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
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Hanford Site Waste Treatment and Immobilization Plant

Supplemental Volume

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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

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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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