



# **Independent Assessment of the Implementation of Operational Safety Controls at Hanford Site Cleanup Projects**

**December 2024**

Office of Enterprise Assessments  
U.S. Department of Energy

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## Acronyms

CFR	Code of Federal Regulations
CPCCo	Central Plateau Cleanup Company
CRAD	Criteria and Review Approach Document
CSB	Canister Storage Building
D4	Deactivation, Decommissioning, Decontamination, and Demolition
DOE	U.S. Department of Energy
EA	Office of Enterprise Assessments
FR	Facility Representative
FWS	Field Work Supervisor
iCAS	Integrated Contractor Assurance System
IHEA	Industrial Hygiene Exposure Assessment
JHA	Job Hazard Analysis
LOTO	Lockout/Tagout
NCO	Nuclear Chemical Operator
OFI	Opportunity for Improvement
OOD	Operations Oversight Division
RL	Richland Operations Office
SHD	Safety and Health Division
SOE	Stationary Operating Engineer
SOM	Shift Operations Manager
TSR	Technical Safety Requirement
WESF	Waste Encapsulation and Storage Facility
WP&C	Work Planning and Control

# INDEPENDENT ASSESSMENT OF THE IMPLEMENTATION OF OPERATIONAL SAFETY CONTROLS AT HANFORD SITE CLEANUP PROJECTS

## Executive Summary

The U.S. Department of Energy (DOE) Office of Enterprise Assessments (EA) conducted an independent assessment of the effectiveness of Central Plateau Cleanup Company's (CPCCo's) implementation of operational safety controls at Hanford Site cleanup projects in August and September 2024. The assessment also evaluated the effectiveness of the Office of River Protection and Richland Operations Office (together "DOE Hanford") oversight of CPCCo conduct of operations program performance.

EA identified the following strengths:

- CPCCo has established effective processes for identifying hazards, developing hazard controls, and documenting those controls as requirements in procedures and work instructions.
- DOE Hanford oversight personnel work collaboratively across organizational boundaries to conduct oversight and communicate information on contractor programs and implementation.

EA also identified several weaknesses in program implementation, including one finding, as summarized below:

- CPCCo did not properly implement numerous work instruction requirements for hazard controls during attempted performance of a work activity supporting cold-and-dark isolations of mechanical systems at the 105K West reactor facility. (Finding)
- At deactivation, decommissioning, decontamination, and demolition (D4) facilities, equipment labeling did not always reflect the current status of equipment, and abandoned hazard signage remained where hazards have been removed, such that it is not always clear when worker safety postings must be followed.
- Work processes were not consistently implemented with the rigor required to ensure that work occurs within controls designed to protect workers.

In summary, CPCCo has established processes for developing and maintaining accurate, understandable written technical procedures and work instructions to support safe facility and equipment operation when followed. However, documented controls were not always implemented in the field and work instructions were not always followed, exposing workers to hazards that were required to have been mitigated. Until the concerns identified in this report are addressed or effective mitigations are put in place, risk to worker safety will remain elevated.

# INDEPENDENT ASSESSMENT OF THE IMPLEMENTATION OF OPERATIONAL SAFETY CONTROLS AT HANFORD SITE CLEANUP PROJECTS

## 1.0 INTRODUCTION

The U.S. Department of Energy (DOE) Office of Nuclear Safety and Environmental Assessments, in coordination with the Office of Worker Safety and Health Assessments, both offices of Environment, Safety and Health Assessments within the independent Office of Enterprise Assessments (EA), conducted an assessment of the effectiveness of Central Plateau Cleanup Company's (CPCCo's) implementation of operational safety controls at Hanford Site cleanup projects. This assessment was conducted in August and September 2024.

CPCCo is the Hanford Site central plateau cleanup contractor tasked with achieving significant risk and financial liability reduction that provides the overall optimal solution to site accelerated completion and closure. This risk reduction is achieved through groundwater and waste site cleanup, facility deactivation and decommissioning, and the management of solid waste and nuclear materials. CPCCo operations are overseen by the DOE Richland Operations Office (RL) and the Office of River Protection (ORP) (together "DOE Hanford").<sup>1</sup>

Consistent with the *Plan for the Independent Assessment of Implementation of Operational Safety Controls at Hanford Site Cleanup Projects, August 2024*, this assessment evaluated the effectiveness of both CPCCo and DOE Hanford programs in managing and implementing effective operational safety controls that protect facility workers at CPCCo cleanup projects through the implementation of select requirements of the conduct of operations program. The assessment included a review of aspects of CPCCo's work planning and control (WP&C) program that develops or informs controls implemented by conduct of operations program requirements. Field and performance-based portions of the assessment focused on risk-reduction work being planned and performed at deactivation, decommissioning, decontamination, and demolition (D4) facilities, including final cold-and-dark activities at the 105K West reactor facility; preparation for the transition of materials to dry storage at the Waste Encapsulation and Storage Facility (WESF); and final welding of multi-canister overpacks at the Canister Storage Building (CSB).

## 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 operational safety requirements implemented through CPCCo's conduct of operations program. Criteria to guide this assessment were based on selected criteria of objectives CO.1, CO.2, CO.8, CO.9, CO.13, CO.17, CO.18, and CO.19 of EA CRAD 31-39, Revision 0, *Review of Conduct of Operations*. Additionally, this assessment

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<sup>1</sup> During the assessment, some oversight functions had been consolidated between ORP and RL, with both providing programmatic oversight for projects managed by both offices. RL's Operations Oversight Division (OOD) provided operational oversight for CPCCo projects. Effective October 1, 2024, the two offices were combined into the new Hanford Field Office.

considered applicable objectives and criteria from section III, *Program Implementation*, of DOE Guide 226.1-2A, *Federal Line Management Oversight of Department of Energy Nuclear Facilities*, appendix D, *Activity Level Work Planning and Control Criterion Review and Approach Documents with Lines of Inquiry*. EA also used elements of EA CRAD 30-07, Revision 0, *Federal Line Management Oversight Processes*, to collect and analyze data on DOE Hanford's oversight of CPCCo integration of WP&C into the conduct of operations program.

EA examined key documents, such as system descriptions, work packages, procedures, manuals, analyses, policies, and training and qualification records. EA also interviewed key personnel responsible for developing and executing the associated programs; observed field work activities; and walked down significant portions of selected D4 facilities, WESF, and CSB, focusing on conduct of operations and the implementation of operational safety controls. The members of the assessment team, the Quality Review Board, and the management responsible for this assessment are listed in appendix A.

There were no previous EA findings reviewed during this assessment.

### **3.0 RESULTS**

#### **3.1 Organization and Administration**

This portion of the assessment evaluated CPCCo's operations organization and administration policies, programs, and procedures, including self-assessment and monitoring.

CPCCo has established an adequate conduct of operations program in accordance with DOE Order 422.1, *Conduct of Operations*. The documented program consists of an adequate conduct of operations procedure (CPCC-PRO-OP-696, *Conduct of Operations*), defining requirements for conduct of operations performance, and a thorough implementation matrix (CPCC-00542, *CPCCo Conduct of Operations Applicability Matrix*), specifying a suite of detailed implementing procedures for all 18 DOE Order 422.1 elements. This program adequately defines roles, responsibilities, authority, and accountability for operations organization personnel.

CPCCo independent assessments of conduct of operations are appropriately required by CPCC-MP-QA-40092, *CPCCo Assessment Program Plan*. Management observation of conduct of operations is adequately governed by CPCC-PRO-QA-40099, *Management Observation Program*. Five management observations and five assessments performed over the previous six months demonstrated appropriate rigor and depth to adequately assess the functional area. Adverse conditions were documented and captured in the CPCCo issues management system, as required. CPCCo has established a work mentor program so that mentors provide real-time feedback to workers regarding the conduct of work, which is contributing to improvements in conduct of operations at some projects. However, the EA-identified finding and 10 deficiencies described below indicate that management observations and assessments have not always been adequate to identify and correct conduct of operations implementation weaknesses.

CPCCo procedures CPCC-PRO-WKM-12115, *Work Management*, and CPCC-GD-WKM-12116, *Work Planning Guide*, provide requirements, guidance, and clear roles and responsibilities for the administration and performance of all CPCCo WP&C activities. These procedures provide appropriate detail for work planning based on a defined set of criteria. CPCC-PRO-WKM-12115 adequately describes the hazard screening criteria that are used to determine the level of work planning based on risk and complexity. The hazard analysis process is appropriately described in CPCC-PRO-WKM-079, *Job Hazard Analysis (JHA)*, and is required for all work performed under technical procedures or work control documents. A general hazard analysis (GHA) addresses routine and skill-based safety hazards, while the JHA process is used

when hazards potentially exceed the scope of GHAs. JHAs help to screen activities that are defined beyond skill-based work. The JHA checklist appropriately identifies hazards covered in the GHA as skill-based and those outside the GHA as beyond skill-based, which require additional controls.

During facility rounds with stationary operating engineers (SOEs) and nuclear chemical operators (NCOs), all personnel demonstrated a thorough understanding of their roles and responsibilities and reporting requirements (e.g., proper notification of system status changes) and were appropriately knowledgeable of facility systems. Reviewed training and qualification records for each participant confirmed full qualification status, including the shift operations managers (SOMs), who were appropriately qualified in accordance with CPCC-PRO-TQ-40164, *Personnel Training and Qualification*. Minimum staffing was confirmed and documented in the facility logs for WESF each day EA was present.

For D4 facilities, CPCCo has appropriately established shift staffing for operator, engineering, and support positions through TPLN-PRO-OP-54792, *D4ES Central Plateau Facility Modes and Minimum Staffing*. However, for Building 224B, the minimum staffing level table is unclear regarding the number and types of personnel required for surveillance and maintenance mode. (See **OFI-CPCCo-1**.)

### **Organization and Administration Conclusions**

CPCCo has established an adequate conduct of operations program. Self-assessment of conduct of operations is being performed, and the performance of mentoring activities at some projects demonstrates a commitment to continuous improvement of conduct of operations. Interviewed personnel demonstrated a thorough understanding of their roles and responsibilities, and observed shifts met established minimum staffing requirements.

### **3.2 Shift Routines and Operating Practices**

This portion of the assessment evaluated CPCCo's established shift routines and operating practices.

CPCCo has established and implemented adequate shift routines and operating practices specified in CPCC-PRO-OP-40120, *Shift Routines and Operating Practices*. CPCC-PRO-OP-40120 provides requirements that support operators remaining alert and informed of conditions, and being able to operate equipment properly. This procedure adequately defines the responsibility for developing round sheets (data sheets that identify important equipment and acceptable equipment instrumentation readings), conducting rounds, and reviewing completed round sheets. These requirements are properly flowed into REDOX-PRO-OP-54973, *REDOX Monitoring System Rounds*; CPCC-PRO-OP-55037, *D4ES Central Plateau Stationary Operating Engineers Log/Rounds*; and WESF-PRO-OP-51869, *WESF NCO Surveillance*. These procedures adequately include requirements for inspections, equipment checks, and round sheets. The surveillance procedures provide adequate instructions and data-recording forms for all facility equipment rounds and surveillances to ensure system functionality and to provide data for performance trends, and the procedures appropriately specify response to out-of-tolerance equipment indicators. Interviewed SOEs, NCOs, and SOMs confirmed their understanding of the requirements for shift routines and cognizance of current facility conditions.

During observed operator rounds at multiple D4 facilities, SOEs and NCOs demonstrated strict compliance with round sheet instructions. However, they did not identify potential adverse conditions that were not specifically required to be reviewed. The following observed material condition/housekeeping issues were not identified by operators during their rounds (see **OFI-CPCCo-2**):

- A fire extinguisher was blocked by a six-foot step ladder and scaffolding.

- Lights were not illuminated on several power panels.
- The identification of power feeds was often incorrect.
- Out-of-service equipment was often improperly identified.
- A calibrated meter exhibited an expired calibration sticker.

Observed work was planned at the level required by CPCC-PRO-WKM-12115, generally released in accordance with procedures, and listed on the approved plan-of-the-day. Stop/pause work authority was emphasized during observed pre-job briefings, and interviewed workers were aware that they had stop/pause work authority; observed work was appropriately paused on two occasions. Industrial hygiene practices associated with hazard identification, evaluation, and development of controls for various contaminants and hazards (e.g., beryllium, silica, asbestos, noise, hot work, and heat stress) were generally adequate. However, numerous weaknesses associated with hazard control implementation and the use of technical procedures and work instructions were observed, as discussed in section 3.6 of this report.

Observed pre-job briefings demonstrated varying levels of rigor and were not always performed in accordance with requirements. Some pre-job briefings used a checklist and thoroughly covered the hazards of the work and the controls. Other pre-job briefings did not use a checklist, and weaknesses in the coverage of hazards and controls were identified. Examples of such weaknesses included lead controls not being adequately addressed, emergency egress paths not being specified, radiation monitor coverage not as specified in the radiological work permit (RWP), and temporary lighting not being properly addressed. Contrary to DOE Order 422.1, attachment 2, requirement 2.b; CPCC-PRO-WKM-12115, step 3.5.1; and CPCC-PRO-WKM-14047, *Pre-Job Briefings and Post-Job Reviews*, CPCCo did not conduct all pre-job briefings in accordance with requirements. (See **Deficiency D-CPCCo-1.**) Not performing pre-job briefings in accordance with requirements may result in workers who are not familiar with the scope of work, individual job assignments, workplace conditions and hazards, or hazard controls.

### **Shift Routines and Operating Practices Conclusions**

CPCCo has established and implemented adequate shift routines and operating practices through operating procedures. Facility equipment rounds and surveillances are appropriately required by procedures and were generally adequately performed during the assessment. However, some issues were not identified by operators during their rounds. Also, observed pre-job briefings demonstrated varying levels of rigor and were not always performed in accordance with requirements.

### **3.3 Control of Equipment and System Status**

This portion of the assessment evaluated CPCCo's practices for the control of equipment and system status.

CPCCo has established and implemented generally adequate practices for initial equipment lineups and subsequent changes to ensure that facilities operate with known and proper configuration, as designed. CPCC-PRO-OP-40122, *Control of Equipment and System Status*, adequately addresses DOE Order 422.1, attachment 2, requirement 2.h. Interviews with SOMs, NCOs, and SOE personnel and observations of activities confirmed awareness of facility equipment status, which included the use of status boards to monitor system deviations and the application of lockout/tagout (LOTO) devices. SOMs at WESF were aware of equipment deficiencies and maintained a log of deficient equipment.

CPCCo has established a well-defined process for authorizing work on safety structures, systems, and components. The interviewed SOMs and field work supervisors (FWSs) clearly understood their responsibilities for maintaining proper configuration and authorizing status changes for major equipment. Interviewed operations and maintenance personnel were knowledgeable of the work authorization process and demonstrated the ability to access work authorization documents as needed. However, contrary to



DOE Order 422.1, attachment 2, requirement 2.h, and CPCC-PRO-OP-40122, step 3.1.1, CPCCo has not established a project-specific process for the control of equipment at D4 projects, resulting in several observed instances of inadequate equipment control. (See **Deficiency D-CPCCo-2.**) This condition could lead to the loss of control of equipment or system status or the exposure of workers to hazardous energy sources. The following weaknesses were observed at several D4 facilities:

- At emergency shower facilities, several breaker panels with light-emitting diodes (LEDs) to indicate whether power is available to the breakers had some LEDs that were not illuminated with the breakers in the on position. When asked about the inconsistency of lit LEDs, the operator was unaware of the required status.
- At the 105K West reactor facility, the system status (i.e., operational or out of service) for 28 of 40 items associated with a motor control center electrical panel with lights, switches, meters, and breakers could not be determined.
- At one emergency shower and one temporary power panel (for construction), the power “Fed From” labels incorrectly identified the electrical feed source.
- At WESF, a radiation monitor exhibited an expired calibration sticker.
- Many examples of caution/danger tape lying on the ground and abandoned hazard signage precluded workers from knowing whether a hazard was still present.
- At Building 224B, a National Electric Code (NEC) inspection tag and some temporary power labels were faded and illegible.

### **Control of Equipment and System Status Conclusions**

CPCCo has established and implemented generally adequate practices for initial equipment lineups and subsequent changes to ensure that facilities operate with known and proper configuration. However, CPCCo has not established a D4 project-specific process for the control of equipment, resulting in several observed instances of inadequate equipment control.

### **3.4 Lockouts and Tagouts**

This portion of the assessment evaluated CPCCo’s operator practices for installing and removing LOTOs and caution tags.

CPCCo has established and implemented generally adequate practices for installing and removing LOTOs to protect personnel from hazardous energy sources and caution tags for equipment protection or operational control. DOE-0336, *Hanford Site LO/TO Procedure*, is used to adequately address the procedures, roles, and responsibilities associated with the development, documentation, review, installation, and removal of a LOTO consistent with DOE Order 422.1, attachment 2, requirement 2.i; 29 CFR 1910, *Occupational Safety and Health Standards*; 29 CFR 1926, *Safety and Health Regulations for Construction*; and National Fire Protection Association (NFPA) 70E, *Standard for Electrical Safety in the Workplace*. CPCC-STD-OP-54266, *Hazardous Energy Control*, provides additional clarification on the execution of DOE-0336 requirements. Timely order WSO-21-006, *WESF–Additional Controls for LOTO*, provides WESF-specific requirements for the Controlling Organization Administrator to ensure compliance with the requirements in DOE-0336 and provide additional shift operations oversight of LOTO activities.

An observed LOTO activity performed at WESF for rectifier acceptance testing demonstrated appropriate practices for installing and removing LOTOs and caution tags. The worker exhibited proper control of the tags, locks, lockboxes, chains, and other components in accordance with DOE-0336. Additional LOTO controls were observed being appropriately performed by shift personnel as directed by timely

order WSO-21-006. Reviewed CPCCo internal metrics identified three potential exposures to hazardous energy sources in 2024, indicating recent LOTO implementation challenges; however, these were not evident during the observed activity. The WESF LOTO log was current and correct, and facility audits of the logs were up to date; there were no active LOTOs at WESF at the time of the LOTO log review.

### **Lockouts and Tagouts Conclusions**

CPCCo has established and implemented generally adequate practices for installing and removing LOTOs to protect personnel from hazardous energy sources and for the use of caution tags. The observed LOTO activity was well conducted and formally followed the LOTO process.

### **3.5 Turnover and Assumption of Responsibilities**

This portion of the assessment evaluated CPCCo's operational shift and operator relief turnover processes.

CPCCo has established and implemented generally adequate shift and operator relief turnover processes to provide for continued safe operations. CPCC-PRO-OP-28033, *Turnover and Assumption of Responsibilities*, adequately defines all key positions and the process for formal turnover of operations from one shift to another, and from one person to another, to ensure a thorough understanding of equipment status and in-progress or planned activities. CPCC-PRO-OP-28033 also adequately defines the process for turnover, including the defined content of turnover checklists, which ensure that comprehensive communication and documentation of current operations are covered. CPCCo operations personnel adequately performed turnovers (transfer of information) during observed shift changes and operator relief. The on-coming and off-going SOMs were fully aware of facility conditions during the shift turnover.

Additionally, the WESF daily order exhibited accurate current facility conditions, which were understood by the on-coming and off-going SOMs. However, the shift turnover process used the WESF SOM status checklist, which is not a controlled document. Also, contrary to DOE Order 422.1, attachment 2, requirement 2.1.(2), and the CPCC-PRO-OP-28033, section 3.1, requirements for turnovers are to be conducted through a formal checklist; CPCCo has not developed a formal turnover checklist for WESF. (See **Deficiency D-CPCCo-3.**) A lack of a formal turnover checklist could result in important plant status information not being discussed.

### **Turnover and Assumption of Responsibilities Conclusions**

CPCCo has established and implemented generally adequate shift and operator relief turnover processes. CPCCo operations personnel adequately performed turnovers during observed shift changes and operator relief. However, a formal shift turnover checklist for WESF has not been developed.

### **3.6 Technical Procedures**

This portion of the assessment evaluated CPCCo's practices for developing and maintaining accurate, understandable written technical procedures and work instructions.

CPCCo has established processes for developing and maintaining accurate, understandable written technical procedures and work instructions to support safe facility and equipment operation when followed. CPCC-PRO-MS-589, *Central Plateau Cleanup Company Procedures*, addresses DOE Order 422.1, attachment 2, requirement 2.p, including procedure content, such as format and use of terms (e.g., prerequisites, warnings, cautions, notes, hold points), details sufficient for accomplishing the operation, technically accurate procedures capable of performance as written, and procedure conformance with the

facility design and manufacturer documentation. CPCC-PRO-MS-589 flows into CPCC-STD-MS-40241, *CPCCo Procedures Standards*, which provides additional procedure program guidance.

While CPCCo has processes for developing and maintaining procedures and work instructions, they are not always properly implemented in the field. During the observed attempted performance of 1K-21-06944/M, *Deactivate Potable Water KW-23.4 Mechanical*, part of the mechanical cold-and-dark work being performed at the 100K area, numerous noncompliances with work instructions and hazard mitigation processes were identified, contrary to 10 CFR 830.122(e)(1), DOE Order 422.1, attachment 2, requirement 2.p, and requirements of CPCC-PRO-MS-589 that procedures be followed exactly as written. (See **Finding F-CPCCo-1**.) Not following hazard mitigation requirements identified through the JHA process could result in worker injury or death. Specifically:

- Six of 28 line items on the JHA checklist were determined to require beyond skill-based controls. These controls were documented in the JHA and appropriately included in the precautions and limitations or prerequisites section of the work instructions in accordance with CPCC-PRO-WKM-079. However, contrary to requirements of CPCC-PRO-WKM-14047, those sections were not discussed during the pre-job briefing for work to be performed on August 27, 2024; personnel incorrectly stated that “hazard controls are all skill-based.” (See **OFI-CPCCo-3**.)
- One of the JHA-analyzed hazards requiring beyond skill-based controls was “inadequate lighting,” and cited industrial hygiene exposure assessment (IHEA) IHEA-100K-21-009, *100K Project Illumination*, which provided criteria for light levels, with industrial hygiene sample plan (IHSP) IHSP-100K-21-009, *100K Project Illumination*, providing direction to ensure that criteria were met. Required controls developed in the IHEA were correctly listed as precautions in the work package, stating that “temporary power and lighting equipment shall be utilized to safely perform the work activities,” and as a “pre-start item” in the prerequisites section, stating that “Portable lighting has been installed in the 105KW East pipe tunnel.” Contrary to these requirements, temporary power and lighting was not established in the pipe tunnel; workers and EA entered the pipe tunnel with only flashlights after not having been alerted to the required controls during the pre-job briefing.
- An additional pre-start item provided that “2-way radio communication [has been] established between shift office and tunnel crew.” While the FWS was observed to have a radio and was attempting to use it to communicate with a worker at another work location, it only worked intermittently, and communication was not observed to have been established with the shift office.
- JHA walkdowns were performed in February 2022, and the JHA was approved in March 2022. The work package was released for work in July 2024, with no indication that the adequacy of the JHA had been reviewed in the two and a half years since it was approved. JHAs prepared in support of technical procedures and periodic maintenance activities are appropriately required to be updated according to the periodic review schedule for the supported document. However, periodic review of JHAs supporting other work packages is not required. CPCC-PRO-WKM-079, step 3.5.2, explicitly states that “it is not required to maintain the JHA after [technical work document] approval (for documents created per CPCC-PRO-WKM-12115).” Not requiring review and update of JHAs when work is significantly delayed could result in inappropriate controls for new or changed hazards. (See **OFI-CPCCo-4**.)
- Several steps of the work instructions directed workers to pages of the “Iso Index,” a reference to the *Deactivation Isolation Index for KW-23.4 – Potable Water*, approved January 2022, which included some work steps not included in the work instruction. The deactivation isolation index was included in the work package but not properly referenced by name in work instructions. A second similarly named document (*105KW Cold & Dark Isolation Index*, approved July 2024) was also in use in support of 105K West cold-and-dark activities, and also contained information on potable water deactivation and isolation, creating potential confusion.

- Work under 1K-21-06944/M was released in full on July 24, 2024, with work being performed in phases over the next several weeks. CPCC-PRO-WKM-12115, section 3.4.1, provides criteria that “must be met for release of an activity,” including that “current facility conditions allow for safe performance of the work activity,” and the “activity is compatible with other work being performed for the day.” For hazard category 2 nuclear facilities, work is only permitted to be released for “<24 hours.” Provisions of CPCC-PRO-WKM-12115 allowing for partial release of work were not used, despite 1K-21-06944/M and other cold-and-dark work packages being implemented in parts over a period of greater than 24 hours.
- During the observed work, step 5.2.2.1, which directed shutting of an isolation valve prior to cutting and air-gapping pipe, was not performed. Discussions among the workers indicated that step 5.2.2.2 had been performed the previous day, and workers were preparing to cut and cap pipe as directed in step 5.2.2.3, but in a location other than that directed by that work step. The work instruction did not permit steps to be performed out of sequence. After EA pointed out to the FWS that a step had been missed, and that the planned cut location did not match the direction in the work step, the FWS appropriately paused work to seek further guidance.

After EA communicated these noncompliances and concerns, CPCCo management promptly suspended all cold-and-dark work at 105K West, and plans were put in place to review all sections of the work packages prior to additional work being performed.

Additionally, the following weaknesses with currency, adequacy, and use of procedures and work instructions were identified during other observed work activities:

- Contrary to DOE Order 422.1, attachment 2, requirement 2.p.(1) and CPCC-PRO-MS-589, a continuous-use procedure was not used as prescribed. (See **Deficiency D-CPCCo-4.**) Not using continuous-use procedures could lead to missed execution steps. Procedure CP-23-05427/W, *Remove the L16E3 and L16H4 Transfer Lines in 202S*, was observed being used to control the transfer of material out of the 202S building at the Reduction-Oxidation Plant (REDOX). This procedure was designated continuous use, i.e., must be present in the work area and sequentially followed for applicable work. However, only parts of three tasks (out of six) were used during this operation, resulting in omitting the requirements to review applicable technical safety requirements (TSRs) and other nuclear safety controls.
- Contrary to DOE Order 422.1, attachment 2, requirement 2.p, multiple “record copies” of procedures were observed in the field. (See **Deficiency D-CPCCo-5** and **OFI-CPCCo-5.**) The existence of multiple record copies could lead to a loss of control and the use of incorrect versions of the procedures. Specifically, multiple copies of work instructions CP-23-05427/W and DD-24-02692/W, *224B Demobilization*, were observed with “Record Copy” in red text on the procedure, incorrectly indicating that both were record copies. Having multiple documents indicating “record copy” does not ensure that placekeeping, hold points, and verification steps, as well as required record retention, are appropriately performed. Additionally, the correct version of the work instructions could contain approved pen-and-ink changes or other revisions not reflected in other copies.
- Contrary to DOE Order 422.1, attachment 2, requirement 2.p.(3), CPCCo has not developed a process to demonstrate compliance with TSR minimum staffing requirements. (See **Deficiency D-CPCCo-6.**) Not using a procedure for properly documenting compliance with a TSR could result in a TSR violation. CPCC-PRO-OP-54792, *D4ES Central Plateau Facility Modes and Minimum Staffing*, is an administrative-use procedure that specifies minimum qualified staffing requirements to comply with TSRs. However, compliance with minimum staffing requirements is not verified or documented. Consequently, an August 2024 event revealed that Building 224B had used an NCO whose qualification had lapsed, which led to the minimum staffing requirement for the facility not being met.

- Contrary to DOE Order 422.1, attachment 2, requirement 2.p.(3), CPCC-PRO-WKM-12115, CPCC-GD-WKM-12116, and CPCC-PRO-MS-589, CPCCo did not properly perform a verification step. (See **Deficiency D-CPCCo-7.**) Not complying with required verification steps could expose personnel to hazardous energy sources or lead to nuclear safety violations. Work package steps were performed out of order during observed work associated with work package 1K-22-05655/M, *105KW Building Cold and Dark Mechanical Isolation*, resulting in a skipped verification step. Mechanical isolation work identified in work package step 5.1.5, was performed without first obtaining the design authority's signature as required in verification step 5.1.3 of the work package. Additionally, a copy of the work package was not in the area while workers were performing work package step 5.1.5, as required. CPCC-GD-WKM-12116, appendix D, *Quality Control Inspection Points*, states that an item identified for verification with a signature and date block must be documented before proceeding.
- Contrary to DOE Order 422.1, attachment 2, requirement 2.p.(1) and CPCC-PRO-MS-589, hazards associated with observed pipe-cutting activities were not properly analyzed. (See **Deficiency D-CPCCo-8.**) Not properly analyzing work hazards could result in unmitigated personnel exposure, leading to injury. Specifically, during observed multiple pipe-cutting activities associated with a tank demolition at the 105K West reactor facility, the cutting of a pipe at the top of the tank, which was connected to an air dryer of unknown weight, presented an inadequately controlled impact hazard to the pipefitter performing the work. Additionally, there was no indication that the chemical constituents of the paint on the pipe being cut were analyzed to determine whether respiratory protection should have been required for the pipefitter. Because these potential hazards were not analyzed, no controls were implemented, resulting in potential worker exposure without appropriate protection or monitoring.
- Contrary to DOE Order 422.1, attachment 2, requirement 2.p.(3) and CPCC-PRO-MS-589, several instances of improper operation of fork-trucks (forklifts and telehandlers) were observed. (See **Deficiency D-CPCCo-9.**) During observed fork-truck operations, the load was not secured to the fork when required, spotters were not used, and loads were not properly handled. Losing control of a load or not ensuring a clear direction of travel could lead to personnel in the immediate operating area being injured. In one case, the operation was on a sloped, gravel surface and the unsecured load could have fallen off the forklift. In another case, a worker stood in front of a telehandler load, manually sliding it off the forks toward him. In several instances at multiple facilities, fork trucks were operated without spotters while the operator's view was obstructed.

### Technical Procedures Conclusions

CPCCo has established processes for developing and maintaining accurate, understandable written technical procedures that include hazard controls to protect workers. However, numerous issues were observed regarding procedure adequacy and compliance.

### 3.7 Operator Aids

This portion of the assessment evaluated CPCCo's practices to manage and use operator aids.

CPCCo has established and implemented an adequate process to provide accurate, current, and approved operator aids. CPCC-PRO-OP-40125, *Operator Aids*, adequately addresses the requirements of DOE Order 422.1, attachment 2, requirement 2.q. WESF currently uses four operator aids. WESF operator aids were annotated with the approved operator aid number and were close to the point of use; none were observed obscuring control room equipment. The operator aid file (which lists all approved operator aids) confirmed that all operator aids observed in the facility were properly reviewed and approved. An emergency phone number listing was observed near a control panel, which included instructions for the

access of the public address system. However, this phone list was not controlled as an operator aid. (See **OFI-CPCCo-6.**)

### **Operator Aids Conclusions**

CPCCo has established and implemented an adequate process to manage and use operator aids at WESF.

### **3.8 Component Labeling**

This portion of the assessment evaluated CPCCo's practices for clear, accurate equipment labeling.

CPCCo has established and implemented an adequate process for equipment labeling. CPCC-PRO-OP-40126, *Equipment and Piping Labeling*, adequately addresses the requirements of DOE Order 422.1, attachment 2, requirement 2.r. The interviewed SOMs were aware of their responsibility for the integrity of component labels, including performing inspections as required by the LOTO process. Interviewed operators, engineers, and maintenance personnel understood their responsibility to identify and report missing or damaged labels to the Operations Manager or SOM. Operations personnel carefully checked component labeling to accurately identify observed process equipment during facility rounds.

Observed facility equipment demonstrated that labels at non-D4 facilities are properly applied, are durable, and contain the required information, enabling facility personnel to accurately identify equipment and hazards as recommended in DOE-HDBK-1226-2019, *Conduct of Operations Implementation*. Equipment labeling was generally adequate at WESF, and temporary power labels were adequate for some construction locations. However, contrary to 10 CFR 851.23(a), *Safety and health standards*; DOE Order 422.1, attachment 2, requirement 2.h.(5); and CPCC-PRO-OP-40122, procedures have not been adequately implemented at D4 facilities to assess equipment status and to ensure that component information is up-to-date, accurate, and legible. (See **Deficiency D-CPCCo-10.**) Not removing or otherwise identifying outdated labels and hazard signage could result in personnel being exposed to hazards due to incorrectly believing that valid labels or signs do not apply. The following issues were identified regarding component labels at multiple D4 facilities:

- Several out-of-service pieces of equipment were not identified as being out-of-service.
- Temporary power labels were faded and no longer legible.
- Power "Fed From" labels identified incorrect power sources.
- NEC inspection tags were not legible.
- Electrical equipment was not provided with arc flash and shock protection labels.
- A door with a "Danger" sign and two "Caution" signs was observed in the door frame; however, the walls were gone, with the hazards associated with the signs clearly not present.
- A step-off pad was observed in the middle of a room without controls for the pad.

### **Component Labeling Conclusions**

CPCCo has established and implemented an adequate process for equipment labeling. Operations personnel effectively used component labeling to accurately identify observed process equipment. Observed equipment labeling was durable, properly placed, and contained the required information. However, numerous component labels and hazard signs that were no longer relevant or were incorrect were observed at D4 facilities.

### 3.9 Federal Oversight

This portion of the assessment evaluated DOE Hanford's oversight of CPCCo integration of WP&C into the conduct of operations program, including program oversight and oversight of field activities.

DOE Hanford has developed an effective oversight program that is implemented through DOE-PRO-PAI-50085, *Integrated Oversight*. Facility Representatives (FRs) in RL's OOD and subject matter experts in DOE Hanford's Safety and Health Division (SHD) perform and conduct operational awareness activities, planned assessments, and surveillances; attend meetings; and perform work observations. Oversight activities and assessments are documented in the integrated Contractor Assurance System (iCAS) for issues management disposition, and reviewed reports were thoroughly written and include evidence to support identified issues and performance conclusions. Interviews with FRs and SHD management reflected strong engagement between the two groups, and staff work collaboratively to share information on contractor programs, implementation, field observations, and events.

Interviews and a review of functional area programs, such as DOE-PPD-SH-50567, *Hanford Integrated Safety Management System Description*; DOE-PPD-QA-50552, *Quality Assurance Implementation Plan*; DOE-0443, *Hanford Site-Wide Assurance Systems Approach Document*; DOE-PRO-PAI-50086, *Integrated Issues Management*; and DOE-PRO-PAI-50635, *Operating Experience and Lessons Learned*, combined with a review of CPCCo's self-reported iCAS entries and performance metrics demonstrate an effective graded approach of field office oversight of WP&C and conduct of operations. DOE Hanford oversight personnel have observed a number of challenges with CPCCo's implementation of work controls over the past several years, which they have documented in iCAS and transmitted to CPCCo for action. However, the repeated communication of these issues to CPCCo as adverse conditions has not resulted in significant performance improvements. DOE Hanford leadership stated in interviews that repeat issues and a lack of effective corrective actions have resulted in escalation to higher levels of both CPCCo and field office management for resolution.

FRs and SHD personnel generally meet the technical qualification program (TQP) requirements in DOE-PPD-QT-50521, *Technical Qualification Plan*. DOE Hanford is currently and timely conducting the TQP self-assessment. Reviewed additional training required by OOD and SHD had appropriate content to support oversight personnel in adequately overseeing safety and health duties. Although DOE Hanford personnel were current with the majority of required training, six individuals in various oversight positions had passed target dates for qualification milestones.

The most recent staffing analysis for RL OOD, dated August 2024, was performed in accordance with DOE-STD-1063-2021, *Facility Representatives*. At the time of the 2024 analysis, staffing was 66% of the analyzed staffing requirements and 50% of the qualified staffing requirement. FR staffing remains 4.5 qualified full-time equivalents below full analyzed staffing requirements, but progress is being made toward achieving full staffing. FRs are supported by government service support contractor (GSSC) personnel to supplement and ensure adequate oversight. Staffing report reviews and interviews with OOD leadership indicated that three FR candidates are anticipated to achieve their full qualification by the end of fiscal year 2024.

#### Federal Oversight Conclusions

DOE Hanford provides effective oversight of WP&C required by CPCCo's conduct of operations program. FRs and subject matter experts work collaboratively to conduct oversight and communicate information on contractor programs and implementation. Identified issues are documented and transmitted to CPCCo for action using iCAS. DOE Hanford management is engaged and monitors FR hiring and qualification; progress to meet full qualified staffing levels continues.

## 4.0 BEST PRACTICES

No best practices were identified during this assessment.

## 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 corrective action plans for findings. Cognizant DOE managers must use site- and program-specific issues management processes and systems developed in accordance with DOE Order 226.1, *Implementation of Department of Energy Oversight Policy*, to manage the corrective actions and track them to completion.

### Central Plateau Cleanup Company

**Finding F-CPCCo-1:** CPCCo did not properly implement numerous work instruction requirements for hazard controls during attempted performance of a work activity supporting cold-and-dark isolations of mechanical systems at the 105K West reactor facility. (10 CFR 830.122(e)(1); DOE Order 422.1, att. 2, requirement 2.p; CPCC-PRO-MS-589; CPCC-PRO-WKM-12115; and CPCC-PRO-WKM-14047)

## 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.

### Central Plateau Cleanup Company

**Deficiency D-CPCCo-1:** CPCCo did not conduct all pre-job briefings in accordance with requirements. (DOE Order 422.1, att. 2, requirement 2.b; CPCC-PRO-WKM-12115, step 3.5.1; and CPCC-PRO-WKM-14047)

**Deficiency D-CPCCo-2:** CPCCo has not established a D4 project-specific process for the control of equipment, resulting in several observed instances of inadequate equipment control. (DOE Order 422.1, att. 2, requirement 2.h, and CPCC-PRO-OP-40122, step 3.1.1)

**Deficiency D-CPCCo-3:** CPCCo has not developed a formal turnover checklist for WESF. (DOE Order 422.1, att. 2, requirement 2.l.(2), and CPCC-PRO-OP-28033, sec. 3.1)

**Deficiency D-CPCCo-4:** CPCCo did not ensure that all continuous-use procedures were used as prescribed. (DOE Order 422.1, att. 2, requirement 2.p.(1), and CPCC-PRO-MS-589)

**Deficiency D-CPCCo-5:** CPCCo's work control processes do not ensure that a single copy of a work instruction is controlled as the record copy for version control and record retention. (DOE Order 422.1, att. 2, requirement 2.p)



**Deficiency D-CPCCo-6:** CPCCo has not developed a process to demonstrate compliance with TSR minimum staffing requirements. (DOE Order 422.1, att. 2, requirement 2.p.(3), and CPCC-PRO-OP-54792)

**Deficiency D-CPCCo-7:** CPCCo did not properly perform a verification step and did not ensure that the work package was in the area during the performance of work. (DOE Order 422.1, att. 2, requirement 2.p.(3); CPCC-PRO-WKM-12115; CPCC-GD-WKM-12116; and CPCC-PRO-MS-589)

**Deficiency D-CPCCo-8:** CPCCo did not ensure that hazards associated with observed pipe-cutting activities were properly analyzed, resulting in work controls that were not properly captured in the work package. (DOE Order 422.1, att. 2, requirement 2.p.(1), and CPCC-PRO-MS-589)

**Deficiency D-CPCCo-9:** CPCCo did not ensure that fork-trucks (forklifts and telehandlers) were operated properly during observed work. (DOE Order 422.1, att. 2, requirement 2.p.(3) and CPCC-PRO-MS-589)

**Deficiency D-CPCCo-10:** CPCCo procedures have not been adequately implemented to assess equipment status and to ensure that component information is up-to-date, accurate, and legible. (10 CFR 851.23(a); DOE Order 422.1, att. 2, requirement 2.h.(5); and CPCC-PRO-OP-40122)

## 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.

### Central Plateau Cleanup Company

**OFI-CPCCo-1:** Consider clearly defining the minimum staffing level required for surveillance and maintenance mode for Building 224B in appendix A, table 1 of TPLN-PRO-OP-54792.

**OFI-CPCCo-2:** Consider increasing the rigor of operator round requirements to include documentation of potentially adverse conditions not explicitly specified on the round sheet.

**OFI-CPCCo-3:** Consider requiring FWSs to review *Tips & Practices for Leading An Effective Pre-Job Meeting* [sic] on the CPCCo work control website.

**OFI-CPCCo-4:** Consider requiring periodic review or expiration of all JHAs, regardless of whether they support technical procedures, periodic maintenance activities, or other work control documents, similar to periodic review requirements of IHEAs or expiration dates of IHSPs.

**OFI-CPCCo-5:** Consider revising document control processes to require that any markings indicating “record copy” of work control documents are affixed to only a single copy of the work instruction when work is released.

**OFI-CPCCo-6:** Consider including the WESF emergency phone number listing and public address instructions in the operator aid program.

## **Appendix A Supplemental Information**

### **Dates of Assessment**

August 12 to September 5, 2024

### **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  
Thomas E. Sowinski, 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  
Christopher E. McFearin  
Christian M. Palay  
William A. Eckroade

### **EA Site Lead for the Hanford Site**

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### **EA Assessment Team**

Eric A. Ruesch, Lead  
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Leslie A. Bermudez  
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