Independent Assessment of Safety Culture Survey Methods and Interpretation at the Hanford Site Waste Treatment and Immobilization Plant

June 2023

Office of Enterprise Assessments
U.S. Department of Energy

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Acronyms

BNI	Bechtel National, Inc.
DOE	U.S. Department of Energy
EA	Office of Enterprise Assessments
EFCOG	Energy Facility Contractors Group
MP	Monitoring Panel
NSQC	Nuclear Safety and Quality Culture
OFI	Opportunity for Improvement
PEMP	Performance Evaluation and Measurement Plan
POMC	Performance Objectives, Measures, and Commitments
SCA	Safety Culture Assessment
SCWE	Safety Conscious Work Environment
SME	Subject Matter Expert
VPP	Voluntary Protection Program
WTCC	Bechtel-AECOM Waste Treatment Completion Company, LLC
WTP	Hanford Site Waste Treatment and Immobilization Plant

INDEPENDENT ASSESSMENT OF
SAFETY CULTURE SURVEY METHODS AND INTERPRETATION
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 safety culture survey methods used by Bechtel National, Inc. (BNI) and the Bechtel-AECOM Waste Treatment Completion Company, LLC (WTCC), collectively referred to as BNI/WTCC, at the Hanford Site Waste Treatment and Immobilization Plant (WTP). EA also assessed the interpretation of survey data by the BNI/WTCC management team and the oversight of safety culture provided by the DOE Richland Operations Office and Office of River Protection (together "DOE Hanford").

DOE allows each organization to determine how it will promote and maintain a strong safety culture and assess or monitor its culture. BNI/WTCC established nuclear safety and quality culture (NSQC) as its safety culture model. BNI/WTCC monitors NSQC by using a combination of an external independent safety culture assessment and an in-house project-wide NSQC survey every two years. Additionally, the BNI/WTCC NSQC monitoring panel routinely monitors safety culture, considering safety culture self-assessments, survey data, and multiple project performance metrics.

EA identified the following positive attributes, including five best practices:

- The NSQC monitoring panel routinely monitors culture across diverse organizational groups for positive trends as well as topics needing attention. (Best Practice)

- The NSQC Program Manager has conducted benchmarking with members of the Energy Facility Contractors Group (EFCOG) safety culture subtask working group and other industry safety culture professionals to improve NSQC monitoring techniques. (Best Practice)

- BNI/WTCC schedules groups of employees without ready access to computers, including craft workers, to complete the safety culture survey at a set time and location using electronic audience response systems to anonymously complete the surveys. (Best Practice)

- The DOE Hanford safety culture subject matter expert has routine, frequent interactions with all DOE Hanford contractors, including BNI/WTCC, to discuss culture topics. (Best Practice)

- DOE Hanford captures culture strengths and weaknesses in the performance evaluation and measurement plan when appropriate. (Best Practice)

- BNI/WTCC senior managers use safety culture data and insights from monitoring activities to make informed decisions and support continuous improvement of the NSQC program.

- BNI/WTCC communicates upcoming safety culture assessments and subsequently shares results and areas of improvement based on those assessments with employees. Management engagement is directly championed and reinforced by the BNI WTP Project Director and WTCC General Manager.

EA also identified some areas needing attention:

- BNI/WTCC's project-wide NSQC surveys and external independent safety culture assessments are not fully consistent with generally accepted practices of validating safety culture questions to ensure that they measure what was intended.

- BNI/WTCC does not explain the assessment methodology in reports in sufficient detail to provide confidence in assessment outcomes or to allow results to be replicated for verification.

- BNI/WTCC does not have or leverage expertise in applied sciences related to the development of safety culture surveys and assessments.

BNI/WTCC has a well-documented and structured program that involves many people and diverse data streams. The attention to safety culture monitoring on the part of BNI/WTCC and DOE Hanford reveals that considerable effort and resources have been devoted to developing requisite competence and ongoing continuous improvement. However, the lack of organizational knowledge in the science of survey design and analysis creates a potential vulnerability that could result in important concerns or trends being missed or reduce the confidence of stakeholders and oversight bodies in survey conclusions.

INDEPENDENT ASSESSMENT OF
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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 safety culture survey methods and interpretation used by Bechtel National, Inc. (BNI) and the Bechtel-AECOM Waste Treatment Completion Company, LLC (WTCC) (collectively referred to as BNI/WTCC) at the Hanford Site Waste Treatment and Immobilization Plant (WTP). Assessment activities were conducted remotely from February 27 to March 10, 2023, and on site from March 13 to 16, 2023.

The EA report *Assessment of Safety Culture Sustainment Processes at U.S. Department of Energy Sites – June 2020* is a rollup report of eight safety culture assessments (SCAs) performed at a cross-section of DOE sites. The rollup report identified that one of the most significant areas of variance within the DOE complex is the quality of safety culture survey instruments and the proper interpretation of gathered survey data[1]. In consultation with the Office of Environment, Health, Safety and Security, program offices, and local DOE field offices, EA established the goal of conducting follow-up reviews of the quality of safety culture surveys used for safety culture decision-making, both of contractors that were assessed in the rollup report and some that were not. This series of follow-up reviews is being performed in accordance with the *Plan for the Enterprise-wide Assessment of Safety Culture Survey Methods and Interpretation – February 2022*.

BNI/WTCC baselines its safety culture (referred to as Nuclear Safety and Quality Culture, or NSQC) using a combination of a qualitative external independent SCA and an in-house quantitative project-wide NSQC survey every two years. An NSQC monitoring panel (MP) routinely monitors the status of NSQC to identify trends, both positive and negative. Self-assessments are used to follow up on areas needing attention.

In accordance with the *Plan for the Independent Assessment of Safety Culture Survey Methods and Interpretation at the Hanford Site Waste Treatment and Immobilization Plant – March 2023*, this assessment evaluated how the survey questions are developed and validated, how the responses are gathered, how the results are evaluated, and what decisions are made based on the survey outcomes. This assessment also evaluated the effectiveness of safety culture monitoring activities conducted by the DOE Richland Operations Office and Office of River Protection (together "DOE Hanford").

DOE Policy 450.4A, *Integrated Safety Management Policy*, sets the expectation that all organizations embrace a strong safety culture where core values are safe work performance and the involvement of workers in all aspects of work performance. That culture includes, among other key considerations, establishing a safety conscious work environment (SCWE) in which employees feel free to raise safety concerns to management without fear of retaliation. While DOE does not set specific requirements for how organizations should promote and maintain a strong safety culture or how they should assess or monitor their culture, DOE and industry guidance documents present acceptable methods for safety culture evaluation as described in section 2.0 below.

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[1] Safety culture surveys, as discussed in the 2020 EA report, are quantitative instruments and associated administrative processes used to gather employee perceptions about factors important for the safe performance of work. To be helpful in decision-making, survey questions should be designed to measure the right factors, and the people participating in the survey should be representative of the full organization.

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. As identified in the assessment plan, EA used selected criteria from objectives SC.1 and SC.3 of EA Criteria and Review Approach Document 30-08, Rev. 0, *Safety Culture Assessment*, to guide the assessment.

Because DOE provided broad safety culture requirements to BNI through language in the contract but expresses no specific requirements, EA referenced generally accepted standards and practices for safety culture surveys and monitoring. Core references used in this assessment included the DOE Safety Culture Improvement Panel's *Tailoring the Analysis of Safety Culture Health Monitoring Means and Methods Working Group*, January 2022; the Energy Facility Contractors Group's (EFCOG's) *A Guide to Safety Culture Evaluation*, Rev. 0, September 2015; EFCOG's *Safety Culture Practitioner's Resources Guide*, Rev. 1, September 2022; EFCOG's *Best Practice #249: Strategy and Design for Internal Surveys*, November 18, 2021; and the International Atomic Energy Agency's *Performing Safety Culture Self-Assessments*, Rev. 0, June 2016.

EA examined 143 documents related to BNI/WTCC NSQC management and surveys, including but not limited to NSQC policy, program/process descriptions, self-assessment reports, integrated safety management system (ISMS) declarations, benchmarking reports, safety culture improvement plans, SCWE training material, and communication examples. EA also reviewed documents related to DOE Hanford safety culture oversight, including operational awareness records, meeting notes, official correspondence, and improvement action records. EA remotely observed an NSQC MP meeting and attended a voluntary protection program (VPP) self-assessment action planning meeting while on site. EA interviewed personnel responsible for developing and conducting NSQC monitoring, as well as leadership responsible for acting on the results. The combination of a well-documented NSQC program and interviews with involved individuals provided the data for this assessment.

The members of the assessment team, the Quality Review Board, and the management responsible for this assessment are listed in appendix A.

3.0   RESULTS

3.1   Valid and Reliable Methods to Maintain Cognizance of Safety Culture

Positive Attributes

Culture Survey Development and Survey Methods

BNI/WTCC's NSQC model is consistent with DOE guidance and commercial nuclear industry practices. The NSQC program is framed by a culture policy that provides a definition of NSQC, emphasizes the importance of safety culture in supporting mission performance, and describes the responsibilities of personnel in sustaining a positive safety culture. A complementary document (24590-WTP-G63-RAEC-EC-0001, *Zero Tolerance for Retaliation*) states the commitment from BNI's WTP project leadership to create an environment in which all project employees feel free and are encouraged to raise concerns without any fear of harassment, intimidation, retaliation, and discrimination. There are 15 NSQC attributes that mirror the *Safety Culture Focus Areas and Associated Attributes* described in DOE Guide 450.4-1C, *Integrated Safety Management System Guide*, att. 10. These 15 attributes are defined in 24590-WTP-GPP-

RANQ-NQ-0002, *Implementing and Monitoring the Nuclear Safety and Quality Culture*, along with the roles and responsibilities of those involved in the NSQC program, and procedures for culture monitoring.

BNI/WTCC performed internal quantitative project-wide NSQC surveys in 2017, 2019, and 2021 to provide snapshots of employee perceptions of culture attributes and focus for external independent SCAs. BNI/WTCC bases its internal project-wide NSQC surveys on the recommendations of DOE Guide 450.4-1C, att. 10. This guidance encourages using questions to examine three safety culture focus areas: leadership, employee/worker engagement, and organizational learning. BNI/WTCC developed a comparison between questions from multiple survey instruments to each of the three focus areas to tailor a question set used in BNI/WTCC project-wide NSQC surveys. The survey also contains questions for assessing perceptions of SCWE, which are consistent with similar questions provided in DOE guidance. Biennial surveys are an appropriate frequency for performing such assessments. The overall response rates have been adequate (greater than 50%[2]). However, the rate in 2021 was the lowest (58%) of the three surveys that have been done since 2017. Another project-wide NSQC survey is planned for 2023.

BNI/WTCC uses an audience response system (i.e., clickers) as an innovative way to encourage employees, including craft workers and those who do not have ready access to computers, to participate in electronic surveys. Each question is projected on a screen and read aloud, and participants select a response using their clicker, which is not tied to them as an individual. The use of this mechanism at BNI/WTCC is considered by EA to be a **Best Practice** because it enhances the ability of participants to respond comfortably and allows BNI/WTCC to reach a broader population of employees that might otherwise not be inclined to participate. (See **BP-BNI/WTCC-1**.) To increase survey participation, groups of employees without ready access to computers, including craft workers, are scheduled to complete the survey at a set time and location during work hours. Session administrators explain to each group that their participation is voluntary and that responses cannot be traced to any individual. Survey administrators provide participants a handout to provide narrative comments to supplement their question responses if desired. To protect employee confidentiality, participants are instructed to not include their name or other identifying information on the handout if they desire to provide such additional comments.

BNI/WTCC has arranged for external independent SCAs of the entire organization biennially since 2019, which is an appropriate frequency. SCA reports provide a general overview of the methodology, noting that the analysis approach is subjective. The SCA team lead is from Energy Northwest's Columbia Generating Station located at the Hanford Site, and half of the SCA team members are from other DOE and Hanford Site organizations and paired with BNI/WTCC representatives. The intent of the SCAs is to provide a baseline against which to evaluate culture changes. The SCA team collects a large amount of qualitative information via interviews and observations.

BNI/WTCC actively monitors culture changes through the NSQC MP, which consists of members who represent a cross-section of the project, with knowledge of the various NSQC feedback data streams. The operation of the NSQC MP closely follows the design provided in the Nuclear Energy Institute's NEI 09-07, *Fostering a Healthy Nuclear Safety Culture*, a generally accepted standard in the U.S. commercial nuclear industry.

The MP members use information sources from a variety of safety culture indicators in addition to the results of the external independent SCAs and project-wide NSQC surveys. MP functions include monitoring the WTP project safety culture; using the NSQC focus areas and associated attributes to review data; engaging in a healthy, self-critical dialogue about cultural implications rather than primarily

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[2] EFCOG Guide to Survey Evaluation, 2015: Survey research expert Babbie asserts that "a response rate of at least 50 percent is considered adequate for analysis and reporting. A response of 60 percent is good; a response rate of 70 percent is very good." Many experts agree that below 50%, the data should be evaluated for nonresponse bias.

focusing on the quantity of data and trending; recommending mitigating or improvement actions; and monitoring the progress of improvement actions for timeliness and effectiveness. The MP presents findings and recommendations to senior management on an as-needed basis during the year. The MP model is considered by EA to be a **Best Practice** because it improves organizational culture by pulling together diverse organizational groups to review safety culture data feeds. (See **BP-BNI/WTCC-2**.)

The NSQC Program Manager has conducted two benchmarking efforts related to safety culture monitoring – one in 2017 and one in 2019, with members of the EFCOG safety culture subtask working group and other industry safety culture professionals. BNI/WTCC's structured benchmarking process is considered by EA to be a **Best Practice** because it enhances their culture monitoring and improvement efforts by providing insight to effective approaches not otherwise apparent. (See **BP-BNI/WTCC-3**.) The NSQC Program Manager is conducting a future benchmark effort to obtain ideas on how to refresh the operation of the NSQC MP, which is supported by the WTP Project Director.

Culture Survey Results Analysis and Communication

During an SCA, SCA team assessors review the results of the BNI/WTCC internal quantitative surveys and determine whether the SCA qualitative results are in alignment. Ultimately, the SCA team ranks safety culture attributes according to a subjective quantitative scale. For attributes where employee perceptions are ranked below expected norms, or rankings declined in comparison to previous SCAs, opportunities for improvement (OFIs) are identified. Based on interviews with the SCA team lead, the external independent SCA approach is intended to be consistent with a generally accepted U.S. nuclear power industry method described in Nuclear Energy Institute's *Industry Joint Initiative Nuclear Safety Culture Assessment Process Manual*, Rev. 0, April 2009.

BNI/WTCC integrates feedback collected from a variety of inputs, including the annual self-assessments of the execution of the VPP, the self-assessments of the NSQC program, the external independent SCAs, and project-wide NSQC surveys. BNI/WTCC also gathers input from the DOE Hanford VPP committee and trends from the VPP action team. This collective feedback is used to help inform annual updates of the WTCC safety culture improvement plan.

BNI/WTCC engages the workforce to improve culture survey participation through communicating upcoming SCAs and sharing results and areas for improvement based on those assessments. For example, project news articles are published, including articles titled *Principles for a Strong Nuclear Safety Culture*, *Exercising the Leadership Covenants*, and *Teamwork and Mutual Respect*. Direct communication from the WTP Project Director has been used to notify employees of SCA results, and NSQC-related communications are published monthly to be used as "culture shares" to keep topics related to NSQC on the forefront. Project-wide NSQC survey results are also presented during all-hands meetings, so everyone has a chance to see the results of their input.

The WTP Project Director and WTCC General Manager are actively engaged and use safety culture insight from monitoring efforts to enhance management decisions. They sponsor an active management field observation program to increase direct contact between managers and employees, with the goal of building trust and respect between management and the workforce and enhancing open communications. The positive effect of this engagement was expressed during interviews with craft safety representatives. Senior managers encourage NSQC program improvements to keep their people actively engaged.

Qualification of Responsible Personnel

Members of the MP come from various disciplines and are chosen based on their knowledge and experience, representing a cross-section of the organization. The NSQC Program Manager ensures that

MP members are provided an orientation before attending an MP meeting as a quorum member. The orientation includes, at a minimum, a review of the NSQC MP charter, the procedure for implementing and monitoring NSQC, and NEI 09-07, with discussions of key concepts with the Nuclear Safety Culture Manager. The combination of this orientation with the group learnings produced through their deliberations served to develop individual and group competencies in the integrated operations of the organization.

Areas Needing Attention

Culture Survey Development and Survey Methods

Limited evidence is available about the validity and reliability of the survey questions used for the quantitative surveys. BNI/WTCC chose to base their project-wide NSQC survey on safety culture questions that had been validated in accordance with accepted psychometric survey development methods. However, the wording of several survey questions was significantly altered, and the revised questions have not been evaluated to determine whether they are valid and reliable with respect to psychometric properties. (See **OFI-BNI/WTCC-1**.)

The external independent SCAs assess the 15 NSQC attributes through a standard set of 10 questions asked to each interviewed person. In some cases, two attributes are grouped together with a single question to support insights of the two attributes. An example is "Leadership: Attribute 1, Demonstrated safety leadership" and "Attribute 3, Management engagement and time in field." The question asked to assess those two attributes was "Are leaders commonly seen in working areas of the project observing, coaching, reinforcing standards and expectations and correcting deviations from standards and expectations promptly?" The question contains multiple topics (observing, coaching, etc.) about which the interviewee might have negative or positive perspectives. Such questions are referred to as "double-barreled questions" and are not considered effective practice. This grouping of attributes and selection of questions was done by the external team lead and the NSQC Program Manager. The NSQC Program Manager developed an explanation of the relationships between the 15 NSQC attributes and the standard 10 questions.

The external independent SCA process is subjective by design. A subjective approach is used in similar SCAs in commercial nuclear plants; however, those plants use the nuclear safety culture traits adopted by the U.S. nuclear power industry and agreed to by the Nuclear Regulatory Commission. The typical SCA performed using this method at a power plant would have a team consisting of people familiar with the safety culture traits used by the U.S. nuclear power industry, so that team would have a common language and a shared understanding of the relationship between the SCA questions and the traits. The relationship of data from the SCA questions to the NSQC attributes is in this case unique to BNI/WTCC. It is not evident that the SCA approach ensures that the team members have a sufficient understanding of the relationship between the questions and the attributes to ensure consistency of interpretation and reliable comparisons over time.

Although the SCA team lead stated that the criteria for selecting interviewees was intended to represent all job categories, demographic stratification is not used to test for possible differences in organizational subcultures. The sampling approach does not ensure that it is representative of the total organization or of individual departments or significant subcultures within the organization. There are known cases in DOE where well-structured SCAs did not uncover significant safety culture issues in an important subculture because the demographics were so broadly defined that the overall positive responses of a majority of demographic constituents obscured the presence of negative perspectives in a single constituent group.

Culture Survey Results Analysis and Communication

Most authorities on organizational assessments recommend collecting both qualitative and quantitative information to assess an organization's safety culture. Convergent information obtained from multiple methods provides confidence that conclusions are reliable to formulate plans for further investigation or improvement. BNI/WTCC does not document how qualitative and quantitative information are combined to draw conclusions about the status of safety culture. For example, BNI/WTCC's project-wide NSQC survey reports include almost exclusively quantitative information, i.e., employee responses to agree-disagree rating scale questions. While comment sheets were provided and comments were received (a total of 226 for the 2021 survey), the reports do not discuss whether comments were correlated with NSQC attributes, or whether correlations between comments and quantitative results were examined.

Sample sizes and response rates were not reported for each of the organizational subunits for which the data is organized (the comparisons based on four demographic characteristics). Without this information, it is not possible to determine whether any observed differences between subunits are based on an adequate sampling of the subunit's employees. Given that the overall response rate for the 2021 survey was only 58%, the response rate for some of the subunits could have been below 50%. It is also unclear whether differences in the average responses of various groups of employees are statistically significant. Further inquiry, for example via focus groups, would be important if significant variance is observed.

BNI/WTCC prepares detailed written reports to document quantitative NSQC survey findings. However, the reports do not include several important details about the survey instrument (as described above in the Culture Survey Development and Survey Methods subsection under Areas Needing Attention), how the survey was administered, or how the data was analyzed (as described below). BNI/WTCC's reports present most of the quantitative findings adequately. However, the reports include neither text to explain or highlight the most important findings nor the implications of bar charts and tables of numbers. Explaining what the survey numbers indicate in positive or negative terms and the logic for such conclusions helps communicate the reasons behind the actions taken in response to the survey. (See **OFI-BNI/WTCC-2**.)

Qualification of Responsible Personnel

NSQC program personnel have applied experience in safety culture, employee concerns, worker safety, and other safety-culture-related disciplines. Because BNI/WTCC chose to develop, conduct, and analyze surveys in house, this experience is not sufficient. Personnel responsible for supporting the project-wide NSQC survey do not have specific education or training in scientific methods associated with surveying. No specific training is provided on safety culture survey development or safety culture monitoring, and no qualification (e.g., applicable degrees in social sciences) or training in recognized culture assessment instruments and methods (e.g., Organizational Culture Inventory, Organizational Culture Assessment Instrument, Denison Culture Model) is required. (See **OFI-BNI/WTCC-3**.)

3.2 DOE Oversight of Contractor Safety Culture Efforts

Positive Attributes

Culture Monitoring Framework

All interviewed DOE Hanford staff members demonstrated a clear professional interest in monitoring BNI/WTCC's safety culture and were able to discuss examples of when they have made culture-related observations to the contractor. In particular, DOE Hanford leadership is familiar with and comfortable

discussing culture issues. DOE Hanford staff members are sensitive to the differences between safety culture oversight and technical oversight, and provide valuable safety culture input to the contractor.

DOE Hanford includes assessments of safety culture as part of its operational awareness activities, including monthly performance summaries, assessments in response to operational events, and reviews conducted specifically to follow up on suspected instances of inadequate safety and quality culture implementation. When documenting operational awareness activities, DOE Hanford staff members identify each functional area covered by the activity, and safety culture is one of the secondary areas under integrated safety management systems that can be applied to the document. DOE Hanford provided numerous examples of operational awareness activity records related to culture, one of which identified an adverse condition for improper implementation of BNI's NSQC procedures. Additionally, DOE Hanford conducted an independent assessment of process safety culture in 2020 as part of the chemical safety management program.

The safety culture subject matter expert (SME) has routine, frequent interactions with all DOE Hanford contractors, including BNI/WTCC, to discuss culture topics. Through these discussions, the SME provides assistance and guidance in meeting the expectations of the field office. DOE Hanford's routine discussion of culture topics with the contractor is considered by EA to be a **Best Practice** because it enhances the quality of DOE Hanford products. (See **BP-DOE Hanford-1**.) The safety culture SME also participated as a team member in the last two independent external SCAs arranged by BNI/WTCC and plans to participate in the upcoming SCA this year. This participation allows for an in-depth look at the culture of the contracting organization that otherwise would be difficult to observe.

For each of the years assessed (2019-2023), BNI has established several integrated safety management system performance objectives, measures, and commitments (POMCs) related to safety culture. Per DOE Order 450.2, *Integrated Safety Management*, the head of the field element is responsible for ensuring that contractor safety POMCs are established to drive performance improvement or maintain excellent performance. DOE Hanford routinely monitors these POMCs, which include self-assessments, training and workshops, and the biennial survey and external assessment. The DOE Hanford POMC process is a collaborative effort, and these commitments are encouraged by the safety culture SME and internal organizations that provide oversight of the contractors. This process allows DOE Hanford to communicate expectations and influence the level of effort the contractor applies to monitoring safety culture. In addition, when appropriate, culture strengths and weaknesses are captured in the performance evaluation and measurement plan (PEMP). DOE Hanford's use of the PEMP is considered by EA to be a **Best Practice** because it enhances communication of safety culture strengths and weaknesses. (See **BP-DOE Hanford-2**.) In 2020, strengths and weaknesses related to NSQC were cited under the safety and health category as part of award fee objective 2, *Environmental, Safety, Health, and Quality Assurance*. In 2021, only strengths were cited under that category.

Development of Safety Culture Competencies

Many DOE Hanford staff, as well as leadership, have had continuing training over their careers related to safety culture. Interviewees cited the high level of attention to safety culture at the site as the driver for the training they had received. DOE Hanford's safety culture SME has extensive experience and training in safety culture that includes previously being qualified to teach the DOE National Training Center's TLP-150, *Safety Culture Training for Front Line Leaders*, course. The safety culture SME stays current on the topic through the latest EFCOG safety culture publications and participation in the safety culture improvement panel.

Safety culture knowledge is reinforced on a frequent basis through the use of a safety culture handbook. *The Hanford Site Safety Culture Focus Areas and Associated Attributes* handbook is a pocket-sized

booklet that includes DOE Guide 450.4-1C, att. 10, along with the ISMS core functions and guiding principles, and a model called the Ladder of Accountability. DOE Hanford has also published an *Ethical Standards and Culture* handbook, which includes ethical requirements that apply to Federal employees. At the start of all DOE Hanford meetings, someone selects a section from either the safety culture handbook or the ethics booklet to review with the group.

Areas Needing Attention

Culture Monitoring Framework

The assessment identified no areas needing attention with respect to DOE Hanford's culture monitoring framework.

Development of Safety Culture Competencies

The most recent safety culture refresher training offered to the DOE Hanford staff was in 2019. Due to COVID impacts, new training was delayed. To address this gap, DOE Hanford has scheduled the DOE National Training Center instructors to conduct in-person training for the TLP-200, *Safety Culture Leadership for DOE and DOE Contractor Senior Leaders*; TLP-150, *Safety Culture Training for Front Line Leaders*; and TLP-100, *Safety Culture Leadership Fundamentals (for employees)*, courses in June 2023. In addition to DOE Hanford federal personnel, this training will also be offered to all Hanford Site contractor personnel, and Pacific Northwest National Laboratory personnel.

3.3   SUMMARY

The SCA and monitoring program at BNI/WTCC is well documented and structured. Baseline SCAs are conducted biennially, and the MP monitors for changes in safety culture, using management observations and other feedback components to improve the program. The level of documentation demonstrates the high level of effort devoted to designing and operating a monitoring program that involves many people and diverse data streams. Senior managers drive active management engagement to build trust and shared learning. Multiple means are used to communicate upcoming assessments, encourage participation, and share results of the assessments with the workforce. The attention to safety culture monitoring with emphasis on internal project-wide NSQC surveys and external independent SCAs, compared to what EA observed in previous WTP assessments, reveals that considerable effort and resources have been devoted to developing monitoring competence and using survey/assessment insights for continuous improvement. The OFIs identified in this report should be interpreted in that context, as opportunities to pursue excellence based on an existing program that is consistent with many accepted standards and practices. Strategically, BNI/WTCC's primary cultural challenge is to continue building upon the substantial progress that has been made to nurture a culture that enables transition to full mission operations and sustains those operations to mission completion.

DOE Hanford promotes and supports safety culture monitoring activities through assessments, oversight, and frequent engagement. Staff members at all levels of the field office are aware of and have the skills to perform their role in encouraging and assessing the safety culture of the contracting organizations under their purview. Use of the POMCs and PEMP to provide specific guidance and feedback to BNI demonstrates a strong understanding of how to show the importance of safety culture.

4.0 BEST PRACTICES

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

BNI/WTCC

BP-BNI/WTCC-1: To improve survey participation of those who do not have ready access to computers, BNI/WTCC schedule groups of employees to complete the survey at a set time and location using electronic audience response systems to anonymously complete the surveys.

BP-BNI/WTCC-2: The BNI/WTCC NSQC MP is an effective model for pulling together and actively engaging many diverse organizational groups in a manner that uses clear criteria not only to facilitate review of multiple safety culture data feeds but also recommend actions to senior management to improve their organization's culture.

BP-BNI/WTCC-3: BNI/WTCC has developed a structured benchmarking process to compare the operation of their culture monitoring and improvement efforts to those of other DOE organizations to facilitate learning and improvements.

DOE Hanford

BP-DOE Hanford-1: DOE Hanford holds routine discussions on culture topics with all its Hanford Site contractors.

BP-DOE Hanford-2: DOE Hanford uses the PEMP to communicate observed safety culture strengths and weaknesses to BNI.

5.0 OPPORTUNITIES FOR IMPROVEMENT

EA identified the OFIs shown below. 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.

BNI/WTCC

OFI-BNI/WTCC-1: Consider reviewing and adopting standards and practices for valid and reliable safety culture surveys either by having current survey questions validated by survey specialists or adopting a set of existing validated safety culture questions that is mapped to the 15 NSQC attributes, such as the Oak Ridge Associated Universities safety culture surveys.

OFI-BNI/WTCC-2: Consider reviewing DOE and industry guidance on suggested formats for safety culture reports. An adequate source of reference is EFCOG's *A Guide to Safety Culture Evaluation*, Rev. 0, September 2015.

OFI-BNI/WTCC-3: Consider conducting a knowledge and skills evaluation of key positions responsible for safety culture program management, monitoring, and analysis with a focus on the science of developing, conducting, and analyzing organizational surveys and assessments. Consider using EFCOG's *Safety Culture Practitioner's Resources Guide* to facilitate such an evaluation and input to knowledge and skills development for in-house expertise.

Appendix A
Supplemental Information

Dates of Assessment

Remote Data Collection: February 27 – March 10, 2023
Onsite Assessment: March 13-16, 2023

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