Worker Safety and Health Program*, in its WSHP and WP&C programs and maps how regulatory requirements are incorporated into site WP&C documents.

Overall, FRNP’s WP&C programs are well-designed and adequate to support deactivation and demolition activities. FRNP has implemented an extensive, single work control process for various types of work activities (construction, maintenance, and deactivation). The FRNP procedures include a robust hazard identification and control development process that directly supports the development of ALWCDs. The procedure set is extensive and well-integrated. Examples of these procedures include CP3-SM-1101, *Work Package Development*; CP3-SM-1102, *Activity Level Work Execution*; CP3-HS-2004, *Job Hazard Analysis*; and CP3-OP-0316, *Pre and Post Job Reviews*. FRNP personnel use two writer’s guides (CP3-SM-1006, *Activity Level Work Control Document Writer’s Guide*, and CP5-SM-1008, *Hazard/Control Integration Guide*), which assist with the accuracy and consistency of ALWCD development.

FRNP made significant improvements to the WP&C institutional programs to address the findings from the 2021 EA report. These improvements include the development of CP5-SM-1001, *Excluded Work Activities*, to address work activities that can be accomplished as “skill of the worker” (SOTW); revised procedures to improve the definition of the scope of work; revised JHAs to be more tailored to job activities; and an additional suite of WP&C training. CP2-SM-1000, *Activity Level Work Planning and Control Program for the Paducah Gaseous Diffusion Plant, Paducah Kentucky*, and supporting documents adequately define the overall elements of the WP&C programs. FRNP procedures for work package development are extensive, kept current, and provide an adequate structure for work planning, development of ALWCDs, and authorization and execution of work activities.

Procedure CP5-SM-1001 includes a noteworthy process for ensuring that all SOTW job tasks are analyzed for hazards and that appropriate controls are identified. “Excluded Work” refers to SOTW work that is low complexity, low risk work that can be “excluded” from the WP&C work package planning processes (i.e., can be performed without developing a work package). Appendix A of this procedure provides a listing of identified excluded work and the relevant JHA for controlling the hazards. For work that is not included in this appendix but is low hazard and low complexity and meets the specified restrictions for excluded work, the procedure describes the process for adding potential excluded work. The same work planning process that is used for higher hazard work is also used for the excluded work – a hazard identification checklist (HIC) planning team walks down the work and documents the work

scope. If the work can be excluded, the team completes the HIC, a JHA is developed, and the appendix is updated to add this new excluded work activity. EA considers the use of this process to enhance the effectiveness of the WP&C program to be a **Best Practice** because it results in fully analyzed and documented work activities that can be accomplished as SOTW work.

CP3-HS-2004 and supporting documents adequately define the process for developing a JHA and/or an industrial hygiene work permit (IHWP). An IHWP documents the IH controls to be implemented and the necessary level of IH monitoring and support. The procedure specifies the responsibilities of workers, line managers, and subject matter experts (SMEs), and provides step-by-step guidance on the development of WP&C documents. The WP&C process for identifying hazards appropriately includes a planning team comprised of workers, supervisors, engineering, environmental, safety and health SMEs, and work planners. The process also involves the completion of an HIC. The checklist includes relevant hazards, including physical, hazardous energy, chemical hazards, ionizing radiation, non-ionizing radiation, biological/vector hazards, equipment hazards, environmental hazards, and miscellaneous hazards.

The industrial safety (IS), IH, and radiation protection (RP) programs are well aligned with the WP&C framework. The programs provide thorough programmatic requirements and procedures to enable proper identification and analysis of IS, IH, and radiological hazards and required controls. The IS, IH, and RP programs provide appropriate programmatic guidance for identifying and analyzing IH, safety, and radiological hazards. Procedures are adequate for identifying hazards, developing applicable controls, deconflicting personal protective equipment (PPE) requirements, collecting samples, and notifying employees. For instance, CP3-HS-2057, *Hydrogen Fluoride Protection, Monitoring, and Response Strategy for Deactivation and Remediation Project*, establishes an adequate program for anticipating, identifying, and controlling potential hydrogen fluoride exposures during deactivation and remediation activities.

The IS, IH, and RP programs and the occupational medicine program are well aligned to ensure that workers receive appropriate medical surveillances and support. CP3-TR-0104-F01, *Training and Medical Surveillance Determination*, documents employee specific requirements based on their assigned duties. This alignment of the programs and required permits ensures that workers receive required medical monitoring based on their exposure potentials.

The FRNP safety and health program areas are well staffed with experienced and trained IS, IH, and RP technical personnel. Some personnel have 20 or more years experience with FRNP operations and other DOE sites. FRNP has access to local graduates from the Occupational Health and Safety academic programs at Murray State University to fill open IS and IH positions. This has helped support the growth in the FRNP IS and IH programs.

Work Planning and Control Institutional Programs Conclusions

FRNP has made significant improvements to WP&C institutional programs since the 2021 EA assessment. Overall, the FRNP WP&C processes and procedures for planning and performing work provide a useful framework for implementing the ISM core functions, including work deemed to be low hazard and low complexity. Procedure CP5-SM-1001 documents a best practice for ensuring that all SOTW work is analyzed for hazards and that appropriate controls are identified. Additionally, the IS, IH, and RP programs are comprehensive with adequate procedural guidance and qualified staff.

3.2 Work Planning and Control Implementation

This portion of the assessment evaluated FRNP's implementation of the WP&C institutional programs through the ISM core functions: defining the scope of work, identifying and analyzing hazards, developing and implementing hazard controls, and performing work within controls.

Defining the Scope of Work

Procedure CP3-SM-1101 provides adequate instructions for preparing and screening work scopes. EA reviewed eight ALWCDs that were developed under the FRNP WP&C process, and the work scopes were sufficiently detailed to permit analysis of hazards and specification of necessary controls for individual work steps.

Identifying and Analyzing Hazards

For most observed work, implementation of the WP&C processes resulted in appropriate SME involvement in identifying and analyzing task-based hazards associated with the work.

EA observed a HIC planning team meeting to identify hazards associated with a planned job to install onsite trailers. The meeting was held at the job worksite and included the appropriate representation, including IH, IS, and RP SMEs, engineering, supervisors, craft workers, and work planners. A work planner led the team, using the HIC as a guide to identify relevant work task hazards. The team conducted a thorough review of the work task and identified relevant hazards, including the consideration of overhead power lines.

The FRNP as low as reasonably achievable (ALARA) review and radiological work permit (RWP) development processes effectively analyzed radiological hazards associated with deactivation activities. RWP FRNP-23138 R1, *All necessary deactivation activities in C-333*, was appropriately prepared in accordance with ALARA review 21-AR-00009, *Work Activities in C-333 (final)*. Radiological controls from this ALARA review were appropriately flowed into RWP-FRNP-23138.

IH effectively implemented practices associated with identifying hazards for various contaminants (e.g., asbestos, silica, lead, hydrogen fluoride) for observed work. IH monitoring plans for the collection of exposure data (personal and area) were robust, technically correct, and aligned with work activities. IH exposure records storage processes were adequate and compliant with applicable records retention requirements. Employees are provided exposure monitoring notification reports which include graphical representation of the exposure monitoring results and the exposure limits, which is effective for aiding employee understanding of the exposure data.

Five of the eight reviewed job-specific JHAs adequately identified hazards present during the observed work evolutions. However, contrary to the requirements of CP2-HS-2000, sec. 4.1.1, and CP3-HS-2004, sec. 5.18, which documents the process for developing a JHA, (including HIC completion) and/or an industrial hygiene work permit (IHWP). EA identified the following weaknesses with respect to the identification, analysis, and documentation of hazards. (See **Deficiency D-FRNP-1**.) The omission of hazards in JHAs can result in workers being exposed to uncontrolled hazards.

- JHA-21558, *Heavy Equipment Demo C-333 Cell Floor*, included the potential of a noise hazard associated with the operation of heavy equipment. In the event of a potential noise hazard, IH was required to perform noise monitoring to establish noise boundaries and hearing protection requirements if needed. During an observed evolution, a potential noise hazard associated with the waste load out was identified by the EA team, and hearing protection was not being worn. A

subsequent determination by FRNP confirmed that no existing monitoring data was available for this activity. Furthermore, this potential hazard and requisite controls were neither included in the WI nor mentioned during pre-job briefings. Meter readings of the sound level were conducted the following day and resulted in the establishment of a hearing protection control zone and the requirement for workers to use hearing protection when inside the control zone.

- JHA-21558 has no identified fall hazards other than the use of aerial lifts, and the general site JHA-9698, *Site Safety Orientation*, identifies potential hazards associated with “Improper performance of elevated work activities” (including ladders and references CP3-HS-2011, *Portable Ladder Procedure*); however, the loading of rail cars associated with waste disposal activities subjected workers to fall hazards other than those identified in either JHA. During the work activity, the radiation control technician providing radiological monitoring of loading waste items was required to place a portable air sampler on the top edge of the rail car to monitor potential airborne contaminants. The height of the rail car was approximately 15-20 feet and required climbing a fixed ladder. The radiation control technician requested a maintenance mechanic to climb the ladder while holding the air sampling pump hose and sampling head; the mechanic positioned the unit on the top edge of the rail car opening. The JHA did not specifically address this elevated hazard. Furthermore, worker training F00128CBT FR1, *Ladder Safety*, primarily addresses portable ladder use and not the specifications for the fixed rail car ladder being used. This potential hazard and requisite controls were neither included in the WI nor mentioned during pre-job briefings.
- JHA-21283, *Asbestos Activities Class 2*, identifies hazards associated with the removal of asbestos-containing materials, including transite panels. EA observed three different evolutions of transite panel removal. During one evolution, workers were removing a panel (approximate weight of 120 pounds) from a cell housing at a height of approximately six feet when they lost control of the panel, resulting in the panel tipping overhead and falling to the floor. While no one was injured, the potential hazard of being struck by a falling object is not directly addressed in the WI or the JHA.

Developing and Implementing Hazard Controls

CP5-SM-1008 provides the primary guidance for integrating hazards and controls from JHAs and IHWPs to work instructions and technical procedures. Hazard controls were effectively developed and implemented for WI activities and hazard-specific permits (IHWPs, RWPs, etc.).

Performing Work Within Controls

FRNP adequately performed observed work within defined work controls by effectively implementing work planning, stop/pause work authority, and work status logs with supporting RP, IH, and IS SME engagement. Procedure CP3-SM-1102 provides a well-defined process for the execution and timely closeout of activity-level work. Most observed pre-job briefings were comprehensive and addressed the work scope, tasks, and hazard controls that in some cases were not explicitly defined in the work control documents, as discussed previously.

Work observations demonstrated the use of appropriate administrative controls and PPE. For example, field work observations identified appropriate work area postings, erected barriers as required, and PPE usage consistent with work package requirements.

However, contrary to CP3-OP-0316, sec. 6.3.2, which requires the use of a pre-job checklist (CP3-OP-0316-F02, *Pre-Job Briefing Checklist*) to conduct pre-job briefings, and sec. 6.5.1, which requires the discussion of lessons learned (LLs) during pre-job briefings, EA observed the following concerns with pre-job briefings that did not follow these requirements (see **Deficiency D-FRNP-2**):

- The briefer did not actively use the pre-job checklist during four of the nine observed pre-job briefings.
- Five of the nine observed pre-job briefings did not include a discussion of relevant LLs.

FRNP's ability to confirm its readiness to perform work can be negatively impacted by the omission of pre-job briefing elements, as well as workers not benefiting from previous LLs.

Work Planning and Control Implementation Conclusions

FRNP is generally effective in defining the scope of work, identifying and analyzing hazards, developing and implementing hazard controls, and performing work within controls. The work scopes for the eight reviewed ALWCDs were screened and prepared consistent with institutional requirements and guidance. However, the associated JHAs and WIs for three work activities did not identify all hazards present during the work conducted, resulting in controls not being included in WI(s). This resulted in potential and actual employee exposures to health and safety hazards while conducting the work. While the work control documents did not adequately capture all hazards and controls, no worker injuries or overexposures were observed. Additionally, some observed pre-job briefings did not follow requirements.

3.3 Contractor Assurance System

This portion of the assessment evaluated whether FRNP has established a CAS to plan and conduct risk-based assessments, analyze and manage WP&C-related issues and associated corrective actions, review performance (including feedback and improvement), and share LLs.

The CAS program effectively monitors and evaluates contractor and subcontractor work and safety performance. PPPO initially approved the contractor performance assurance program description (11/21/2017) and a review of the CAS is included in the contractor-led biennial review of the integrated safety management system (ISMS) description. CP2-QA-3000-FR2, *Contractor Performance Assurance Program Description at the Paducah Gaseous Diffusion Plant*, appropriately addresses the CAS elements of assessments, issues management, assurance communications, feedback and LLs, and metrics. Management duties and responsibilities are adequately described in CP2-TS-2000, *Roles, Responsibilities, Authorities and Accountability*, and also discussed in numerous other documents, including the ISMS description document.

CAS results are appropriately compiled, analyzed, and communicated through a variety of methods, including the quarterly trending report, a monthly contractor performance assurance program (CPAP) report, and a monthly performance objectives, measures, and commitments (POMC) key performance indicators report. Reviewed training records for personnel with CAS responsibilities (i.e., causal analyst, lead auditor) demonstrated appropriate training and qualification. The FRNP's Executive Review Board monitors CAS activities based on the Board's charter, meeting minutes, and interviews with senior managers. These activities include the review of issues, assessment plans, annual POMCs, and CAS data. Safety is emphasized through numerous activities, including documented management walk-through performance observations, observed daily safety topics to start meetings, the documented monthly safety meeting, and the Take Two for Safety Program, which earned the DOE/HQ Outstanding Safety Culture team award in 2021.

CP3-QA-1003, *Management and Self-Assessments*, and CP3-QA-1004, *Independent Assessment Program*, describe an appropriate process for preparing, conducting, and documenting risk-based assessments, including the use of an assessment checklist and lines of inquiry. The reviewed fiscal year (FY) 2022 and FY 2023 FRNP annual assessment plans included core and supplemental management, self, and independent assessments. FRNP has a metric to self-identify over 70% of issues, encouraging a

self-critical approach to assessments. The monthly February 2023 CPAP report highlighted overdue and upcoming assessments, including DOE external assessments and the status of externally generated issues. Reviewed assessments (two independent assessments, two self-assessments, and one third-party management assessment) were adequately documented, included an assessment checklist with lines of inquiry, and identified issues appropriately. In addition to formal assessments, the FRNP performance observations program encourages management walk-throughs in the field, with a goal of three per month for selected managers. The February monthly performance observation report documented 239 observations by 74 managers, and included trending results, focus areas, and corrective actions for negative trends.

The issues management and corrective action systems are adequately defined in FRNP procedure CP3-QA-3001, *Issues Management*, which describes a comprehensive system for identifying and analyzing issues, developing and monitoring corrective actions, and conducting extent-of-condition and effectiveness reviews for high-level issues. EA observed two FRNP Screening Committee meetings; these meetings occur daily to confirm priority level determination and the issue owner for newly identified issues. Reviewed quarterly trending report FRNP-RPT-0284, *Contractor Performance Assurance Program Quarterly Trending Report—FY 2023 Q1*, appropriately tracked, trended, and reported issues. Also, the monthly CPAP report provides a status of overdue and upcoming action items.

FRNP adequately develops, tracks, and trends an extensive suite of performance metrics, including safety statistics. FRNP-RPT-0284 documents a thorough analysis of the safety trends, which are compiled and distributed in the quarterly trending report. FRNP provides a monthly status to PPPO on the mutually agreed upon set of POMCs. The monthly safety meeting includes safety performance metrics, as evidenced by the December 2022 Monthly Safety Meeting presentation. EA reviewed the executive dashboard, which provides senior management with a focused set of metrics.

FRNP has generally effective processes in place to share LLs and use feedback to drive improvement in the WP&C program. FRNP has an effective LL program that gathers information from multiple sources, including the DOE OPEX Share website. FRNP shares LLs with appropriate FRNP organizational elements and generates LLs. The LL coordinator distributes LL daily, and applicable LLs are included in the *Source References* section of work packages; however, as noted in section 3.2 of this report, LLs are not always shared during pre-job briefings. The lack of incorporation of LLs into the WP&C process was previously identified in an FRNP FY 2020 feedback and continuous improvement self-assessment.

The employee concerns program (ECP) is appropriately managed in accordance with CP2-EC-0131, *Four Rivers Nuclear Partnership, LLC, Employee Concerns Program*, including case file management and ECP communication to employees and subcontractors. The employee concerns manager is a trained employee concerns investigator and is part of the senior management team.

Despite a generally effective CAS, the FRNP issues management process did not result in the correct categorization of a finding from the 2021 EA assessment. CP3-QA-3001, section 6.1.6, states that level 2 high issues include those that have a high impact to the environment, safety, or health of workers and the public, including hazards associated with nuclear criticality or electrical arc flash. Finding F-FRNP-2 from the 2021 EA assessment included a weakness related to the inappropriate use of the general JHA to address hazards and controls associated with nuclear criticality, electrical arc flash, and exposure to potential release of hazardous energy. Contrary to CP3-QA-3001, this finding was incorrectly categorized as a level 3 moderate issue instead of a level 2 high issue. (See **Deficiency D-FRNP-3**). Categorizing the finding as a level 2 would have required the development of an effectiveness review to ensure resolution of the identified weaknesses. The reluctance to categorize issues as a level 1 or 2 finding was previously identified as a key improvement area warranting senior management attention in NU-MASS-0117, *Parent Company Independent Assessment Contractor Assurance System (CAS)*

Effectiveness Review of Four Rivers Nuclear Partnership, LLC. The report notes that “Self-identifying a significant issue as a ... Level 1/2 would signal the importance of the issue both internally and with DOE; ensure an effective and comprehensive corrective action plan is developed to address the underlying issues; and ensure the necessary resources and priority are applied to correct the issues in a timely manner.” In response to the key improvement area, FRNP implemented two initiatives to increase senior management engagement in the priority level determination – the distribution of a daily list of submitted corrective action plans prior to the screening meeting, and the presentation to the Executive Review Board of new corrective action plan reports.

Contrary to DOE Order 226.1B, *Implementation of Department of Energy Oversight Policy*, att. 1, 2.b.(10), feedback is not routinely collected for WP&C performance. Post-job feedback forms are only required to be prepared on type 1 high risk work packages. The forms, even when completed, are not systematically reviewed and analyzed to improve program performance. (See **Deficiency D-FRNP-4.**) The lack of worker feedback mechanisms can result in feedback not being collected, analyzed, and trended to drive improvements in the WP&C program.

Contractor Assurance System Conclusions

FRNP has effectively developed and implemented a DOE-approved CAS. It provides a comprehensive system for planning and conducting assessments, issues management including developing and monitoring corrective actions, and the development and use of metrics to track and trend performance. FRNP effectively manages the ECP and LLs are generated and shared. Safety is emphasized through numerous activities including the Take Two for Safety Program. However, a deficiency was identified related to the incorrect categorization of a previous EA finding. Also, FRNP does not effectively collect worker feedback from WP&C processes.

3.4 Portsmouth/Paducah Project Office Oversight

This portion of the assessment evaluated PPPO’s WP&C oversight of FRNP and specific PPPO programs, including issues management, the technical qualification program (TQP), and employee concerns.

PPPO has established and implemented effective oversight processes that evaluate the adequacy and effectiveness of CAS and DOE oversight processes. Enterprise Technical Assistance Services, Inc. (ETAS) is contracted to provide technical support services to PPPO. Services include supporting the implementation of PPPO oversight programs and procedures to maintain operational oversight, and providing feedback and recommendations.

Facility Representatives (FRs) and the ETAS staff perform operational awareness. During observed FR walkdowns, the FRs demonstrated adequate knowledge of the operations. Additionally, industrial safety hazards were observed associated with improper ladder usage, rigging, and trenching. The FRs appropriately brought these concerns to the attention of the accompanying FRNP representative.

Reviewed employee training records showed that the ETAS staff did not have the appropriate level of training to effectively oversee asbestos abatement work. Contrary to PPPO-M-226.1-2, *Oversight Program Plan*, sec. 5.4.2.6, PPPO has not identified site-specific training for support service contractor personnel who perform safety oversight of site operational activities. (See **Deficiency D-PPPO-1.**) Inadequate safety training can result in safety and industrial hazards not being recognized and adequately controlled.

PPPO conducts scheduled integrated assessments and surveillances of FRNP focused on ISMS, and conducts management assessments of its own programs. Identified issues from these oversight activities are entered in the management tracking system (MTS), tracked to completion, and the data analyzed for trends. The issues are tracked in MTS and closed after verifying the effectiveness of corrective actions.

PPPO continues to exhibit weakness in effectively implementing FR program requirements. The PPPO FR staffing analysis for the Paducah site demonstrates that they are fully staffed with five FRs. One FR out of the five spends 30% of their time conducting oversight duties and the remaining 70% on Federal project management. This employee is credited as a full-time FR, thus resulting in an inaccurate FR staffing analysis. Additionally, PPPO has not conducted a triennial self-assessment of its FR program as required by PPPO-2691323, secs. 5.1.1 and 5.7.4; and DOE-STD-1063-2021, *Facility Representatives*, secs. 4.2.4.a & e, 5.1, and 5.6.2. (See **Finding F-PPPO-1.**) Maintaining an optimal FR staffing level is needed to maintain effective oversight, and a periodic self-assessment is needed to determine the effectiveness of the program.

PPPO has made considerable progress in the administration of its TQP. PPPO is currently in the process of conducting a self-assessment of its TQP. Four FRs are qualified, and their qualifications are documented in electronic TQP (eTQP). PPPO is in the process of entering qualification elements for the newly hired FR. The TQP participants' names along with their legacy qualification information have been entered into eTQP. PPPO has an ETAS support staff member assisting the training manager to update the qualification records in eTQP. However, PPPO-M-426.1-0, *Technical Qualification Program Plan Procedure*, has not been updated to meet the current version of DOE Order 426.1B, *DOE Federal Technical Capabilities*, to include the current requirement for completing 80-hour continuing training activities in a nominal 5-year cycle. (See **Deficiency D-PPPO-2.**) Not completing the required continuing training could disrupt TQP participant's qualification status. The process allows the employees to use their individual development plan to document their continuing training plan; however, the completed training could be documented in eTQP. (See **OFI-PPPO-1.**)

PPPO has implemented a generally effective ECP. PPPO has assessed the contractor's ECP, conducted a self-assessment of its ECP, appropriately processed ECP cases, and displayed ECP posters. Also, the DOE Office of Environment, Health, Safety and Security HQ ECP Director completed a review of PPPO's ECP in October 2022 and provided recommendations to PPPO; PPPO is implementing these recommendations.

Portsmouth/Paducah Project Office Oversight Conclusions

PPPO has generally effective processes for Federal line oversight of WP&C. PPPO conducts adequate assessments and surveillances, operational awareness activities, and performance assurance analyses and effectively communicates issues from oversight activities to FRNP. PPPO has made significant improvement in the administration of its TQP and has an ETAS staff member updating qualifications records in eTQP. However, PPPO has not conducted a self-assessment of its FR program or an accurate FR staffing analysis, or developed site-specific safety training requirements for support service personnel supporting the Federal oversight program.

3.5 Finding Follow-up

This portion of the assessment examined the completion of corrective actions for the two findings documented in the 2021 EA report.

FRNP made significant improvements to the WP&C institutional programs to address the findings from the 2021 EA assessment. These improvements include the development of a procedure to address excluded work activities for SOTW work, revised procedures to improve the definition of the scope of the work, revised JHAs to be more tailored to the job activities, and a suite of training for WP&C.

Finding F-FRNP-1 of the 2021 EA report stated that the FRNP WP&C program did not include sufficient requirements or instructions to ensure adequate implementation of the ISM core functions, including work scope boundaries, hazards, and hazard controls, for low-hazard and low-complexity work to be performed as SOTW, contrary to 48 CFR 970.5223-1, *Integration of environment, safety, and health into work planning and execution*, sec. (c).

The compensatory measures and corrective actions were sufficient to address this finding. The development and revision of CP5-SM-1001 and the requirement to develop JHAs for excluded work adequately address SOTW. The revision to CP3-SM-1101 and CP3-SM-1102 to add job walkdowns and the requirement to conduct a pre-job briefing are adequate to address the concern related to insufficient requirements or instructions for work scope boundaries, hazards, and controls for SOTW. FRNP completed the action to develop computer-based training modules on excluded work.

Finding F-FRNP-2 of the 2021 EA report stated that FRNP had not implemented the JHA process in accordance with established FRNP procedures. Specifically, FRNP did not adequately tailor hazards or controls to specific work activities, placed an over-reliance on general JHAs that do not cover all identified hazards, and in some cases inappropriately relied on safety permits to identify hazards not addressed in JHAs, contrary to 48 CFR 970.5223-1, sec. (h).

The compensatory measures and the corrective action plan were sufficient to address this finding. The revisions to CP3-HS-2004 included revising the IHWP request form and the procedure to require a more specific approach to developing JHAs and IHWPs. Numerous JHAs, including JHA-9583, *Asbestos Glove Bagging (Maintenance Activities)*, were revised, and the active work packages for C-333 work that referenced JHA-19032, *Deactivation of C-333*, were reviewed to determine whether a specific JHA needed to be developed. CP3-HS-2004 was also revised to address the IHWP. While FRNP corrective actions for this finding were found to be appropriate, a deficiency was identified related to the incorrect issue categorization of finding F-FRNP-2, as discussed in section 3.3 of this report. A consequence of this error is that an effectiveness review was not performed by FRNP to ensure resolution of the identified weaknesses.

Finding Follow-up Conclusions

The corrective actions for the previous EA findings adequately address the concerns with the WP&C institutional programs, however as discussed in section 3.3 of this report, there is a deficiency related to the incorrect issue categorization of finding F-FRNP-2.

4.0 BEST PRACTICES

Best practices are safety-related practices, techniques, processes, or program attributes observed during an assessment that may merit consideration by other DOE and contractor organizations for implementation. The following best practice was identified as part of this assessment:

CP5-SM-1001 documents a noteworthy process for ensuring that all SOTW work is analyzed and documented. Appendix A of this procedure describes identified SOTW work and the relevant JHA for controlling the hazards. For work that is not included in this appendix but is low hazard and low

complexity and meets the specified restrictions for excluded work, the procedure describes the process for adding potential excluded work. The same work planning process that is used for higher hazard work is also for the SOTW work; an HIC planning team walks down the work and documents the work scope. If the work can be excluded, the team completes the HIC checklist, a JHA is developed, and appendix A is updated to add this new excluded work activity. EA considers the use of this process to enhance the effectiveness of the WP&C program to be a **Best Practice** because it results in fully analyzed and documented work activities that can be accomplished as SOTW work.

5.0 FINDINGS

Findings are deficiencies that warrant a high level of attention from management. If left uncorrected, findings could adversely affect the DOE mission, the environment, the safety or health of workers and the public, or national security. DOE line management and/or contractor organizations must develop and implement CAPs for findings. Cognizant DOE managers must use site- and program-specific issues management processes and systems developed in accordance with DOE Order 226.1 to manage the corrective actions and track them to completion.

Portsmouth/Paducah Project Office Oversight

Finding F-PPPO-1: PPPO has not conducted an accurate FR staffing analysis or conducted a triennial self-assessment of the FR program. (PPPO-2691323, secs. 5.1.1 and 5.7.4; DOE-STD-1063-2021, secs. 4.2.4a &e., 5.1, and 5.6.2)

6.0 DEFICIENCIES

Deficiencies are inadequacies in the implementation of an applicable requirement or standard. Deficiencies that did not meet the criteria for findings are listed below, with the expectation from DOE Order 227.1A for site managers to apply their local issues management processes for resolution.

Four Rivers Nuclear Partnership, LLC

Deficiency D-FRNP-1: FRNP has not fully implemented the JHA process in accordance with established FRNP procedures. Specifically, FRNP has not identified hazards associated with some specific work activities. Neither job-specific nor general JHAs cover all hazards associated with assigned work activities and associated WIs. (CP2-HS-2000, sec. 4.1.1, and CP3-HS-2004, sec. 5.18)

Deficiency D-FRNP-2: FRNP does not ensure that pre-job briefings are adequately performed. The pre-job briefing checklist was not consistently used, and LLs were not always discussed. (CP3-OP-0316, sec. 6.3 and 6.5)

Deficiency D-FRNP-3: The FRNP issues management process did not result in the correct categorization of a previous EA finding. (CP3-QA-3001, sec. 6.1.6)

Deficiency D-FRNP-4: FRNP does not effectively collect, analyze, or trend feedback from the WP&C processes. (DOE Order 226.1B, att. 1, 2.b.(10))

Portsmouth/Paducah Project Office Oversight

Deficiency D-PPPO-1: PPPO has not identified site-specific training for support service contractor personnel who perform safety oversight of site operational activities. (PPPO-M-226.1-2, sec. 5.4.2.6)

Deficiency D-PPPO-2: PPPO has not updated PPPO-M-426.1-0, *Technical Qualification Program Plan Procedure* to meet the current version of DOE Order 426.1B, *DOE Federal Technical Capabilities*. (DOE Order 426.1B, 4.f.(4)(c))

7.0 OPPORTUNITIES FOR IMPROVEMENT

EA identified the OFIs shown below to assist cognizant managers in improving programs and operations. While OFIs may identify potential solutions to findings and deficiencies identified in assessment reports, they may also address other conditions observed during the assessment process. These OFIs are offered only as recommendations for line management consideration; they do not require formal resolution by management through a corrective action process and are not intended to be prescriptive or mandatory. Rather, they are suggestions that may assist site management in implementing best practices or provide potential solutions to issues identified during the assessment.

Portsmouth/Paducah Project Office

OFI-PPPO-1: Consider having the TQP participants document their continuing training directly in eTQP which allows the program to centralize and track progress in a more efficient manner.

Appendix A Supplemental Information

Dates of Assessment

Onsite Assessment: March 13-16, 2023

Office of Enterprise Assessments (EA) Management

John E. Dupuy, Director, Office of Enterprise Assessments
William F. West, Deputy Director, Office of Enterprise Assessments
Kevin G. Kilp, Director, Office of Environment, Safety and Health Assessments
David A. Young, Deputy Director, Office of Environment, Safety and Health Assessments
Vacant, Director, Office of Nuclear Safety and Environmental Assessments
Kimberly G. Nelson, Director, Office of Worker Safety and Health Assessments
Jack E. Winston, Director, Office of Emergency Management Assessments
Brent L. Jones, Director, Office of Nuclear Engineering and Safety Basis Assessments

Quality Review Board

William F. West, Advisor
Kevin G. Kilp, Chair
James O. Low
Daniel M. Schwendenman
Michael A. Kilpatrick

EA Assessment Team

Thomas M. Wirgau, Lead
Nimalan Mahimaidoss
James C. Cantwell
Joseph Lischinsky
Terry B. Olberding