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BEFORE THE UNITED STATES SENATE
HOMELAND SECURITY AND GOVERNMENTAL AFFAIRS COMMITTEE

SUBCOMMITTEE ON FINANCIAL AND CONTRACTING OVERSIGHT

"Whistleblower Retaliation at the Hanford Nuclear Site"

March 11, 2014

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Introduction and Summary

I am the Executive Director of Hanford Challenge- a regional public interest organization based in Seattle, Washington. Hanford Challenge's mission is to foster transparency and accountability at Hanford, and to help assure an effective and safe cleanup that protects current and future generations. We do this through listening to, empowering and advocating on behalf of employees who disclose safety, health and environmental violations. Hanford Challenge also has an active role on the Hanford Advisory Board, which provides advice to the Department of Energy (DOE), the State of Washington and the Environmental Protection Agency (EPA). Hanford Challenge helped found and sits on the Board of the Hanford Concerns Council, which is comprised of Hanford contractor representatives, independent members and employee advocates, to resolve environmental, health and safety concerns raised by employees as well as any inappropriate management responses to those concerns.

I am a lawyer, and have represented scores of nuclear whistleblowers throughout the DOE complex, including at sites such as Fernald in Ohio, Los Alamos, Lawrence Livermore, Pantex, Rocky Flats, the Knolls Atomic Power Lab, and the Hanford nuclear site, in Washington State. My history of assisting, counseling and representing nuclear whistleblowers goes back to 1985, when I joined the Government Accountability Project (GAP) in Washington, D.C. and became the Director of the Nuclear Oversight Campaign. In 1992, due to the high volume and intensity of whistleblower retaliation claims at Hanford, I opened an office for GAP in Seattle, Washington. In 2007, I established Hanford Challenge to focus solely on Hanford.

It is fitting that this hearing occurs on the third anniversary of the Fukushima triple-meltdown and fuel pool catastrophe. The Fukushima disaster continues to rage out of control three years later, dumping 300,000 gallons of contaminated water *every day* into the ocean. The world has learned that the Fukushima catastrophe was preventable. Experts tell us that was the tsunami that caused the disaster. The plants survived the earthquakes. The disaster was preventable because

Fukushima engineers were on record advising TEPCO to build higher tsunami walls and to put the all-important emergency generators on higher ground, out of the flood plain. These steps, if they had been taken, would likely have averted the worst of the effects of the tsunami. However, TEPCO ignored their own engineers, and chose not to spend a few million extra dollars to implement this advice.

We have a chance, now, to assure that we don't allow our own government to make the same mistakes at Hanford. But only if we listen and take action.

The pattern of reprisal at Hanford is historical, well-documented, and has gotten progressively worse. It is not just about individual employees who get wrongfully terminated. It is about a broken nuclear safety culture that, if unaddressed, risks silencing employees who might otherwise reveal a nuclear safety defect that could lead to loss of life, contamination of the environment, or lead to a nuclear catastrophe.

The people before you today, Dr. Tamosaitis and Donna Busche, are heroes who consciously chose to maintain their integrity and insist on following nuclear safety requirements. Both of them are acknowledged national experts. Donna Busche is listed as a "key personnel" on the Waste Treatment and Immobilization Plant (WTP) project, one of only a few people whom the Department of Energy (DOE) reserves the right to approve the contractor's hiring or termination. Ironically, a check of the current contract on the Hanford website still lists Ms. Busche as key personnel, almost a month after her termination. Both Ms. Busche and Dr. Tamosaitis have long and unblemished careers spanning 44 years for Dr. Tamosaitis and 26 years for Ms. Busche, and were specifically recruited for the jobs they held. Today you may hear slanderous and outrageous accusations against both of them. Don't buy into these stories. Ms. Busche and Dr. Tamosaitis were considered experts by their employers and were highly-compensated, essential employees *until* they took their concerns to contractor management officials and to the Defense Nuclear Facilities Safety Board (DNFSB). That is when the contractors began their campaigns of isolation, removal, harassment and eventually, termination. This is a textbook campaign companies wage against truth-tellers, and it should not be countenanced at a federally-funded nuclear facility – the most contaminated of its kind in the United States.

Ms. Busche and Dr. Tamosaitis are not the only ones. There are many other engineers, scientists and craft employees who have been fired, harassed and silenced at Hanford and specifically at the WTP. Some remain silent in an effort to protect what is left of their careers. But DOE and the contractors know who these individuals are, and they know that the strategy of high-profile reprisals against the likes of Donna and Walt is working; it is silencing critical voices.

DOE's failure to listen to, to address the problems raised by, and to protect the highest echelon of nuclear safety experts at the WTP has put this multi-billion dollar much needed project at risk. As a result, no foreseeable treatment options exist for the high level radioactive waste that continues to leaks from Hanford nuclear waste storage tanks. Worse, there are disturbing questions about the viability of the project to meet required safety and quality regulations. This is not only bad business, as documented by the GAO and others, but threatens the welfare of the community and generations to come.

Summary of Recommendations

- **Congress must take action to subject DOE to independent regulation on two fronts.** First, Congress needs to legislate the establishment of an independent expert body with the resources and authority to assure compliance with nuclear safety laws and regulations. This could be performed by DNFSB, but only if that agency's charter is modified to give them authority, and enough funding to assure that they have the capacity to carry this mission. DOE has been and continues to be unwilling or unable to create a robust and healthy safety culture. The Department cannot or will not protect employees who raise concerns. It cannot even assure that ironclad nuclear safety regulations are followed. DOE is conflicted. DOE owns, operates, and regulates its facilities. It regulates itself. It has schedules to meet along with additional pressures from Congress, the State of Washington and other stakeholders to hurry up. It seems the more DOE hurries, the more unacceptable shortcuts are tolerated, and the slower it goes. Whistleblowers are not welcome in this system. Thirty years of documented history substantiates this.

  Second, employees need a reliable and independent avenue to report concerns and have those concerns addressed, and to have immediate reaction and protection from discrimination and reprisal. Again, this function could be performed by DNFSB. This is how the Nuclear Regulatory Commission (NRC) regulates commercial nuclear facilities. Contractors who discriminate against employees should be dealt with firmly – the stakes are too great to allow latitude when it comes to nuclear safety. Further, the independent body should, much like the NRC, require the establishment and maintenance of a robust and healthy nuclear safety culture. If a nuclear project fails to do so, the agency must be given the regulatory tools necessary to reform behaviors.

- **Stop the practice of reimbursing the attorney fees in whistleblower cases** to multi-billion dollar corporations. The use of taxpayer dollars to fight whistleblowers – typically people with no resources – is unconscionable. This seems so obvious, but DOE nonetheless continues to include this practice in its contracts, despite decades of criticism. If Congress doesn't legislate on this issue, they won't change.

- **Give whistleblowers who prevail in court meaningful remedies** and allow punitive damages against corporations who make self-interested decisions to fire a whistleblower and pay a pittance in penalties down the road instead of addressing safety issues. Only significant punitive damages will speak the language of corporations and persuade them not to harass or discharge their own ethical employees.

- **Keep up the pressure.** Reconvene another hearing in six months, and six months after that, to continue your oversight on this vital issue. Oversight and legislation is necessary to bring about the reforms so drastically needed.

Overview of Hanford and the Waste Treatment Plant

This statement comes on the heels of the recent terminations of two high-profile senior managers and experts who were assigned to the Waste Treatment Plant (WTP). The WTP is being built to treat the 56 million gallons of high-level nuclear waste contained in Hanford's famous leaky tanks. The mission of the WTP is urgent and dire, and central to the cleanup of Hanford. Dr. Walter Tamosaitis was the Manager of Research and Technology at the WTP until July 2010 when he was removed from his position there after raising significant nuclear safety and design issues with his management. These concerns included unacceptable and unresolved risks of hydrogen gas buildup and explosion, which, in the right circumstances, would result in a nuclear catastrophe of the kind we most urgently need to avoid. Dr. Tamosaitis raised some 50 very serious unresolved technical concerns at a time when Bechtel, the contractor at the plant, was anxious to close all the technical issues associated with the WTP and "pivot" to finishing construction and commissioning. Bechtel removed Dr. Tamosaitis, and the company in fact claimed that all the significant technical issues had been resolved, and subsequently received millions of dollars in fee for doing so.

Findings of the Defense Nuclear Facilities Safety Board (DNFSB)

The response to Dr. Tamosaitis' removal was swift. The DNFSB held a hearing a few months after Dr. Tamosaitis' removal, and eventually issued recommendation 2011-1 to the Secretary of Energy. In this June 11, 2011 Recommendation, DNFSB Chairman, Peter Winokur wrote:

> "The Defense Nuclear Facilities Safety Board (Board) has determined that the prevailing safety culture at the Waste Treatment and Immobilization Plant (WTP) is flawed and effectively defeats this Secretarial mandate. The Board's investigative record demonstrates that both *DOE and contractor project management behaviors reinforce a subculture at WTP that deters the timely reporting, acknowledgement, and ultimate resolution of technical safety concerns.*" p.1
>
> "The Board's investigation found significant failures by both DOE and contractor management to implement their roles as advocates for a strong safety culture." p.2
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> "The successful completion of WTP's mission to remove and stabilize high-level waste from the tank farms is essential to protect the health and safety of the public and workers at Hanford. However, *the flawed safety culture currently embedded in the project has a substantial probability of jeopardizing that mission*." p.2
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> "In a WTP project managers' meeting on July 1, 2010, Dr. Tamosaitis raised safety concerns related to the adequacy of vessel mixing, technical justifications for closing mixing issues, and other open technical issues. The next day he was abruptly removed from

the project. This sent a strong message to other WTP project employees that *individuals who question current practices or provide alternative points of view are not considered team players and will be dealt with harshly*." p.3

"The Board finds that expressions of technical dissent affecting safety at WTP, especially those affecting schedule or budget, were discouraged, if not opposed or rejected without review. Project management subtly, consistently, and effectively communicated to employees that differing professional opinions counter to decisions reached by management were not welcome and would not be dealt with on their merits." p.3

"As of the writing of this finding, Dr. Tamosaitis sits in a basement cubicle in Richland with no meaningful work. His isolated physical placement by contractor management and the lack of meaningful work is seen by many as a constant reminder of what management will do to an employee who raises issues that might impact budget or schedule." p.3

"A high ranking safety expert on the project testified that the expert felt next in line for removal after Dr. Tamosaitis because of the expert's refusal to yield to technically unsound positions on matters affecting safety advanced by DOE and contractor managers responsible for design and construction at the WTP." p.3

"The investigative record shows that the DOE Office of River Protection Employee Concerns program is not effective. One safety expert explicitly testified that employees would not and did not use the program, and believed that individuals running the program would "bury issues" brought to them." p.4

"The Board's investigation concludes that the WTP project is not maintaining a safety conscious work environment where personnel feel free to raise safety concerns without fear of retaliation, intimidation, harassment, or discrimination." p.4

"Previous independent reviews, contractor surveys, investigations, and other efforts by DOE and contractors demonstrate repeated, continuing identification of the same safety culture deficiencies without effective resolution." p.4

"The testimony of several witnesses confirms that the expert witness was verbally admonished by the highest level of DOE line management at DOE's debriefing meeting following this session of the hearing. Although testimony varies on the exact details of the verbal interchange, it is clear that strong hostility was expressed toward the expert witness whose testimony strayed from DOE management's policy while that individual was attempting to adhere to accepted professional standards. Testimony by a senior DOE official confirmed the validity of the expert witness' concerns. In addition, the expert witness testified that they felt pressure to change their testimony, but refused to do so." Pp.5-6 [Note: the expert witness referred to above was Donna Busche.]

"Taken as a whole, the investigative record convinces the Board that the safety culture at WTP is in need of prompt, major improvement and that corrective actions will only be successful and enduring if championed by the Secretary of Energy. The Board recommends that the Secretary of Energy:

1. assert federal control at the highest level and direct, track, and validate the specific corrective actions to be taken to establish a strong safety culture within the WTP project consistent with DOE Policy 420.1 in both the contractor and federal workforces,

2. conduct an Extent of Condition Review to determine whether these safety culture weaknesses are limited to the WTP Project, and conduct a non-adversarial review of Dr. Tamosaitis' removal and his current treatment by both DOE and contractor management and how that is affecting the safety culture at WTP." Pp.6-7

The DNFSB letter is available on the DNFSB website, and is attached to this Statement.

The Long Record of Retaliation and the Culture of Reprisal at Hanford

I have testified before Congress on this matter before, including a 2000 hearing before the Subcommittee on Oversight and Investigations of the Committee on Commerce in the House of Representatives. I have appended that testimony to this statement as an exhibit. Some highlights from Hon. Richard Burr's (R-NC) opening remarks illustrate the historical pattern that has persisted for decades throughout the DOE complex[1]:

> Today the committee will review whistleblower retaliation at the Department of Energy facilities operated by its contractors. We will primarily focus on two issues: first, has the Department taken the necessary steps to ensure that contractor employees are encouraged to openly disclose violations of law, unsafe work conditions, and other examples of waste, fraud, and abuse without fear of retaliation, or has the Department's zero tolerance policy for reprisals against whistleblowers simply been a false promise that has died due to the vacuum of leadership? Second, is the Department's policy to reimburse its contractors' legal defense costs to fight a whistleblower an appropriate use of taxpayer funds, or has the Department all too willingly funded contractor defense costs in an effort to wear down whistleblowers, regardless of the merits of the whistleblower's claim?

[1] Hearing, before the Committee on Commerce House of Representatives, Subcommittee on Oversight and Investigations, 106th Congress, Second Session, "WHISTLEBLOWERS AT DEPARTMENT OF ENERGY FACILITIES: IS THERE REALLY "ZERO TOLERANCE" FOR CONTRACTOR RETALIATION?" May 23, 2000.

The committee has been studying these issues closely, and I am concerned that the Department has once again fallen into a very familiar cycle. This familiar cycle at DOE begins with a genuine understanding of a problem, then a commitment to reform, and then an announcement and lengthy press release from DOE headquarters describing how they will resolve the problem, but the Department always seems to forget to follow through on these reforms.

In 1995, former Secretary Hazel O'Leary presented a package of whistleblower protection initiatives, including a zero tolerance policy for reprisals and a proposed limitation on the reimbursement of contractors' legal defense cost in certain cases, but the implementation of these reforms at DOE sites has been inconsistent due to the lack of a clear guidance from headquarters--again, an all-too-familiar problem at the Department of Energy.

Soon after announcing these reforms, Secretary O'Leary realized that they were not being implemented. In March 1996, in a press release she quoted, "These whistleblower initiatives have not been implemented to my satisfaction, and I want to get this effort back on track."

Secretary O'Leary asked former Under Secretary Tom Grumbly to take the lead, but again implementation was derailed. In my mind, the real test of zero tolerance policy is whether contractor employees are now more willing to come forward with a legitimate workplace concern without the fear of retaliation from management and with confidence that DOE will protect them.

Unfortunately, we will hear about the cases today of several whistleblowers who not only suffered acts of reprisal when they initially identified serious safety concerns, but who also, in some cases, were subject to ongoing and unrelenting retaliation by both DOE and its contractors throughout the complaint process.

In all these cases, the Department of Labor investigated the complaints and issued findings in favor of these whistleblowers. Remarkably, the Department has responded by providing virtually no support to the whistleblowers, while providing generous taxpayer support for the contractors fighting these meritorious claims.

- Hon. Richard Burr (R-NC) Subcommittee on Oversight and Investigations of the Committee on Commerce House of Representatives, 106th Congress, Second Session, Hearing on “WHISTLEBLOWERS AT DEPARTMENT OF ENERGY FACILITIES: IS THERE REALLY "ZERO TOLERANCE" FOR CONTRACTOR RETALIATION?" May 23, 2000.

The Systemic Nature of the Problem Documented by the DOE Health Safety and Security Office

The issue at hand isn't just about individual cases of illegal reprisal against nuclear workers. A robust nuclear safety culture is of the utmost importance for the safety of any nuclear facility, let

alone a facility with stakes as high as Hanford's WTP. On January 12, 2012, the DOE's enforcement office, called the Office of Health, Safety and Security (HSS), released a report on the safety culture at the Hanford Waste Treatment Plant. The report, provided as an attachment to this Statement, was a critical indictment of the broken safety culture at WTP, finding that there was widespread reluctance in both DOE and contractor organizations to report safety concerns, and a fear of retaliation in some key departments at Bechtel.

In its 2012 Safety Culture Report on the WTP, DOE HSS found:

> "[A] significant number of staff within ORP, DOE-WTP, and BNI expressed reluctance to raise safety or quality concerns for various reasons. Fear of retaliation was identified in some BNI groups as inhibiting the identification of problems."
>
> "*48 percent of the responding electricians disagreed or strongly disagreed* with a statement on the K-MR survey stating "I am confident that the 'zero-tolerance' policy against retaliation at WTP is enforced." p. x
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> "In this atmosphere, instances where individuals perceive that their concerns about design questions are not listened to, that management does not want to hear problems, that technical dissent is suppressed, and that blame is being assigned unfairly are almost inevitable (for both Engineering and E&NS staff members). *The end result is that a significant number of staff either express a general reluctance to raise issues or indicate perceptions of retaliation; the situation is not consistent with a healthy safety culture*." p. viii
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> "ORP, DOE-WTP, and BNI management has not achieved timely resolution of important issues, including those discussed above; in some cases, issues have remained unresolved for about ten years. Further, typically ORP, DOE-WTP, and BNI senior managers are highly experienced but do not have specific experience in applying DOE-STD-3009 nuclear safety design and safety basis processes." p. viii
>
> "Interviews with construction crafts personnel indicated a widespread perception that the performance rating system used for most crafts workers, which defines the ratings that are used as a major factor in decisions about promotions and reductions in force, is arbitrary and unfairly implemented in a way that inhibits or penalizes the raising of safety and quality issues." – p. ix
>
> "Some interviewees indicated that they had heard that colleagues working on the Pre-Treatment (PT) and High Level Waste (HLW) facilities have been asked to leave things out of their reports, e.g. pipe erosion and criticality issues." p.7
>
> "…many crafts workers identified concerns about safety culture, including mistrust of the construction superintendents; frustration with inconsistent disciplinary actions and the craft rating system; fear of retaliation for raising safety issues; inconsistent application and communication of rules and procedures among WTP buildings; and inadequate planning, scheduling, and coordination of work." P. 32

> "Overall, only 30% of all survey respondents feel that they can openly challenge decisions made by management." p. 20
>
> "Approximately 50% of survey respondents agreed with the statement that they feel that they can approach the management team with concerns." P. 21

Despite these very strongly-worded findings, well-known whistleblowers such as Donna Busche, Walt Tamosaitis, and Gary Brunson (the Chief Engineer at the WTP for DOE who resigned after calling for a shut-down of all nuclear-related work in 2013) have all been terminated or forced out. Below the public radar are many more professional engineers, scientists, experts and craft workers who have suffered reprisal, including removal from their position, termination, harassment, isolation, threats, gag orders, intimidation and discrimination. In short, since its report nothing substantive has been done by DOE or the contractors to address the broken safety culture.

The chilling effect on employees has gotten worse. DOE makes no effort to ascertain the concerns expressed by employees who have gone public or confidentially within the ranks. This is a telling indicator that DOE has abdicated its core responsibility to protect public health and safety and the environment. For instance, Donna Busche testified to the DNFSB about numerous safety and technical concerns. *Not one person* from DOE sought to debrief her about her issues. Nonetheless, she attempted to bring issues directly to DOE on numerous occasions. Donna's efforts were met with disinterest and denial. Even though DOE has re-invigorated its promises to employees that it welcomes and encourages employees to raise safety issues without fear of reprisal, when employees do so, and suffer reprisal, DOE officials have repeatedly stated that the agency doesn't get involved in "personnel issues." Do they truly expect the contractor to *admit* that it took retaliatory action against a whistleblower? Yet this seems to be the only scenario where DOE *would* take action. DOE's deafening silence in response to the recent terminations of Dr. Tamosaitis and Donna Busche can only be interpreted by the contractor community as approval. Actions speak louder than slogans.

Actions of Secretary of Energy, Dr. Ernest Moniz

Following Secretary Stephen Chu's departure from DOE, in April 2013, Dr. Ernest Moniz assumed leadership of the Energy Department. During his confirmation hearing before Senator Ron Wyden (D-OR), Dr. Moniz expressed his support for whistleblowers and agreed to meet with Hanford whistleblowers, if confirmed in his nomination.

In June 2013, Dr. Moniz did meet with six Hanford whistleblowers. However, the visit turned out to be perfunctory, meaningless and stilted. To begin with, DOE HQ revealed the names of the whistleblowers to the local DOE office against our wishes and distinct agreement for them not to do so, which promptly notified the contractors of the list. This exposed several people who were anxious to not be identified as whistleblowers to their employer, but had raised serious safety concerns about the WTP with the DNFSB, DOE and others. Of the six whistleblowers who each met for 20 minutes with Dr. Moniz –

- *None of them* received a follow-up call or visit from a DOE official asking for documentation or evidence;

- Three were terminated; one was removed from his position; and one left under pressure.

- One of those terminated was an employee whose company only learned of his impending meeting with Secretary Moniz through an email from the local DOE office. Upon being confronted by a contractor manager, this employee denied being a whistleblower, and attended the meeting with Secretary Moniz with his supervisor at his side. He spoke of technical issues only to the Secretary. This individual was terminated soon thereafter.

- DOE expressed zero concern over the fact that five of the six were terminated, removed, or forced out.

Secretary Moniz did issue a Safety Culture policy on September 20, 2013. In that Memo, he stated:

> "We will pursue a safety culture built on an environment of trust and mutual respect, worker engagement and open communication, an atmosphere that promotes a questioning attitude with effective resolution of repo1ted problems, and continuous learning…
>
> We will foster a safety conscious work environment across all Departmental operations. Federal, laboratory, and contractor workers have the right to identify and raise issues that affect their safety and health or that of their co-workers openly, and without fear of reprisal. We must not deter, discourage, or penalize employees for the timely identification of safety, health, environmental, quality or security issues, the reporting of illnesses or injuries, or the use of Employee Concerns or Differing Professional Opinion Programs. Our workers will receive a prompt, professional, and transparent evaluation and resolution of their concerns."

These encouraging words sound good on paper, but without action, they sound like the countless other pronouncements from DOE that have been issued for over 25 years on the very same subject. Secretary Moniz had a chance to give these words some weight when Dr. Tamosaitis was summarily terminated from the project in October 2013. Strong letters of protest were issued by Senators Ron Wyden and Ed Markey (D-MA), and the firing received international press attention. Yet Secretary Moniz said nothing and did nothing. His actions contradicted his statements and the silence appears to be approval.

Secretary Moniz had a second chance when Donna Busche's employer, URS Energy and Construction, Inc., fired her on February 18, 2014. Ms. Busche was a "key personnel" on the contract, requiring DOE notice and approval before any change is made to her employment, yet DOE claims in the press that URS did not notify DOE. Again, despite the clear evidence of retaliatory intent by URS to fire a well-known whistleblower, the Secretary did nothing to vindicate his now-meaningless policy.

This is Not Just About Donna Busche and Walt Tamosaitis

The silencing of employees at the WTP is getting worse. On the day following Donna Busche's firing, employees in the project were given a copy of a Non-Disclosure Agreement and warned

that speaking out would carry harsh consequences. URS and Bechtel hardly needed to spell out what might happen – the answer to that was emblazoned on the front page of many newspapers, on the radio and on TV.

What urgent nuclear safety issues will now go unreported since the message is so clear and unchallenged that contractors have unfettered discretion to act against individuals who raise concerns? As Director of Hanford Challenge and an attorney, I have spoken with dozens of other engineers, scientists and craft workers who have suffered similar reprisals. Some of these have acted by filing complaints, others simply move on or shut up. The point is that nobody with authority really seems to care what issues these people have, or that they have been silenced, isolated, harassed or terminated.

A Safety Conscious Work Environment Needs to Be Mandated at DOE

A Safety Conscious Work Environment (SCWE) is defined as a work environment in which employees are encouraged to raise concerns and where such concerns are promptly reviewed, given the proper priority based on their potential safety significance, and appropriately resolved with timely feedback to employees. Attributes of a Safety Conscious Work Environment include (1) a management attitude that promotes employee involvement and confidence in raising and resolving concerns; (2) a clearly communicated management policy where safety has the utmost priority, overriding, if necessary, the demands of production and project schedules; (3) a strong, independent quality assurance organization and program; (4) a training program that encourages a positive attitude toward safety; and (5) a safety ethic at all levels that is characterized by an inherently questioning attitude, attention to detail, prevention of complacency, a commitment to excellence, and personal accountability in safety matters.

Congress should empower the DNFSB to:

- establish Departmental policy that calls for the positive presence of a Safety Conscious Work Environment in its nuclear facilities;

- institute rules, procedures and regulations requiring DOE managers, supervisory personnel as well as contractor and subcontractor employers to achieve and maintain Safety Conscious Work Environment programs at nuclear sites;

- establish protocols and procedures for DNFSB field representatives and investigators to ascertain, through its normal inspection duties or upon good cause, whether a demonstrative "Safety-Conscious Work Environment" program exists at a specific facility or within any DOE division, and to order corrective actions to remedy departures from such an environment;

Such regulations are consistent with the policy and purpose of the Atomic Energy Act which includes advancing "the goals of restoring, protecting, and enhancing environmental quality, and to assure public health and safety." 42 U.S.C. § 5801(a). Also see, 42 U.S.C. § 7101 (Department of Energy Organization Act) and 42 U.S.C. § 2011, (the Atomic Energy Act of 1954, as amended).

It has been repeatedly demonstrated that workers are the key ingredient to protecting the health and safety of the public, workers and the environment. Agency and contractor officials alike rely upon employees to exercise sound judgment in their work, and also as an early warning system for problems that have the potential to escalate and cause injuries and fatalities, threats to the environment, and waste of resources.

The DNFSB has recently documented employees who have raised environmental, safety and health concerns have subsequently experienced significant workplace reprisal that has impacted their careers, financial stability, and personal and familial relationships.

Too often, concerned employees are turned into whistleblowers, who must take their concerns up the chain of command and often to government agencies, the news media, Congress and the public in an effort to bring attention and reform to an issue that involves safety, health, protection of the environment, management of fiscal resources, security and other vital public policy concerns. As often, such employees have fallen victim to harassment, intimidation, retaliation, and discrimination. Many have been terminated from their jobs, and their careers effectively ruined.

In the last 25 years, there have been hundreds of cases from DOE sites brought by workers who have resorted to litigation in courts and before administrative agencies because of alleged reprisals. These cases have cost contractors, the government (the taxpayer), and the employees literally millions of dollars in attorney fees and judgments, fines and penalties.[2]

Operations at DOE facilities have been adversely affected in a multitude of ways because of these cases. A systemic approach is needed to institute and encourage a culture at DOE nuclear facilities that assures the prompt and safe reporting of concerns in a manner that protects the disclosure and the person making the disclosure, and results in a timely and effective review of the allegations.

It is fundamental to the mission of the Department of Energy that it protect the public safety and health in the regulation and control of its nuclear weapons production facilities. It is also crucial that DOE and DOE contractor employees be encouraged to voice environmental, safety and health concerns without even the fear of experiencing reprisal.

The "chilling effect" the DNFSB has noted that occurs when an employee is terminated for raising a concern suppresses reporting destabilizes the work environment, dampens morale, and creates an unsupportive atmosphere must end.

[2] For example, in October 2007, the Washington Supreme Court affirmed a jury verdict in the case of 11 pipefitters, whistleblowers at Hanford, and an award of $7.3 million. Internal agency records indicate that the contractor charged the Department millions of dollars in attorney fees and costs in addition to the award – effectively putting the Department in the position of subsidizing illegal retaliation.

The NRC Model

The commercial nuclear industry has a long history of dealing with the issue of employee concerns, and during the past 20 years has developed principles and procedures that establish work environments encouraging safety reports and prohibiting retaliatory conduct that could chill such reports. The Nuclear Regulatory Commission (NRC) defines its mission as the protection of the public safety and health in its regulation of commercial nuclear facilities.

In an Order issued on August 14, 1996, the NRC mandated independent, third party oversight to address licensee noncompliance with regulatory requirements concerning, among other things, employee safety concerns at the Millstone Nuclear Plant. In this Order, the NRC directed that, prior to resumption of power operations, the Licensee should develop, submit to the NRC, and implement a comprehensive plan for reviewing and dispositioning safety issues raised by plant employees and ensuring that employees who raise safety concerns are not subject to discrimination. Additionally, the Licensee was ordered to retain the independent third party, subject to the approval of the NRC, to oversee its implementation of a comprehensive plan. The plan for independent third party oversight was required until the Licensee demonstrated by its performance that the conditions which led to the requirement of that oversight had been corrected to the satisfaction of the NRC.

The NRC has made a clear and cogent determination that the ability of employees to raise concerns is integral to the protection of public health and safety. The hazards at DOE nuclear facilities are no less dangerous, and yet throughout the DOE complex, reprisals against employees continue unabated, and hostile working environments are instituted without challenge from the DOE. We urge the prompt incorporation of the NRC methodology for protecting employee concerns at its facilities. This would assist the DOE in improving its operations consistent with its mission and in accomplishing a work environment that has a "zero tolerance for reprisal" in fact and not just in rhetoric.

In 2005, the NRC issued a Regulatory Issue Summary, (RIS 2005-18, "Guidance for Establishing and Maintaining a Safety Conscious Work Environment") which identified effective practices for licensees and contractors "for ensuring problem identification and resolution essential to ensuring the safe use of nuclear materials and operations of facilities." (RIS 2005-18 at 3.)

Some of the principles and guidance can help structure Board-promulgated regulations for a DOE version of the Safety Conscious Work Environment. These could include:

- Establishing a Policy Statement published to all employees that asserts that it is "everyone's responsibility to promptly raise concerns" and "makes clear that retaliation for doing so will not be tolerated." (Id. At 4) This includes allowing and encouraging workers to use work hours to report concerns, sanctions for retaliation, setting expectations for management behaviors that fosters employee confidence in raising concerns, providing information on the various avenues for raising

concerns, making clear that employees have the right to raise concerns externally and a commitment to training.

- The training program helps reinforce the principles and practices of SCWE and should include clear explanations of the legal definition for protected activity, adverse action and retaliation, as well as consequences for deviation from applicable laws and regulations. Training can also include defining gateways to identify concerns, appeal processes, and alternative processes for raising concerns. Training can also emphasize appropriate management behaviors, including the importance of protecting confidentiality, fostering good listening skills and identifying countervailing pressures (goals and deadlines) that may interfere with appropriate listening and responses.

- Important aspects of an effective SCWE include conducting the necessary open inquiry to identify the full scope of the concern(s) being brought forward, and assuring that concerns are promptly prioritized, reviewed, and resolved. Employees who bring forth concerns should be provided feedback, and appeal avenues made available for employees who continue to hold a concern.

- Management should establish an alternative process to raising concerns with line management.

- The program requires assessment, including lessons learned evaluations, benchmarking, the establishment of performance indicators, survey and interview tools, direct observations, exit interviews and 360-degree appraisals.

- Contractors should be required to flow down expectations and requirement of the SCWE program to sub-contractors.

- Senior management should be involved in reviewing employment actions when there is any indication that it involves an employee who raised a concern.

Recommendations

The path forward to the safe and effective cleanup of the Hanford Nuclear Site does not lie in continuing to silence technical dissent and hide safety issues. Rather, there needs to be an effective effort to instill a new culture which encourages and rewards the reporting of safety and technical issues and which provides an effective resolution path for such concerns. This has as much to do with modifying behaviors as it does with systemic changes. Leadership at all levels is needed to

meet this challenge.[3] For any future reform to work, DOE and Bechtel managers whose credibility has been damaged by orchestrating retaliation and suppression of concerns must be replaced. The people who have suffered, and continue to suffer reprisal and isolation because they have raised technical and safety issues need to be reinstated, re-empowered, and made whole.

Congress should enact legislation that mandates independent oversight of the DOE's activities and increased protection for whistleblowers. Congress should mandate the implementation of a program requiring a Safety Conscious Work Environment program similar to the Nuclear Regulatory Commission (10 CFR 50.7).

We need additional hearings to get the full story from DOE and the DNFSB on whether the Waste Treatment Plant will work, whether the safety issues are being addressed, and what, if anything, the Department is doing to effectively address the safety culture problems.

Strengthen the whistleblower protection laws for both DOE and contractor personnel at nuclear facilities. Currently, the only remedy for whistleblowers who suffer reprisal is protracted litigation, leading to a "make-whole" remedy. There is no incentive for a contractor not to retaliate against employees who "slow down" work through raising safety concerns.

In fact, the DOE continues to reimburse the attorney fees of contractors who engage in reprisal.[4] This practice must stop. There needs to be meaningful, and fast, resolution mechanisms that keep whistleblowers in their jobs, and penalties against the contractor that deters future misconduct. Whistleblowers deserve jury trials in federal court, with burdens of proof that level the playing field and putting the contractor at risk of losing the contract and significant penalties if it loses.

The Defense Nuclear Facilities Safety Board (the Safety Board) provides an important oversight role which should be strengthened. Since 1986, the Board has attempted to oversee the DOE through *advisory* authority only and it has proved insufficient. The Board should have certification authority over facilities like the WTP – the facility should not operate without Board certification. The Board should also have investigative authority and be able to enforce safety culture issues similar to the NRC, which has the ability to suspend operations, take action against individual management personnel found guilty of suppressing and retaliating against employees who raise safety issues, issuing civil fines, and the like.

Conduct an external, independent full-scale review of the WTP. At this point, with several key experts warning of design failures, it is less than clear that this significant federal investment will perform as advertised. DOE clearly lacks the management skills, the technical capacity, and the will to bring about a workable and reliable design. With the plant already ten years behind schedule and billions over budget, there is no end in sight. An independent external technical panel, should be tasked to undertake a top to bottom review of the design to ascertain whether the

[3] Hanford has a model for creating such a culture: it is called the Hanford Concerns Council, and it exists to resolve technical and reprisal concerns by covered employees in a confidential and safe setting. None of the WTP contractors are members of the Council, despite invitations and opportunities to join.

[4] In the case of Dr. Tamosaitis, we have documented legal fees being reimbursed to the contractor's several law firms in the millions of dollars.

pre-treatment portion of the facility is even feasible, or economically defensible, given the serious array of technical challenges facing it.

Submitted by:

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DATED: MARCH 11, 2014

Attachments:

Letter, P. Winokur, DNFSB to S. Chu, DOE, transmitting RECOMMENDATION 2011·1 TO THE SECRETARY OF ENERGY, *Safety Culture at the Waste Treatment and Immobilization Plant,* Pursuant to 42 U.S.C. § 2286a(a)(5) Atomic Energy Act of 1954, As Amended, Dated: June 09, 2011

Assessment, Department of Energy, Office of Health, Safety and Security, Office of Enforcement and Oversight, "Assessment of the Nuclear Safety Culture and Management of Nuclear Safety Concerns at the Hanford Waste Treatment and Immobilization Plant," January 2012.

Memorandum for Heads of Departmental Elements, Secretary Ernest Moniz, Re: Personal Commitment to Health and Safety through Leadership, Employee Engagement and Organization Learning, September 20, 2013.

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

Washington, DC 20004-2901

June 09, 2011

The Honorable Steven Chu
Secretary of Energy
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585-1000

Dear Secretary Chu:

On June 09, 2011, the Defense Nuclear Facilities Safety Board (Board), in accordance with 42 U.S.C. § 2286a(a)(5), unanimously approved Recommendation 2011-1, *Safety Culture at the Waste Treatment and Immobilization Plant*, which is enclosed for your consideration.

After you have received this Recommendation and as required by 42 U.S.C § 2286d(a), the Board will promptly make it available to the public. The Board believes that this Recommendation contains no information that is classified or otherwise restricted. To the extent that this Recommendation does not include information restricted by the Department of Energy (DOE) under the Atomic Energy Act of 1954, 42 U.S.C. §§ 2161-2168, as amended, please arrange to have it placed promptly on file in your regional public reading rooms. The Board will also publish this Recommendation in the *Federal Register*.

The Board will evaluate DOE's response to this Recommendation in accordance with the Board's Policy Statement 1, *Criteria for Judging the Adequacy of DOE Responses and Implementation Plans for DNFSB Recommendations*.

Sincerely,

Peter S. Winokur, Ph.D.
Chairman

Enclosure

c: Mrs. Mari-Jo Campagnone

RECOMMENDATION 2011-1 TO THE SECRETARY OF ENERGY
Safety Culture at the Waste Treatment and Immobilization Plant
Pursuant to 42 U.S.C. § 2286a(a)(5)
Atomic Energy Act of 1954, As Amended

Dated: June 09, 2011

Introduction

Secretary of Energy Notice SEN-35-91, *Nuclear Safety Policy*, issued on September 9, 1991, and superseding policy statement #2 of DOE Policy 420.1, *Department of Energy Nuclear Safety Policy*, issued on February 8, 2011, state that the Department of Energy (DOE) is committed to establishing and maintaining a strong safety culture at its nuclear facilities. The Defense Nuclear Facilities Safety Board (Board) has determined that the prevailing safety culture at the Waste Treatment and Immobilization Plant (WTP) is flawed and effectively defeats this Secretarial mandate. The Board's investigative record demonstrates that both DOE and contractor project management behaviors reinforce a subculture at WTP that deters the timely reporting, acknowledgement, and ultimate resolution of technical safety concerns.

Background

In a letter to the Secretary of Energy dated July 27, 2010, the Board stated that it would investigate the health and safety concerns at the WTP at Hanford raised in a letter to the Board dated July 16, 2010, from Dr. Walter Tamosaitis.

The Board's investigation focused on allegations raised by Dr. Tamosaitis, a contractor employee removed from his position at WTP, a construction project in Washington State funded by DOE and managed by Bechtel National, Incorporated (BNI). The Board's inquiry did not attempt to assess the validity of Dr. Tamosaitis's retaliation claim, but rather, as required by the Board's statute, examined whether his allegations of a failed safety culture at WTP, if proven true, might reveal events or practices adversely affecting safety in the design, construction, and operation of this defense nuclear facility.

The Board is required by statute to investigate any event or practice at a defense nuclear facility which it determines may adversely affect public health and safety. The Board conducted this investigation pursuant to its investigative power under 42 U.S.C. § 2286a(a)(2). During the course of the Board's inquiry, 45 witnesses were interviewed and more than 30,000 pages of documents were examined. The Principal Investigator was Joel R. Schapira, Deputy General Counsel, assisted by John G. Batherson, Associate General Counsel, and Richard E. Tontodonato, Deputy Technical Director. The record of the investigation is non-public and will be preserved in the Office of the General Counsel's files.

During the period of the investigation, the Board held a public hearing regarding safety issues at WTP. During that hearing the Board received additional information related to the kind

of safety culture concerns raised by Dr. Tamosaitis. Consequently, the investigation was expanded to review these new concerns.

Secretary of Energy Notice SEN-35-91, *Nuclear Safety Policy*, issued on September 9, 1991, and superseding policy statement #2 of DOE Policy 420.1, *Department of Energy Nuclear Safety Policy*, issued on February 8, 2011, state that DOE is committed to establishing and maintaining a strong safety culture at its nuclear facilities. The investigation's principal conclusion is that the prevailing safety culture at this project effectively defeats this Secretarial mandate. The investigative record demonstrates that both DOE and contractor project management behaviors reinforce a subculture at WTP that deters the timely reporting, acknowledgement, and ultimate resolution of technical safety concerns.

A key attribute of a healthy safety culture as identified by DOE's Energy Facility Contractors Group and endorsed by Deputy Secretary of Energy memorandum dated January 16, 2009, and in the Nuclear Regulatory Commission's proposed policy statement on safety culture (NRC-2010-0282, dated January 5, 2011), is that leaders demonstrate clear expectations and a commitment to safety in their decisions and behaviors. The Board's investigation found significant failures by both DOE and contractor management to implement their roles as advocates for a strong safety culture.

The record shows that the tension at the WTP project between organizations charged with technical issue resolution and development of safety basis scope, and those organizations charged with completing design and advancing construction, is unusually high. This unhealthy tension has rendered the WTP project's formal processes to resolve safety issues largely ineffective. DOE reviews and investigations have failed to recognize the significance of this fact. Consequently, neither DOE nor contractor management has taken effective remedial action to advance the Secretary's mandate to establish and maintain a strong safety culture at WTP.

Taken as a whole, the investigative record convinces the Board that the safety culture at WTP is in need of prompt, major improvement and that corrective actions will only be successful and enduring if championed by the Secretary of Energy. The successful completion of WTP's mission to remove and stabilize high-level waste from the tank farms is essential to protect the health and safety of the public and workers at Hanford. However, the flawed safety culture currently embedded in the project has a substantial probability of jeopardizing that mission.

Findings

Finding One: A Chilled Atmosphere Adverse to Safety Exists

In a letter to the Defense Nuclear Facilities Safety Board (Board) dated July 16, 2010, Dr. Walter Tamosaitis, a former engineering manager at the Waste Treatment and Immobilization Plant (WTP), alleged that he was removed from the project because he identified certain technical issues that in his view could affect safety. Dr. Tamosaitis also alleged that there was a failed safety culture at WTP. With full understanding that the formal claims of retaliation raised by Dr. Tamosaitis would be looked into by others, the Board decided that his assertions raised serious questions about safety culture and safety management at WTP. From late July

2010 to May 2011, the Board reviewed a large number of documents and interviewed a substantial number of persons, including Dr. Tamosaitis, to assess whether or not his allegations of safety issues and of a faulty safety culture were borne out. The Board's investigation later expanded in scope to address matters related to the Board's October 2010 public hearing at Hanford on safety issues at WTP. This phase of the investigation consisted of closed hearings at which sworn testimony was elicited from DOE and contractor personnel.

The Board finds that the specific technical issues identified by Dr. Tamosaitis in his July 16, 2010, letter were known and tracked by the WTP project. In a WTP project managers' meeting on July 1, 2010, Dr. Tamosaitis raised safety concerns related to the adequacy of vessel mixing, technical justifications for closing mixing issues, and other open technical issues. The next day he was abruptly removed from the project. This sent a strong message to other WTP project employees that individuals who question current practices or provide alternative points of view are not considered team players and will be dealt with harshly.

The Board finds that expressions of technical dissent affecting safety at WTP, especially those affecting schedule or budget, were discouraged, if not opposed or rejected without review. Project management subtly, consistently, and effectively communicated to employees that differing professional opinions counter to decisions reached by management were not welcome and would not be dealt with on their merits. There is a firm belief among WTP project personnel that persisting in a dissenting argument can lead, as in the case of Dr. Tamosaitis, to the employee being removed from the project or reassigned to other duties. As of the writing of this finding, Dr. Tamosaitis sits in a basement cubicle in Richland with no meaningful work. His isolated physical placement by contractor management and the lack of meaningful work is seen by many as a constant reminder of what management will do to an employee who raises issues that might impact budget or schedule.

Other examples of a failed safety culture include:

- The Board heard testimony from several witnesses that raising safety issues that can add to project cost or delay schedule will hurt one's career and reduce one's participation on project teams.

- A high ranking safety expert on the project testified that the expert felt next in line for removal after Dr. Tamosaitis because of the expert's refusal to yield to technically unsound positions on matters affecting safety advanced by DOE and contractor managers responsible for design and construction at the WTP. This safety expert's concern was validated by a senior DOE official in separate sworn testimony.

- A report prepared by a subcontractor on the WTP project, "URS Report of Involvement in WTP Investigation," discusses the "tension between organizations charged with technical issue resolution and development of safety basis related scope and those organizations charged with completing design and advancing construction. Some level of such tension is normal and healthy in projects of such scope and complexity; but at WTP, this tension is higher than what might be expected or desired. Some individuals whose personalities tend toward avoidance of conflict could view the organizational environment as not conducive to raising issues or

perhaps even potentially suppressing some issues that might deter progress or that might add cost."

- The investigative record shows that the DOE Office of River Protection Employee Concerns program is not effective. One safety expert explicitly testified that employees would not and did not use the program, and believed that individuals running the program would "bury issues" brought to them. The record shows that in the removal of Dr. Tamosaitis, Human Resources (HR) for URS was interested only in implementing management's demand that the employee be removed immediately. The record shows HR did not assert any consideration or concern regarding the effect the process and manner of his removal would have on the remaining workforce and the effectiveness of the contractor employee protection program required under 10 CFR Part 708.

- An independent review of the WTP safety culture performed by DOE's Office of Health, Safety and Security (HSS) found that "a number of individuals have lost confidence in management support for safety, believe there is a chilled environment that discourages reporting of safety concerns, and/or are concerned about retaliation for reporting safety concerns. These concerns are not isolated and warrant timely management attention, including additional efforts to determine the extent of the concerns." Although the HSS report stated that most WTP personnel did not share these opinions, the Board notes that personnel interviewed by HSS were escorted to their interviews by management. The Board's record shows that involving management with the interviews clearly can inhibit the willingness of employees to express concerns. In its own way, DOE's decision to allow management to be involved in the HSS investigation raises concerns about safety culture.

This environment at WTP does not meet key attributes established by DOE's Energy Facility Contractors Group, and endorsed by the Deputy Secretary of Energy, that describe a strong safety culture: DOE and contractor leadership must have a clear understanding of their commitment to safety; they are the leading advocates of safety and the public trust demands that they demonstrate their commitment in both word and action. The Board's investigation concludes that the WTP project is not maintaining a safety conscious work environment where personnel feel free to raise safety concerns without fear of retaliation, intimidation, harassment, or discrimination.

Finding Two: DOE and Contractor Management Suppress Technical Dissent

The HSS review of the safety culture on the WTP project "indicates that BNI has established and implemented generally effective, formal processes for identifying, documenting, and resolving nuclear safety, quality, and technical concerns and issues raised by employees and for managing complex technical issues." However, the Board finds that these processes are infrequently used, not universally trusted by the WTP project staff, vulnerable to pressures caused by budget or schedule, and are therefore not effective. Previous independent reviews, contractor surveys, investigations, and other efforts by DOE and contractors demonstrate repeated, continuing identification of the same safety culture deficiencies without effective resolution.

Suppression of technical dissent is contrary to the principles that guide a high-reliability organization. It is essential that workers feel empowered to speak candidly without fear of retribution or criticism. In extreme cases, refusal to consider a different view of a safety issue can lead to catastrophic consequences. WTP is a complex and difficult project that is essential to the nation's nuclear waste remediation program. Therefore, federal and contractor managers must make a special effort to foster a free and open atmosphere in which all competent opinions are judged on their technical merit, to sustain or improve worker and public safety first and foremost, and then evaluate potential impacts on cost and schedule.

One of the primary examples of suppressing technical information is a study that was performed by BNI in July 2009 on deposition velocity, a parameter used in modeling the offsite transport of radioactive particles for nuclear facility safety analyses. The study found that the correct value of the dry deposition velocity for Hanford fell in the range of 0.1 to 0.3 cm/sec. The Board's investigation includes testimony by the former manager of DOE's Office of River Protection and the DOE Chief of Nuclear Safety in Washington, DC, that the results of this study were not shared with them. Consequently, DOE continued to follow its policy requiring the WTP project to use a less conservative default value of 1.0 cm/sec for dry deposition velocity. In the fall of 2010, the Chief of Nuclear Safety hired an independent consultant to investigate the issue. This consultant also found that deposition velocity fell in the range of 0.1 to 0.3 cm/sec, information that was already available to the project in the summer of 2009. Suppression of the 2009 study delayed the identification of properly conservative values for dry deposition velocity to use in the safety analyses that determine the need for safety-related controls for WTP facilities. Once this information was made available to DOE's Office of Health, Safety and Security, a technical study ensued that determined the need for a more conservative value of deposition velocity to serve as a default value.

This problem also manifested itself when one of the expert witnesses, a nuclear safety professional, specifically asked by the Board to testify at the Board's October 2010 public hearing on WTP safety issues, failed to support the DOE policy on the appropriate value for dry deposition velocity. This witness testified that using DOE's prescribed default value for the dry deposition velocity in safety basis calculations could not be justified if it were known to be non-conservative for the Hanford Site. At the time of the hearing, the witness understood the correct value of deposition velocity was not being used in calculations of potential dose consequences to the public receptor and was unwilling to simply state the DOE position that a default value could be used or justified. The expert witness later testified for the record that DOE was fully aware of the July 2009 study on dry deposition velocity at the time of the public hearing. The expert witness' testimony during the public hearing clashed with the position taken by senior management in the DOE Office of River Protection and by the DOE Chief of Nuclear Safety.

The testimony of several witnesses confirms that the expert witness was verbally admonished by the highest level of DOE line management at DOE's debriefing meeting following this session of the hearing. Although testimony varies on the exact details of the verbal interchange, it is clear that strong hostility was expressed toward the expert witness whose testimony strayed from DOE management's policy while that individual was attempting to adhere to accepted professional standards. Testimony by a senior DOE official confirmed the

validity of the expert witness' concerns. In addition, the expert witness testified that they felt pressure to change their testimony, but refused to do so.

Management behavior of this kind creates an atmosphere in which workers are reluctant to speak candidly for fear of retribution or criticism. Whether or not this behavior possibly violates federal law is not for the Board to determine; however, the Board does assert that fear of retribution visited on a competent professional for offering an honest opinion in a public hearing is incompatible with the objective of designing and building a safe and operationally sound nuclear facility and sustaining a healthy safety culture.

Another example of failure to act on technical information in a timely manner concerns a report related to the occurrence of a potential criticality event at WTP. In April 2010, the WTP project issued a plan of action to address recommendations of the WTP Criticality Safety Support Group, specifically, to review historical information on plutonium dioxide (PuO_2) wastes discharged by the Plutonium Finishing Plant to the tank farms. The report of the review was completed and submitted to the WTP project in August 2010. A key finding of the report was that the maximum PuO_2 particle size of 10 microns assumed in WTP criticality safety analyses was not conservative. Instead of receiving immediate attention, the report languished without action until February 2011.

Once the report was finally reviewed, the WTP project reached the initial conclusion that it may no longer be possible to assume that criticality in WTP is an incredible occurrence. (Based on this information, the Hanford Tank Farms operating contractor halted activities involving the affected tanks.) If criticality is confirmed to be credible, changes in the WTP criticality strategy will be required. This will result in changes to the existing safety basis and require an assessment of the existing WTP design to determine if design changes are required. Depending upon the magnitude of the criticality hazard, significant changes in the WTP design may be necessary. DOE was not informed of this important finding in a timely manner, and actions to better characterize the PuO_2 problem were delayed by approximately 6 months because the WTP project delayed evaluation of the report.

Recommendation

Taken as a whole, the investigative record convinces the Board that the safety culture at WTP is in need of prompt, major improvement and that corrective actions will only be successful and enduring if championed by the Secretary of Energy. The Board recommends that the Secretary of Energy:

1. assert federal control at the highest level and direct, track, and validate the specific corrective actions to be taken to establish a strong safety culture within the WTP project consistent with DOE Policy 420.1 in both the contractor and federal workforces,

2. conduct an Extent of Condition Review to determine whether these safety culture weaknesses are limited to the WTP Project, and

3. conduct a non-adversarial review of Dr. Tamosaitis' removal and his current treatment by both DOE and contractor management and how that is affecting the safety culture at WTP.

The Board urges the Secretary to avail himself of the authority under the Atomic Energy Act (42 U.S.C. § 2286d(e)) to "implement any such recommendation (or part of any such recommendation) before, on, or after the date on which the Secretary transmits the implementation plan to the Board under this subsection."

Peter S. Winokur, Ph.D., Chairman

Independent Oversight
Assessment of Nuclear Safety Culture
and Management of Nuclear Safety Concerns
at the

Hanford Site Waste Treatment and Immobilization Plant

January 2012

Office of Enforcement and Oversight
Office of Health, Safety and Security
U.S. Department of Energy

HSS
Office of Health, Safety and Security

Table of Contents

Abbreviations Used in This Report

BNI	*Bechtel National, Incorporated*
CFR	*Code of Federal Regulations*
DNFSB	*Defense Nuclear Facilities Safety Board*
DOE	*U.S. Department of Energy*
DOE-WTP	*DOE WTP Project Office*
DPO	*Differing Professional Opinion*
DSA	*Documented Safety Analysis*
ECP	*Employee Concerns Program*
EM	*Office of Environmental Management*
EM-1	*Assistant Secretary for Environmental Management*
E&NS	*Environmental and Nuclear Safety*
FPD	*Federal Project Director*
FRA	*Functions, Responsibilities, and Authorities*
HPA	*Human Performance Analysis Corporation*
HSS	*Office of Health, Safety and Security*
K-MR	*K-Management Resources*
LAW	*Low Activity Waste*
M3	*Pulse Jet Mixing Design Issue*
NRC	*U.S. Nuclear Regulatory Commission*
NSD	*ORP Nuclear Safety Division*
NSQC	*Nuclear Safety and Quality Culture*
NSQI	*Nuclear Safety and Quality Imperative*
ORP	*Office of River Protection*
PDSA	*Preliminary Documented Safety Analysis*
PEP	*Project Execution Plan*
PIER	*Project Issue Evaluation Report*
QA	*Quality Assurance*
RL	*Richland Operations Office*
SCWE	*Safety Conscious Work Environment*
SSC	*Structures, Systems, and Components*
URS	*URS Corporation*
WRPS	*Washington River Protection Solutions*
WTP	*Waste Treatment and Immobilization Plant*

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Executive Summary

The U.S. Department of Energy (DOE) Office of Enforcement and Oversight (Independent Oversight), within the Office of Health, Safety and Security (HSS), conducted an independent assessment of nuclear safety culture[1] and management of nuclear safety concerns at the DOE Waste Treatment and Immobilization Plant (WTP). The assessment focused on the DOE organizations with site-level line management responsibility for WTP – the Office of River Protection (ORP) and the DOE WTP Project Office (DOE-WTP) – and the site contractor – Bechtel National, Incorporated (BNI), including its subcontractors.

This assessment provides DOE management with a follow-up on the October 2010 HSS review of the WTP nuclear safety culture, including a mature and effective safety conscious work environment (SCWE).[2] It also satisfies a Secretarial commitment to the Defense Nuclear Facilities Safety Board (DNFSB) related to DNFSB Recommendation 2011-1, *Safety Culture at the Waste Treatment and Immobilization Plant*. HSS accelerated the schedule for the follow-up assessment in response to a request from the Acting Assistant Secretary for Environmental Management (EM) in an August 2011 letter, citing the serious concerns that had been raised about the safety culture at WTP. As part of a broad extent-of-condition assessment (to start following this assessment) and based on the results of this assessment, the HSS Independent Oversight team will more fully evaluate DOE Headquarters organizations to gather additional information about the role of Headquarters line management organizations in safety culture and management of safety issues at WTP.

WTP is DOE's largest ongoing design and construction project, with an estimated cost of over $12 billion and a current workforce of about 3000, and plans to transition to an operating nuclear facility in 2019.

Although WTP is not yet processing radioactive materials, WTP personnel are currently making design decisions and developing a safety basis to demonstrate that the WTP can be operated safely, and WTP personnel are also procuring, installing, and constructing systems, structures, and components that will be relied on for safe operation of an extraordinarily complex set of nuclear facilities. If these functions are not performed correctly and with high standards of quality, the safety of the WTP could be compromised during future operations by latent failures in design or safety analysis or in the installed systems, structures, and components. Therefore, a healthy nuclear safety culture, one in which employees feel empowered to raise safety questions without fear of retaliation, is essential at WTP during the current

1 While there are various safety culture models, the definition used in the Energy Facility Contractors Group report, which was accepted by the Deputy Secretary and referenced in the DOE Integrated Safety Management Guide is: An organization's values and behaviors modeled by its leaders and internalized by its members, which serve to make safe performance of work the overriding priority to protect workers, the public, and the environment.

2 A SCWE can be characterized as an environment in which employees are encouraged and are willing to raise safety concerns both to their own management and to DOE without fear of retaliation.

design and construction phase, as well as for the future operational phase. An effective nuclear safety culture is also important in light of various allegations and reviews in recent years, including a 2010 whistleblower event (questioning the safety of the design and alleging retaliation), another whistleblower revelation/event in late 2011, a subsequent allegation of retaliation by a BNI manager, and a differing professional opinion filed by an ORP staff member.

Senior DOE management has recently taken visible actions in support of a healthy safety culture. The Secretary of Energy and the Deputy Secretary of Energy issued a memorandum on December 5, 2011, on nuclear safety at DOE, which emphasized DOE expectations for a healthy safety culture. The Deputy Secretary of Energy visited WTP in July 2011 and emphasized the importance of safety, a questioning culture, and freedom to raise safety concerns without fear of retribution.

Safety Culture

To ensure a valid and effective assessment of the existing safety culture, HSS engaged external independent safety culture experts[3] with extensive experience and expertise in safety culture reviews to help plan and collect data during onsite activities (briefings, individual and focus group interviews, etc.) to supplement and complement the nuclear safety expertise of its staff. These external independent safety culture experts analyzed the data collected in accordance with established methods using a framework described by the U.S. Nuclear Regulatory Commission and provided their independent external assessment of the safety culture at WTP, which is summarized in Section 2 and provided in its entirety in the supplemental volume to this report as Appendix A. Some of the key conclusions of the report focus on the willingness of employees to raise concerns, which is an area of particular management focus in light of the 2010 whistleblower allegations, the recent DNFSB recommendation, and the Secretary's recent memorandum on nuclear safety that encourages raising issues and emphasizes that retaliation against individuals is prohibited by law and DOE policy.

While there is no fear of retaliation in the ORP (including DOE-WTP) work environment, there is a definite unwillingness and uncertainty among employees about the ability to openly challenge management decisions. There are definite perceptions that there is not an environment conducive to raising concerns or where management wants or willingly listens to concerns. Most employees also believe that constructive criticism is not encouraged.

The willingness to raise concerns and issues across the BNI organization needs to be improved to ensure that the organization is preventing events and learning from its performance. Fear of retaliation was identified in some groups as inhibiting the identification of problems. While the HSS Independent Oversight team did not hear many direct references to the 2010 whistleblower event, the event is well known among WTP personnel, and there were some indications that the whistleblower event may still be at a level of awareness that is contributing to the other indicators surrounding the reluctance to identify problems or raise concerns. Employee engagement, particularly at lower levels of the organization, would facilitate the involvement of these groups in resolving such issues and could ultimately mitigate this perception.

3 While HSS does not normally advocate the use of the term "experts" in its oversight reports, in this case, HSS engaged the services of internationally recognized experts in safety culture evaluations. Section 6 provides information about the expert qualifications of the company and individuals used by HSS to provide perspectives on the safety culture at WTP.

The organizational separation of the DOE-WTP organization from the rest of the ORP organization has created difficulties in the communication, coordination, and cohesiveness of the implementation of DOE requirements and oversight of BNI. Questions concerning how DOE-WTP is managing the project, what impact their decisions are having on the project, who is in control of the project, and ultimately who will deliver the project remain unanswered for many of ORP's employees and stakeholders.

The external independent safety culture experts determined that BNI needs to be more forthcoming in its transparency with its employees and the public for trust to improve. While BNI acknowledges that it is dealing with significant issues, various employees and stakeholders indicated that these issues are communicated in a way that diminishes their importance, contributing to a lack of trust and the perception of denial by those involved with the organization.

The external independent safety culture experts recognize that ORP and BNI are making efforts to resolve many of the technical issues that encumber the WTP Project and that these activities are taking place under intense scrutiny by numerous stakeholders and external organizations. However, more consideration of organizational and cultural considerations could facilitate the project's forward movement and make ORP's and BNI's efforts more successful. Achieving the needed changes will also depend on ORP, DOE-WTP, and BNI establishing, implementing, and expecting consistent standards and devoting more effort to behavioral change to ensure that the traits and behaviors of a healthy safety culture become the accepted way of doing business.

ORP Management of Safety Concerns

In its 2010 safety culture review report, HSS recommended that ORP "institutionalize the processes and formally define the roles and responsibilities and clarify interfaces between the WTP Federal organization and the other ORP organizations." Since then, ORP has taken several actions, including submitting a proposed revision to the WTP Project Execution Plan to DOE Headquarters in July 2011 that defined the roles and reporting relationships of DOE-WTP and ORP support organizations. The revised plan has not yet been formally approved, but most of the proposed changes to the PEP are being implemented in practice.

Some aspects of the ORP and DOE-WTP issues management processes are functioning effectively. ORP and DOE-WTP personnel have appropriate mechanisms for the Federal staff to raise safety concerns, such as the employee concerns program and differing professional opinion program. Several ORP reviews have been effective in identifying deficiencies in WTP design products and in identifying vulnerabilities that could impact the future operability of waste treatment facilities. ORP has also critically reviewed the corrective action plans proposed by BNI to address design deficiencies.

Although progress has been made, increased attention and further improvement are needed in a number of areas. Internal assessments performed by ORP quality assurance (QA) and DOE-WTP line organizations over the past two years have identified continuing weaknesses in ORP action item tracking and the management of corrective actions. A particular concern is that ORP and DOE-WTP have not established an effective approach for systematically tracking and validating corrective actions taken to enhance safety culture at the site level, therefore limiting the ability of EM or senior DOE management to ensure tracking and validation of corrective actions; tracking and validation constitute one of DOE's commitments in the June 30, 2011, letter from the Secretary of Energy to the DNFSB in which DOE

accepted DNFSB Recommendation 2011-1. Another concern is that management expectations regarding safety culture have not been formally communicated to the Federal staff through a policy statement or programmatic requirements, and safety culture training has not been provided to the staff. Improvements are also needed in the ORP Safety Management Functions, Responsibilities and Authorities (FRA), which was revised in September 2011. This document now appropriately addresses DOE-WTP but does not sufficiently define certain responsibilities and authorities, such as the organizational authority to approve documented safety analyses (DSAs).

BNI Management of Safety Concerns

BNI has taken many actions to address the specific recommendations in the 2010 HSS safety culture report. For example, BNI enhanced new employee orientation and continuing general employee training on issue identification and resolution and took several actions to improve issues management processes. However, BNI management did not adequately evaluate the significance of the collective safety culture issues documented by the DNFSB, the 2010 HSS report, BNI internal reviews, and other external assessments.

The WTP issues management processes, when implemented properly, can be effective tools for identifying and resolving safety issues. The corrective action management system uses the Project Issue Evaluation Report (PIER) form to document issues and initiate the process for evaluating, correcting, documenting, and verifying the resolution of the issues. A strength of this process is the application of PIERs to opportunities for improvement as well as violations. The Engineering Technical Issues Identification Management Guide was significantly enhanced in a March 2011 revision. The HSS Independent Oversight team's review of selected technical issues and tracking systems indicates that processes were appropriately implemented and progress is being made to resolve the numerous open technical issues, although significant work remains. If not satisfied with the issues management processes, BNI employees can report formal employee concerns to the BNI or DOE employee concerns programs, or they can use the differing professional opinion process.

However, issues are often not managed effectively to resolution at WTP because of inadequate implementation of the processes. In some cases, safety issues at WTP are not documented in the PIER system, are improperly categorized for significance, are inadequately analyzed for causes, or are not resolved with effective corrective and preventive actions. Although most investigations have been thorough, some process and implementation weaknesses were evident in the employee concerns and differing professional opinion programs. There are instances where ineffective implementation of the issues management process specifically contributed to issues with the project's safety culture. For example, WTP staff, management, and senior managers were unable to effectively execute a timely causal analysis for a PIER issued in October 2010 related to nuclear safety analysis. Senior BNI management was informed about the difficulties in completing the causal analysis and resolving this PIER before July 2011 but did not achieve resolution of the issues, and the root cause analysis was never finalized. The PIER was not resolved until BNI was prompted by formal DOE requests, which led to development of an Integrated Licensing Strategy that addresses the applicability of DOE-STD-3009-94, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Safety Analysis*. The PIER was subsequently downgraded to a Level B PIER, and a more limited apparent-cause analysis was completed and approved. Interviews with BNI staff revealed that this extended, contentious, and poorly managed

causal analysis activity resulted in strong negative feelings among personnel in several groups, and it did not result in development of a root cause analysis commensurate with the significance of the issue.

The BNI QA organization is aware of weaknesses in project corrective action management processes and has been working on various improvement actions, but actions taken to date have not been fully successful in preventing performance deficiencies. A BNI users group has identified an appropriate set of process improvements (e.g., integrating the 23 current issues management systems) that address some of the current deficiencies. However, the group recognized that process changes will have little effect on project personnel's negative perceptions of individual PIER management or the PIER process unless management devotes serious attention to addressing employee and management behaviors and cultural beliefs.

Nuclear Safety Design and Safety Basis Personnel

The information from multiple sources, including the 2010 HSS review, the recent safety culture assessment (performed by outside nuclear professionals, as directed by the Secretary's initial response to DNFSB Recommendation 2011-1, and sponsored by BNI), and the interviews and focus group data collected by the HSS Independent Oversight team during this 2011 assessment, point to safety culture issues with personnel who are directly involved in the design and engineering functions and the nuclear safety basis analysis and review functions. The HSS Independent Oversight team identified a number of specific factors that contribute to the current state of the safety culture in some groups at WTP and that need to be addressed if ORP, DOE-WTP, and BNI are to make progress in addressing the cultural issues. As examples: there are inconsistencies between contractual documents (e.g., safety basis review procedures) and regulatory requirements; and DOE-STD-3009 was not consistently applied over the years, so part of the existing safety basis documents and some aspects of the design may not comply with DOE-STD-3009 and 10 CFR 830, impacting the ability to gain approval of the final DSA. In addition, preliminary DSAs (PDSAs) are out of date, and various reviews have highlighted significant deficiencies in PDSAs and safety basis processes in general. Further, issues related to funding of DSA development have not been resolved, contributing to uncertainty in approaches and staffing for the effort.

The above factors and other conditions (e.g., limited staff experience with the DOE-STD-3009 safety analysis) have contributed to a situation where there is often severe tension and frequent animosity within and between personnel with nuclear safety design and safety basis responsibilities. Most of these individuals are in the Environmental and Nuclear Safety (E&NS) and Engineering organizations. In essence, Engineering personnel must meet aggressive milestones (e.g., completing elements of the design) to meet their performance objectives, and must demonstrate that the design will be safe (i.e., meeting the PDSA provisions), while E&NS personnel are charged with verifying that a design is safe and compliant with the PDSA before approving the submittals. With the factors described above, neither organization has performed their responsibilities effectively; technical questions and differing opinions have not been effectively resolved because the requirements are conflicting or not commonly understood, the procedures do not match the requirements, the previous analyses (e.g., PDSAs) are not reliable, and the safety basis organization is understaffed (although requisitions for new staff have recently been approved).

Most of the above factors have been in place for ten years. However, until the past few years, it appears that safety basis documents were often not reviewed by the E&NS organization and ORP against the

requirements of DOE-STD-3009. In March 2009, a new manager was brought to WTP and assigned to E&NS. This manager had experience with and an understanding of DOE-STD-3009 methodology and later changed some of the existing expectations for safety reviews of design, engineering, and environmental documents, including expectations that reviews address DOE-STD-3009 provisions or an approved alternative – a necessity if the design is ultimately to be approved for operations. However, achieving these expectations was a challenge because of many factors, including the complex and restrictive requirements for gaining DOE approval of changes to the contract that must then be reflected in E&NS implementing procedures; the inconsistencies in requirements and procedures; and inconsistent interpretation of requirements by various DOE (ORP and DOE-WTP) and BNI managers and staff. The net effect is that the recent expectations for strict conformance with DOE-STD-3009 have resulted in increased workloads, approval delays, and missed milestones, all of which have contributed to tension and animosity within the organization. The situation has become increasingly worse as the WTP design has progressed, the PDSA has become further out of date, and the delays in safety reviews of design and engineering documents have become longer. In this atmosphere, instances where individuals perceive that their concerns about design questions are not listened to, that management does not want to hear problems, that technical dissent is suppressed, and that blame is being assigned unfairly are almost inevitable (for both Engineering and E&NS staff members). The end result is that a significant number of staff either express a general reluctance to raise issues or indicate perceptions of retaliation; the situation is not consistent with a healthy safety culture. While reconciliation of design and safety basis issues is a challenge in any project in which construction and design are occurring concurrently, the problems cited (e.g., specification and communication of requirements and interpretations) have exacerbated the ongoing challenges associated with maintaining the safety bases and reconciling design changes.

Although most of the symptoms are evident within the E&NS and Engineering departments, most of the contributing factors listed above result from actions or inactions at higher levels of ORP, DOE-WTP, and BNI management. ORP, DOE-WTP, and BNI management has not achieved timely resolution of important issues, including those discussed above; in some cases, issues have remained unresolved for about ten years. Further, typically ORP, DOE-WTP, and BNI senior managers are highly experienced but do not have specific experience in applying DOE-STD-3009 nuclear safety design and safety basis processes.

In the past few months, ORP, DOE-WTP, and BNI management have begun some promising initiatives that could lead to resolution of the underlying concerns. The Independent Oversight review indicated that the current management of the E&NS organization, and certain other BNI managers, supported by some individuals within DOE-WTP, have been a focal point of change in DOE-WTP's and BNI's very recent efforts to resolve the fundamental issues that were likely to prevent or delay efforts to develop a safety basis that could be approved under applicable regulations and DOE-STD-3009. Such actions include:

- BNI recently conducted a management workshop on safety basis requirements to raise the level of management understanding of safety basis requirements and issues at WTP.
- BNI completed a gap analysis between the safety basis procedures and DOE-STD-3009 that identified the differences in the hazard analysis provisions and provides an essential baseline for action.

- In July 2011, BNI submitted a contract change request to DOE to resolve some of the discrepancies and allow revision of the E&NS implementing procedures to align them with DOE-STD-3009. As of the time of this report, DOE had not approved the contract change.

- On September 27, 2011, the DOE-WTP Federal Project Director issued a letter to the BNI WTP Project Director stating DOE's position that DOE "has not (and will not) approve an alternate methodology to meet the requirements of 10 CFR 830…"

- BNI completed a plan, called the Integrated Licensing Strategy, to develop a regulatory-compliant safety basis and submitted it to DOE on October 31, 2011. This strategy provides an approach to resolving the findings from certain other management assessments and open technical issues. However, the pertinent action due dates in the licensing strategy are based on DOE's approval of the contract change, which was submitted July 27, 2011, and has not yet been approved.

While the above actions are positive signs, some of them have not been finalized and/or are contingent on funding and the ability to attract additional personnel with the requisite skills and experience in nuclear design and safety bases. In addition, although the above actions have the potential to address the underlying problems, significant and sustained ORP, DOE-WTP, and BNI management attention will be needed to ensure that the safety culture concerns are also addressed for personnel who are involved in design and engineering functions and the nuclear safety basis analysis and approval functions.

Factors Impacting Safety Culture for Construction Activities

In addition to the broad cultural concerns identified with various ORP and BNI groups, the HSS Independent Oversight team identified some specific concerns unique to construction activities that warrant increased management attention as ORP, DOE-WTP, and BNI work to enhance the safety culture:

- **Potential for Schedule Pressure Impacts on Safety and Quality.** A significant number of crafts personnel indicated that schedule pressures and other factors (e.g., inadequate planning, frequently shifting priorities, poor communications, inadequate work packages) have resulted in instances where safety rules, procedures, and practices were not clearly communicated or were inconsistent among WTP buildings or not followed, or where work did not meet quality standards.

- **Performance Rating System.** Interviews with construction crafts personnel indicated a widespread perception that the performance rating system used for most crafts workers, which defines the ratings that are used as a major factor in decisions about promotions and reductions in force, is arbitrary and unfairly implemented in a way that inhibits or penalizes the raising of safety and quality issues. The HSS Independent Oversight team determined that most craft (including foremen and general foremen) were not aware of a Guide describing the process, and the superintendents received no formal training on rating and ranking the crafts.

- **ORP Oversight of Worker Safety.** ORP personnel indicated that the involvement of ORP subject matter specialists in oversight of worker safety at WTP, the DOE's largest construction site, is currently limited.

Conclusions

Overall, the HSS Independent Oversight team determined that most personnel at WTP believed that safety was a high priority. However, during the safety culture evaluation, a significant number of staff within ORP, DOE-WTP, and BNI expressed reluctance to raise safety or quality concerns for various reasons. Fear of retaliation was identified in some BNI groups as inhibiting the identification of problems. Employees' willingness to raise safety concerns without fear of retaliation is an essential element of a healthy safety culture, and therefore significant management attention is needed to improve the safety culture at WTP. While EM, ORP, DOE-WTP, and BNI managers espoused support for a healthy nuclear safety culture, they do not have a full appreciation of the current culture or the nature and level of effort needed to foster a healthy safety culture, including a mature and effective SCWE, and the WTP community has not been sufficiently engaged in creating a mutually shared and desired culture. In addition to the concerns about the current safety culture, the Independent Oversight team identified significant concerns about ORP, DOE-WTP, and BNI processes for nuclear design and safety basis and for managing safety issues.

HSS Independent Oversight Team Recommendations

To achieve the needed improvements, the HSS Independent Oversight team offers two sets of interrelated recommendations. The first set provides a tiered hierarchy of recommendations, from general to specific, for enhancing various aspects of the safety culture. The second set of recommendations identifies actions that should be considered by DOE organizations and BNI to enhance various other aspects of integrated safety management, focusing on nuclear design and safety basis development and safety issues management processes. DOE organizations and BNI should evaluate the results of this Independent Oversight report in their entirety, including the culture insights, identified process deficiencies, and both sets of recommendations, in accordance with established issues management processes and initiate appropriate causal analysis, corrective actions, organizational enhancements, and effectiveness reviews as appropriate.

Part 1: Recommendations for Cultivating a Healthy Safety Culture (ORP, DOE-WTP, and BNI)

DOE defines safety culture as "an organization's values and behaviors modeled by its leaders and internalized by its members, which serve to make safe performance of work the overriding priority to protect workers, the public, and the environment." A healthy safety culture is most often found within an aligned organization that has effective processes and motivated people. While WTP organizations have attempted to improve safety culture by adapting concepts and principles from external organizations, safety culture is unique in that improvement cannot be forced by discrete procedure or policy changes that are typically used for traditional technical issues. A healthy safety culture is enacted by advocating and inculcating a set of shared core values and beliefs, facilitated through continuous communication and trust building, and supported by organizational systems, with the goal of promoting collaborative human relationships that will sustain safe organizational and individual behaviors.

The overarching recommendation for improving the safety culture at WTP is:

1. **WTP needs to establish a safety culture competence commensurate in priority to science, engineering, and project management competencies.** Safety culture competence requires that organizations:[4]

    - Have a defined set of values and principles, and demonstrate behaviors, attitudes, policies, and structures that enable them to sustainably accomplish mission goals

4 Discussion of culture competence adapted from The National Center for Cultural Competence, Georgetown University Center for Child & Human Development.

- Have the capacity to (1) value diversity, (2) conduct self-assessment, (3) manage the dynamics of difference, (4) acquire and institutionalize cultural knowledge, and (5) adapt to diversity and the cultural contexts of complex and dynamic environments

- Incorporate the above in all aspects of policy-making, administration, practice, and operations, systematically involving employees, suppliers, stakeholders, and communities

- Recognize that development of cultural competence is a process that evolves over an extended period of time. Individuals and organizations are at various levels of awareness, knowledge, and skills all along the cultural competence continuum. Consequently, a specific set of actions cannot be prescribed; a collaborative effort is required to understand and enact core principles that ensure that a healthy safety culture is developed and internalized. A number of steps can be taken that will initiate the basis for the development of the WTP safety culture competence.

In support of the above overarching safety culture recommendation, the Independent Oversight team has identified the following additional recommendations as possible steps for implementing the overarching recommendation and initiating the development of cultural competence:

2. **The WTP project organizations (ORP, DOE-WTP, and BNI) need to evaluate and clearly delineate core values for moving forward. The development and definition of these values must be made with the engagement of individuals at all organizational levels across all functional groups to ensure alignment throughout the organization.** Specific actions to consider include:

   - Identifying a consensus set of values to support the safety culture the WTP community wishes to achieve. Initiate this activity with a values definition workshop engaging representatives of the collective WTP organization. The workshop should be facilitated by an external specialist with specific knowledge and experience in culture change. The output of the initial workshop should be a draft statement of values that will then be socialized with all members of the organization, leading to a formal statement of values that will be signed by senior leadership of EM, ORP, BNI, principal BNI line managers, and employee representatives to the value identification team.

   - Conducting a facilitated workshop, based on the 2020 Vision One System Strategic Plan and the Federal Project Director's 2010 report, to identify the implicit values associated with the activities outlined in those documents. The output of this workshop should be an analysis of the values implicit in those documents.

   - Conducting a comparison of the value statement and the analysis of the document values. The values in the documents need to be reconciled to ensure that the long term strategy outlined for the project is consistent with the organization's defined values. Achieving this consistency may require modification of the 2020 Vision One System Strategic Plan.

3. **ORP (including DOE-WTP) and BNI each need to develop, implement, and continuously monitor their own safety culture, including SCWE, using the organizationally defined values as the foundation.** BNI has initiated some efforts and needs to re-evaluate its program with the following considerations:

   - Short-term: Conduct further analyses from the recent 2011 safety culture survey of BNI personnel. Shortcomings were identified in the manner in which the 2011 survey results were

analyzed. Additional statistical analyses for the various groups at WTP, as well as appropriate comparative analyses between these populations, might provide insight into some of the differences between work groups in those populations.

- Long-term: A more comprehensive, ongoing, sitewide programmatic and assessment effort focused on safety culture and SCWE that includes a more reliable and validated survey, as well as additional methods that can focus on the organizational behaviors needed to promote a healthy safety culture, would be useful. This effort can be conducted as a self-assessment or an independent assessment.

- Follow-up: DOE-WTP and ORP need to follow up on the results of this assessment of its safety culture. Multiple resources are available within the DOE complex, such as the Energy Facility Contractors Group, to provide guidance on how to establish a program and conduct continuous monitoring of its organization.

4. **ORP and BNI need to develop accountability models for their organizations.** Many individuals in management and supervision do not consistently exhibit desired behaviors and are not challenged by their managers or peers. Inconsistent implementation of standards and expectations in work activities is common and may be influenced by ineffective communication and an ineffective change management process. Significant management oversight and attention are needed to implement a performance management system that establishes accountable behavior as the accepted norm. A sitewide accountability model that is consistently implemented against clearly defined standards and expectations, that recognizes and reinforces desired behaviors, and that uses effective coaching while minimizing punitive actions for undesirable behaviors is recommended.

5. **ORP and BNI can both benefit from employee engagement in many of the activities that they regularly conduct.** Engagement needs to be implemented from lower levels of the organization and can be introduced by initiating activities that are staffed with all individuals from the same working level or by introducing new employees into existing committees and meetings. Engagement is also necessary across functional groups to promote and facilitate a better understanding and development of the organization's needs and priorities.

6. **Working with ORP and DOE-WTP, BNI should enhance capabilities in behavioral sciences to assist BNI senior management in addressing problems involving organizational behaviors and interfaces.** BNI's corrective actions for past reviews often have not addressed the underlying organizational behavior and human performance factors; these actions have tended to focus on specific technical issues or very broad safety culture fixes (e.g., "train all staff"), rather than identifying the causes of the concern and focusing on the specific organizations and groups that are impacted. BNI should consider developing and adopting a strategic approach to enhance its capabilities and competencies in organization, management, and social sciences, perhaps by obtaining external support initially and building internal staffing over the longer term. Increasingly, high-hazard organizations are including specialists with advanced degrees in organizational/industrial psychology, organizational development, human factors/human performance, and related disciplines as a necessary augmentation to a strong technical staff. Such personnel, particularly those experienced with nuclear facilities or organizations, could help BNI senior management address current issues in the nuclear safety culture and proactively identify and address changes and emerging concerns. Such personnel could apply recognized tools and techniques to identify and analyze cross-cutting

issues, recurring findings, and organizational causes. These tools can also be applied to help develop and implement efforts to perform and improve risk communications, risk-informed decision making, leadership development initiatives, and self-assessments for the enhancement of the safety culture. BNI also needs to focus more on transparency with its employees and the public to enhance trust and provide confidence that issues are being addressed.

7. **ORP, DOE-WTP, and BNI should ensure that senior managers understand the need for and direct implementation of systematic approaches to change management[5] in order to avoid or mitigate potential negative consequences resulting from significant changes in project plans, processes, and/or organization.** Specific actions to consider include:

   - Ensuring that managers with the authority to direct significant changes are trained to recognize the likelihood and nature of potential adverse consequences
   - Ensuring that managers are trained and able to develop and implement change management plans to avoid or appropriately mitigate the negative consequences of change
   - Ensuring that the authority and responsibility to direct development, approve, require implementation, and assess the effectiveness of change management plans is formally assigned
   - Applying recently-developed BNI change management guidance or other proven change management processes, preferably with the support of behavioral science personnel as recommended above, to manage the changes that will occur while resolving current problems and underlying factors in such areas as transitioning to a DOE-STD-3009 compliant hazard analysis and safety basis, revamping the design and safety basis processes, and revising the rating system for craft personnel
   - In the longer term, proactively applying change management principles to the design and development of the 2020 Vision One System for WTP Project Transition to Operations and in other aspects of the ongoing transition from design to commissioning and the eventual transition to an operating facility.

Part 2: Recommendations for Enhancing Selected Integrated Safety Management Processes

In addition to evaluating the current safety culture at WTP, the Independent Oversight team was tasked to evaluate ORP, DOE-WTP, and BNI management of safety concerns. During the course of the review, the Independent Oversight team also identified concerns about nuclear design and safety basis processes and certain other aspects of integrated safety management. The Independent Oversight team identified the following recommendations for improving various WTP processes and the primary organizations to which they apply.

5 Change management is used in the sense described in International Atomic Energy Agency publication "MANAGING CHANGE IN THE NUCLEAR INDUSTRY: THE EFFECTS ON SAFETY, INSAG-18, IAEA 2003" and in Nordic Nuclear Safety Research document "MANAGEMENT OF CHANGE IN THE NUCLEAR INDUSTRY – Evidence from maintenance reorganizations," NKS 119, March 2006.

ORP, DOE-WTP, and BNI

1. **Evaluate and address factors that adversely impact the design and safety basis processes.** ORP and BNI have recently initiated efforts that are appropriate to address many of the current concerns about the design and safety basis processes, including the recent training for managers; the September DOE-WTP letter clarifying expectations for compliance with DOE-STD-3009-94, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Safety Analysis*; and the ongoing efforts to modify the contract. However, these actions need to be systematically analyzed and managed as a part of the BNI/ORP Risk Management Plan, required by DOE Order 413.3A, *Program and Project Management for the Acquisition of Capital Assets*, to ensure that they will be effective, complete, supported by management, communicated, and universally understood and accepted by the key managers and staff. Additional actions are needed to establish effective processes for updating the PDSA and modify various safety basis procedures to ensure that they support the intended objectives.

2. **Develop and implement a strategic approach to enhance management's and the professional staff's understanding of DOE expectations for the nuclear design and safety basis processes.** Some personnel at ORP, DOE-WTP, and BNI have experience working on nuclear design and construction projects, but a significant number of managers and staff with responsibilities for the safety bases have limited previous experience with design and safety basis processes using DOE-STD-3009. This situation has contributed to problems with the nuclear design and safety basis processes (e.g., inconsistent direction and understanding of the applicable hazards analysis requirements) and culture (e.g., organizational interfaces) that have persisted for many years. The recent training/workshop efforts by E&NS management and others at WTP have helped provide BNI management with a better perspective on nuclear design and safety basis process expectations, but more such efforts are needed to ensure consistent and effective understanding of the nuclear safety design and safety basis processes at all levels of management and staff. In addition, more diligence is needed to support those managers and staff with direct responsibilities for nuclear design and safety in internalizing the expectations and lessons learned for a healthy nuclear safety culture and SCWE. ORP and BNI should develop a strategic approach to enhance staff capabilities for targeted groups of ORP and BNI management and staff (especially those with design, engineering, and safety basis responsibilities), including focused training efforts, targeted mentoring programs, increased emphasis on qualification requirements for current and future open job positions, and clear performance objectives related to nuclear safety and safety culture in organizational and individual performance evaluation processes.

Headquarters EM

3. **Finalize the WTP Project Execution Plan.** Ensure that the proposed Revision 1 to the WTP Project Execution Plan is reviewed, modified as needed, finalized, and approved in a timely manner so that ORP and DOE-WTP personnel are operating in accordance with an approved document that clearly defines expectations for ORP and DOE-WTP, including nuclear safety responsibilities and interfaces.

ORP and DOE-WTP

4. **Evaluate and address factors that may adversely impact the clarity and understanding of responsibilities and expectations for ORP staff.** Specific actions to consider include:

   - Completing changes to the BNI contract to eliminate inconsistencies and clarify DOE expectations for full compliance with DOE-STD-3009. Closely monitor BNI's implementation of this standard, and use incentive fees as appropriate to obtain the desired performance.

   - Establishing a process to ensure that Federal employee performance awards are used to encourage desired behaviors. Consider the use of an awards committee, chaired by the ORP Manager and WTP Federal Project Director, for annually setting criteria and determining awards to celebrate desired behaviors. Use performance awards to recognize Federal employees who demonstrate good safety culture.

   - Continuing the efforts to improve communications between DOE-WTP and ORP support organizations. Focus on team building to encourage working together to achieve common objectives.

   - Providing training to managers and supervisors to enhance capabilities in behavioral sciences and aid in creating and maintaining a SCWE.

   - Continuing the efforts to better define the roles and responsibilities of the Federal staff. Revise the FRA to comply with DOE Order 450.2, *Integrated Safety Management*. Consider memoranda of understanding in areas where past performance indicates the need, such as resolution of WTP operational readiness vulnerabilities identified pursuant to Washington River Protection Solutions (WRPS) Contract Line Item 3.2.

   - Establishing milestone dates and responsibility assignments for completing planned initiatives, such as SCWE training and culture surveys.

   - Re-evaluating the current level of involvement of ORP subject matter specialists in oversight of worker safety and health at WTP construction areas. Ensure that organizational responsibilities are clarified and implemented in a manner that provides for adequate ORP oversight of worker safety and health.

   - Ensuring that expectations for Federal oversight of BNI safety culture are defined and communicated, including consideration of performance measures, a process for routinely assessing the effectiveness of BNI efforts to strengthen its safety culture, and a mechanism for tracking and validating BNI actions to improve safety culture and related processes.

   - In making any changes, ensuring that the ORP group that reviews safety basis submittals maintains an appropriate degree of independence from project management priorities and schedules.

5. **Develop and implement a strategic approach to ensuring that performance incentives are aligned with nuclear safety.** In addition to considering nuclear safety requirements, the goals and performance incentives for ORP and DOE-WTP managers should explicitly consider nuclear safety, including efforts to establish a healthy nuclear safety culture. The BNI contract fee structure

should also be reevaluated to ensure that nuclear safety and quality of design and construction are appropriately weighted and promote the desired objectives. As one possible measure, progress milestones might include provisions to ensure that the design and safety bases are aligned and that the safety basis demonstrates a safe design as part of the progress payments evaluation.

6. **Apply additional Federal management attention to improve the timeliness and effectiveness of corrective actions.** Specific actions to consider include:

   - Tracking the status of assigned actions, monitoring performance, and holding Federal managers and contractors accountable when clearly-defined expectations are not met
   - Communicating to BNI and ensuring appropriate and timely resolution of the operational readiness vulnerabilities identified in 2010 and 2011 by WRPS pursuant to Contract Line Item 3.2
   - Assigning and tracking actions to address DOE commitments to the DNFSB and actions planned in response to recommendations from other external organizations
   - Assessing the WRPS issues management program with an emphasis on PIERs to determine whether issues are initiated as required, appropriate causal analysis is performed, corrective and preventive actions are appropriate, and closure is adequate and timely.

Richland Operations Office

7. **Strengthen the employee concerns program.** Ensure that RL procedural guidance is provided to adequately safeguard the confidentiality of employee concerns program participants, and also define when ORP management approval of referrals is required. Check and validate all concerns with the originator before issuing formal correspondence or referral.

BNI

8. **Strengthen the implementation of the corrective action management program.** Specific actions to consider include:

   - Conducting a comprehensive independent assessment or assessments of the implementation of the various elements of the corrective action management program (i.e., PIER initiation, significance categorization, analysis, action development, closure, and effectiveness review) to more fully characterize the nature and extent of implementation problems.
   - Reviewing and clarifying as needed the definitions and guidance for determining PIER significance levels to promote more consistent and accurate categorization.
   - Reviewing project procedures and guidance to ensure that extent-of-condition and cause evaluations are considered in resolving non-conformance reports and construction deficiency reports and that trend analyses of these documents are rigorous and comprehensive in order to ensure that the needed recurrence controls are identified and implemented.
   - Reviewing, and revising as appropriate, Trend Analysis and Reporting procedure GPP-MGT-050 to add a process for formally performing periodic project-wide trend analysis; provide more

detailed requirements and guidance on analysis and reporting processes; and require individual organizations to develop formal internal procedures detailing responsibilities, process steps, and outputs for their trending activities. Establish specific requirements for formal analysis reporting, both for individual organizations and for the project, addressing periodicity, content, format, and distribution/presentation.

- Establishing a structured, project-level, ongoing monitoring program by subject matter specialist(s) to review in-process and completed PIERs to grade their quality and provide feedback to responsible individuals, organizations, and senior management. Adjust sample size and organizational focus based on performance trends. Establish a grading system for various elements of the PIER process that will provide metrics supporting the identification of progress and areas needing greater attention.

- Evaluating current guidance and requirements for conducting root and apparent cause analysis to identify areas for simplification and remove barriers that may be adversely influencing the assignment of PIER significance levels. Consider simplifying the expectations for apparent cause analysis, and eliminate expectations for developing "judgments of need" in addition to recommended corrective/preventive actions.

- Conducting a formal root cause analysis of the problems associated with the safety basis issues described in PIER MGT-10-0999 to identify needed recurrence prevention controls.

- Including a specific Performance Improvement Review Board agenda item to identify and remove barriers to resolving and holding managers responsible for overdue critical path actions, such as the long-delayed causal analyses identified in this report.

- Ensuring that resolution of the PIER users working group's recommendations for "capturing" management and employee attention regarding issues management is assigned to the WTP Director's Office, because these issues must be owned by the complete senior leadership team.

- Specifying that the senior leadership team needs to ensure adequate resources to support timely and effective implementation of the necessary process improvements and the enhanced monitoring and mentoring activities necessary for the desired fully-effective corrective action management system.

9. **Strengthen the implementation of the BNI employee concerns program.** Include a formal second-party review of completed investigation reports to ensure that all aspects of the concerns have been identified and sufficiently addressed, that any additional issues raised during the investigation have been appropriately documented and dispositioned, and that any actions identified or taken are adequate to fully address the concerns.

10. **Strengthen the BNI differing professional opinion program.** Specific actions to consider include:

    - Reviewing and revising procedure GPP-MGT-023 to address the weaknesses identified in this report

    - Ensuring that in each case a documented review is performed to identify why lower-level formal and informal issues management processes were unable to resolve issues before they

escalated to the level of a formal differing professional opinion investigation. Establish any needed corrective actions.

11. **Strengthen the BNI management workplace visitation program.** Specific actions to consider include:

    - Reviewing GPP-MGT-062 and revising it as appropriate to address the misalignment between stated objectives and actual implementation results. Consider including some level of periodic analysis of the observation data gathered by the management walk-around teams to characterize what information and conclusions the program is providing to management regarding the project safety culture and employee performance with respect to safety, quality, compliance, and other objectives specified in the procedure. Emphasize expectations to focus on increasing direct interaction and feedback between senior management and employees and promoting management presence in the field to observe work performance and physical conditions.

    - Developing methods to ensure regular participation by all leadership team members, such as pre-assigning the membership of small teams (with target dates and locations) in an annual schedule, to facilitate schedule coordination and participation. Provide more definitive expectations for all members of the senior leadership team to routinely participate in these activities.

    - Taking action to ensure that the required formal documentation of visitation reports is completed in a timely manner, is legible, and reflects consolidated results as required by the procedure.

12. **Evaluate and address selected aspects of safety management processes governing the work of construction craft workers.** Specific actions to consider include:

    - Re-evaluating the implementation of the craft rating system to ensure that the process is perceived as fair and non-retaliatory for workers raising safety or quality concerns, including allowing workers to have more information about how the ratings were established and providing periodic feedback on their performance.

    - Investigating and addressing the view that managers allow or encourage workers to "cut corners" on worker safety and health or construction quality requirements and safety practices to meet schedules. Actions may include clarification of expectations, focused safety audits, assessment of the roles of supervisory personnel, increased management accountability, and increased efforts to solicit worker feedback on safety program implementation in a manner that allows anonymity.

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1 Introduction

The U.S. Department of Energy (DOE) Office of Enforcement and Oversight (Independent Oversight), within the Office of Health, Safety and Security (HSS), conducted an independent assessment at the DOE Waste Treatment and Immobilization Plant (WTP) to evaluate the current status of the nuclear safety culture and the effectiveness of DOE and contractor management in addressing nuclear safety[6] concerns at WTP. This assessment provides DOE management with a follow-up on the October 2010 HSS review of the WTP nuclear safety culture.

This assessment also satisfies a Secretarial commitment to the Defense Nuclear Facilities Safety Board (DNFSB) related to DNFSB Recommendation 2011-1, *Safety Culture at the Waste Treatment and Immobilization Plant*. Specifically, in a letter to the DNFSB dated June 30, 2011, the Secretary of Energy directed HSS to conduct a follow-on safety culture review at WTP as part of a broader extent-of-condition review across the DOE nuclear complex. As part of the planning for this review, DOE senior management tasked the HSS Independent Oversight team to examine the effectiveness of actions taken at WTP since the 2010 HSS report to address safety concerns. HSS accelerated the schedule for the follow-up assessment in response to a request from the Assistant Secretary for Environmental Management (EM-1) in an August 2011 letter, citing the serious concerns that had been raised about the safety culture at WTP. As part of a broader extent-of-condition assessment and based on the results of this assessment, the HSS Independent Oversight team will perform additional assessment activities at DOE Headquarters to gather additional information about the role of Headquarters line management organizations in safety culture and management of safety issues at WTP.

Currently, WTP is in the design and construction phase, with the plan of transitioning to an operating nuclear facility in 2019. Although WTP is not yet processing radioactive materials, WTP personnel are currently making design decisions and developing a safety basis to demonstrate that WTP can be operated safely, and WTP personnel are also procuring, installing, and constructing structures, systems, and components (SSCs) that will be relied on for safe operation of an extraordinarily complex set of nuclear facilities. If these functions are not performed correctly and with high standards of quality, the safety of the WTP could be compromised during future operations by latent failures in design or safety analysis or in the installed SSCs. Therefore, a healthy safety culture, one in which employees feel empowered to raise safety questions without fear of retaliation, is essential at WTP.

Senior DOE management has recently taken visible actions in support of a strong safety culture. The Secretary of Energy and the Deputy Secretary of Energy issued a memorandum on December 5, 2011,

6 The term "nuclear safety" includes the quality of design, engineering, and construction of nuclear facilities at WTP.

on nuclear safety at DOE, which emphasized DOE expectations for a healthy safety culture. The Deputy Secretary of Energy visited WTP in July 2011 and emphasized the importance of safety, a questioning culture, and freedom to raise safety concerns without fear of retribution.

As the Independent Oversight team was completing its review of WTP, DOE issued its DOE Implementation Plan for DNFSB Recommendation 2011-1 (dated December 27, 2011). Among other things, the Implementation Plan identifies needed improvements in translating DOE's high level policy expectation for a healthy safety culture into detailed guidance for implementing that expectation. Although not a focus of this progress assessment, the results of this Independent Oversight assessment confirm the need for better definition and communication of expectations for actions needed to ensure a healthy safety culture for both DOE organizations and contractors.

1.1 Background

WTP Organizations

Within DOE, the Headquarters Office of Environmental Management (EM) has line management responsibility for WTP and most other activities at the Hanford Site. At the site level, DOE line management responsibilities for WTP have been assigned to the DOE Office of River Protection (ORP). The DOE Richland Operations Office (RL) and ORP have a joint employee concerns program (ECP), which encompasses the Hanford Site, and is administered by RL.

Formal assignment of responsibility for WTP activities remains with ORP. However, in practice, the DOE WTP Project Office (DOE-WTP) has been established to oversee most WTP activities and provide line management direction to the WTP contractor. DOE-WTP was reorganized in late 2010 (at about the same time HSS conducted its 2010 review) to provide more organizational focus on WTP and independence within ORP. It is now an organizational element within ORP and is led by the DOE WTP Federal Project Director (FPD). FPD and DOE-WTP responsibilities and interfaces are defined in a revision to the Project Execution Plan (PEP), but the revision has not yet been formally approved. In practice, the FPD has been implementing the draft revised PEP, which has the project functionally reporting directly to EM-1 as the Program Secretarial Office, with a direct line of communication to the Deputy Secretary of Energy as the Acquisition Executive. With this arrangement, DOE-WTP currently functions largely autonomously within ORP at the direction of FPD.

DOE-WTP personnel carry out most onsite DOE line management responsibilities for WTP, but certain important safety-related functions are performed by ORP. Most significantly, a nuclear safety organizational element within ORP has primary responsibility for reviewing and approving contractor submittals for nuclear safety basis documents and related analyses. Because DOE-WTP's activities are largely autonomous, Independent Oversight strived to be specific in distinguishing DOE-WTP activities from those performed by other elements of ORP.

Under contract to DOE, Bechtel National, Incorporated (BNI) is designing and coordinating the construction of the WTP. URS Corporation is a major subcontractor to BNI and performs a significant fraction of the design and safety basis work. BNI intends BNI and URS personnel to work closely together, and in practice BNI and URS personnel are intermingled. For example, BNI personnel may

work in an organization with a URS supervisor, or vice versa. BNI also has several other subcontractors and consultants at the WTP.

WTP Functions and Status

The WTP will be used to transform radioactive wastes into a stable glass form for disposition, using a process called vitrification. About 56 million gallons of highly radioactive and hazardous chemical and radioactive wastes are currently stored in underground tanks at the Hanford Site. Some of the tanks are single-wall containers that present a risk of leaking radioactive materials into the ground, where they could eventually reach the Columbia River. Removing the radioactive materials from the tanks and processing them into a stable form is one of DOE's highest priorities and is required by the Hanford Federal Facility Agreement and Consent Order Tri-Party Agreement (more commonly called the Tri-Party Agreement). Timely completion of the WTP project is an essential element of DOE's approach to meeting the Tri-Party Agreement milestones and addressing legacy tank waste hazards.

Located on the Hanford Site in southeastern Washington State, WTP is DOE's largest ongoing construction project, with an estimated cost of over $12 billion and a current workforce of about 3000. According to information provided by the BNI website, the WTP project is more than 60 percent complete, design of the plant will be complete by 2013, construction will be complete in 2016, and all facilities and systems will be fully operational and begin the process of vitrifying tank waste by 2019. Recent DOE project reviews, however, indicate that the WTP project is likely to incur further delays and cost increases of $800-900 million, partly because of identified technical issues and uncertainties.

For the WTP project, DOE decided to implement a "design-build" approach in which significant construction efforts are undertaken in parallel with the design efforts. The goal of this approach was to complete the WTP sooner, thus allowing DOE to meet milestones for addressing tank waste hazards and reducing the environmental and safety risks associated with the hazardous wastes in the tank.

Background on Nuclear Safety Issues

Since work began on the WTP in the late 1990s, a number of nuclear safety issues have had a direct or indirect impact on the nuclear safety culture. The following brief summary of some of the most important issues – identified during contractor assessments and during reviews by DOE organizations (including ORP and HSS) and non-DOE organizations, such as the DNFSB – provides context for understanding the results of this assessment.

In the mid-2000s, certain structures and components had to be strengthened to ensure that WTP met seismic standards, and certain piping had to be replaced because of quality assurance (QA) deficiencies. These delays contributed to cost increases for the project and caused DOE and BNI to accelerate the remaining efforts in an attempt to meet the Tri-Party Agreement milestones.

HSS enforcement activities identified concerns about safety-related design and quality functions, dating back to 2002, that are documented in three enforcement actions and one consent order. These enforcement activities identified non-compliances in various aspects of design, procurement, and QA of components important to nuclear safety; examples include failure to adhere to design codes documented in facility safety requirements, failure to follow requirements, inconsistent design and procurement specifications, failure to use appropriate suppliers, failure to correct deficient conditions, and failure to identify discrepancies between procurement specifications and authorization bases. The HSS enforcement

documents also cited contributing factors that raised questions about the safety culture at BNI, such as procurement decisions that were driven by cost and schedule rather than giving priority to nuclear quality requirements, and staff who lacked sufficient experience to properly consider nuclear quality in making project decisions.

A number of identified technical issues (including design questions that could impact safety) have taken considerable effort to address, and some are still being evaluated. Most notably, in 2006, an external panel identified 28 technical issues involving the WTP design. By the time of the 2010 HSS review of the safety culture, DOE and BNI had completed the analysis and closed 27 of the 28 technical issues. The remaining issue, referred to as the M3 issue or the *Pulse Jet Mixing Design* issue, addressed the adequacy of the systems that ensure adequate mixing of materials in the Pre-Treatment Building of the WTP, both to promote efficient operations and to prevent buildup of flammable gases or accumulation of fissile material in the bottom of tanks. Inadequate mixing could violate the assumptions, parameters, or controls that the WTP safety bases have established to prevent gas explosions/deflagrations and criticality accidents. Although the broad M3 issue was categorized as closed, a number of related or subordinate issues were developed and tracked to provide additional assurance or confirmation that the uncertainties in the mixing issue are sufficiently understood.

In 2010, BNI and ORP identified additional small-scale testing to gather data about the mixing process. They also specified hold points in the construction process to examine the test results to determine whether the additional testing would confirm the adequacy of the design. Subsequently, in response to DNFSB concerns and internal DOE discussions, WTP personnel made some design changes and developed a plan for large-scale testing of the pre-treatment mixing systems.

One ORP engineer has filed a differing professional opinion (DPO) that documents concerns about the technical issues and related management decisions. The DPO indicated that the initial test results raise additional concerns about the viability and safety of the mixing system design. One specific concern raised in the DPO is that the system changes that are designed to enhance mixing could have the undesired side effect of increasing the erosion rate within the mixing system, which could cause premature failure of components and/or other difficulties in demonstrating the safety of the system.

While aware of the technical uncertainties and recognizing the possibility that their decisions could result in significant rework, DOE-WTP and BNI recently decided to proceed with certain activities, such as welding heads on vessels. Some staff and external organizations have cited this decision as an indicator that management places priority on schedule over safety. DOE-WTP and BNI managers, however, have indicated that such decisions will not compromise safety (e.g., if testing and analysis demonstrate that the system cannot be shown to be safe, they will take the necessary actions, including significant redesign and rework) and that the recent decisions were made based on an informed perspective on project risks, schedules, and costs. However, DOE-WTP and BNI management did not effectively communicate to stakeholders the rationale for this decision, nor did management communicate the fact that the action was reversible if ongoing analysis concluded that the design needed to be modified.

Background on Safety Culture Issues and Initiatives

BNI, in coordination with ORP and DOE-WTP, has a longstanding effort to establish and sustain an effective safety culture. BNI established its Nuclear Safety and Quality Imperative (NSQI) in response to a 2005 ORP assessment that identified a number of systemic weaknesses in the WTP project and

concluded that the underlying cause was a "less than adequate nuclear safety and quality culture." Major focus areas of the NSQI included: (1) development and implementation or improvement of project systems, especially for procedures and procedure compliance and the management of issues and concerns; and (2) communication efforts on the importance of various aspects of a nuclear safety and quality culture. In the 2005-2010 time frame, BNI performed a number of assessments of the safety culture and an annual employee survey.

In 2009, based on a review of prior assessments and corrective actions, BNI concluded that the culture of safety and quality at WTP had improved as a result of NSQI initiatives and actions. However, BNI also concluded that aspects of the nuclear safety culture needed to be strengthened as the project was transitioning from the engineering, procurement, and construction phase to the startup, commissioning, and operating phase. Consequently, BNI established a Nuclear Safety and Quality Culture (NSQC) working group in early 2010, with representatives from many WTP organizations, to identify a set of actions to achieve and sustain an effective nuclear safety culture and a strong, safety conscious work environment (SCWE) at WTP. These actions were in various stages of development and implementation at the time of the HSS review in 2010.

In 2010, a URS contractor employee raised several concerns in a letter to the DNFSB, questioning the safety and reliability of the WTP. This whistleblower letter prompted EM-1 to ask HSS to review the nuclear safety culture at WTP. The 2010 HSS independent review identified a number of concerns, including pockets[7] of individuals within the WTP who believed that BNI management had created a "chilled" atmosphere (an environment that discourages questions or safety concerns and promotes fear of retaliation for raising safety issues), as well as some deficiencies in processes for managing safety issues. After the 2010 review, EM Headquarters management accepted the HSS report and directed BNI to address the recommendations. ORP and BNI developed corrective actions that were intended to address the HSS recommendations and integrated the corrective actions into their NSQC improvement initiatives.

In 2011, DNFSB Recommendation 2011-1 identified weaknesses in the nuclear safety culture at WTP and recommended that management "Assert federal control at the highest level and direct, track, and validate the specific corrective actions to be taken to establish a strong safety culture within the WTP Project consistent with DOE Policy 420.1 in both the contractor and federal workforces."

DOE accepted the recommendation and exchanged letters with the DNFSB to clarify the intent of the recommendation. DOE is working on a formal implementation plan, and the Secretary's direction that HSS perform this Independent Oversight review is part of the response actions.

DOE's initial response to DNFSB Recommendation 2011-1 (transmitted in a June 30, 2011, letter to the DNFSB from the Secretary of Energy) also committed that DOE and BNI would jointly sponsor an "executive-level assessment of the project's nuclear safety culture" to be conducted by a group of experienced nuclear industry subject matter professionals. Subsequently, the DNFSB and others raised questions about the independence of a team that would be sponsored by BNI. In a September 19, 2011, follow-up letter to the DNFSB, DOE indicated that it would "monitor and cooperate with – but not partner in – the BNI review" and would gauge the validity of the BNI process and examine the results

7 In the context of the 2010 HSS review, "pockets" referred to groups within the organization that had significant numbers of personnel who expressed concerns to the extent that HSS believed that the concerns were not isolated and warranted significant management attention.

for relevant findings. In the same letter, DOE indicated that HSS would perform an independent, DOE-directed assessment of the status of the nuclear safety culture at WTP.

The DOE-directed, BNI-sponsored team of nuclear safety professionals completed its activities and reported its review results in a report dated November 30, 2011, which was provided to DOE and BNI.

In November 2011, a URS manager filed a complaint with the Department of Labor, alleging retaliation for trying to adhere to safety requirements and for providing testimony contrary to DOE positions at a DNFSB public meeting.

The WTP project is experiencing budget uncertainty and reductions in staffing. Schedule and cost pressures and uncertainties impact workers' job security, attitudes, and anxiety level. These conditions need to be factored into the evaluation of the current safety culture.

1.2 Scope and Methodology

This Independent Oversight assessment covers the DOE and contractor organizations at the Hanford Site that have responsibilities for WTP activities. Within DOE, the focus was on ORP and DOE-WTP. The HSS Independent Oversight team also examined the relevant programs managed by RL (e.g., the ECP). The review of BNI included its primary subcontractor, URS. The assessment was led by an experienced HSS manager. Onsite data collection was conducted primarily by HSS staff, with support from an external independent specialist in group dynamics and focus groups.

In designing and conducting this 2011 assessment, the HSS Independent Oversight team considered the results and scope of the 2010 HSS review, which determined that problems with the safety culture were not widespread but that there were significant pockets of personnel that had concerns about retaliation and suppression of safety issues. In this 2011 review, the HSS Independent Oversight team devoted particular attention to those pockets – most notably those in the Environmental and Nuclear Safety (E&NS) and Engineering organizations – including examining the cultural perceptions of individuals in these organizations in light of the complex technical issues and safety basis framework. Considering the advice of the external independent safety culture experts and other factors, the Independent Oversight team decided to include all site personnel in the scope of the safety culture assessment.

The Independent Oversight team also designed its evaluation to encompass the impacts of the 2010 whistleblower event. Specifically, the focus groups and interviews were performed in a manner that allowed individuals to raise issues that were significant to them. For instances where individuals raised the issue of the 2010 whistleblower event or related concerns, the Independent Oversight team prepared questions designed to probe the concerns to develop a better understanding of the perceptions of the workforce.

In accordance with the Secretary of Energy's direction, the scope of the Independent Oversight review included two major areas:

- **Evaluation of the Current Nuclear Safety Culture at WTP.** The safety culture assessment data was analyzed by external independent safety culture experts. This analysis is summarized in Section 2, and the detailed results are presented in the supplemental volume of this report (Appendix A).

- **Management of Safety Concerns.** The HSS Independent Oversight team's assessment of ORP's (including DOE-WTP's) management of safety issues is summarized in Section 3, with additional details provided in the supplemental volume of this report (Appendix B). The HSS Independent Oversight team's assessment of BNI's management of safety issues is summarized in Section 4, with additional details provided in the supplemental volume of this report (Appendix C).

As the assessment progressed, the HSS Independent Oversight team evaluated information from various sources, including the external evaluation of safety culture (i.e., the effort directed by the Secretary, sponsored by BNI, and documented in a report dated November 30, 2011); the identified technical issues, issues management processes, and corrective actions; document reviews; interviews; and observations of various site activities (e.g., safety meetings). The Independent Oversight evaluation determined that there are continuing concerns about the safety culture at WTP and identified a number of factors that contribute to the continuing concerns, as discussed in Section 5. Recommendations that identify potential methods for enhancing the safety culture and that target the factors that are impeding effective resolution of safety concerns at WTP are provided in the front of this report, immediately after the Executive Summary.

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2 Current Safety Culture

This section summarizes the results of an evaluation of the existing safety culture at the WTP. To ensure a valid and effective assessment of the existing safety culture, HSS sponsored external independent safety culture experts to analyze various sources of data and perform the independent evaluation.

2.1 Background

Before starting the assessment, HSS enhanced its capability to assess safety culture processes and capability, through consultation with the U.S. Nuclear Regulatory Commission (NRC), several nuclear power generating utilities, and associated support organizations to benchmark their processes. Recognizing that it has significant expertise in nuclear safety and issue management but limited on-staff expertise in systematic application of behavioral science-based methodologies for performing safety culture assessments, the Independent Oversight team added an HSS human performance specialist as an advisor to the team. HSS also contracted with an external professional sociologist with a strong background in both organizational research and design and group dynamics to provide support on training and data collection and contracted with an external company that specializes in human performance analysis.

The external company that specializes in human performance analysis – Human Performance Analysis Corporation (HPA) – provided its two principals to help design the approach for data collection, analyze the data, and independently evaluate the safety culture. Both of the individuals have extensive experience in the development and application of safety culture assessment methodologies used by commercial nuclear and other industries. The credentials of the company and its principals are provided in Section 6.

With the guidance of the external independent safety culture experts, the Independent Oversight team selected a methodology for the assessment that provides an objective and systematic measurement of the organizational behaviors that impact safety performance, using multiple data collection tools to assess organizational behaviors. These tools include functional analysis, semi-structured focus group and individual interviews, observations, and behavioral anchored rating scales. The Independent Oversight team also arranged for the external independent safety culture experts to conduct a culture survey for ORP (including DOE-WTP) personnel[8] using commonly used survey tools and techniques. The culture survey was conducted and analyzed by the HPA external independent safety culture experts.

8 The Independent Oversight safety culture survey tool was limited to Federal personnel in order to avoid overlap and confusion with a parallel survey administered to contractor personnel in the same time frame. The survey for contractor personnel was sponsored by BNI, performed by a survey organization, analyzed and reported by a law firm (Pillsbury) under contract to BNI, and used as an input for the BNI-sponsored quality culture review.

The external independent safety culture experts trained HSS staff on applying the data collection techniques and conducting focus group interviews. In addition, the external professional sociologist provided training, both before and during data gathering activities, and supported data collection efforts by facilitating focus group interviews and using a structured approach to record and analyze data.

The HPA safety culture experts were tasked to analyze the data collected during the functional analysis, interviews, focus groups, and observations conducted by the external independent safety culture experts and HSS staff along with the safety culture survey implemented by the external independent safety culture experts in accordance with their established methodology. The safety culture evaluation by the external independent safety culture experts is summarized in the remainder of this section and provided in its entirety in the supplemental volume of this report as Appendix A. The recommendations by the external independent safety culture experts are included in the recommendations following the Executive Summary of this report.

2.2 Scope and Methods

The population addressed in the evaluation included all employees, both Federal and contractor, in ORP, DOE-WTP, and BNI. The evaluation was conducted from September through November 2011. The primary objective of the evaluation was to provide information regarding the status of the safety culture at WTP project. The applied framework was the one recently described by the NRC. The evaluation was conducted using the same methodology that aligns with the current NRC procedures for independent safety culture assessment. Positive observations and areas in need of attention with respect to the traits necessary for a healthy safety culture are presented. Conclusions regarding the information collected on the safety culture traits are also presented to facilitate the identification of improvement strategies. Finally, recommendations are provided for some initial steps that the external independent safety culture experts believe are necessary to effectively implement and execute the actions that will result in improved safe and reliable performance.

The safety culture components important for the existence of a healthy safety culture within a nuclear facility have been identified (INSAG-15, 2002; Institute of Nuclear Power Operations Principles for a Strong Nuclear Safety Culture, 2004; NRC Inspection Manual 0305, 2006). The NRC and its stakeholders have recently agreed upon nine traits that are viewed as necessary in promoting a positive safety culture. These include: leadership safety values and actions, problem identification and resolution, personal accountability, work processes, continuous learning, environment for raising concerns, effective safety communication, respectful work environment, and questioning attitude. Particular behaviors and attitudes have been identified to evaluate the extent to which the organization has attained these traits.

While the methodology used in this evaluation was based upon work originally developed with the support of the NRC to assess the influence of organization and management on safety performance, the methodology has also been effectively implemented in non-nuclear organizations, such as mining, health care, research, engineering, and transportation. The methodology entails collecting a variety of information that is largely based upon the perceptions of the individuals in an organization, as well as conducting observations of individuals performing work activities. Perceptions are often reality when it comes to influencing behavior and understanding basic assumptions. Therefore, the data collected regarding individuals' perceptions are critical to this type of evaluation.

The external independent safety culture experts recognize that ORP and BNI are making efforts to resolve many of the technical issues that are encumbering the WTP project. These activities are taking place under intense scrutiny by numerous stakeholders and external organizations. However, the lack of consideration of organizational and cultural considerations will not facilitate the project's forward movement or make ORP's and BNI's efforts as successful as they could be. The external independent safety culture expert's independent analysis offers the following conclusions that will provide insight into some of the difficulties the WTP project may be encountering.

2.3 ORP (including DOE-WTP)

ORP is perceived by many to have a strong focus on nuclear safety. While many interviewees indicated that their line management was supportive of their challenging conditions and activities, the Independent Oversight team concluded that there is a lack of full engagement on the part of ORP senior management in the area of safety culture. There is a perception that the value of safety is sometimes degraded in the presence of schedule and cost pressures. ORP senior management has not addressed delays in the implementation of the corrective actions from the previous HSS assessment as well as from the DNFSB Recommendation. In addition, ORP management has not provided clear direction to ORP staff on the importance and implementation of safety culture into their oversight activities.

The organizational separation of the DOE-WTP organization from the rest of the ORP organization has created difficulties in the communication, coordination, and cohesiveness of the implementation of DOE standards and oversight of BNI. Questions concerning how DOE-WTP is managing the project, what impact their decisions are having on the project, who is in control of the project, and ultimately who will deliver the project remain unanswered for many of ORP's employees and stakeholders.

While the external independent safety culture experts determined that there is no fear of retaliation in the ORP work environment, there is a strong indication of an unwillingness and uncertainty among ORP staff about the ability to openly challenge management decisions. There are definite perceptions that the ORP work environment is not conducive to raising concerns or whether management wants to or willingly listens to concerns. Most ORP staff members also strongly believe that constructive criticism is not encouraged.

2.4 BNI

The external independent safety culture experts recognize that BNI has recently initiated several activities designed to enhance safety culture across the organization. However, the external independent safety culture experts identified significant cultural differences within the BNI organization that will inhibit the success of these activities if they are not appropriately addressed. These differences were identified in groups in both the "Manual" and "Non-Manual" worker populations. The differences are predicated upon the groups' perceptions and priorities around the value the organization places on safety. If BNI is to succeed in implementing some of its initiatives involving the enhancement of safety culture, it must first acknowledge these organizational safety culture differences and work toward having all groups, on all organizational levels, share the same values and perceptions.

The external independent safety culture experts determined that there is a lack of consistency in the behavior of BNI's supervisory and management personnel. This behavior has resulted in the inconsistent

implementation of the desired expectations and standards across the BNI organization. The external independent safety culture experts identified informality with respect to the expectations used in determining the behavior that supervision and management must model for their staff and the methods that are employed to hold all employees accountable for the desired behaviors. Clear and consistent communication of standards and expectations is needed across the BNI organization.

The external independent safety culture experts observed that the BNI organization has become very adept in portraying itself in the most favorable position possible. This is a behavior learned and reinforced given the circumstances (numerous external stakeholder expectations) that it has to confront on a regular basis. While the organization does not deny that it is dealing with significant issues, it handles the communication of these issues in such a way as to diminish their importance. This behavior is not lost on BNI's employees or stakeholders and may be contributing to a lack of trust and the perception of denial by those involved with the organization. The external independent safety culture experts determined that BNI needs to be more forthcoming and transparent with its employees and the public if trust is to improve and if its legitimate efforts are to be successful.

The external independent safety culture experts determined that there is some reluctance to raise concerns and issues across the BNI organization. Fear of retaliation was identified in some groups as inhibiting the identification of problems. Employee engagement in decision making, development of policies and procedures, and the implementation of practices and standards, particularly at lower levels of the organization, would facilitate the involvement of these groups in resolving issues and ultimately mitigating this perception.

The events involving the URS contractor employee/whistleblower who sent a letter to the DNFSB in 2010 are well publicized nationally and are well known to most WTP personnel. The aftermath of the events subsequent to the URS contractor employee's letter to the DNFSB is still evident. Some interviewees indicated that the events around the 2010 whistleblower incident were still on their minds and made subtle reference to the potential for similar consequences as a potential inhibitor to their raising concerns. In addition, some BNI personnel indicated that information regarding the decisions and status of the whistleblower event have been lacking. While employees made few direct references to the whistleblower event, there were some indications that it may still be at a level of awareness that contributes to the hesitancy to challenge management decisions and the belief that management does not want to hear problems or concerns.

2.5 WTP Project

The external independent safety culture experts identified two conclusions, applicable to both ORP (including DOE-WTP) and BNI, that are impacting the safety culture at WTP:

The external independent safety culture experts believe that a potential conflict for WTP is the different perceptions of the role of safety in a research/design project as compared to a construction project as compared to a production project. These perceptions set up the priorities of schedule, cost, and safety differently and may be contributing to some of the organizational issues. WTP needs to establish, implement, and expect the same standards and behaviors for safety, regardless of the phase of the project.

The external independent safety culture experts identified that all organizations involved at WTP have adopted a procedural approach to dealing with safety, and especially safety culture. The behaviors and traits important for a healthy safety culture will not be effective until they are internalized by the members of the organization. More effort is needed in behavioral change to ensure that these traits become the accepted way of doing business.

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3 ORP Management of Safety Concerns

The Independent Oversight team's evaluation of ORP's management of safety concerns focused on the effectiveness of actions implemented by ORP and DOE-WTP to improve safety culture since the 2010 HSS independent assessment of safety culture. Accordingly, the Independent Oversight team examined the actions taken by ORP and DOE-WTP to address the specific HSS 2010 recommendations and to enhance the safety culture. The Independent Oversight team also reviewed the effectiveness of various ORP issues management processes to determine whether the improvement actions have been effective and whether the processes are currently effective in improving the safety culture. Additional details are provided as Appendix B in the supplemental volume of this report.

3.1 Corrective Actions for the 2010 HSS Review

In its 2010 safety culture review report, HSS recommended that ORP "institutionalize the processes and formally define the roles and responsibilities and clarify interfaces between the WTP Federal organization and the other ORP organizations."

Since that time, DOE has made progress in establishing an effective DOE-WTP project organization. ORP has taken steps to better define roles and responsibilities and to strengthen interfaces between DOE-WTP and the rest of the ORP staff. For example, new positions have been established in DOE-WTP to facilitate liaison with ORP support organizations. Most ORP staff members who were interviewed by the Independent Oversight team said that communications between the DOE-WTP organization and supporting ORP organizations had improved but were not yet fully effective.

A proposed revision to the WTP PEP has been prepared and was submitted to EM for approval in July 2011. The revised PEP describes roles and responsibilities for the current DOE-WTP and ORP support organizations. In the revised PEP, both the WTP FPD and the ORP Manager report to EM-1. The proposed plan specifies a direct line of communication from the FPD to the Deputy Secretary and assigns a support role to the staff of the ORP Manager. Most of the proposed changes to the PEP are being implemented in practice, even though they have not yet been approved.

The ORP Safety Management Functions, Responsibilities and Authorities (FRA) was revised in September 2011 to include functions, responsibilities, and authorities for the line management of ORP, including DOE-WTP. The FRA does not fully comply with DOE Order 450.2, *Integrated Safety Management*, in that it does not describe the organization and management structure, does not consistently identify who within the organization has responsibility to perform the functions, and does

not specify the authorities delegated to responsible organizational elements. For example, the FRA identifies the ORP Nuclear Safety Division (NSD) as the position responsible for safety and hazards analyses, but it does not specify whether NSD has authority to approve or disapprove documented safety analyses (DSAs). Formal agreements, such as memoranda of understanding or interface agreements, have not been established to clarify shared responsibilities.

While the above steps were partially responsive to HSS recommendations, continued management attention is needed to better define roles and responsibilities, improve communications, and approve the PEP.

3.2 Processes for Managing Issues

RL and ORP have established appropriate mechanisms for the Federal staff to raise safety concerns, but these mechanisms have seldom been used. Most Federal staff members said that they would have no reservations about raising concerns to their supervisors and no reservations about using those mechanisms. However, a significant number of ORP staff indicated a reluctance to raise safety concerns.

ORP reviews have been effective in identifying deficiencies in WTP design products and in identifying vulnerabilities that could impact the future operability of waste treatment facilities. However, correcting these deficiencies has been problematic. Many of the corrective action plans proposed by BNI to address design deficiencies have been judged inadequate by DOE-WTP, and certain operability vulnerabilities identified by DOE-WTP sponsored reviews have not been addressed in a timely manner. Internal assessments performed by ORP QA and DOE-WTP line organizations over the past two years have identified continuing weaknesses in ORP action item tracking and the management of corrective actions.

The Independent Oversight team was provided no evidence of systematic or formal Federal actions to track or validate corrective actions taken to strengthen safety culture at the site level, limiting the ability of EM or senior DOE management to ensure timely and effective tracking and validation of corrective actions. This tracking and validation constitute one of DOE's commitments in the June 30, 2011, letter from the Secretary of Energy to the DNFSB in which DOE accepted DNFSB Recommendation 2011-1.

Senior ORP and DOE-WTP managers consistently said that safety was their overriding priority and that they had taken steps to convey this message to their staffs. They require that each ORP meeting begins with a safety message, and they emphasize the importance of safety during all-hands meetings. However, some middle managers and staff members said that senior management placed a higher priority on cost and schedule than on safety, and some management actions have contributed to this view. Certain management actions and communication weakness suggest the priority of schedule and cost or raise questions about management priorities among the staff members. For example, the basis for a decision approving the welding of heads on certain vessels was not effectively communicated to Federal or BNI staffs, causing some staff members to conclude that project management had compromised safety in order to meet cost and schedule objectives. The decision to weld the heads was opposed by a DPO, a union grievance, and a stop-work order.

BNI has taken a number of actions to strengthen its safety culture, but most of these actions appear to have been prompted by DNFSB comments and HSS reviews and enforcement actions, rather than by proactive efforts on the part of ORP or DOE-WTP. At the time of this Independent Oversight review,

management expectations regarding safety culture had not been formally communicated to the Federal staff through a policy statement or programmatic requirements, and safety culture training had not been provided to the staff. DOE-WTP had not established a program for periodically monitoring safety culture and providing feedback to management. Additional Federal leadership and actions are needed to strengthen the safety culture within ORP and BNI, including formalizing roles and responsibilities of Federal employees, ensuring that management actions and communications demonstrate the stated priority of safety, and ensuring that factors that could deter Federal staff from raising safety issues are addressed.

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4 BNI Management of Safety Concerns

The Independent Oversight team's evaluation of BNI's management of safety concerns focused on the effectiveness of actions implemented by BNI to improve safety culture since the 2010 HSS independent assessment of safety culture. Accordingly, the Independent Oversight team examined the actions taken by BNI to address the specific HSS 2010 recommendations and to enhance the safety culture. HSS also reviewed the effectiveness of various ORP issues management processes to determine whether the improvement actions have been effective and whether the processes are currently effective. The supplemental volume of this report (Appendix C) provides additional details.

4.1 Corrective Actions for the 2010 HSS Review

The Independent Oversight team reviewed the status, adequacy, and effectiveness of actions identified, taken, and planned to address the recommendations identified in the HSS 2010 safety culture review at WTP. The recommendations addressed the four broad areas of issues management, change management, safety culture improvements to address the groups of employees who perceive a chilled environment, and measures to continuously improve the safety culture. BNI responded to the 2010 HSS report and recommendations in December 2010 and provided the team with a status of BNI commitments to address the recommendations in August 2011.

Recommendation #1, Issues Management

BNI management has identified and has implemented or is implementing many actions to address weaknesses in project issues management, including addressing issues identification and management processes in an NSQC gap assessment and employee survey, a focused process review by a Project Issue Evaluation Report (PIER) users group with associated improvement recommendations, and enhanced new employee orientation and continuing general employee training on issue identification and resolution. BNI has devoted significant effort and made progress in addressing Recommendation #1. However, the Independent Oversight team determined that PIERs written to address this recommendation were given a lower significance designation than warranted for this issue, obviating BNI requirements for performing cause and extent-of-condition reviews and identifying recurrence control actions. Further, the specified actions taken for several of the PIERs addressing this recommendation were insufficiently comprehensive and/or were inappropriately closed (e.g., issue on unclear interface between PIER and other systems is not clearly closed, with actions related only to trend analysis). Many of the actions to address the 2010 HSS concerns about the implementation of BNI processes for identifying and resolving nuclear safety concerns are either only recently implemented or not yet implemented, and it is too early to determine their effectiveness. In addition, the Independent Oversight team identified many PIER

process implementation deficiencies (e.g., institutional trend analysis not addressed) that do not appear to be specifically or adequately addressed by the corrective actions and recommendations identified to date. Continued and focused senior management attention is needed to address these issues.

Recommendation #2, Change Management

The WTP change management program and procedure requirements, when effectively and appropriately implemented, provide assurance that approved changes will not degrade nuclear safety SSCs. However, additional effort is planned and needed to enhance BNI change management planning processes in order to ensure avoidance or appropriate mitigation of potential negative impacts of changes in project plans, procedures, schedules, organizations, and responsibilities on nuclear safety culture.

Recommendation #3, Safety Culture Improvements to Address the Pockets of Employees who Perceive a Chilled Environment

Many avenues of communication have been established. Several initiatives, including small group meetings with the WTP FPD and small group meetings with the BNI Manager of Engineering, were recently initiated. BNI also provided additional training to employees on safety culture issues and established a management walk-around program. However, based on the feedback from interviews, the effort to strengthen trust among the workforce is not fully effective in some organizations, and BNI management has not made sufficient efforts to identify the groups of workers who have specific concerns and to identify and address the specific concerns and the underlying factors. In addition, based on interviews with employees, training has not been sufficient, and there is limited appreciation of what a nuclear safety culture is, especially among employees who had not worked at a nuclear facility before working at WTP.

Recommendation #4, Measures to Continuously Improve the Safety Culture

BNI provided training in response to this recommendation and performed a gap analysis indicating that the NSQC effort was sufficient to improve the safety culture. The Independent Oversight team considers that the gap analysis review was insufficiently rigorous in that it did not include any direct evaluation of any performance evidence and did not adequately address the indicators of less-than-adequate safety culture performance that are evident in the results of previous surveys and other data.

Overall, BNI has taken many actions to address the specific recommendations in the 2010 HSS safety culture report. However, BNI management did not sufficiently or accurately evaluate the significance of the collective safety culture weaknesses, deficiencies, and concerns documented by the DNFSB, the 2010 HSS report, BNI internal reviews, and other external assessments. This shortcoming was reflected in assigning the lowest significance level to the PIERs that were used to evaluate and manage the HSS recommendations. Further, weaknesses in developing corrective actions for some of the recommendations, specified actions that were later deemed unnecessary or less rigorous than required, and less than fully effective implementation of some actions have limited the progress in improving the WTP nuclear safety and quality culture.

4.2 Processes for Managing Issues

The Independent Oversight team evaluated the adequacy and effectiveness of the primary programs BNI uses at WTP to document, evaluate, and resolve safety issues, including processes and implementation.

Programs that were evaluated included corrective action management, engineering technical issues management, the BNI ECP, and the DPO program.

Corrective Action Management

The WTP issues management processes, when implemented properly, can be effective tools for identifying and resolving safety issues. The WTP formal corrective action management system, as described in the project QA manual and the contractor assurance system description, is required to be used to manage adverse conditions, as well as other unwanted or unplanned issues and recommendations and suggestions for improvement. The corrective action management system uses the PIER form to document issues and initiate the process for evaluating, correcting, documenting, and verifying the resolution of the issues. A strength of this process is the use of PIERs to formally document, disposition, and track resolution of opportunities for improvement in addition to violations. Many PIERs are written at WTP, providing for formal documentation, review, and resolution of issues. Approximately 100 PIERs were written per month in the past year. WTP's formal trend analysis and reporting procedure specifies that selected organizations will periodically identify, collect, review, and analyze data for their organizations to identify trends. Trending is performed by a number of organizations as required.

However, inadequate implementation of the requirements of these processes can damage the nuclear safety culture at WTP because issues are often not managed effectively to resolution. In some cases, safety issues at WTP are not documented in the PIER system, are improperly categorized for significance, are inadequately analyzed for causes, or are not resolved with effective corrective and preventive actions. There are instances where ineffective implementation of the issues management process specifically contributed to negative effects on the project's safety culture. For example, WTP staff, management, and senior managers were unable to effectively execute a timely root cause analysis for a PIER issued in October 2010 related to nuclear safety analysis. Senior management was made aware of the difficulties in completing the causal analysis and resolving this PIER no later than July 2011, but management was not effective in resolving the issues and the root cause analysis was not finalized. The final resolution of this PIER was driven by formal DOE requests and BNI's provision of a formal licensing strategy that addresses the applicability of DOE-STD-3009-94. Because consensus agreement on the root cause could not be achieved and there was pressure from DOE to take actions, the PIER was subsequently downgraded to a Level B PIER, a more limited apparent-cause analysis was completed and approved, and corrective actions were identified. Interviews with BNI staff revealed that this extended, contentious, and poorly managed causal analysis activity resulted in strong negative feelings among and between Engineering, E&NS, and QA personnel, and it did not result in development of a root cause analysis commensurate with the significance of the issue. This issue is a significant contributor to the current nuclear safety culture problems at WTP, discussed in Section 5. Although this issue was discussed in a November 2011 Performance Improvement Review Board meeting, where it was suggested that a lesson learned might be appropriate, no definite actions or responsibilities were identified. A rigorous root cause analysis is warranted to identify and establish recurrence control actions that will address the fundamental problems contributing to this PIER and the substantial difficulties and delays in completing the causal analysis and resolving this issue.

The BNI QA organization is aware of weaknesses in project corrective action management processes and has been working on various improvement actions. These include several ongoing efforts, including a "six sigma" group and a PIER users group. The actions taken to date have resulted in process improvements, but they have not been fully successful in preventing performance deficiencies.

The PIER users group has identified an appropriate set of process improvements (e.g., integrating the 23 current issues management systems) but recognized that process changes will have little effect on project personnel's negative perceptions of individual PIER management or the PIER process unless management devotes serious attention to addressing employee and management behaviors and cultural beliefs. While the recommendations are appropriate and have the potential to strengthen project issues management, especially with regard to the need to modify behaviors and cultural weaknesses, they do not specifically address the implementation deficiencies identified during this review.

Engineering Technical Issues Management

The Engineering Technical Issues Identification Management Guide was significantly enhanced in a March 2011 revision. The revised Guide clarifies applicability and expectations.

An HSS review of BNI Engineering activities in 2008 identified a concern that the WTP design did not provide adequate mitigation for potential volcanic eruption ash fall from the nearby Cascade Mountain Range. The Independent Oversight team reviewed documentation associated with the closure status of this issue to follow up on this concern and to evaluate the effectiveness of the Guide process. In reviewing the issue, BNI appropriately determined that the original proposed strategy (requiring replacement of approximately 7000 filters within a 24-hour period) was not feasible. The revised, optimized, and agreed strategy requires bringing the facilities to a safe configuration during a two-hour warning period after a volcanic eruption (e.g., shutting down certain processes) and adding or modifying various filtration and ventilation equipment. For this issue, the Guide process was effectively followed, and a path forward is in place and scheduled to occur in 2012.

Consistent with the revision of the Engineering Technical Issues Identification Management Guide, Engineering appropriately consolidated the list of technical issues identified in the 2009 and 2010 "Clean Out the Drawers" initiative and ensured that the status of each was being tracked in an appropriate formal or informal process. The Independent Oversight team also reviewed the October 2011 WTP Technical Issues Summary Table for open technical issues (included in Technical Issue Evaluation Forms and Cut Sheets). These processes were appropriately implemented, and progress is being made to resolve the numerous open technical issues, although significant work remains.

BNI Employee Concerns Program

The Independent Oversight team reviewed current process documents and a sample of case files for BNI employee concerns that were filed with the BNI, ORP, and RL ECPs and were closed after October 2010. In the past year, approximately 100 WTP workers have reported formal concerns to the BNI, ORP, or RL concerns programs, including construction craft, technical, and administrative staff. Many of the concerned individuals reported multiple concerns, all of which were investigated/resolved individually by the concerns program staff. The continuing reports of formal employee concern cases show that many WTP employees feel free to report their concerns, as well as reflecting continuing worker perceptions of a less-than-adequate safety culture. Most investigations were generally thorough and reflect significant effort by ECP investigators to communicate and establish a positive working relationship with the concerned individuals to draw out as much information as possible and communicate investigation status. The BNI ECP has established a formal exit interview process to solicit safety concerns from departing employees that is more formal and specific than typical concerns programs.

While the investigations that were conducted were generally thorough, in a number of the ECP case files reviewed, the investigations were not sufficiently comprehensive. For example, a BNI ECP case that identified peripheral safety issues was closed based on an e-mail from the superintendent stating that he had talked with his foremen, heard that they were unaware of any problems, and told them he expected procedures to be followed. These actions were insufficient to definitively establish whether the expressed concerns were accurate or to identify the extent of condition. The failure to address all aspects of the case or to fully address emergent issues can damage the credibility of the program with concerned individuals, who may conclude that the ECP process is ineffective or biased. Also, formal BNI ECP communications of resolutions to the concerned individuals did not address any recourse for the concerned individual if he/she did not agree with the resolution; the ECP manager took action to improve this situation during this Independent Oversight assessment by changing the standard template for responses.

Differing Professional Opinion Program

Two DPO cases have been filed since the 2010 HSS review. Both were decided in favor of the initiator. The investigations and case files were generally well documented and involved independent personnel with nuclear safety qualification and experience who evaluated the facts of the competing positions and made appropriate recommendations for resolution.

A procedure describes the DPO process expectations. However, deficiencies in the DPO procedure and the implementation of the process were identified. For example, the revised procedure does not describe, in the text or the process flow chart, the documentation and management of any issues and associated corrective actions or recurrence controls resulting from the DPO resolution (i.e., document and manage as a PIER). Also, deficiencies in the application of the DPO process included providing insufficient analysis of the reasons why prior issue resolution methods were ineffective in resolving the issue, documenting corrective actions in the wrong system (a commitment tracking system rather than the PIER system), and incorrectly categorizing corrective actions in the PIER system (resulting in a lower priority than warranted and thus obviating requirements for analysis of causal factors).

DOE-Directed, BNI-Sponsored Safety Culture Assessment

As discussed in Section 1, DOE directed and BNI sponsored a review of the WTP nuclear safety culture by a group of nuclear industry subject matter professionals. The BNI-sponsored safety culture assessment team consisted of six well qualified individuals with extensive executive-level experience in nuclear facilities and nuclear safety, which conducted its review from August through November 2011 and provided its results in a report dated November 30, 2011. In a related effort, BNI initiated a safety culture survey. Conducted in August 2011, the BNI safety culture survey used questions developed by the BNI-sponsored team and was administered by K-Management Resources (K-MR), an organization that performs surveys. The results were analyzed by Pillsbury Winthrop Shaw Pittman LLP (Pillsbury), a law firm whose services to BNI have included evaluations of previous culture surveys and conduct of safety culture interviews in August 2010. Pillsbury's analysis of the survey results were documented in a report issued in November 2011. The BNI-sponsored team reviewed the BNI survey results and the Pillsbury report and incorporated the results in its evaluation of the safety culture in its report dated November 30, 2011. The Independent Oversight team reviewed the survey, the Pillsbury analysis, and the BNI-sponsored safety culture assessment team report; a brief summary of the Independent Oversight perspectives on these efforts is provided below.

The BNI safety culture survey was an extensive effort that provided valuable insights. The detailed data tables provide information about the perspectives of various BNI and URS organizational elements, which identified significant variation in perspectives among various groups at WTP. However, the Independent Oversight team identified several concerns about the survey methodology, statistical approaches, and analysis methodologies. For example, bounding numbers were used inconsistently and were applied in a manner that made it relatively easy to identify an item as an area of strength and relatively difficult to identify an item as an area for improvement. More consistent application of the bounding numbers would have resulted in fewer areas of strength and more potential areas for improvement; in one instance, the lax application of bounding numbers resulted in the report identifying six areas of strength and three areas of weakness, whereas a strict application would identify only three areas of strength and six areas of weakness. The HSS-sponsored external safety culture experts provided a set of specific concerns about the survey approach and methodologies to BNI and Pillsbury personnel during the assessment and validated the concerns.

The DOE-directed, BNI-sponsored safety culture assessment team report provides the perceptions and interpretation of a group of senior management-level professionals with considerable experience in nuclear safety and operations. They primarily used document reviews and interviews that targeted knowledgeable individuals and key managers and a limited number of random employees to collect data, rather than a systematic sampling of the WTP population using formal safety culture inspection protocols (such as focus groups of individuals representing the various groups at WTP). Nevertheless, the report provides useful insights about the nuclear safety culture of ORP, DOE-WTP, and BNI, and many of the results are broadly similar to results of the 2010 HSS review and this 2011 Independent Oversight assessment. For example, all of these efforts determined that some individuals were reluctant to raise safety concerns and problems regarding the processes for reviews of nuclear designs and safety basis documents. However, the BNI-sponsored safety culture assessment report and this Independent Oversight assessment have differences in scope and methods, and, in a few important areas, have differing perspectives and conclusions. Some of the more important areas where the BNI-sponsored team report and this Independent Oversight progress assessment reached somewhat differing conclusions include:

- **The degree to which there is a chilled atmosphere.** The BNI-sponsored safety culture assessment report concluded that there was no widespread evidence of a chilled atmosphere and that reluctance to raise safety and technical issues was isolated (which was clarified in a December 1, 2011, teleconference as a very small number or handful of BNI personnel). The Independent Oversight team determined that concerns about the safety culture, while not necessarily widespread, are not isolated to a small number of individuals and are prevalent enough, particularly in certain groups, to warrant significant and timely management actions.

- **The role of the E&NS organization in the current problems with nuclear design and safety bases processes.** The BNI-sponsored safety culture assessment team and the Independent Oversight team both identified the safety basis as one of the most important problems impacting the safety culture and that management's failure to resolve the alignment between the Engineering and E&NS organizations was one of the most significant contributors to this problem. The BNI-sponsored safety culture assessment report focuses on "management and performance of the E&NS organization" as a key contributor to the problem. The Independent Oversight team has different perspectives on the most important causal factors. This Independent Oversight review indicates that the current management of the E&NS organization, along with certain DOE-WTP and BNI managers, has been active in the recent efforts to resolve the fundamental

issues that were likely to prevent or delay efforts to develop a safety basis that could be approved under current standards (e.g., hazard assessments that meet DOE-STD-3009-94, and provision of resources needed to perform safety basis activities). While there are some concerns about management style and performance problems (e.g., delays in approvals) within the current E&NS organization, this Independent Oversight review indicates that the more fundamental problems affecting E&NS performance result from ineffective communications, inaction, and ineffective direction in a number of areas (e.g., lack of timely decisions on and communication of applicable requirements) by more senior BNI and ORP/DOE-WTP management over the past years.

- **Adequacy of the safety culture with respect to construction work.** Based on their analysis of the status of industrial safety at the construction site and other data, the BNI-sponsored safety culture assessment team determined that there were no significant concerns about industrial safety at the construction site and that ORP and BNI were making good progress in advancing the industrial safety culture. Accordingly, the BNI-sponsored safety culture assessment team decided not to further discuss the safety culture for manual workers (e.g., construction workers) in its report. The Independent Oversight team's progress assessment results, which included extensive focus group interviews with construction superintendents and the construction craft, foremen, and general foremen, indicate that the safety culture for construction work and industrial safety warrants increased attention in a number of areas. Also, the Independent Oversight team's review of the detailed results of the 2011 BNI survey (administered by K-MR) identifies some potential concerns with respect to crafts workers. For example, 48 percent of the responding electricians disagreed or strongly disagreed with a statement on the K-MR survey stating "I am confident that the 'zero tolerance' policy against retaliation at WTP is enforced."

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5 Factors Affecting the Safety Culture

Based on the review of data from multiple sources, the Independent Oversight team identified two areas for further analysis of factors that contribute to the observed weaknesses in the safety culture: the nuclear safety construct[9] and construction activities.

5.1 Nuclear Design and Safety Basis Processes

The information from multiple sources, including the 2010 HSS review, the November 2011 BNI-sponsored team report, and the interviews and focus group data collected by the Independent Oversight team during this 2011 assessment, point to problems with the nuclear safety construct. These problems impact the efforts to achieve a positive safety culture, particularly for BNI, ORP, and DOE-WTP personnel who are directly involved in the interfaces between design and engineering functions and the nuclear safety basis analysis and approval functions. The Independent Oversight team identified a number of specific factors that contribute to the current degraded safety culture in some groups at WTP; ORP, DOE-WTP, and BNI need to address these factors as part of the effort to address the cultural issues. The factors discussed here, many of which are interrelated, need to be evaluated and addressed both individually and collectively by WTP line management.

Longstanding and Continuing Inconsistencies in Contractual Requirements

Clearly defined requirements are a prerequisite to an effective nuclear safety construct, including development of a safe design and adequate safety basis; if requirements are not clearly understood, problems in safety basis reviews are inevitable. Currently, there are some important inconsistencies and deficiencies in the Safety Requirements Document, which is a part of the contract that defines the safety requirements applicable to WTP that complement the applicable regulatory requirements (e.g., 10 CFR 830). Specifically, the Safety Requirements Document identifies certain safety basis procedures that include requirements that are inconsistent with regulatory requirements, as described below. Additionally, because certain procedures (e.g., safety basis review procedures) are included in the Safety Requirements Document, they cannot be changed without a DOE safety evaluation review and approval (a process that typically takes six months).

Deficiencies in the contract date back to the initial contract between DOE and BNI in the late 1990s, when DOE and BNI believed that WTP would be licensed by the NRC, a strategy that was later abandoned.

9 As used in this report, the "nuclear safety construct" refers to the spectrum of nuclear safety requirements and processes, including design processes and safety basis processes, that have the ultimate goal of ensuring a safe design, DOE approval of the safety bases, and DOE authorization to operate.

In addition, the original contract predated the issuance of 10 CFR 830 (final rule issued in 2001), which contained new requirements for safety bases. Among other things, 10 CFR 830 requires contractors to obtain approval from DOE for the methodology used to prepare the DSA for nuclear facilities unless the contractor uses DOE-STD-3009-94, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Safety Analysis*. However, the contract Safety Requirements Documents included some requirements that were directly in conflict with DOE-STD-3009, as discussed under the next factor. During the 2002 time frame, reviews by DNFSB and others indicated problems with the requirements and safety basis procedures; however, actions at that time were not effective for long-term resolution of the problems. In the past two years, other events (e.g., assigning a manager for the E&NS organization who was experienced in DOE-STD-3009 and recognized the procedure inadequacies) and various internal and external assessments highlighted the conflicting requirements and prompted action.

In 2011, BNI took actions that have the potential to lead to resolution, including a gap analysis between the Safety Requirements Document safety basis procedures and DOE-STD-3009. In July 2011, BNI submitted a contract change request to DOE to resolve some of the discrepancies and allow revision of the E&NS implementing procedures to align them with DOE-STD-3009. As of the time of this report, DOE had not approved the contract change. Interviews indicated that the reasons for delaying approval were influenced by budget constraints. Further, the proposed change does not resolve the discrepancies in the safety basis requirements in other standards of the contract, namely standard 7 and standard 10. Although actions to resolve this concern are now under way, the inconsistent requirements have been a source of conflict between the Engineering and E&NS organizations, and within the E&NS organization, particularly in the past two years. E&NS management has attempted to meet the more stringent standards of DOE-STD-3009 in order to achieve eventual approval of the safety basis, even though they cannot change the procedures until the contract modification is approved (discussed further below).

DOE and BNI Communications about the Applicability of DOE-STD-3009

Ineffective DOE and BNI communications about DOE-STD-3009 resulted in conflicting views about its applicability, exacerbating the above concern. In September 2001, BNI asked DOE to allow BNI to use the DOE-STD-3009 format for the authorization basis documents, but stated that they were not requesting relief from the approved authorization basis document methodology requirements as documented in the Safety Requirements Document or other requirements that were in place at that time. According to corroborating interviews during this Independent Oversight assessment, BNI believed at that time that the safety basis documentation would be developed under the NRC methodology established in the Safety Requirements Document (since much work had already been done using this method), but that the results would be published in the format of DOE-STD-3009. According to interviews and later correspondence, there was much disagreement, both within BNI and DOE and between BNI and DOE, about whether DOE-STD-3009 fully applied. Some individuals, both within BNI and DOE, believed that the change notice constituted approval from DOE to use the NRC methodology specified in the Safety Requirements Document while using the DOE-STD-3009 format, but others within both BNI and DOE believed that the methodologies in DOE-STD-3009 fully applied because DOE never issued a formal approval letter for the alternate approach.

In the 2002 time frame, a DNFSB review identified a concern that the BNI methodologies and safety documents did not meet DOE-STD-3009 provisions. Among other things, the DOE response informed the DNFSB that "DOE-STD-3009-94, Change Notice 2, is not included in the contract and is not required during this phase of the project. However, DOE has attempted to remain consistent with this guidance,

where appropriate for a new construction facility, and with a view to its eventual use for the Documented Safety Analysis for the facility." This language further complicated BNI's and ORP's understanding of the applicability of DOE-STD-3009 in that the meaning and intent of the statements "attempted to remain consistent with this guidance" and "with a view to its eventual use for the Documented Safety Analysis" were never formally communicated to BNI.

An August 2011 DOE construction project review recognized the disagreement about DOE-STD-3009 applicability within BNI and recommended resolving the internal BNI conflict regarding the applicability of DOE-STD-3009, as well as the applicability of 10 CFR 830 to commissioning and testing. On September 27, 2011, the DOE-WTP FPD issued a letter to the BNI WTP Project Director (Letter 11-WTP-35, *Contract No.DE-AC27-01RV14136 – Department of Energy Concerns, Licensing Approach for Waste Treatment and Immobilization Plant*) stating DOE's position on DOE-STD-3009. The FPD stated, "DOE has not (and will not) approve an alternate methodology to meet the requirements of 10 CFR 830…" The FPD also stated that "DOE wants to avoid the possible repetition of issues identified in the November 4, 2002, DNFSB letter…. Actions taken several years ago to address DNFSB's concerns should have effectively addressed the process and organizational interfaces that develop and deliver the engineering and safety basis documents for the project." Although it appears clear in this letter that DOE's intent is to have WTP fully comply with DOE-STD-3009, it was apparent from several interviews during the week of November 28, 2011, that this information has not been well communicated within either organization (neither DOE nor BNI), and misunderstandings of the applicability of DOE-STD-3009 persist within both organizations.

The resolution of the applicability of DOE-STD-3009 has had wide-ranging impacts that have not yet been fully evaluated. In June 2011, BNI E&NS performed a gap analysis to determine the gaps between DOE-STD-3009 and existing BNI E&NS procedures dealing with safety basis requirements. The items below summarize key requirements of DOE-STD-3009 that are not addressed in existing BNI procedures:

- There are no criteria/requirements for the evaluation of "other hazardous conditions." Chemicals have been routinely screened as "not a concern" using the "extremely hazardous quantities" thresholds.
- There are no criteria/requirements for evaluating impacts to the environment.
- Defense-in-depth criteria/requirements are inconsistent with DOE-STD-3009; BNI criteria are consequence-based, contrary to the guidelines in DOE-STD-3009 for hierarchy of controls.
- There are no requirements for protecting inputs and assumptions in technical safety requirements, if required.
- The criteria/requirements for selecting controls and developing accident analyses are incomplete. Inaccurate use of the terms "prevent" and "mitigate" in BNI procedures has led to the safety basis documents containing no mitigated accident scenarios.
- There are no criteria/requirements for addressing beyond design basis events.
- Accident binning is based on accident consequences rather than accident type (e.g., fires, spills, explosions).

- There are no criteria/requirements for establishing performance criteria for credited safety SSCs.
- There are no criteria/requirements for establishing system boundaries/interface points for credited safety SSCs.

Although DOE has very recently clarified its position and indicated that BNI must fully comply with DOE-STD-3009, some safety basis analyses and design reviews over the past ten years were performed against procedures that do not fully meet all DOE-STD-3009 requirements. As a result, the existing safety bases documents and some aspects of the design may later be found to not comply with DOE-STD-3009 and 10 CFR 830, impacting the ability to gain approval of the safety basis for hot operation (the final DSAs). The impacts of this issue on design, cost, and budget have not been fully analyzed, but some ORP, DOE-WTP, and BNI personnel indicated a potentially large impact that may require redesign of some systems, further stressing the Engineering and E&NS organizations.

Inadequacies in the Current PDSA and Safety Basis Process

The original safety analysis report and preliminary safety evaluations were developed in accordance with NRC standards. With the issuance of 10 CFR 830, BNI was required to develop individual facility preliminary DSAs (PDSAs) to supersede the WTP initial safety analysis report and preliminary safety analysis reports. The PDSAs are the authorization basis documents for authorizing procurement and construction of the facilities and serve as the primary safety basis documents until the final DSAs are approved for hot operations. Over the years, processes to keep the PDSAs current have not been effective, and the PDSA is out of date, a situation that is getting worse.

Various internal WTP reviews have highlighted significant deficiencies in PDSAs and safety basis processes in general. A September 2010 PIER described an inconsistency in that the Pre-Treatment Facility PDSA fire barrier design feature requirements for fire barriers had not been incorporated into the plant design. In June 2011, E&NS issued the results of a management assessment that focused on the Low Activity Waste (LAW) Facility PDSA and concluded that comprehensive corrective actions would be necessary to achieve a "licensable" DSA for the LAW Facility; since the findings apply equally to the other WTP facilities, the corrective actions should be structured and implemented to address all WTP facilities. Another review led to a November 2011 decision to suspend design, procurement, or installation of several key systems (e.g., safety systems required for ash fall events). The resolution of these issues involves bringing the design and safety bases into alignment.

Insufficient Planning and Management Support for Developing the Safety Bases

Developing a compliant safety basis for a facility as large and complex as the WTP is a massive effort. Historical experience with other large efforts shows that the cost for a major DSA is on the order of $20 million, and WTP needs to develop five major DSAs. According to a BNI presentation for an August 2011 construction project review, the current budget calls for funding for completion of all five DSAs at a level of less than $4 million, which appears to be less than 10 percent of the amount needed (based on historical experience with development of safety basis documents). Some personnel at WTP indicated that the gap occurred because DOE never fully budgeted or provided the appropriate funds for a DOE-approved safety basis, and others indicated that BNI significantly underestimated the cost of developing DSAs. In addition, as discussed previously, DOE has not provided a concise and unambiguous set of requirements and expectations for the safety basis effort, and BNI has not provided adequate resources and organizational leadership to ensure that the expectations for the WTP safety basis are fully defined and supported by all organizations.

Some senior DOE and BNI managers have begun to recognize the likelihood of a large budget gap for the DSA effort, but the magnitude of the gap seems not to have been evaluated and widely understood within WTP. Also, during interviews with the Independent Oversight team, some ORP and BNI personnel indicated that DOE had been reluctant to ask Congress for additional funding because of previous budget cap commitments to keep the cost of the WTP below the current cap (about $12 billion). Some personnel at WTP indicate that reluctance to request funding has contributed to delays in approving the contract modification discussed above, since the contract modification would involve a cost adjustment. Subsequently, other BNI personnel indicated that funding the safety basis effort was within the contingency funds and would not cause costs to exceed the cap. At this time, the safety basis effort is significantly underfunded, and no plan for resolving the issue has been finalized.

Tension between E&NS and Engineering

In March 2009, a manager experienced in DOE-STD-3009 methodology was brought to WTP and assigned to E&NS. Before this manager was assigned, it appears that safety basis documents were reviewed and approved by the E&NS organization and ORP based on contract requirements that did not meet requirements of DOE-STD-3009. The current E&NS manager has been active in setting expectations for safety reviews of design, engineering, and environmental documents that are consistent with DOE-STD-3009 expectations. However, formalizing the DOE-STD-3009 expectations in E&NS implementing procedures was hindered by the complex and restrictive Safety Requirements Document that was not consistent with DOE-STD-3009, and the time consuming requirement for DOE approval of changes to the Safety Requirements Document and revision of the E&NS procedures that must reflect the revised requirements of the Safety Requirements Document. Consequently, these expectations were communicated through less-formal channels, such as verbal or e-mail instructions to the staff. These expectations significantly increased the workload of the E&NS staff and delayed E&NS safety review and approval of documents from other organizations. Because these delays could not be attributed to requirements in the BNI procedures (which do not meet DOE-STD-3009) and caused Engineering milestones to be missed (sometimes impacting performance appraisals), hard feelings ensued. Engineering organizations felt that the new approach, along with the resulting delays, was unwarranted and placed blame directly on the E&NS department. Additionally, some E&NS staff felt pressure from E&NS management and design and engineering organizations, and they resented the lack of a procedural basis for the additional safety review requirements and workload. Over the last two years, WTP design has progressed, but the PDSA has become further out of date, and delays in safety reviews of design and engineering documents have worsened. The animosity between some groups (e.g., Engineering) and managers and the entire E&NS group has become severe. A contributing factor is that much of the existing E&NS safety review staff and engineering staff has limited experience with the DOE-STD-3009 safety analysis format.

This Independent Oversight review indicated that the current management of the E&NS organization and certain other BNI managers, supported by some individuals within DOE-WTP, have been active in DOE-WTP's and BNI's very recent efforts to resolve the fundamental issues that were likely to prevent or delay efforts to develop a safety basis that could be approved under applicable regulations and DOE-STD-3009. Although most of the symptoms are evident within the E&NS and Engineering departments, most of the contributing factors listed above result from actions or inactions at higher levels of ORP, DOE-WTP, and BNI management. While the Independent Oversight team determined that senior managers are supportive of safety in general, ORP, DOE-WTP, and BNI management has not achieved timely resolution of important issues, including those discussed above, in some cases for

about ten years. Further, typically ORP, DOE-WTP, and BNI senior managers are highly experienced but do not have specific experience in applying DOE-STD-3009 nuclear safety design and safety basis processes.

In the past few months, ORP, DOE-WTP, and BNI management have begun some promising initiatives that could lead to resolution of the underlying concerns:

- BNI recently conducted a management workshop on safety basis requirements to raise the level of management understanding of safety basis requirements and issues at WTP.
- BNI completed a gap analysis between the safety basis procedures and DOE-STD-3009 that identified the differences in the hazard analysis provisions and provides an essential baseline for action.
- In July 2011, BNI submitted a contract change request to DOE to resolve some of the discrepancies and allow revision of the E&NS implementing procedures to align them with DOE-STD-3009. As of the time of this report, DOE had not approved the contract change.
- On September 27, 2011, the DOE-WTP FPD issued a letter to the BNI WTP Project Director stating DOE's position that DOE-STD-3009 "has not (and will not) approve an alternate methodology to meet the requirements of 10 CFR 830…"
- In response to a finding in the August 2011 construction project review, BNI completed a plan, called the Integrated Licensing Strategy, to develop a regulatory-compliant safety basis and submitted it to DOE on October 31, 2011. This strategy provides an approach to resolving the findings from certain other management assessments and open technical issues. However, the pertinent action due dates in the licensing strategy are based on DOE's approval of the contract change, which was submitted July 27, 2011, and has not yet been approved.

While these actions are positive signs, some of them are not finalized and/or are contingent on funding and the ability to attract additional personnel with the requisite skills and experience in nuclear design and safety bases. In addition, although the above actions have the potential to address the underlying problems, significant and sustained ORP, DOE-WTP, and BNI management attention will be needed to ensure that the safety culture concerns are also addressed for personnel who are involved in design and engineering functions and the nuclear safety basis analysis and approval functions.

5.2 Construction Activities

Information collected through Independent Oversight team interviews, focus groups, and document reviews confirms that many construction personnel believe that the Hanford Site and/or WTP are among the safest places they have ever worked. However, many crafts workers identified concerns about safety culture, including mistrust of the construction superintendents; frustration with inconsistent disciplinary actions and the craft rating system; fear of retaliation for raising safety issues; inconsistent application and communication of rules and procedures among WTP buildings; and inadequate planning, scheduling, and coordination of work. Although not highlighted in the Pillsbury report, the BNI safety survey (administered by K-MR) responses to certain questions revealed strong concerns among the construction craft. In many respects, the concerns raised by construction craft personnel are similar to

those expressed by other groups at WTP, as discussed in Section 2 and in the supplemental volume of this report (Appendix A). However, the Independent Oversight team identified three areas with concerns unique to construction activities: the potential for impacts on safety and quality, the rating system, and ORP oversight of worker safety. These areas warrant increased management attention.

Potential for Schedule Pressure to Impact Safety and Quality

A significant number of crafts personnel indicated that schedule pressures and other factors (e.g., inadequate planning, frequently shifting priorities, poor communications, inadequate work packages) have resulted in instances where safety rules, procedures, and practices were not followed. The crafts recognize that procedures and work packages must be followed verbatim, but believe that supervisors do not always support that requirement in work judged to have a high priority. For example, following procedures verbatim could take too long and cause delays for other crafts. Due to production pressures, some foremen make compromises or ask the crafts to decide for themselves (and take the risk of violating procedures). BNI, DOE-WTP, and ORP management should evaluate these concerns to determine their validity and extent. In addition to the safety risks to workers, compromising procedures and rules could impact the quality of construction and installation of safety grade SSCs. Crafts personnel described a few instances where safety grade structures or components (e.g., electrical cable trays) may not have been installed correctly because of schedule pressures, poor planning, or inadequate work packages (e.g., needed parts not available). BNI, DOE-WTP, and ORP management should evaluate work practices, QA processes, and communication and understanding of expectations to ensure that safety and quality are not compromised by schedule pressures or insufficient management expectations, controls, and oversight.

Performance Rating System

Interviews with construction crafts personnel indicated widespread dissatisfaction with the rating system used for most crafts workers, which defines the ratings that are used as a major factor in decisions about promotions and reductions in force. The perception that the rating system is arbitrary and unfairly implemented in a way that inhibits or penalizes the raising of safety and quality issues is a particularly important factor in many craft workers' views of the safety culture. The Independent Oversight team's focus group discussions related to the ratings indicates that construction superintendents consider the BNI performance rating system to be complex but more effective than the previous seniority system. Craft personnel are rated primarily by their superintendents based on input from foremen and general foremen on three broad factors (safety, job knowledge, and initiative). However, crafts workers, foremen, and general foremen strongly and almost universally believe that the crafts rating and ranking system is poor, inconsistent, and unfair; they cite several concerns about inconsistent application, insufficient input from the persons most knowledgeable of the workers' performance, and insufficient communication of the reasons for ratings. The Independent Oversight team determined that although BNI has a guide (WTP Craft Employee Evaluation Guide) describing the rating system, most craft, including foremen and general foremen, are not aware of it, and the superintendents receive no formal training on rating and ranking the crafts.

ORP Oversight of Worker Safety

ORP and DOE-WTP oversight of functional areas, such as industrial safety, industrial hygiene, and radiation protection, warrants attention. Some ORP personnel indicated that the only Federal presence performing oversight of worker safety at WTP facilities is the Facility Representatives, and that ORP safety subject matter specialists did not regularly communicate with the DOE-WTP Facility Representatives. Several ORP safety subject matter specialists indicated that they had not been to the

WTP site for months because they were not welcome by the DOE-WTP team; were not involved in safety functions they had previously performed (e.g., review of the worker safety and health plan); and were not involved in reviewing, and sometimes were not formally made aware of, significant safety events at WTP (e.g., the steel girder drop). Conversely, a DOE-WTP manager with responsibility for oversight of construction has indicated that attempts have been made to engage ORP subject matter specialists and that the amount of oversight by subject matter specialists at WTP had been low for some time and was not impacted by the de facto separation of DOE-WTP from the rest of ORP. The apparently limited involvement of subject matter specialists in Federal oversight of worker safety at a major construction site warrants timely management evaluation and attention.

6 Supplemental Information

Dates of Review

Scoping/Planning Visit:	September 26-30, 2011	
Onsite Data Collection:	October 10-14, 2011	October 31-November 4, 2011
	November 14-18, 2011	November 28-December 2, 2011
Validation and Briefing	December 20-22, 2011	

Office of Health, Safety and Security Management

Glenn S. Podonsky, Chief Health, Safety and Security Officer
William A. Eckroade, Principal Deputy Chief for Mission Support Operations
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Training and Support on Group Dynamics and Focus Groups

Dr. Janet Billson

Support

Mary Anne Sirk Tom Davis

Independent Safety Culture Experts

Dr. Sonja B. Haber Dr. Deborah A. Shurberg

Expertise and Credentials of the Independent Safety Culture Experts

Human Performance Analysis Corporation (HPA) is one of the leading consulting groups working to assist organizations in **performance improvement** through the understanding and leveraging of the individual, process, and organizational behaviors necessary to facilitate safe operating performance.

The HPA team is composed of experts in **organization and management, safety culture,** and **human performance analysis**. HPA has decades of experience working across numerous different industries where high safety performance is required, both in the United States and abroad.

HPA provides performance improvement services to public and private sector clients conducting safety-sensitive operations across a wide range of industries including nuclear, healthcare, mining, research, engineering, transportation, and energy.

The principals are:

Sonja B. Haber, Ph.D. Dr. Haber has been conducting work in the area of human performance analysis for over 30 years. She has been involved in the evaluation and intervention of human performance strategies in various applications, including nuclear facilities. For the last 23 years, Dr. Haber's work has focused on improving human performance within organizations that must operate with a high degree of reliability. She has been extensively involved in conducting fieldwork for various international agencies in efforts related to enhancing human performance. Her work has also included cross-cultural analysis of organizational issues in the areas of safety culture and management and supervisory skills. Most recently, Dr. Haber has been conducting safety culture evaluations in various organizations; providing consultation in organizational interventions including leadership and management training, enhanced communication, and observational skills training; and working toward the development of performance measures for organization and management processes.

Deborah A. Shurberg, Ph.D. Dr. Shurberg's primary interests lie in the development and implementation of methodological tools useful for the analysis and improvement of organizational functioning and in the assessment and evaluation of human resource practices critical to effective organizational performance. In particular, her work focuses on improving human performance within organizations that must function with a high degree of reliability and the assessment and improvement of organizational behaviors that impact safety culture. Dr. Shurberg has extensive experience across a variety of industries and countries, providing support in the diagnosis of organizational and management strengths and areas in need of improvement. She has significant experience in the development and implementation of intervention strategies within the nuclear industry, particularly on human-performance related topics including communication skills, observational skills, and management and supervisory skills.

More information can be found at: http://hpacorp.com/

Supplemental Volume

Independent Oversight
Assessment of Nuclear Safety Culture
and Management of Nuclear Safety Concerns
at the

Hanford Site Waste Treatment and Immobilization Plant

January 2012

Office of Enforcement and Oversight
Office of Health, Safety and Security
U.S. Department of Energy

HSS
Office of Health, Safety and Security

Independent Oversight
Assessment of Safety Culture and
Management of Nuclear Safety Concerns at the
Hanford Site Waste Treatment and Immobilization Plant

Supplemental Volume

Table of Contents

FOREWORD

This supplemental volume provides additional technical details regarding a September through December 2011 assessment of the U.S. Department of Energy (DOE) Waste Treatment and Immobilization Plant (WTP). The assessment was performed by an Office of Health, Safety and Security (HSS) Independent Oversight team. This detailed information is provided to help the DOE Office of River Protection (ORP), the DOE WTP Project Office, and the WTP contractor (Bechtel National, Incorporated) in their efforts to improve the safety culture and safety management.

This supplemental volume includes three technical appendices, which contain detailed results developed during the HSS Independent Oversight assessment. Appendix A provides the results of a review of the WTP safety culture by external independent safety culture experts. Appendix B presents the results of the Independent Oversight team's assessment of ORP's management of safety concerns. Appendix C presents the results of the Independent Oversight team's assessment of the WTP contractor's management of safety concerns.

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Acronyms

ABAR	Authorization Basis Approval Request
ATS	Action Tracking System
BARS	Behavioral Anchored Rating Scales
BNI	Bechtel National, Incorporated
BOF	Balance of Facilities
CDR	Construction Deficiency Report
CLIN	Contract Line Item
DNFSB	Defense Nuclear Facilities Safety Board
DOE	U.S. Department of Energy
DOE-WTP	DOE WTP Project Office
DPO	Differing Professional Opinion
DSA	Documented Safety Analysis
ECP	Employee Concerns Program
EM	Office of Environmental Management
EM-1	Assistant Secretary for Environmental Management
E&NS	Environmental and Nuclear Safety
ERB	Executive Review Board
ESH	Environment, Safety and Health
FEOSH	Federal Employee Occupational Safety and Health
FPD	Federal Project Director
FRA	Functions, Responsibilities, and Authorities
FY	Fiscal Year
HGET	Hanford General Employee Training
HLW	High Level Waste
HPA	Human Performance Analysis Corporation
HR	Human Resources
HSS	Office of Health, Safety and Security
IG	Inspector General
INPO	Institute of Nuclear Power Operations
IPT	Integrated Project Team
IRT	Integrated Resolution Team
ISMS	Integrated Safety Management System
LAW	Low Activity Waste
NCR	Nonconformance Report
NRC	Nuclear Regulatory Commission
NSD	ORP Nuclear Safety Division
NSQC	Nuclear Safety and Quality Culture
NSQCMP	Nuclear Safety and Quality Culture Monitoring Panel
ORP	Office of River Protection
PDSA	Preliminary Documented Safety Analysis
PEP	Project Execution Plan
PER	Problem Evaluation Request
PIER	Project Issue Evaluation Report
PIP	Process Improvement Project
PIRB	Performance Improvement Review Board
POD	Plan of the Day
PRC	PIER Review Committee
PT	Pre-Treatment

PTF	Pre-Treatment Facility
Q&PA	Quality and Performance Assurance
QA	Quality Assurance
QC	Quality Control
RADKAR	Recognition, Awareness, Desire, Knowledge, Ability, and Reinforcement
RL	Richland Operations Office
SCWE	Safety Conscious Work Environment
SPI	Schedule Performance Indicator
TIEF	Technical Issue Evaluation Form
WED	DOE-WTP Engineering Division
WRPS	Washington River Protection Solutions
WTP	Waste Treatment and Immobilization Plant

APPENDIX A

An Independent Evaluation of Safety Culture at the Waste Treatment and Immobilization Plant

External Independent Safety Culture Evaluation Team:

Dr. Sonja B. Haber, Consultant, HPA
Dr. Deborah A. Shurberg, Consultant, HPA

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APPENDIX A

An Independent Evaluation of Safety Culture at the Waste Treatment and Immobilization Plant

A.1 Introduction

This report describes the results of an independent evaluation of the existing Safety Culture at the U.S. Department of Energy (DOE) Waste Treatment and Immobilization Plant (WTP). The population of the evaluation was all employees, both federal and contractor, in the DOE Office of River Protection (hereafter referred to as ORP), including the DOE WTP Project organization (hereafter referred to as DOE-WTP) and all contractor employees working for Bechtel National, Incorporated and their subcontractors (hereafter referred to as BNI). The evaluation was conducted between September and November 2011. The primary objective of the evaluation was to provide information regarding the status of the safety culture components at the WTP Project. The evaluation was conducted using the same methodology that aligns with the current U.S. Nuclear Regulatory Commission (NRC) procedures for independent safety culture assessment. In addition, the framework applied to the collection and analysis of data is that recently described by the NRC. Positive observations and areas in need of attention with respect to the traits necessary for a healthy safety culture are presented. Conclusions regarding the results of the information collected on the safety culture traits are also presented to facilitate the identification of improvement strategies. Finally, recommendations are provided for some initial steps that the Independent Safety Culture Evaluation Team – i.e., the external independent safety culture experts, supported by the DOE Office of Health, Safety and Security (HSS) Independent Oversight personnel who collected data, referred to as the Team in this appendix – are necessary to effectively implement and execute the actions that will result in improved safe and reliable performance.

A.2 Background

Evaluating the safety culture of a particular organization poses some challenges. Cultural assumptions, which influence behavior and, therefore, safety performance, are not always clearly observable. Schein (1992) presents a model of culture that helps in understanding how the concept can be assessed. In Schein's model, culture is assumed to be a pattern of shared basic assumptions, which are invented, discovered or developed by an organization as it learns to cope with problems of survival and cohesiveness.

According to Schein's three-level model, an organization's safety culture can be assessed by evaluating the organization's artifacts, claimed values, and basic assumptions. On the first level of the model are the organization's artifacts. Artifacts are the visible signs and behaviors of the organization, such as its written mission, vision, and policy statements. The second level consists of the organization's claimed or espoused values. Examples of claimed values might include mottos such as, "safety first" or "maintaining an open reporting work environment." The third level is comprised of the basic assumptions of the individuals within the organization. Basic assumptions are the beliefs and attitudes that individuals bring into the organization or that are developed because of experience within the organization. Examples of basic assumptions may include, "safety can always be improved" or "everyone can contribute to safety." The organization's basic assumptions regarding safety culture are less tangible than the artifacts and claimed values. They are often taken for granted within the organization that shares the culture.

Artifacts, claimed values, and basic assumptions are evaluated to identify the presence or absence of the safety culture traits that have been found to be important for the existence of a healthy safety culture within a nuclear facility (INSAG-15, 2002; INPO Principles for a Strong Nuclear Safety Culture, 2004; NRC Inspection Manual 0305, 2006). The NRC and its stakeholders have recently agreed upon nine traits which are viewed to be necessary in the promotion of a positive safety culture. These include:

- **Leadership Safety Values and Actions**
- **Problem Identification and Resolution**
- **Personal Accountability**
- **Work Processes**
- **Continuous Learning**
- **Environment for Raising Concerns**
- **Effective Safety Communication**
- **Respectful Work Environment**
- **Questioning Attitude**

Particular behaviors and attitudes have been identified to evaluate the extent to which the organization has attained these attributes. A variety of different methods are employed to collect information about the various behaviors and attitudes identified.

Most of the methodology used in this evaluation was originally developed with the support of the NRC (1991) to assess the influence of organization and management on safety performance. The methodology entails collecting a variety of information that is largely based upon the perceptions of the individuals in an organization, as well as conducting structured observations of individuals performing work activities. Perceptions are often reality when it comes to influencing behavior and understanding basic assumptions. Therefore, the data collected regarding individuals' perceptions are critical to this type of evaluation.

A.3 Scope of Safety Culture Evaluation

The scope of this safety culture evaluation was defined to include all employees, both Federal and contractor, in ORP, including DOE-WTP and all contractor employees working for BNI including BNI subcontractors. Throughout this appendix, the term "ORP" refers to all ORP organizations including individuals assigned to DOE-WTP.

The HSS Independent Oversight Team was on site at the WTP Project between September and November, 2011. In addition, the Organizational Safety Culture Survey was electronically administered during that same time period with the survey being open for completion by employees from October 26 through November 10, 2011.

The HSS Independent Oversight Team was used by the external independent safety culture experts to assist in collecting onsite data and was comprised of the HSS Independent Oversight Team (including an HSS specialist in Human Performance Improvement) and an external professional sociologist.

This safety culture evaluation is a 'point in time' snapshot of ORP and BNI. Although the Team recognizes that ORP and BNI may be making organizational and process changes to continue improving safety culture since the point in time at which the evaluation was conducted, the Team has not evaluated the impact of those actions. Therefore, changes that have occurred subsequent to the time of the evaluation are not discussed in this report.

A.4 Methodology

The complete details of most of the methodology used in this evaluation are presented elsewhere (Haber and Barriere, 1998), but are briefly described in this section. Five methods are used to collect information on the organizational behaviors associated with the safety culture traits. These methods are:

- Functional Analysis
- Structured Interviews and Focus Groups
- Behavioral Anchored Rating Scales (BARS)
- Behavioral Observations
- Organizational and Safety Culture Survey.

The use of multiple methods to assess any organizational behavior assures adequate depth and richness in the results obtained. In addition, confirming the results obtained through the use of one method with results obtained through the use of another method provides convergent validity for the results. A brief description of each method is provided below.

A.4.1 Functional Analysis

The purposes of the Functional Analysis are to: (1) clearly identify the organizational units of the ORP and BNI, (2) gain an understanding of each organizational unit's functions and interfaces, (3) examine the way in which information flows within and between units, and (4) identify the key supervisory and managerial positions of each organizational unit. Information to support this activity was obtained primarily through the review of the documentation identified below, some semi-structured interviews, and some observations of organizational activities. The organizational behaviors to be evaluated were identified from the information collected during this analysis.

In addition, a scoping visit was conducted September 26-29, 2011 so that documentation could be reviewed at the facility and select interviews could be conducted so that plans for the onsite evaluation could be developed. During the scoping visit, interviews were conducted with approximately 20 individuals both in ORP and BNI.

Documentation Review

During the data collection activities, a wide variety of documents were reviewed including WTP program and project plans, WTP and ORP technical and administrative procedures, project organization charts, interoffice memoranda, applicable DOE regulations and technical standards, corrective action reports, and documented employee concerns.

Organizational Behaviors

Based upon the information obtained from the Functional Analysis, the following organizational behaviors were identified for evaluation:

Attention to Safety – Attention to Safety refers to the characteristics of the work environment, such as the norms, rules, and common understandings that influence site personnel's perceptions of the importance that the organization places on safety. It includes the degree to which a critical, questioning attitude exists that is directed toward site improvement.

Communication – Communication refers to the exchange of information, both formally and informally, primarily between different departments or units. It includes both the top-down (management to staff) and bottom-up (staff to management) communication networks.

Coordination of Work – Coordination of Work refers to the planning, integration, and implementation of the work activities of individuals and groups.

Formalization – Formalization refers to the extent to which there are well-identified rules, procedures, and/or standardized methods for routine activities as well as unusual occurrences.

Organizational Learning – Organizational learning refers to the degree to which individual personnel and the organization, as whole, use knowledge gained from past experiences to improve future performance.

Performance Quality – Performance quality refers to the degree to which site personnel take personal responsibility for their actions and the consequences of the actions. It also includes commitment to and pride in the organization.

Problem Identification and Resolution – Problem identification and resolution refers to the extent to which the organization encourages facility personnel to draw upon knowledge, experience, and current information to identify and resolve problems.

Resource Allocation – Resource Allocation refers to the manner in which the facility distributes its resources including personnel, equipment, time and budget.

Roles & Responsibilities – Roles and responsibilities refer to the degree to which facility personnel's positions and departmental work activities are clearly defined and carried out.

Time Urgency – Time urgency refers to the degree to which facility personnel perceive schedule pressures while completing various tasks.

These behaviors are then used to provide information on the nine traits according to the following framework:

- Leadership Safety Values and Actions – Attention to Safety; Time Urgency
- Problem Identification and Resolution – Problem Identification and Resolution
- Personal Accountability – Performance Quality; Roles and Responsibilities
- Work Processes – Coordination of Work; Formalization
- Continuous Learning – Organizational Learning
- Environment for Raising Concerns – Safety Conscious Work Environment (SCWE)
- Effective Safety Communication - Communication
- Respectful Work Environment – Communication Trust
- Questioning Attitude – Attention to Safety.

A.4.2 Structured Interview and Focus Group Protocol and Behavioral Anchored Rating Scales (BARS)

The Structured Interview and Focus Group Protocol was derived from a database of interview questions. A particular subset of questions can be selected to provide a predefined focus to an interview or focus group session. The Independent Safety Culture Evaluation Team selected a set of questions to gather

information related to the safety culture traits from the organizational behaviors identified from the Functional Analysis.

A total of 25 individual interviews and 37 focus groups were conducted as part of the assessment. A total of 253 individuals were involved in one these activities, 44 of them at the ORP (representing 7 focus groups and 9 individual interviews). Each interview and focus group lasted approximately one hour and a few less formal follow-up interviews were conducted to provide further clarification when necessary. A Hot Line was established for the purpose of giving ORP and BNI employees and other stakeholders an opportunity to speak with HSS Independent Oversight data collectors.

The Behavioral Anchored Rating Scales (BARS) were administered to most individuals who participated in the structured interviews and/or focus groups (i.e., logistics and time constraints in some cases prevented the administration of the BARS to all participants and in a couple of cases, participants declined to complete the BARS). Each interviewee was administered the BARS associated with four different organizational behaviors. The BARS provided the opportunity to quantitatively summarize qualitative data associated with the interviewee's perceptions of the organization. Approximately 980 BARS were collected representing 10 organizational behaviors (172 of the BARS were from ORP).

A.4.3 Behavioral Observations

The use of behavioral observations provides an unobtrusive assessment of particular organizational behaviors and critical processes including work planning, management meetings, department meetings, and responses to planned or unplanned events. The selected organizational behaviors are specifically identified in the evaluation of the activities observed.

During the course of the Safety Culture Evaluation, approximately 10 observations were conducted. The data represent observations of Brown Bag Meeting, Performance Improvement Review Board (PIRB) Meetings, Project Issue Evaluation Report (PIER) Review Committee Meetings, Joint Risk Management Team Meeting, Supervisor Safety Watch, Quarterly Assessment Program Review Meeting, Critical Items Action Reporting Meeting, Plan of the Day (POD) Meeting, a high level Project Management Meeting, and BNI Superintendent Meeting.

A.4.4 Organizational and Safety Culture Survey

The primary purpose of administering a survey is to measure, in a quantitative and objective way, topics related to the behaviors of interest. By conducting a survey, a broad sample of the individuals in the organization can be obtained and it is possible to gather information from a larger number of personnel than can be reached through the interview process alone. The survey used in this evaluation has been administered previously by the Independent Safety Culture Evaluation Team Lead at over 40 different organizations.

Because of the surveys recently administered to employees of the BNI population, this group was not included in the survey administration for this evaluation. Consequently only the ORP population was invited to participate in the survey administered as part of this evaluation. A total population of approximately 193 ORP personnel (including both federal and contractor employees within that Office) was invited to participate. A total of 140 individuals actually completed the survey, which represents a 72.5% response rate. This is an acceptable rate of response from which representative conclusions regarding ORP employee and contractor perceptions and attitudes concerning the work environment can be made.

A.5 Results

The results presented below summarize the insights gained from the evaluation team's analyses of the structured interviews and focus groups, BARS, observations, and survey data. Survey data was only obtained for the ORP employees. The results are presented in terms of the Safety Culture traits for each organization, ORP and BNI. Positive Observations and Areas in Need of Attention related to each trait are presented and provide the observations, insights and data to understand their impact on the overall health of Safety Culture. In addressing needed safety culture improvements, ORP and BNI should focus on recommendations in this report and address the examples in the Areas in Need of Attention, including exceptions noted in the Positive Observations, within that larger framework. Resolution of the issues should be managed in accordance with the WTP corrective action management program. It is not the intention that each Area in Need of Attention necessarily result in a corrective action. Developing numerous corrective actions in this area perpetuates a compliance mentality which does not foster a 'healthy safety culture'.

Leadership Safety Values and Actions
Leaders demonstrate a commitment to safety in their decisions and behaviors.

ORP

Positive Observations

- ORP is perceived by many interviewees to have a strong focus on nuclear safety.
- Interviewees and observations by the Team indicated that safety issues are addressed regularly and that every meeting begins with a safety topic.
- Several individuals indicated that they would not hesitate to issue a stop work order if they believed that safety would be compromised. Many believe that they all have the responsibility for safety and that they can penalize the WTP contractor for doing unsafe work.
- Most interviewees indicated that they did not perceive a tradeoff between production and safety. While most acknowledged that schedule was important they did not perceive it to be at the expense of safety.
- Results from the Behavioral Anchored Rating Scale on Time Urgency indicate that the majority of interviewees do not perceive schedule pressures while completing various tasks. This perception was strongest among the Management Group.
- Interviewees indicated that behaviors which override safety are not incentivized.
- The Integrated Resolution Team (IRT) is generally perceived as a valuable tool for understanding disagreements on various issues and then working to direct safety decisions.
- Leadership, performance, integrity, and safety are all included in the Simultaneous Excellence program.

Areas in Need of Attention

- Interviewees provided some examples of where decision making was not perceived to reflect the highest commitment to safety.

- Use of garnet to cut a tank in the Tank Farm was perceived as a schedule over safety decision to meet a commitment to the State without a formal evaluation of the impact of the effects of garnet on erosion.

- Categorization of findings is prioritized from 1 to 3, with the highest safety significance being a 3. Staff related instances of where they wanted findings changed from a 2 to a 3 but their management decided that the findings were not that significant; however, no basis for their decisions was communicated.

- There is a perception among some staff that there is less concern with risk now among the current ORP managers, and more concern with project, cost, and schedule.

- Some interviewees indicated that they had heard that colleagues working on the Pre-Treatment (PT) and High Level Waste (HLW) facilities have been asked to leave things out of their reports, e.g. pipe erosion and criticality issues.

- Management is described by staff as considering an issue closed unless testing shows otherwise. Staff indicated that they do not necessarily share that perspective.

- While the IRT is perceived as a valuable tool, several individuals indicated that communication, integration and consistency across the teams need to be improved.

- Results on the Attention to Safety Scale on the electronic survey were on the low end of scores compared to a database of other organizations' responses to the same questions. This indicates that survey respondents did not have a high perception of the importance that safety has to success in their organization as measured by the value placed on various safety promoting behaviors.

- Interviewees did indicate that they perceive mixed messages with respect to incentives for schedule and cost as compared to performance. Interviewees perceived that if the Initial Plant Operation is accelerated, the contractor can earn 80 – 100 million dollars in award fees. Fees for cost are higher than for performance; however, a minimum level of safety must be reached before any fee in performance is issued, and larger contractors are incentivized for schedule, with fees for cost performance.

- Some interviewees described struggling with concerns that there is the perception that the schedule takes priority over safety and that it is misunderstood. Some in ORP hold the view that the entire project is safety driven because meeting the schedule is safety from an environmental risk perspective.

- Perceptions around the allocation of resources are generally negative within ORP. In particular, results on the Behavioral Anchored Rating Scale for Resource Allocation were overwhelmingly negative for the General Engineering and Safety System Oversight/Facility Representative groups.

- Interviewees indicated that additional resources could be used to develop a better human capital management plan, provide additional staff for support organizations, improve the action tracking system, develop a comprehensive document control system, add safety training activities and implement a safety recognition program.

BNI

Positive Observations

- Many of the engineering and management interviewees across all functional groups indicated that safety takes precedence over any schedule or productivity concerns. Safety is identified as the top priority and doing the job right is the stated expectation.

- Many interviewees indicated that while schedule pressure can be an issue, if management is made aware of the reasons early enough, there is generally enough flexibility in the schedule.

- Most interviewees indicated that there are no incentives for them to complete jobs ahead of schedule. Some interviewees questioned whether this was also true for management based upon some of the behaviors they observed with respect to schedule pressure.

- Interviewees and observations collected during the evaluation indicated that meetings start with a discussion of safety.

- Some interviewees indicated that some managers are now 'walking the talk' around safety and that they have seen these improvements over the last half of this year. Examples cited included the restart of the propane back up system, x-raying of the pipe welds in the HLW, re-analysis and testing of all products by a fabricator who may not have understood the full safety requirements.

- Construction Management interviewees indicated that all new hires are required to attend a one hour class on Nuclear Safety and Quality Culture in their first hour of their first day on site. Topics include all types of safety, importance of verbatim compliance and the promotion of identifying problems.

- There is acknowledgement by some management interviewees that certain BNI Groups are understaffed and an effort is being made to align budget with resource needs. This has been identified for Project Controls and Environmental and Nuclear Safety (E&NS) in particular.

- Some interviewees indicated that they perceive that supervision and management gives attention to resolve issues appropriately, e.g., design issues will be elevated if they affect safety, the full scale design of test stands had issues and was elevated to the BNI Project Manager.

- Results from the Behavioral Anchored Rating Scale on Time Urgency indicate that the majority of BNI interviewees who completed this scale (68%) do not perceive schedule pressures while completing various tasks. This perception was strongest among the Non-Manual Groups. The E&NS Group had the lowest perceptions among the Non-Manual Groups on this behavior. The Construction Manual Group had the lowest perceptions on this scale across all BNI Groups.

Areas in Need of Attention

- Numerous examples were provided by interviewees in Construction of their perception of the lack of internalization and prioritization of the commitment to safety by various levels of management in BNI.

    - Building Superintendents have different interpretations of management expectations. If an incident happens in their area they may change expectations, but those changes are not

necessarily implemented in other facilities by other superintendents resulting in confusion among the craft workforce.

- Craft get moved around a lot and the rules are different in different buildings (e.g., HLW, PT, Low Activity Waste, Analytical Laboratory, Balance of Facilities).

- Some cases of overlapping and conflicting requirements within work packages or automated job hazard analyses, e.g., material handling hazards.

- For the crafts, tradeoffs between production and safety depends on schedule, preach safety but must get it done, e.g., due to a need to move staff in a short time, no STARRT card was used and a Superintendent personally directed drivers bypassing the chain of command; water containers weighing greater than 50 lbs were moved by single individuals because of the lack of available resources and time pressure.

- If there are issues with radiography at the site, radiography is shut down; if there are issues with construction it continues even if it was the cause of the problem.

- Individuals are arguing and fighting over issues with fire codes.

- Hot work training is inadequate and yet issues continue at the site.

- Incident on crossing radiological boundary was characterized by management as a safety issue rather than a radiological protection issue because the penalties for a safety issue are less severe.

- After girder came out of the wall in the PT building, many individuals could not believe that management would allow them to resume work in areas of the building while inspections of the building for additional problems were ongoing.

- There is a pervasive perception about the lack of competence and/or accountability at the Superintendent level of management. This was described not only by those in the construction side of BNI but also by interviewees in the oversight and licensing groups.

- Many interviewees indicated that safety culture at BNI is not perceived to be modeled by its leaders or internalized by its members but is rather just procedural.

- While many interviewees indicated that they believed that safety would not be compromised for schedule, several examples were provided by other interviewees that could be perceived to be contrary to that expectation.

    - Project Management has a deputy that interviewees perceive is assigned to focus on Earned Value Management, but not on Safety or Quality.

    - There is a Schedule Performance Indicator (SPI) that is perceived to have the highest priority. Interviewees described an example where an activity was manipulated so that the SPI for that activity could still be rated a one.

    - Some Non-Manual interviewees indicated that the failure to meet schedule deadlines in their work group was clearly reflected in their annual review and earnings. Often the

pressure to meet the deadlines was created by the performance of other groups. These individuals indicated having to work a lot of overtime.

- Some activities are described as not being in the schedule because then they would have to be worked; interviewees indicated that safety system reconciliation is not in the schedule.

- Some interviewees indicated that understaffed groups are having a potential impact on safety performance.

  - Interviewees in Quality and Performance Assurance described having to conduct audits without subject matter specialists in several areas, e.g., fire safety.

  - Some groups indicated that they are working a lot of overtime and people are getting tired and less likely to be asking questions or be as vigilant in their work.

  - Some personnel are held up from conducting their work because of resource shortages in other groups, e.g., vehicles and drivers and delayed material deliveries due to procurement issues.

  - Interviewees described needing additional resources to update and maintain the prelimary documented safety analysis on an annual basis.

  - Craft interviewees indicated that the shift turnover time has been reduced and that they perceive that walk downs are now not being performed properly.

- Data on the Behavioral Anchored Rating Scale for Resource Allocation indicated that only slightly more than 30% of the BNI respondents who completed this scale felt positively about the way the organization distributes its resources, including time, money, people and equipment. Manual respondents had slightly lower perceptions about resource allocation than did Non-Manual respondents. The E&NS, Procurement and Administration Work Groups had the lowest perceptions on this behavior.

Problem Identification and Resolution

Issues potentially impacting safety are promptly identified, fully evaluated, and promptly addressed and corrected commensurate with their significance.

ORP

Positive Observations

- Multiple mechanisms for identifying problems within ORP were described by interviewees including, independent peer reviews, construction project reviews, contractor surveillances and assessments, facility representatives and an open door policy with supervision and management.

- Management described the 'broaden your bandwidth' initiative which allocates 20% of an individual's time to be used outside their job function.

- Data from the Behavioral Anchored Rating Scale on Problem Identification and Resolution indicates that about 80% of all ORP interviewee respondents believe that employees are

encouraged to notify management of problems they observe and that there is a system that evaluates the problem and makes a determination regarding future action.

Areas in Need of Attention

- Some interviewees also described concerns that the day to day oversight of the Project was not sufficient.
    - No good mechanism for DOE Facility Representatives to report more 'subjective' information, e.g., impact of certain personal protection equipment. Non-compliance based items are not solicited.
    - ORP oversight tasked individuals believe that they need to be empowered to ensure the appropriate oversight is conducted. They cite perceptions that their supervisors are sometimes aligned more with the contractor than with them.
    - Clarification of the oversight model for the Project is needed; perception that not everyone is concerned about a nuclear safety culture at a construction site.
    - Cut backs in ORP personnel present a challenge for conducting the appropriate oversight both in the field and for system reviews.
    - Perception that the erosion in the communication and relationships between ORP, DOE-WTP, and BNI has impacted the effectiveness of oversight.

BNI

Positive Observations

- Most interviews identified that multiple mechanisms exist within BNI to report problems and that everyone is encouraged to do so. Mechanisms described included the risk identification process, technical issues identification program, PIERs and Action Tracking System, management, supervision, Employee Concerns Program (ECP), DOE, meetings, training, Project Management Team, Safety Logbook, craft safety representatives, and SETO (Safety Education Through Observation).
- Many interviewees indicated that there were no inhibitors to identifying problems.
- Data from the Behavioral Anchored Rating Scale on Problem Identification and Resolution indicated that slightly more than 60% of the BNI interviewee respondents who completed this scale perceived that the organization encourages project personnel to draw upon knowledge, experience and current information to identify and resolve problems positively. All of the respondents in the Construction Non-Manual Group (100%) viewed this behavior positively. Respondents in the E&NS Group had the lowest perceptions about Problem Identification and Resolution.

Areas in Need of Attention

- Interviewees and observations by the Data Collection Team did identify problems with the problem identification and resolution processes at BNI that may inhibit a healthy safety culture.

- Several interviewees indicated that they will not use the differing professional opinion (DPO) or PIERs process to resolve issues with ORP because they have been told by management that these are not to be used against the customer.

- Several interviewees indicated that management expectations on the threshold for identifying problems vary across the organization, and they are often different than the stated expectations.

- Some interviewees indicated that they believe that they should question before reporting a problem to see if they can resolve it first.

- Some individuals indicated that they do not identify problems because they believe it makes no difference and will never be addressed.

- Interviewees indicated that when a problem is identified it often comes back to the originator creating a 'boomerang' effect.

- Many interviewees complained that it takes too long to resolve issues and that is a reflection of the culture and the importance that organization places on problem identification and resolution.

- The value of the PIERs process for BNI performance improvement is not being realized.

  - Some supervision indicated that they perceive that the PIERs process is being improperly used to "manage" people and behaviors.

  - Interviewees describe spending a lot of time managing PIERs issues and trying to correct data in the system by convincing employees to change their entries. There is a perception that there is a punishment factor in PIERs by overrating PIERs as a level B versus C since there is a limit on how long it can be extended and multiple extensions are not viewed positively.

  - Many interviewees perceive that the emphasis in PIERs is on the closing time, rather than on actually solving the problem.

  - Interviewees describe that working on PIERs is not scheduled or funded.

  - There is the perception that if you raise an issue, you are expected to have a firm understanding of the issue.

  - Several interviewees indicated it is difficult to get people to pay attention to the 'little' issues, like organizational or programmatic problems as compared to larger technical issues.

  - The fee for milestone structure is perceived to be contrary to promoting the identification and understanding of problems.

Personal Accountability
All individuals take personal responsibility for safety.

ORP

Positive Observations

- Job descriptions for many of the ORP positions are described as accurate by interviewees.

- Several interviewees perceive accountability for safety through position descriptions, which include performance standards, performance appraisals, safety criteria in work activities, procedures, and management reinforcement of behaviors.

- Some interviewees indicated that self-reporting is encouraged, acknowledged and appreciated. Efforts focus on understanding the problem and finding a solution.

- A new interface management process was described which includes functional responsibilities with BNI to evaluate interface issues.

- Data on the Behavioral Anchored Rating Scale for Roles and Responsibilities indicates that approximately 70% of the ORP interviewees who completed this scale perceive that positions and work activities are clearly defined and carried out.

Areas in Need of Attention

- Several interviewees indicated that the reporting structure for DOE-WTP has yet to be clarified. Although organizational charts exist, it is not clear who the DOE-WTP Federal Project Director reports to, how the various lines fit together, and who is responsible for what issues. Some individuals asked the question, "Who is responsible for delivering the WTP Project?"

- Interviewees describe that issues raised against DOE-WTP and BNI by other ORP organizations are not formally transmitted.

- Some interviewees indicated that with the reorganization, ORP Federal employees outside of DOE-WTP have lost communication and cognizance of WTP issues and feel more distant even though they are supposed to support the Project, e.g., Industrial Safety.

- Along similar lines, other interviewees indicated that while DOE-WTP currently makes decisions for WTP, when the plant is operational ORP will have responsibility and they will not have been involved in the decision making process up to that point. Some interviewees indicated concerns about effectively covering oversight at startup of WTP.

- There is the perception described by some individuals that ORP Management is presently ineffective against DOE-WTP Management, e.g., perception that in the safety area there is no accountability and ORP organizations not in DOE-WTP have been stifled in assessing the safety and quality of the WTP Project.

- Data on the Behavioral Anchored Rating Scale for Performance Quality indicates that about 60% of the ORP interviewees who completed this scale perceive that project personnel take personal responsibility for their actions and the consequences of the actions. It also reflects on commitment and pride in the organization. Within the ORP respondents the most negative

perceptions on this behavior are held by those in the General Engineering Group. One hundred percent of ORP Management respondents had positive perceptions about Performance Quality.

- Scores on the Commitment Scale from the electronic survey validated the Performance Quality BARS data. ORP Non-Supervisory personnel had statistically significantly lower scores on Commitment than did ORP Supervisory or Contractor personnel.

- Additionally, statistically significant differences between ORP organizational work groups were obtained on the Commitment Scale with the Nuclear Safety and Physical Scientist and General Engineering Groups scoring lower than others.

BNI

Positive Observations

- Several interviewees indicated that there would be no repercussions for self-reporting if the individual notified their supervision right away, e.g., engineer approved a Piping and Instrument Drawing without E&NS signature, wrote PIER on it.

- People perceive being held accountable through peer pressure, performance evaluations, work rules and procedures, supervision in the field, modification walk downs, engineering design review process, work checkers and formal peer reviewers, Construction Review Board, and craft safety representatives.

- Interviewees identified that safety is included as a high level goal for annual performance reviews; however, it is handled differently across BNI and its subcontractors.

- Several management interviewees indicated that their job descriptions and roles and responsibilities have been clearly identified.

Areas in Need of Attention

- Accountability for safety is perceived by several groups to be an issue at BNI. During this assessment, the Team obtained several examples indicative that accountability has not been internalized by the organization. Some include:

  - Many interviewees believe that individuals at all levels in the organization are inconsistently held accountable for behavior, e.g., red tape work, crossing radiological boundaries, forgetting to turn keys in.

  - Non-manual employees indicated that there is no consistency in what happens to individuals for reporting.

  - Many managers and supervisors do not consistently exhibit the desired behaviors and are not challenged by their managers or peers, e.g., superintendents.

  - The Team could not identify a Project Plan to enhance personnel performance through the use of human performance tools or a better personal accountability to standards.

  - There is a perceived lack of accountability for corrective actions in timeliness, ownership, and quality, e.g., effectiveness reviews.

- Some interviewees indicated that rationalization, justification, and finger pointing are used by individuals at all levels of the organization to describe why events have occurred at WTP. There is a clear reluctance to share accountability and effectively move forward to prevent reoccurrence.

- Interviewees described accountability to be perceived as a punitive behavior. The only tool that is described by individuals that is used is a performance evaluation process that is inconsistently implemented from one facility to another.

- Several interviewees did indicate that the reorganization in the Engineering Group has resulted in some confusion about roles and responsibilities. In particular, one issue that has been identified is who is currently responsible for designating systems related to the identification of fire barriers. Additionally relationships between engineering support groups evaluating calculations and their liaisons have been lost and different competing priorities increase the risk that the focus on safety and quality may be reduced. Interviewees also indicated that a clear engineering organizational chart does not currently exist.

- Several interviewees indicated that there are some situations in which the chain of command is not followed, e.g., managers go directly to individuals, bypassing their supervision or management, to assign them work.

- Interviews indicated that there is a wide difference of opinion between construction superintendents and manual labor regarding the worker performance rating system. Superintendents believe that the performance rating system, although complex, is an improvement over the prior seniority system. Manual workers (craft foremen and general foremen) indicated that the current rating system is poor, inconsistent and unfair.

- Data from the Behavioral Anchored Rating Scale for Performance Quality indicated that less than 50% of the BNI interviewed individuals who were asked about this behavior were positive in their perception that employees take personal responsibility for their actions and the consequences of the actions. It also includes the perception of commitment to and pride in the organization. In particular, only 22% of Manual Respondents had positive perceptions about this behavior and within the Non-Manual Respondents individuals in the E&NS Group had the lowest perceptions of all BNI Groups.

- Data on the Behavioral Anchored Rating Scale for Roles and Responsibilities indicates that almost 60% of BNI respondents to this scale have a negative perception of the extent to which facility personnel's positions and departmental work activities are clearly defined and carried out. Among the BNI Functional Groups only the Construction Non-Manual Group (about 55% of the group) and the Quality and Performance Assurance Group had positive perceptions about this behavior.

Work Processes

The process of planning and controlling work activities is implemented so that safety is maintained.

ORP

Positive Observations

- Interviewees described weekly meetings with BNI to facilitate the coordination of work.

- ORP interviewees indicate that the contract with BNI spells out the work to be done, the list of deliverables, and the milestones very clearly.

- Interviewees indicated that three DOE-WTP staff are located with BNI and that they attend the POD Meetings to understand what is needed in acquisitions and procurement.

- ORP Management interviewees indicated that ORP interprets worker safety requirements very conservatively, that verbatim procedure compliance is required, and that DOE has adequate safety standards and orders to ensure that work is performed safely.

Areas in Need of Attention

- Issues with the planning and coordination of work identified by many interviewees across ORP included:

  - DOE made the choice to do design concurrent with build and that brought a lot of risk and problems to the project.

  - The non-alignment across the project in a lot of areas is the best insight into the safety culture of the WTP project.

  - Coordination and communication between ORP and RL has created some difficulties, e.g., need for air monitoring supplied by a different contractor at the site that reports through the Richland Operations Office (RL) was not easy to negotiate.

  - Work planning and coordination is hindered by the geographical dispersion of the groups.

  - Coordination is an identified issue across the DOE Hanford facilities and the resolution was a commitment to the Defense Nuclear Facilities Safety Board (DNFSB).

  - Resources and planning in licensing on the BNI side were inadequate to determine what was needed to put into the documented safety analysis and final resolution requires a $50 million contract change that is currently under review by ORP.

- Among survey respondents Coordination of Work is perceived to be somewhat varied across ORP but generally not positive. In particular, respondents in the Administrative Work Group were the most positive about the Coordination of Work scoring significantly higher than most of the other Organizational Groups. The General Engineering Group had the lowest scores on this scale.

- Data from the Behavioral Anchored Rating Scale for Coordination of Work indicated a lot of uncertainty across ORP with regard to this behavior, validating the survey data. Approximately 55% of the BARS respondents on this measure believe that when work plans are implemented most departments and individuals know their roles and responsibilities. However, they also believe that departments work individually and usually do not have the acceptance or support of other departments, nor are all the involved parties included in the planning.

- Some interviewees described some procedures as not user friendly, cumbersome, and verbose and likely cannot be used effectively. They perceive that the gap with the standards is then because of the complexity of the procedure the intent of the standard is not being implemented correctly.

- Data from the Behavioral Anchored Rating Scale for Formalization indicated that about 65% of ORP interviewees who completed this scale believe that rules and procedures governing plant activities are readily available and that personnel are aware of the importance of procedural adherence. General Engineering had the most negative perception about formalization with only a little over 30% of the respondents having a positive response.

BNI

Positive Observations

- Some interviewees indicated that there is a schedule for all work to be loaded into and that they are starting to load a commissioning schedule.

- Several interviewees described that work is not held up often because of having to wait for other individuals. Work can be held up as a result of design change, trends, often due to safety enhancements.

- POD meetings were described by some interviewees as a good way to know what is being done.

- Data on the Behavioral Anchored Rating Scale for Coordination of Work indicates that 65% of the BNI respondents to this scale have a positive perception of the planning, integration, and implementation of work activities of individuals and groups.

- Interviewees describe most work being required to be performed according to national nuclear standards.

- Most interviewees indicated that verbatim compliance to standards and procedures is the underlying management expectation. If the procedure is deficient the expectation is to raise a concern to management, e.g., welds called for in design documents were less specific than those in the field, did field change to make sure they were aligned.

- Interviewees described that most procedures have been reworked a lot so they are not generally problematic.

- Construction Management interviewees generally believe that work packages are procedurally driven and are generally clear and correct.

- Data on the Behavioral Anchored Rating Scale for Formalization indicates that almost 80% of BNI respondents to this scale have a positive perception of the extent to which there are well-identified rules, procedures, and/or standardized methods for routine activities as well as unusual occurrences. Among the BNI Functional Groups only the Construction Manual Group (about 55% of the group) had negative perceptions about this behavior.

Areas in Need of Attention

- Some interviewees indicated that when work requires more than one department it can be held up, e.g., pouring needs teamsters, fitters, electrical craft.

- Several interviewees indicated that there was a need for a more detailed priority plan and that sometimes it seems it is difficult to have a realistic schedule.

- Interviewees indicated that coordination of work issues is often in the development of work packages, not in conducting the work in the field.

- Some interviewees indicated that over 50% of work packages are documented in an unclear manner and are too complex to be used. Procedures are often out-of-date, contradictory and inconsistently implemented among the various WTP buildings.

- Rejection of work packages is high as indicated by several interviewees.

- Data on the Behavioral Anchored Rating Scale for Coordination of Work indicated that among the BNI Functional Groups, the Construction Manual Group (about 75% of the group) had the most negative perceptions about this behavior.

- Some construction interviewees indicate that verbatim compliance is dependent upon who the superintendent is; they say that it is expected but then circumvent worker safety measures for priority.

    - Installation of step boxes in lifts – all regulations say not to do it, manufacturer says not to do it, yet there is a procedure that requires it but they tell us to follow the manufacturer's recommendation; no one takes accountability;

    - Brought in a generator and there was no work package to install it, superintendent said to go ahead and do it any way and get the work package later and just add work package number to STARRT card later; additionally, generators needed to be grounded but there was no time to ground them.

- When design efforts do not support milestones, schedule takes precedence over design. Interviewees provided the example of a roof being put on incorrectly; the schedule milestone was met, but rework was required. The design documents were still being revised but because of the pressure to meet the milestone the work was done.

- Interviewees described how poor planning resulted in a missing rebar in a wall.

Continuous Learning
Opportunities to learn about ways to ensure safety are sought out and implemented.

ORP

Positive Observations

- Interviewees indicated that operating experience (lessons learned) is communicated at multiple levels through different mechanisms, e.g. POD meetings conducted by BNI. If the experience is a success, some interviewees described that it is recognized and celebrated, e.g., corrosion rate calculation was found to be incorrect.

- Some management interviewees indicated that they perceived the co-location of ORP staff with BNI Staff in different locations, while difficult, to be a success. ORP staff viewed it more negatively and the union had issues with the idea. Lessons learned from that experience is to provide the union more information when these types of ideas and issues arise.

Areas in Need of Attention

- While the concept of lessons learned was identified by many ORP interviewees, the organization is missing opportunities to use this information as part of a learning process.
    - Interviewees expressed the belief that greater collaboration between ORP and DOE-WTP would facilitate organizational learning.
    - Interviewees described primarily technical opportunities for lessons learned, not organizational or programmatic opportunities.
    - The lessons learned database (HILLS) was not familiar to all interviewees and to some who knew about it they indicated they didn't use it.
    - OPR interviewees acknowledged not doing a good job following up on the corrective actions of the contractor.
- Several ORP staff indicated that they do not have access to the BNI PIER database to support their oversight activities.
- Data on the Behavioral Anchored Rating Scale for Organizational Learning indicated that approximately 45% of ORP interviewee respondents believed that while the organization usually holds review sessions to discuss operating problems and attempts to uncover solutions to past difficulties, the information is generally only communicated to the population when it concerns significant activities. This perception was held by 100% of the General Engineering interviewee respondents.

BNI

Positive Observations

- There are multiple mechanisms identified to communicate operating experience and lessons learned. These include, weekly meetings, awards, newsletters, PIERS, trend process, Integrated Project Team (IPT) meetings, Critical Action Reports, all hands meetings, training, DOE Lessons Learned, Safety Church, and IRTs.
- A new corporate program KASE – Key Actions for Successful Execution – sets up gate posts before a new activity to do as part of a readiness review.

Areas in Need of Attention

- Interviewees indicated that BNI does not do a good job in learning from successes.
- Information obtained from several interviewees indicates that operating experience and lessons learned are not really part of a learning process.
    - Individuals don't always get the reasons behind events but rather just a simplified explanation.

- Better communication about lessons learned might help to standardize the rules from one building to another; e.g., PT building must have spotter, not required by procedure in other buildings.

- Feedback on outcome of PIERs is not usually provided.

- Lock out/tag outs are a big concern but there are still repetitive events.

- Data on the Behavioral Anchored Rating Scale for Organizational Learning indicated that over 65% of the BNI respondents to this scale did not have a positive perception on the extent to which project personnel and the organization use knowledge gained from past experience to improve future performance. I n particular, all Functional Groups except the Construction – Non-Manual Group had negative perceptions of this behavior.

Environment for Raising Concerns

A safety conscious work environment is maintained where personnel feel free to raise safety concerns without the fear of retaliation, intimidation, harassment, or discrimination.

ORP

Positive Observations

- Interviewees clearly understand the mechanisms available to identify safety concerns, e.g., supervisors, managers, ECP, Human Resources (HR), Government Accountability Office, and Hotline.

- Most interviewees identified that they did not perceive any inhibitors to reporting concerns within their organization.

- The statement that management does not tolerate retaliation of any kind for raising concerns was agreed to by a majority of survey respondents, approximately 75%. This was especially true of respondents in the General Engineering, Project Control Specialist, Program Manager, and Administrative Work Groups.

Areas in Need of Attention

- Among survey respondents, only about 70% agreed with the statement that everyone in the organization is responsible for identifying problems. While overall this represents a higher percentage of people agreeing than disagreeing, it is lower than is typically seen in other organizations and still indicates that approximately 30% of the population did not agree with this statement. Respondents in the Program Manager, Nuclear Safety and Physical Scientist and General Engineering Work Groups believed this to a greater extent than respondents in the other work groups. Survey respondents in the Supervisory Group believed that everyone is responsible for identifying problems to a greater extent than respondents in the Non-Supervisory and Contractors Groups did.

- Overall, only 30% of all survey respondents feel that they can openly challenge decisions made by management. Respondents in the Contract Specialist/Budget and Finance, Project Control Specialist, General Engineering and Administrative Work Groups feel most negatively about being able to challenge decisions. Non-Supervisory Personnel and Contractors either do not believe or are uncertain about openly challenging management decisions. Among Supervisory

Personnel slightly more than 70% agreed with the statement related to the ability to openly challenge management decisions.

- Approximately 50% of survey respondents agreed with the statement that they feel that they can approach the management team with concerns. Respondents in the Nuclear Safety and Physical Scientist, Contract Specialist/Budget and Finance, and Project Control Specialist Groups believed this to a lesser degree than respondents in the other work groups. Among Supervisory Personnel slightly more than 70% believed that management could be approached with concerns.

- Only slightly more than 50% of survey respondents agreed with the statement related to management wants concerns reported, and approximately 58% believe that constructive criticism is encouraged. Work group differences were largely in the same direction described for the other responses.

- Interviewees could not identify a formal Nuclear Safety Culture Policy or Program for ORP.

- While interviewees were aware that an ECP program for ORP is available, it has been recently transferred to RL and most individuals did not believe that ORP personnel made much use of it.

- Interviewees indicated that training on SCWE had not yet been provided throughout the ORP organization.

- Some organizational work groups had consistently more disagreements with several survey statements related to SCWE than other groups. In particular, the Nuclear Safety and Physical Scientist and Contract Specialist/Budget and Finance Work Groups tended to either disagree or score lower than other work groups on the majority of the statements related to SCWE.

- Of particular note among survey respondents on the statement that management does not tolerate retaliation of any kind for raising concerns is that respondents in the Supervisory Employee Category disagreed with the statement to a slightly greater extent than the respondents in the other employee categories did. While not statistically significant, in most other organizations supervisors generally agree with this statement to a greater extent than non-supervisory personnel.

BNI

<u>Positive Observations</u>

- Most interviewees clearly understand the mechanisms available to identify safety concerns, e.g., supervisors, managers, safety representatives, ECP, HR, and Hotline.

- Interviewees from certain functional groups identified that they did not perceive any inhibitors to reporting concerns within their organization.

- Almost all interviewees indicated that they wanted to be successful in their jobs and to work as safely as possible.

Areas in Need of Attention

- Some interviewees perceive a double standard between workers and management with respect to accountability and how individuals are treated for raising safety concerns.
    - Identification of lock out/tag out violation with 3 circuits being covered in the same work package; foreman and superintendent indicated that it was okay but individuals were subsequently reprimanded for conducting work.
    - Supervisor stepped into a red tape zone and was suspended for one week; if craft would do that they would be fired.
- Some interviewees indicated that while it appears that the safety log book is a good way to identify concerns anonymously, they believe that if you don't put your name with your concern, the idea is ignored. Additionally, since the books are placed in occupied gathering areas (e.g., lunchrooms) interviewees question the anonymity of the process.
- Several interviewees indicated that while supervision and management claim there will be no retaliation for identifying issues, most people choose not to speak up. There is a strong perception that you will be labeled or red flagged and some individuals indicated that they were transferred to another area by their supervision after having raised concerns.
- Some interviewees indicated a fear of retaliation if they were to use the ECP. They perceive that it is not anonymous and that information is shared without their permission.
- Some interviewees indicated that they need to be careful when bringing up a problem due to possible retaliation, and indicated that "questions were invited, but not wanted."
- Fear of retaliation is also described by some interviewees as part of a legacy issue. While it is difficult to prove, discrimination in the assignment of overtime and other more subtle behaviors on the part of supervision is perceived against those who raise issues.
- Some interviewees did indicate that the event around the whistleblower incident of last year was still on their minds and subtle references to similar consequences were raised as potential inhibitors to their raising concerns.

Effective Safety Communication
Communications maintain a focus on safety.

ORP

Positive Observations

- Interviewees identified multiple mechanisms for communication in the ORP organization.
    - Frequent meetings are held with ORP and DOE Headquarters Office of Environmental Management (EM/HQ);
    - Direct and frequent communication between the DOE-WTP and BNI Project Director;

- EM/HQ individual detailed to ORP staff to facilitate communication between managers at the site and Headquarters;

- Employee meetings, comments boxes, IPT Meetings, all hands meetings, emails are used regularly for communication;

- Information through POD meetings; and

- Efforts identified to overcome the size, scope, and complexity of WTP for communications.

- Some interviewees perceive that communications have improved between DOE-WTP and other ORP organizations through improved roles, responsibilities, authorities and accountabilities and DOE-WTP adding an Environment, Safety and Health Lead to interface with the ORP Nuclear Safety and ORP Quality Assurance Groups.

Areas in Need of Attention

- Several interviewees identified examples in communication that may impact safety performance.

  - Some manager behaviors are so confident that they may be overpowering less assertive individuals in the scientist and engineering groups inhibiting their bringing problems forward.

  - Better communication is needed around the how and why of management decisions.

  - Communication from BNI is inadequate, e.g., BNI process changes were not communicated directly; BNI is not perceived to be forthcoming with their information.

  - Perception exists that DOE-WTP Project Management has become BNI advocate even in light of recurring mistakes.

  - ORP still needs to provide a broader perspective of the project to some of its groups.

- Data from the Behavioral Rating Scale on Communication indicated that approximately 60% of the ORP interviewee respondents who completed that scale had positive perceptions about the exchange of information, both formal and informal, between the different departments or units in the project, including the top-down and bottom-up communication networks. Respondents in the General Engineering Group had the poorest perception of communication.

BNI

Positive Observations

- Interviewees identified multiple mechanisms for communication in the BNI Organization. They included:
  - Newsletters
  - Weekly meetings
  - Staff meetings,
  - Emails
  - Supervisor updates
  - POD Meetings
  - Face to face interactions

- Safety representatives
- PIERS
- ECP

- Many interviewees indicated that they believe that they are pretty well informed about what is going on around the Project.

Areas in Need of Attention

- Several interviewees indicated that they believe that the geographical dispersion of personnel does not facilitate good communication.

- Many interviewees indicated that BNI could benefit from more interdisciplinary meetings.

- Interviewees questioned the flow down of communication and indicated that they believed it could be better, e.g., supervisors always meet but yet they don't always hear anything; someone goes to the weekly Construction meeting but they don't get any information about it; information regarding the decisions and status of the whistleblower event have been lacking.

- Some interviewees perceive that the organizational structure creates artificial barriers to communication and that groups are only thinking about themselves and not the Project.

- Many interviewees indicated that managers are not very available to talk to because they are always in meetings; results in unclear management expectations – those above and beyond procedural requirements.

- Manual workers indicated that communications were less than adequate, and believed that their views were often disregarded without management providing an explanation. Different rules and work practices among buildings were not well communicated.

- Data from the Behavioral Rating Scale on Communication indicated that only approximately 40% of the BNI interviewee respondents who completed that scale had positive perceptions about the exchange of information, both formal and informal, between the different departments or units in the project, including the top-down and bottom-up communication networks. Respondents in the Quality and Performance Assurance and Engineering Groups had the most positive perceptions of communication.

Respectful Work Environment
Trust and respect permeate the organization.

ORP

Positive Observations

- Results from the Communication Trust Scale on the electronic survey indicated that ORP survey respondents had very positive perceptions regarding the freedom they feel to discuss the problem and difficulties in their jobs with an immediate supervisor without jeopardy.

Areas in Need of Attention

- The overall organizational culture style exhibited by the ORP organization can be characterized as a Constructive Cultural Style indicated by the slightly higher scores on questions related to the sensitivity to others, humanistic values, achievement and self-actualization on the electronic survey. However, statistically significant differences were obtained between work groups on many of the behaviors associated with several cultural styles suggesting a high degree of variability across the organization. A significant observation is the consistency within some of the organizational groups of a positive or negative direction with respect to the organizational behaviors.

- The Administrative, Program Manager, and Other Work Groups had the more positive organizational cultural profiles.

- The Nuclear Safety and Physical Scientist and Contract Specialist/Budget and Finance Work Groups had the more negative organizational cultural profiles.

- Contractors and Supervisory survey respondents tended to have the most positive organizational cultural profiles, while Non-Supervisory respondents had the most negative.

- Results obtained on the Communication-Accuracy Scale from the electronic survey indicated that ORP survey respondents did not have very positive perceptions of the accuracy of information that they receive from other organizational levels (superiors, subordinates, and peers).

- Statistically significant differences were obtained on the Communication Accuracy Scale between several of the ORP Organizational Work Groups. In particular, the Nuclear Safety and Physical Scientist, Contract Specialist/Budget and Finance and General Engineering Groups had the most negative perceptions about this behavior.

BNI

Positive Observations

- Most interviewees in primarily the Manual BNI organizational groups indicated that they perceived that the interfaces among work groups were professional and respectful.

- Interviewees in the Non-Manual BNI organizational groups generally perceived the relationship between individuals on the same working level to be effective.

Areas in Need of Attention

- Interviewees in some functional groups described perceiving a patronizing and demeaning attitude on the part of some supervision with respect to how they were being treated regarding safety issues.

    - The removal of golf carts and top half of windshields from golf carts after an accident resulting from an individual's failure to clear ice from the windshield of a cart. Interviewees describe this action as creating new safety hazards as well as delaying their ability to perform their jobs.

- Lighting in a battery room was identified as problematic and the superintendent indicated that the individuals should use their truck lights instead of purchasing new lights. A work package is currently being prepared.

- Superintendent indicated that since craft were working alone in an area in T-1 they did not need to put up red tape (violation of safety procedure). The individual in fact communicated this message over the radio.

Questioning Attitude

Individuals avoid complacency and continuously challenging existing conditions and activities in order to identify discrepancies that might result in error or inappropriate action.

ORP

Positive Observations

- Interviewees indicated that for the most part their line management was supportive of their challenging conditions and activities.

Areas in Need of Attention

- Many interviewees did not perceive support from upper level management for their identification of problems or challenging of conditions and activities.

- Results from the electronic survey administered at ORP indicated a fairly negative perception among most survey respondents about management's interest in having concerns reported and in the ability to openly challenge management's decisions.

- Interviewees did not believe that ORP was interested in being a learning organization or felt a need to improve.

- Several interviewees indicated that stakeholders with personal agendas were influencing DOE and that it was sometimes compromising their oversight activities.

BNI

Positive Observations

- Interviewees from primarily Non-Manual BNI Organizational Groups identified several mechanisms to challenge decisions and identify discrepancies. In particular, the DPO process was described as such a mechanism.

Areas in Need of Attention

- While many interviewees described the expectation for all employees to maintain a questioning attitude in all aspects of their work, they also often indicated a reluctance to do so because of their perception of other expectations by management, e.g., schedule pressure, not challenging the customer.

- The DPO process is perceived as relatively new and has rarely been used; several interviewees indicated that they have some uncertainty about how the process will actually be implemented.

- Many interviewees in certain BNI organizational groups had indicated that as a result of the fear of retaliation as well as the way they perceived that some supervision and management treated them, they no longer felt comfortable to challenge existing conditions or activities.

A.6 Conclusions

The results of this evaluation have been presented using the 9 traits recently identified by the U.S. NRC and their stakeholders for evaluating the attributes important for a healthy safety culture. The integration of those results can be formulated into several conclusions for each of the assessed organizations, ORP and BNI, and for the entire Project.

The Independent Safety Culture Evaluation Team recognizes that ORP and BNI are making efforts to resolve many of the technical issues that are encumbering the WTP Project. These activities are taking place under intense scrutiny by numerous stakeholders and external organizations. However, the lack of consideration of organizational and cultural considerations will not facilitate the project's forward movement or make ORP and BNI's efforts as successful as they could be. The Independent Safety Culture Evaluation Team offers the following conclusions that will provide insight into some of the difficulties ORP and BNI may be encountering.

ORP

ORP is perceived by many to have a strong focus on nuclear safety. While many interviewees indicated that their line management was supportive of their challenging conditions and activities, the Team concluded that there is a lack of full engagement on the part of ORP Senior Management in the area of safety culture. There is a perception that the value of safety is sometimes degraded in the presence of schedule and cost pressures. ORP Senior Management has not addressed delays in the implementation of the corrective actions from the previous HSS Assessment as well as from the DNFSB Recommendation. In addition, ORP management has not provided clear direction to ORP staff on the importance and implementation of safety culture to their oversight activities.

The organizational separation of the DOE-WTP organization from the rest of the ORP organization has created difficulties in the communication, coordination, and cohesiveness of the implementation of DOE Standards and Oversight of BNI. Questions concerning how DOE-WTP is managing the project, what impact their decisions are having on the project, who is in control of the project and ultimately who will deliver the project, remain unanswered for many of ORP's employees and stakeholders.

While the Team determined that there is no fear of retaliation in the ORP work environment, there is a strong indication of an unwillingness and uncertainty among ORP staff about the ability to openly challenge management decisions. There are definite perceptions that the ORP work environment is not conducive to raising concerns or where management wants to or willingly listens to concerns. Most ORP staff also strongly believe that constructive criticism is not encouraged.

BNI

The Team recognizes that BNI has recently initiated several activities designed to enhance safety culture across the organization. However, the Team identified significant cultural differences within the BNI Organization that will inhibit the success of these activities if they are not appropriately addressed. These differences were identified in groups in both the Manual and Non-Manual populations. The differences are predicated upon the groups' perceptions and priorities around the value the organization places on safety. If BNI is to succeed in implementing some of its initiatives around the enhancement of safety

culture, it must first acknowledge these organizational safety culture differences and work towards having all groups, on all organizational levels, sharing the same values and perceptions.

The Team determined that there is a lack of consistency in the behavior of its supervisory and management personnel. This behavior has resulted in the inconsistent implementation of the desired expectations and standards across the BNI Organization. The Team identified informality with respect to the expectations used in determining the behavior that supervision and management must model for their staff and the methods that are employed to hold all employees accountable to the desired behaviors. Clear and consistent communication of standards and expectations is needed across the BNI Organization.

The Team observed that the BNI Organization has become very adept in portraying itself in the most favorable position possible. This is a behavior learned and reinforced given the circumstances (numerous external stakeholder expectations) that it has to confront on a regular basis. While the organization does not deny that it is dealing with significant issues, it handles the communication of these issues in such a way as to diminish their importance. This behavior is not lost on its employees or stakeholders and may be contributing to a lack of trust and the perception of denial by those involved with the organization. The Team believes that BNI needs to be more forthcoming in its transparency with its employees and the public for trust to improve and for its legitimate efforts to be successful.

The Team believes that there is some reluctance to raise concerns and issues across the BNI Organization. Fear of retaliation was identified in some groups as inhibiting the identification of problems. Employee engagement in decision making, development of policies and procedures, and the implementation of practices and standards, particularly at lower levels of the organization, would facilitate the involvement of these groups in the resolution of issues and ultimately mitigate this perception.

WTP Project

The Team identified two conclusions that are applicable to both ORP and BNI that are impacting the safety culture at WTP.

The Team believes that a potential conflict for the WTP is the different perceptions of the role of safety in a research/design project as compared to a construction project as compared to a production project. These perceptions set up the priorities of schedule, cost, and safety differently and may be contributing to some of the organizational issues. WTP needs to establish, implement, and expect the same standards and behaviors for safety regardless of the phase of the Project.

The Team identified that all organizations involved at WTP have adopted a procedural approach to dealing with safety and especially safety culture. The behaviors and traits important for a healthy safety culture will not be effective until they are internalized by the members of the organization. More effort is needed in behavioral change to ensure these traits become a way of doing business.

A.7 References

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APPENDIX B

Office of River Protection
Management of Safety Concerns

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Appendix B
Office of River Protection Management of Safety Concerns

B.1 Introduction

The Office of Enforcement and Oversight (Independent Oversight), within the Office of Health, Safety and Security (HSS), conducted an independent progress assessment at the U.S. Department of Energy (DOE) Waste Treatment and Immobilization Plant (WTP) to evaluate two major areas with respect to Office of River Protection (ORP) management of safety concerns: processes for managing safety concerns and corrective actions in response to previous recommendations and commitments.

When HSS assessed the safety culture of ORP in 2010, ORP was undergoing a significant restructuring at the direction of the Secretary of Energy and the Assistant Secretary for Environmental Management (EM-1). The restructuring separated the project organization (DOE-WTP) from supporting organizations within ORP. The current DOE-WTP organization is headed by a Federal Project Director (FPD) who reports to EM-1 for program direction and has a direct line of communication to the Deputy Secretary. The ORP Manager retains full responsibility and authority for all aspects of the Tank Farm. In addition, the ORP Manager retained nuclear safety responsibility and approval authority for the WTP documented safety analysis (DSA). The ORP Manager also provides support to DOE-WTP in areas such as quality assurance (QA), fire protection, and environment, safety, and health (ESH). DOE-WTP is organizationally a part of ORP but functions semi-autonomously, and the FPD does not report to the ORP Manager.

The scope of the review included activities performed by the entire ORP organization, including DOE-WTP. The scope also included ORP efforts to direct, monitor, and validate the safety culture of the prime contractor for the WTP project, Bechtel International, Incorporated (BNI), and administration of the Hanford Federal employee concerns program (ECP) managed by the DOE Richland Operations Office (RL). The Independent Oversight team interviewed ORP and RL personnel and reviewed various program documents and procedures. Independent Oversight also selectively examined the implementation of procedures and observed meetings.

B.2 Results

B.2.1 ORP Processes for Managing Safety Concerns

The Independent Oversight team's review of ORP processes for managing safety concerns examined mechanisms for ORP staff to raise safety concerns and ORP oversight of contractor nuclear safety programs. The Independent Oversight team also reviewed selected aspects of DOE-WTP's implementation of their management functions, including leadership and accountability, as relevant to the safety culture programs and initiatives.

Mechanisms for Raising Safety Concerns

A safety conscious work environment (SCWE) is an environment in which employees are encouraged to raise safety issues and have no fear of retaliation. Several mechanisms are available to the ORP staff for raising safety concerns, and these mechanisms are generally consistent with DOE directives. They include an ECP (administered by RL), a differing professional opinion (DPO) process, a Federal Employee Occupational Safety and Health (FEOSH) program, and an allegation process. The RL ECP is also available to the employees of Hanford contractors, and the ORP allegation process is available for

use by ORP to identify, track, and resolve allegations by individuals who work at Hanford, as well as those who are not affiliated with the Hanford Site.

RL administers the Federal ECP for the Hanford Site. ORP employee concerns case files were transferred to the RL office effective June 2011. RL and ORP management had been considering this transfer for approximately a year in order to conserve resources by eliminating the dual programs and as part of an effort to consolidate other functions, such as Human Resources and Legal. The implementing procedure is shared by RL and ORP. The program and processes meet the requirements of DOE Order 442.1A. The signage and hotlines are adequate. The program office has also just designed new signs that provide good graphics and better visibility.

ORP personnel have originated only two employee concerns since October 2010. Most of the concerns since the 2010 HSS review were received from personnel in contractor organizations, with 52 cases in fiscal year (FY) 2011 and 3 so far in FY 2012. Because the combined program is new, no self-assessment has been conducted by the ECP Program Manager.

The Independent Oversight team reviewed about 20 RL ECP case files – both open and closed. Most RL investigations were thorough and well documented, and findings were issued when appropriate. In a few cases, the documentation did not fully address the specific concerns or provide a complete basis for closure, and some non-compliances related to employee concerns were not fully resolved in a timely manner through contractor corrective action programs. An example of this problem involved an anonymous concern case referred from the DOE Inspector General (IG), relating to black cell (inaccessible areas after initial waste processing) tank welding records, that was investigated by ORP. The case file did not contain some related closure information and the case was prematurely closed as unsubstantiated, although a surveillance performed by the ORP Construction Oversight and Assurance Division staff documented that no weld records or weld maps were on site for one nozzle weld in a vessel from one of five tank vendors reviewed. The surveillance report was not included in the file. In addition, ORP staff requested the IG to solicit further information from the concerned individual, if possible. The file contained no evidence of any response from the IG or the individual, or any notation of the resolution or failure to resolve the questions. The Independent Oversight team's discussions with ORP staff revealed that the IG continued to conduct its investigation, supported by additional surveillances by ORP staff, that identified inadequate BNI investigations of the weld records issues. The IG and ORP investigation efforts finally resulted in BNI generating a Level B Project Issue Evaluation Report (PIER) and BNI's conduct of a 100 percent review of weld records for black cell and "hard to reach" vessels. The four PIERs written to address these issues were all initially designated as Level C, even though the stated actions included determining the extent of condition, which should have resulted in a Level B categorization as defined in GPP-MGT-043. The last PIER, issued in September 2011, identified a number of missing records and stated that the PIER was written to investigate the potential for similar conditions in other packages and determine the need for recurrence controls, again warranting designation and management as a Level B. This PIER was upgraded to Level B only after discussions with ORP. None of these facts were included in the closed case file.

Another 2010 case involved employee concerns about the corrective action program of the Tank Farm contractor, Washington River Protection Solutions (WRPS), specifically the generation and resolution of Problem Evaluation Requests (PERs). WRPS personnel are involved in coordinating the transition to operations and the interface between the Tank Farm (from which the waste material will be pumped) and the WTP. The RL ECP investigation concluded that PERs were not being issued for non-compliances as required. ORP conducted surveillances in support of the ECP investigation and issued formal findings to WRPS for some of the concerns that had been substantiated, but no finding was issued for the failure to issue PERs. Further, subsequent employee concerns related to improper issues management by WRPS have been filed with RL, indicating that this problem has persisted. Issues with WRPS management of

issues were also the subject of a finding in ORP assessment 10-ESQ-148 in 2010, which identified that most of the Radiation Control personnel who were interviewed did not routinely write PERs for conduct of radiological operations issues at the Tank Farm. WRPS subsequently developed a PER improvement program. There is no evidence that ORP performed further reviews to ensure that corrective actions for ECP issues were thorough and effective. WRPS performance was not a part of this HSS review; however, because of the continuing nature and the safety culture implications of this PER issue, further review by ORP is warranted.

In some cases where issues were referred to the contractor's organization for follow-up, the basis for referral was not clear. Further, ORP concurrence for referral was routinely obtained informally, and there are no procedural requirements for a formal concurrence. The ECP procedure definitions section references the referral of concerns but does not provide adequate guidance to ensure confidentiality. The ECP procedure does not provide for a first-step factual accuracy validation with the originator to ensure that concerns are appropriately addressed, particularly for referrals. Some cases had been validated, and some had not. The RL ECP retains responsibility for final closeout in all cases.

The DPO process has been incorporated into the RL Employee Concerns procedure, DOE-RL-RIMS-HR-ECP, *Employee Concerns Program*, and is referenced in recently revised ORP procedures. The process meets the requirements of DOE Order 442.2, *Differing Professional Opinions on Technical Issues Related to Environment Safety and Health Technical Concerns*, except that it does not provide for appeal of ORP decisions to DOE Headquarters. The requirement for an appeal process became effective in July 2011, when DOE Order 442.2 replaced previous directives (DOE Policy 442.1A and DOE Manual 442.1-1) that did not include this requirement.

One DPO was filed during the past year. This DPO, which involved concerns regarding the mixing of non-Newtonian fluid waste in the Pre-Treatment Facility (PTF), was filed in April 2011 and was processed in accordance with the RL procedure. The RL DPO procedure does not include timeliness limits or guidelines, and this DPO was not processed in a timely manner, in part because of the time required to procure a DPO panel and chairperson. DOE management had not made a final decision on this DPO at the time of this HSS review (November 2011).

ORP has established an adequate FEOSH program, which includes provisions for Federal workers to raise safety concerns. The FEOSH implementing procedure is shared by RL and ORP and is maintained by RL. The program procedure, *Federal Employee Occupational Safety and Health (FEOSH), Hanford's Program*, is consistent with DOE Order 440.1B, *Worker Protection Program for DOE Federal Employees*. The FEOSH Committee has an appropriate charter and meets quarterly. One initiative was the establishment of suggestion boxes strategically located where employees can raise issues anonymously if they wish.

ORP procedure ESQ-QSH-IP-02 R1, *Allegations Management*, provides instructions for identifying, tracking, resolving, and closing allegations. The procedure defines allegations as potentially adverse conditions brought to the attention of ORP by organizations or individuals who may or may not be Hanford Site employees. To date, ORP Federal employees have not raised a concern through this process.

ORP procedure ESQ-QSH-GU-01, *Guide to Facilitate Sessions for the Collection of Worker Feedback regarding Safety at the Hanford Site*, was established in January 2009 to provide an additional mechanism for contractor employees to raise safety concerns but the procedure had not been implemented at the time of this HSS review. When HSS identified the failure to implement, ORP promptly developed a corrective action report and will evaluate the extent of condition and determine needed actions.

In general, RL and ORP have established appropriate mechanisms for the Federal staff to raise safety concerns, but these mechanisms have seldom been used. Most Federal staff members said that they would have no reservations about raising concerns to their supervisors and no reservations about using the mechanisms discussed above. However, some Federal staff members indicated that some ORP staff would be reluctant to raise safety concerns and that this is not an isolated problem. The following comments from five different Federal staff members provide insight into why those mechanisms have not been used more frequently:

- "Harassment and intimidation of the ORP staff has occurred and has happened to me." This individual cited an example in which he/she was intimidated and harassed by a previous ORP Site Office Manager for raising concerns.

- "The current ORP staff is still affected by their experience with the previous ORP Manager who did not welcome negative feedback from the staff."

- "Over at ORP, they don't want to listen to you unless they agree. The people at the top don't want to admit that this project is on the wrong track because they would lose their jobs if they did."

- One person said that "raising a concern to my management makes me feel like a whistleblower," implying that this was an unpleasant experience.

- A manager said that "use of the DPO process is an indication that the normal management systems are not functional."

ORP Oversight of Contractor Nuclear Safety Programs

Effective problem identification and resolution is an important element of a strong safety culture. The Independent Oversight team reviewed ORP procedures for safety oversight of its contractors and assessed the application of these procedures to contractor performance issues identified during interviews.

ORP has established an appropriate set of procedures for contractor oversight. ORP procedure ESQ-QA-IP-01, *Integrated Assessment Process*, establishes responsibilities and requirements for assessments and surveillances of both contractor and ORP activities. The requirements of this procedure are supplemented by desk instructions that have been established by implementing organizations. Implementing procedure ESQ-QA-IP-07, *Management (Self) Assessment*, provides requirements for ORP management self-assessments, and desk instruction ESQ-OA-DI-05, *Quality Assurance (QA) Audits*, provides requirements for QA audits performed by the ORP QA Team. ORP procedure ESQ-QSH-IP-06, *Corrective Action Management*, establishes responsibilities and defines methods to be used by the ORP staff for initiating and processing corrective action reports for conditions adverse to quality identified by ORP and external organizations. These procedures assign responsibilities and provide instructions for planning, executing, and documenting assessments, surveillances, and audits and for managing corrective actions, consistent with the requirements of DOE Order 226.1B, *Implementation of Department of Energy Oversight Policy*.

Implementation of these procedures has not been fully effective. As discussed in the following paragraphs, the ORP oversight process has been effective in identifying deficiencies in contractor performance, but resolution of these deficiencies has been problematic.

Resolution of WTP Design Deficiencies. The DOE-WTP Engineering Division (WED) provides effective oversight of the quality of BNI design products. DOE-WTP desk instruction MGT-PM-DI-03, *Conduct of Engineering Oversight*, assigns responsibilities and provides adequate instructions to WED for planning, conducting, and documenting assessments and surveillances of BNI engineering products

and programs. WED has used this process to identify a number of significant deficiencies in the quality of BNI design products. Examples of design deficiencies include the failure to:

- Produce a verified design, as required by BNI design control procedures, before procuring and installing pulse jet mixers in non-Newtonian vessels

- Limit operating temperatures, or select appropriate materials, to prevent WTP process vessels from exceeding corrosion-related temperature limits

- Establish design margins in a risk management plan as required by DOE Order 413.3A, *Program and Project Management for the Acquisition of Capital Assets*, resulting in questionable safety margin for some WTP systems

- Provide reliable cathodic protection to control the corrosion of underground piping

- Maintain weld examination records for some vessels to be placed in black cells in the PTF.

WED has identified an increasing number of design deficiencies over the past year as its engineering staff has become more familiar with the WTP design. However, BNI's responses to these deficiencies have not been consistently adequate. For example, six of ten corrective action plans submitted by BNI during the quarter ending September 30 were rejected by WED when first submitted. Repeat submittals were necessary before satisfactory responses were received. The WED engineering staff expressed frustration about the frequency of inadequate responses. Continued frustration in obtaining satisfactory resolutions to identified deficiencies could discourage these WED engineers from pursuing future corrective actions and thus could reduce the effectiveness of Federal oversight of design activities. Senior DOE-WTP management understood the potential for this problem and conducted two workshops with the WED staff to formulate plans for addressing it.

Correction of WTP Operational Readiness Vulnerabilities. Neither ORP nor BNI has addressed potential vulnerabilities in waste treatment facility operational readiness identified by WRPS (which performed a review under contract to ORP) in a timely manner. ORP included contract line item (CLIN) 3.2 in the WRPS contract to require WRPS to perform semiannual operational readiness reviews of WTP. WRPS performed these reviews in 2010 and provided an annual report to ORP in September of that year. At the request of DOE-WTP, BNI reviewed the 2010 report for factual accuracy; WRPS revised the report based on BNI's factual accuracy comments and returned it to DOE-WTP in October 2010. A Construction Project Review performed by DOE in August 2011 found that "DOE has not directed BNI to address issues from external reviews (e.g., CLIN 3.2) that address WTP operability" and recommended that by December 2011, "ORP should address issues raised by external operability reviews of the WTP facility (e.g., WRPS CLIN 3.2)."

The 2010 WRPS report identifies the following five "Principal Overall Vulnerabilities":

- Pre-treatment (and WTP) Throughput. Future PTF operability, maintainability, and throughput performance are vulnerable to the reliability of hot cell equipment. The future plant performance, as predicted by the WTP Operations Research model (version 5), is sensitive to changes in failure rates used for the crane and hot cell equipment.

- Ion Exchange Hydrogen Control System. The current hydrogen mitigation control system for the pre-treatment ion exchange columns, as presently designed, will not allow consistent, steady process control and will lead to false alarms in safety significant systems and many unplanned shutdowns.

- Precipitation of Solids in Pre-treatment Vessels and Piping. The risk of precipitation of solids from saturated waste solutions as temperatures decrease during processing, and consequential potential plugging of in pre-treatment vessels and piping, will result in the need for operational controls (temperature control, dilution, and flushing) to avoid negative impacts on plant throughput performance.

- Control System Documentation. The current control system specification and structure does not follow a structured software life-cycle approach based on industry best practice and is likely to lead to difficulties in demonstrating compliance with Nuclear Quality Assurance (NQA)-1 for software life-cycle configuration management during testing, commissioning, and operations.

- Complex Contact Maintenance in the Low Activity Waste (LAW) Facility. The contact (hands-on) maintenance approach for the LAW Facility will be vulnerable to loss of containment control, lead to degrading contamination conditions over time, and impact plant availability and throughput performance.

These vulnerabilities were not transmitted to BNI for action but instead were given to WED to be incorporated into future surveillances. WED addressed the first and fourth vulnerabilities in formal surveillance reports in accordance with procedure ESQ-QA-IP-01 and desk instruction MGT-PM-DI-03, *Conduct of Engineering Oversight.* WED evaluated the third vulnerability and determined that no surveillance was needed, since it was already being addressed by BNI. However, as of December 1, 2011, this evaluation was not documented and the remaining 2010 vulnerabilities had not been transmitted to BNI for action or included in the ORP integrated assessment schedule. Five additional vulnerabilities identified by WRPS pursuant to CLIN 3.2 are described in a report that was transmitted to ORP in October 2011. These vulnerabilities were under review by DOE-WTP at the time of this HSS review (November 2011). ORP procedures do not clearly address how to manage issues identified by one contractor (e.g., WRPS) that need to be resolved by another contractor (e.g., BNI). As of December 1, 2011, the ORP Tank Farm and DOE-WTP project organizations were developing a strategy for transmitting the 2010 and 2011 reports to BNI for action, but neither report had been transmitted.

ORP Corrective Action Management System. ORP Procedure ESQ-QSH-IP-06, *Corrective Action Management*, and desk instruction MGT-PM-DI-08, *Action Tracking for the WTP Project*, assign responsibilities and provide adequate instructions for documenting and tracking corrective actions associated with the WTP. Internal assessments performed by ORP QA and WTP line organizations over the past two years have identified continuing weaknesses in ORP action item tracking and the management of corrective actions. Actions have not been consistently documented or tracked as required by ORP procedures, and individuals have not been held accountable for completing corrective actions in a timely manner. A recent self-assessment, led by the DOE-WTP Deputy Project Director for Field Operations, identified a continuing need for improvement. Continuing weakness in these areas indicates a culture in which management is willing to accept or tolerate conditions that do not meet established performance standards. DOE-WTP management has acknowledged the need for improvement in this area and, at the time of this HSS review, was developing corrective actions to improve performance.

Overall, ORP reviews have been effective in identifying deficiencies in WTP design products and in identifying vulnerabilities that could impact the future operability of waste treatment facilities. However, correcting these deficiencies has been problematic. Many of the corrective action plans proposed by BNI to address design deficiencies have been judged inadequate by WED, and operability vulnerabilities identified by WRPS pursuant to CLIN 3.2 have not been addressed in a timely manner. Internal assessments performed by ORP QA and DOE-WTP line organizations over the past two years have identified continuing weaknesses in ORP action item tracking and the management of corrective actions.

Leadership

DOE has made significant progress in establishing an effective WTP project organization since the 2010 HSS safety culture review. A Project Execution Plan (PEP), describing the strategy, objectives and processes used by DOE-WTP Project Team to manage completion of the WTP Project, has been prepared and submitted to Headquarters for approval. Important positions have been established and filled, including a Manager of Startup and Commissioning Integration and a Program Manager for Environment Health and Safety. Procedures have been established and implemented for performing oversight of BNI design products. The engineering oversight program has matured and is effective. DOE-WTP has worked with ORP support organizations to establish and maintain an integrated assessment schedule for oversight of BNI environmental controls and worker health and safety. The new project organization is taking important steps to clarify expectations regarding the methodology to be used in preparing a DSA. At the time of this Independent Oversight evaluation, contract changes were being made to support these expectations.

Efforts to improve communications between DOE-WTP and ORP support organizations and to strengthen the management of corrective actions are continuing. As previously discussed, DOE-WTP has established new positions to provide liaison with ORP support organizations. Integrated project teams and integrated assessment schedules are also facilitating improvements in communication. DOE-WTP and ORP support organizations are working together as members of integrated project teams to provide oversight of the WTP project and are working together to develop and maintain the integrated assessment schedule. Interviews and performance observations during this HSS review indicate the need to continue efforts to improve communications. During interviews, some individuals conveyed that they were not engaged in the WTP project since their support was not welcomed by the ORP WTP Project Team and that there was little communication with the WTP Facility Representatives. Observations also indicate the need for improvement in the management of corrective actions. A recent DOE-WTP assessment also identified this need, and corrective actions were being formulated at the time of this HSS review.

In September 2010, the FPD sent EM-1 a report setting forth the FPD's "initial assessment and recommendations to ensure project success." The recommendations are targeted to a transition from design/construction to commissioning and hot operations. The report presented a number of recommendations, including the concept of a "One System" model for the goal of combined WTP and Tank Operations integration. The report stated that accomplishing the project objective required strategies in three areas: management/organizational, contract, and technical. In response to the One System concept articulated in the FPD's September report, along with subsequent amplification, the FPD directed the ORP contractors to prepare a strategic document to guide implementation of the One System. In October 2011, BNI and WRPS delivered a collaborative proposal for "Integration of Operability, Commissioning, and Operations to Support the 2020 Vision One System for WTP Project Transition to Operations."

Notwithstanding the evidence of progress, some aspects of Federal leadership have not promoted an effective safety culture within ORP and BNI. At the time of this HSS review, management expectations regarding safety culture had not been formally communicated to the Federal staff through a policy statement or programmatic requirements, safety culture training had not been provided to the staff, and no program had been established to periodically monitor safety culture and provide feedback to management. BNI has taken a number of actions to strengthen its safety culture, but most of these actions appear to have been prompted by Defense Nuclear Facilities Safety Board (DNFSB) comments and HSS reviews and enforcement actions, rather than by proactive efforts by ORP or DOE-WTP. There is little evidence that ORP has directed, tracked, or validated these actions.

Senior managers consistently said that safety was their overriding priority and that they had taken steps to convey this message to their staffs. They require that each ORP meeting begins with a safety message, and they emphasize the importance of safety during all-hands meetings. The WTP FPD issued medallions to his managers with inscriptions emphasizing the importance of safety. Nonetheless, some middle managers and staff members said that senior management placed a higher priority on cost and schedule than on safety, and some management actions have contributed to this view.

Certain management actions and communication weaknesses also indicate the priority of schedule and cost or raise questions about management priorities among the staff members. For example:

- The basis for a decision approving the welding of heads on certain vessels was not effectively communicated to Federal or BNI staffs, causing some staff members to conclude that project management had compromised safety in order to meet cost and schedule objectives. The decision to weld the heads had been opposed by a DPO, a union grievance, and a stop-work order. Many Federal and contractor staff members were aware of the issue. DOE-WTP management indicated that they approved the welding based on their assessment that the associated risks were to cost and schedule and that the welding would not adversely impact safety, but the basis for this decision was not effectively communicated to the many staff members who were aware of the issue.

- When WED engineers learned that WRPS planned to use a garnet abrasive to cut a hole in the top of a waste tank, they expressed concern about the effect that the garnet might have on components in the WTP. ORP management told the engineers that the effect had been evaluated and there was no cause for concern. The engineers asked for a copy of the evaluation report but were told that the evaluation was not formal and there was no report. When ORP allowed the use of garnet, the engineers perceived that management had given schedule a higher priority than safety.

- The fee incentives provided to BNI by DOE are significantly greater for meeting cost and schedule expectations than for safety and quality. This topic is discussed in more detail under Accountability, below.

Accountability

The Independent Oversight team reviewed administration of the award fee process and performance awards to determine how incentives are managed.

Award Fee. DOE-WTP grants award fee to BNI semiannually as an incentive for project management and for cost management. The amount of fee available semiannually for project management is about $2M, and the amount available for cost management is about $4.1M. The amount actually awarded is based on the level of BNI's performance over the six-month period, as determined by assessments conducted by DOE-WTP. A portion of the project management fee is related to worker safety and to performance related to nuclear safety, such as the quality of engineering, procurement, and construction. Over the ten-year period of the contract, about $40M award fee will be available for project management performance and about $82M for cost management. BNI is also entitled to collect milestone fees whenever milestones are completed to the satisfaction of DOE-WTP, regardless of the completion date. The fee is paid in full when the milestone is met; there is no contract provision for partial payment. Over the ten-year period of the contract, about $312M will be available for completing milestones. Significant additional fee will be available at the end of the project for completing construction and testing of facilities on schedule. In total, the fee available for safety performance over the ten-year period will be less than $40M, and the amount available for cost management, milestone completion, and completing the project on schedule will be well over $394M.

To assess the extent to which BNI has been held accountable for the quality of its design engineering products, the Independent Oversight team reviewed the award fee that has been withheld in the project management subcategory of engineering technical performance for the five most recent six-month rating periods. The award fee available for engineering performance was about $400K for each of these five periods, and the percentage of this fee awarded, from the earliest to the most recent period, was 60, 60, 49, 55, and 35. The declining trend in the percentage of fee awarded is consistent with the increasing number of deficiencies identified in BNI engineering design products, and the amounts awarded indicate that ORP has held BNI accountable for their performance in this area. However, as previously discussed, the amount of award fee available in this area may not provide sufficient incentive to produce the desired level of quality.

Performance Awards to Federal Employees. The ORP recognition and awards program is administered by RL. While the program does not specifically address attributes related to nuclear safety performance or safety culture, it provides guidance to recognize employees for safety as a value. The program is active, as evidenced by the 29 cash awards issued during FY 2011. Several awards were related to nuclear safety performance, including an award for evaluations reflecting the high value placed on nuclear and process safety for structural engineering and seismic equipment qualification reviews, and an award for effective implementation of mechanical equipment codes and standards. Also, a cash award for technical leadership and focus on technical issues was given to the individual who filed a DPO earlier this year. Award resources are limited by budget constraints, and some safety awards have been discontinued (gift cards and quarterly Safety Awareness Week). There does not appear to be a process that allows ORP line managers to participate in prioritizing award resources to reinforce desired behaviors.

B.2.2 Actions Taken in Response to Previous Recommendations and Commitments

The Independent Oversight team reviewed actions taken in response to the recommendation from the 2010 HSS review. In addition, the Independent Oversight reviewed the status of commitments made by the Secretary in his letters to the DNFSB in accepting DNFSB Recommendation 2011-1.

HSS 2010 Safety Culture Review

In its 2010 safety culture review report, HSS recommended that ORP "institutionalize the processes and formally define the roles and responsibilities and clarify interfaces between the WTP Federal organization and the other ORP organizations." Since that time, ORP has taken steps to better define roles and responsibilities and to strengthen interfaces between DOE-WTP and the rest of the ORP staff. The steps taken are detailed in the following paragraphs.

New positions have been established in DOE-WTP to facilitate liaison with ORP support organizations, including an ESH and Nuclear Safety Manager, a Technical Operations Program Manager, and a Project Oversight and Quality position. The ESH and Nuclear Safety Manager serves as the DOE-WTP principal point of contact for matters involving nuclear safety and ESH and interfaces with ORP ESH and nuclear safety organizations. Similarly, the Technical Operations Program Manager serves as the DOE-WTP point of contact and interfaces with ORP organizations in a number of technical areas, including configuration management, waste management, systems engineering, and environmental permitting. The incumbent in the Project Oversight and Quality position serves as the DOE-WTP interface with the ORP QA organization and the ORP Verification and Confirmation Division.

Most ORP staff members who were interviewed by the Independent Oversight team said that communications between the DOE-WTP organization and supporting ORP organizations had improved but were not yet fully effective. ORP managers said that the new liaison positions have been helpful in

facilitating communications between these organizations, but a few ORP staff members commented that they had never met the DOE-WTP liaison individual assigned to their organization and that they had not noticed improvement in communication. Some interviewees commented that an attitude of "us versus them" existed between WTP project and support organizations and that these organizations were not yet working together effectively as a team.

DOE-WTP and ORP maintain an annual integrated assessment schedule pursuant to ESQ-OA-IP-01, *Integrated Assessment Process*, and the results of completed assessments and surveillances are reviewed at Quarterly Assessment Program Review meetings chaired by DOE-WTP. These meetings serve to inform Federal Project Managers of assessment results and to provide an opportunity for division directors to adjust future assessment plans based on these results.

Additional steps are planned for integration of WTP and Tank Farm activities. Plans include the merger of BNI and WRPS into a single organizational structure to support the future waste feed delivery and treatment. After cold commissioning and verification of operational readiness of WTP facilities, the DOE-WTP project will be closed out and ORP will administer integrated Tank Farm and WTP radioactive operations.

A proposed revision to the WTP PEP has been prepared and was submitted to Headquarters for approval in July 2011. The revised PEP describes roles and responsibilities for the current DOE-WTP and ORP support organizations. In the revised PEP, both the WTP FPD and the ORP Manager report to EM-1. The proposed plan specifies a direct line of communication from the FPD to the Deputy Secretary and assigns a support role to the staff of the ORP Site Manager. Some of the proposed changes to the PEP are being implemented even though they have not yet been approved. The FPD and ORP Manager are managing as if DOE-WTP and the rest of ORP are separate organizations. The ORP Manager understands that WTP project activities are directed by the FPD, and in practice, the WTP FPD reports directly to Headquarters as stated in the draft PEP.

The ORP Safety Management Functions, Responsibilities and Authorities (FRA) document was revised in September 2011 to include functions, responsibilities, and authorities for the line management of ORP, including DOE-WTP. The FRA lists required functions, the DOE directives or regulatory requirements applicable to each function, and the organization responsible for implementing each function. The FRA does not fully comply with DOE Order 450.2, *Integrated Safety Management*, in that it does not describe the organization and management structure as required by Section 4.g (1); does not consistently identify who within the organization has responsibility to perform the functions as required by Section 4.g (4); and does not specify the authorities delegated to responsible organizational elements as required by Section 4.g (4). For example, the FRA identifies the ORP Nuclear Safety Division (NSD) as the position responsible for safety and hazards analyses, but does not specify whether NSD has the authority to approve or disapprove DSAs. Formal agreements, such as memoranda of understanding or interface agreements, have not been established to clarify shared responsibilities.

While the above steps were partially responsive to HSS recommendations, continued management attention is needed to better define roles and responsibilities, improve communications, and approve the PEP.

June 30, 2011, Commitments to DNFSB

In a letter to the DNFSB dated June 30, 2011, the Secretary acknowledged the need to continue improving nuclear safety at WTP and committed to several specific actions to address the Board's recommendation to strengthen safety culture. The Independent Oversight team reviewed the status of the following commitments from that letter:

- Commitment: DOE accepts the Board's recommendation to assert Federal control to direct, track, and validate corrective actions to strengthen the safety culture at WTP.

  Status: BNI has taken a number of actions to strengthen its safety culture, and DOE-WTP management has maintained an awareness of these actions. However, there is no clear evidence that DOE-WTP, as the site-level Federal organization with line management responsibility for WTP, or DOE Headquarters line management has asserted control to direct, track, or validate these actions.

- Commitment: DOE and BNI have been engaged in a variety of initiatives to strengthen nuclear safety culture at WTP, including more clearly delineating Federal roles and responsibilities in the PEP and conducting employee forums to ensure that these roles and responsibilities are clearly understood.

  Status: ORP has initiated steps to strengthen the safety culture within the Federal staff. Steps include better defining ORP roles and responsibilities in the WTP PEP and FRA, establishing new positions to strengthen interfaces between DOE-WTP and ORP support organizations, and establishing integrated project teams to better integrate ORP support activities with DOE-WTP project needs. Continued management attention is needed to better define roles and responsibilities and strengthen interfaces. Arrangements are being made to train the Federal staff on maintaining a SCWE, and a "Federal Employee View Point Survey" is being planned to assess the safety culture of both RL and ORP Federal employees. BNI has also taken several steps to strengthen the safety culture of its staff. Both DOE and BNI have conducted employee forums to convey safety expectations. Other steps taken by BNI include establishing a nuclear safety policy and Nuclear Safety and Quality Culture program, performing a gap analysis, chartering an independent assessment of BNI safety culture, and providing safety culture training to managers and supervisors.

- Commitment: The Secretary and Deputy Secretary personally ensure that corrective actions to strengthen safety culture are tracked and validated.

  Status: The Deputy Secretary visited the WTP construction site and met with the workforce there to emphasize his expectation that safety be maintained as an overriding priority in the design and construction of the facility. However, as discussed above, HSS was provided no evidence of Federal actions to track or validate corrective actions taken to strengthen safety culture at the site level, limiting the ability of the Headquarters Office of Environmental Management (EM) or senior DOE management to ensure corrective action tracking and validation. Thus, it appears that DOE has not been fully effective in ensuring that corrective actions to strengthen safety culture are tracked and validated.

- Commitment: DOE and BNI are arranging SCWE training for managers and supervisors with a firm that conducts SCWE training for the Institute of Nuclear Power Operations.

  Status: BNI had completed this training and ORP was in the process of making arrangements for similar training at the time of the HSS review in November 2011.

- Commitment: Within EM Headquarters, we have established ombudsmen to act as advocates for employees and their concerns.

  Status: EM Headquarters completed this action and has appropriately publicized this initiative.

- Commitment: Both EM Headquarters and field sites will assess nuclear safety culture and the implementation of SCWE in their annual integrated safety management system (ISMS) declarations.

  Status: A letter from the EM Principal Deputy Assistant Secretary for Environmental Management, dated July 28, 2011, directed the ORP and other EM site managers to include assessments of nuclear safety as part of their Annual ISMS and QA Effectiveness Review Declarations, which are due by December 31, 2011. Criterion 4 of this letter requires that all aspects of nuclear safety culture be evaluated using the structure of the Energy Facility Contractors Group/DOE ISMS safety culture focus areas and attributes. At the time of the HSS safety culture review, ORP was making arrangements for a contractor to perform a safety culture survey and was developing a 2011 ISMS declaration. The 2011 declaration is expected to include an assessment of nuclear safety culture but will not include the results of the planned survey because the survey will not be conducted until early 2012.

- Commitment: Each office (EM Office of Safety and Security Programs, HSS, and the Under Secretary of Energy's Chief of Nuclear Safety) now offers employees access to both a hotline number and a general e-mail inbox.

  Status: The referenced offices have established hotline telephone numbers and e-mail addresses consistent with statements to the DNFSB. The Independent Oversight team verified that the advertised telephone numbers were operable. Separate e-mail inboxes have been established and are listed on the EM website. The Independent Oversight team also verified that a local hotline maintained by RL was in service during and after normal business hours.

- Commitment: DOE and BNI have been engaged in a variety of initiatives to strengthen the nuclear safety culture at WTP for over a year. Steps that have already occurred include completing a revision of the WTP PEP, currently under review, to more clearly delineate Federal roles and organizational responsibilities at WTP and ORP, and conducting a number of employee forums to ensure that employees clearly understand the changes in those roles and responsibilities.

  Status: The revised PEP is still under review. The Deputy Secretary and senior BNI and Federal managers at the Hanford Site have conducted forums with the WTP workforce.

In summary, six of the above eight commitments have been met or are on track; two are not. BNI has met each of its commitments, and DOE has met, or has plans to meet, each of its commitments except for the two involving directing, tracking, and validating BNI actions to strengthen safety culture.

B.3 Conclusions

ORP and DOE-WTP have made progress in establishing an effective WTP project organization since the 2010 HSS safety culture review. However, additional Federal leadership and actions are needed to strengthen the safety culture within ORP and BNI, including formalizing the roles and responsibilities used by Federal employees, ensuring that management actions and communications demonstrate the stated priority of safety, and ensuring that factors that could deter Federal staff from raising safety issues are addressed.

APPENDIX C

Bechtel National, Incorporated
Management of Safety Concerns

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Appendix C
Bechtel National, Incorporated Management of Safety Concerns

C.1 Introduction

The Office of Enforcement and Oversight (Independent Oversight), within the Office of Health, Safety and Security (HSS), conducted an independent progress assessment at the U.S. Department of Energy (DOE) Waste Treatment and Immobilization Plant (WTP) to evaluate two major areas with respect to Bechtel National, Incorporated's (BNI's) management of safety concerns: processes for managing safety issues and concerns, and corrective actions for issues identified during the 2010 HSS review.

Independent Oversight interviewed BNI personnel and reviewed various program documents and procedures. Independent Oversight also selectively examined the products of issues management processes, such as corrective action reports, engineering technical issue forms and cut sheets, employee concern packages, and differing professional opinions (DPOs).

C.2 Results

C.2.1 BNI Management of Safety Issues and Concerns

Establishing and implementing effective programs for reporting and resolving safety problems is essential to a safety conscious work environment (SCWE). The Independent Oversight team evaluated the primary programs used at the WTP to document, evaluate, and resolve safety and quality issues, including processes and implementation, for adequacy and effectiveness. Programs evaluated included corrective action management, engineering technical issues management, the BNI employee concerns program (ECP), and the DPO program.

Corrective Action Management

The WTP issues management processes, when implemented properly, can be effective tools for identifying and resolving safety and quality issues. The WTP formal corrective action management system, as described in the project quality assurance (QA) manual and the contractor assurance system description, is required to be used to manage adverse conditions, as well as other unwanted or unplanned issues and recommendations and suggestions for improvement. The corrective action management system uses the Project Issue Evaluation Report (PIER) form to document issues and initiate the process for evaluating, correcting, documenting, and verifying the resolution of the issues. The PIER process provides the primary WTP mechanism for workers to report issues or provide feedback and/or recommendations. The process is appropriately designed such that the worker only has to describe the issue, without having to establish significance or identify the appropriate communication or resolution process. PIERs can be written anonymously, or workers (issue initiators) can request confidentiality, resulting in restricted distribution of initiator information. A strength of this process is the use of PIERs to formally document, disposition, and track resolution of opportunities for improvement in addition to violations. In addition to PIERs, hardware and construction installation problems are reported and resolved using Nonconformance Reports (NCRs) and Construction Deficiency Reports (CDRs).

PIERs are managed through a graded process based on the significance of the issue. Four significance categories are assigned, ranging from high significance (Level A), to analysis and action required (Level B), to "broke/fix" (Level C), to recommendations and opportunities for improvement (Level D). Level A PIERs require a formal root cause analysis, a formal extent-of-condition review, remedial and preventive

actions (recurrence controls), and an effectiveness review of actions taken. Level B PIERs require an apparent cause analysis, remedial and preventive actions, and an extent-of-condition review. Level C PIERs require only remedial actions and assignment of a cause code for trending purposes. Level D PIERs require none of the above listed actions and can be closed by the responsible manager if no actions are deemed necessary or by an assigned responsible employee when defined actions are completed. A PIER Review Committee (PRC), consisting primarily of managers from various project organizations and chaired by the site Corrective Action Manager, meets several times a week to screen all new PIERs for initial significance categorization, assignment of a responsible organization/manager, and review of Action Tracking System (ATS, a commitment tracking system) entries to ensure that no adverse conditions are documented as ATS items rather than PIERs. PIER significance levels can be (and frequently are) revised by the assigned responsible managers based on subsequent investigation results or other factors.

The Independent Oversight team observed several PRC meetings and, with some exceptions, agreed with the significance level designations. In some instances, the committee assigned significance levels that appeared to be non-conservative given the extent or substance of the issues. For example, numerous examples of construction site deficiencies in industrial safety functional areas (e.g., confined spaces, compressed gas cylinders, fall protection, cranes and lifting operations) identified in a July 2011 Bechtel Corporate assessment report were all bundled on PIERs by functional area and categorized as Level C, obviating the need for an extent-of-condition review, causal analysis, and recurrence controls even though preventive actions were appropriate and in some cases specified as actions on these PIERs. Thus, these PIERs should have been categorized as Level B, as defined in the corrective action management procedure. In addition, bundling of multiple similar examples of deficiencies, without classifying the issue at a significance level high enough to initiate further analysis as to extent and cause, also adversely impacts the effectiveness of trend analysis. (Trend analysis of deficiencies is discussed in more detail below.)

Several other panels provide oversight and evaluation of PIER management. The Performance Improvement Review Board (PIRB) is a chartered panel that is designed to provide senior management oversight of the WTP corrective action program through review and concurrence with root cause analyses, monitoring of response to and management of Level A PIERs, evaluation of corrective action effectiveness for Level A and B PIERs, review of root and apparent cause analyses and extent-of-condition determinations for selected PIERs, and review of quarterly project trends. It also serves as a forum for resolving organizational conflicts and resource constraints. The PIRB is sponsored by the Project Director, chaired by the Project Manager, facilitated by the site Corrective Action Manager, and populated by senior managers (12 designated positions). Board activities and decisions are documented in meeting minutes.

The Independent Oversight team observed a PIRB meeting and reviewed minutes from previous board meetings. Managers were engaged and knowledgeable of the issues, asked appropriate questions about aspects of the issue being addressed, and made appropriate decisions to ensure a rigorous evaluation and resolution of significant nuclear safety, quality, and technical issues. In PIRB meetings observed by the Independent Oversight team, the status of PIERs and causal analyses was covered in the handout and agenda, but there was little or no discussion or communication of expectations for accountability to responsible organizations with overdue or significantly overdue actions.

The Engineering organization has long used a dedicated panel of subject matter specialists, called the Corrective Action Review Board, that is effective in screening and oversight of Engineering PIERs. This panel reviews the adequacy of Level A, B, and C PIERs generated by engineering personnel and associated analyses and actions plans and provides feedback to responsible employees and managers.

WTP's formal trend analysis and reporting procedure, GPP-MGT-050, specifies that the organizations represented in a "trend working group," composed of ten specific project organizations, will periodically identify, collect, review, and analyze data for their organizations to identify trends. The identified trends are required to be reported in the PIER system and/or as a lesson learned, as appropriate, and shared with other working group members at periodic meetings. Trending of data sources, including PIERs, NCRs, CDRs, events, and other organization-specific data, is performed by a number of organizations as required. Trend PIERs are being written, and the trend working group has met eight times in calendar year 2011.

Many PIERs are written at WTP, providing for formal documentation, review, and resolution of issues. Approximately 100 PIERs were written per month in the past year. These consisted of three categorized as Level A, 67 at Level B, 560 at Level C and 632 at Level D.

The Independent Oversight team reviewed the WTP institutional issues management procedures and many PIERs and associated documents, including apparent and root cause analyses, effectiveness reviews, and trend reports. The basic processes for managing issues at the WTP are sound and generally user-friendly. Many issues are being identified and appropriately resolved.

However, inadequate implementation of the requirements of these processes can damage the nuclear safety culture at WTP because issues are often not managed effectively to resolution. In some cases, safety and quality issues at the WTP are not documented in the PIER system, are improperly categorized for significance, are inadequately analyzed for causes, or are not resolved with effective corrective and preventive actions. Examples of such implementation deficiencies and weaknesses include the following (see Finding #1 in Section C.4):

- In a number of cases identified by the Independent Oversight team, BNI did not document and manage the resolution of safety and quality issues using the PIER process in accordance with its corrective action procedure, contractor assurance system, and integrated safety management system descriptions. For example, 24 observations/opportunities for improvement identified in a June 2011 management self-assessment of the low activity waste preliminary documented safety analysis (PDSA) were not documented as PIERs. A Quality and Performance Assurance (Q&PA) staff review of the adequacy of a construction injury event root cause analysis concluded that the cause analysis was inadequate, and that the performance deficiency was not documented as a PIER and no corrective/preventive action was taken. In March 2011, Engineering Assurance conducted an assessment of the accuracy of PIER significance categorizations, concluding that 30 of 100 PIERS had not been conservatively categorized as defined in the WTP corrective action procedure. Although actions were taken informally to address this issue within engineering, this performance deficiency was not documented on a PIER and thus did not contribute to any trending data set. In addition, BNI did not use the PIER process (or address in any other formal corrective action method) for the three recommendations from the third-party safety culture assessment conducted by Pillsbury (a law firm that provides services to BNI), which was completed in November 2010. Although many of the issues identified in the Pillsbury report were similar to those documented in the 2010 HSS report and the corrective actions of the PIER written to address the 2010 HSS recommendations, the WTP process requires documentation and referral to other closure documents if an evaluation identifies that the issues are the same. Further, as discussed below in the section on the BNI DPO program, resolutions to deficiencies identified in case DPO-MGT-11-0002 were corrective/preventive actions, but were documented in the ATS rather than on a PIER.

- The Independent Oversight team identified examples where recent issue descriptions, titles, and action statements for PIERs were insufficiently detailed or inappropriately documented. For example, PIER MGT-11-0914-C, addressing issues from a management review of material handling

events and construction work practices, documented three separate "issues" into one PIER, precluding effective trend analysis. Further, the PIER "Issue Description" field was completed with the basis/purpose of the management review without describing the issue(s). In addition, the action statements were to "address" the issue identified in the management review report, rather than identifying specific actions to be taken to resolve the issue. Further, although the actions were described as "Corrective (Prevent/Preclude Recurrence)," which defines the required actions for Level B but not Level C PIERs, no cause determination was documented to support identification of recurrence controls as expected for a Level B PIER. In addition, PIER MGT-11-0897-D, addressing ten additional issues from the same management review, binned multiple different issues into one PIER, precluding effective trending. This PIER also included three issues from a Bechtel Corporate assessment. In this case too, the action descriptions simply stated the issues rather than identifying specific actions to conduct a review of the issue and determine the steps for resolution. As another example, PIERs MGT-11-0117-B and MGT-11-0371-B reflect numerous weaknesses in the specified remedial and corrective/preventive actions. Examples include: actions to "enhance" testing were not specific; the action taken for assessing a procedure was simply a procedure revision, with no explanation of what was changed; actions 7 and 8 specify the same action, but different actions were taken; and an action for sharing a lesson learned at a safety meeting was closed without any indication that this action was taken or that a lesson learned was drafted. Descriptions of required actions and of actions taken for a Level B PIER should provide sufficient specificity to ensure alignment of expected and completed actions. Additional examples of recently issued PIERs that were improperly categorized are provided below in the section on the BNI ECP.

- In many cases, BNI has not properly categorized issues for significance in accordance with corrective action procedure definitions. Initial significance categorizations are assigned by the PRC, but the procedure allows the assigned responsible managers to change the assigned significance level, an action that happens for approximately 10 percent of PIERs. A project-wide database search by Independent Oversight indicated that in the past 21 months, line management had downgraded the significance categories of more than twice as many PIERS as they upgraded. As discussed previously, Engineering recently identified that a significant percentage of their issued PIERs had not been accurately categorized. Six QA/quality control surveillance reports issued since March 2008 (conducted as a result of a recommendation from a 2008 Environmental Management audit) reviewed the significance level categorizations of a random sample of approximately 10 percent of issued PIERs. These reports indicate that over 15 percent of the PIERs that were evaluated by QA would have been categorized differently by the assessor, and approximately 85 percent of those were categorized by the PRC or line management at a lower level than the assessor would have assigned. However, all of these surveillances, as well as a summary surveillance on this topic issued in February 2011, categorized the results as "satisfactory." No criteria or justifications/bases for accepting that level of discrepancy were provided in the surveillances. In another example, MGT-11-0166, resulting from the Nuclear Safety and Quality Culture (NSQC) gap assessment conducted in part in response to the 2010 HSS safety culture review, identified that recommendations from two common-cause analyses of the construction work control process in 2009 and 2010 had not been documented as PIERs; the failure to document these recommendations on a PIER was categorized as a Level D PIER. However, this failure to document would be a violation of issues management procedure requirements and thus should have been categorized as a Level C or B PIER. Although some revisions of assigned significance levels are appropriate and reflect proper characterization and support the necessary level of rigor applied to issue management, the number of changes occurring at WTP and the disconnect between significance levels and the substance of issues and the level of response (e.g., recurrence controls for Level C and D PIERs) indicates weaknesses in process or implementation. Frequent changes or improper assignment of significance levels represents a vulnerability to the effectiveness of WTP corrective action management process.

As detailed in Section C.2.2 below, BNI identified and implemented many corrective actions to address the recommendations provided by HSS in the 2010 report of the review of safety culture at WTP. However, all of the problems related to the WTP nuclear safety culture identified by HSS in 2010 and by BNI's NSQC gap assessment in 2011 were categorized as Level D PIERs (opportunities for improvement), rather than as Level B or even Level C issues. Although these recommendations were not explicitly linked to a regulatory or DOE requirement, the issues clearly reflected a need for management attention and action, including developing an understanding of the cause and extent of programmatic shortcomings and identifying corrective and preventive actions. These needs are specific elements in the definition of a Level B PIER in procedure GPP-MGT-043. In addition, consideration of the DNFSB concerns, the results of the self-initiated August safety culture survey, and the NSQC gap assessment, along with the culture issues identified in the Independent Oversight report collectively, should have resulted in BNI management assigning higher significance levels, thereby ensuring more extensive analysis and attention to these recommendations.

- Many Level C PIERs and some Level D PIERs reviewed by the Independent Oversight team included corrective or preventive actions, indicating that some evaluators recognized that in many of these cases, recurrence controls were needed. GPP-MGT-043, defines PIERs that require corrective actions (i.e., recurrence controls) as Level B.

- In some cases identified by the Independent Oversight team, PIERs were not properly dispositioned. For example, PIER MGT-11-0166-D, described above, was closed improperly with the statement that the causal analysis guide for these analyses did not specify that PIERs needed to be written. That statement was incorrect. Additional examples of inappropriate PIER dispositions are provided in the following sections on the DPO program and the resolution of recommendations from the 2010 HSS safety culture review.

- The Independent Oversight team identified deficiencies in the timeliness and comprehensiveness of apparent and root cause determinations. Relatively few formal cause analyses are performed at the WTP. Of the approximately eight root cause analyses in progress and completed between July 2010 and October 2011, five took more than 80 days to complete, one took approximately 7 months, and one was open for over a year. In addition, several apparent cause analyses reviewed by the Independent Oversight team were not sufficiently rigorous to address important aspects of the deficiency and drive recurrence controls. For example, the apparent cause analysis for PIER MGT-11-0117-B did not adequately describe/justify the bases for the selected cause codes and human performance error precursors, resulting in blaming the workers rather than focusing on latent organizational weaknesses. Further, recommended actions in the analysis and actions specified in the PIER were not sufficiently specific. The "why staircase" analysis in root cause analysis RCA-CON-11-003 (PIER MGT-11-0371-B) contained conflicting statements (i.e., the process is complex, and no formal process is in place), and also failed to identify the reasons for a lack of a process in the field and an inadequate procedure. In addition, as noted above, in March 2011 BNI's Q&PA staff identified an inadequate root cause analysis of an injury event.

  One example demonstrates the negative effect of improper management of causal analysis on the project's safety culture. WTP staff, management, and senior managers were unable to effectively execute a timely root cause analysis for a Level A PIER issued in October 2010 related to nuclear safety analysis. Differing beliefs in Environmental and Nuclear Safety (E&NS) and Engineering concerning the applicability of DOE STD 3009-94 to current WTP safety analysis and design, different management styles, and various other factors contributed to conflicts and the inability of the "independent" multi-organization causal analysis team to produce a report agreeable to the E&NS manager, who was the owner of the issue. Senior management was made aware of the difficulties in completing the causal analysis and resolving this PIER no later than July 2011, but management was

not effective in resolving the issues and the root cause analysis was never finalized. The final resolution of this PIER was driven by formal DOE requests and BNI's provision of a formal licensing strategy that addresses the applicability of STD 3009-94. The PIER was downgraded in November 2011 to Level B, and an apparent cause analysis was performed and corrective actions identified. Interviews with BNI staff revealed that this extended, contentious, and poorly managed causal analysis activity resulted in strong negative feelings among and between Engineering, E&NS, and Q&PA personnel. As described in more detail in the primary volume of this report (Section 5), this issue is a significant contributor to the current nuclear safety culture problems at the WTP. Although this issue was discussed in a November 2011 PIRB meeting, where it was suggested that a lesson learned might be appropriate, no definite actions or responsibilities were identified. A rigorous root cause analysis is warranted to identify and establish recurrence control actions that will address the fundamental problems contributing to this PIER and the substantial difficulties and delays in completing the causal analysis and resolving this issue.

- Additional problems with PIER resolution and closure were identified. In evaluating the results from the NSQC survey part of the gap assessment, the NSQC staff identified specific organizational "pockets" of chilled environment/culture problems, also noted more generally by HSS, prior Pillsbury survey results, and Defense Nuclear Facilities Safety Board (DNFSB) reviews. However, the NSQC staff chose not to address the pockets specifically. BNI's approach has been to address the culture issues from a global standpoint through policies, procedures, guides, training and communication to everyone on the project. In the absence of actions targeted at the specific organizations or positions that these reviews have indicated are most affected by safety culture weaknesses, systemic solutions do not appear to have been fully effective, based on the analysis of interviews conducted by the Independent Oversight team during this assessment. Also, PIER MGT-0166-D, discussed above, was closed improperly based on an erroneous statement that the causal analysis guide did not specify that PIERs needed to be written.

- There are a number of weaknesses in WTP trend analyses and in the reporting procedure, and the procedure is not consistently implemented by all organizations as required. The procedure requires trending to be performed by specified individual organizations for their own processes and activities, but it does not require any collective trend analysis at the institutional level to identify cross-cutting issues that need project-level management attention. As discussed in Section C.2.2., PIER MGT-10-1200C identified issues with the lack of institutional level trend analysis. Actions due to be completed in early 2012 should address that process weakness. Although the procedure includes "reporting" in its title, the only reporting it addresses is writing PIERs for negative trends, and it does not address any expectations for reporting periodicity, reporting of data analysis to management for information and action, or wider distribution (e.g., senior management or the process lead and owner in Q&PA). Although there are some examples of trend charts and some limited general guidance on data sources and methods for identifying trends, there is no expectation that organizations develop internal procedures defining their internal processes and requirements for trend analysis. Some designated organizations have not established any internal procedures for trending, some do not issue any trend reports, and others only issue trend information if a negative trend is identified. A review of several organizations' trend documents identified charts that set out some periodic data, but little or no analysis of the implications of the data or actions needed or taken. Some reports lack cover sheets or other identification of the preparer, issue date, and management approval. Several organizations no longer exist in the form or with the title cited in the procedure, and additional organizations that attend the working group meetings are not mentioned in the procedure. Contrary to the procedure, several organizations have attended working group meetings only sporadically. In addition, several meetings had only two or three attendees, plus the Q&PA working group program lead; the procedure does not specify quorum requirements.

- In many cases, the "planned action completion dates" are far into the future, with no apparent rationale for the time frames. In addition to the potential for delays in needed actions, the long completion dates may result from a desire to reduce the chance of overdue actions/closure or needed extensions (and the consequences, which are viewed as negative).

The BNI Q&PA organization is aware of weaknesses in project corrective action management processes and has been working on various improvement actions. A WTP Corrective Action Program Improvement Implementation Plan was issued in August 2008 and has been updated five times since, most recently in October 2010. Each revision of this plan describes the beginning state, current state, and desired end state of the corrective action program and each of its various elements, along with improvement actions taken, or to be taken, by the Q&PA organization. While the actions already taken have resulted in process improvements, they have not been fully successful in preventing the performance deficiencies described above. In addition, at the direction of site management, in September 2011 WTP's "six sigma" group completed a formal process improvement project (PIP) with the stated objective of reducing the cycle times for processing PIERs. The study also identified a number of areas for improvement and resulted in a recommended action plan. A PIER users group was chartered and performed a focused review of the PIP report and the PIER process in general. In November 2011, the users group issued a report identifying 23 different project business processes or systems that were considered to be part of a WTP issues management system. The report also identified six recommendations to achieve a more effective issues management process. Although the report identified process improvements and additional resources for improving implementation, its conclusions strongly emphasized that process changes will have little effect on project personnel's negative perceptions of individual PIER management or the PIER process unless management devotes serious attention to addressing employee and management behaviors and cultural beliefs. Recommended actions included consistent demonstration and communication of management commitment to effective and compliant corrective action management, effective management communication of expectations for corrective action management to employees, use of organizational subject matter specialists, and improvements in the PIER tool and online help module. The group recommended redefining the corrective action system to include the 23 systems in use and ensuring that all processes are modified to demonstrate a fully integrated approach to managing issues. The recommendations are appropriate and have the potential to strengthen project issues management, especially with regard to the need to modify behaviors and cultural weaknesses. However, the users group charter did not include process implementation and their recommendations do not specifically address the implementation deficiencies described above. Targeted management evaluation and attention are needed.

Engineering Technical Issues Management

The Independent Oversight team reviewed the Engineering Technical Issues Identification Management Guide that was revised in March 2011 to better describe the purpose and details of the identification, characterization, and management of technical issues. The revised Guide was significantly enhanced by clarifying its applicability to only those engineering technical issues whose resolution requires WTP management attention and may require DOE involvement; clarifying the distinction between technical issues and issues that should be resolved at the discipline level in the normal course of design development, design review, and design coordination; introducing the technical issue grouping terms Management Watch List and Cut Sheet (which were previously not defined); adding detail for binning technical issues as Management Watch List Items, Technical Issue Evaluation Forms (TIEFs), or Cut Sheets by increasing level of significance; clarifying the expectation that lower-significance technical issues should be monitored at the discipline level; assigning responsibility to supervisors for feedback to the identifiers of issues; and encouraging the engineering staff to identify and report technical issues and concerns to their supervisors. The revised Guide does not recommend or prohibit identifying technical

issues in PIERs, but does indicate that the Guide process should not be used in place of formal change control processes, PIERs, or ATS.

An HSS review of BNI Engineering activities in 2008 identified a concern that the WTP design did not provide adequate mitigation for potential volcanic eruption ash fall from the nearby Cascade Mountain Range. As follow-up to this concern and evaluation of the effectiveness of the Guide process, the Independent Oversight team reviewed documentation associated with the closure status of TIEF 2009-0004, "WTP Ash Fall Control Strategy Finalization and Design Implementation" and Cut Sheet "Technical Issue 2009-0004: Ashfall Control Strategy." The 2009 TIEF defined the path forward as: "Review volcanic ash fall control strategies and implementation into design. Perform analyses and evaluations to confirm feasibility of control strategies. Update the PDSA, and flow down requirements into applicable design documents." The TIEF was appropriately superseded upon establishment of a Cut Sheet as required by the Guide. The original proposed strategy requiring replacement of approximately 7000 filters within a 24-hour period was appropriately determined not to be feasible. The revised, optimized, and agreed strategy requires bringing the facilities to a safe configuration during a two-hour warning period after a volcanic eruption, adding several skid-mounted filtration units (cartridge baghouse and fan) to the design, modifying safety air conditioner condensers to be ash tolerant, stopping melter feed, isolating the ammonia supply and the carbon beds, shutting down or minimizing flow through selected ventilation systems, and incorporating ash dropout features. The Cut Sheet was subsequently closed in January 2011, based on the actions completed, agreement on the control strategy, and an assignment to E&NS to draft and receive approval of the related Authorization Basis Approval Request (ABAR). The Guide process was followed effectively, including establishing an ATS listing requiring a post-closure effectiveness assessment. DOE approval of the related ABAR is expected in 2012.

Consistent with the revision of the Engineering Technical Issues Identification Management Guide, Engineering appropriately consolidated the list of technical issues identified in the 2009 and 2010 "Clean Out the Drawers" initiative and ensured that the status of each was being tracked in an appropriate formal or informal process. Of the 191 identified technical issues, 9 were determined to be worthy of elevated attention and were added to one of the formal technical issue tracking processes. The remaining technical issues were appropriately referred back to various processes to continue to be worked on or closed as PIERs, ATS, discipline-specific punch lists, etc. By October 2011, 88 of the 191 technical issues had been closed.

The Independent Oversight team also reviewed the October 2011 WTP Technical Issues Summary Table for open TIEFs and Cut Sheets. The table appropriately summarizes the TIEF and Cut Sheet technical issues, lists the BNI and Office of River Protection (ORP) Technical Leads, outlines the status of activities required for resolution of each TIEF, and documents TIEF concurrence by the BNI Manager of Engineering. Reviewed open Cut Sheets are consistent with those listed in the WTP Technical Issues Summary Table, appropriately summarize the technical issues, outline the status of activities required for resolution, highlight challenges to timely resolution, have been updated monthly, and show concurrence by both the assigned BNI and the ORP Technical Leads. No concerns about the Technical Issue Update process were identified. As of October 2011, 19 of 34 Management Watch List issues, 8 of 14 TIEFs, and 36 of 44 Cut Sheet issues identified since 2008 have been closed.

BNI Employee Concerns Program

The Independent Oversight team reviewed current process documents and a sample of case files for BNI employee concerns filed with the BNI, ORP, and DOE Richland Operations Office (RL) ECPs that were closed after October 2010. Although there continue to be allegations of retribution for raising safety issues and a number of issues were identified only during the exit interview process, most have been adequately investigated and found to be unsubstantiated. However, many employee concern cases are

closed as unsubstantiated because of insufficient evidence or failure of the concerned individual to provide specifics or follow-up information, especially in cases of anonymous concerns or concerns from exiting employees. In the past year, approximately 100 WTP workers have reported formal concerns to the BNI, ORP, or RL concerns programs, including construction craft, technical, and administrative staff. Many of the concerned individuals reported multiple concerns, all of which were investigated/resolved individually by the concerns program staff. However, the continuing reports of formal employee concern cases show that many WTP employees feel free to report their concerns, as well as reflecting continuing worker perceptions of a less than adequate safety culture, including concerns related to safety, quality, and reprisal (intimidation, retaliation, and/or a hostile work environment).

Most concerns reported to the ECP suffer from a lack of tangible, corroborated, clearly defined evidence and facts. In many instances, the cases cannot be definitively resolved because the available data consists primarily of conflicting statements about an event or situation. Personnel can speak and act in completely opposite ways, depending on whether there are witnesses or a documented record. "Concerned" individuals sometimes have ulterior motives or misunderstandings, such as protecting their employment if they suspect imminent loss of their position or deflecting negative actions for poor performance to a charge of retribution. However, even if cases are not substantiated or actionable facts are lacking, the very fact that an investigation is conducted and questions are asked can change behaviors and reinforce positive cultural expectations.

The Independent Oversight team reviewed approximately 20 closed case files for concerns reported by WTP employees to BNI (15) or to ORP or RL (5). Most investigations were generally thorough and reflect significant effort by ECP investigators to communicate with and establish a positive working relationship with the concerned individuals to draw out as much information as possible and communicate investigation status. Concern intake information, investigation actions, and details are generally well chronicled and organized in case files. The BNI ECP has established a formal exit interview process soliciting safety concerns from departing employees that is more formal and specific than typical concerns programs. This process has resulted in many new investigations by the ECP staff (approximately 12 of the cases that the ECP investigated in the past year), although most are not substantiated due to lack of actionable facts and evidence or the inability to get further details from departed employees.

While the investigations that were conducted were generally thorough, in a number of the ECP case files reviewed, the investigations were not sufficiently comprehensive. That is, the investigation activities for specific elements were rigorous and well documented, but in some cases not all elements of the concern or ancillary concerns identified during the investigation were investigated or sufficiently addressed. The failure to address all aspects of the case or to fully address emergent issues can damage the credibility of the program with concerned individuals, who may conclude that the ECP process is ineffective or biased. Following are several examples:

- A recent concern reported to the BNI ECP related to apparently conflicting management communications and actions that did not reflect a sound nuclear safety culture. A briefing where a supervisor discussed the WTP policy that "schedule does not take precedence over quality" was followed only hours later by a reduction in staffing for conduct of a supplier quality audit. The case was closed based on a memorandum to the investigator from Q&PA management clarifying that the staffing reduction was a standard management decision point (covered in the procedure) and would not affect the scope or length of the audit. The memo also indicated that the perception of schedule over quality "could have been damaging." However, neither the memo nor the case file indicates that any action was taken to communicate or clarify the situation to the concerned individuals in the affected group.

- In another BNI ECP case, peripheral safety issues were identified during an ECP investigation that fire watches were not properly performed (the person performing the hot work acted as his/her own fire watch) in one facility, and workers were not permitted to review work packages but were just told by supervisors where to go and what to do. The ECP staff appropriately followed up on these issues by notifying the superintendent of that group of the issues and requesting feedback on resolution. The case was closed based on an e-mail from the superintendent stating that he had talked with his foremen, heard that they were unaware of any problems, and told them he expected procedures to be followed. These actions were insufficient to definitively establish whether the expressed concerns were accurate or to identify the extent of condition. Independent review of the processes, observations of performance in the field, and additional interviews with workers would have been more appropriate actions to address these employee concerns.

- A BNI ECP case related to a June 2011 construction site event (near miss of dropped structural steel) was generally thoroughly investigated, but several key elements identified by the investigator were not fully evaluated and documented as resolved. Statements by the concerned individual relating to the project's failure to adhere to its own structural steel erection specification were not addressed. The investigator sent an e-mail to Q&PA staff expressing his concerns about several aspects of the root cause analysis and requesting a review of the analysis report. No reply (apparently none was received) or final disposition of the investigator's concerns was documented in the case file. The case was closed as unsubstantiated.

Although the formal BNI ECP communications of resolutions to the concerned individuals are factual and polite (e.g., expressing appreciation for reporting the concern and cooperation during the investigation), they do not address any recourse for the concerned individual if he/she does not agree with the resolution (e.g., appeal to DOE ECP, DPO, or DOE Inspector General). After discussion with the ECP manager, a new template for a resolution appeals statement was developed for future correspondence/communication about resolution with concerned employees.

Differing Professional Opinion Program

Two DPO cases have been filed since the 2010 HSS review. Both were decided in favor of the initiator, although in one case no additional actions were needed because changes in site management's approach to the applicability and implementation of DOE-STD 3009-94 will address the concerns. The investigations and case files were generally well documented and involved independent specialists who thoroughly evaluated the facts of the competing positions and made appropriate recommendations for resolution. A procedure, revised November 1, 2011, describes the DPO process expectations.

Although BNI has been successful in resolving these recent DPOs, Independent Oversight identified deficiencies and weaknesses in the DPO procedure and implementation of the procedure that need to be addressed by BNI. These problems include:

- The revised procedure deleted the previous requirements to first process the DPO as a PIER and then continue through completion before entering the issue into the DPO process. The revised procedure still requires the DPO coordinator to ensure that the "normal review process" (not further defined) has been attempted, but the only criterion is that it must include a formal meeting between senior management and differing parties. The procedure does not require any documentation/description of this activity or any evaluation of process adequacy or identification of any corrective actions or recurrence controls to improve lower-level processes or their implementation. There is no field on the DPO resolution form or evidence in the two case files reviewed that documents this determination by the coordinator.

- The Procedure section is a list of responsibilities of various involved parties, not a chronological or step-by-step process description.

- The procedure does not identify the organization responsible for the process or how the DPO coordinator position is determined (e.g., what organization, who appoints, necessary qualifications).

- The Background section of the procedure specifies a requirement and process step, included in the responsibilities listed in the Procedure section, that the DPO originator initiates either a PIER or ATS item to track the DPO issue. It is unclear why a separate tracking system is required, because the DPO resolution form includes a description of the issue by the originator as well as the resolution team determination and the DPO Review Board decision.

- The DPO reporting and disposition form does not have a field for the initiation date.

- There are no instructions or guidance for completing the DPO form. The procedure contains a definition of the "DPO submittal" that does not reference use of the DPO form. Although the definition lists the minimum information required, some of these requirements do not align with the fields contained on the DPO form.

- The responsibilities of the independent resolutions team (non-WTP personnel in the two cases in 2011) include evaluation of the need for immediate actions using existing WTP policies and procedures and evaluation to identify any reportability or operability issues and initiate required actions. However, there are no defined qualifications/training for non-resident/WTP resolution team members to inform them of the WTP policies and procedures for these conditions.

- The flowchart of the DPO process in the appendix to the procedure does not show any steps for using the PIER/ATS for tracking or for documenting any identified necessary resolution action items in PIERs or ATS.

Deficiencies and weaknesses in the application of the DPO process included the following:

- The resolution team for DPO-BGT-11-0001 identified five recommended actions in its investigation report. BNI issued a Level C PIER and a Level D PIER that revised and reworded the resolution team's recommendations and added additional recommended actions. Several of the recommendations from the team, including design compliance with specific standards, determination of the cause of its failure to achieve "best practice" in this instance, and making a general practice of benchmarking design practices in the nuclear industry for remaining design activities, were documented on the Level D PIER. These recurrence control actions would have required issuance of a Level B PIER as defined in the BNI corrective action management procedure. BNI management should have considered these issues of greater significance than "find & fix" and "opportunity for improvement" level PIERs, regardless of whether an outside review team characterized the issues or needed actions as "recommendations" for several additional reasons. Specifically: (1) this difference in technical positions had to be resolved at the highest level of the BNI issues management process (DPO); (2) the resolution team's decision was that the initiator's position was the appropriate one; and (3) the evaluation identified deficiencies in WTP processes.

- The investigation and resolution of DPO-MGT-11-0002 did not address why prior issue resolution methods were ineffective in resolving the issue.

- DPO-MGT-11-0002 was decided in favor of the initiator, and the disposition included three corrective/recurrence control actions as recommended by the resolution team. However, these were all documented in ATS, rather than documenting and ensuring proper resolution of these problems in the PIER system. WTP should identify these problems as issues to be resolved and tracked in the WTP issues management/corrective action process (as Level B or C PIERs), not in a commitment tracking system.

C.2.2 Corrective Actions for the HSS 2010 Review Issues and Recommendations

The Independent Oversight team reviewed the actions identified, taken, and planned to address the recommendations identified in the HSS 2010 safety culture review at WTP for status, adequacy, and effectiveness. BNI provided a response to the 2010 HSS report and recommendation in December 2010 and provided the team with a status of BNI commitments to address the recommendations as specified in PIER MGT-10-1128-D on August 30, 2011. The following is a discussion of the status and evaluation of BNI's response to each HSS recommendation.

HSS Recommendation #1 for BNI

"**As part of the Nuclear Safety and Quality Culture initiative, perform a systematic assessment of the existing processes for identifying and resolving nuclear safety issues, with particular emphasis on root cause analysis of problems involving the initial identification of issues.** BNI has many different issues management processes that follow the same general steps of issue identification/entry into a formal process, screening, evaluation, development of actions, tracking and monitoring, and effectiveness verification. Some specific concerns about individual processes need attention, but once an issue is identified and entered into one of the WTP issues management process, the processes appear to work well to achieve resolution and track progress to completion. However, a number of concerns were evident with respect to the identification and entry step in multiple processes, including the lack of minimum management expectations for when to use the processes, a reluctance to enter issues into PIERs and to use the DPO process, the use of less formal means that bypass important analysis and trending functions, and concerns among a subset of employees that management is discouraging individuals from raising issues. A formal causal analysis of these factors, considering cultural issues as well as the adequacy of guidance, training, and procedures, could provide a needed baseline for determining how to modify site processes to improve the identification of safety issues for evaluation and resolution." (Quoted from HSS report *Independent Review of Nuclear Safety Culture at the Hanford Waste Treatment and Immobilization Plant Project*, October 2010)

WTP Actions: PIER MGT-10-1200-C, "Interface between the PIER and other Systems is not clear nor amenable to trending," was issued to address part of this recommendation. In addition, PIER MGT-10-1128-D, Action 2, was issued specifying that an NSQC gap assessment was to be performed to specifically include the examination of existing processes for identifying and resolving nuclear safety issues.

Current Status and Independent Oversight Evaluation: The NSQC gap assessment was completed and a report issued in May 2011. The analysis included a review of the PIRB, WTP's "Knothole" process (discussed under HSS Recommendation #2 for BNI, below), insight on nuclear culture from trends associated with anonymously submitted PIERs, and alternative processes for reporting concerns (ECP and DPO). Two PIERs and an ATS item were generated related to these topics. The survey included questions related to the issue identification and resolution processes and one additional PIER (MGT-11-0377-D) was issued; however, the gap assessment did not constitute a root cause analysis of the problems involving the initial identification of issues. Interviews with four BNI Engineering and NSQC managers responsible for developing and implementing corrective actions for the HSS recommendations indicated

that BNI did not understand this recommendation, resulting in a call to HSS for clarification. As a result of that call, BNI understood that "The authors of this recommendation did not intend for the WTP to conduct a root cause analysis, per se. Rather the intent was to recommend an assessment of the process for identification (particularly the initial identification) and resolution of nuclear safety issues." This information was included as a footnote in BNI's December 2010 response to DOE describing their planned corrective action plan for the HSS recommendations. Regardless of the conversations with HSS personnel regarding the need for a formal root cause analysis, WTP management's decision not to perform the suggested causal analysis reflects their belief that the cultural issues discussed in the HSS report and raised by the DNFSB were not significant enough to warrant that level of evaluation to establish the necessary corrective actions and recurrence controls.

The interviewed managers acknowledged there were multiple issue identification processes and pockets of concern about the initial identification of issues; however, they maintained that most Engineering staff members were aware of and generally used one or more of the available formal or informal issue identification processes, when needed. The interviewed managers also indicated they did not believe the volume of issues identified during Engineering's "Clean Out the Drawers" initiative indicated problems in the initial identification of issues. They indicated that most of the issues were already known and tracked in less formal or discipline-specific processes, such as punch lists. Finally, the interviewed managers did not agree that there were significant problems with issue identification and indicated their belief that the results of the BNI NSQC gap assessment supported their conclusion.

Although the PIER initiator (the WTP Corrective Action Manager) and the WTP status report on actions taken as a result of the 2010 HSS report identified PIER MGT-10-1200 as a Level B PIER, it was actually categorized by the PRC as a "find and fix" Level C PIER that required no causal analysis, extent-of-condition review, or recurrence control actions. Although not required by procedure for a Level C PIER, an apparent cause determination, identified as "draft," was attached to the PIER, which indicated that "management policy and guidance/expectations were not well-defined, understood, or enforced." The PIER report identifies four actions, all open and with due dates in January or April 2012: (1) More clearly define what information should be captured in the PIER system for project-wide trending and other key project wide performance indicators and integrating the information for management; (2) Develop a communication for project-wide dissemination providing the results of action 1; (3) Revise GPP-MGT-050, *Trend Analysis and Reporting*, based on actions 1 and 2; and (4) Identify issue tracking systems used at the WTP that are not procedurally controlled through an established process and provide an appropriate method for managing the relationship between the ad hoc tracking systems and the PIER system.

The Independent Oversight team considers that the recommended significance level of B was appropriate for this PIER because management attention was required, the cause needed to be determined, and recurrence controls needed to be identified and implemented. Further, the specified actions do not fully address the underlying issue of unclear interfaces between issues management systems. The actions focus on project trending and interface agreements but do not ensure that the procedure provides a clear understanding of expectations and that personnel correctly apply issues management processes based on the issue and circumstances. The specified "planned action completion" dates do not appear to be sufficiently aggressive, with some actions (i.e., identify ad hoc tracking systems and issue some sort of interface document) scheduled to occur a year and a half after issue identification. No actions had been completed for this PIER as of December 20, 2011, over a year after issuance.

The Independent Oversight team considers that, in this instance, the bundling of the 2010 HSS recommendations into one PIER precludes effective trending of issues. The significance categorization of all the 2010 HSS issues related to problems with the nuclear safety culture at WTP (as well as safety culture issues from most other internal and external reviews) as Level D was inappropriate and non-conservative, given the external attention and costs involved in addressing NSQC questions. Level D

PIERs require no evaluation for causes or extent of condition and no recurrence control actions, and they can be closed by staff personnel without management review and approval. In addition, the gap assessment did not thoroughly evaluate all of the existing processes for identifying and resolving nuclear safety issues or their relationship and application. Regarding PIERs, the study looked only at the role of the PIRB and the very small subset of anonymously submitted PIERs. It did not address Engineering issues management processes; the relationship of PIERs and Engineering processes; and whether the intended application of these various processes is sufficiently defined, understood by WTP personnel, and appropriately applied in practice. A more comprehensive evaluation of all processes might have identified the safety basis approach issues and the related PDSA and design conflicts between Engineering and E&NS.

Per the gap assessment report, Action 3 of PIER MGT-11-0377-D was issued to address "management involvement in problem identification and resolution." However, the specified actions for resolving this issue was limited to conducting a review of the PIRB, revising the corrective action procedure (or producing a memorandum explaining why no revision was needed), conducting a review of the PRC decisions on the significance level categorizations, and issuing the results as a management assessment. This PIER action was closed without action (i.e., procedure changes or formal assessment), with the statement that the PIRB is now more focused on Level B PIERs than on Level D PIERs (never identified as an issue), and that the PRC had changed to be more conservative, with a bias toward higher significance level categorization. No review information or specifics were provided as a basis for these closure statements, and the changes cited did not reflect process changes, only non-specific changes in application. Further, the actions did not address several questions cited in the gap assessment related to the PIRB, such as possible weaknesses in the procedural requirements and in the scope of selection of Level B PIERs.

In addition to the specific concerns and resulting actions outlined above, the Manager, NSQC and Commission Support, indicated that the gap assessment highlighted the need to enhance teamwork, organization and cross-functional communication, and supervisors' and managers' knowledge of how to establish and sustain NSQC. The WTP NSQC Plan outlines actions planned and taken that address these and other concerns, including issuing additional guidance on the change management process; establishing enhanced training for managers, employees, and new hires on NSQC principles and expectations; initiating "management by walk-around" activities; and evaluating the PIER process with particular emphasis on improving initial identification of issues. The recently issued NSQC procedure outlines the responsibilities of a new NSQC Monitoring Panel, managers, supervisors, individual contributors, and subcontractors to support and sustain NSQC expectations. The NSQC Monitoring Panel is responsible for monitoring indications of the health of the WTP NSQC to identify potential concerns that merit additional attention by management and to identify organizational behaviors and practices that are strengths for fostering a strong NSQC. The NSQC procedure also requires biennial employee surveys and annual NSQC internal assessments.

In addition to the actions specifically identified in PIER MGT-1128-D, BNI management has identified and has implemented or is implementing other actions to address weaknesses in project issues management as documented on various PIERs. These actions include a focused process review by a PIER users group with associated improvement recommendations, as well as enhanced new employee orientation and general employee training. BNI has devoted significant effort and made progress in addressing the 2010 HSS Recommendation #1 for BNI. Although no plan of action has been formulated to address the specific identified "pockets" of concern for initial issue identification, actions taken to train supervisors and increase communication of NSQC expectations should enhance performance. However, many of the actions to address the 2010 HSS concerns about the implementation of BNI processes for identification and resolution of nuclear safety concerns are either only recently implemented or not yet implemented, and it is too early to determine their effectiveness. In addition, the Independent Oversight

team identified many PIER process implementation deficiencies that do not appear to be specifically or adequately addressed by the corrective actions and recommendations identified to date. WTP employees and managers interviewed by the Independent Oversight team also continued to express concerns about project issues management processes. Continued and focused senior management attention to addressing these issues is needed.

HSS Recommendation #2 for BNI

"**As part of the ongoing effort to strengthen the safety culture, establish a formal change management process that identifies the actions needed to ensure that safety programs are not degraded by changes in project status or priorities.** Change management is a proven management technique for systematically evaluating the impact of planned changes, taking actions to minimize the negative impacts of change (e.g., revising procedures, providing needed training), and proactively communicating with employees to alleviate concerns and encourage understanding and acceptance of changes and management decisions. Some of the concerns identified during this review could have been precluded by a more systematic approach to change management that considers needs and concerns at all levels of the organization." (Quoted from HSS report *Independent Review of Nuclear Safety Culture at the Hanford Waste Treatment and Immobilization Plant Project*, October 2010)

WTP Actions: PIER MGT-10-1128-D, Action 3, required the establishment of a new change management requirement and/or guidance document. In addition to issuance of a new change management guide, a revision was made to the Change Authorization guide to reference the new change management guide, revise the "Ten Hard Questions" to address potential NSQC impacts, and remove reference to the "Knothole" process.

Current Status and Independent Oversight Evaluation: BNI's response correspondence to DOE stated in part that: "The WTP currently has several formal change management processes that are used to ensure nuclear safety programs are not degraded by changes in project scope, design, status or priorities." The BNI correspondence went on to outline what these processes were and why they were required. However, BNI also indicated that an action outlined in their NSQC Plan required development and issuance of requirements and/or guidance document(s) that address the impact of change on project personnel. The avoidance or mitigation of such impacts is not otherwise addressed by BNI's formal change management processes. The PIER established to document and track WTP's response to the 2010 HSS recommendations required establishment of this new document.

The Manager, NSQC and Commissioning Support, indicated that BNI learned that some members of the staff had positive experiences with change management using the "RADKAR (Recognition, Awareness, Desire, Knowledge, Ability, Reinforcement) Change Assessment Questionnaire." Management decided to establish a new change management guide endorsing the use of the RADKAR questionnaire to supplement existing WTP formal change management processes. The new Guide for Assessment, Planning and Execution of Organization and Process Changes was issued in June 2011. Implementation of this Guide was intended to ensure that changes to requirements, programs, processes, procedures, organizations, and work conditions are thoroughly evaluated and accepted by affected personnel. The stated intent of the Guide is to challenge management with a series of questions in anticipation of change implementation that may result in detrimental, unexpected, or unacceptable consequences, and to identify corrective or mitigating action to avoid those consequences. Use of the Guide was not mandatory unless directed by senior management.

BNI was also aware of HSS and WTP staff concerns about the then-current Change Authorization guide, known as the "Knothole" process. The Change Authorization guide is intended to ensure that those changes or actions that may fall into the category of limited return to the customer and WTP, while

increasing cost, are evaluated by senior management prior to implementation. The guide is not intended to be applied to minor changes that have no material impact on cost, schedule, procedures, processes, or infrastructure; when organizational acceptance of change is not essential; or when the consequence of change is minimal. The guide assigns responsibility to the initiator to outline the justification for the change considering ten change attributes (the former "Ten Hard Questions"). BNI revised the Change Authorization guide in July and November 2011 to remove the term "Knothole" and require documented justification of any impact on NSQC as the revised tenth "Hard Question."

The establishment of the new Guide without a requirement, thresholds, or criteria for its use does not resolve the HSS recommendation. Further, the fact that senior managers decided that their staff did not even need training on either the new Change Authorization guide or the new Guide for Assessment, Planning and Execution of Organization and Process Changes indicates that BNI had not appropriately responded to the 2010 HSS report recommendation as defined above.

The Manager of Engineering indicated during an interview that most WTP staff did not need training on the new Guide because the decision to implement the described process should be reserved to senior management, such as the Executive Review Board (ERB), due to the resulting imposition of significant additional effort and resource expenditures.

In response to Independent Oversight team feedback and questions, senior management revisited the decision on the need to train appropriate managers on the revised and new change management guides. On November 4, 2011, the ERB made the following decisions:

- The ERB will revise its charter to add change management to its scope.
- The ERB will add a standing agenda item to discuss any salient changes of interest.
- The Change Authorization guide will be revised to strengthen the tie between it and the Guide for Assessment, Planning, and Execution of Organization and Process Changes. The new wording puts the decision to use the new tools in the new guide, and the RADKAR checklist and/or change management plans, in the hands of the Project Management Team instead of the "user." It also changes the expectation from "may use" to "is used" when implementing major change. In addition, new wording will be added to the new guide to outline what sorts of events should prompt its use, as administered by the ERB.
- Cascaded training will be developed for delivery to management on the processes, requirements, and expectations for management's role in implementing major change.
- Actions will be tracked in either a PIER or an ATS item.

These decisions had not been implemented by December 1, 2011, when the Independent Oversight team completed its onsite data gathering activities.

No changes were made to the other WTP change management processes that are responsive to the HSS recommendation. These processes include the change control program, the E&NS Screening and Authorization Basis Maintenance procedure, the Review of Engineering Documents procedure, the Project Risk Assessment and Management procedure, the Critical Items Action Reporting (CIAR) procedure, the Design Change Control instruction, the Design Change Control Documents procedure, and the Advance Change Authorization instruction. The Independent Oversight team agrees that the WTP change management programs and procedure requirements, when effectively and appropriately

implemented, provide assurance that approved changes will not degrade physical nuclear safety. However, additional effort is planned and needed to enhance BNI change management planning processes to ensure avoidance or appropriate mitigation of potential negative impacts of changes in project plans, priorities, procedures, schedules, organizations, and responsibilities on nuclear safety culture.

HSS Recommendation #3 for BNI

"**As part of the ongoing effort to strengthen the safety culture, identify mechanisms to strengthen trust among the workforce and better communicate information to employees.** Management attention is needed to address the pockets of employees who perceive a chilled environment. A major focus of the effort should be the belief among some employees that job security is enhanced by not reporting safety issues. BNI needs to establish a formal company policy addressing all aspects of nuclear safety culture and train or retrain supervision and management at all levels (including work group leads) on fostering and maintaining a SCWE. BNI also needs to ensure that its communications to staff clearly indicate that the increased focus on WTP's transition to commissioning and operations does not reduce the importance of a strong safety culture that encourages identification and reporting of all problems, issues, and concerns. Improved processes are also needed to provide feedback to professional staff on the status of technical issues, including planned follow-on actions (e.g., further research and testing) and, in some cases, the reasons why some technical issues may not be implemented (e.g., because the benefits of implementation are not sufficient to outweigh the impact on project cost, schedule, and scope). BNI should also consider increasing efforts to positively reinforce reporting of safety issues (e.g., recognition of individuals who raise safety issues)." (Quoted from HSS report *Independent Review of Nuclear Safety Culture at the Hanford Waste Treatment and Immobilization Plant Project*, October 2010)

WTP Action: PIER MGT-10-1128-D, Action 4, required the development and issuance of an NSQC Communications Plan.

Current Status and Independent Oversight Evaluation: Nuclear Safety and Quality Culture Communication Plan (24590-WTP-PL-MGT-10-0004, Rev 0), was issued December 15, 2010. This is a three-page, high-level document that mimics the slide presentation used to communicate the three key messages about the program: (1) NSQC is not a new program, but a renewed focus as the WTP transitions from design-and-construct job to a construct-and-commission job; (2) There are three attributes to NSQC, each one important in achieving the project goals, i.e., leadership, employee/worker engagement, and organizational learning; and (3) NSQC is personal to employees. The program takes credit for communications activities initiated prior to the plan, including general newsletter articles such as the "Message from Management" section in the *WTP Today* newsletter; the NSQC intranet website; and "all employee" meetings.

Based on feedback from focus group interviews, employees – both "manual" and "non-manual" employee groups – had strong perspectives/opinions on nuclear safety culture. Many employees indicated that BNI as a company had safety as a core value. However, some employees indicated the need to remove the reference to "values and behaviors modeled by its Leader" when referring to the Energy Facility Contractors Group/DOE safety culture definition as it applies to the WTP project. Many groups indicated that there are many communication avenues. Some commented that they are sometimes given too much information, making it difficult to focus on what is important/relevant to safety and project status. Many indicated that they much prefer the small group meetings (which were recently initiated), rather than the all-employee meetings, for effective communication. In general, the immediate supervisor may be the best source for what is important to the individuals, if the working relationship is good.

Many avenues of communication have been established. Several initiatives, including small group meetings with the WTP Project Director, were recently initiated. Early responses indicate that the small

group meetings are worthwhile and support two-way communications. However, based on the feedback from interviews, the effort to strengthen trust among the workforce is not fully effective, and BNI management has not made sufficient efforts to identify the pockets of workers who have specific concerns and to identify and address the specific concerns and the underlying factors.

WTP Action: PIER MGT-10-1128-D, Action 5, required the development of an NSQC guide for "management by walk-around."

Current Status and Independent Oversight Evaluation: GPG-MGT-062, *WTP Management Workplace Visitation Program*, was issued on March 1, 2011, to enhance the WTP nuclear safety and quality culture. This procedure specifies the requirements and process for senior management to "review project activities and associated worker environments and gauge employee performance." The specified intent of the program includes emphasizing the importance of continuous improvement; increasing the interface between workers and senior management; encouraging workers to actively participate and take ownership for safety, quality, and compliance; increasing management oversight; and providing workers with positive feedback for improvements and for identifying and resolving issues or deficiencies. The procedure establishes a goal of performing one team "walk-around" per month. The team is nominally conducted by the Project Director and Safety Assurance Manager, with other members of the senior leadership team invited to participate. Visits are to cover the construction site, the Material Handling Facility, and in-town offices. Visits are structured with presentations to the management team by facility/area managers on recent activities, accomplishments, and ongoing activities and management concerns, followed by a tour with the team engaging employees and observing work. Any actions resulting from the visits are to be captured and addressed by the cognizant manager. Team members are to submit written feedback about the visit to the Safety Assurance Manager, who is to consolidate responses and complete the WTP Management Workplace Visitation form.

While the walk-around activity is a positive, proactive method for providing face-to-face communication between senior managers and employees, HSS considers that the WTP leadership team is not taking full advantage of this activity and the information gathered to accomplish the stated intent and objectives of this process. In addition, implementation weaknesses reduce the effectiveness of this program in achieving its intended objectives.

The Independent Oversight team interviewed the Safety Assurance Manager and reviewed available documentation related to implementation of this program. As of November 1, 2011, nine walk-arounds had been performed, but only two visits have been documented on a walk-around form. For the two visits with completed report forms, the responses are not being consolidated as specified in the procedure, but separate report forms are completed for each participating manager. The report forms are handwritten, often illegible, and cryptic in content. Neither the procedure nor the reporting form provides for any analysis or documentation to achieve the intention of gauging employee performance, periodically and formally analyzing the collective results of these interactions to characterize the safety culture in the facilities and organizations observed, and formulating any needed additional improvement actions. The form provides fields only for listing areas toured, employees engaged, positive points, and "issues." Actions to address the issues are not identified on the form. As might be expected, it has been difficult to coordinate the schedules of project senior managers to support team visitations. A number of the walk-arounds to date involved only two managers, neither of whom was the Project Director or Deputy Director. It is also possible that the project over-reached in its definition of the intent and objectives of this process and that a more modest objective, focused on increasing direct interaction and feedback between employees and senior management, would be appropriate. WTP management needs to review this process and how it is being implemented and take action to align the prescribed expectations with the actual results.

WTP Action: PIER MGT-10-1128-D, Action 6, required conducting NSQC "cascading training."

Current Status and Independent Oversight Evaluation: The cascading training lesson plan was reviewed. The content was appropriate as a starting point for NSQC awareness. Based on the sign-in sheets and other handwritten documentation, it appears that 1786 people had been trained as of April 2011. It was interesting that there was no central training database to pull the training records for such a significant effort. Individual managers are relied on to ensure that they provide the training to each of their employees.

The training course provided to management by consultant Morgan Lewis, *Maintaining a Healthy Safety Culture at WTP*, focused on using case studies with issues similar to those that exist or could occur at WTP to instruct management on how not to respond in a manner that could create a chilled environment. Case studies were geared primarily toward distinguishing the appropriate response to personnel performance issues from the appropriate response when employees exercise their rights to protected activities, especially when the two issues are combined in one event.

Training is one important element in understanding expectations. However, training alone is not sufficient to achieve "sustainable and continuous improvement in NSQC." Based on some interviews with employees, there is limited appreciation of what a nuclear safety culture is, especially among employees who had not worked at a nuclear facility before working at WTP. Continued BNI management attention is needed in this area.

WTP Action: PIER MGT-10-1128-D, Action 7, required issuance of a "new NSQC procedure or guide (sustainability via assessments, surveys, etc.)."

Current Status and Independent Oversight Evaluation: Procedure 24590, WTP-GPP-MGT-061, Rev 0, WTP Nuclear Safety and Quality Culture (September 15, 2011), was issued to direct the implementation of NSQC at Hanford Tank Waste Treatment and WTP. This procedure is a good start for specifying requirements and expectations for implementing NSQC. The implementation procedure flows from the policy statement WTP Nuclear Safety and Quality, 24590-WTP-G63-MGT-016, and the Nuclear Safety and Quality Culture Plan, 24590-WTP-PL-MGT-10-0001. The procedure contains management expectations for behaviors and activities that are intended to augment NSQC at WTP. The prime management expectation is that the WTP facility is designed, built, and operated ensuring the nuclear safety of workers, the public, and the environment remain the top priority.

The procedure identifies the responsibilities for the Nuclear Safety and Quality Culture Monitoring Panel (NSQCMP) and the frequency for meetings (a procedure that governs the activities of the NSQCMP has yet to be developed). It also identifies the responsibilities of managers and supervisors, as well as individual contributors and subcontractors. In addition, it maps to other procedures as implementing procedures for various attributes. For example, for the Leadership attribute, the Senior Supervisory Watch, the area operations management observation program, and the WTP workplace management visitation program are the implementing procedures for those actions. The procedure also includes a step that requires a nuclear safety culture survey to be performed biennially. One of three NSQC focus areas will be assessed each year so that all three will be completed every three years. In addition to self-assessments, independent subject matter experts may be hired to evaluate the program. Training is covered by formal classroom and computer-based training, as well as the various forms of communication.

Appendix C of the procedure provides details on management expectations for achieving acceptable results on each attributes, tying into the expectations for behaviors that leaders (supervisors through

senior managers) should exhibit. Setting these expectations establishes the foundation for evaluating and holding leaders accountable for implementing NSQC.

HSS Recommendation #4 for BNI

"**Include actions and elements in the development and implementation of the NSQC Plan to ensure that it results in sustainable and continuous improvement in the nuclear safety and quality culture at the WTP.** A structured analysis is needed to identify why the actions and initiatives for implementing the WTP NSQI [Nuclear Safety and Quality Imperative] have not been fully effective or consistently maintained or implemented. A structured analysis is also needed to identify causal factors contributing to any deficiencies and weaknesses identified in recent or planned culture surveys, assessments, or gap analyses, as well as effective actions for addressing these causal factors. Where appropriate, formal project policies and procedures, processes, controls, and other initiative elements need to be established as part of the improvement plan to ensure continuity and consistency. BNI also needs to examine all credible concerns to ensure that the nuclear safety culture does not degrade over time and to better determine the extent of the concerns." (Quoted from HSS report *Independent Review of Nuclear Safety Culture at the Hanford Waste Treatment and Immobilization Plant Project*, October 2010)

WTP Action: PIER MGT-10-1128-D, Action 8, required the development of NSQC modules for continuing Hanford General Employee Training (HGET) and orientation training for new employees.

Current Status and Independent Oversight Evaluation: New employee training on NSQC was developed and is being provided as part of the HGET training. The information provided in the HGET course is similar to the information provided in the cascading training to ensure that new employees receive a message similar to what current employees receive. As previously stated, this information is appropriate as an introduction to nuclear safety and quality culture. BNI managers indicated that they have yet to determine the need (content and frequency) for periodic refresher training to continue reinforcing NSQC.

The NSQC gap assessment discusses performance monitoring done by the ECP staff and presentations to BNI management and ORP since 2006. It concluded that the data showed that WTP personnel are increasingly comfortable using internal processes to address issues, including PIERs, NCRs, and the ECP. This conclusion was based on the decreasing number of reported concerns, fewer requests for confidentiality or anonymity, fewer concerns being transferred or referred from ORP/RL, and the results of the NSQC survey.

HSS considers that the gap assessment review was insufficiently rigorous in that it did not include any direct examination and evaluation of any performance evidence, such as ECP investigations and case file contents. Contrary to the conclusions in the gap assessment report (e.g., that WTP employees are more comfortable using the various issue systems and that the ECP was effective), the survey data actually shows that a noticeable fraction of employees have concerns about the ECP process. For example, the report cited as a positive factor that 67 percent of respondents had a clear understanding of what comprises a nuclear safety and quality culture. However, the Independent Oversight team considers that about 33 percent of workers lacking a clear understanding of the nuclear safety culture is not a positive statistic, but a condition warranting management attention. Similarly, the report noted that 84 percent of respondents were aware of the various processes for identifying and resolving issues and concerns, but BNI management should be concerned that 16 percent of the workforce is not aware of these important processes. Likewise, the report cited as a positive factor that 69 percent of respondents believe that the existing procedures for identifying and resolving issues are effective, but BNI management should consider that 31 percent of their employees believing that issues management processes are not effective is a significant issue that needs to be investigated to identify its validity and take specific actions to either

strengthen these processes or better communicate their effectiveness. Finally, the report cited as a positive factor that 75 percent of respondents believe they can report concerns without fear of retribution, but BNI management should consider that one-quarter of their employees fearing retribution for reporting concerns constitutes a significant issue warranting specific investigation and corrective action.

C.3 Conclusions

BNI has taken many actions to address the specific recommendations in the 2010 HSS safety culture report and other reviews identifying cultural and issues management weaknesses. These actions have contributed, and will continue to contribute, to a stronger nuclear safety and quality culture at the WTP. However, the Independent Oversight team considers that project management did not sufficiently or accurately evaluate the significance of the collective safety culture weaknesses, deficiencies, and concerns documented by the DNFSB, the 2010 HSS report, BNI internal reviews, and other external assessments. This shortcoming was reflected in assigning the lowest significance level to PIERs used to evaluate and manage the HSS recommendations. Further, weaknesses in developing corrective actions for some of the recommendations, specified actions that were later deemed unnecessary or were less rigorous than specified, and less than fully effective implementation of some actions have limited the progress in improving the WTP nuclear safety and quality culture.

C.4 Finding

The Independent Oversight team identified one finding that requires a formal corrective action plan to be developed and managed using site issues management processes, in accordance with DOE Order 227.1, *Independent Oversight Program.*

Finding #1: BNI has not been fully effective in implementing its corrective action management process for documenting, evaluating, and resolving safety issues as required by DOE Order 226.1B, *Implementation of Department of Energy Oversight Policy*; BNI procedure WTP-GPP-MGT- 043, *Corrective Action Management*; the WTP Assurance Program Description CASP-MGT-06-0001; and BNI QA manual WTP-QAM-QA-06.

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The Secretary of Energy
Washington, DC 20585

September 20, 2013

MEMORANDUM FOR HEADS OF DEPARTMENTAL ELEMENTS

FROM: ERNEST J. MONIZ
SECRETARY OF ENERGY

DANIEL B. PONEMAN
DEPUTY SECRETARY

SUBJECT: Personal Commitment to Health and Safety through Leadership, Employee Engagement, and Organizational Learning.

We are writing to ask you to join us in reaffirming our personal and professional commitment to safely fulfilling the Department's important mission responsibilities. The Department's thousands of Federal, laboratory, and contractor employees work hard every day in pursuit of energy independence, global scientific leadership, national security, and environmental stewardship. They are the key to our success. We would like to revitalize our efforts to protect the health and safety of our employees, as well as the health and safety of those who reside in the communities in which the Department operates or are otherwise affected by our work. The Department's ultimate safety objective is to have zero accidents, work-related injuries and illnesses, regulatory violations, and reportable environmental releases. The Department's Integrated Safety Management policy is the foundation of our approach to safety and health.

The following precepts reflect our strong commitments to safety and health. We ask you to join us in advancing these leadership, employee engagement, organizational, and educational goals in your areas of responsibility.

- We will pursue a safety culture built on an environment of trust and mutual respect, worker engagement and open communication, an atmosphere that promotes a questioning attitude with effective resolution of reported problems, and continuous learning.

- We will operate our facilities and conduct work activities in a manner that protects our employees, the public, and the environment. We recognize that meeting minimum requirements merely reflects the starting point in our pursuit of excellence and is not the end objective.

- Each one of us is responsible for safety at the Department. We will strive to ensure that every employee understands his or her role, responsibility, authority, and accountability in safely planning, executing, and monitoring work performance.

- We will foster a safety conscious work environment across all Departmental operations. Federal, laboratory, and contractor workers have the right to identify and raise issues that affect their safety and health or that of their co-workers openly, and without fear of reprisal. We must not deter, discourage, or penalize employees for the timely identification of safety, health, environmental, quality or security issues, the reporting of illnesses or injuries, or the use of Employee Concerns or Differing Professional Opinion Programs. Our workers will receive a prompt, professional, and transparent evaluation and resolution of their concerns.

- We will learn from our mistakes and experiences. We will report errors and problems, establish vigorous corrective action programs, monitor performance through multiple means, learn from operational experience, and encourage a questioning attitude.

We greatly value – and depend upon – the service of the men and women working to achieve the Department's important missions that the American people have entrusted to us. We can only advance these challenging missions if we provide all of our employees a safe and healthy work environment and foster a culture in which workers at all levels are empowered to bring forth problems, participate in the development of solutions, and are considered partners in decisions that affect their work.

Thank you for your leadership in ensuring the safe execution of the Department's vital and urgent responsibilities.