

Independent Assessment of the Management of Safety Issues at the Hanford Site Waste Treatment and Immobilization Plant

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Acronyms

AC	Adverse Condition
BNI	Bechtel National, Inc.
CAMP	Corrective Action Management Program
CAS	Contractor Assurance System
CAT	Causal Analysis Tree
CCN	Correspondence Control Number
CR	Condition Report
CRAD	Criteria and Review Approach Document
CRD	Contractor Requirements Document
CSMP	Chemical Safety Management Program
DFLAW	Direct-feed Low-activity Waste
DOE	U.S. Department of Energy
EA	Office of Enterprise Assessments
HFO	Hanford Field Office
IMRB	Issues Management Review Board
IMRG	Issues Management Review Group
LAW	Low-activity Waste
LOTO	Lockout/Tagout
MOP	Management Observation Program
OFI	Opportunity for Improvement
PA	Public Address
QA	Quality Assurance
WTCC	Waste Treatment Completion Company, LLC
WTP	Waste Treatment and Immobilization Plant

INDEPENDENT ASSESSMENT OF THE MANAGEMENT OF SAFETY ISSUES AT THE HANFORD SITE WASTE TREATMENT AND IMMOBILIZATION PLANT

Executive Summary

The U.S. Department of Energy (DOE) Office of Enterprise Assessments (EA) conducted an independent assessment of the effectiveness of the management of safety issues at the Hanford Site Waste Treatment and Immobilization Plant, which is managed and operated by Bechtel National, Inc. (BNI) and its subcontractor, Waste Treatment Completion Company, LLC (WTCC), for the DOE Hanford Field Office (HFO). The assessment was performed in April and May 2026.

EA identified the following strengths:

- BNI/WTCC has two full-time event investigators who, when engaged following unanticipated conditions, provide thorough review of the facts and circumstances of the event. In-process revisions to post-event review processes will, if implemented as intended, drive consistency and improve follow-up processes for abnormal occurrences and undesirable conditions.
- Some BNI/WTCC personnel use data visualization tools to identify trends using available condition reporting data.

EA also identified several areas of concern, including three findings, as summarized below:

- The BNI/WTCC issues management process does not fully capture all program and performance deficiencies from external assessments, take compensatory corrective actions when needed, or categorize the significance of findings to ensure that problems are evaluated and corrected on a timely basis and that causes are addressed to prevent recurrence. (Finding)
- BNI/WTCC has not provided adequate communications systems (i.e., clearly audible alarms and public address systems providing intelligible announcements in affected areas) for emergency and normal operations to ensure that all personnel are promptly notified of facility emergencies. No actions were taken to address this issue since identification in 2024. (Finding)
- HFO did not ensure that the DOE Order 227.1A, *Independent Oversight Program*, contractor requirements document or its requirements were included in the BNI contract. (Finding)
- BNI/WTCC does not have rigorous, objective processes for trending issues using all available data sources such that leading indicators can be identified prior to a condition resulting in an event that could challenge the mission or worker safety.
- BNI/WTCC's follow-up processes for unexpected conditions do not always effectively determine event details with rigor and consistency such that effective actions can be taken to preclude recurrence of undesirable outcomes.

In summary, BNI/WTCC has programs in place to manage identified safety issues. However, the variety of different programs and data sets challenge the ability to effectively identify adverse trends, before they result in events. Additionally, follow-up activities for events and other operational anomalies are not always effective at identifying causes such that recurrence can be prevented. Findings were identified related to BNI/WTCC follow-up of independent assessment results and effectiveness of emergency communications. An additional finding was identified for HFO not including a contractor requirements document in the BNI contract. Until the concerns identified in this report are addressed or effective mitigations are put in place, elevated risk exists of adverse events from programmatic gaps.

INDEPENDENT ASSESSMENT OF THE MANAGEMENT OF SAFETY ISSUES AT THE HANFORD SITE WASTE TREATMENT AND IMMOBILIZATION PLANT

1.0 INTRODUCTION

The U.S. Department of Energy (DOE) Office of Nuclear Safety and Environmental Assessments, within the independent Office of Enterprise Assessments (EA), conducted an assessment of the effectiveness of the management of safety issues at the Hanford Site Waste Treatment and Immobilization Plant (WTP). The assessment was conducted in April and May 2026.

Bechtel National, Inc. (BNI) and its subcontractor, Waste Treatment Completion Company, LLC (WTCC), began direct-feed low-activity waste (DFLAW) processing operations at WTP in late 2025. Since initial waste processing, DFLAW operations continue intermittently while BNI/WTCC operators, engineers, and other personnel work to achieve steady-state, two-melter operation of the low-activity waste (LAW) facility. Federal oversight of WTP construction, commissioning, and operations under the BNI contract is provided by the Hanford Field Office (HFO).

Consistent with the *Plan for the Independent Assessment of Management of Safety Issues at the Hanford Site Waste Treatment and Immobilization Plant, April – May 2026*, this assessment evaluated the effectiveness of BNI/WTCC programs in identifying, managing, and effectively resolving safety issues that have arisen during startup and initial DFLAW operation.

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 requirements related to issues management from DOE Order 226.1B, *Implementation of Department of Energy Oversight Policy*, contractor requirements document (CRD) sections 2.b.(3), (5), and (6), and from DOE Order 422.1, *Conduct of Operations*, attachment 2, section 2.f. Criteria to guide this assessment were based on selected objectives and criteria from EA CRAD 30-01, Revision 2, *Contractor Assurance System*, and EA CRAD 31-39, Revision 0, *Review of Conduct of Operations*.

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 issue screening and other meetings where issues were identified and discussed; and walked down significant portions of selected DFLAW facilities, focusing on the identification, evaluation, and resolution of issues. The members of the assessment team, the Quality Review Board, and the management responsible for this assessment are listed in appendix A.

EA conducted previous assessments of issues management, chemical safety, conduct of operations, and training and qualification at WTP between 2019 and 2025, during which six findings were identified. This current assessment examined the completion and effectiveness of corrective actions for those findings, in accordance with DOE Order 227.1A. Results of the corrective action review are included in section 3.4 of this report.

3.0 RESULTS

3.1 Issues Management Systems

This portion of the assessment evaluated whether BNI/WTCC's issues management systems effectively capture program and performance issues from appropriate sources and are capable of categorizing the significance of issues to ensure that problems are reported, evaluated, and corrected on a timely basis to prevent recurrence.

In general, BNI/WTCC has established adequate issues management systems in accordance with DOE Order 226.1B, CRD section 2.b.(3), through 24590-WTP-GPP-RACA-CR-0111, *Condition Report, Recommendation Initiation, and Screening*; 24590-WTP-GPP-RACA-CR-0112, *Condition Report, Recommendation Evaluation, and Action Plan Development*; and 24590-WTP-GPP-RACA-CR-0113, *Condition Report, Recommendation Action Response, Approval, Verification, Closure, and Effectiveness Review*. Procedure 24590-WTP-G63-RACA-CR-0001, *Integrated Issues Management Policy*, establishes the Corrective Action Management Program (CAMP) and Nonconformance Reporting systems as the primary issues management programs for documenting and resolving conditions adverse to quality. CAMP also appropriately includes the opportunity for employees to document recommendations, OFIs, and suggestions.

BNI/WTCC personnel enter identified problems into CAMP as condition reports (CRs); CRs are then evaluated for issue significance and are assigned corrective actions. A review of 30 CRs, interviews with 25 BNI/WTCC personnel, and observations of 11 issues management review meetings (e.g., Issues Management Review Group [IMRG], Issues Management Review Board [IMRB], and Performance Assurance Program Coordination meetings) collectively demonstrated that the issues management systems generally capture program and performance issues from many sources; categorize issues to ensure that problems are reported, evaluated, and corrected; and provide for issue analysis, resolution, and tracking.

BNI/WTCC appropriately implements a quality grading system, initially performed by contractor assurance system (CAS) personnel and reviewed and approved by the IMRG and IMRB. CRs are categorized by the effect on safety, quality, operability, and the environment, with Level A CRs being the most significant. Level B CRs are conditions that have an adverse impact, and Level C CRs are considered minor performance issues. Most reviewed CRs were categorized in accordance with procedures.

BNI/WTCC management has appropriately recognized the need to improve the quality of Level C CR corrective actions. The recent closure quality metric of Level C CRs (performed on a random 10% sample) did not meet acceptable levels, prompting the review of 100% of Level C CRs by CAS personnel until quality improved. Further, over the past year, quality assurance (QA) surveillances identified several Level C CRs that needed to be revised due to inadequate corrective actions. Finally, corrective actions did not adequately address the identified issues for 3 of the 10 Level C CRs reviewed during this assessment.

While BNI/WTCC has established and implemented generally adequate issues management procedures, 24590-WTP-GPP-RACA-CR-0113 only requires an independent confirmation (via a procedural compliance checklist) of a completed effectiveness review rather than an overall independent evaluation of the quality and effectiveness of corrective actions. The verification is performed in accordance with 24590-WTP-GPP-RAQS-QS-0001, *Quality Assurance Site Surveillances*, which also only requires verification to a procedural compliance checklist. (See **OFI-BNI/WTCC-1.**) For example, a reviewed February 2026 QA surveillance (24590-WTP-SSUV-QA-26-00009, *WTCC Quality Assurance Site Surveillance Report for Verification of Level A CR 24590-WTP-GCA-MGT-24-00138 Closure*) of a Level A configuration control effectiveness review, confirmed completion but did not evaluate the quality of the

corrective actions. In this case, the limited scope of the QA surveillance process resulted in a missed opportunity to identify an adverse trend; other similar examples are discussed in section 3.2 below.

Issues Management Systems Conclusions

In general, BNI/WTCC has established adequate issues management systems. However, a weakness was identified associated with QA surveillances of effectiveness reviews.

3.2 Performance Metrics and Improvement

This portion of the assessment evaluated BNI/WTCC's analysis of CAS results to measure performance and identify trends, which are communicated to management and workers to improve performance.

Performance Measurement and Trending

BNI/WTCC has established generally effective means of analyzing CAS results. Procedure 24590-WTP-GPP-RACA-TM-0001, *Performance Measures and Trending*, provides an adequate process for data analysis. Some BNI/WTCC personnel use a data visualization software tool (Power BI) to generate graphical presentations of data, facilitating the identification of anomalies and trends; a demonstration of this enhanced capability to track process codes and nature-of-issue codes yielded immediate results.

Six reviewed trending analysis documents demonstrated that trend analyses were well performed and reached logical conclusions. The lead for trend analysis explained during interviews how trend analyses are performed and stated that they use cognitive trending (expert recognition of repetitive issues) in their daily review of CRs. Several significant issues have been identified using cognitive trending. For example:

- Objects dropped from height: During an interview, the lead for trend analysis explained that they noticed a repetition of key words “drop” and “fall” among numerous CRs. Further analysis resulted in the identification of 14 CRs from January 2023 to July 2024 that clearly showed a negative trend associated with dropping objects from height. This trend analysis was subsequently presented to management, resulting in a new Level B CR 24-00673¹, which documented a potential negative trend in dropped objects, with associated corrective actions. Prior to this trend analysis and resultant Level B CR (which was closed in August 2024), nearly one drop-related CR was issued per month. Since December 2025, only two drop-related CRs have been issued.
- Lockout/tagout (LOTO): A review of December 2024 Level B CR 24-01149, which documented a potential negative trend in LOTO-related events, and an interview with the cognizant individual revealed that corrective actions were effective. Within a year of implementing these corrective actions, the number of LOTO-related CRs decreased from 55 to 34, with high-significance (Level A and B) CRs dropping from 5 to 1.

While BNI/WTCC has established generally effective means of analyzing CAS results, the following weaknesses related to trending were identified:

- The practice of cognitive trending entails having to search specific key words without the benefit of a data visualization tool, resulting in analyses that are sometimes time consuming to perform and based only on lagging indicators. (See **OFI-BNI/WTCC-2**.)

¹ Full CR document numbers follow the format 24590-WTP-GCA-MGT-[YY]-[#####], where YY is the two digit year and ##### is a serial number. CRs are referred to in this report using the YY-##### portion only.

- Interviews revealed that the use of various trend coding (cause codes, process codes, nature-of-issue codes, and event codes) is often misunderstood and inconsistent, even though the codes provided in 24590-WTP-GPP-RACA-TM-0001 and 24590-WTP-LIST-RACA-TM-0001, *Condition Report Event Codes*, are consistent. (See **OFI-BNI/WTCC-3.**)
- The use of DOE causal analysis tree (CAT) codes is not consistent among different work groups; CAS personnel use DOE-STD-1197-2011, *Causal Analysis*, while DOE-STD-1197-2024 is used for event reviews, and the CAT code updates have not been captured in all BNI/WTCC procedures. (See **OFI-BNI/WTCC-4.**)
- BNI/WTCC personnel were not aware of an adverse trend in configuration control and plant status issues. Specifically, Level A CR 24-00138 (initiated in February 2024) documented an increase in adverse events related to configuration control; an associated effectiveness review (completed in June 2025) concluded during a 3-month review period that there was no continuing negative trend. However, EA identified over 100 CRs initiated since January 2025 associated with configuration control issues, including 3 Level B CRs, demonstrating an adverse trend since the effectiveness review was completed. (See **OFI-BNI/WTCC-5.**)

Assessments

BNI/WTCC has established and implemented a generally adequate assessment program through 24590-WTP-GPP-RACA-AM-0002, *Conduct of Assessments*. This procedure provides requirements for planning, scheduling, performing, documenting, and issuing risk-informed management assessments. Nine reviewed BNI/WTCC assessments reports and five BNI corporate assessments were overall adequately performed and documented, although compliance assessments generally were limited in scope. However, the assessment planning process, as outlined in attachment 2 of 24590-WTP-GPP-RACA-AM-0002, does not define several key terms used to determine the severity of consequences (e.g., “crisis” and “critical”) or the probability of recurrence. (See **OFI-BNI/WTCC-6.**) Further, while all departments performed multiple self-assessments, there is a lack of management assessments for all departments other than Project Management; from the start of 2024 to the time of this assessment, only one management assessment was performed outside of Project Management. (See **OFI-BNI/WTCC-7.**)

Other Methods of Data Collection

In addition to analyzing CRs and performing assessments, BNI/WTCC has other methods of data collection that are useful. QA managers and their staff routinely monitor CR screening, the progress of corrective actions, and closure in accordance with 24590-WTP-GPP-RACA-CR-0111, 24590-WTP-GPP-RACA-CR-0112, 24590-WTP-GPP-RACA-CR-0113, and 24590-WTP-GPP-RACA-CR-0115, *Condition Report and Recommendation Change Process*. The interviewed CAS Manager and two specialists demonstrated knowledge of their assigned roles and responsibilities and how CRs are screened, reviewed, and closed in accordance with the established procedures.

BNI/WTCC has also established a conduct of operations council (represented by all BNI/WTCC organizations) to evaluate multiple metrics. These metrics include management observation program (MOP) reports (a leading indicator) and CRs (a lagging indicator). During an observed council meeting, the group appropriately reviewed the data from MOPs and CRs for trends or relationships. In the area of technical procedure adherence, the trend over the past year indicated a transition from negative performance to positive performance; the group recognized this appropriate direction but emphasized the importance of maintaining management attention on this issue. Reviewed data from two other council meetings showed this to be a valuable tool for looking at data other than CRs.

Further, BNI/WTCC has established appropriate CR closure performance verification mechanisms through the IMRG and IMRB. IMRG participants review CRs and make disposition recommendations in accordance with 24590-WTP-GPP-RACA-CR-0111. During five observed IMRG meetings, participants provided data-based recommendations on the disposition of CRs on the agenda. These IMRG meetings demonstrated appropriately critical review of CRs and recommendations for advancement to the IMRB or return to the CR owner or initiator for further work. The IMRB provides the final disposition of all CRs in accordance with 24590-WTP-GPP-RACA-CR-0111. Three interviewed participants were knowledgeable of their roles and responsibilities. Four observed IMRB meetings demonstrated thorough review of CRs on the agenda, with information-based closure recommendations and/or request for further information prior to issuance of final disposition recommendations.

Notably, document reviews, demonstrations, and interviews showed that BNI/WTCC has many methods of data collection that engage the workforce at all levels to support the identification and ownership of safety issues. However, while these many methods of data collection are useful, the sources of data (e.g., CRs, recommendations, MOPs, craft safety watch [CSW], area safety team [AST] walkdowns, event reviews) are all largely independent of one another. (See **OFI-BNI/WTCC-8.**)

Communication and Improvement

BNI/WTCC has established and implemented a generally adequate feedback and improvement process that includes formal lessons learned, post-job reviews, and the employee concerns program. Procedure 24590-WTP-GPP-RACA-LL-0001, *WTP Lessons Learned*, describes the overall lessons learned program. Eight reviewed internal and six external lessons learned were appropriately disseminated through emails or postings. Further, during one observed pre-job briefing, a relevant lesson learned was disseminated. However, a review of three Level A and B CRs revealed that lessons learned, while captured, were not always communicated. (See **OFI-BNI/WTCC-9.**)

Self-identified gaps in the lessons-learned program were being addressed at the time of the assessment. The Lessons Learned Coordinator recently updated software to place a prompt for initiators of Level C CRs to create a lesson learned; a revision to the procedure that reflects this change is underway. Interviewed staff also recognized that the existing process for developing and communicating lessons learned and operating experience needs to be strengthened.

The employee concerns program is adequately documented in 24590-WTP-DOEI-RAEC-EC-0400, *DOE-0400, Revision 2, Hanford Site-Wide Employee Concerns Program Procedure*. This procedure captures the required elements, and the Employee Concerns Program Lead showed how issues were documented depending on whether the initiator wished to remain anonymous. The interviewed Employee Concerns Program Lead also stated that they attend new hire orientations to describe the program and distribute literature that includes contact information for the DOE employee concerns program, in case the initiator did not feel comfortable going through the corporate employee concerns process.

Performance Metrics and Improvement Conclusions

BNI/WTCC has established generally effective means of analyzing CAS results through various work groups and implemented a generally adequate feedback and improvement process that includes formal lessons learned, post-job reviews, and the employee concerns program. Notably, BNI/WTCC has many methods of data collection that engage the workforce at all levels to support the identification and ownership of safety issues. However, the sources of data are all largely independent of one another, resulting in missed opportunities for identifying safety trends.

3.3 Event Investigation

This portion of the assessment evaluated BNI/WTCC's processes for investigating abnormal events and conditions (i.e., matters requiring follow-up).

BNI/WTCC has established and implemented generally adequate procedures (24590-WTP-GPP-RAPR-OR-0001, *Event Notification, Evaluation, and Management*, and 24590-WTP-GPP-RAPR-OR-0003, *Event Investigation*) in accordance with DOE Order 422.1, attachment 2, section 2.f. These procedures appropriately include provisions and criteria for identifying specific events that require investigation; specify training and qualification requirements for event investigators; require causal analysis, extent-of-condition reviews, and corrective actions to preclude recurrence; and include guidance for conducting fact-finding meetings. Reviewed training records showed that the two event investigators and their supervisor were appropriately trained and qualified. During interviews, these individuals exhibited a commitment to properly investigating unanticipated conditions.

While BNI/WTCC's event investigation procedures are generally adequate, the following weaknesses were identified:

- Contrary to DOE Order 422.1, attachment 2, appendix A, section 2.f, BNI/WTCC's event investigation procedures do not require the use of a process to reconstruct the facts of an event chronologically from event data that ensures the rigor and consistency of investigations. (See **Deficiency D-BNI/WTCC-1.**) Not requiring a consistent process could result in the incomplete collection of facts about the event and lead to recurrence. In particular, the conduct of observed follow-ups was inconsistent and included the unclear usage of terms such as "fact-finding meeting" and "post-job review." The interviewed event investigators explained that in-progress revisions of the event-investigation procedures should result in use of an "after-action review" process, which will add consistency to follow-up processes. They also explained that these procedure revisions are intended to drive the use of a "quad chart," a one-page visual summary to document gathered event information (e.g., timeline, details, and immediate corrective actions). A review of the draft procedures indicated that, if implemented as intended, the changes will drive consistency and improve the event investigation process.
- Contrary to DOE Order 422.1, attachment 2, appendix A, section 2.f, BNI/WTCC's review process following three recent unexpected conditions was inadequate for determining the event details. (See **Deficiency D-BNI/WTCC-2.**) The inadequate determination of facts about an event could lead to recurrence. Specifically:
 - An observed fact-finding meeting for an auto-sampling system (ASX) needle exchange event did not effectively establish a timeline or determine the pertinent facts regarding the event. Another ASX needle exchange event occurred during the assessment.
 - A fact-finding meeting was not conducted for an ammonia release event, even though the event resulted in alarms that were unexpected and personnel were exposed. Instead, a post-job review was conducted three days after the event but did not establish a timeline or the pertinent details regarding the event.
 - During the repair of a pump, it was determined that the work could not continue because the torque requirements for the coupling plate were unknown. Three days later, at the end of the assessment, a fact-finding meeting had not yet been conducted to identify and document how the coupling plate had previously been installed without torque specifications, and thus the work had not resumed.

Event Investigation Conclusions

BNI/WTCC has established and implemented generally adequate event investigation procedures, and event investigation personnel exhibited a commitment to properly investigating events. However, BNI/WTCC's procedures do not require the use of a consistent process to reconstruct event facts, and event investigation performance for three recent events was not adequate.

3.4 Follow-up on Previous EA Findings

This portion of the assessment examined the status and corrective actions for six findings identified by EA at WTP and documented in assessment reports between November 2019 and March 2025. EA findings are defined in DOE Order 227.1A as “deficiencies that warrant a high level of attention on the part of management. If left uncorrected, findings could adversely affect the DOE mission, the environment, worker safety or health, the public or national security.” The six EA findings and their statuses are described below. A summary table with links to the EA reports is provided as appendix B.

When an EA report is transmitted to HFO, the HFO point of contact initiates an assessment item in the site CAS. Findings and deficiencies are individually entered as adverse conditions (ACs) and transmitted to BNI with the EA report as an attachment. However, the process that HFO uses to document external assessment results is inconsistent. In two reviewed transmittals (sent as Operational Awareness items), HFO used the finding number as the AC title and the one-sentence finding statement as the description together with the statement “This issue is transmitted from EA report: [title]. There may be additional content and background information contained in the report relevant to this issue.” In a third reviewed transmittal (sent as an Independent Assessment item), HFO included the finding statement as the title and the full description from the body of the EA report as the description.² (See **OFI-HFO-1**.)

BNI enters each received AC into CAMP as an individual CR exactly as documented, with the correspondence control number (CCN) for the transmittal referenced in the CR. For CRs initiated for EA findings and deficiencies, the EA report itself is not attached. Additionally, BNI does not distinguish EA findings from other ACs transmitted from HFO. As a result, all six reviewed findings were processed as Level C issues; no causal evaluations were performed. Based on a review of documentation and interviews with responsible managers, in several cases where HFO did not transmit the full finding description, the individual assigned actions made assumptions about the problem statement without referring to the “additional content and background information contained in the report.” (See **OFI-BNI/WTCC-10**.) For example, a white paper attached to CR 23-00894 action 1 stated, “The issue described in the EA-31 report is specific to comparing either [one of two scenarios],” one of which was explicitly described in detail in the discussion of Finding F-BNI/WTCC-1 from the September 2023 chemical safety management program (CSMP) report described below. The white paper concluded that no action was required, without consideration of the additional detail contained in the report.

Additionally, contrary to DOE Order 227.1A, section 3.b, HFO did not include the DOE Order 227.1A CRD in the BNI contract. (See **Finding F-HFO-1**.) Not including all requirements in the contract could result in important safety and security requirements not being met.

Based on review of the timeliness and adequacy of corrective actions, and BNI documentation of their effectiveness, EA has confirmed the closure of the following three findings:

² HFO procedure DOE-PRO-PAI-50085, *Integrated Oversight*, defines independent assessment activities as assessments “conducted by individuals that are independent from the work or process being evaluated, or by individuals from an external organization or company”; operational awareness activities are defined as “[t]he least rigorous and most informal of the oversight activities.”

- Finding F-BNI/WTCC-2 from EA report *Independent Assessment of the Chemical Safety Management Program at the Hanford Site Waste Treatment and Immobilization Plant – September 2023* stated that BNI/WTCC did not consider all potential safety consequences of increasing water content in the anhydrous ammonia storage vessels.

In response to this finding, which was processed as CR 23-00895, BNI/WTCC revised 24590-BOF-N1D-AMR-00001, *Corrosion Evaluation: AMR-VSL-00003 & AMR-VSL-00004 Anhydrous Ammonia Storage Vessels*, to address the potential for corrosion of the anhydrous ammonia storage vessels in the presence of water and update the corrosion allowance, and reevaluated and revised the water action level chart previously developed in Recommendation 24590-WTP-GRN-MGT-21-00837, to consider the full design temperature range. In performing these actions, BNI/WTCC also identified and addressed a missing justification for water action levels. However, while the action level chart was updated and attached to CR 23-00895, it is not maintained in a controlled procedure. (See **OFI-BNI/WTCC-11**.)

Of note, despite the details of the finding not being transmitted from HFO in DOE-ASMT-2023-4340 (CCN 335453), and therefore not included in the CR when initiated, the factual-accuracy (not final) copy of the EA report was attached to action 1 of CR 23-00895 by the individual performing the action such that the full context of the finding was available in CAMP.

- Finding F-BNI/WTCC-2 from EA report *Independent Assessment of Conduct of Operations at the Hanford Site Waste Treatment and Immobilization Plant – May 2024* stated that BNI/WTCC had not established and implemented operating practices for the control of interrelated processes.

When the report was transmitted, CR 24-00592 was generated and closed to actions already taken. The canceled procedure 24590-WTP-GPP-RAOP-OP-0034, *Interfacing Systems Program Requirements*, had been removed from the conduct of operations matrix, and the revised matrix with correct references to implementing procedures had been approved by HFO.

- Finding F-BNI/WTCC-1 from EA report *Independent Assessment of the Training and Qualification Program at the Hanford Site Waste Treatment and Immobilization Plant – March 2025* stated that BNI/WTCC was not applying the requirements of DOE Order 426.2, *Personnel Selection, Training, Qualification, and Certification Requirements for DOE Nuclear Facilities*, to all required personnel; implementation was mostly limited to specific administrative control-affecting and special relief device-affecting positions and did not include all safety management programs (SMPs).

In response to this finding, which was processed as CR 25-00181, BNI/WTCC performed a reanalysis of documented safety analysis-affecting positions and updated 24590-WTP-LIST-RATQ-TQ-0001, *Qualified Positions in Accordance with DOE O 426.2*, to reflect use of a position training program description to ensure adequate training for SMP-affecting personnel. Based on additional analyses, the Maintenance Execution Manager was also added to the qualified list.

The following three findings were closed in BNI's CAMP system with inadequate or incomplete actions taken to correct the condition, contrary to DOE Order 226.1B, CRD section 2.b.(3). (See **Finding F-BNI/WTCC-1**.) Not fully evaluating and addressing findings could adversely affect the DOE mission, the environment, worker safety or health, the public or national security. EA will perform additional future follow-up to review the timeliness and adequacy of additional corrective actions for these findings, verify and validate their effectiveness, and confirm closure:

- Finding F-BNI-1 from EA report *Assessment of Issues Management at the Hanford Site Waste Treatment and Immobilization Plant – November 2019* stated that BNI does not consistently categorize or screen significant conditions which, if uncorrected, could have a serious adverse effect on safety, quality, operability, the environment, or Project mission to ensure that issues are managed with appropriate rigor to preclude recurrence. Three examples were provided in a bulleted list.

In response to this finding, which was partially processed as CR 20-00141, BNI addressed an issue documented by EA as a deficiency in one of the provided examples but did not address the finding itself. Specifically, the first example provided was a series of three dropped-item events over a three-month period in 2019 where an individual was either struck or nearly struck.³ CR 20-00141 evaluated only the screening of the three individually referenced CRs. The other two conditions—significant recurring problems in hazardous energy control and LOTO implementation, and repeated National Electric Code violations—were not discussed. The finding, which was a noncompliance with screening criteria in WTP-GPP-RACA-CR-0111, was similarly not addressed.

- Finding F-BNI/WTCC-1 from EA report *Independent Assessment of the Chemical Safety Management Program at the Hanford Site Waste Treatment and Immobilization Plant – September 2023* stated that BNI/WTCC altered the DOE-approved applicability criteria in its web-based Plant Engineering Technical Authority Review form used to determine whether the management of change process needs to be applied to changes potentially affecting DOE-controlled portions of the CSMP.

In response to this finding, which was partially processed as CR 23-00894, BNI/WTCC assigned an action to evaluate the finding “and develop an action plan accordingly.” The CR was initially closed with no action and without responsible manager approval. After being appropriately rolled back for additional action and approval, BNI/WTCC produced a white paper that stated, as discussed above, “The issue described in the EA-31 report is specific to comparing either [one of two scenarios],” one of which was described in detail in the report with amplifying information. The white paper was used to justify closure of the CR with no action taken to address the noncompliance identified in the EA finding and without consideration of the amplifying information.

- Finding F-BNI/WTCC-1 from EA report *Independent Assessment of Conduct of Operations at the Hanford Site Waste Treatment and Immobilization Plant – May 2024* stated BNI/WTCC had not established and implemented operations practices that ensure accurate, unambiguous communications by providing adequate communications systems for emergency and normal operations and ensuring that all personnel are promptly notified of facility emergencies.

In response to this finding, which was partially captured as CR 24-00591, BNI/WTCC initiated an action “to clarify the language and guidance in [24590-WTP-GPP-RACO-CO-0004, *Communications*] to ensure that accurate and unambiguous communications are being provided to WTP personnel for routine and emergency communications.” However, the noncompliance identified in the finding had to do with the inability to hear alarms and public address (PA) announcements, not with their content. The assessment report included multiple examples, including the following:

- The Hanford Site take-cover siren test and the associated PA system announcement could not be heard in Building T-1.
- During a fire response in the Analytical Laboratory (LAB), the fire alarm was not audible in Building T-1; no PA announcement or other communication was provided, despite Building T-1 being adjacent to LAB.
- PA announcements during a drill were not audible in the LAW +28-foot elevation, where emergency actions may have been required for worker protection.

³ It is notable that appendix B of the 2019 assessment report documents that actions from the first and second events were not completed until after the third event. The third event was initially screened as Level A but was downgraded when the event was reevaluated to require less than a “high” level report under DOE Order 232.2A, *Occurrence Reporting and Processing of Operations Information*; there is no indication that actual consequences to workers, repeated occurrence of dropped items, and the unacceptability of recurrence were considered.

None of these were addressed. During this assessment, observations both in LAW and while outside between LAW and Building 23 (the anhydrous ammonia storage vessels) confirmed that emergency communications continue to be inaudible in areas where personnel may be required to take protective actions, contrary to DOE Order 422.1, attachment 2, section 2.d. (See **Finding F-BNI/WTCC-2**.) The inability to effectively communicate the need for protective actions to personnel continues to endanger worker safety.

Follow-up on Previous EA Findings Conclusions

While several findings were thoroughly addressed and adequately resolved, BNI/WTCC does not consistently evaluate and correct EA findings; findings identified as warranting a high level of management attention are not distinguished from other ACs. Three EA findings identified over the previous seven years have not been fully addressed, including the inability to effectively communicate to personnel the need to take protective actions during emergencies. Additionally, the DOE Order 227.1A CRD is not included in the BNI contract. Finally, weaknesses in HFO and BNI processes for initiation of CRs to address independent assessment findings could result in identified conditions adversely affecting the DOE mission, the environment, worker safety or health, the public or national security not being appropriately corrected.

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 to manage the corrective actions and track them to completion.

Bechtel National, Inc./Waste Treatment Completion Company, LLC

Finding F-BNI/WTCC-1: The BNI/WTCC issues management process does not fully capture all program and performance deficiencies, take compensatory corrective actions when needed, or categorize the significance of all findings to ensure that problems are evaluated and corrected on a timely basis and that causes are addressed as appropriate to prevent recurrence. (DOE Order 226.1B, CRD sec. 2.b.(3))

Finding F-BNI/WTCC-2: BNI/WTCC has not provided adequate communications systems (i.e., clearly audible alarms and PA systems providing intelligible announcements in affected areas) for emergency and normal operations to ensure that all personnel are promptly notified of facility emergencies. (DOE Order 422.1, att. 2, sec. 2.d)

Hanford Field Office

Finding F-HFO-1: HFO did not ensure that DOE Order 227.1A CRD or its requirements were included in the BNI contract. (DOE Order 227.1A, sec. 3.b)

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.

Bechtel National, Inc./Waste Treatment Completion Company, LLC

Deficiency D-BNI/WTCC-1: BNI/WTCC's event investigation procedures do not require the use of a process to reconstruct the facts of an event chronologically from the event data that ensures the rigor and consistency of investigations. (DOE Order 422.1, att. 2, app. A, sec. 2.f)

Deficiency D-BNI/WTCC-2: BNI/WTCC's event investigation performance for three events was inadequate for determining the event details. (DOE Order 422.1, att. 2, app. A, sec. 2.f)

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.

Bechtel National, Inc./Waste Treatment Completion Company, LLC

OFI-BNI/WTCC-1: Consider revising 24950-WTP-GPP-RACA-CR-0113 and/or 24590-WTP-GPP-RAQS-QS-0001 to require an independent evaluation of the adequacy of corrective actions following the completion of an effectiveness review, rather than just a verification that the effectiveness review was performed.

OFI-BNI/WTCC-2: Consider expanding the use of data visualization tools for the routine analysis of CRs.

OFI-BNI/WTCC-3: Consider clarifying relevant procedures and conducting additional training on the use of various trend codes.

OFI-BNI/WTCC-4: Consider updating procedures to ensure that DOE CAT codes from DOE-STD-1197-2024 (the current version of the standard) are consistently used by all BNI/WTCC work groups.

OFI-BNI/WTCC-5: Consider evaluating the adverse trend of configuration control/plant status issues since January 2025.

OFI-BNI/WTCC-6: Consider revising attachment 2 of 24590-WTP-GPP-RACA-AM-0002 to include definitions and relevant examples of key terms used to determine the severity of consequences and the probability of recurrence.

OFI-BNI-WTCC-7: Consider scheduling and performing management assessments that review all departments and requirements areas on a defined periodicity.

OFI-BNI/WTCC-8: Consider integrating various data sources and issue repositories to give a more comprehensive picture of issues, aid in improving performance, and improve the ability to identify leading indicators.

OFI-BNI/WTCC-9: Consider additional means of communicating lessons learned, especially from Level A and Level B CRs.

OFI-BNI/WTCC-10: When processing DOE oversight reports into CAMP, consider attaching the report file to all CRs or other CAMP items, rather than just referencing the CCN, to ensure that all context surrounding any ACs or OFIs is readily available to all personnel taking actions in response.

OFI-BNI/WTCC-11: Consider adding the water action level chart, *Saturation pressure depression due to water logging*, currently attached to CR 23-00895, to a controlled procedure.

Hanford Field Office

OFI-HFO-1: Consider revising DOE-PRO-PAI-50086, *Integrated Issues Management*, to clarify direction for processing external assessment reports being transmitted to site contractors for action. Consider requiring documentation and transmittal as an Independent Assessment, with all documented details of each issue included (rather than just the one-sentence statement of noncompliance), similar to what was done in DOE-ASMT-2025-1677.

Appendix A Supplemental Information

Dates of Assessment

April 14 to May 13, 2026

Office of Enterprise Assessments (EA) Management

Mark D. Barth, Acting Director, Office of Enterprise Assessments

VACANT, Deputy Director, Office of Enterprise Assessments

Jack E. Winston, Acting Director/Deputy Director, Office of Environment, Safety and Health Assessments

Tamara D. Powell, Director, Office of Nuclear Safety and Environmental Assessments

David Olah, Director, Office of Worker Safety and Health Assessments

Dr. Wade W. Gough, Acting Director, Office of Emergency Management Assessments

Brent L. Jones, Director, Office of Nuclear Engineering and Safety Basis Assessments

Quality Review Board

VACANT, Advisor

David A. Young, Acting Chair

John S. Boulden III

Dr. Wade W. Gough

William A. Eckroade

EA Site Lead for the Hanford Site

Eric A. Ruesch

EA Assessment Team

Eric A. Ruesch, Lead

Gregory D. Baker

N. Scott Dolezal

Thomas R. Hipschman

Appendix B
Summary of Previous EA Findings Reviewed in Assessment

EA Assessment Report (hyperlinked)	HFO iCAS entry	BNI CCN	EA Finding	BNI/WTCC CR	Status
<i>Assessment of Issues Management at the Hanford Site Waste Treatment and Immobilization Plant – November 2019</i>	N/A	318844	Finding F-BNI-1	20-00141	Noncompliance not fully addressed
<i>Independent Assessment of the Chemical Safety Management Program at the Hanford Site Waste Treatment and Immobilization Plant – September 2023</i>	Operational Awareness DOE-ASMT-2023-4340	335453	Finding F-BNI/WTCC-1	23-00894	Noncompliance not fully addressed
			Finding F-BNI/WTCC-2	23-00895	Resolved
<i>Independent Assessment of Conduct of Operations at the Hanford Site Waste Treatment and Immobilization Plant – May 2024</i>	Operational Awareness DOE-ASMT-2024-2698	339726	Finding F-BNI/WTCC-1	24-00591	Noncompliance not addressed
			Finding F-BNI/WTCC-2	24-00592	Resolved
<i>Independent Assessment of the Training and Qualification Program at the Hanford Site Waste Treatment and Immobilization Plant – March 2025</i>	Independent Assessment DOE-ASMT-2025-1677	343020	Finding F-BNI/WTCC-1	25-00181	Resolved