DEFENSE NUCLEAR FACILITIES SAFETY BOARD
Washington, DC 20004-2901

August 12, 2025

Mr. Roger Jarrell, Principal Deputy Assistant Secretary
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585-1000

Dear Principal Deputy Assistant Secretary Jarrell:

The Defense Nuclear Facilities Safety Board (Board) reviewed the configuration management and conduct of operations programs at the Hanford Site Waste Treatment and Immobilization Plant's (WTP) Low-Activity Waste (LAW) Facility. These safety management programs are key to keeping workers safe and need to be well-established. While instituting robust programs is important to support near term LAW Facility operations, these programs will also form the foundation for the configuration management and conduct of operations at the future WTP High-Level Waste Facility. The Board evaluated the programs against Department of Energy (DOE) and applicable industry safety standards, identifying several areas for improvement that warrant your attention.

Most significantly, there is a high number of configuration deviations throughout the facility. These include temporary modifications, out-of-service equipment, nonconformances, and system impairments. Although this condition is expected for a new, first of a kind facility at this stage in the startup, they represent an increased level of safety risk and must be closely managed. Furthermore, technical procedures, which are a cornerstone of the conduct of operations program and essential to ensure work is performed safely, exhibit quality issues. Many technical procedures provide inadequate instructions, frequently requiring modifications to allow completion. Lastly, turnover processes are not always performed in a consistent manner, which has resulted in impacts such as loss of valve lineup configuration and inadvertent liquid transfers on multiple occasions.

Improving the configuration management and conduct of operations programs will improve safety margins and minimize the potential for operator error. The attached report provides additional information for your consideration.

Sincerely,

Thomas A. Summers

Thomas A. Summers
Acting Chairman

Enclosure

c: The Honorable Christopher Wright, Secretary of Energy
Mr. Brian Harkins, Acting Manager, Hanford Field Office
Mr. Joe Olencz, Director, Office of the Departmental Representative to the Board

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

Staff Report

May 22, 2025

Configuration Management and Conduct of Operations Programs at the Hanford Site's Waste Treatment and Immobilization Plant Low-Activity Waste (LAW) Facility

Summary. A Defense Nuclear Facilities Safety Board (DNFSB) team conducted safety reviews of the LAW Facility's configuration management and conduct of operations programs. The reviews evaluated whether the programs adequately perform their safety functions to ensure workers, the public, and the environment are protected from high-hazard operations involving radiological wastes and chemicals. The LAW Facility Documented Safety Analysis (DSA) emphasizes the importance of both programs. In chapter 17, the DSA states, "***The fundamental concept of configuration management is to provide assurance that the plant is designed, maintained, and operated in accordance with the design and safety bases,*** while complying with Project commitments ***for safety of the workers, public, and protection of the environment*** [***emphasis added***]." Further, in the executive summary, the DSA states that "***SMPs [Safety Management Programs] such as the c****onduct of operations with formal procedures, training and qualification***, conduct of maintenance, hazardous material control, radiological protection, and emergency management ***help ensure fundamental aspects of nuclear facility operations are maintained in accordance with specified requirements to ensure the highest level of*** performance and ***safety*** [***emphasis added***]." The two programs are fundamentally linked. The configuration management program establishes and maintains a formal safety envelope for operations throughout the life of the facility and the conduct of operations program ensures that basic operations are carried out within the defined safety envelope. This minimizes the likelihood and consequence of errors and failures that could compromise safety.

While these programs can be considered implemented at the LAW Facility, their effectiveness in maintaining safety margin is degraded by shortcomings in several key areas. The DNFSB team identified that improvements are needed in: (1) processes for managing and controlling facility configuration deviations; (2) quality of technical procedures (e.g., maintenance, operation and testing work documents); and (3) shift turnover and assumption of responsibilities.

Management personnel for both the Department of Energy's (DOE) Hanford Field Office (HFO) and the operating contractor, Waste Treatment Completion Company LLC (WTCC), agreed that these issues exist and initiated actions to resolve some shortcomings. WTCC management also noted that its configuration management and conduct of operations programs are still maturing and have shown continual improvement. WTCC management further noted that the LAW Facility would be undergoing additional assessments, which are expected to help improve these programs. However, HFO and WTCC completed and planned actions will not fully address the DNFSB team's concerns.

Background. The LAW Facility is a new hazard category 3 defense nuclear facility, which DOE will use to vitrify low-activity radioactive liquid waste into a glass form suitable for disposal. In addition to the hazardous radioactive waste, the facility uses industrial quantities of hazardous chemicals in the treatment process that also pose a significant hazard to workers. The LAW facility does not use safety class or safety significant (SS) structures, systems, and components (SSCs) but does implement SS specific administrative controls. Additionally, WTCC has defined other active systems and passive structures that perform important defense-in-depth functions in the DOE approved DSA. Consistent with DOE intent, WTCC management has implemented requirements related to system engineering and configuration management from DOE Order 420.1C, *Facility Safety* [1] for their active defense-in-depth systems, and for mission critical systems and chemical safety SSCs that are important to life or safety.

DOE completed construction of the LAW Facility, which is now undergoing the final phase of startup. The facility is currently processing simulated waste, which is chemically like tank waste but does not contain any radiological material. Radiological waste is scheduled to be introduced during the summer of calendar year 2025. The introduction of radiological waste into the facility will increase the hazards associated with operating and maintaining the plant.

Throughout the final phase of startup, the DNFSB team independently evaluated DOE's readiness to process radioactive materials. This included dedicated reviews of plant systems, procedures, and operations through onsite review of the configuration management program during April 15–18, 2024, and the conduct of operations program during July 15–19, 2024. The reviews included facility walkdowns; interviews of engineering, operations, and maintenance personnel; discussions with facility managers; observations of field work; and attendance at relevant meetings. The DNFSB team provided preliminary observations to DOE on February 20, 2025, for the configuration management program and on November 21, 2024, for the conduct of operations program.

Discussion. The DNFSB team identified three areas for improvement in the configuration management and conduct of operations programs, which if addressed, could reduce operational and safety risk.

Processes for Management and Control of Facility Configuration Deviations— Throughout the startup process and associated testing, WTCC identified a significant number of design and construction deficiencies. There have also been instances where equipment was installed in the plant but not recognized as deviations even though they augmented or replaced equipment with design functions. Although facility personnel are working effectively to resolve the deviations, the number and complexity of the issues has resulted in a significant backlog. Consequently, facility personnel are tasked to operate the plant at an increasing pace with higher hazard levels while simultaneously managing substantial numbers of deviations from the intended design configuration.

Configuration deviations in the LAW facility impact important systems such as the consumable changeout, process ventilation, glass former feed, and effluent management systems. Many of these systems are already chemically contaminated and will also become radiologically contaminated after the introduction of tank waste into the facility. Consequently, the

introduction of tank waste will add radiation exposure risks to the chemical risks the workers already face as they work to resolve outstanding deviations.

WTCC prioritizes the accomplishment of work to support milestones. This action is intended to ensure work is accomplished at the appropriate time from an operational and hazard perspective. Despite ongoing efforts to reduce the number of existing deviations and plant management's willingness to manage the waste introduction milestone to support correction of high priority deviations, WTCC personnel continue to identify new problems that require design changes or system modifications. Consequently, the deviation backlog remains consistently high as the facility approaches the expected tank waste introduction date resulting in a highly compressed work schedule and a difficult operating environment. The compressed schedule increases the urgency to complete work, reduces planning time, and suboptimizes the work scheduling process for lower priority work. These deficiencies in work execution processes were noted in the Board's letter dated October 3, 2024, [2] and work execution has not notably improved since. These circumstances have a significant impact on the workforce. It is not uncommon for field supervisors to be assigned work for the day on the morning of execution, only to find that facility conditions do not allow for its completion. Additionally, the numbers and duration of these deviations have also resulted in the normalization of workarounds by WTCC personnel.

In addition to the above work execution issues, the existence of long-standing configuration deviations, combined with changes in plant state, create plant conditions that are outside of the designed conditions that form the basis for operator training and frequently require operators to use non-standard, temporary procedures, increasing the potential for human error. The deviations can also introduce unknown vulnerabilities, which can place the plant outside of its designed safety envelope or result in unintended process changes compromising quality, compliance, and safety.

Unidentified interactions between deviations, or between related compensatory measures may be synergistic and can increase risk exposure. It is difficult to identify and quantify these interactions in complex facilities, such as the LAW Facility, especially if there are large numbers of deviations.

Lastly, in some cases, deviations were introduced into the facility but were not recognized as such. These deviations were not evaluated using the appropriate process. Non-evaluated deviations add further operational and safety risk. Some instances included installation of cooling units to keep power supplies or an exhauster from overheating, supporting permanent facility components with ropes, using ropes to tie off out-of-service equipment to in-service equipment, and scaffolding in contact with, or in proximity to, SSCs. Providing guidance to staff to help them recognize when an activity replaces, augments, or changes SSC design function would help to alleviate these occurrences. In addition, periodic walkdowns by system engineers would be a tool to assist in noting unintended deviations. Periodic system walkdowns are not being performed as required by procedure 24590-WTP-REQM-RACM-CM-0001, *Configuration Management Requirements Document* [3] which states, "The Cognizant System Engineer program system assessments shall include periodic review of system operability, reliability, and material condition to assess the system for ability to perform design and safety

functions, physical configuration as compared to system documentation including system and component performance in comparison to established performance criteria."

While WTCC has established and maintains a graded configuration management program per the intent described in DOE Order 420.1C and DOE Standard 1073-2016, there are improvements WTCC management could implement that would enhance their ability to routinely preserve design margin and provide a well-defined operating envelope for plant operators. Specifically, improvements in the identification, management and timely removal of deviations to restore plant configuration would help ensure the efficiency, reliability, and safety of plant operations. Based on the above observations, the DNFSB team identified the following suggested program and procedure enhancements:

- Expand the work prioritization process under 24590-WTP-GPP-RAMN-WC-0001, *Work Control Process* [4] to include criteria that encourages rapid removal of configuration deviations, such as temporary configurations, procedures, or standing orders. The existing prioritization matrix focuses on safety classification and the needs of the system, including milestones. Work arounds that have become normalized tend to reduce the removal condition or system need. This can extend the length of time a system or component is used outside of its normal configuration.

- Modify the temporary modification procedure under 24590-WTP-GPP-RAEN-EN-0013, *Temporary Modification Control* [6] to include more rigorous guidance and definitions of what constitutes a change to the facility. Specific guidance would alleviate instances where unrecognized temporary modifications get introduced to the facility. For instance, any activity that replaces, augments, or changes an in-service SSC design function should be screened as a modification to the facility.

- Expand maintenance and work control key performance measures under 24590-WTP-GPP-RAMN-MN-0001, *Maintenance and Work Control Performance Measures* [7] to include indicators that track aging of configuration deviations such as non-conformances, temporary modifications, and impairments, and establish time goals for their removal. Individually track and expedite deviations that are not cleared in a timely manner.

- Modify the scheduling, work authorization, and work release process under 24590-WTP-GPP-RAMN-WC-0003, *Scheduling, Work Authorization, and Release* [8] to consider age of open items when scheduling work to reduce the number of deviations that remain open for extended time periods.

- Evaluate the alignment of the unreviewed safety question process under 24590-WTP-GPP-RANS-NS-0012, *Unreviewed Safety Question Process* [9], and the management of change process 24590-WTP-GPP-RAWS-SS-0003, *Management of Change Process for Chemical Safety* [10]. Identify ways to reduce processing times to ensure timely resolution of new information or configuration changes that could affect operational safety and to ensure the prompt implementation of appropriate

compensatory measures. Additionally, ensure effective coordination between the two processes to ensure interface issues are not lost.

- Enforce the existing procedural obligation under *Configuration Management Requirements Document* [3] for periodic system walkdowns by the cognizant system engineer. Walkdowns are required per 24590-WTP-GPG-RAEN-EN-0047, *System Health Reporting* [11] which requires the system engineer to, "**IDENTIFY** any Facility/System(s) not matching approved design." Guidance should be referenced for the system engineer on how to recognize unintended system design changes. A periodicity for these walkdowns is not assigned in the procedure. The procedure should designate either a condition or a periodicity for walkdowns. Walkdowns should include installed deviations and ensure they have not been altered and are properly installed (e.g., verifying temporary modification equipment tags, equipment, and boundaries).

- Incorporate additional guidance in the *Configuration Management Requirements Document* [3] for periodic review of open configuration deviations. Periodic reviews of configuration deviations would ensure that changing plant conditions have not inappropriately affected the underlying design assumptions and conditions that allowed for their original installation and use.

- Incorporate a timeline requirement for removal of configuration deviations from the system as part of the corrective action requirements of the *System Health Reporting* [11] procedure. Currently, the number and age of certain configuration deviations, are used to calculate system health score. However, there is no timeline requirement to drive these items from the system. Additionally, system impairments should be included in the system health score.

Since the DNFSB team's observations, WTCC management has initiated corrective actions, such as revising several procedures, to resolve some of these issues and believes it has addressed the DNFSB team's concerns. However, the procedure changes have not been in place long enough for the DNFSB team to validate their effectiveness.

In summary, WTCC has not effectively controlled its large number of configuration deviations, which can potentially reduce safety margin, lead to operational errors, result in safety equipment damage, and compromise the maintenance and testing programs. WTCC management attention is needed to improve the effectiveness of the configuration management program with specific focus on resolving the substantial number of open configuration deviations in a timely manner.

Quality of Technical Procedures—WTCC technical procedures were not consistently accurate and understandable as required by DOE Order 422.1, *Conduct of Operations* [12]. Accurate procedures are essential in nuclear facilities to ensure safe and effective mission completion and maintain safety margin.

During the reviews, the DNFSB team noted that technical procedures were frequently revised immediately prior to starting work or during performance of work. The prevalence of these instances indicated that the technical procedures development process, which is intended to verify and validate technical procedures prior to sending them to the field, is not effective, and that issues are being found and resolved at the very last opportunity. Ineffective technical procedures place substantial responsibility on the workers in the field, who are the last line of defense for ensuring the safe accomplishment of work. Additionally, perturbations to the work plan due to these revisions further introduces risk as plans must consistently be changed on short notice.

The DNFSB team noted that, in many cases, workers properly stopped to correct technical procedures. However, the DNFSB team also observed several instances where, despite a lack of clarity, workers continued work without obtaining necessary clarifications or procedure changes, often by interpreting ambiguous instruction steps or proceeding even when the instructions could not be completed as written. The DNFSB team also observed that, on some occasions, prior operations feedback was not effectively incorporated into the technical procedures.

The above observations were like those noted during a previous DNFSB team review of the LAW Facility maintenance safety management program. In the Board letter dated October 3, 2024 [2], the Board noted that workers could not carry out technical procedures for nine of twelve work activities observed during the DNFSB team visit. Although the DNFSB team for the current reviews noted some improvement since the Board's previous communication, significant deficiencies remain. WTCC would benefit from a causal analysis to identify corrective actions to resolve the continuing deficient conditions and reduce the likelihood of operations and maintenance errors.

Shift Turnover and Assumption of Responsibilities—WTCC shift operating and turnover practices were not consistently meeting DOE expectations as defined in Conduct of Operations Order [12], for establishing organizational roles and responsibilities and effectively tracking equipment and system status and are also not consistent with facility requirements.

For example, shift operations manager (SOM) qualified personnel who are not on the watch bill are, in some cases, assigned roles and responsibilities that are not clearly defined but result in the operation of plant equipment. In one instance during the cold commissioning management assessment, the DNFSB team observed that conditions did not match procedural requirements. A qualified back-up SOM approved moving forward without approval from the watch bill SOM. These conditions appear inconsistent with expectations defined in 24590-WTP-GPP-RACO-CO-0002, Revision 21, *Shift Routines and Operating Practices* [13]. However, the procedure does not specifically address the topic of backup SOMs. Clarification of this role would ensure responsibilities and authorities remain aligned, as is expected by DOE requirements.

As another example, the DNFSB team observed multiple instances in which the assisting individuals performed actions without direction or knowledge of the on-duty operator. The *Shift Routines and Operating Practices* procedure allows the control room supervisor to assign

additional operations personnel to assist in the monitoring of both non-affected and affected indications during abnormal or emergency conditions, and further states that equipment should only be operated with the knowledge and consent of the watch bill assigned operator. However, the DNFSB team noted that actions performed by watch standing assistants frequently went beyond simple monitoring, and the watch bill assigned operator was not always cognizant of their actions.

The DNFSB team also observed several examples of less than adequate turnover of work during multiple shifts. 24590-WTP-GPP-RACO-CO-0012, *Turnover and Assumption of Responsibilities* [14], establishes clear expectations for shift and watch turnover that are not consistently met. For instance, fact-finding meetings held by WTCC management determined that several inadvertent or incorrect water transfers were caused by a loss of awareness of valve positions and by poor turnover practices associated with the evolutions. In another instance, previously performed steps in a procedure were not tracked or briefed to a new work crew and a step was unknowingly reperformed by the new work crew. Furthermore, in a separate case, a technical procedure required the manipulation of valves to prevent a potential release of water, however the technical procedure did not anticipate that the valve repositioning could result in the valves remaining out of position over multiple shifts or consider how the valves would be controlled using appropriate tags. In this case, plant personnel expected to work the procedure for multiple days and made an ad-hoc decision to track valve position using a deviation instead of a caution tag as required by the facility's procedure for tagging, 24590-WTP-GPP-RACO-CO-0019, *Caution and Miscellaneous Tags* [15]. The DNFSB team also noted the following:

- Required personnel were not always present at pre-job briefings.

- In other instances, personnel at the pre-job briefing were not always the same personnel performing the actual evolution that was briefed and did not always receive a briefing with the same rigor as the original pre-job briefing.

- Instances in which the control room operators were not aware of activities in the plant that directly affected or had the potential to affect operations, which is indicative of poor turnover practices.

Good shift turnover is crucial for addressing safety hazards, ensuring a smooth transition of information, responsibilities, and tasks between outgoing and incoming personnel, and minimizes disruptions and potential errors.

Other Observations—The DNFSB team observed that the as-built facility configuration did not always agree with design configuration documents. For instance, the DNFSB team identified:

- Field-installed equipment (e.g., instrument block valves and piping, valves attached to the high efficiency particulate air filter housings) that were not identified on piping and instrumentation diagrams and were not labeled with a unique identifying component number.

- Permanent plant piping was being used to support temporary power cables without appropriately evaluating the impact on interfacing equipment. In this case, WTCC acknowledged that it is not allowed per its procedures and documented the DNFSB team's observation under management condition report procedure, 24590-WTP-GCA-MGT-24-01006 [16].

Industry best practice such as Nuclear Regulatory Commission Information Notice 2012-06, *Ineffective Use of Vendor Technical Recommendations* [17], and the DOE-STD-1073-2016, *Configuration Management* [18], demonstrate that accurate and up-to-date vendor manuals are essential to ensuring equipment is maintained in a compliant and safe manner. Further, WTCC has adopted DOE Order 420.1C [1] for mission critical equipment and equipment which is used to ensure safe operating conditions, which states, "System design documents and supporting documents must be identified and kept current using formal change control and work control processes." However, WTCC did not have a standard process to periodically review critical vendor technical manuals to ensure that they are maintained and updated. In response to the DNFSB team's concerns, WTCC created Management Action Report, 24590-WTP-DAR-MGT-24-00287 [19] to address newly received vendor manuals. The DNFSB team considers this action appropriate but too limited in scope because the action excluded existing vendor manuals. Vendors frequently revise or reissue equipment manuals to correct errors, or to incorporate operating experience improvements and industry standards updates. Consequently, previously received vendor technical manuals may be out-of-date unless they are maintained. Use of unmaintained technical information can result incomplete or incorrect work, or inaccurate operating instructions for affected equipment, which can result in equipment malfunction or damage and reduced safety or operating margins.

In some cases, the technical procedures used to support testing and initial plant operations relied on significant expert-based verbal direction (e.g., from a system engineer) to complete assigned tasks. This direction was sometimes applied by operators without the knowledge of the control room supervisor. This is inconsistent with management expectations as defined in 24590-WTP-GPP-RACO-CO-0001, Revision 8, *Organization and Administration*, which states the control room supervisor oversees facility processes from the control room and directs operators in the performance of their duties [20]. Additional expectations are established in the *Shift the Routines and Operating Practices* procedure [13] which states "the authority for operating certain equipment and systems may be given to specific watch stations; however, the supervisor maintaining [sic] ultimate responsibility for the equipment and should be notified of changes in status." Although expert-based direction is sometimes appropriate, procedures should specify boundaries for their direction and activities performed at the direction of such personnel should be monitored by trained and qualified operations supervisory personnel to reduce the potential for error.

The DNFSB team noted areas for improvement in WTCC's *Work Planning Guide*, 24590-WTP-GPG-RAMN-WC-0012 [21], and *Troubleshooting Guide*, 24590-WTP-GPG-RAEN-EN-0038 [22] documents. These documents did not clearly specify when workers should use the troubleshooting process or how troubleshooting should be implemented. The DNFSB team also observed occasions in which troubleshooting was performed ad-hoc without developing specific troubleshooting technical procedures. This practice is inconsistent with

DOE Guide 433.1-1A, *Nuclear Facility Maintenance Management Program Guide for Use with DOE O 433.1B* [5], which states that the first step of troubleshooting is the development of a methodology. Using a formal troubleshooting process is crucial for safety because it ensures a systematic and thorough approach to identifying and resolving issues, minimizing risks, and preventing potential hazards.

Additionally, instead of using a new, dedicated work instruction to support repairs resulting from a troubleshooting activity, WTCC personnel frequently use existing corrective maintenance work instructions to facilitate the repairs. The DOE Guide 433.1-1A [5] states that "any follow-up corrective maintenance deemed necessary as a result of troubleshooting should be performed under a separate corrective maintenance work order or under an approved revision to the work plan." WTCC's current practice is a safety concern unless the related work instruction modification undergoes adequate review to ensure any new prerequisites or hazard controls associated with correcting the deficient condition are addressed in the revision to the existing work instructions.

Conclusion. The DNFSB team identified concerns with the implementation of the configuration management and conduct of operations programs that warrant additional attention from DOE and WTCC. Addressing these concerns would reduce operational and safety risk and protect safety basis assumptions.

References

[1] Department of Energy, *Facility Safety,* DOE Order 420.1C Chg 3, November 14, 2019.

[2] Defense Nuclear Facilities Safety Board, *Letter to Energy Secretary Candice Robertson regarding the maintenance program at the WTP's Low Activity Waste Facility at the Hanford Site,* October 3, 2024.

[3] Waste Treatment Completion Company, *Configuration Management Requirements Document,* 24590-WTP-REQM-RACM-CM-0001, Aprill 22, 2021.

[4] Waste Treatement Completion Company, *Work Control Process,* 24590-WTP-GPP-RAMN-WC-0001, April 29, 2025.

[5] Department of Energy, *Nuclear Facility Maintenance Management Program Guide for Use with DOE O 433.1B,* DOE G 433.1-1A, September 12, 2021.

[6] Waste Treatment Completion Company, *Temporary Modification Control,* 24590-WTP-GPP-RAEN-EN-0013, June 19, 2025.

[7] Waste Treatment Completion Company, *Maintenance and Work Control Performance Measures,* 24590-WTP-GPP-RAMN-MN-0001, May 13, 2024.

[8] Waste Treatment Completion Company , *Scheduling, Work Authorization, and Release,* 24590-WTP-GPP-RAMN-WC-0003, December 9, 2024.

[9] Waste Treatment Completion Company, *Unreviewed Safety Question Process,* 24590-WTP-GPP-RANS-NS-0012, May 27, 2025.

[10] Waste Treatment Completion Company, *Management of Change Process for Chemical Safety,* 24590-WTP-GPP-RAWS-SS-0003, February 27, 2023.

[11] Waste Treatment Completion Company, *System Health Reporting,* 24590-WTP-GPG-RAEN-EN-0047, June 2, 2025.

[12] Department of Energy, *Conduct of Operations,* DOE Order 422.1 Chg 4, February 3, 2022.

[13] Waste Treatment Completion Company, *Shift Routines and Operating Practices,* 24590-WTP-GPP-RACO-CO-0002, October 6, 2022.

[14] Waste Treatment Completion Company, *Turnover and Assumption of Responsibilities,* 24590-WTP-GPP-RACO-0012, Febrary 2, 2025.

[15] Waste Treatment Completion Company, *Caution and Miscellaneous Tags,* 24590-WTP-GPP-RACO-CO-0019, August 19, 2020.

[16] Waste Treatment Completion Company, *Management Condition Report,* 24590-WTP-GCA-MGT-24-01006, November 4, 2024.

[17] Nuclear Regulatory Commission, *Ineffective Use of Vendor Technical Recommendations,* Information Notice 2012-06, April 12, 2012.

[18] Department of Energy, *Configuration Management,* DOE-STD-1073-2016, December 23, 2016.

[19] Waste Treatment Completion Company, *Management Action Report,* 24590-WTP-DAR-MGT-24-00287, November 18, 2024.

[20] Waste Treatment Completion Company, *Organization and Administration,* 24590-WTP-GPP-RACO-CO-0001, July 10, 2024.

[21] Waste Treatment Completion Company, *Work Planning Guide,* 24590-WTP-GPG-RAMN-WC-0012, December 6, 2022.

[22] Waste Treatment Completion Company, *Troubleshooting Guide,* 24590-WTP-GPG-RAEN-EN-0038, February 25, 2021.