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**DEFENSE NUCLEAR FACILITIES
SAFETY BOARD**

Washington, DC 20004-2901



July 30, 2019

The Honorable James Richard Perry
Secretary of Energy
US Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585-1000

Dear Secretary Perry:

In order to determine whether the Department of Energy adequately addressed the Defense Nuclear Facilities Safety Board's concerns outlined in Recommendation 2011-1, *Safety Culture at the Waste Treatment and Immobilization Plant*, issued on June 9, 2011, a staff team conducted a review of the effectiveness of the actions taken to date to fulfill the Department's Implementation Plan and address the Board's Recommendation.

The Board has concluded that the Department of Energy has adequately addressed the underlying causes associated with the Board's concerns. Therefore, the Board closes Recommendation 2011-1.

Enclosed for your consideration is the staff report from that review, including several observations relating to the sustainment of the improved safety culture. The Board recognizes that challenges persist, but believes that the Department is equipped to address those challenges so long as it maintains vigilance.

Yours truly,


Bruce Hamilton
Chairman

Enclosure

c: Mr. Brian Vance
Mr. Joe Olencz

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

Staff Report

May 6, 2019

Effectiveness of Actions to Improve WTP Safety Culture

Members of the Defense Nuclear Facilities Safety Board's (Board) staff evaluated safety culture at the Hanford Site Office of River Protection (ORP), its contractor, Bechtel National, Incorporated (BNI), and at the Waste Treatment and Immobilization Plant (WTP) project, to determine the effectiveness and sustainability of the corrective actions implemented to address the safety culture concerns detailed in Recommendation 2011-1, *Safety Culture at the Waste Treatment and Immobilization Plant* [1].¹

The Department of Energy (DOE) completed all actions contained in its implementation plan [2] in 2015. The staff team gathered information during its review to determine whether DOE's actions resulted in significant changes in leadership behavior and observable safety culture improvements within ORP and BNI. The staff team evaluated the information and concludes that ORP and BNI have made adequate progress towards resolution of behaviors and conditions that were the basis for the Board's recommendation. Consequently, the staff team concludes that the Board can close Recommendation 2011-1.

However, the staff team also determined that existing evidence indicates that ORP and BNI leadership must continue efforts to further strengthen some instituted processes to ensure their sustainability. To this end, the staff team identified four potential safety items (PSIs) related to sustainment of the safety culture at WTP.

Background. The Board's Recommendation 2011-1 identified that the prevailing safety culture at the WTP project defeated the secretarial mandate contained in DOE Policy 420.1, *Department of Energy Nuclear Safety Policy*, which states that all DOE elements are committed to "establishing and maintaining strong safety culture." Specifically, the Board identified the following findings related to poor safety culture, and the corresponding underlying causes:

- *Finding #1: A Chilled Atmosphere Adverse to Safety Culture Exists*
 - Management failed to adequately advocate for a strong safety culture. In particular, management behaviors discouraged timely and effective resolution of safety issues, and gave the impression that differing professional opinions were not welcome.

¹ In this report, ORP refers to the field office federal staff, BNI refers to the contractor staff, and WTP refers to the overall project, which collectively is composed of both ORP and BNI staff.

- Unhealthy tension existed between organizations charged with technical issue resolution and development of the safety basis, and those organizations charged with completing design and advancing construction.
- *Finding #2: DOE and [BNI] Management Suppress Technical Dissent*
 - ORP and BNI continually identified the same safety culture deficiencies, but did not effectively resolve those concerns. For example, the DOE employee concerns program (ECP), DOE differing professional opinion (DPO) program, and similar BNI processes were all ineffective.
 - Management behavior created an atmosphere in which workers were reluctant to speak candidly due to fear of retribution.

The Board has monitored DOE's efforts to improve safety culture through various initiatives, including several public meetings and hearings related to safety culture, and correspondence related to the execution of DOE's implementation plan². In addition, following the Board's recommendation, DOE's Office of Enterprise Assessment conducted a series of independent safety culture assessments of ORP and BNI and identified additional concerns, which it documented in three DOE reports published in January 2012 [3], June 2014 [4] and June 2015 [5].

Review Conduct. To understand actions taken by ORP and BNI to improve their safety culture, the staff team analyzed external assessments, metrics, and documented evidence of corrective actions since 2011. Based on this analysis, the staff team developed lines of inquiry and traveled to Hanford during the week of July 9, 2018, to conduct discussions with ORP and BNI leadership and personnel. Leadership from the DOE Environmental Management (DOE-EM) Safety, Security, and Quality Assurance organization traveled from DOE headquarters to observe the review interactions. The staff also conducted teleconferences with ORP and BNI personnel on August 22, 2018, and March 19, 2019.

ORP Corrective Actions. During the course of this review, the staff team observed that ORP implemented several actions (detailed in Appendix A) modeled after industry best practices to address its deficient safety culture. Most importantly, ORP established two organizations, (a) a diversified employee driven group, the Organizational and Safety Culture Improvement Council (OSCIC), and (b) a management monitoring group, the Organizational Safety Culture Advisory Group (OSCAG). ORP also established a formal position for a safety culture advisor. The safety culture advisor is a member of both OSCAG and OSCIC and acts as the link between the employee and management groups. He or she also coordinates and analyzes functional area safety culture data feeds and supporting information to aid in monitoring safety culture as requested by the OSCAG team and supported by OSCIC.

² For a complete list of hearings and correspondence related to Recommendation 2011-1, please reference the Board's website at <https://www.dnfsb.gov/board-activities/recommendations/safety-culture-waste-treatment-and-immobilization-plant>

Organizational and Safety Culture Improvement Council—OSCIC is a safety culture integrated project team. ORP formed the group in March 2012 to support the ORP manager’s efforts to strengthen ORP’s safety culture following the Board’s Recommendation 2011-1. As defined in its charter [6], OSCIC’s purpose is to:

- Enhance management’s efforts to establish and maintain a good safety culture at every level of the federal and contractor workforce of the River Protection Project (RPP);
- Provide an open forum that encourages strong employee engagement;
- Develop short and long-term tactical safety culture initiatives; and
- Conduct assessments of ORP organizational safety culture, assist in causal analysis of the results, and develop corrective actions.

OSCIC’s role has changed since its formation. It is now focused on helping ORP management demonstrate safety culture behaviors, detect changes in safety culture, identify areas where safety culture needs improvement, and help implement safety and organizational improvement initiatives through employee engagement.

Organizational Safety Culture and Advisory Group—ORP established OSCAG following DOE-Enterprise Assessment’s 2015 assessment report, which recommended that ORP focus on improvement actions that support expanding OSCIC actions for organizational learning. ORP thus established the senior management monitoring panel, OSCAG, which is modeled after the nuclear industry experience provided in NEI-09-07 [7], to monitor and measure the health of ORP safety culture.

OSCAG provides ongoing and in-depth senior management strategic analysis of the health of RPP safety culture. It ensures that ORP maintains an ongoing effort to understand the current culture at RPP and what is needed to improve. ORP’s safety culture sustainment plan [8] identifies the key areas for OSCAG analysis. Additionally, OSCAG uses several other functional area data feeds shown in Figure 1 that help to identify potential safety culture issues and determine the need for new focused improvement actions across RPP.

Issue Reporting and Employee Concerns Programs—In addition to establishing organizational structures designed to identify safety culture issues and associated corrective actions, ORP initiated other actions to improve and strengthen existing programs that support a healthy safety culture environment.

- ORP established a number of performance measures to monitor the issue management system (IMS) and the associated issue reports contained in the IMS database.
- DOE’s Richland Operations Office (RL), ORP, and all Hanford contractors, implemented a new Hanford site-wide ECP.

- The ECP program issued a procedure that provides a process to independently and objectively address employee concerns including, but not limited to, environment, safety, health, security, quality, business ethics, non-compliance with the laws or regulations, fraud, waste, abuse, and mismanagement, as well as harassment, intimidation, retaliation, and discrimination.
- OSCIC benchmarked mature DPO programs and worked to create processes in which employees could raise issues in a collegial and open-minded environment, while being respected and valued throughout.
- ORP further institutionalized its safety culture training for all employees and institutionalized its procedures for ECP, DPO, and IMS.

Communications and Engagement—ORP acted to reduce unhealthy tensions within the workforce and to address related issues it identified during assessments and reviews. In particular, ORP worked to strengthen safety culture communications and improve employee engagement, and reviewed and restructured organizational alignments to provide clarity for authority and responsibility within the organization. These ORP initiatives included:

- Frequent all hands meetings that focus on development of shared values among the work force.
- Conduct of yearly safety culture workshops.
- Establishment of a management development program that focuses on improving management’s modeling of safety culture attributes.
- Collocation of the WTP project federal staff with the rest of the ORP staff in Building 2440 to improve communications and reduce tensions between ORP organizational groups.
- Improved definition of staff roles, responsibilities, authorities, and accountabilities including updating ORP’s functions, responsibilities, and authorities’ document in March 2016.
- Use of hallway gatherings, the *FOCUS Magazine*, and newly established ORP expectations of accountability, behavior, communication, trust, and vision (ABC-TV) workshops to help convey a consistent message and expectation across all groups.
- Improved resource allocation and teaming activities to better utilize current resources and increased staffing levels to alleviate work tension.

Interface of Corrective Actions—The OSCIC, OSCAG, and other corrective actions combine to allow management to monitor and assess safety culture. The systems ORP established act as a two-way conduit for communication between the workforce and leadership, and facilitate sharing of data and ideas related to safety culture. Figure 1 shows the relationships between ORP’s initiatives.

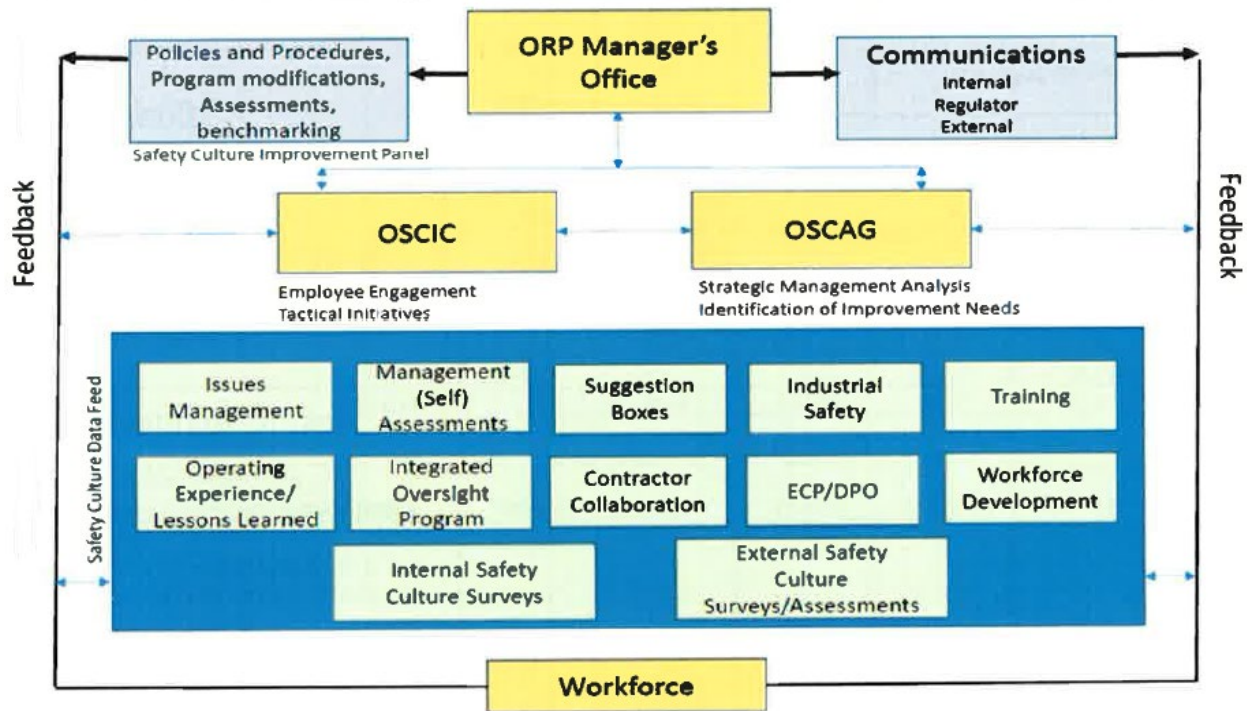


Figure 1. Relationship of ORP Initiatives (Chart provided by ORP)

Broadly, the staff team believes that this system gives ORP the tools it needs to monitor, trend, and assess its safety culture. This paper will address the staff team’s analyses of these initiatives.

BNI Corrective Actions. A catalogue of BNI’s actions and initiatives to address the safety culture concerns identified by the Board’s Recommendation 2011-1 can be found in Appendix B. BNI implemented organizational changes to support the actions described below. The organizational changes include establishment or redefinition of multiple leadership positions that were assigned specific accountable roles and responsibilities related to safety culture. BNI selected individuals to assign to these positions based on their experience in developing and sustaining a strong safety culture.

Nuclear Safety and Quality Culture (NSQC) Program—BNI established the NSQC program to develop and establish procedures and processes that ensure accountability, establish roles and responsibilities, and increase transparency for organizational effectiveness to improve its safety culture. BNI’s program provided the foundation for a number of organizational practices designed to establish a healthy safety culture and implemented various actions to monitor and continuously improve the culture, some of which are discussed below.

NSQC Monitoring Panel—After establishing the NSQC program, BNI created the NSQC monitoring panel, an oversight assessment team consisting of leadership personnel, to support implementation of the NSQC program. Additionally, BNI charged the NSQC Monitoring Panel with evaluating Recommendation 2011-1 and other independent assessments to identify necessary actions to strengthen safety culture. Based on that evaluation, BNI identified a need for action in the six strategic improvement areas (SIA) listed below:

- Realign and maintain the WTP project design safety basis;
- Manage NSQC processes;
- Maintain the timeliness of issues identification and resolution;
- Assign roles, responsibilities, accountabilities, and authorities;
- Develop, teach, and communicate managerial and supervisory behavioral competencies; and
- Deal with WTP project construction site specific issues.

BNI designated a senior manager as the executive sponsor for each area, and tasked the sponsor with developing effective action plans. BNI then consolidated these action plans into the Comprehensive Corrective Action Plan (CCAP) [9], a single action plan for strengthening safety culture.

Corrective Action Management Program (CAMP)—One of the SIAs addresses the timeliness of issue identification and resolution, which is both a product and an indicator of a healthy safety culture. DOE determined that the program was ineffective and issued BNI a Level 1 finding on the program in 2013. In addition, the DOE Office of Inspector General (OIG) reviewed the BNI CAMP in 2016 and also concluded that BNI needed more timely resolution of issues, including resolution of programmatic CAMP issues.

BNI has made several improvements to CAMP that it believes are responsive to the issues identified in the 2013 and 2016 assessments. In particular, BNI upgraded its CAMP software to support improved monitoring and trending. Additionally, BNI implemented several metrics related to CAMP, including the total number of CAMP entries per year, what percentage of those entries are self-identified (higher is healthier), and what percentage of those entries are anonymously entered (lower is healthier).

BNI requires routine monitoring of CAMP metrics through both the contractor assurance system and the NSQC monitoring panel. These monitoring activities have self-identified gaps in performance, and BNI has implemented actions or has planned actions to correct the gaps. Lastly, BNI has modified CAMP processes to improve accountability for action and quality of closure, and increased senior management focus on high priority issues. Subsequent internal and external reviews have concluded that CAMP has improved.

During the review, BNI management candidly discussed the NSQC monitoring panel's observations and conclusions with the staff team. In particular, the NSQC monitoring panel observed negative trends related to effective resolution of reported issues, and provided this feedback to the project director and other senior management. BNI first identified these trends in late 2017 and continued to see them into 2018. In late 2017, BNI also self-identified an increase in the time to complete apparent cause evaluations when resolving issues. BNI later attributed this trend to lack of alignment on the problem definition and significance of the issue being

analyzed. Also in 2017, BNI noted four negatively trending performance indicators related to CAMP timeliness. While BNI has completed several corrective actions to address these concerns, they remained open at the time of the staff team discussions with BNI, with some concerns awaiting effectiveness reviews.

Other Corrective Actions—To address the previous tension between organizations, BNI physically collocated the safety basis and design engineering organizations within the same building, and revised the organizational structure to have both groups report directly to the same senior manager. Though it is hard to prove direct cause and effect of such a decision, it is likely that this shift in organizational structure contributed to the improved safety culture the team observed while on site for the review.

Like ORP, BNI implements the Hanford site-wide ECP, which has the dual role of supporting opportunities to promote and support a healthy safety culture while also being an alternate resolution path for employees. Further resources, such as BNI's DPO program, also are available to all personnel to discuss concerns. The ECP new hire training discusses the availability of the DPO program. In addition, BNI sends quarterly messages to project personnel regarding the availability of the DPO program and includes contact information for the DPO coordinator. The DPO program received three technical concerns in 2018.

BNI established a suite of NSQC metrics, which are aligned with the safety culture focus areas and attributes defined in DOE G 450.4-1C, *Integrated Safety Management System Guide*, Attachment 10. This guide suggests implementing performance assurance metrics for timely and effective resolution of deficiencies.

BNI used its NSQC program to initiate management improvement plans (MIP) [10] for development and establishment of procedures and processes that ensure accountability, establish roles and responsibilities, and increase transparency for organizational effectiveness to improve safety culture. BNI also improved its safety culture training for managers, which reinforced management behaviors that promote a healthy safety culture.

Interface of Corrective Actions—Figure 2 details BNI's corrective actions interface. This diagram shows how BNI manages NSQC within the project structure. Each key business area has a small team led by an Organizational Culture Lead that monitors status of NSQC within their area. The dark blue boxes list key information sources. The Organization Culture Lead format allows members of the work force to provide independent input on NSQC matters while maintaining anonymity if desired. The Organizational Culture Leads collect and report NSQC observations and suggestions to their business area managers, who are also members of the NSQC monitoring panel. The NSQC monitoring panel evaluates Organizational Culture Team input, as well as data from other sources, and develops initiatives to address NSQC issues as well as NSQC sustainment plans. Project management then implements the initiatives and plans. Effectiveness of any initiatives or plans is monitored via the same process.

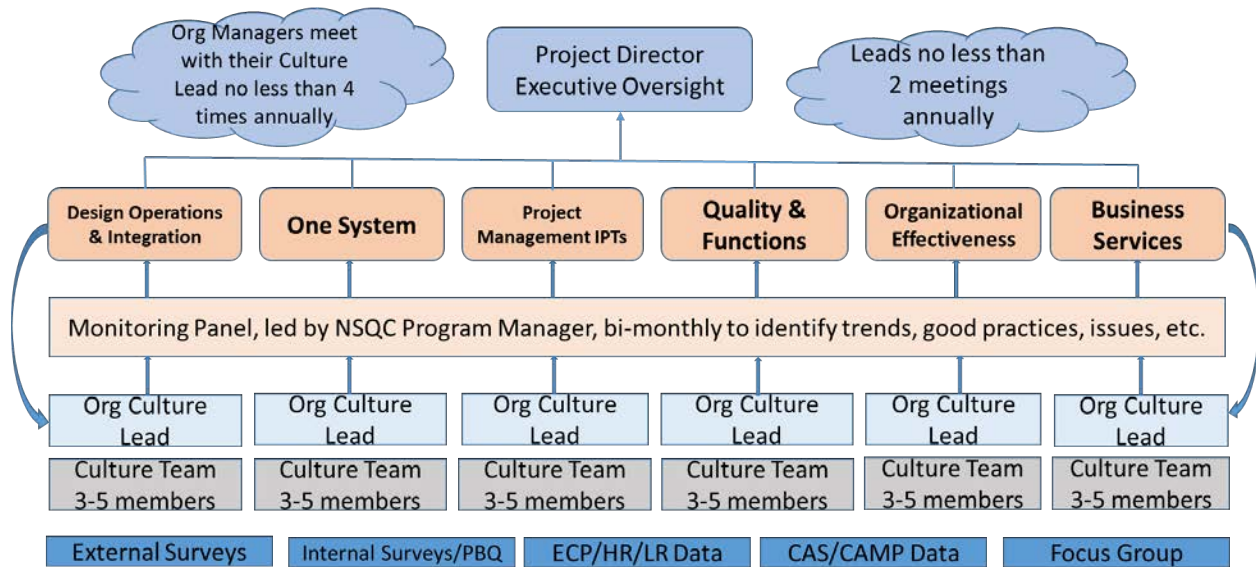


Figure 2. Relationship of BNI Initiatives (Chart provided by BNI)

Staff Analysis. The staff team reviewed the corrective actions that ORP and BNI implemented to address the specific concerns, and evaluated how the instituted management structures, procedures, and processes have improved the safety culture at WTP. Both organizations have established management structures to address the underlying causes of the recommendation, and have undertaken significant efforts to implement those structures. The staff team noted that these efforts have resulted in observable safety culture improvements at WTP.

OSCIC/OSAG—The staff team reviewed the charters and several meeting minutes for the OSCIC and OSAG groups, and discussed their effectiveness related to monitoring and addressing WTP safety culture. Based on the discussions and review of related information, the staff team found significant evidence that OSCIC is monitoring indicators and conditions within the organization, and is providing feedback and recommendations to the OSAG. Additionally, the staff team found that OSAG does act on OSCIC feedback and recommendations. Lastly, OSCIC and OSAG both track safety culture metrics to determine if the result of ongoing initiatives are improving safety culture. Consequently, the staff team determined that OSCIC and OSAG are effective at both monitoring and resolving concerns that could impact safety culture and provide a sound approach for managing organizational safety culture.

Survey Results—Data from recent Federal Employee Viewpoint Surveys (FEVS) indicate significant improvement in ORP’s safety culture. Over the past few years, ORP has analyzed FEVS results and mapped the questions and answers to elements of DOE-Guide-450.4-1C, *Integrated Safety Management System Guide*. Specifically, ORP aligned groups of questions to the safety culture focus areas and associated attributes found in Attachment 10 of DOE-Guide-450.4-1C.

While the staff review team was onsite, ORP senior management presented data extracted in this manner from the FEVS surveys spanning 2013 to 2017. Overall, results from these

surveys show significant improvement in important elements of safety culture within the ORP organization. Between 2013 and 2017, the rate of positive responses, aggregated over all safety culture metrics selected for analysis, increased by 22.4 percentage points. The rate of positive responses over indices measured by the Office of Personnel Management (OPM), such as Employee Engagement and Global Satisfaction, increased by 16.2 percentage points. ORP management has interpreted this improvement as proof of the effectiveness of some of its corrective actions, particularly OSCIC and OSCAG. The staff team concurs with this assessment. ORP stated that it is committed to monitoring these metrics to ensure that it does not develop “blind spots” with respect to worker opinion. ORP has codified this commitment in its sustainment plan.

DPO/ECP—OSCIC worked with external organizations that have effective and mature DPO programs such as the Columbia Generating Station at Richland, Washington, to develop ORP’s DPO program with a goal of creating a process in which employees could raise issues in a collegial and open-minded environment, and employees were respected and valued for their opinions. ORP and BNI include the DPO program in the training of new hires during the ECP discussion. In addition, they send quarterly messages to the workforce broadcasting the availability of their ECP and DPO programs and contact information for the ECP/DPO coordinators. This can increase the workforce’s awareness of the two programs, as indicated below.

For the period of May 2014 to July 2018, DOE-RL was presented with and resolved 136 employee concern cases, of which 12 were safety related. ORP received 166 cases for the same period, of which 41 were safety cases. One ORP safety case is still open. ORP received three cases related to safety through its DPO process between 2011 and 2014, all of which are closed.

From January 2012 to June 2018, BNI recorded 414 ECP cases, of which 26 cases were for the combined areas of environment, safety, health, and security, and one case was categorized as nuclear safety. BNI also recorded eight DPO cases from 2011 to 2015, zero in 2016 and 2017, and three in 2018. The eight earlier DPOs were all safety related and have been resolved, and BNI is still processing the three later DPOs for resolution.

The above data indicates that the workforce is using the ECP and DPO programs. Absent a significant declining trend, this information provides evidence of a healthy program for resolving employee issues and technical disagreements.

LAW D&O Report Process—The staff team evaluated safety culture-related ORP and BNI actions associated with the WTP Low-Activity Waste (LAW) Design and Operability (D&O) technical review to determine adequacy of processes used and actions taken to address identified vulnerabilities. Independent subject matter experts chartered by ORP performed the WTP LAW D&O technical review in 2014 [11]. The reviewers were to evaluate whether BNI had the necessary systems, processes, information, and deliverables in place to ensure that the LAW facility design and construction proceeded appropriately. The reviewers identified 519 design vulnerabilities that, in their determination, could challenge operability of the LAW facility. Broad concerns included:

- Incomplete or inconsistent safety basis or environmental permitting requirements,
- Vague requirements subject to individual interpretation, and
- System designs that may not be aligned with safety and environmental requirements.

The staff team reviewed a sample of the vulnerabilities to determine if ORP had appropriately dispositioned them. Although there were some inconsistencies in documentation, the staff team was able to determine that ORP was appropriately tracking and resolving the items.

Although ORP was handling the vulnerabilities appropriately, it also was clear to the staff team that the sheer number of vulnerabilities identified by the LAW D&O review team created a safety culture challenge for both ORP and BNI. BNI's perspective on the D&O report was that the independent review team approached the review without appropriate consideration for project status, WTP design procedures, actions already underway, and contract requirements.

BNI discussed its lessons learned from the D&O report process, particularly with regard to how it would interface with external review teams in the future. BNI recognized that the initial interaction with the independent review team was somewhat adversarial, and that it would have been more positive if each side had approached the review with a "more collaborative and constructive mindset." Further, BNI stated that similar issues identified today would be incorporated into the new design review process to ensure suitable dispositioning. In the end, ORP and BNI used a binning process to analyze the issues and develop a matrix of actions to address and track all the vulnerabilities. During discussions with the review team, ORP managers confirmed that the experience resulted in lessons learned. Since the report was issued, BNI has been less defensive about its conclusions and more receptive to feedback and willing to take action to resolve identified issues.

The staff team notes that both BNI and ORP had an opportunity to apply the lessons learned to a similar situation in 2017 when they were tasked to meet a challenging deadline mandated by DOE-EM Headquarters related to development of the LAW facility documented safety analysis (DSA). In order to meet the time constraint, but still deliver an adequate safety basis, ORP and BNI modified their normal approach and instituted the LAW DSA "war room," a forum where personnel from both organizations collaborated to expedite development and approval. To this end, ORP personnel were embedded with BNI project teams, such that they were present during discussions and able to provide immediate feedback as BNI developed DSA language. To maintain independent review capability, ORP segregated development and review personnel, meaning that the embedded ORP reviewer for a given system or accident was not part of the approval chain for that section. The overall approval authority for ORP was not involved in the war room efforts.

Together, BNI and ORP developed a "rules of the road" document to govern interactions between groups and facilitate respectful, professional discussion of contentious topics. Activities in the war room were documented in meeting minutes, which captured discussions regarding the necessary levels of conservatism on topics such as quality level and safety classification. Any disagreements were documented and promptly escalated to the next level of management. Appropriate BNI and ORP managers met weekly to discuss these disagreements, jointly come to

a solution, and document any decisions in a white paper, which would in turn become part of the meeting minutes. In this way, ORP and BNI managers were able to come to a bipartisan solution that would be transparent to employees involved in the debate.

Based on a review and comparison of the two cases, the staff team determined that the changes in approach applied to the LAW DSA development circumstance indicate that BNI and ORP did apply the lessons learned. Additionally, the approach used for the LAW DSA development, when compared to the LAW D&O technical vulnerability resolution case, provides evidence for existence of a more open and healthy safety culture in both organizations in 2017 when compared to what existed in 2015.

Other War Room Initiatives—During onsite discussions, managers from both BNI and ORP praised the war room concept as an effective way to collaborate and resolve professional differences in a timely and respectful manner. BNI and ORP see the success of the war room used for LAW DSA development process as both an indicator of the success of previous safety culture efforts, as well as an initiative that itself contributes to improved safety culture. In this specific case, the staff team agrees that the war room represents the presence of a more productive, collegial environment that did not exist in previous years. Consequently, BNI and ORP plan to incorporate aspects of the war room concept to tackle other issues in the future, including a current effort related to quality assurance. Currently, they employ a similar war room to find solutions related to outstanding quality assurance issues. Members of the war room meet daily, and managers meet weekly, to discuss progress on these issues. Management from both organizations also mentioned that lessons learned from the war room effort will be applied universally to all work going forward, even though a formal war room will not be used for all future tasks.

The staff team attended a quality assurance war room meeting and observed constructive interaction between the staff. Collaborative discussions ensured that all parties understood the specific nature of ORP's quality assurance concerns. Once both sides had a similar understanding of the issue, BNI staff briefed ORP staff on proposed corrective actions to resolving ORP's concerns, and received direct ORP feedback on acceptance of their path forward before wasting time on an unacceptable solution. The staff team concludes that the collaborative method has substantial benefits as long as ORP retains adequate separation between individuals responsible for assisting in the development of the solutions and those responsible for safety oversight. Based on discussions during the onsite review, the staff team believes that ORP maintained this separation adequately. During future incarnations of the war room, ORP should continue to rigorously maintain this independent oversight capability.

Management Openness—During the review discussions, both BNI and ORP management were open with the staff team in discussing areas for improvement in addition to areas of progress. The staff team appreciated the candor of the discussions and both organizations' willingness to share less polished information. For example, ORP provided the staff team with meeting minutes and other informal discussion materials from several previous OSCAG meetings. The fact that ORP was comfortable providing the staff team with raw, internal materials used to diagnose and correct issues related to culture is a testament to the

improvements made to the Hanford culture. The staff team considers this openness an indicator of improved safety culture.

Remaining Challenges to Safety Culture—Although safety culture at both BNI and ORP has improved, some of the processes that are driving the improvements remain immature and are not yet sustainable without careful monitoring and application of timely management action to ensure that the processes consistently achieve expected results. Furthermore, as with any complex and enduring project, safety culture at the WTP project is vulnerable to dynamics of change resulting from evolving customer priorities, frequent staff turnovers associated with an evolving construction project, funding uncertainties, emergent technical challenges, and changes in senior management. The WTP project will also be uniquely challenged over the next three years due to expected changes in the workforce and site operations as the LAW facility transitions to operations. The staff team notes that the relatively new structures, processes, and procedures have not been fully challenged by a changing environment, providing another reason for close monitoring over the near term.

DOE-EM Headquarters priorities have been a significant driver in setting the work scope and schedule at Hanford. The acceleration of the LAW facility DSA development process is perhaps the best example of this, but the Board's staff team has noted similar headquarters' influence on other (non-WTP) projects at the site, such as the Test Bed Initiative and Tank Side Cesium Removal projects at the site's tank farms. While schedule and cost pressures are a reality and cannot be entirely avoided, it is incumbent upon headquarters leadership to balance that pressure appropriately, and give due deference to the obligation to perform work deliberately and safely in order to sustain these safety culture improvements.

Potential Safety Items. The staff team identified four potential safety items related to sustainment of an improved WTP safety culture.

Potential Safety Item #1, Inconsistent Corrective Action Management Program Performance—Institute for Nuclear Power Operations (INPO) 12-021, *Traits of a Healthy Safety Culture*, states that a key trait signifying healthy safety culture is when “[i]ssues potentially impacting safety are promptly identified, fully evaluated, and promptly addressed and corrected commensurate with their significance.” Organizations must take “effective corrective actions to address issues in a timely manner commensurate with their safety significance.”

INPO grouped these ideas under “Management Systems” within its report. Consequently, the report implies that if leadership has not implemented structures that identify issues and facilitated timely and effective issue resolution, it could send the unintended signal to workers that management does not care about fixing their issues. It is therefore imperative that leadership implement a robust issues management structure to ensure this facet of safety culture is strong.

Since the Board's Recommendation, BNI's corrective actions, most notably related to the CAMP system, significantly improved issues management. BNI configured CAMP to provide metrics that categorize timeliness and quality of issue closure, establish performance thresholds against which to judge the adequacy of those metrics, and generate reports for senior

management to facilitate discussions on lessons learned and improvement efforts.

However, while issue management at the WTP project has improved in recent years, the structure is still maturing and will need further development before it can deliver sustainable, effective performance. Specifically, BNI identified weaknesses in late 2017 after noting negative trends in four key CAMP metrics:

- Timely completion of condition reports (i.e., entries in the CAMP database),
- The average age of level B condition report corrective action plan (CAP) approvals,
- The average age of the condition report backlog, and
- The average age of the corrective actions for the condition report backlog.

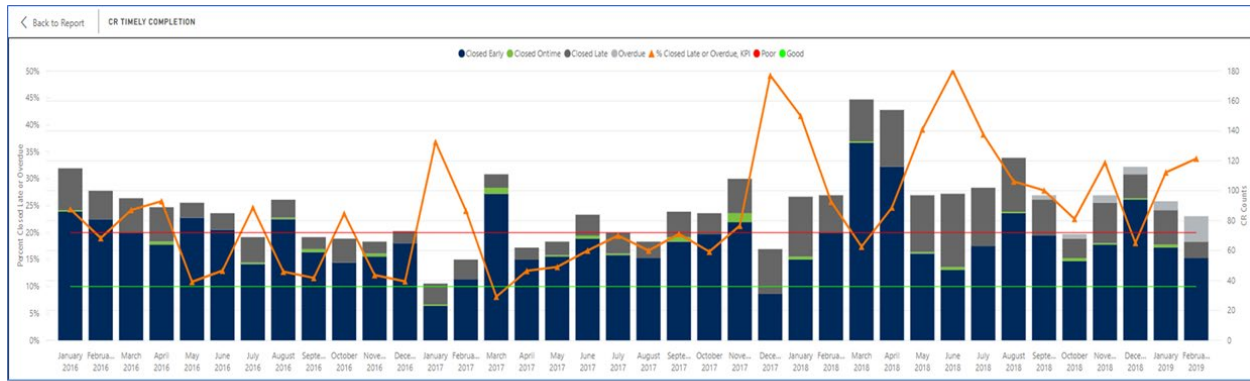
In late 2017, BNI further identified an increase in completion time for apparent cause evaluations, following a period of sustained improvement in this area. BNI attributed this regression to lack of alignment on the problem definition and significance level determination. BNI is still working to resolve these issues.

During the onsite review, BNI management was forthcoming with the staff team in discussing areas for improvement regarding issues management. BNI provided metrics reports through December 2017 that showed data for quality and timeliness of condition report closure (Figures 3 & 4). While the percentage of issues that meet the “closure quality” criteria is still above the level that BNI considers “good” (i.e., 90 percent), the staff team notes that there was a downward trend in that metric in late 2017. Similarly, the staff team notes that the percentage of issues closed in a timely manner consistently underperformed BNI’s benchmark of “good” (i.e., 90 percent) during the second half of 2017, and was in fact closer to BNI’s benchmark of “poor” (i.e., 80 percent).



Metric Description: The orange line depicts the average age of open CRs in the backlog.
Performance thresholds: Good is 360 days and below, Caution is 361-450 days, Poor is 451 days and older.
Performance since June 2018: The average age has continued to drop, continuing the improving trend started in January 2018 that resulted from a focus on aging CRs related to direct-feed LAW.

Figure 3. CR Backlog Average Age



Metric Description: The orange line depicts the percentage of CRs closed late or overdue (per the assigned due date) each month.
Performance thresholds: Good is 10% and less, Caution is 11%-20%, Poor is 21% and above.
Performance since June 2018: Performance has varied but stayed (mostly) in the Poor range. Project Management has developed a detailed secondary metric and scheduled recurring meeting to discuss expectations with those responsible for CRs that remain overdue at the end of each month. Emphasis has been on completing actions to close CRs (as seen in the CR Backlog Average Age metric) rather than extending dates when CRs are nearing completion.

Figure 4. CR Timely Completion

The staff team understands from discussions with BNI that extenuating circumstances contributed to these dips in performance. The staff team therefore appreciates BNI’s candor and willingness to discuss these issues and take responsibility for them. Nevertheless, BNI must carefully evaluate these indicators in order to assess the overall health of the issues management program, and how the program relates to safety culture at the site.

The staff team also observed other trends that could indicate weaknesses in the issues management structure as a whole. For example, the condition report generation rate across the WTP project is often used as a basic (if incomplete) indicator of program health. In general, higher condition report rates indicate willingness of workforce elements to report potential problems or issues, and therefore may correspond to good safety culture. INPO 12-021 states that corrective action programs should have a “low threshold for identifying issues,” which would correspond to a higher condition report generation rate, to encourage workers to report issues. It is important to note safety culture is not the only factor that determines condition report generation rate; however, it is part of a suite of factors that should be understood. The condition report generation rate has decreased every year since 2015, with no corresponding reduction in project activity that would explain this trend. Because the cause of the drift is unclear, the staff team suggests that BNI analyze and understand the implications of this trend.

Further, the preponderance of condition reports pertain to design and engineering topics, and seldom cover issues discovered in the field. BNI personnel responded that other processes, such as non-conformance reports, may be used to flag issues in the field, and further explained that in their view, workers should use condition reports to catalogue patterns of behavior (i.e., several similar occasions may be rolled into a single condition report) rather than isolated events. The staff team noted, however, that without a catalogue of seemingly isolated incidents, it is much more difficult to identify trends and patterns of adverse behavior. This will become especially important in the coming years, as the WTP project transitions from engineering and procurement to operations.

Additionally, the staff team notes that CAMP only contains issues designated as “conditions adverse to quality,” a term with very specific definitions that may not apply to certain important issues. While the staff team does not take issue with this delineation in principle, the staff team notes that that BNI does not employ a similar tracking system for issues that are not designated as such. Consequently, some issues may not be formally tracked with the same level of rigor if they are not determined to be conditions adverse to quality. BNI must take steps to ensure that such issues do not fall through the cracks.

The staff team also notes that the condition report self-identification rate, which was in the “good” range (>80 percent) and on an improving trend for all of 2017 started a declining trend in early 2018 and, although currently in the caution range, is on a track to enter the “poor” range. Similarly, anonymous condition reports are increasing, with more anonymous condition reports generated in the last year (seven) than in the previous two years combined (four).

The Hanford site (including federal and prime contractor organizations) is in the process of implementing a new contractor assurance system (CAS), the Hanford iCAS. This system is intended to allow for broader ability to track and analyze issues by improving real-time integration between data flows used for contractor assurance. One benefit for the integration is that these capabilities would assist OSCIC and OSCAG in monitoring and assessing safety culture. However, based on discussions between the Board’s staff and members of ORP management, it is unlikely that BNI will ever transition to the iCAS system. Consequently, unless or until BNI is included in iCAS, BNI and ORP must ensure that CAMP issues remain fully visible and that BNI applies appropriate attention to resolving, tracking, and trending the issues that are retained in the separate CAMP system.

Potential Safety Item #2, BNI Management Engagement—BNI has self-identified concerns related to management engagement through its various safety culture monitoring strategies, and spoke openly with the staff team during the team’s review, saying that it was working on solutions to make improvements in this area. The staff team notes that BNI’s current safety culture monitoring framework, the NSQC program, identified this downward trend of management engagement and promptly placed this concern in its annual safety culture sustainment plan. While BNI’s recognition and improvement actions are positive signs, the staff team believes that this downward trend still illustrates that some of BNI’s previous efforts to enhance management engagement were not fully institutionalized in order to sustain their performance. The staff team is encouraged by BNI’s corrective action plans to address these concerns; however, the concern remains a potential safety item until BNI completes its corrective actions and determines their effectiveness.

Potential Safety Item #3, Survey Improvement—As discussed previously, results from multiple BNI and ORP surveys indicated that safety culture has improved since the issuance of the Board’s Recommendation. While the current surveys are useful tools for gauging the safety climate, the staff team notes that BNI and ORP could improve their safety culture surveys to better monitor the health of their safety culture as follows:

- BNI management noted that the response rate for these surveys has historically averaged at about 65 percent. While BNI considers this to be good participation, the

staff review team noted that significant information could be lost by not receiving input from the remaining 35 percent. BNI acknowledged this shortcoming, but stated that it reinforces the importance of participation during interactions with the workforce (i.e., BNI cannot optimize safety culture initiatives without feedback).

- BNI management explained that initially, development of the survey was subcontracted to Oak Ridge Associated Universities (ORAU) before that service became too expensive and BNI took over development. In subsequent years, BNI modified the questions developed by ORAU and reissued slightly different surveys. As a result of this process, the questions on the NSQC surveys have varied from year to year, which has made tracking and trending more difficult. In the future, providing consistent questions from year to year would assist BNI in assessing effectiveness of initiatives and adjusting accordingly.
- The review team noted that because responding to the FEVS is not mandatory, some ORP employees have not had their opinions catalogued. Without full participation, it is more difficult to understand the workforce's impressions of safety culture initiatives. ORP management agreed with this concern, and noted that further engagement with the workforce was still necessary.
- ORP management also noted that there was a slight dip in the percentage of positive responses between 2016 and 2017. For example, positive response rate for the question "I can disclose a suspected violation of any law, rule, or regulation without fear of reprisal" went down 5.3 percentage points. During discussions with the review team on this topic, ORP management specifically called out this data point, and noted that it would closely track this concern going forward.

Potential Safety Item #4, Use of External Assessments—Both BNI and ORP should consider more frequent external safety culture assessments to ensure sustainability of a healthy safety culture. External review teams can offer a more objective safety culture assessment because they are composed of safety culture experts. While training can improve BNI and ORP staff competencies for assessing safety culture, the objectivity and expertise of outside experts can help identify concerns. Management and workers within ORP and BNI can become too close to their culture, which does not allow them to be the best judges of weaknesses in their organizations. Therefore, while self-assessment efforts may have limited usefulness in this area, ORP and BNI should not rely on them as the primary determination of the strength of the cultures. The staff team notes that BNI has planned an external assessment led by Energy Northwest personnel later in the spring, and encourages BNI to continue making use of such assessments.

Conclusion. The staff team analyzed the effectiveness of actions BNI and ORP took in response to the underlying causes associated with the concerns outlined in Board Recommendation 2011-1. The staff team verified that BNI and ORP have implemented corrective actions and evaluated the effectiveness of these actions at strengthening the BNI and ORP safety cultures. The staff team concludes that adequate progress has been made towards resolution of behaviors that were the basis for the Board's recommendation, such that the Board can close the recommendation. The team notes, however, that the WTP project is undergoing changes that will require consistent leadership focus and timely actions to sustain a healthy

organizational and safety culture. To this end, the staff team did identify four potential safety items related to the long term sustainability of BNI and ORP's improved safety culture. Consequently, it is incumbent upon ORP, BNI, and DOE Headquarters to collaborate on creative solutions, encourage organizational leaders to develop and own improvement initiatives, and strive for a healthy safety culture at the WTP project.

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Appendix A
Timeline for ORP Improvement Initiatives (Provided by ORP)

2011	2012	2013	2014
<ul style="list-style-type: none"> • DNFSB Recommendation 2011-1 issued 	<ul style="list-style-type: none"> • Directed BNI to revise NSQC plan • Revised WTP Project Execution plan • Established OSCIC • Conducted DOE and BNI management training • Added safety culture elements to senior leader performance plans • Strengthened ECP • Conducted Hanford “Speak-up” survey 	<ul style="list-style-type: none"> • Implemented ABC-TV Expectations • Strengthened DOE Issues Management Program • Conducted SCWE Self-Assessment • Completed Effectiveness Review of completed BNI and DOE actions • Conducted safety culture training for entire workforce • Created “Grand Challenge Competition” program to solicit new ideas 	<ul style="list-style-type: none"> • Developed Safety Culture sustainment plans • Standardized criteria for “Finding” priority levels in oversight • Modified BNI PEMP to place 50 percent of the fee on self-discovery and self-reporting to enhance culture • Conducted follow-up HSS assessments • Conducted workshops on ABC-TV • Established new policies to prevent “bashing” and “surprises” between DOE and the contractor
2015	2016	2017	2018
<ul style="list-style-type: none"> • Consolidated ORP into one building • Evaluated Key Performance Goals quarterly • Increased ORP staffing to balance workload • Modified BNI PEMP to strengthen focus on organizational culture • Added safety culture elements to senior leader performance plans • Reinvigorated and chartered “One System” as mission integrator • Supported DOE-wide Safety Culture Improvement Panel 	<ul style="list-style-type: none"> • Established OSCAG • Developed a safety culture monitoring procedure modeled after NEI 09-07 • Added additional leadership development requirements • Completed additional safety culture self-assessments • Embedded safety culture into contract language and incentives • “One System” mission integrator named a best practice 	<ul style="list-style-type: none"> • Developed Safety Culture Communication Plan • Developed metrics to support senior management monitoring • Continued collaboration with DOE SCIP to identify and implement best practices • Identified four safety culture themes to improve through monitoring programs 	<ul style="list-style-type: none"> • New ORP Manager focused on safety culture improvements • Continued safety culture and ISMS training for leadership and workforce • Developed mutually agreed on interface behaviors with regulator • Conducted contractor collaboration meetings with safety culture subject matter experts • Conducted safety culture assessment

Acronyms Used in Appendix A

ABC-TV	accountability, behavior, communications, trust, and vision
BNI	Bechtel National Inc.
DOE	Department of Energy
ECP	employee concerns program
HSS	health, safety and security
ISMS	integrated safety management system
NEI	Nuclear Energy Institute
NSQC	nuclear safety and quality culture
ORP	Office of River Protection
OSCAG	Organizational Safety Culture Advisory Group
OSCIC	Organizational and Safety Culture Improvement Council
PEMP	project execution management plan
SCIP	safety culture improvement panel
SCWE	safety conscious work environment
WTP	Waste Treatment and Immobilization Plant

Appendix B
Timeline for BNI Improvement Initiatives (Provided by BNI)

2011	2012	2013
<ul style="list-style-type: none"> ● DNFSB Recommendation 2011-1 issued ● Manual/Non Manual Survey ● Independent Safety and Quality Culture Assessment Team Review Results (11/2011) 	<ul style="list-style-type: none"> ● Independent Oversight Assessment of NSQC (1/2012) ● Developed Comprehensive Corrective Action Plan [CCAP] (24590-WTP-PL-MGT-12-0005] for strengthening the NSQC at WTP. Evaluated DNFSB 2011-1 and other independent assessments. Six strategic improvement areas were identified, management sponsors established, and action plans developed (5/2012): <ul style="list-style-type: none"> ○ SIA A: Realignment and Maintenance of the Design Safety Basis ○ SIA B: Management Process of the WTP NSQC ○ SIA C: Issues Identification and Resolution ○ SIA D: Roles, Responsibilities, Accountabilities and Authorities (R2A2) ○ SIA E: Management and Supervisory Behaviors ○ SIA F: WTP Construction Site Specific Issues ● Delivered SCWE Training to BNI and subcontractors (12/2012) <ul style="list-style-type: none"> ○ Instituted training over 2300 WTP personnel, including non-manual, craft, and sub-contractors. ○ Later evaluated by ORP under surveillance S-13-WTP-RPP-WTP-003-07 to be complete with no findings, OFIs or AFIs. ○ Training model recognized as a strength by the June 2014 Independent Oversight Follow-up Assessment of Safety Culture at the WTP ● Targeted senior managers to attend TLP-200, Safety Culture for DOE and DOE Contractor Leaders (2012-2018 and ongoing) <ul style="list-style-type: none"> ○ Evaluated by ORP under surveillance S-13-WTP-RPP-WTP-003-07, concluded action was complete 	<ul style="list-style-type: none"> ● Conducted SCWE Self-Assessment (1/2013) [24590-WTP-SAA-MGT-12-0003] <ul style="list-style-type: none"> ○ Concluded that improvements in SCWE are evident because of considerable effort to address a range of cultural organizational and programmatic issues ○ Continued growth is dependent on the Project's ability to execute CCAP and other initiatives ● Developed Leadership Academy (1/2013) [24590-WTP-SAR-MGT-14-0001] <ul style="list-style-type: none"> ○ Forthright Conversations ○ Employee Engagement ○ Supervisory Development ● Implemented self-critical assessments to support learning ● Restructured culture to recognize WTP is a nuclear job <ul style="list-style-type: none"> ○ Increased transparency with customer and internal project folks <ul style="list-style-type: none"> ▪ Employee All Hands Meetings ▪ Customer meetings at all levels ▪ Customer incorporated the concept of transparency into award fee ▪ No Bashing ○ Reinforced and rewarded Questioning Attitude ○ Emphasis to use the CAMP system to track and close issues ○ Project Director held 7 All Hands meetings with Managers to roll out upcoming Procedure Use and Adherence policy and discuss expectations ○ Established the Organizational Effectiveness Department to better reflect journey to becoming a learning organization (8/2013)

2011	2012	2013
	with no findings OFIs, or AFIs	<ul style="list-style-type: none"> ● Instituted Spotlight of Excellence (9/2013) <ul style="list-style-type: none"> ○ Catching people doing something good ○ Positive reinforcement

2014	2015	2016
<ul style="list-style-type: none"> ● Conducted PIER Appreciation Day (1/2014) [Peggy's Post 1/16/14] ● Published Policy on Procedure Use and Adherence [24590- WTP-G63 -RAPR-PR-0001] to promote quality ● Leveraged the Bechtel-wide Leadership Academy training [tracked by Qual 623 and Leadership Academy Metric] <ul style="list-style-type: none"> ○ Leadership modeling right behaviors ○ Began holding leaders accountable for demonstrating the right behaviors ● Held all employee meetings reinforcing Quality as a core value <ul style="list-style-type: none"> ○ MIP video roll-out (4/2014) ● 94 percent of WTP Supervisors with three or more director reports are receiving feedback from their direct reports through Upward Feedback Process (As of 3/2014) ● Independent Oversight Follow Up Assessment of NSQC ● Plan and Initiation of Assessments for CCAP Effectiveness [24590-WTP-PL-MGT-14-0019] (6/2014) ● PBQ Program institutionalized [WTP-PL-MGT-13-0025] ● Managed Improvement Plan (MIP) [24590-WTP-PL-MGT-14- 0006] issued to drive concentrated efforts to embed quality as a core value (8/2014) ● Developed NSQC Sustainment Plan [24590-WTP-PL-MGT-14- 0037] (8/2014) ● Project Health Meetings began (11/2014) ● Information Flow Down and developmental topics shared to demonstrate desired Leadership behaviors 	<ul style="list-style-type: none"> ● Independent Oversight Follow Up Assessment of NSQC (6/2015) ● Favorable conclusions regarding improvement in safety culture at WTP ● Began Effectiveness Reviews of CCAP Strategic Improvement Areas (<i>throughout 2015-see final Effectiveness Review of CCAP in 2016 for overall conclusions</i>) ● Began annual SCWE workshops (June 2015) [SCWE Workshop attendance rosters are submitted to Training and tracked by the ECP manager] <ul style="list-style-type: none"> ○ Patterned after highly effective Bechtel ethics awareness workshop ○ Later in 2017 and 2018, began to include craft personnel in the workshops and had them help with development of the workshop materials. ● Generated and approved MIP Initiative Health Checks (10/2015) [MIP-77, NSQC Monitoring Plan health check completed showing good performance] ● Created Project Health Dashboard (<i>In 2018, transitioned Project metrics to Power BJ</i>) ● Institutionalized Requirements management document hierarchy and training ● Issued Principles for a Strong NSQC booklet to promote Safety Culture focus areas and attributes throughout the organization <ul style="list-style-type: none"> ○ Booklet incorporated into onboarding training and provided to Project personnel also available electronically on NSQC website ● Received 2015 Scorecard Award fee for AFO 3: Environmental/Safety/Health and SCWE awarded at 97% 	<ul style="list-style-type: none"> ● Completed Final Effectiveness Review of CAP [24590- WTP-SAR-OE-16-0001] (1/2016) <ul style="list-style-type: none"> ○ Evaluated the effectiveness of individual strategic improvement areas and the overall CCAP ● The effects of the suite of NSQC CCAP actions clearly demonstrate that significant progress on each SIA was made and that together they progressed the Project's NSQC ● The actions and the subsequent documentation provide a solid basis for cultural sustainment and continuous improvement. ● Reviewed MIP Closure Packages (9/2016 for MIP-77, Nuclear Safety and Quality Culture Monitoring Plan). ● Verification that MIP actions are complete, institutionalized, and effective ● Streamlined NSQC governing documents, enhanced NSQC Monitoring Panel (10/2016) [CR 2015-02106 Action 3] ● Governing documents institutionalize implementing contractual requirements (H.54) for NSQC ● Conducted DOE-VPP On-site Triennial Recertification Assessment (10/2016) ● WTP met four of the five DOE-VPP tenets ● Employee Involvement had dropped substantially since the 2013 assessment ● 2017 VPP Improvement Plan established [WTCC- PL-17-00001] ● Conducted NSQC self-assessment (10/2016) [24590-WTP- SAR-OE-16-0013]

2014	2015	2016
<ul style="list-style-type: none"> ● Published R2A2s for Level 1 and 2 managers as well as managers, supervisors and individual employees [24590-WTP-GPG-RAMS-MS-0001] (11/2014) ● Meeting Effectiveness (built into Meeting Agenda) ● Evaluating and providing feedback on desired behaviors, helps hold us accountable ● Reinvigorated the CAMP [MIP-01] ● Reinforced line accountability with response to CAs ● Assigned budget to CAMP activities and Provide CAMP training. ● Established a robust governance structure for PIRB/IPIRBs to review CAMP products ● Implemented positive recognition for CAMP ● Strengthened Change Management process [MIP-74] ● Explaining the basis for changes in order to ensure buy-in and alignment. 		<ul style="list-style-type: none"> ● Concluded objective evidence exists that the actions in the NSQC Sustainment Plan are sustainable. Six OFIs captured in CAMP. ● Updated NSQC Sustainment Plan based on results of self-assessment (10/2016) [24590-WTP-SAR-OE-16-0013] ● Focused on accountability, management engagement and time in the field based on NSQC MP results ● Updated Procedure Use and Adherence Policy to reflect results of DOE Audit { 12/2016) [24590-WTP-G63-RAPR-PR-0001] ● Policy clearly defines all types of written instructions that require compliance ● ORP Effectiveness Review of BNI's NSQC Program (12/2016) [16-WTP-0159, CCN 294555] ● Received 2016 Award Fee Determination: "...high marks for continued focus on a healthy NSQC."

2017	2018
<ul style="list-style-type: none"> ● Developed WTCC VPP Improvement Plan Actions (1/2017 to 2/2018) [WTCC-PL-17-00001] ● Updated Principles for a Strong NSQC booklet (3/2017) ● Conducted WTCC Baseline Perception Survey [CCN 285965] (4/2017) <ul style="list-style-type: none"> ○ Additional actions taken and incorporated into the 2017 VPP Improvement Plan [WTCC-PL-17-00001] ● CAMP Appreciation Day (4/2017) ● Evaluated recommendations to improve management engagement and time in field (5/2017) [CCN 299360, 1st Quarter 2017 NSQC MP Minutes] ● Conducted EFCOG Safety Culture Benchmarking (5/2017) [24590-WTP-BMRK-OE-17-00001] <ul style="list-style-type: none"> ○ WTP Project is in alignment with the safety culture monitoring practices in industry – ○ 3 OFIs entered into CAMP. ○ Information assisted in Project-wide survey development ● Pantex/Y-12 benchmarked WTP's NSQC Monitoring Practices (6/2017) <ul style="list-style-type: none"> ○ <i>"We hope we 'are as successful as you were in building a collaborative team that is able to surface and talk about the tough topic of safety culture to improve your operations." Rick Hartley</i> ● Implemented Project-wide Survey/Self-Assessment (9/2017) [CCN 300135] <ul style="list-style-type: none"> ○ Overall score was 4.21 on a 5-point scale for all questions ○ Leadership = 4.14, Employee/Worker Engagement = 4.37, Organizational Learning = 4.21 ○ OFI's captured in CAMP and actions are being taken to address OFIs ● Retired MIP, improvements determined to be institutionalized and part of our daily work through reinforced processes and a strengthened NSQC (10/2017) [10/3/17 Peggy's Post] ● Conducted self-assessment of NSQC Sustainment (12/2017) Plan [24590-WTP-SAR-OE-17-0010] <ul style="list-style-type: none"> ○ Assessment determined that objective evidence exists, overall intent of majority of actions is met Six issues and 2 OFIs 	<ul style="list-style-type: none"> ● Launched PD@Bechtel (1/2018) ● DOE-VPP On-site Review (2/2018) <ul style="list-style-type: none"> ○ WTCC has implemented several changes and attempted to stimulate Employee Involvement through several approaches <ul style="list-style-type: none"> ▪ Increased manager presence ▪ Increased opportunity for participation in safety committees ▪ Managers emphasizing respect between workers and supervisors ○ WTCC needs additional time to stabilize its management structure, institutionalize its management expectations and regain the trust and respect of the workforce ● Issue WTCC Safety Culture Improvement Plan ● New senior leadership actions ● Promote open communication and transparency with the workforce ● Quarterly all hands meetings begin (increased frequency), surveys requesting employee feedback about leadership's transparency and authenticity added ● Monitor and reinforce CAMP backlog reduction ● Upcoming NSQC Program Manager Improvement Actions <ul style="list-style-type: none"> ○ Update NSQC Sustainment Plan based on NSQC Self- Assessment [24590-WTP-SAR-O E-17-0010] ○ Complete remaining open actions from 2017 NSQC Employee Survey [tracked through CR 2017-01527] ○ Complete open NSQC MP Action Items (e.g., improve NSQC metrics, obtain management engagement data and evaluate management engagement next steps, etc.) ○ Plan next Project-wide Safety Culture Survey incorporating lessons learned from the 2017 NSQC Employee Survey implementation ● Provide feedback to the workforce regarding actions taken prior to implementing survey <ul style="list-style-type: none"> ○ Ongoing NSQC monitoring in accordance with <i>institutionalized</i> governing documents ○ Continued participation in EFCOG and SCIP meetings to stay

2017	2018
<p>documented in CAMP</p> <ul style="list-style-type: none"> ● Conducted VPP self-assessment (finalized 1/2018) [24590-WTP-SAR-CON-7-0010] ● Areas identified by the VPP Headquarters team in 2016 were addressed by the 2017 WTCC VPP Improvement Plan, 9 issues entered in CAMP ● Received 2017 Award Fee Determination: "...we were recognized for high marks forcontinuous improvement of our NSQC programs." [PD Update, 4/1/18] 	<ul style="list-style-type: none"> ○ apprised of safety culture initiatives and best practices throughout the industry ○ Continued safety culture benchmarking ○ Integration with WTCC Safety Culture personnel ● Other planned improvement initiatives <ul style="list-style-type: none"> ○ Continued focus on strengthening employee and management engagement ○ Effective implementation of Escalation Ladder ○ Document critical thinking issue resolution ○ Stabilize management structure and processes ○ Improve effectiveness of issue management

Acronyms Used in Appendix B

AFI	actions for improvement
AFO	award fee offering
BNI	Bechtel National Inc.
CAMP	corrective action management program
CAP	corrective action plan
CCAP	comprehensive corrective action plan
DOE	Department of Energy
DNFSB	Defense Nuclear Facilities Safety Board
ECP	employee concerns program
EFCOG	Energy Facility Contractors Group
IPIRB	integrated project team performance improvement review board
MIP	managed improvement plan
NSQC	nuclear safety and quality culture
OFI	opportunity for improvement
ORP	Office of River Protection
PBQ	people-based quality
PIER	project issue evaluation report
PIRB	performance improvement review board
SCIP	safety culture improvement panel
SCWE	safety conscious working environment
SIA	strategic improvement area
VPP	volunteer protection program
WTCC	waste treatment Completion Company
WTP	Waste Treatment and Immobilization Plant