Department of Energy
Washington, DC 20585

December 12, 2012

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DNF SAFETY BOARD

The Honorable Peter S. Winokur
Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, NW, Suite 700
Washington, DC 20004

Dear Mr. Chairman:

The purpose of this letter is to update you on Action 2-6 in the Department of Energy's Implementation Plan for Defense Nuclear Facilities Safety Board Recommendation 2011-1, *Safety Culture at the Waste Treatment and Immobilization Plant.*

In accordance with this action, the Office of Health, Safety and Security's Office of Enforcement and Oversight has completed independent safety culture assessments for the following projects/organizations:

- Los Alamos National Laboratory Chemistry and Metallurgy Research Replacement Project
- Y-12 National Security Complex Uranium Processing Facility Project
- Idaho Cleanup Project Sodium Bearing Waste Treatment Project
- Office of Environmental Management Headquarters
- Pantex Plant

Copies of the reports documenting these reviews are enclosed. The final assessment at the Savannah River Site Salt Waste Processing Facility Project has been completed and the report is being finalized. A copy of this report will be provided in future correspondence. Note that the Pantex Plant was added to the scope of extent of condition reviews based on your recommendation. Due to resource limitations the Pantex Plant assessment replaced the Savannah River Site Waste Solidification Building as planned in the initial action.

If you have any questions or need further information, please contact me at (202) 586-0271, or Mr. Thomas Staker, Deputy Director for Oversight, Office of Enforcement and Oversight, at (301) 903-5392.

Sincerely,

Glenn S. Podonsky
Chief Health, Safety and Security Officer
Office of Health, Safety and Security

Enclosures

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Independent Oversight Assessment of Nuclear Safety Culture at the Los Alamos National Laboratory Chemistry and Metallurgy Research Replacement Project

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April 2012

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

Independent Oversight Assessment of Nuclear Safety Culture at the Los Alamos National Laboratory Chemistry and Metallurgy Research Replacement Project

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Acronyms

BARS	Behavioral Anchored Rating Scales
CMRR	Chemistry and Metallurgy Research Replacement Project
CMRRPO	CMRR Federal Project Office
DNFSB	Defense Nuclear Facilities Safety Board
DOE	U.S. Department of Energy
DOGS	Daily Observation Getting Better
HSS	Office of Health, Safety and Security
IWD	Integrated Work Document
LANL	Los Alamos National Laboratory
LANS	Los Alamos National Security, LLC
LASO	Los Alamos Site Office
MOX	Mixed Oxide Fuel Fabrication Facility
NNSA	National Nuclear Security Administration
PAT	Performance Assessment Team
PIP	Problem Identification Process (Sargent & Lundy)
STARRT	Safety Risk Analysis and Risk Reduction Talk
UPF	Uranium Processing Facility

1. Introduction

The U.S. Department of Energy (DOE) Office of Enforcement and Oversight (Independent Oversight), within the Office of Health, Safety and Security (HSS), conducted an independent assessment of nuclear safety culture[1] at the DOE Chemistry and Metallurgy Research Replacement Project (CMRR). The primary objective of the evaluation was to provide information regarding the status of the safety culture at CMRR project. The data collection phase of the assessment occurred in January 2012.

The CMRR includes design, construction, and start-up of new laboratory facilities at the Los Alamos National Laboratory (LANL) in support of the National Nuclear Security Administration's (NNSA) mission to maintain and certify the U.S. nuclear stockpile. CMRR is one of DOE/NNSA's largest nuclear projects with an estimated cost of over 4 billion and a workforce of over 700. However, NNSA recently proposed deferring CMRR construction for at least five years because of budget constraints. The NNSA proposal occurred about the time the Independent Oversight team had completed its data collection activities.

Within DOE, the National Nuclear Security Administration has line management responsibility for the CMRR project. At the site level, line management responsibility for CMRR and other LANL facilities and activities falls under the Los Alamos Site Office (LASO) Manager. Under contract to DOE/NNSA, Los Alamos National Security, LLC (LANS) is responsible for managing the CMRR project. Sargent & Lundy and Merrick & Company are major subcontractors performing design and safety basis work within the CMRR project.

In addition to providing information to line management, this assessment satisfies a Secretarial commitment to the Defense Nuclear Facilities Safety Board (DNFSB) related to DNFSB Recommendation 2011-1, *Safety Culture at the Waste Treatment and Immobilization Plant*. Specifically, in the Department's Implementation Plan dated December 27, 2011, the Secretary of Energy directed HSS to perform safety culture assessments of five major ongoing large nuclear design/construction projects to determine the extent of condition of safety culture concerns identified at the Hanford Site Waste Treatment and Immobilization Plant. The assessment of CMRR is the first of the five planned safety culture evaluations to be performed as part of the extent of condition review. A separate report documenting the results will be developed for each project evaluated.

Before starting the assessment, HSS enhanced its capability to assess safety culture processes and capability, through consultation with the U.S. Nuclear Regulatory Commission (NRC), several nuclear power generating utilities, and associated support organizations to benchmark their processes. Recognizing that it has significant expertise in nuclear safety and issues management but limited on-staff expertise in systematic application of behavioral science-based methodologies for performing safety culture assessments HSS contracted with an external company that specializes in human performance analysis to support the data collection and analysis efforts.

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

2. Scope and Methodology

This Independent Oversight assessment covered the DOE and contractor organizations that have responsibilities for CMRR activities. Within DOE, the Independent Oversight team focused on the CMRR Federal Project Office. The contractor organizations that were assessed included LANS and its primary subcontractors: Sargent & Lundy and Merrick & Company.

An experienced HSS manager led the assessment. Onsite data collection was conducted primarily by HSS personnel. To ensure a valid and effective assessment of the existing safety culture, HSS used external independent safety culture experts to analyze various sources of data and perform an independent evaluation. The independent safety culture experts have extensive experience in the development and application of safety culture assessment methodologies used by commercial nuclear and other industries. Appendix A provides additional information about the composition of the Independent Oversight team, including the credentials of the independent safety culture experts.

With the guidance of the external independent safety culture experts, the Independent Oversight team selected a methodology for the assessment that provides an objective and systematic measurement of the organizational behaviors that impact safety performance, using multiple data collection tools to assess organizational behaviors. These tools include functional analysis, semi-structured focus group and individual interviews, observations, and behavioral anchored rating scales.

The Independent Oversight team also arranged for the external independent safety culture experts to conduct a culture survey for project personnel using commonly used survey tools and techniques. The culture survey was conducted and analyzed by the external independent safety culture experts. The population sampled in the survey included Federal and contractor project employees.

The evaluation was conducted using the same methodology that aligns with the current NRC procedures for independent safety culture assessment, which identifies nine traits that are viewed to be necessary in the promotion of a positive safety culture:

- 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

HSS tasked the independent safety culture experts to analyze the data collected during assessment in accordance with their established methodology. Appendix B provides additional information about the methods and framework for the safety culture assessment.

3. Results and Conclusions

The safety culture evaluation performed by the external independent safety culture experts is provided in Appendix B, which provides positive observations and identifies areas in need of attention for each of the nine traits of a healthy safety culture. The independent safety culture experts evaluated the collective results to formulate conclusions about the status of the safety culture for the CMRR Federal Project Office, CMRR contractors (including LANS and its primary design and construction subcontractors), and for the project as a whole. The conclusions are provided to facilitate the identification of improvement strategies.

CMRR Federal Project Office

The independent safety culture experts determined that overall the CMRR Federal Project Office is exhibiting many of the behaviors important for a healthy safety culture. Employees in the Project Office are aware of the issues that need to be addressed and are working to resolve them within the available resources. One area specifically highlighted as warranting further evaluation is the perception that constructive criticism is not encouraged. This attitude, which may stem from the negative opinion of the differing professional opinion (DPO) process, and the belief that there is a strong hierarchical reporting line, could inhibit the proactive involvement of CMRR Federal Project Office individuals in raising concerns.

The independent safety culture experts also concluded that the safety roles and responsibilities of the CMRR Federal Project Office should be clarified in terms of their oversight and support activities for the Project. Such clarification would help reduce the overlap between CMRR groups and CMRR Federal Project Office. Accountability for CMRR Federal Project Office in terms of the Project could then be clearly defined and lines of communication between the organizations could be better delineated and supported.

CMRR Contractors

The safety culture experts determined that significant cultural differences exist within the CMRR Project Organization. Among the four different organizations (that make up the Project Organization), the Merrick & Company organization personnel are consistently more negative in their perceptions about behaviors related to the Project Organization. The LANS organization personnel generally exhibited more positive perceptions. These differences in opinions and perceptions may be attributed to several factors, including the nature of the parent organization, the role and function of the group in the Project and, not insignificantly, the physical separation of the Merrick & Company and Sargent & Lundy personnel from the site of the Project Office. The understanding and management of these cultural differences will become increasingly important if the project moves forward.

The safety culture experts observed a pervasive desire on the part of the CMRR Managers to create more of a team environment within the Project. The absence of a sense of teamwork may be attributed to the lack of strong organizational and programmatic processes (e.g., corrective action process, communication, decision-making, lessons learned, and DPO) that would afford them opportunities for ownership and engagement. The Project is currently managed on more of a personalized accountability model than on an organizational and programmatic one.

The safety culture experts identified the willingness to raise concerns and identify problems across the CMRR Organization is not as pervasive as it should be to ensure that the organization is preventing

events and learning from its performance. Some elements of fear of retaliation were identified in some groups as inhibiting the identification of problems. Negative perceptions around feeling free to challenge management decisions and believing that constructive criticism is not encouraged may be contributing to the behavior.

CMRR PROJECT

The safety culture experts identified two conclusions that are applicable to both the CMRR Federal Project Office and CMRR contractors that are impacting the safety culture for the Project.

A potential conflict for the Project is the informal nature of the relationships and roles of all the different organizations involved in the Project. While the Project has established some of its own processes and procedures, it must follow the LANS processes and procedures in other areas. The processes and procedures of a research laboratory may not meet the standards of a project such as CMRR. Without clear guidance on what should take precedence, the CMRR Federal Project Office cannot be as effective in its oversight role. In this environment, Project personnel must often decide what course to follow and risk not meeting the expectations of all of its stakeholders appropriately.

The two primary organizations involved with the Project, LANS and the CMRR Federal Project Office, have identified resource issues in trying to meet the established goals and schedules of the Project. In some instances, the quality of the work conducted is perceived to have been compromised because of shortages in available resources.

4. Recommendations

A healthy safety culture is most often found within an aligned organization that has effective processes, and motivated people. The independent safety culture experts provided the following recommendations for the CMRR Project that are necessary initial steps for effectively implementing and executing actions that will result in improved safe and reliable performance.

1. Consideration needs to be given to having greater representation of all participating organizations located at the same site. Such co-location will increase the probability of more effective communication, common understanding of the Project's goals and values, greater commitment and stronger work group cohesion.

2. The CMRR Federal Project Office and CMRR contractors need to re-evaluate their organizational and programmatic processes and procedures and ensure that they will establish the behaviors that are necessary to facilitate a healthy safety culture and safety conscious work environment. Consideration needs to be given to construction and operational phases of the Project as well as completion of the design. A formal Safety Culture Program and Policy for the Project would facilitate meeting this recommendation.

NNSA, LASO, and LANS should evaluate the results of this Independent Oversight safety culture report in their entirety, including the culture insights provided in Appendix B and the above conclusions and recommendations, in accordance with established issues management processes and initiate appropriate causal analysis, corrective actions, organizational enhancements, and effectiveness reviews as appropriate. Any actions should also consider the potential impacts of the recent NNSA proposal to defer further activities.

Appendix A
Supplemental Information

Appendix A
Supplemental Information

Dates of Review

Scoping Visit	December 14-15, 2011
Onsite Data Collection:	January 16-26, 2012
Closeout:	March 8, 2012

Office of Health, Safety and Security Management

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William A. Eckroade, Principal Deputy Chief for Mission Support Operations
John S. Boulden III, Director, Office of Enforcement and Oversight
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Support

Mary Ann Sirk

Independent Safety Culture Experts

Dr. Sonja Haber, Independent Safety Culture Expert
Dr. Deborah A. Shurberg, Independent Safety Culture Expert

Expertise and Credentials of the Independent Safety Culture Experts

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

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

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

The principals are:

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

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

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

Appendix B
An Independent Evaluation of Safety Culture at the Chemistry and Metallurgy Research Replacement (CMRR) Project

Independent Safety Culture Experts:

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

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B.1 Introduction

This Appendix describes the detailed results of an independent evaluation of the existing Safety Culture at the Department of Energy Chemistry and Metallurgy Research Replacement (CMRR) Project. The population of the evaluation was all employees, Federal, contractor, and subcontractor assigned to the CMRR Project including personnel from the DOE CMRR Project Office, the Los Alamos Site Office, the Los Alamos National Laboratory, Sargent & Lundy, Merrick & Company, and other subcontractor organizations. The evaluation was conducted during December 2011 and January 2012. The primary objective of the evaluation was to provide information regarding the status of the safety culture traits at the CMRR 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. The detailed results presented in this Appendix support the summary results and recommendations provided in the main report.

B.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 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 U.S. Nuclear Regulatory Commission (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 U.S. Nuclear Regulatory Commission (1991) to assess the influence of organization and management on safety performance. While the methodology used in this evaluation was based upon work originally developed with the support of the NRC to assess the influence of organization and management on safety performance, the methodology has also been effectively implemented in non-nuclear organizations, such as mining, health care, research, engineering, and transportation.

The methodology entails collecting a variety of information that is largely based upon the perceptions of the individuals in an organization, as well as conducting 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.

B.3 Scope of Safety Culture Evaluation

The scope of this safety culture evaluation was defined to include all employees, federal, contractor, and subcontractor assigned to the CMRR Project including personnel from the DOE CMRR Project Office, the Los Alamos Site Office, the Los Alamos National Laboratory, Sargent & Lundy, Merrick & Company, and Other Subcontractor organizations. The Safety Culture Data Collection Team was on site at the CMRR Project (located at Los Alamos National Laboratory) as well as at various subcontractor organization offices between December 2011 and January 2012. 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 January 9 to January 23, 2012.

The Safety Culture Data Collection Team was used by the Independent Safety Culture Evaluation Team to assist in collecting onsite data and was comprised of the HSS Independent Oversight Team (including a HSS specialist in Human Performance Improvement). The external independent safety culture experts trained HSS staff on applying the data collection techniques and conducting focus group interviews.

This safety culture evaluation is a 'point in time' snapshot of the CMRR project. Although the team recognizes that the CMRR Project 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.

B.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.

B.4.1 Functional Analysis

The purposes of the Functional Analysis are to: (1) clearly identify the organizational units of the CMRR Project, (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 December 13-15, 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 or focus groups were conducted with approximately 17 individuals associated with the CMRR Project.

Documentation Review

During the Data Collection Team's activities, a wide variety of documents were reviewed including CMRR program and project plans, CMRR technical and administrative procedures, project organization charts, interoffice memoranda, applicable DOE regulations and technical standards, corrective action reports, and root cause analyses.

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
- Effective Safety Communication – Communication
- Respectful Work Environment – Communication Trust
- Questioning Attitude – Attention to Safety

B.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 30 individual interviews and 19 focus groups were conducted as part of the assessment. A total of 131 individuals were involved in one these activities. Each interview lasted one hour and each focus group lasted approximately one and a half hours. A few less formal follow-up interviews were conducted to provide further clarification when necessary.

The Behavioral Anchored Rating Scales (BARS) were administered to most individuals who participated in the structured interviews and/or focus groups. 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 524 BARS were collected representing 10 organizational behaviors. Of those 524 BARS, 228 were from Los Alamos National Laboratory personnel, 164 were from Sargent & Lundy personnel, 76 were from Merrick & Company personnel, and 56 were from DOE personnel.

B.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 14 observations were conducted. The data represent observations of Daily White Board Meetings, Monthly All Hands Safety Meeting, Nuclear Facility Integration Meeting, Special Facility Equipment Group Schedule Update Weekly Meeting, Sargent & Lundy CMRR HVAC Weekly Assignment Meeting, Sargent & Lundy CMRR Architectural Review Meeting, Sargent & Lundy CMRR Structural Review Meeting, Sargent & Lundy Structural Model Meeting, Sargent & Lundy Model Design and Engineering Coordination Meeting, CMRR Plan of the Day Meeting, Glove Box Meeting, Infrastructure Meeting, and Change Control Meeting.

B.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 50 different organizations.

A total population of approximately 843 personnel was invited to participate in the survey of which 707 actually completed the survey, representing a response rate of 84%. This is a very acceptable rate of response from which representative conclusions regarding employee, contractor and subcontractor perceptions and attitudes concerning the work environment can be made.

B.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 obtained

for the CMRR Project Contractor, Subcontractors, and Federal Employees who are dedicated to the Project on a full-time basis, as well as those individuals from all organizations that support the Project on a part time basis. The results are presented in terms of the Safety Culture traits for both the Contractor and Federal organizations. 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 improvements, the Areas in Need of Attention should be considered and used as examples for an action that would address a behavior that would help several if not all of these points. It is not the intention that each Area in Need of Attention result in a corrective action as would occur with an Area for Improvement. Developing a massive amount of corrective actions only perpetuates a compliance mentality, which is not conducive to creating and promoting a 'healthy safety culture'.

B.5.1 Leadership Safety Values and Actions

Leaders demonstrate a commitment to safety in their decisions and behaviors.

Positive Observations

CMRR Federal Project Office (CMRRPO)

- Interviewees indicated that individuals from the Los Alamos Site Office (LASO) were not inhibited to raise issues.
- Many individuals indicated that CMRRPO has a strong focus on nuclear safety.
- CMRRPO Management has indicated that they will use their own resources in overseeing how the CMRR Division monitors nuclear safety in the Project.
- Most individuals acknowledge that time pressures exist but when additional time is requested to complete work it is normally given.

CMRR Division (CMRR)

- CMRR 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 and activity at the job site begins with a safety moment.
- Several individuals indicated that they would not hesitate to stop work if they believed that safety would be compromised. Examples include instances where some contractors did not have radiological safety training and their work was stopped until they received the necessary training; and craft workers that stopped work on a number of occasions during construction of the RLOUB for construction deficiencies (e.g. mounting of a hood on a wall)
- Many believe that they all have the responsibility for safety.
- 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.
- Most interviewees indicated that they are not aware of financial incentives for them to complete jobs ahead of schedule.
- Most interviewees indicated there were no real inhibitors to raising safety concerns.
- Results on the Attention to Safety Scale on the electronic survey were on the high end of scores compared to a database of other organizations' responses to the same questions. This indicates that survey respondents did 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.
- Results from the Behavioral Anchored Rating Scale on Attention to Safety indicate that almost all of the interviewees from Sargent & Lundy and Merrick & Company perceive that individuals in

the project believe that safety is the number one priority. These results correspond to interviewees from those organizations who indicated that safety was built into the Sargent & Lundy and Merrick & Company cultures. Merrick & Company employees described the 'Merrick Way' which they perceived to be indicative of the organization's value on safety.

- Results from the Behavioral Anchored Rating Scale on Time Urgency indicate that almost all Sargent & Lundy and over 80% of Merrick & Company individuals that completed this scale perceive that most tasks are completed on time without compromising safety or quality.
- Results from the Behavioral Anchored Rating Scale on Resource Allocation indicate that 100% of the interviewees from Sargent & Lundy and Merrick & Company that completed this scale perceive that employees have sufficient resources to implement corporate goals and that they understand how these goals relate to their daily activities.

Areas in Need of Attention

CMRR Federal Project Office (CMRRPO)

- CMRRPO interviewees indicated that all organizations involved in the project are still struggling to incorporate DOE Standard 1189, Integration of Safety into the Design Process.
- Most CMRRPO interviewees indicated that they have more jobs than people to complete their work. Resources are often shifted to meet assignments but the perception is that they have to do more with less.
- CMRRPO interviewees indicated that they have received support from DOE HSS in some of their reviews. The question was raised whether this support by HSS would present a conflict of interest in terms of being able to perform its oversight role.
- Results on the Behavioral Anchored Rating Scale for Attention to Safety indicate that approximately 32% of CMRRPO individuals that completed this scale provided a mid-range score which indicates that they perceive that project management reflects a delicate balance of emphasizing safety, while at the same time making it clear that there is a need to keep the project on schedule. This coincides with the belief by several CMRRPO interviewees that schedule appears to be more important than safety and quality to some of the project management team.
- Results on the Behavioral Anchored Rating Scale for Time Urgency indicates that almost 30% of the CMRRPO interviewees that completed this scale provided a mid to low rating which indicates that they perceive that there is little concern among some employees for timely completion of tasks. This often results in work extending beyond deadlines and interruptions in the project's progress.

CMRR Division (CMRR)

- Interviewees and observations by the Team provided some examples of where decision making was not perceived to reflect the highest commitment to safety.
    - Issues with the contractor not wanting to go above and beyond the fire protection code on this project.
        - CMRRPO individuals indicated that meeting the code per se is not enough and that exemptions and equivalencies put forth have to be resolved before the final design.
        - CMRRPO individuals do not perceive the contractors' responsiveness to their questions on the reasons that the contractor has for their position on this issue to be cooperative.
    - Some CMRRPO interviewees perceive that the period of time allotted for design reviews are too short and have not yielded the most critical reviews. Examples were cited where CMRRPO reviewers had 40-50 comments on a review and LANS reviewers had none.

    - LANS uses institutional subject matter experts as reviewers that are not on the project and have competing priorities in their work load. These individuals are also accountable to non-project managers.
- The Team observed a meeting that discussed the process for design reviews. The CMRR Deputy Manager indicated that no more vertical slice reviews of systems would be conducted and that the normal process of review would be resumed. No discussion or challenge by the other participants in the meeting, including CMRRPO individuals, about the possibility of any extent of condition of issues identified on the vertical slice review was observed.
- Results on the Behavioral Anchored Rating Scale for Attention to Safety indicate that approximately 30% of LANL individuals that completed this scale provided a mid-range score, which indicates that they perceive that project management reflects a delicate balance of emphasizing safety, while at the same time, making it clear that there is a need to keep the project on schedule.
- Results on the Behavioral Anchored Rating Scale for Time Urgency indicates that approximately 28% of the LANL interviewees that completed this scale provided a mid to low rating on this scale which indicates that they perceive that there is little concern among employees for timely completion of tasks. This often results in work extending beyond deadlines and interruptions in the project's progress.
- Results on the Behavioral Anchored Rating Scale for Resource Allocation indicate that 70% of the LANL interviewees who responded to this scale were either negative or uncertain in their perceptions of how resources are allocated across the project.
- There is a perception among some interviewees that the non-LANL craft workers do not have the same concern for quality and safety that the LANL MSS craft workers have.
- 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.
    - While appropriate documents were not yet approved, a contractor trying to save schedule time, pushed to get a foundation for a fuel tank poured.
    - Some engineers indicated that they believe that system design documents are being produced too early for review because of schedule pressures and that it becomes a waste of time for them to review them.
    - Some individuals indicated that cost estimates for work where the scope is not yet detailed enough are being provided because managers 'just need a number'.
    - There is a perception among some interviewees that the schedule is being driven by the schedule for personnel evaluations of managers by DOE so that they can ensure their bonuses.
- Some interviewees indicated that staffing issues may have a potential impact on safety performance.
    - Interviewees, including those from CMRRPO, indicated that additional resources are required in Quality Assurance, LANL Project Engineering, and Procurement.
    - CMRR Senior Management no longer has the authority to hire engineers; hiring must now go through the LANL Engineering Line Manager and then gets assigned to the project.
    - Positions on the project are of a limited term and consequently interviewees indicated that resources are difficult to obtain, even from within LANL, because of the risk to job security associated with coming to the project.
    - Interviewees described the hiring process as problematic even when resources are available.

B.5.2 Problem Identification and Resolution

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

Positive Observations

CMRR Federal Project Office (CMRRPO)

- Multiple mechanisms for identifying problems within CMRRPO were described by interviewees including, independent peer reviews, contractor surveillances and assessments, facility representatives and an open door policy with supervision and management.
- Interviewees described the interface with DOE Headquarters as a very accessible line and indicated that there are daily interactions with the Federal Project Director, weekly calls with the project team and quarterly video conferences.

CMRR Division (CMRR)

- Most interviews identified that multiple mechanisms exist within CMRR to report problems and that everyone is encouraged to do so. Mechanisms described included management and supervision open door policy, safety awareness at the beginning of each meeting, Daily Observation Getting Safer DOGS teams, PIPs (Problem Identification Process – a Sargent & Lundy corrective action reporting and tracking system), safety rewards, emails, meetings, verbal discussions, and human resources.
- Some interviewees indicated that there were no inhibitors to identifying problems.
- Data from the Behavioral Anchored Rating Scale on Problem Identification and Resolution indicated that 100% of the Sargent & Lundy and Merrick & Company interviewee respondents who completed this scale provided a high rating indicating that they perceived that the organization encourages project personnel to draw upon knowledge, experience and current information to identify and resolve problems positively.

Areas in Need of Attention

CMRR Federal Project Office (CMRRPO)

- Some CMRRPO interviewees described that LASO has no specific procedure that governs the criteria in safety reviews. MP01.01 and MP 01.03 are procedures that govern safety basis review that were issued in 2009 and are now being updated.
- Within LASO, interviewees indicated that the Differing Professional Opinion (DPO) Process is negatively perceived. Interviewees stated that this perception resulted from the large amount of paperwork required for the process as well as the fact that efforts to date have all gone in management's favor.
- Some interviewees indicated that the current LASO Management prescribes a very hierarchical line of reporting which may inhibit the raising of some concerns. Most individuals perceived, however, that if they had a significant concern they could bypass the line to get quick resolution of the issue.
- Interviewees perceive that continued budget cuts dictate that if they raise a concern, it better be valid because there are not enough resources to waste time on the wrong issues.

CMRR Division (CMRR)

- Interviewees and observations by the Team did identify problems with the problem identification and resolution processes at CMRR that may inhibit a healthy safety culture.
    - CMRR does not have a DPO process. However, as a result of the root cause analysis of the glove box performed by the CMRR project, the Project Director indicated that they would consider the implementation of such a process.
    - Some Sargent & Lundy interviewees indicated a fear of being 'PIPed '(having an improvement action assigned to them for completion by a designated due date).
    - Several interviewees indicated that external stakeholder pressure can inhibit the raising of concerns so as not to delay the schedule.
    - Some interviewees indicated that the management assessment processes at LANL site were immature and not yet contributing to performance improvement initiatives.
    - Some individuals indicated that they believe that the corrective action process is being controlled at too high a level in the organization.
    - Interviewees indicated that craft workers do not have access to computers; how do they feel free to raise concerns into the system?
    - Not all of the subcontractor organizations contribute to the formal problem identification process in a systematic way, e.g. Merrick & Company provides only verbal information.
- The 'glove box event' was not perceived by several interviewees to be a good example of a healthy use of the problem identification and resolution process. Individuals described concerns over the attributions, the identification of the causes, the implementation of the procedures involved, the way in which the resolution was handled, and the lack of information and communication about the event in general.

B.5.3 Personal Accountability

All individuals take personal responsibility for safety.

Positive Observations

CMRR Federal Project Office (CMRRPO)

- CMRRPO interviewees indicated that roles and responsibilities on the Federal side of the project are well defined.
- CMRRPO interviewees indicated that a formal interface document is being written with the AM for Safety Operation in LASO.
- DOE has also created a Safety Basis Academy and it is NNSA's expectation that by 2015 all Federal Employees will be qualified by the Academy.
- Several interviewees indicated that there would be no repercussions for self-reporting if the individual notified the Federal Project Director right away. It was not clear to these interviewees if there would be a similar situation on the LANS side of the project.
- Scores on the Commitment Scale from the electronic survey indicated that approximately 70% of the CMRRPO respondents felt positively committed to the project.

CMRR Division (CMRR)

- Most interviewees indicated that their job descriptions were accurate but not very detailed. Performance review job descriptions were more specific.
- The project created a Quality Council for the Quality Assurance Managers of all of the contractors. The Laboratory picked up on the idea and now chairs the meetings.
- Data on the Behavioral Anchored Rating Scale for Roles and Responsibilities indicated that 88% of Sargent & Lundy and 80% of Merrick & Company interviewees who completed this scale

provided a high rating indicating a perception that employees understand their duties, know who to go to when a task needs to be done and understand their role in completing cooperative activities.

- Data on the Behavioral Anchored Rating Scale for Performance Quality indicated that 75% of Sargent & Lundy and 75% of LANL interviewees who completed this scale provided a high rating suggesting that they perceive that employees understand their duties and have a sincere desire to do top quality work. Among Merrick & Company interviewees, approximately 68% perceived performance quality positively.
- Scores on the Commitment Scale from the electronic survey indicated that approximately 70% of the LANL respondents felt positively committed to the project. This was a statistically significant difference from the Sargent & Lundy and Merrick & Company respondents to the survey who scored lower.

Areas in Need of Attention

CMRR Federal Project Office (CMRRPO)

- Several interviewees indicated that there has been some overlap and friction in the roles of the LASO Safety Engineering Group and the LASO Quality Assurance Group. The friction is primarily over what areas each group assesses when there are aspects of a program that have both quality and nuclear safety implications. The conflicts have been resolved but may need better clarification.
- CMRRPO interviewees describe that an oversight procedure is needed to clearly identify what role the Federal Project Office has; there is a perception that they are trying to take away LANS jobs.
- Some CMRRPO interviewees indicated that they did not understand how they could be held accountable when their role on the project is oversight.
- Data on the Behavioral Anchored Rating Scale for Performance Quality indicates that about 68% of the CMRRPO interviewees who completed this scale are either negative or uncertain in their perceptions that project personnel take personal responsibility for their actions and the consequences of the actions.

CMRR Division (CMRR)

- Several interviewees perceive that accountability for safety is appropriately handled through processes such as performance standards, performance appraisals, safety criteria in work activities, drawings, procedures, and the PDSA. There is a lack of recognition of personal accountability.
- Accountability is perceived by several groups to be an issue at CMRR. Some examples include:
    - Many craft interviewees perceive a double standard between outside contractors and LANL MSS workers. Poorer quality of work by the outside contractors is believed to be accepted and then MSS has to rework their jobs.
    - Interviewees indicated that accountability at the laboratory is not a clearly reinforced behavior.
    - Attendance or late arrival at meetings is not consistently challenged.
    - The Team could not identify an initiative to enhance personnel performance through the use of human performance tools or a better personal accountability to standards.
- Some interviewees indicated that management's reaction to self-reporting is dependent upon how much time it takes to fix the problem.
- Several individuals identified that the Laboratory struggles with the concept of quality and perceives it to be a paper exercise with too much of an audit mentality.

- Several interviewees did indicate that the matrix organizational structure has created some issues for the project. These include:
    - Performance evaluations are conducted by Functional Area Managers, not Project Managers.
    - Responsibility for functional areas is not clearly defined as either inside or outside of the Project.
    - Project organizational charts show only managers.
    - Organizational charts on the website are not up to date.
    - Line of responsibility between LANL and NNSA were not very clear for a long period of time and while improving they still need better explanation.
- Several interviewees indicated that they perceive that there is too much controlled from the Project Director's position e.g., all communication, decision making.
- Data on the Behavioral Anchored Rating Scale for Roles and Responsibilities indicates that 60% of LANL 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.
- Scores on the Commitment Scale from the electronic survey indicated that slightly over 50% of the Sargent & Lundy and 55% of the Merrick & Company respondents were negative or uncertain in their commitment to the project. This was a statistically significant difference from the LANL and Other respondents to the survey who responded more favorably in terms of commitment.

B.5.4 Work Processes

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

Positive Observations

CMRR Federal Project Office (CMRRPO)

- CMRRPO interviewees described regularly scheduled meetings with CMRR to facilitate the coordination of work.
- CMRRPO interviewees indicate that there is a general assessment plan that is integrated fairly well with CMRR activities.
- Interviewees indicated that the physical proximity of CMRRPO employees with CMRR individuals facilitated interaction and workflow paths.
- Interviewees indicated that CMRRPO has a combined integrated safety management and functions, responsibilities, and authorities document. LASO processes are used to implement elements of each part of the document.
- Interviewees indicated that LASO and the Program Office were supportive of the CMRRPO.
- Data on the Behavioral Anchored Rating Scale for Coordination of Work indicates that 68% of the CMRRPO respondents to this scale have a positive perception of the planning, integration, and implementation of work activities of individuals and groups.
- Data on the Behavioral Anchored Rating Scale for Formalization indicates that 82% of CMRRPO 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.

CMRR Division (CMRR)

- Plan of the Day meetings and daily status white boards were described by interviewees as good ways to know what everyone is doing and places to avoid.

- Interviewees described that Integrated Schedule meetings between LANL, Sargent & Lundy, and Merrick & Company are held regularly.
- Data on the Behavioral Anchored Rating Scale for Coordination of Work indicates that 100% of the Merrick & Company, 82% of the Sargent & Lundy, and 68% of the LANL respondents to this scale have a positive perception of the planning, integration, and implementation of work activities of individuals and groups.
- Data from the Coordination of Work Scale on the electronic survey indicated that were no statistically significant differences between any of the project organizations on this scale and the overall scores for the Project were high compared to other organizations that have responded to the same scale.
- Interviewees indicated that project work is required to be performed according to NQA1 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. At Sargent & Lundy PIPs are often created to change a deficient procedure.
- Interviewees described that most procedures are very clear and not problematic.
- Interviewees from the various contractor organizations identified their own project instructions, codes and standards as well as Quality Assurance and Quality Control program documents.
- Data on the Behavioral Anchored Rating Scale for Formalization indicates that 95% of Sargent & Lundy, 80% of Merrick & Company, and 78% of LANL 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.

Areas in Need of Attention

CMRR Federal Project Office (CMRRPO)

- Issues with the planning and coordination of work identified by interviewees across CMRRPO were primarily focused on the shortage of resources to get reviews and assessments done in a timely manner.

CMRR Division (CMRR)

- Several interviewees described that work is often held up often because delays with materials, permits, getting LANL to meet the schedule for review, reaching agreement on comment resolutions, NNSA decisions.
- Some interviewees indicated that because procurement is understaffed, it can create a bottleneck in getting work done. In addition, a recent procedural change requires any procurements of more than $100K must be approved by Senior Management/Leadership in Stewardship Council (LISC) which creates more delays.
- Many interviewees discussed the issue of having to use both LANL institutional procedures and project procedures which can create confusion and that some of these procedures contain conflicting requirements. The training received on institutional procedures was often described as not relevant to the project and in some cases even counterproductive to the project.
- Interviewees also described having to fill out two sets of forms for some processes, one set for the project and the other for the laboratory.
- Some interviewees indicated that LANL employees do not get consistent direction from their management for following processes, but perceive that contractor employees receive better guidance.

- Several interviewees described how poor IWDs resulted from planners cutting and pasting information into work packages and leaving things out.

B.5.5 Continuous Learning

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

Positive Observations

CMRR Federal Project Office (CMRRPO)

- CMRRPO interviewees indicated that CMRR uses LANS processes for lessons learned. While there is no comparable process on the Federal Project side, DOE does have a complex – wide lessons learned database that is also used.
- CMRRPO interviewees indicated that communication with other federal personnel on other projects is easy if it is within NNSA.
- The LASO Manager has his personnel prepare briefs on various topics that are sent to other site offices.
- CMRRPO interviewees indicated that CMRR is following DOE Standard 1189 and is ahead of other projects in doing so. They will provide the lessons learned for others.

CMRR Division (CMRR)

- Interviewees identified multiple mechanisms to communicate operating experience and lessons learned. These include, weekly meetings, awards, newsletters, PIPs, all hands meetings, training, DOE and LANL Lessons Learned Programs, Safety Task Analysis and Risk Reduction Talk (STARRT) Cards.
- Performance Assessment Team (PAT) Meetings are also described as another way to discuss lessons learned to improve future performance.
- RLOUB was perceived as a successful project by being under budget and ahead of schedule. Lessons learned are being used for the Nuclear Facility.
    - An example of a lesson learned from RLOUB is some ductwork that was off by 15 degrees on one glove box. Better detail needs to be put into the work for CMRR.
    - Structural issues related to expansion joints were also identified from RLOUB. Now a common 3D software is being used to integrate all aspects of the design.
- Interviewees indicated that UPF, CMRR and MOX are sharing lessons learned for the radiological laboratory glove boxes. Communication between these projects has been ongoing and described as useful.
- Interviewees from the contractor organizations indicated that they communicate lessons learned within their own organizations as well.
- Interviewees identified that all Merrick & Company and Sargent & Lundy new hire engineers get mentoring support from an experienced engineer.

Areas in Need of Attention

CMRR Federal Project Office (CMRRPO)

- Interviewees from CMRRPO indicated that in order to facilitate continuous learning for CMRR they needed to better understand LANS policies and procedures so that they can make suggestions for improvements.

- Data on the Behavioral Anchored Rating Scale for Organizational Learning indicated that 50% of CMRRPO interviewee respondents provided mid-range ratings suggesting that they believe 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.

CMRR Division (CMRR)

- Interviewees indicated that in general CMRR does not do a good job in learning from successes.
- While the concept of lessons learned was identified by many CMRR interviewees, the organization is missing opportunities to use this information as part of a learning process.
    - Interviewees expressed that a lot of the information shared comes from the Project Director who keeps up well with what is going on at the laboratory side as opposed to being a function of a systematic process.
    - Interviewees primarily described technical opportunities for lessons learned, not organizational or programmatic opportunities.
- Interviewees indicated that LANL has never endorsed NQA-1 and it has created gaps between CMRR and LANL in their Quality Assurance Programs.
- Information obtained from many interviewees about the glove box event indicates that the opportunity to learn from this event has not been used in the most effective manner.
    - No formal communication had been released on the event.
    - The Evaluation Team was provided the report on the root cause analysis of the event, despite reluctance by LANL Management to provide it.
    - Some interviewees indicated that they believed there was pressure to 'tone down the report.';
    - Dialogue on the issues around the event needs to be conducted to resolve unanswered questions and to use the information as a learning opportunity.
- Data on the Behavioral Anchored Rating Scale for Organizational Learning indicated that over 78% of the Merrick & Company, 42% of the LANL, and 38% of the Sargent & Lundy respondents to this scale provided mid-range ratings suggesting that they 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.

B.5.6 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.

Positive Observations

CMRR Federal Project Office (CMRRPO)

- CMRRPO interviewees clearly understand the mechanisms available to identify safety concerns, e.g., supervisors, managers, ECP, HR, GAO, IG, and Hotline.
- Most CMRRPO 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 the CMRRPO survey respondents, approximately 80%.
- Among CMRRPO survey respondents approximately 95% agreed with the statement that everyone in the organization is responsible for identifying problems.

- Among CMRRPO survey respondents approximately 95% feel that they can openly challenge decisions made by management. This was a statistically significant difference from all the other CMRR Organizations.
- Approximately 95% of CMRRPO survey respondents agreed with the statement that they feel that they can approach their management team with concerns.
- Approximately 88% of CMRRPO survey respondents agreed with the statement that management wants concerns reported.

CMRR Division (CMRR)

- 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.
- The Sargent & Lundy mentoring program was identified by interviewees as another avenue, especially for new young engineers, to have someone to raise concerns to if they were not yet comfortable to do it on their own.
- The statement that management does not tolerate retaliation of any kind for raising concerns on the electronic survey was agreed to by a majority of the CMRR survey respondents. Specifically, approximately 78% of the Sargent & Lundy and 75% of the LANL respondents agreed with this statement.
- Approximately 85% of the Sargent & Lundy, 80% of the LANL, 78% of the Other, and 75% of the Merrick & Company survey respondents agreed with the statement that they feel that they can approach the management team with concerns.
- Among CMRR survey respondents, 82% of the Sargent & Lundy, 78% of the Other, 75% of the LANL, and 70% of the Merrick & Company employees agreed with the statement related to management wants concerns reported.
- Approximately 80% of the Sargent & Lundy survey respondents believe that constructive criticism is encouraged.

Areas in Need of Attention

CMRR Federal Project Office (CMRRPO)

- Among CMRRPO survey respondents only 62% believe that constructive criticism is encouraged.
- CMRRPO does not have a formal Nuclear Safety Culture Policy for the project.

CMRR Division (CMRR)

- Among CMRR survey respondents, about 80% of the LANL, 80% of the Other, 78% of the Sargent & Lundy, and about 70% of the Merrick & Company respondents 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 still lower than is seen in other organizations and indicates that between 20 to 30% of the population did not agree with this statement.
- The statement on the electronic survey that management does not tolerate retaliation of any kind for raising concerns was agreed to by a majority of the CMRR survey respondents. However, only 65% of the Merrick & Company and 65% of the Other respondents agreed with this statement.

- Among CMRR survey respondents 68% of the Sargent & Lundy, 68% of the Other, 60% of the LANL, and only 48% of the Merrick & Company employees feel that they can openly challenge decisions made by management.
- Approximately 70% of the Other, 70% of the Merrick & Company, and 68% of the LANL survey respondents believe that constructive criticism is encouraged.
- Results from a survey conducted by CMRR prior to this evaluation indicated that employees would not use Human Resources to raise concerns because of the belief that HR was more concerned with process transparency than with people's integrity.
- Several interviewees indicated that while supervision and management claim there will be no retaliation for identifying issues, some recent examples have given some individuals cause for concern.
    - An individual who placed a stop work order on contracting work will not have their employment contract renewed.
    - As a result of the glove box event finger pointing was leveraged against a single individual during the investigation process.
    - LANL Senior Leadership responses to the root cause analysis of the glove box event.

B.5.7 Effective Safety Communication

Communications maintain a focus on safety.

Positive Observations

CMRR Federal Project Office (CMRRPO)

- Interviewees identified multiple mechanisms for communication in the CMRRPO organization.
    - Frequent meetings are held with different organizations within CMRR.
    - Direct and frequent communication with the Federal Project Director.
    - Weekly discipline meetings, all hands meetings, emails are used regularly for communication.
    - Information through Plan of the Day meetings.
- Interviewees described a lot of direct interaction with Directors on the Project and Federal side and a lot of one on one interactions.
- CMRRPO survey respondents had some of the highest scores on the Desire for Interaction and Trust in Communication Scales.

CMRR Division (CMRR)

- Interviewees identified multiple mechanisms for communication in the CMRR Organization. They included:
    - Newsletters
    - Weekly meetings
    - Staff meetings
    - Emails
    - Supervisor updates
    - Plan of Day Meetings
    - Face to face interactions
    - Safety representatives
    - PIPs.
- Many CMRR interviewees indicated that they believe that they are well informed about what is going on around the Project.

- Several interviewees indicated that some groups have coordinators to facilitate communication.
- Team building efforts were initiated to improve communication between all organizations involved with CMRR.
- Data from the Behavioral Rating Scale on Communication indicated that 85% of the LANL 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.

Areas in Need of Attention

CMRR Federal Project Office (CMRRPO)

- Several CMRRPO interviewees identified examples in communication that may impact safety performance.
    - CMRRPO individuals have to be actively engaged to get information as it is not routinely provided to them unless they ask, search, or attend meetings.
    - CMRRPO individuals described being perceived as second class citizens by some groups within CMRR.
    - The CMRRPO Safety Basis Team indicated that they are only cognizant of information relevant to their job.
    - Several CMRRPO individuals believe that there needs to be more formality in what and how they are to communicate with the contractor.
- Data from the Behavioral Rating Scale on Communication indicated that only 50% of the CMRRPO 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.

CMRR Division (CMRR)

- Many CMRR interviewees indicated that the project could benefit from more interdisciplinary meetings.
- Several CMRR interviewees indicated that they perceived a very strong project center management that keeps information and limits the flow down of communication.
- Some groups (Craft Workers) indicated that they could be better informed about many things, e.g. change orders which can be safety related, if they were aware of what others are working on.
- Interviewees indicated that there is a lot of variability in the quality and quantity of communication and information that is received and it is dependent upon who you are working for whether you get the big picture or just your picture.
- Many interviewees expressed the view that they don't always know or hear about emerging issues.
- Interviewees indicated that there have been discrepancies in the information that employees have received concerning the glove box event.
- Data from the Behavioral Rating Scale on Communication indicated that only approximately 38% of the Sargent & Lundy and 55% of the Merrick & Company 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.

B.5.8 Respectful Work Environment

Trust and respect permeate the organization

Positive Observations

CMRR Federal Project Office (CMRRPO)

- Results from the Communication Trust Scale on the electronic survey indicated that over 90% of the CMRRPO 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.
- Results from the Work Group Cohesion Scale on the electronic survey indicated that approximately 86% of the CMRRPO survey respondents had very positive perceptions regarding their identification with and involvement in their work group.

CMRR Division (CMRR)

- Results from the Communication Trust Scale on the electronic survey indicated that overall CMRR 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. CMRR scores on this scale were among the highest across several different organizations that have responded to this same scale.

Areas in Need of Attention

CMRR Federal Project Office (CMRRPO)

- Results on the electronic survey for CMRRPO survey respondents indicated statistically significant higher scores on overall job satisfaction than respondents in the Sargent & Lundy, Merrick & Company and Other organizations. However, within the CMRRPO organization over 50% of the survey respondents were either negative or neutral about their overall job satisfaction.
- Results obtained on the Communication-Accuracy Scale from the electronic survey indicated that overall CMRR Project survey respondents did not have the most positive perceptions of the accuracy of information that they receive from other organizational levels (superiors, subordinates, and peers).

CMRR Division (CMRR)

- Results on the electronic survey for CMRR survey respondents indicated statistically significant higher scores on overall job satisfaction for LANL respondents than for Sargent & Lundy and Merrick & Company respondents. However, even within the LANL organization 60% of the survey respondents were either negative or neutral about their overall job satisfaction. In both the Sargent & Lundy and Merrick & Company Organizations, approximately 75% of the survey respondents were either negative or neutral about their overall job satisfaction.
- Results obtained on several of the scales already discussed in this report present a consistent profile of the organizational culture of the Merrick & Company employees working on the CMRR project. For the most part these individuals are the least committed, least satisfied, least cohesive and least positive about their safety conscious work environment.
- Results obtained on the Communication-Accuracy Scale from the electronic survey indicated that overall CMRR survey respondents have negative perceptions of the accuracy of information that they receive from other organizational levels (superiors, subordinates, and peers).

B.5.9 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.

Positive Observations

CMRR Federal Project Office (CMRRPO)

- CMRRPO Interviewees indicated that their line management was supportive of their challenging conditions and activities.

CMRR Division (CMRR)

- Some examples of fostering an environment where a questioning attitude is desired and accepted were described. Individuals voluntarily took on reviewing specification packages to ensure that safety related issues had been addressed. In cases where they questioned whether the safety related aspects of the work in the package had been fully considered, they raised the issues with the owner of the package.

Areas in Need of Attention

CMRR Federal Project Office (CMRRPO)

- Results from the electronic survey indicated a fairly negative perception among many CMRRPO survey respondents about management's interest in encouraging constructive criticism. .
- Several interviewees indicated that stakeholders with personal agendas were influencing DOE and that it was sometimes compromising their oversight activities through schedule and cost pressures.

CMRR Division (CMRR)

- While many CMRR 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 feeling free to challenge management decisions, management not encouraging constructive criticism.
- There has not been a DPO process for CMRR, although recently there has been some discussion about implementing one. Several interviewees indicated that they have some uncertainty or doubt about how or if the process will actually be implemented.
- Many interviewees in certain CMRR 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.

B.8 References

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Independent Oversight Assessment of Nuclear Safety Culture at the Y-12 National Security Complex Uranium Processing Facility Project

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Independent Oversight Assessment of Safety Culture at the Y-12 National Security Complex Uranium Processing Facility Project

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Acronyms

BARS	Behavioral Anchored Rating Scales
B&W Y-12	Babcock & Wilcox Technical Services Y-12, LLC
BOA	Basic Ordering Agreement
DNFSB	Defense Nuclear Facilities Safety Board
DOE	U.S. Department of Energy
HSS	Office of Health, Safety and Security
NNSA	National Nuclear Security Administration
UPF	Uranium Processing Facility
URS	URS Corporation
Y-12	Y-12 National Security Complex
YSO	Y-12 Site Office

1. Introduction

The U.S. Department of Energy (DOE) Office of Enforcement and Oversight (Independent Oversight), within the Office of Health, Safety and Security (HSS), conducted an independent assessment of nuclear safety culture[1] at the DOE Uranium Processing Facility Project (UPF). The primary objective of the evaluation was to provide information regarding the status of the safety culture at UPF project. The data collection phase of the assessment occurred from late February through March 2012.

The UPF includes design, construction, and start-up of new processing facilities at the Y-12 National Security Complex (Y-12) in support of the National Nuclear Security Administration's (NNSA) mission to maintain and certify the U.S. nuclear stockpile. UPF is one of DOE/NNSA's largest nuclear projects with an estimated cost of over several billion dollars.

Within DOE, the National Nuclear Security Administration has line management responsibility for the UPF project. At the site level, line management responsibility for UPF and other facilities and activities falls under the Y-12 Site Office Site Office (YSO) Manager. Under contract to DOE/NNSA, Babcock & Wilcox Technical Services Y-12, LLC, (B&W Y-12) is responsible for managing the UPF project. Within the UPF project engineering organization, there are four sub tier organizations managed by basic ordering agreement (BOA) subcontractors. These organizations are referred to as BOA's with BOA 1 managed by Merrick & Company, BOA 2 managed by Jacobs Engineering, BOA 3 managed by CH2M HILL, and BOA 4 managed by URS Corporation (URS).

In addition to providing information to line management, this assessment satisfies a Secretarial commitment to the Defense Nuclear Facilities Safety Board (DNFSB) related to DNFSB Recommendation 2011-1, *Safety Culture at the Waste Treatment and Immobilization Plant*. Specifically, in the Department's Implementation Plan dated December 27, 2011, the Secretary of Energy directed HSS to perform safety culture assessments of five major ongoing large nuclear design/construction projects to determine the extent of condition of safety culture concerns identified at the Hanford Site Waste Treatment and Immobilization Plant. The assessment of the UPF project is the second of the five planned safety culture evaluations to be performed as part of the extent of condition review. A separate report documenting the results will be developed for each project evaluated.

Before starting the assessment, HSS enhanced its capability to assess safety culture processes and capability, through consultation with the U.S. Nuclear Regulatory Commission (NRC), several nuclear power generating utilities, and associated support organizations to benchmark their processes. Recognizing that it has significant expertise in nuclear safety and issues management but limited on-staff expertise in systematic application of behavioral science-based methodologies for performing safety culture assessments, HSS contracted with an external company that specializes in human performance analysis to support the data collection and analysis efforts.

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

2. Scope and Methodology

This Independent Oversight assessment covered the DOE and contractor organizations that have responsibilities for UPF activities. Within DOE, the Independent Oversight team focused on the UPF Federal Project Office. The contractor organizations that were assessed included B&W Y-12 and its primary subcontractors Merrick and Company, URS, Jacobs Engineering, and CH2M HILL.

An experienced HSS manager led the assessment. Onsite data collection was conducted primarily by HSS personnel. To ensure a valid and effective assessment of the existing safety culture, HSS used external independent safety culture experts to analyze various sources of data and perform an independent evaluation. The independent safety culture experts have extensive experience in the development and application of safety culture assessment methodologies used by commercial nuclear and other industries. Appendix A provides additional information about the composition of the Independent Oversight team, including the credentials of the independent safety culture experts.

With the guidance of the external independent safety culture experts, the Independent Oversight team selected a methodology for the assessment that provides an objective and systematic measurement of the organizational behaviors that impact safety performance, using multiple data collection tools to assess organizational behaviors. These tools include functional analysis, semi-structured focus group and individual interviews, observations, and behavioral anchored rating scales.

The Independent Oversight team also arranged for the external independent safety culture experts to conduct a culture survey for project personnel using commonly used survey tools and techniques. The culture survey was conducted and analyzed by the external independent safety culture experts. The population sampled in the survey included Federal and contractor project employees.

The evaluation was conducted using the same methodology that aligns with the current NRC procedures for independent safety culture assessment, which identifies nine traits that are viewed to be necessary in the promotion of a positive safety culture:

- 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.

HSS tasked the independent safety culture experts to analyze the data collected during assessment in accordance with their established methodology. Appendix B provides additional information about the methods and framework for the safety culture assessment.

3. Results and Conclusions

The safety culture evaluation performed by the external independent safety culture experts is provided in Appendix B, which provides positive observations and identifies areas in need of attention for each of the nine traits of a healthy safety culture. The independent safety culture experts evaluated the collective results to formulate conclusions about the status of the safety culture for the contractors (including B&W Y-12 and its primary design and construction subcontractors), and for the project as a whole. While positive observations were identified within the organizational behaviors evaluated, the conclusions provided highlight areas of importance to facilitate the identification of improvement strategies.

Federal Project Office (YSO)

The independent safety culture experts determined that, overall, YSO personnel do not perceive that many of the behaviors important for a healthy safety culture exist at the UPF Project to the same extent that those in the contractor organizations do. No statistically significant differences were evident between YSO employees associated with the UPF Project and those not associated with it, so some of these perceptions might apply to YSO itself.

The independent safety culture experts also concluded that efforts to resolve longstanding and repetitive issues across the UPF Project by YSO employees are often delayed by multiple levels of management review and approval. Individuals responsible for the oversight of the day-to-day activities of the Project are often frustrated in their efforts to see corrective actions implemented.

UPF Contractors

The safety culture experts determined that significant cultural differences exist within the UPF Project Organization. Among the different groups that make up the Project Organization, the BOA Contractor Group (BOA's 1-4) is consistently more negative in its perceptions about behaviors related to the Project Organization. The Bechtel and B&W Groups had consistently more positive perceptions. Coordination and communication issues with the BOA Contractors are contributing to technical issues for the Project and may be influencing the negative perceptions around some important behaviors such as questioning attitude, raising concerns, and commitment to the project. The understanding and management of these differences must be a priority.

The safety culture experts observed a lack of ownership and accountability for safety across the UPF Contractor Organizations. There is the perception that external organizations, e.g., DOE, DNFSB, independent reviewers, will identify significant safety concerns. The perceived priority among the contractor groups is to focus on maintaining the schedule and meeting their performance based incentives (PBIs).

The safety culture experts determined that the willingness to raise concerns and identify problems across the UPF Organization is not as pervasive as it should be to ensure that the organization is preventing events and learning from its performance. Negative perceptions around feeling free to challenge management decisions and believing that constructive criticism is encouraged may be contributing to the behavior.

UPF Project

The safety culture experts identified one conclusion that is applicable to both YSO and UPF that is impacting the safety culture for the Project. While some of the data in this assessment indicated that many individuals understand the behaviors that promote safety, the implementation of many of those behaviors is not evident across the project. A potential conflict for the Project is the fact that UPF will be a production facility, and is managed by the contractor currently operating the plant that UPF will replace. Consequently, the project is being driven, even in the design phase, by a production mentality. The heavy emphasis on performance metrics and cost, often at the perceived expense of understanding and developing the right technology, has created issues for the completion of the Project. All UPF Organizations need to find the right balance between implementing the behaviors that drive a healthy safety culture, achieving desired performance and cost through the best technology to address some of the problems that have surfaced as a function of this production mentality.

4. Recommendations

A healthy safety culture is most often found within an aligned organization that has effective processes, and motivated people. The independent safety culture experts provided the following recommendations for the UPF Project that are necessary initial steps for effectively implementing and executing actions that will result in improved safe and reliable performance.

1. Accountability for safety needs to be everybody's responsibility. YSO in its oversight role should not accept the responsibility for identifying safety concerns for the Contractor Organization. Results from this assessment indicate that YSO recognizes many of the behaviors that need to be improved for the Project and they should identify ways to hold the Contractor accountable to improve them. Roles and responsibilities across all UPF Organizations need to be more clearly identified and understood to prevent the continued lack of ownership for many of the existing, and potential future, issues for the Project.

2. YSO and the UPF Contractor Organizations need to re-evaluate their organizational and programmatic processes and procedures to ensure that they will establish the behaviors that are necessary to facilitate a healthy safety culture and safety conscious work environment. A formal Safety Culture Program and Policy for the Project would facilitate meeting this recommendation.

NNSA, YSO, and the Contractor should evaluate the results of this Independent Oversight safety culture report in their entirety, including the culture insights provided in Appendix B and the above conclusions and recommendations. The insights are intended to stimulate the organizations to reflect on their culture in order to understand the values and assumptions that may be driving behaviors and thus help to shape interventions supportive of a healthy safety culture. Developing a massive amount of corrective actions may perpetuate a compliance mentality, which is not conducive to creating and promoting a healthy safety culture thus efforts to assure that there is a traditional corrective action associated with each insight may be counterproductive. To the extent that corrective actions are identified for specific recommendations, it is recommended that they be managed in accordance with established causal analysis and issues management processes and initiate appropriate, processes as appropriate.

Appendix A
Supplemental Information

Appendix A
Supplemental Information

Dates of Review

Scoping Visit	January 30-31, 2012
Onsite Data Collection:	March 12-20, 2012
Closeout:	April 10, 2012

Office of Health, Safety and Security Management

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William A. Eckroade, Principal Deputy Chief for Mission Support Operations
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Support

Mary Ann Sirk

Independent Safety Culture Experts

Dr. Sonja Haber, Independent Safety Culture Expert
Dr. Deborah A. Shurberg, Independent Safety Culture Expert

Expertise and Credentials of the Independent Safety Culture Experts

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

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

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

The principals are:

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

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

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

Appendix B

An Independent Evaluation of Safety Culture at the Uranium Processing Facility (UPF) Project

Independent Safety Culture Evaluation Team:

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

Appendix B
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B.1 Introduction

This Appendix describes the results of an independent evaluation of the existing Safety Culture at the Department of Energy Uranium Processing Facility (UPF) Project. The population of the evaluation was all employees (contractor, and subcontractor) assigned to the UPF Project as well as all personnel within the DOE Y-12 Site Office (YSO). The evaluation was conducted between January and March 2012. The primary objective of the evaluation was to provide information regarding the status of the safety culture traits at the UPF 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. The detailed results presented in this Appendix support the summary results and recommendations provided in the main report.

B.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 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 U.S. Nuclear Regulatory Commission (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 U.S. Nuclear Regulatory Commission (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.

B.3 Scope of Safety Culture Evaluation

The scope of this safety culture evaluation was defined to include all employees, federal, contractor, and subcontractor assigned to the UPF Project including personnel from the DOE UPF Project Office, the Y-12 Site Office (YSO), the Y-12 contractor organization - Babcock & Wilcox Technical Services Y-12, LLC, (B&W Y-12), and its subcontractor organizations; and a sample of YSO employees not assigned to the UPF project. For the electronic survey data collection all YSO employees, even those not assigned to the UPF Project, were invited to participate. The Safety Culture Data Collection Team was on site at the UPF Project (located at the Y-12 Site in Tennessee) between January and March 2012. 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 February 27 to March 9, 2012.

The Safety Culture Data Collection Team was used by the Independent Safety Culture Evaluation Team to assist in collecting onsite data and was comprised of the HSS Independent Oversight Team (including a HSS specialist in Human Performance Improvement). The HSS staff had been trained on applying data collection techniques and conducting focus group interviews.

This safety culture evaluation is a 'point in time' snapshot of the UPF project. Although the team recognizes that the UPF Project 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.

B.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.

B.4.1 Functional Analysis

The purposes of the Functional Analysis are to: (1) clearly identify the organizational units of the UPF Project, (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 January 30 – 31, 2012 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 or focus groups were conducted with approximately 11 individuals associated with the UPF Project.

Documentation Review

During the Data Collection Team's activities, a wide variety of documents were reviewed including UPF program and project plans, UPF technical and administrative procedures, project organization charts, interoffice memoranda, applicable DOE regulations and technical standards, corrective action reports, and root cause analyses.

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; Resource Allocation; 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 Questions from electronic survey
- Effective Safety Communication - Communication
- Respectful Work Environment – Communication Trust Scale from electronic survey
- Questioning Attitude – Attention to Safety.

B.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 28 individual interviews and 21 focus groups were conducted as part of the assessment. A total of 140 individuals were involved in one these activities. Each interview lasted one hour and each focus group lasted approximately one and a half hours. A few less formal follow-up interviews were conducted to provide further clarification when necessary.

The Behavioral Anchored Rating Scales (BARS) were administered to most individuals who participated in the structured interviews and/or focus groups. Each interviewee was administered the BARS

associated with four of the 10 different organizational behaviors previously identified. The BARS provided the opportunity to quantitatively summarize qualitative data associated with the interviewee's perceptions of the organization. Approximately 556 BARS were collected representing the 10 organizational behaviors. Of those 556 BARS, 216 were from employees that work for the Prime Contractor, 268 were employees that worked for organizations on a BOA Contract, and 72 were from DOE personnel.

Individuals who completed the BARS selected the behavioral example they felt best exemplified that behavior within UPF. The BARS data was analyzed by reporting the frequency of individuals who selected each behavioral example. The attributes of low, medium/neutral, and high had previously been assigned to each example by a panel of experts in the field of nuclear safety.

B.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 12 observations were conducted. The data represent observations of Extend Assumptions Meeting, CD 2/3C Baseline Review, Quarterly Virtual Walkthrough of Decontamination/SDOR Operational Areas, B&W Weekly Status Meeting for Specialty Mechanical Design Group, Weekly UPF Trend/Change Control Board Meeting, UPF Comment Resolution Meeting, UPF Issues Review Board Meeting, B&W Schedule/Staffing/Issues Meeting, CD 2/3 TBC Estimate Interface Civil-Structural-Architectural Meeting, UPF Project Team Orientation, CD 2/3 TBC Estimate Interface Electrical – Instrumentation and Control Meeting, and B&W Risk Management Meeting. .

B.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. Portions of the survey used in this evaluation have been administered previously by the Independent Safety Culture Evaluation Team Lead at over 50 different organizations.

A total population of approximately 820 personnel was invited to participate in the survey of which 663 actually completed the survey, representing a response rate of 81%**.** This is a very acceptable rate of response from which representative conclusions regarding employee, contractor and subcontractor perceptions and attitudes concerning the work environment can be made.

The data collected from the survey was evaluated using an analysis of variance to determine which organizational groups (as defined by the demographic variables on the survey) differed from other organizational groups on the survey scales. For those scales on which statistically significant differences between organizational groups were obtained (using an extremely conservative probability of .001 to correct for the potential for false positive findings), the survey data was plotted to show the frequency of respondents for each survey scale response point on the 5 point scale.

B.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 obtained for the UPF Project Prime Contractor, Subcontractors, and Federal Employees who are dedicated to the Project on a full-time basis, as well as those individuals from all organizations that support the Project on a part time basis and those individuals within the DOE YSO organization. Analyses conducted did not reveal any statistically significant differences between YSO Project and YSO Non-Project personnel on any of the survey scales. The results are presented in terms of the Safety Culture traits for both the Contractor and Federal organizations. 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 improvements, the Areas in Need of Attention should be considered and used as examples for an action that would address a behavior that would help several if not all of these points. It is not the intention that each Area in Need of Attention result in a corrective action as would occur with an Area for Improvement. Developing a massive amount of corrective actions only perpetuates a compliance mentality, which is not conducive to creating and promoting a 'healthy safety culture'.

B.5.1 Leadership Safety Values and Actions

Leaders demonstrate a commitment to safety in their decisions and behaviors.

Positive Observations

UPF Federal Project Office/YSO

- Many individuals indicated that YSO has an overarching goal of safety.
- Several interviewees did not perceive a trade-off between production and safety at YSO.
- Most individuals acknowledge that time pressures exist but when additional time is requested to complete work it is normally given.

UPF Project

- UPF is perceived by many DOE interviewees to have a healthy safety culture on the construction side of the organization.
- UPF is perceived by many contractor interviewees to have a strong focus on overall safety.
- Interviewees and observations by the Team indicated that safety issues are addressed regularly and that many meetings begin with a safety topic.
- 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.
- Many interviewees indicated there were no real inhibitors to raising safety concerns.
- Results on the Attention to Safety Scale on the electronic survey were on the high end of scores compared to a database of other organizations' responses to the same questions. This indicates that survey respondents did 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.
- No statistically significant differences were obtained between any organizational groups on the Attention to Safety Survey Scale indicating a similarly high value across the Project organization.
- Scores on the Employee Awareness of Risk in their Work Environment Question on the survey were among the highest in a database of other organizations' responses to the same question.

- Results from the Behavioral Anchored Rating Scale on Time Urgency indicate that approximately 80% of the Prime Contractor interviewee respondents and close to 75% of BOA Contractor individuals that completed this scale perceive that most tasks are completed on time without compromising safety or quality. This was truer of Managers in both of those groups than Non-Managers.

Areas in Need of Attention

UPF Federal Project Office /YSO

- Interviewees indicated that they perceive that DOE is the gate keeper of safety and that the contractors are the keepers of the schedule.
- Several interviewees indicated that there is a tremendous amount of technical information to review and that they were concerned that they would miss something in the process.
- Several YSO interviewees indicated they did not believe that there was a strong enough emphasis on quality at the UPF Project. Interviewees described inadequate reviews and allowing cost and schedule to play a significant role in the decision making process, e.g., lack of rigorous incorporation of NQA1 requirements perceived to be due to schedule pressure.
- YSO Interviewees indicated that they would like to increase federal staff in the areas of nuclear safety engineering, project controls for reviewing base line management for schedule and cost, and procurement quality specialists to oversee the anticipated increase in procurement as well as the vendors to be contracted. Requests for additional staff for the project for several years have been addressed by matrix support from the site office but that support has often been weak.
- Results from the survey indicate that respondents in the YSO Group had statistically significantly lower scores than all other organizational groups with the exception of the Y-12 Contractor respondents, in their perception of how much emphasis management places on environment, safety and health issues across the UPF Project.
- Results from survey respondents in the YSO Group were statistically significantly lower than the Contractor Group in their perception of how aware employees are of the risks in their work environment.
- Results on the Behavioral Anchored Rating Scale for Attention to Safety indicate that approximately 50% of the YSO individuals that completed this scale provided a mid-range score which indicates that they perceive that project management reflects a delicate balance of emphasizing safety, while at the same time making it clear that there is a need to keep the project on schedule. This coincides with the belief by several YSO interviewees that schedule appears to be more important than safety and quality to some of the UPF Project Management Team.
- Results on the Behavioral Anchored Rating Scale for Time Urgency indicates that almost 40% of the YSO interviewees that completed this scale provided a mid to low rating which indicates that they perceive that there is little concern among some employees for timely completion of tasks.
- Results from the Behavioral Anchored Rating Scale on Resource Allocation indicate that over 80% of the interviewees from YSO that completed this scale either do not perceive or are unsure that employees have sufficient resources to implement corporate goals or that they understand how these goals relate to their daily activities.

UPF Project

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

- Some interviewees indicated that problems that affect the safety and operation of the facility need to be evaluated in terms of schedule and budget impact prior to the decision to resolve them.
- Some UPF interviewees perceive that the period of time allotted for design reviews are too short and have not yielded the most critical evaluations. Examples were cited where UPF reviewers had only a couple of days to assess the impact of new safety items which had been added to a new drawing.
- Many interviewees indicated that they perceive a lot of pressure to meet PBIs (Performance Based Incentives) and that some believe it can impact safety, e.g., incentive to finish safety documents early; dates associated with PBIs or on critical path cannot be slipped.
- Many interviewees indicated that the fact that the safety basis of the Project is still not complete represents a non-conservative approach to the value to safety.

- Many interviewees indicated the need to add additional people on the project to cover specific areas including:

  - Electrical designers to model their own systems
  - Database manager
  - Criticality safety engineers
  - System engineers

- Results from the Behavioral Anchored Rating Scale on Attention to Safety indicate that over 50% of the interviewees from the Prime Contractor and 35% of the interviewees from the BOA Contractors are either unsure or do not perceive that individuals in the project believe that safety is the number one priority.
- Results on the Behavioral Anchored Rating Scale for Resource Allocation indicate that 60% of the BOA Contractor interviewees and almost 50% of the Prime Contractor interviewees who responded to this scale were either negative or uncertain in their perceptions of how resources are allocated across the project.

B.5.2 Problem Identification and Resolution

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

Positive Observations

UPF Federal Project Office/YSO

- Multiple mechanisms for identifying problems within YSO were described by interviewees including, peer review process, differing professional opinion process (DPO), Employee Concerns Program (ECP), assessments, an open door policy with supervision and management, self-assessment procedure (YSO-3.3), Performance Assurance Matrix (PAM) input, Annual Performance Evaluation Report.
- Interviewees described using the Lessons Learned database, the Risk Register, and Preliminary Safety Design Report review to help identify problems.
- Interviewees identified that YSO had an offsite retreat last year which provided an open forum to bring up concerns and problems
- YSO conducted its own employee satisfaction survey recently and has begun to have employee advisory team meetings.

- Interviewees indicated that the site wide policy gives authority to stop work to anyone.
- Data from the Behavioral Anchored Rating Scale on Problem Identification and Resolution indicated that 75% of the YSO interviewee respondents who completed this scale provided a high rating indicating that they perceived that the organization encourages project personnel to draw upon knowledge, experience and current information to identify and resolve problems positively.

UPF Project

- Most interviews identified that multiple mechanisms exist within UPF to report problems and that everyone is encouraged to do so. Mechanisms described included management and supervision open door policy, Employee Concerns Program, safety awareness at the beginning of each meeting, Issues Management System (IMS), VPP, security concerns program, YSO, safety rewards, emails, meetings, verbal discussions, and human resources.
- Interviewees described efforts to communicate to employees how to report concerns. Some examples included:
    - Employee Handbook
    - Website
    - Formal procedure on Employee Concerns
    - Ethics and Business Conduct procedures
    - Training
    - Posters and business cards
    - Briefing in February 2012 on Employee Concerns.
- Some interviewees indicated that there were no inhibitors to identifying problems.
- Interviewees indicated that UPF promotes the identification of problems through personal integrity and values, procedures, legal requirements, bulletins, emails, safety teams, management expectations, recognition programs, self-assessments, independent audits, SDIT (Safety Design Integration Team).
- Data from the Behavioral Anchored Rating Scale on Problem Identification and Resolution indicated that approximately 88% of the Prime Contractor interviewee respondents who completed this scale provided a high rating indicating that they perceived that the organization encourages project personnel to draw upon knowledge, experience and current information to identify and resolve problems positively.

Areas in Need of Attention

UPF Federal Project Office/YSO

- Some YSO interviewees described that the assessment process of issues that are raised can be difficult to navigate. Issues have to be reviewed by a screening team (IST) of five peers, one from each functional area. It can be a lengthy process to get the issue then raised to the Assistant Manager Forum (MAR) for resolution where it can be deferred or rejected, e.g., an example was identified where the issue was deferred by the MAR because of a lack of understanding and then took several months to get it resolved.
- Interviewees identified four areas of recurring issues over the last several years; design deliverables, integration of safety into design, corrective actions, and procedural noncompliance.
- Several YSO interviewees indicated corporate pressure from Bechtel or Babcock and Wilcox, schedule pressure from Headquarters, Contractor Management schedule and cost pressure, the unknown of the technology of UPF and the complexities in the operation may all contribute to the inhibition of reporting problems.

- Interviewees indicated that although YSO does have a DPO process, there have been times where its use would have been appropriate, but it was not used. The perceived absence of the use of the process, especially in situations where it would be appropriate, has raised the question among some YSO individuals of why it isn't being used.
- Some individuals indicated that it can be difficult to get things through to management because it can take too long. Others also indicated that they would prefer to solve the issue themselves rather than involving management.

UPF Project

- Interviewees and observations by the Team did identify issues with the problem identification and resolution processes at UPF that may inhibit a healthy safety culture.

    - UPF has not had a DPO process. At the time of this assessment a draft procedure was being developed.
    - Interviewees indicated that schedule pressures can inhibit reporting of concerns.
    - Some interviewees indicated there is a reluctance to identify company issues at meetings with the client.
    - Several interviewees indicated that external stakeholder pressure can inhibit the raising of concerns so as not to delay the schedule.
    - Some interviewees indicated that if there are many redlines on a drawing they may be hesitant to add more.
    - Some individuals indicated that they believe that poor communication on safety concerns inhibits identification of further problems.
    - Several interviewees indicated that there is a fixation on tracking and reporting hours worked without a lost time accident and that no one wants to be the one that breaks the record.

- Data from the Behavioral Anchored Rating Scale on Problem Identification and Resolution indicated that only 58% of the BOA Contractor interviewee respondents who completed this scale provided a high rating indicating that they perceived that the organization encourages project personnel to draw upon knowledge, experience and current information to identify and resolve problems positively.

B.5.3 Personal Accountability

All individuals take personal responsibility for safety.

Positive Observations

UPF Federal Project Office/YSO

- Most YSO interviewees indicated that roles and responsibilities on the Federal side of the project are well defined.
- YSO interviewees indicated that they have an oversight role that is clearly implemented through assessments, surveillances and the monitoring of performance metrics. The contractor is held accountable through the PBIs.
- Interviewees indicated that the FEOSH Manual has a safety procedure which governs YSO and that they have to comply with all B & W procedures as well.
- Several interviewees indicated that there would be no repercussions for self-reporting and that YSO has a non-reprisal policy.

- Data on the Behavioral Anchored Rating Scale for Performance Quality indicates that about 68% of the YSO interviewees who completed this scale are positive in their perceptions that project personnel take personal responsibility for their actions and the consequences of the actions.

UPF Project

- Most interviewees indicated that there is a lot of emphasis on being accountable for safety, for personal safety, design safety, and contamination safety.
- Interviewees identified that UPF is going to implement a Human Performance Initiative (HPI) shortly.
- Data on the Behavioral Anchored Rating Scale for Roles and Responsibilities indicated that 88% of Prime Contractor interviewees who completed this scale provided a high rating indicating a perception that employees understand their duties, know who to go to when a task needs to be done and understand their roles in completing cooperative activities.
- Data on the Behavioral Anchored Rating Scale for Performance Quality indicated that approximately 75% of Prime Contractor interviewees who completed this scale provided a high rating suggesting that they perceive that employees understand their duties and have a sincere desire to do top quality work.
- Scores on the Commitment Scale from the electronic survey indicated that approximately 72% of the Bechtel respondents felt positively committed to the project. This was a statistically significant difference from several of the other organizational groups who felt less positively in their commitment to the project.

Areas in Need of Attention

UPF Federal Project Office/YSO

- Some YSO interviewees indicated that when the BOA was set up there was some confusion around roles and responsibilities and how B&W would use the BOA. There are still some differences in the YSO and B&W's perceptions around the tasks and deliverables, but YSO interviewees indicated that they can not intervene in how it is implemented.
- Scores on the Commitment Scale from the electronic survey indicated that only about 38% of the YSO respondents felt positively committed to the project. This was statistically significantly lower than the Bechtel, B&W, and Staff Augmentation Groups.
- Data on the Behavioral Anchored Rating Scale for Roles and Responsibilities indicated that 60% of YSO interviewees who completed this scale did not have a positive perception that employees understand their duties, know who to go to when a task needs to be done and understand their role in completing cooperative activities.

UPF Project

- Many interviewees indicated that either they hadn't seen their job description or that it was very generic. Several interviewees stated that the expectations for their roles are documented in the procedures.
- Accountability is perceived by several groups to be an issue at UPF. Some examples include:
    - Several interviewees indicated that there is a lack of personal accountability and that there is the expectation that someone else or something else will take care of

accountability, e.g., external reviewers, PBIs, performance standards, safety criteria in work activities, drawings, procedures.
    - Attendance or late arrival at meetings was not observed to be consistently challenged.

- The Team could not identify an initiative to enhance personnel performance through the use of human performance tools or a better personal accountability to standards. (Interviewees indicated that HPI was going to be implemented but it could not be evaluated as part of this assessment.)
- Some interviewees indicated that management's reaction to self-reporting is dependent upon what the action is and how much time it takes to fix the problem.
- Several individuals identified that the Project struggles with the concept of quality and perceives it to be expendable when faced with schedule and cost pressures.
- Several interviewees did provide examples of issues that are unresolved because of a lack of ownership. These include:

    - Pieces of equipment that are in the design drawings but outside the building
    - Design interface issues between the BOAs because of communication problems, e.g., use of different design packages by different BOAs may result in equipment being placed in the wrong locations
    - Locations in the design that do not have owners and their functionality cannot be determined to complete work in that area
    - Technical Independent Project Review identified issues in the design of containers but it was not clear who owned the problem
    - Addition of glove box stools presented an access problem but it was not clear whose problem it was to resolve
    - Decisions that cross boundaries and require multiple inputs are difficult, e.g., liquid management
    - Resolution of HEPA filtering that was 'over designed' and has created space and cost issues.

- Data on the Behavioral Anchored Rating Scale for Roles and Responsibilities indicates that almost 50% of BOA Contractor respondents to this scale have a neutral to negative perception of the extent to which facility personnel's positions and departmental work activities are clearly defined and carried out.
- Data on the Behavioral Anchored Rating Scale for Performance Quality indicated that approximately 65% of BOA Contractor interviewees who completed this scale provided a mid to low rating suggesting that they do not perceive that employees understand their duties and have a sincere desire to do top quality work as much as the Prime Contractor respondents do.
- Scores on the Commitment Scale from the electronic survey indicated that Merrick, CH2MHill, URS and Other Contractor respondents were statistically significantly more negative or uncertain in their commitment to the project than Bechtel respondents were.

B.5.4 Work Processes

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

Positive Observations

UPF Federal Project Office (YSO)

- YSO interviewees indicated that strategically, the Program Office provides the mission and that both the Site Office and Contractor work together to implement it.

- YSO interviewees described work as being defined and assigned through the PEGASUS system.
- YSO interviewees indicate that there is a general assessment plan that is integrated fairly well with UPF activities.
- Interviewees indicated that YSO is perceived to be more procedure oriented than other sites, e.g., issues management is a formal process, while at other sites may be more at the discretion of the Assistant Managers.
- YSO interviewees identified that requirements flow down from DOE O 413.3b which encompasses Health and Safety, Quality Assurance, Project Management and code of record.
- Data on the Behavioral Anchored Rating Scale for Formalization indicates that 100% of YSO 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.

UPF Project

- Interviewees describe regularly scheduled meetings with task leads, discipline leads, staff, and red-lined meetings as part of the coordination effort.
- Many interviewees indicated that the master work schedule was becoming more mature and better defined and other processes, e.g., Engineering, Procurement, and Construction, are fed into the schedule.
- Data on the Behavioral Anchored Rating Scale for Coordination of Work indicates that 85% of the Prime Contractor respondents to this scale have a positive perception of the planning, integration, and implementation of work activities of individuals and groups.
- Data from the Coordination of Work Scale on the electronic survey indicated there were no statistically significant differences between any of the project organizations on this scale and the overall scores for the Project were moderately high compared to other organizations that have responded to the same scale.
- Most interviewees indicated that verbatim compliance to standards and procedures is the underlying management expectation. If a procedure is deficient the expectation is to raise a concern to supervision or management and get it resolved.
- Interviewees indicated that the BOA Contractors are expected to follow the UPF (Y-12) procedures.
- Data on the Behavioral Anchored Rating Scale for Formalization indicates that 85% of the BOA Contractor and 75% of the Prime Contractor 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.

Areas in Need of Attention

UPF Federal Project Office/YSO

- Data on the Behavioral Anchored Rating Scale for Coordination of Work indicates that only 62% of the YSO respondents to this scale have a positive perception of the planning, integration, and implementation of work activities of individuals and groups.
- Data on the Cohesion Scale from the electronic survey indicates that YSO respondents had statistically significantly lower perceptions of their work group cohesion than all of the UPF Contractor Organizations.

UPF Project

- Several interviewees described that getting work coordinated can be challenging because:

- Software doesn't interface well between different groups and design layouts can be mismatched;
- The building footprint was set before the equipment and process was designed;
- Some technical groups are ahead of others and it creates an unbalanced work load;
- Some groups are not meeting regularly with others and it can create delays and potentially impact the quality of the deliverables; and
- Groups are spread out across multiple geographic locations.

- Some interviewees indicated that the organization of the procedures to be used is not effective and that deviations are constantly being written.
- Several interviewees discussed that using some combination of Y-12 and Bechtel procedures and then modifying them for the project can create confusion.
- Data on the Behavioral Anchored Rating Scale for Coordination of Work indicates that only 55% of the BOA Contractor respondents to this scale have a positive perception of the planning, integration, and implementation of work activities of individuals and groups.

B.5.5 Continuous Learning

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

Positive Observations

UPF Federal Project Office/YSO

- YSO interviewees indicated that when a project is completed, a lessons-learned document is usually developed to outline both the positive and negative outcomes from the activity. The information is typically communicated through e-mails, staff meetings, discussions and all hands meetings.
- YSO interviewees indicated that federal personnel on other projects such as WTP, CMRR and MOX visit each other and form peer review teams to share lessons learned.
- Interviewees indicated that at YSO staff meetings lessons learned is a routine agenda item. Recently, the WTP safety culture issue was one of the topics.
- YSO interviewees indicated that the Pegasus reporting system is set up to identify weaknesses and deficiencies. The contractor is then required to conduct formal causal analysis and develop a corrective action plan that must be approved.

UPF Project

- Interviewees identified multiple mechanisms to communicate operating experience and lessons learned. These include weekly meetings, awards, newsletters, all hands meetings, training.
- Several interviewees indicated that when operating experience information becomes part of the IMS (Issues Management System) collective action plan, it gets much more attention and can be more effectively communicated and managed.
- Performance Assessment Meetings (PAM) are also described as another way to discuss lessons learned to improve future performance.
- Interviewees described good communication with the HEUMF (Highly Enriched Uranium Materials Facility) to consider their issues in the UPF design, e.g., placement of rebar.
- Interviewees indicated that UPF, CMRR and MOX are sharing lessons learned for the glove boxes. Communication between these projects has been ongoing and described as useful.
- Interviewees from the BOA Contractor organizations indicated that they communicate lessons learned within their own organizations as well.

- Data on the Behavioral Anchored Rating Scale for Organizational Learning indicated that 78% of the Prime Contractor respondents to this scale had positive perceptions about how UPF learns from their own experience as well as those of other organizations.

Areas in Need of Attention

UPF Federal Project Office/YSO

- Interviewees from YSO indicated that they rarely perform detailed analyses of why things succeeded. Many agreed that it would be a good thing to do to better understand the successes and learn from them.
- Data on the Behavioral Anchored Rating Scale for Organizational Learning indicated that approximately 82% of YSO interviewee respondents provided mid-range ratings suggesting that they believe 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.

UPF Project

- While the concept of lessons learned was identified by many UPF interviewees, the organization is missing opportunities to use this information as part of a learning process.
    - Some interviewees indicated that there are too many barriers to learn from the lower levels in the organization through a systematic process, e.g., suggestion to go to MOX and learn how they dealt with a similar issue to save cost.
    - Interviewees primarily described technical opportunities for lessons learned, not organizational or programmatic opportunities.
    - Some interviewees described that lessons learned have to be written so that the root cause does not appear to have been an old action item that was not fixed.
    - Some interviewees, who worked on fire protection systems, when asked about the fire alarms in ducts at HEUMF responded that they did not know about that because they were not involved with alarms and that was handled by others.

- Data on the Behavioral Anchored Rating Scale for Organizational Learning indicated that 95% of the BOA Contractor respondents to this scale provided mid to low range ratings suggesting that they 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.

B.5.6 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.

Positive Observations

UPF Federal Project Office/YSO

- YSO interviewees understand the mechanisms available to identify safety concerns, e.g., supervisors, managers, ECP, HR, GAO, IG, and Hotline.

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

UPF Project

- 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.
- Interviewees described the process to investigate an anonymous concern received through YSO as effective with representatives from UPF, the union, ES&H, Legal, YSO and Facilities. While the allegations were not substantiated, additional issues that resulted from the investigation are currently being addressed.
- Among all UPF Contractor survey respondents, about 85% agreed with the statement that everyone in the organization is responsible for identifying problems. While overall this represents a high percentage of people agreeing, there was variation between some of the contractor groups. Respondents from the CH2MHill, Jacobs, Staff Augmentation, and Y-12 Contractor Groups had the lower scores on this question. B&W and Bechtel survey respondents had the higher scores among the contractor groups.

Areas in Need of Attention

UPF Federal Project Office /YSO

- Among YSO survey respondents only 65% agreed with the statement that everyone in the organization is responsible for identifying problems. This was a statistically significant lower score from that obtained for the UPF Contractor Organizations.
- Within the YSO Organization, survey respondents from the Office of the Assistant Manager for Program and Business Management had statistically significant lower scores on the statement that everyone in the organization is responsible for identifying problems than the other work groups within YSO.
- The statement that management does not tolerate retaliation of any kind for raising concerns was agreed to by only 60% of YSO survey respondents.
- Approximately 68% of YSO survey respondents agreed with the statement that they feel that they can approach their management team with concerns.
- Approximately 58% of YSO survey respondents agreed with the statement that management wants concerns reported and willingly listens to problems.
- Among YSO survey respondents only 55% feel that they can openly challenge decisions made by management.
- Among YSO survey respondents only 58% believe that constructive criticism is encouraged.

UPF Project

- Approximately 70% of the survey respondents across the UPF Contractor Groups agreed with the statement that they feel that they can approach the management team with concerns. Respondents in the B&W Group had the lowest agreement with this statement (60%) while respondents in the Other, URS, Merrick and Bechtel Groups had the highest agreement.
- The electronic survey statement that management does not tolerate retaliation of any kind for raising concerns was agreed to by approximately 70% of the UPF Contractor survey respondents. Specifically, almost 80% of Bechtel survey respondents agreed with this statement, while only 58% of Merrick survey respondents believed the statement to be true.

- Among UPF Contractor survey respondents, 70% agreed with the statement related to management wants concerns reported. Respondents in the B&W and Y-12 Groups had the lowest scores on this question.
- Approximately 60% of the UPF Contractor survey respondents believe that constructive criticism is encouraged. Bechtel and Other survey respondents had the most positive perceptions of this statement, while Y-12 survey respondents had the most negative perceptions.
- Among UPF Contractor survey respondents only slightly more than 50% feel that they can openly challenge decisions made by management.
- Several interviewees indicated that while supervision and management claim there will be no retaliation for identifying issues, some recent situations have given some individuals cause for concern, e.g., interviewees indicated that they have heard that 'if a milestone is missed people will lose their jobs'.

B.5.7 Effective Safety Communication

Communications maintain a focus on safety.

Positive Observations

UPF Federal Project Office/YSO

- YSO interviewees identified multiple mechanisms for communication in the UPF Federal Project Office organization:
    - Direct and frequent communication with the Federal Project Director
    - Weekly meetings, management briefings, all hands meetings, emails are used regularly for communication
    - Information through Project update meetings.
- Interviewees described also receiving information from Pegasus, on-line video chat and one-on-one interactions.
- Survey respondents across all of the UPF Organizations had some of the highest scores on the Desire for Interaction and Trust in Communication Scales.

UPF Project

- Interviewees identified multiple mechanisms for communication on the UPF Project. They included:
    - Management
    - Input documents, e.g., drawings, design guidelines
    - Plan of the Day meetings
    - Weekly and monthly meetings
    - Staff meetings
    - Emails
    - Telephone calls
    - Newsletters
    - Supervisor updates
    - Face to face interactions.

- Some UPF interviewees indicated that they believe that they are well informed about what is going on around the Project.
- Several interviewees indicated that some groups have coordinators to facilitate communication.
- Survey respondents across all UPF Organizations had some of the highest scores on the Desire for Interaction and Trust in Communication Scales.

Areas in Need of Attention

UPF Federal Project Office/YSO

- Several YSO interviewees identified many challenges in communication. Some examples included:
    - YSO individuals described trying to get enough time to interact with people at the appropriate level of detail.
    - Some YSO individuals indicated that their geographical location (not being collocated) can be an impediment to communication.
    - Interviewees indicated that they need to prepare more detailed communication for senior management.
- Data from the Behavioral Anchored Rating Scale on Communication indicated that only 50% of the YSO 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.

UPF Project

- Many interviewees indicated that the project could benefit from more interdisciplinary communication, e.g. across the BOA Contractor organizations.
- Some groups indicated that they could be better informed about many things, e.g. change in personnel, so they would know who they needed to contact for signatures, memos, etc.
- Interviewees indicated that there is a lot of variability in the quality and quantity of communication and information that is received and it is dependent upon who you are working for whether you get the big picture or just your picture.
- Many interviewees expressed the view that they don't always know or hear about emerging issues.
- Interviewees indicated that they have good relationships with their counterparts but that geographical distances hinder their interaction and communication.
- While scores on the Desire for Interaction Scale from the electronic survey were high across the Project, there were statistically significant differences among some of the Contractor Work Groups on this scale. In particular, respondents in the Project Controls, Engineering (including Staff Augmentation) and Other Groups had significantly lower scores than respondents in most of the other work groups.
- Data from the Behavioral Anchored Rating Scale on Communication indicated that 50% of the Prime Contractor and only 15% of the BOA Contractor 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.

B.5.8 Respectful Work Environment

Trust and respect permeate the organization

Positive Observations

UPF Federal Project Office/YSO

- Results from the Communication Trust Scale on the electronic survey indicated that YSO 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.

UPF Project

- Results from the Communication Trust Scale on the electronic survey indicated that overall UPF 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. UPF scores on this scale were among the highest across several different organizations that have responded to this same scale.
- Results on the electronic survey for the CH2MHill, Other, and URS Organization survey respondents indicated statistically significant higher scores on overall job satisfaction than respondents in the YSO, B&W, Merrick, and Jacobs organizations.

Areas in Need of Attention

UPF Federal Project Office /YSO

- Results on the electronic survey for YSO survey respondents indicated statistically significant lower scores on overall job satisfaction than respondents in the other UPF Organizations. Within the YSO organization over 40% of the survey respondents were either negative or neutral about their overall job satisfaction.
- Results from the Work Group Cohesion Scale on the electronic survey indicated that approximately 65% of the YSO survey respondents did not have very positive perceptions regarding their identification with and involvement in their work group.
- Results obtained on the Communication-Accuracy Scale from the electronic survey indicated that overall UPF Project survey respondents did not have the most positive perceptions of the accuracy of information that they receive from other organizational levels (superiors, subordinates, and peers).

UPF Project

- Within the B&W, Merrick, and Jacobs Contractor organizations over 30% of the survey respondents were either negative or neutral about their overall job satisfaction.
- Results obtained on several of the scales already discussed in this report present a consistent profile of the organizational culture of the BOA Contractor employees working on the UPF project. For the most part these individuals have the most negative perceptions around many of the behaviors that have been discussed. In addition, they appear to be less committed, less satisfied, and in some cases less positive about their safety conscious work environment than the Prime Contractors.

B.5.9 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.

Positive Observations

UPF Federal Project Office/ YSO

- YSO interviewees indicated that their line management was supportive of their challenging conditions and activities.

UPF Project

- Some examples of fostering an environment where a questioning attitude is desired and accepted were described. The UPF Project has adopted several technical tools to help identify those areas that might be problematic for coordinating and implementing work. The Integrated Schedule Management process and the 3 D Modeling approach facilitates the identification of potential problems that might occur as each group works independently of each other.

Areas in Need of Attention

UPF Federal Project Office/YSO

- Results from the electronic survey indicated a fairly negative perception among many YSO survey respondents about several of the behaviors associated with a healthy safety conscious work environment, e.g., openly challenging management decision, perceiving that constructive criticism is encouraged.
- YSO interviewees indicated that while a DPO process exists, it has rarely been used and questioned why given that there had been some situations for which it would have been appropriate.

UPF Project

- Interviewees indicated that the design-build approach does not often provide the opportunities for a healthy questioning attitude. The need for the 'Fit Study' to reexamine how well the planned equipment will fit into the rooms that have already been sized is a reactive way of operating. The results of that study have not been encouraging and the Project has had to go back and redesign some equipment that won't fit into the building as currently configured.
- While many UPF Project 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 feeling free to challenge management decisions, management not encouraging constructive criticism.
- There has not been a DPO process for the UPF Contractor Organizations, although the Team was told that one was being developed and would be implemented shortly.
- While the Team did not hear about any cases of direct retaliation, several interviewees in some UPF organizational groups had indicated perceived negative repercussions for missing schedule milestones or for making a mistake.

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Independent Oversight Assessment of Nuclear Safety Culture at the Idaho Cleanup Project Sodium Bearing Waste Treatment Project

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Independent Oversight Assessment of Nuclear Safety Culture at the Idaho Cleanup Project Sodium Bearing Waste Treatment Project

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Appendix B: Independent Evaluation of Safety Culture at the Idaho Cleanup Project Sodium Bearing Waste Treatment Project B-1

Acronyms

BARS	Behavioral Anchored Rating Scales
COBRA	Changing our Behavior Reduces Accidents
CWI	CH2M-WG Idaho
DNFSB	Defense Nuclear Facilities Safety Board
DOE	U.S. Department of Energy
DOE-ID	Idaho Operations Office
ECP	Employee Concerns Program
EEO	Equal Employment Opportunity
HSS	Office of Health, Safety and Security
IWTU	Integrated Waste Treatment Unit
NRC	Nuclear Regulatory Commission
ORR	Operational Readiness Review
SBWTP	Sodium Bearing Waste Treatment Project
VPP	Voluntary Protection Program

1. Introduction

The U.S. Department of Energy (DOE) Office of Enforcement and Oversight (Independent Oversight), within the Office of Health, Safety and Security (HSS), conducted an independent assessment of nuclear safety culture[1] at the DOE Sodium Bearing Waste Treatment Project (SBWTP). The primary objective of the evaluation was to provide information regarding the status of the safety culture at SBWTP. The data collection phase of the assessment occurred in April and May 2012.

SBWTP is one of DOE's largest nuclear design and construction projects and a key part of the Idaho Cleanup Project (ICP). SBWTP, also known as the Integrated Waste Treatment Unit (IWTU), is a first-of-a-kind facility that will treat the remaining 900,000 gallons of liquid radioactive waste generated from the Idaho Site's legacy cleanup mission. DOE completed its Operational Readiness Review of IWTU in March 2012. IWTU entered a commissioning and initial equipment testing phase at the end of April 2012.

Within DOE, the DOE Headquarters Office of Environmental Management (EM) has line management responsibility for SBWTP. At the site level, line management responsibility for SBWTP falls under the Idaho Operations Office (DOE-ID). Under contract to DOE, CH2M-WG Idaho (CWI) is responsible for managing the SBWTP.

In addition to providing information to line management, this assessment satisfies a Secretarial commitment to the Defense Nuclear Facilities Safety Board (DNFSB) related to DNFSB Recommendation 2011-1, *Safety Culture at the Waste Treatment and Immobilization Plant*. Specifically, in the Department's Implementation Plan dated December 27, 2011, the Secretary of Energy directed HSS to perform safety culture assessments of five major ongoing large nuclear design/construction projects to determine the extent of condition of safety culture concerns identified at the Hanford Site Waste Treatment and Immobilization Plant. The assessment of the SBWTP is the third safety culture evaluation of design/construction projects conducted as part of the extent of condition review.

Before starting the assessment, HSS enhanced its capability to assess safety culture through consultation with the U.S. Nuclear Regulatory Commission (NRC), several nuclear power generating utilities, and associated support organizations to benchmark their processes. Recognizing that it has significant expertise in nuclear safety and issues management but limited on-staff expertise in systematic application of behavioral science-based methodologies for performing safety culture assessments, HSS contracted with an external company that specializes in human performance analysis to support the data collection and analysis efforts.

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

2. Scope and Methodology

This Independent Oversight assessment covered the DOE and contractor organizations that have responsibilities for SBWTP activities. These include the:

- DOE Idaho Operations Office. The review of the DOE-ID included organizational elements and individuals involved with the SBWTP.
- CH2M-WG Idaho. The review of CWI included the CWI partners and its subcontractors engaged with the SBWTP. CWI is a partnership among CH2M HILL, the Washington Division of URS Corporation (formerly Washington Group International), and Premier Technology (a small business partner).

An experienced HSS manager led the assessment. Onsite data collection was conducted primarily by HSS personnel. To ensure a valid and effective assessment of the existing safety culture, HSS used external independent safety culture experts to analyze various sources of data and perform an independent evaluation. The independent safety culture experts have extensive experience in the development and application of safety culture assessment methodologies used by commercial nuclear and other industries. Appendix A provides additional information about the composition of the Independent Oversight team, including the credentials of the independent safety culture experts.

With the guidance of the external independent safety culture experts, the Independent Oversight team selected a methodology for the assessment that provides an objective and systematic measurement of the organizational behaviors that impact safety performance, using multiple data collection tools to assess organizational behaviors. These tools include functional analysis, semi-structured focus group and individual interviews, observations, and behavioral anchored rating scales.

The Independent Oversight team also arranged for the external independent safety culture experts to conduct a culture survey for project personnel using validated survey tools and techniques. The culture survey was conducted and analyzed by the external independent safety culture experts. The population sampled in the survey included Federal and contractor project employees.

The evaluation was conducted using the same methodology that aligns with the current NRC procedures for independent safety culture assessment, which identifies nine traits that are viewed to be necessary in the promotion of a positive safety culture:

- 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.

HSS tasked the independent safety culture experts to analyze the data collected during the assessment in accordance with their established methodology. Appendix B provides additional information about the methods and framework for the safety culture assessment.

3. Results and Conclusions

The safety culture evaluation performed by the external independent safety culture experts is provided in Appendix B, which provides positive observations and identifies areas in need of attention for each of the nine traits of a healthy safety culture. The independent safety culture experts evaluated the collective results to formulate conclusions about the status of the safety culture to facilitate the identification of improvement strategies.

The remainder of this section presents the conclusions of the independent safety culture experts for DOE-ID, CWI, and for the project as a whole.

Idaho Operations Office

The low overall response rate on the electronic survey, the expressed attitude by some that they "had higher priority things to do," and the perceptions of some of those that did provide information, indicate a disengagement from the importance of safety culture for the SBWTP. The importance of schedule and pressure to start the facility was prevalent throughout the time of the assessment and while some individuals expressed the "correct" values, the many perceptions provided to the team related to schedule pressure and identified in this report could evolve into more severe safety culture problems during the operation of the facility.

Information collected during this assessment indicates weaknesses of oversight of SBWTP by the DOE-ID personnel during the construction phase of the project. Several interviewees indicated that they perceive that CWI is willing to accept increased risk because some safety improvements cost too much or would take too much time. Several interviewees also perceive that DOE was willing to accept the risk by allowing CWI to do these things. Based on the existing DOE-ID management and personnel perceptions provided to the team, as well as identified contractor perceptions of DOE-ID, DOE needs to ensure the safe startup and operation of the facility by providing stronger oversight to the project.

CWI

The success of elements of the project has been driven by subcultures within the CWI Organization. Operations personnel hired into the SBWTP early on have taken their responsibilities professionally and have maintained many of the behaviors important for promoting a healthy safety culture. The short duration of the SBWTP may make the retention of these individuals throughout the life of the project tenuous.

Several initiatives by CWI are positive artifacts and claimed values around safety. However, the implementation of significant behaviors and decisions has demonstrated the value of production over safety and has been evident throughout various stages of the project through the commissioning/startup phase. Pressure to get the facility built and operating by emphasizing time over quality, relaxing oversight because of contractual relationships; poor quality of instructors, simulators not fully functional, and heavy reliance on self-study for operators and shift supervisors; delaying the hiring and training of radiological personnel; not ensuring sustainability of standards through continued training for staff in general; and not fully embracing As Low as Reasonably Achievable (ALARA) radiological practices are some examples cited by employees. These inconsistencies between the initiatives and the actions will not facilitate a healthy safety culture and while the life cycle of the facility and process may be short, the potential for low probability high consequence event must always be considered.

The data collected during this assessment indicates problems consistent with a project that has a short duration and a lot of uncertainty. Strong values around safety have not been internalized, the time span of the 'organization' is too short to develop a sense of ownership, and the culture is not cohesive but rather a collection of individual goals and values that drives behavior. This situation is also evident from the significant differences in perception between those in Senior Management and the rest of the organization.

SBWTP

The preponderance of the perceptions provided during this review from all involved parties indicate that the short life cycle of this project and the impending deadline of the agreement with the State of Idaho has created a 'just get it done' attitude on the part of all the parties involved. This has resulted in the perception of construction issues, procedural non-compliances and, in some cases, lax oversight.

There is a significant disconnect between the perceptions of the project's values and attitudes by the Senior Management of the Project and the rest of the Management Team and Staff. While not uncommon to see differences between management and staff in these types of perceptions, in the SBWTP the differences also exist between the different levels of management.

4. Recommendations

A healthy safety culture is most often found within an aligned organization that has effective processes, and motivated people. The following recommendations are initial steps that the Independent Safety Culture Evaluation Team believes are necessary to effectively implement and execute actions that will result in improved safe and reliable performance at SBWTP.

1. Senior Management of DOE-ID and CWI need to fully embrace the value of promoting the behaviors important for a healthy safety culture. This will require more of an oversight role for DOE in ensuring that all standards are implemented as intended regardless of the duration of the project through facility operation. Accountability to implementing those standards must be ensured by DOE as well as CWI.

2. The retention of the Operations Personnel who have been critical to the success of elements of the Project need to be ensured throughout the life of the Project and operation of the facility. Efforts to ensure their engagement for the duration of time that they are needed must continue to be implemented and perhaps enhanced.

EM, DOE-ID, and the contractor should evaluate the results of this Independent Oversight safety culture report in their entirety, including the culture insights provided in Appendix B and the above conclusions and recommendations. The insights are intended to stimulate the organizations to reflect on their culture in order to understand the values and assumptions that may be driving behaviors and thus help to shape interventions supportive of a healthy safety culture. Developing a massive amount of corrective actions may perpetuate a compliance mentality, which is not conducive to creating and promoting a healthy safety culture thus efforts to assure that there is a traditional corrective action associated with each insight may be counterproductive. To the extent that corrective actions are identified for specific recommendations, it is recommended that they be managed in accordance with established causal analysis and issues management processes and initiate appropriate, processes as appropriate.

Appendix A
Supplemental Information

Appendix A
Supplemental Information

Dates of Review

Scoping Visit	April 11-12, 2012
Onsite Data Collection:	May 21-24, 2012
Survey Open Period	April 23 to May 10, 2012
Closeout:	June 12, 2012

Office of Health, Safety and Security Management

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Dr. Deborah A. Shurberg, Independent Safety Culture Expert

Expertise and Credentials of the Independent Safety Culture Experts

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

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

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

The principals are:

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

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

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

Appendix B

An Independent Evaluation of Safety Culture at the Idaho Cleanup Project Sodium Bearing Waste Treatment Project

Independent Safety Culture Evaluation Team:

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

Appendix B
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B.1 Introduction

This Appendix describes the results of an independent evaluation of the existing Safety Culture at the Department of Energy (DOE) Sodium Bearing Waste Treatment Project (SBWTP). The population of the evaluation was all employees (contractor, and subcontractor) assigned to the SBWTP at the Idaho Cleanup Project. These employees included personnel from the DOE Idaho Operations Office (both the DOE-EM and DOE-NE Offices) and the CH2M-WG Idaho (CWI) Contractor Organization. The evaluation was conducted during April and May 2012. The primary objective of the evaluation was to provide information regarding the status of the safety culture traits at the SBWTP. 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. The detailed results presented in this Appendix support the summary results and recommendations provided in the main report.

B.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 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 U.S. Nuclear Regulatory Commission (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.

B.3 Scope of Safety Culture Evaluation

The scope of this evaluation was defined to include all employees, federal, contractor, and subcontractors assigned to the SBWTP in Idaho. This scope included personnel from the DOE Idaho Operations Office (both the DOE-EM and DOE-NE Offices) and personnel from the CH2M-WG Idaho (CWI) Contractor Organization. The Safety Culture Data Collection Team was on site at the SBWTP in Idaho during April and May 2012. 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 April 23 to May 10, 2012.

The Safety Culture Data Collection Team was used by the Independent Safety Culture Evaluation Team to assist in collecting onsite data and was comprised of the HSS Independent Oversight Team. The HSS staff had been trained on applying data collection techniques and conducting focus group interviews.

This safety culture evaluation is a 'point in time' snapshot of the SBWTP. During the timeframe the review was conducted, the project was completed with the completion of the DOE Operational Readiness Review (ORR). The SBWTP facility, also known as the Integrated Waste Treatment Unit (IWTU) started commissioning and initial equipment testing at the end of April. Therefore SBWTP and IWTU are used interchangeably.

Although the team recognizes that the SBWTP 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.

B.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.

B.4.1 Functional Analysis

The purposes of the Functional Analysis are to: (1) clearly identify the organizational units of the Project, (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 April 11-12, 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 or focus groups were conducted with approximately 20 individuals associated with the SBWTP.

Documentation Review

During the Data Collection Team's activities, a wide variety of documents were reviewed including SBWTP program and project plans, SBWTP technical and administrative procedures, project organization charts, interoffice memoranda, applicable DOE regulations and technical standards, corrective action reports, and root cause analyses.

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; Resource Allocation; 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 Questions from electronic survey
- Effective Safety Communication - Communication
- Respectful Work Environment – Communication Trust Scale from electronic survey
- Questioning Attitude – Attention to Safety.

B.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 22 individual interviews and 7 focus groups were conducted as part of the assessment. A total of 63 individuals were involved in one these activities. Each interview lasted one hour and each focus group lasted approximately one and a half hours. A few less formal follow-up interviews were conducted to provide further clarification when necessary.

The Behavioral Anchored Rating Scales (BARS) were administered to most individuals who participated in the structured interviews and/or focus groups. 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 239 BARS were collected representing 10 organizational behaviors. Of those 239 BARS, 171 were from CWI personnel, and 68 were from DOE personnel.

B.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 13 observations were conducted. The data represent observations of IWTU Corrective Action Review Boards, IWTU Multiple Room Low Oxygen Monitor Alarm Drill, IWTU Plan of the Day Meeting, IWTU Rad Con Technician Shift Turnover, Control Operations and Shift Turnovers, Off gas Blower Post Maintenance Testing, Operations activities during off gas blower startup, Federal Operations Activities Team Meeting, Maintenance Crew Briefing, IWTU Blower Seal Removal Pre-Job Briefing and Seal Removal, and a facility tour.

B.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. Portions of the survey used in this evaluation have been administered previously by the Independent Safety Culture Evaluation Team Lead at over 50 different organizations.

A total population of approximately 223 personnel was invited to participate in the survey of which 151 actually completed the survey, representing a response rate of 67.7%**.** While this response rate is considered to be an acceptable rate of response from which representative conclusions regarding perceptions and attitudes concerning the work environment can be made, it is lower than desirable. Of note is the fact that only 23 individuals identified themselves as belonging to a DOE organization which represents a 45% response rate for that organization's population.

B.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 obtained for the SBWTP Contractor, Subcontractors, and Federal Employees who are dedicated to the Project on a full-time basis, as well as those individuals from all organizations that support the Project on a part time basis. The results are presented in terms of the Safety Culture traits for both the Contractor and Federal organizations. 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 improvements, the Areas in Need of Attention should be considered and used as examples for an action that would address a behavior that would help several if not all of these points. It is not the intention that each Area in Need of Attention result in a corrective action as would occur with an Area for Improvement. Developing a massive amount of corrective actions only perpetuates a compliance mentality, which is not conducive to creating and promoting a 'healthy safety culture'.

It must be noted that the response rate for the survey among Federal Idaho Operations Office employees associated with the SBWTP was only 45%. This low response rate does not allow extrapolation to the entire population of Federal employees that were invited to participate in the survey. Consequently, any data obtained solely from the survey of the Federal respondents cannot be included as representative of the organizational opinions and beliefs of the DOE employees associated with this project, although information from the survey that corroborates data obtained from the functional analysis, structured interviews and focus groups, BARS, and behavioral observations may be referenced and used to support overall conclusions. The response rate for the CWI employees was 70.3 % which is considered minimally acceptable; therefore that data will be included but must also be carefully evaluated in light of the other sources of data collection.

B.5.1 Leadership Safety Values and Actions

Leaders demonstrate a commitment to safety in their decisions and behaviors.

Positive Observations

Idaho Operations Office/IWTU

- Many interviewees perceive that nuclear safety is not traded off over schedule on either the federal or contractor side.
- Several individuals indicated that they have never been turned down when requesting additional resources, e.g., hired more contractors for Quality Assurance when needed.
- Interviewees indicated that they perceive that the SBWTP takes top priority even within the Nuclear Energy side of the Site Office and that they do not perceive any conflict with support for the project.
- Some interviewees indicated that oversight plans can be updated and that there is some flexibility in meeting the plan.
- Interviewees do not perceive that anyone is pressured or coerced to do something that isn't right.
- Results from the Behavioral Anchored Rating Scale on Time Urgency indicate that approximately 88% of DOE individuals that completed this scale perceive that most tasks are completed on time without compromising safety or quality. All of the DOE Managers that completed this scale perceived this to be true.

CWI/IWTU

- Interviewees and observations by the Team indicated that safety issues are addressed regularly and that efforts are made at every meeting and activity to begin with a safety share.
- Several interviewees indicated that individuals are not afraid to use the step back/stop work process, e.g., craft identified a potential gas release issue in a work order and called for a step back; at least 6 different step backs were used during construction.
- Efforts in Voluntary Protection Program (VPP), COBRA (Changing our Behavior Reduces Accidents), reward programs, and management training were identified by interviewees as steps to improve safety performance.

- Some interviewees indicated that some procedures were changed to address safety concerns identified by operators, e.g., installation of scaffolding instead of ladders, un-insulated piping was barricaded.
- Some interviewees indicated that additional resources were provided when needed, e.g., Environment, Safety and Health positions, contractor support in Employee Concerns Program.
- Most management level interviewees indicated that they did not perceive a tradeoff between schedule and safety. While most acknowledged schedule pressure they did not perceive it to be at the expense of safety.
- Some interviewees indicated that there are bonuses for safety at the end of the year.
- The Team observed post maintenance testing on the Off gas Blower and saw clear examples of conservative decision making by the Maintenance Foreman. The Foreman ensured that all parties were engaged in asking questions and providing input towards the decisions that needed to be made.
- Results from the Behavioral Anchored Rating Scale on Time Urgency indicate that approximately 78% of CWI individuals that completed this scale perceive that most tasks are completed on time without compromising safety or quality. Managers perceived this to a greater extent than Non-Managers did.

Areas in Need of Attention

Idaho Operations Office/IWTU

- The Team believes that the low response rate on the part of the DOE Employees is an indication that the message to participate in the survey was not communicated well or perceived to be important enough for individuals to act upon. This reflects an attitude that has not been seen in other DOE sites evaluated to date. In addition, the data that was collected (45%) was fairly neutral, indicating less than highly prioritized perceptions and beliefs around many of the behaviors demonstrated to be important for a healthy organizational safety culture.
- Several interviewees indicated that they perceive that CWI is willing to accept increased risk because some safety improvements cost too much or would take too much time. Examples cited by the interviewees include:
    - Accelerated Retrieval Project (ARP) tents did not meet fire protection codes;
    - INTEC Communication System did not work;
    - Accepting radiological risk because of the short life time of the IWTU facility, e.g., the facility was not built using common ALARA practices. Contractor ORR did not identify all issues as perceived by DOE. However, the contractor's review (ESH and Rad Con) process was used to identify and document compensatory measures as to why risks were acceptable. DOE oversaw the process and ultimately resolved the issue by accepting that this documentation met the requirements of 10 CFR 835, subpart K.
    - Less than conservative decisions to get things done quickly, e.g., silicon controlled rectifiers, coal system.
    - Safety cannot really be the priority when there are issues like weld defects in the piping, seals and filters not functioning properly.
- Several interviewees also perceive that DOE was willing to accept the risk by allowing CWI to do these things.
- Some interviewees indicated that they have to do a lot of work to convince people within DOE that things are not as safe as they should be. They perceive that the basic assumption is that things are safe until proven otherwise. Interviewees indicated that this was not necessarily specific to IWTU but that schedule pressure was often cited as a reason for this philosophy.
- Some interviewees perceive limited time to complete some tasks and the work load then induces pressure which potentially impacts safety. For example, some interviewees stated that if the

schedule for reviewing safety basis documents is missed, documents are automatically approved increasing the pressure to turn more documents around. This was agreement negotiated with the contractor.

- Results on the Behavioral Anchored Rating Scale for Attention to Safety indicate that approximately 50% of the DOE Non-Managers that completed this scale provided a mid-range score which indicates that they perceive that project management reflects a delicate balance of emphasizing safety, while at the same time making it clear that there is a need to keep the project on schedule.
- Results from the Behavioral Anchored Rating Scale on Resource Allocation indicate that approximately 80% of the DOE Non-Manager interviewees that completed this scale are either uncertain or do not perceive that employees have sufficient resources to implement corporate goals nor do they perceive that the employees understand how these goals relate to their daily activities.

CWI/IWTU

- Many interviewees provided examples of where decision making was not perceived to reflect the highest commitment to safety.
    - CWI did not hold URS to the same standard that it would for other subcontractors because of their partnership.
    - URS put oversight people on the project and then did not back fill the oversight positions.
    - Piping in the building is not well labeled.
- Interviewees indicated that the facility was not built using common ALARA practices:
    - Unfinished floors
    - Facility is not partitioned to stop the spread of airborne contaminants
    - No decontamination sinks or showers
    - The Rad Con office is in a storage room
- Compensatory measures for the radiological issues are described by interviewees as not yet complete because of budget issues, e.g., opening the fence to INTEC for decontamination.
- Radiation Control Technicians were brought in late to the project, perceived by some interviewees to be because of budget concerns. Many interviewees have expressed concerns about their capabilities once the facility becomes radioactive.
- Operations personnel were brought in early. However, interviewees indicated that the poor quality of instructors, poor performance of simulators, heavy reliance on self-study, and lack of refresher training, is indicative of either budget issues or how the value of training is perceived by management.
- Interviewees describe that training is starting to slip because of budget issues. Lockout tag out (LOTO) training for planners has lapsed and consequently some jobs can't be walked down because they cannot sign in on a LOTO.
- Many interviewees described feeling a lot of time pressure with unrealistic schedules to meet and taking shortcuts and working outside of procedures to get things done quickly.
    - Interviewees indicated that threats were made by Senior Management for people to work beyond the overtime rules.
    - Some interviewees described managers pressuring them by indicating to them that if they didn't get things done on time that it would make the manager's job harder.
    - Several interviewees indicated that the pressure was not for critical equipment or personnel protection but so that Senior Management could get their bonuses.
    - Many interviewees indicated that they were afraid to challenge the work rules and would sometimes work 7 days a week.

- Interviewees expressed the perception that many of the issues that the project had during construction were because schedule was the issue and construction workers were pushed to work fast and cheap.
- The Team observed a significant amount of pressure being applied to the maintenance supervisors to replace the 260B Off-gas Blower seals since the failure of these seals was resulting in delays in start-up testing. A lot of pressure was coming from the IWTU Vice President's office to fix the seals and in fact inspection of the seals was to occur in his office.

- Results on the Behavioral Anchored Rating Scale for Attention to Safety indicate that approximately 42% of CWI Non Managers and 22% of CWI Managers that completed this scale provided a mid-range score, which indicates that they perceive that project management reflects a delicate balance of emphasizing safety, while at the same time, making it clear that there is a need to keep the project on schedule.
- Results on the Behavioral Anchored Rating Scale for Resource Allocation indicate that 60% of the CWI Non Managers and 32% of the CWI Manager interviewees who responded to this scale were either negative or uncertain in their perceptions of how resources are allocated across the project.
- Results on the Attention to Safety Scale on the electronic survey were on the moderate side of scores compared to a database of other similar organizations' responses to the same questions. This indicates that survey respondents had moderate perception of the importance that safety has to success in their organization as measured by the value placed on various safety promoting behaviors.

B.5.2 Problem Identification and Resolution

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

Positive Observations

Idaho Operations Office/IWTU

- Multiple mechanisms for identifying problems within the Site Office were described by interviewees including Operations Activities Team meetings, IPT meetings, DOE/Contractor meetings, facility representatives, Senior Management visible in the field, an open door policy with supervision and management.
- Interviewees indicated that they were encouraged to write up their assessments and put them in Pegasus.
- The Site Office is part of the VPP.
- Interviewees described the interface and support from DOE Headquarters, especially the Office of Safety in EM, as impressive in bridging the gap between the field and HQ.
- Data from the Behavioral Anchored Rating Scale on Problem Identification and Resolution indicated that 82% of the DOE Non-Manager Interviewee respondents who completed this scale provided a high rating indicating that they perceived that the organization encourages project personnel to draw upon knowledge, experience and current information to identify and resolve problems positively.

CWI/IWTU

- Most interviewees identified that multiple mechanisms exist within CWI to report problems and that people are generally willing to do so. Mechanisms described included management and supervision open door policy, safety shares, ICares, Employee Safety Teams (EST), pre-job briefs, COBRA meetings, verbal discussions, and ECP
- Interviewees indicated that negative observations entered into COBRA generally get a lot of follow up, e.g., access cover in the road, slippery concrete pad.
- Data from the Behavioral Anchored Rating Scale on Problem Identification and Resolution indicated that 100% of the CWI Manager and 92% of the CWI Non-Manager Interviewee respondents who completed this scale provided a high rating indicating that they perceived that the organization encourages project personnel to draw upon knowledge, experience and current information to identify and resolve problems positively.

Areas in Need of Attention

Idaho Operations Office/IWTU

- Several interviewees indicated that they believe that both DOE and the Contractor were not as diligent as they could have been during construction.
- Some interviewees expressed the belief that the DNFSB had the right to want more rigor from the Project, but they believe that they went overboard.
- Interviewees expressed the perception that there is weak oversight of the IPT on the Federal side and that there are different expectations for EM and for NE for project management. Additionally interviewees indicated that independent oversight is only from HQ – EM.
- Interviewees expressed concerns about the proficiency of the Rad Con technicians that had been brought in by CWI and hoped that they would improve over time.

CWI/IWTU

- Interviewees and observations by the Team did identify some problems with the problem identification and resolution processes at SBWTP that may inhibit a healthy safety culture.
    - Every item is urgent and there are always a lot of things on the critical path which increases the pressure not to add to the work load, especially if they are perceived to be lower level priority issues.
    - Interviewees indicated that it takes a long time to get things resolved.
    - The Team observed a discussion at the IWTU Corrective Action Board (CARB) Meeting about some new ICARES items resulting from DOE entries into Pegasus, as well as ORR observation or Facility Representative walk down items. The double entry of some items needs to be resolved.

B.5.3 Personal Accountability

All individuals take personal responsibility for safety.

Positive Observations

Idaho Operations Office/IWTU

- The interface between DOE-EM and DOE-NE through the AM for Nuclear Safety and Performance is described by most interviewees as good. Areas such as Fire Protection, Quality Assurance, Radiation Protection and Facility Representatives are managed such that there are no gaps in the Safety and Health area.

- Interviewees indicated that their position descriptions and technical qualification profiles are fairly generic and high level and correct at the level at which they are written.
- Interviewees perceive that DOE held CWI accountable during construction of the facility when CWI had to put in their own money to complete construction.
- Some interviewees also indicated that through quality control, from both the DOE and Contractor side, no issues should remain in the quality of the building from the work performed by those individuals involved in the substance abuse issue.

CWI/IWTU

- Most interviewees indicated that their job descriptions were fairly generic and therefore accurate for that level.
- Several interviewees indicated that CWI has a better relationship with the unions than URS did. They hold all employee meetings and discuss their strategy for certain company actions, e.g., downsizing.
- Interviewees described that DOE was very good at sharing resources across the NE and EM Offices, e.g., NE has better approach to oversight of safety, while EM has an approach to project management which NE did not have until recently.
- Accountability for safety is part of performance management which includes safety criteria.
- The Team observed accountability in the CARB Meeting where the Chair continually queried member on the status of their ongoing closure activities.
- Data on the Behavioral Anchored Rating Scale for Roles and Responsibilities indicated that 100% of CWI Manager interviewees who completed this scale provided a high rating indicating a perception that employees understand their duties, know who to go to when a task needs to be done and understand their role in completing cooperative activities.
- Data on the Behavioral Anchored Rating Scale for Performance Quality indicated that 75% of CWI Manager interviewees who completed this scale provided a high rating suggesting that they perceive that employees understand their duties and have a sincere desire to do top quality work. Among CWI Non-Manager interviewees approximately 60% perceived performance quality positively.

Areas in Need of Attention

Idaho Operations Office/IWTU

- Several interviewees indicated that there are different expectations between the DOE-EM and DOE-NE Offices on the project. DOE-EM is more hands on because their driver is the DNFSB. This has created double standards for the Site Office and the Project.
- Interviewees indicated that the relationship between CWI and URS created several issues for DOE on the project.
    - Towards the end of the construction phase of the project it was difficult for DOE to find a responsible party; CWI was the main contractor with URS as a subcontractor for construction. When URS safety disappeared, CWI safety was there but if DOE went to CWI they would often say that they were not responsible and that DOE should go to URS.
    - CWI provided the QA Manager, URS provided the inspectors. DOE was finding issues and asked why CWI QA wasn't finding the issues first.
    - No one would take ownership of doing good analyses, corrective actions, reporting in ORPS; CWI said it was URS' problem and URS was doing it with CWI employees; DOE eventually demanded that CWI take ownership for the ORPS entries.

- Interviewees indicated that there have been no employee concerns from IWTU, either on the Federal or Contractor side, which is unusual for a project of this size and duration. Concerns have been raised from other areas within ICP, but not from SBWTP.
- Data on the Behavioral Anchored Rating Scale for Performance Quality indicates that about 32% of the DOE Non Manager interviewees who completed this scale are either negative or uncertain in their perceptions that project personnel take personal responsibility for their actions and the consequences of the actions.

CWI/IWTU

- Accountability is perceived by several groups to be an issue during construction. Some examples include:
    - Lack of welding documentation; URS had good procedures but they were not followed because of a "production – get it done mentality"; reporting was on how many welds were completed every day, but welders did not complete paperwork to certify the welds.
    - Deficiency reports on work were written, but the IWTU Project Director did not perceive them to be a priority at the time; at one point there were 43 deficiency reports and at least one was a year overdue; accountability was not there until it was clear that resolving deficiency reports were essential for project completion (i.e. successful ORR).
    - During construction there were breakdowns in job execution and work control, e.g., a heavy shield door was tipped in an area where several people were working; no critical lift plan or work package was at the worksite, workers did not follow hold points while performing the task and no accountability was taken for how it happened. *(Note: refer to PAAA Notice of Violation issued on 10/3/11 to URS for event that occurred 10/4/2010 - telescopic hydraulic gantry system (THGS) tipped against building structure while lifting a 7,800 lb shield plug door at the SBWTP.)*
    - Often steps in the procedures cannot be followed as written because subject matter experts are not reviewing them.
    - Had to do a lot of rework during construction because of URS subcontract arrangement and the quality of the work could not be verified. Perception from a number of workers was that since URS was both the construction subcontractor and part of the IWTU project team that as a subcontractor they were less accountable than if another construction subcontractor had been hired who was not part of the IWTU project management team.
- Some interviewees perceive that the impact of several changes that have been made since passing the ORR may not be the best for the project, e.g., less experienced Rad Con Manager has been moved into the position; QA Manager is now moved into ICP rather than being dedicated to IWTU.
- Most CWI interviewees perceive DOE in an oversight role; some however see that DOE needs to support the project with DNFSB and EM-1.
- Data on the Behavioral Anchored Rating Scale for Roles and Responsibilities indicates that 40% of the CWI Non-Manager 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.
- Scores across SBWTP on the Commitment Scale from the electronic survey indicated that 70% of the Union, 62% of Non-supervisory, 40% of Management/Supervisor/Team Lead, and almost 30% of the Senior Management respondents were negative or uncertain in their commitment to the project. These differences were statistically significantly different and included both the DOE and CWI survey respondents.

B.5.4 Work Processes

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

Positive Observations

Idaho Operations Office/IWTU

- Interviewees described and the Team observed that DOE participates in the daily Plan of the Day Meeting where all ongoing and planned IWTU work activities are discussed.
- Interviewees described a lot of formalization – policy directives, office procedures, agreements which control work and outline roles and responsibilities.
- Interviewees indicated that all DOE Orders and Manuals are contained in the CWI Contract and clearly identify requirements for the project.
- Interviewees indicated that CWI and DOE work together to help resolve issues.
- Interviewees indicated that they were incredibly pleased with the support that the project receives from the Idaho Operations Office.
- Data on the Behavioral Anchored Rating Scale for Formalization indicates that 100% of DOE Manager and 68% of DOE Non-Manager 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.

CWI/IWTU

- Plan of the Day meetings were described by interviewees as a good way to plan out the day and work through issues.
- Interviewees described that through ISMS every piece of work is done with a piece of paper and that the project is integrated through that system.
- Interviewees indicated that all maintenance comes through INTEC and that non-shift individuals cover the day to day maintenance activities, while on shift covers the process.
- Interviewees pointed out that IWTU has its own dedicated planners.
- Some interviewees indicated that resources can be pulled from other projects in CWI if needed for IWTU.
- Data on the Behavioral Anchored Rating Scale for Coordination of Work indicates that 100% of the CWI Manager respondents to this scale have a positive perception of the planning, integration, and implementation of work activities of individuals and groups.
- Interviewees indicated that project work is performed with 3 types of procedures, in hand use, must be on the person, or reference.
- Interviewees indicated that if the procedure is unclear, work is stopped and the procedure is sent back to the planner. Initially this was common but the procedures have been improving.
- Most interviewees indicated that they perceive that verbatim compliance to standards and procedures is the underlying management expectation.
- Data on the Behavioral Anchored Rating Scale for Formalization indicates that 100% of CWI Manager and 82% CWI Non-Manager 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.

Areas in Need of Attention

Idaho Operations Office/IWTU

- Some interviewees perceived that the Documented Safety Analysis (DSA) for IWTU was inadequate and that DOE-EM did not know about it until after the ORR was complete. They stated that items were identified that needed to be fixed before startup.
- Interviewees indicated that most coordination of work is shifting often based upon the types of expertise that is needed and available.
- Data on the Behavioral Anchored Rating Scale for Coordination of Work indicates that only 50% of the DOE Non-Manager respondents to this scale have a positive perception of the planning, integration, and implementation of work activities of individuals and groups.

CWI/IWTU

- Many interviewees expressed concerns about the coordination of work with Rad Con in particular. Issues included:
    - Questioning their capabilities
    - Often holding up jobs because they are not ready or prepared
    - Communication channels are not always effective
- Interviewees indicated that many pre job briefings are held up because something else comes up and individuals leave. Prioritization of work needs to be clearer.
- Interviewees indicated that during construction a significant issue around work coordination was that work packages were not complete and not followed, issues were not closed out, and line management was not taking ownership of the issues.
- Interviewees indicated that procedural compliance was often lax during the construction phase and this was most likely due to that fact that the procedures were incomplete and being developed and because of schedule pressure they could not wait for the procedure to be issued.
- Data from the Coordination of Work Scale on the electronic survey indicated that there were statistically significant differences between the different CWI employee categories on this scale. Senior Management had significantly higher scores than respondents in the Supervisors/Managers/Team Leads, Non-Supervisory and Union categories.

B.5.5 Continuous Learning

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

Positive Observations

Idaho Operations Office/IWTU

- Interviewees indicated that CWI has a formal trend program that DOE observes. Positive and negative trends are identified, resolutions proposed, corrective measures are identified, and DOE can go back into the program and evaluate progress.
- Lessons learned from project related Occurrence Reporting and Processing System (ORPS) reports are available, Federal Project Directors talk with each other and there have been several workshops on lessons learned from the various projects at Headquarters.
- Concept of grooming is a good example of organizational learning that saved projects a lot of money; usually the process went from turnover to test; intermediate step of grooming allows the process to be exercised but not to take credit for it, or use for performance verification, rather use to find out all sorts of things about the process.

CWI/IWTU

- Interviewees identified a lessons learned program, e.g. supervisor identified a new hazard in the building, hot nitrogen and emailed information about it; portable johns were tied down due to high winds.
- Interviewees indicated that there is a draft document on the Integrated Waste Project which contains lessons learned, management self-assessments, independent expert reviews; and they will be videoconferencing with other sites to discuss.
- Data on the Behavioral Anchored Rating Scale for Organizational Learning indicated that 100% of CWI Manager and 60% of CWI Non-Manager interviewee respondents provided positive ratings suggesting that they believe that individuals and groups of employees pay close attention to past behaviors and how they can be improved in the future. They believe that information about past activities is formalized and available for future reference.

Areas in Need of Attention

Idaho Operations Office/IWTU

- Interviewees indicated that some DOE Orders have not been changed even as a function of information that provides a basis for change, e.g., DOE Order does not state that the Contractor Employee Concerns Program must be independent.

CWI/IWTU

- Interviewees indicated that in general IWTU does not do a good job in learning from successes since they perceive there have been so few.
- While many interviewees identified the concept of lessons learned, the organization is missing opportunities to use this information as part of a learning process. Perceptions provided by interviewees included:
    - Missed opportunity to visit the subcontractor facility and review their operation before awarding the contract for assembling the blowers and again when they rebuilt it after the seals failed the first time.
    - Doing an extent of condition on paperwork throughout ICP; did a horrible job on paperwork on IWTU; URS did not do a good job on paperwork during construction; CWI has not done good job either, so need to do root cause analysis and corrective action, as directed by DOE.
    - Have to do root cause analysis and corrective action on work planning as well.
- Interviewees indicated that there have been significant issues in training due to the pressures on the project, e.g., a lot of procedural steps that got bypassed or missed because they were not in training; job and task analysis didn't always align with job checklists.
- Some interviewees indicated that the poor quality of instructors, lack of refresher training, and heavy reliance on self-study is indicative of how the value of training is perceived by management.

B.5.6 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.

Positive Observations

Idaho Operations Office/Integrated Cleanup Project (ICP)/SBWTP

- Most interviewees clearly understand the mechanisms available to identify safety concerns, e.g., supervisors, managers, ECP, HR, and Hotline.
- Some interviewees perceive that CWI has a good Employee Concerns Program.

CWI/IWTU

- Most interviewees clearly understand the mechanisms available to identify safety concerns, e.g., supervisors, managers, ICARES, ECP, HR, and Hotline.
- Some interviewees indicated that they perceive that CWI has made efforts to eliminate or reduce the fear of retaliation through reminders via IClips, the ECP Manager spending more time in the field, and encouraging people to use different reporting routes.

Areas in Need of Attention

Idaho Operations Office/IWTU

- Some interviewees indicated that they have seen retribution on the contractor side in the past, not in IWTU but at other INL facilities, e.g., INTEC, ARP.
- Interviewees described that EM Contractors had twice as many employee concerns in the past year as NE contractors, 5 were from CWI, none of which were related to IWTU. Most of the concerns were around Human Resources/Management issues.
- Interviewees and observations by the Team indicated that the Headquarters ECP/EEO information is buried in ED (DOE's office of Economic Impact and Diversity) and that it doesn't get the recognition, visibility, or importance that it should.

CWI/IWTU

- Among CWI survey respondents, about 80% 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 still lower than is seen in other organizations and indicates that about 20% of the population did not fully agree with this statement (with 7% disagreeing and 13% being neutral on this statement).
- The statement on the electronic survey that management does not tolerate retaliation of any kind for raising concerns was agreed to by only 60% of the CWI survey respondents.
- Among CWI survey respondents only 52% of employees feel that they can openly challenge decisions made by management.
- Approximately 60% of CWI survey respondents believe that constructive criticism is encouraged.
- Approximately 68% of the CWI survey respondents agreed with the statement that they feel that they can approach the management team with concerns.
- Among CWI survey respondents 65% agreed with the statement related to management wants concerns reported.
- Approximately 60% of CWI survey respondents agreed with the statement that concerns raised are addressed.
- While there were no statistically significant differences among the SBWTP CWI Work Groups on any of the Safety Conscious Work Environment Questions from the electronic survey, the Maintenance and Operations Work Groups consistently had more negative responses to the questions.
- There were statistically significant differences between the SBWTP CWI Employee Categories on most of the Safety Conscious Work Environment Questions with Senior Management exhibiting more positive responses than the other categories of Supervisor/Manager/Team Lead, Non-Supervisory, and Union.

B.5.7 Effective Safety Communication

Communications maintain a focus on safety.

Positive Observations

Idaho Operations Office/IWTU

- Interviewees identified multiple mechanisms for communication in the ICP/SBWTP organization.
  - Frequent meetings are held with different organizations;
  - Direct interaction with individuals on the Federal and Contractor side;
  - Emails are used regularly for communication; and
  - Information through Plan of the Day meetings.
- Most interviewees indicated good communication and availability with DOE Headquarters personnel.

CWI/IWTU

- Interviewees identified multiple mechanisms for communication especially at the Division Level. They included:
  - Meetings
  - Emails
  - Telephone calls
  - Open door policy
  - Plan of Day Meetings
  - Face to face interactions
- Some interviewees indicated that they believe that they are well informed about what is going on in the Project.
- Interviewees identified that some organizational changes are effectively communicated, e.g., changes in the use of PPE were communicated via email, posted signage and in meetings.
- Observations by the Team indicated that communications among the Operations personnel during their activities was very good. Three way communication with acknowledgements were used and turnovers were conducted in a very professional manner.
- Data from the Behavioral Rating Scale on Communication indicated that 100% of the CWI Manager 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.

Areas in Need of Attention

Idaho Operations Office/IWTU

- Data from the Behavioral Rating Scale on Communication indicated that 68% of the DOE 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.

CWI/IWTU

- Several interviewees indicated that the amount of information that is received depends upon who you work for and where you work.
  - In Rad Con it is dependent on whether the individual is on shift or straight days, e.g., those on shift get a lot of information from work crew;
  - Some Rad Con foremen email instructions but the email doesn't get sent to those on straight days – ex. didn't know that shift crews were pulling CAM filters daily.
  - Interviewees indicated that the Rad Con Technicians don't always receive shift information, e.g., practiced posting of doors and provided survey data without doing full surveys; one day procedure changed and required full survey data but RCT crew didn't receive information, did not conduct full survey and got into trouble over it.
- Several interviewees indicated that it is sometimes difficult to focus and understand priorities, e.g. work crews are getting briefed while morning POD is going on, changes and redirections occur, accept and acknowledge but don't always get information in timely manner or understand why the change occurred.
- Observations by the Team of Operations and Maintenance activities during the off gas blower startup indicated a breakdown of communications between Maintenance and Operations concerning the increasing seal temperatures during the startup. Maintenance did not inform Operations of the rising temperatures over the span of the entire activity.
- Data from the electronic survey on several of the Communication Scales indicated that CWI SBWTP survey respondents had some of the lowest scores across the DOE database on their opinions about perceived Accuracy in Communication and overall Satisfaction in Communication.
- Statistically significant differences were obtained between CWI Employee Categories on the electronic survey on the Satisfaction in Communication Scale. Survey respondents in the Senior Management Category had significantly higher scores on their opinions about satisfaction in communication than respondents in the Supervisor/Manager/Team Lead, Non-Supervisory, and Union Categories. This was the trend across the other communication scales as well.

B.5.8 Respectful Work Environment

Trust and respect permeate the organization

Positive Observations

Idaho Operations Office/IWTU

- Some interviewees described good working relationships with the CWI Contractor Organization. Issues can usually be worked out before they become too problematic.

CWI/IWTU

- Interviewees indicated that the relationship between CWI Management and the union was cooperative. Meetings are held regularly to discuss issues and resolutions.

Areas in Need of Attention

Idaho Operations Office/Integrated Cleanup Project (ICP)/SBWTP

- While not able to draw organizational conclusions from the electronic survey data due to the overall low response rate (i.e., less than 50%) obtained among the DOE ICP/SBWTP survey respondents, those that did choose to take the survey indicated low scores on Job Satisfaction.

- Similarly the DOE survey respondents indicated low scores on their perceptions of Trust in Communication regarding the freedom they feel to discuss the problems and difficulties in their jobs with an immediate supervisor without jeopardy.

CWI/IWTU

- Results from the Communication Trust Scale on the electronic survey indicated statistically significant differences between work groups among CWI survey respondents. Respondents in the Support Work Group had significantly more negative perceptions regarding the freedom they feel to discuss the problem and difficulties in their jobs with an immediate supervisor without jeopardy compared to respondents in the Operations and Engineering Work Groups. While not statistically significant, respondents in the Maintenance Work Group had lower scores on this scale as well. This was the only scale on which CWI Work Groups statistically significantly differed from each other.
- Results on the electronic survey for CWI survey respondents indicated that overall job satisfaction scores were on the low end of the scores obtained in the database of other similar organizations.
- Results obtained on the Communication-Accuracy Scale from the electronic survey indicated that overall CWI survey respondents have negative perceptions of the accuracy of information that they receive from other organizational levels (superiors, subordinates, and peers).
- Results across the CWI organization indicate an overall gap between the perceptions of those in Senior Management versus all other employee categories, including those in the Supervisor/Manager/Team Lead category.

B.5.9 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.

Positive Observations

Idaho Operations Office/IWTU

- Interviewees indicated that line management is supportive of their identifying issues and deficiencies and documenting conditions and activities for follow up.

CWI/IWTU

- Some examples of fostering an environment where a questioning attitude is desired and accepted were described and observed by the Team. Observations of post maintenance testing on the off gas blower indicated that the appropriate personnel from operations, engineering and safety along with the maintenance technicians were involved in the decisions on how to execute portions of the test.

Areas in Need of Attention

Integrated Cleanup Project (ICP)/SBWTP

- Several interviewees indicated that they believed that DOE was sometimes compromising their oversight activities because of schedule and cost pressures. They believed this to be true especially during the construction phase of the project.

CWI/IWTU

- During this Assessment the Team identified several examples of the lack of a questioning attitude.
    - During the crew and pre-job briefings it was clear that the 260B seal would be taken to the IWTU Director's office where the vendor would perform the seal inspection. However, no one ever questioned why it was necessary to perform this inspection in the Director's office since there were closer more suitable locations in which to conduct this work.
    - During set up of the spider crane, a loud audible alarm (over 95dBA) was actuated and maintained for approximately a 10 minute period. No questioning or discussion of this noise hazard or the use of hearing protection was evident. However, later in the day when the operation of the same crane produced a more modest noise level, everyone was required to wear hearing protection. The operating noise level had been identified in the work package, but not the noise level associated with the equipment alarms.
    - Two lapel monitors for heavy equipment operators to wear to measure their exposure to ambient gas levels were calibrated for nitrogen instead of carbon monoxide. In the haste to grab the monitors, the foreman never checked or questioned if he had the correct monitor.
    - During the seal removal task, Foreign Material Exclusion (FME) controls were required to ensure that no materials entered the blower during maintenance. Two FME subject matter experts attended the pre-job briefing and were assigned to establish the boundary and monitor the work area. When questioned by the Team they could not identify the criteria or trigger for when FME was required and indicated that it was at management's discretion.

B.6 References

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Independent Oversight Assessment of Safety Culture at the U.S. Department of Energy Office of Environmental Management Headquarters

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Independent Oversight Assessment of Safety Culture at the U.S. Department of Energy Office of Environmental Management Headquarters

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Appendices

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Appendix B: Independent Evaluation of Safety Culture at the U.S. Department of Energy Office of Environmental Management Headquarters B-1

Acronyms

BARS	Behavioral Anchored Rating Scales
DNFSB	Defense Nuclear Facilities Safety Board
DOE	U.S. Department of Energy
EM	U.S. Department of Energy Office of Environmental Management
EM-HQ	U.S. Department of Energy Office of Environmental Management - Headquarters
HSS	Office of Health, Safety and Security
NRC	Nuclear Regulatory Commission
WTP	Waste Treatment and Immobilization Plant

1. Introduction

The U.S. Department of Energy (DOE) Office of Enforcement and Oversight (Independent Oversight), within the Office of Health, Safety and Security (HSS), conducted an independent assessment of the safety culture[1] at the DOE Office of Environmental Management (EM) – Headquarters (EM-HQ). The primary objective of the evaluation was to provide information regarding the status of the safety culture at EM-HQ. The data collection phase of the assessment occurred in April and May 2012.

The EM mission is to complete the safe cleanup of the environmental legacy brought about from five decades of nuclear weapons development and government-sponsored nuclear energy research. EM has management responsibility for several site offices and major DOE sites, including various cleanup sites, operating facilities, and construction projects.

The Defense Nuclear Facilities Safety Board (DNFSB) issued DNFSB Recommendation 2011-1, *Safety Culture at the Waste Treatment and Immobilization Plant*, on June 9, 2011. In the Department's Implementation Plan dated December 27, 2011, the Secretary of Energy directed HSS to perform safety culture assessments of five major ongoing large nuclear design/construction projects to determine the extent of condition of safety culture concerns such as those identified at the Hanford Site Waste Treatment and Immobilization Plant (WTP). EM has line management for two of the five other ongoing large nuclear design/construction projects cited in the Secretarial commitment: the Salt Waste Processing Facility Project at the Savannah River Site and the Sodium Bearing Waste Treatment Project at the Idaho Site. HSS, in coordination with EM, decided to also perform a safety culture assessment of the EM-HQ organization because of its line management role for the WTP and two other large nuclear design/construction projects.

Before starting the assessment, HSS enhanced its capability to assess safety culture processes and capability, through consultation with the U.S. Nuclear Regulatory Commission (NRC), several nuclear power generating utilities, and associated support organizations to benchmark their processes. Recognizing that it has significant expertise in nuclear safety and issues management but limited on-staff expertise in systematic application of behavioral science-based methodologies for performing safety culture assessments, HSS contracted with an external company that specializes in human performance analysis to support the data collection and analysis efforts.

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

2. Scope and Methodology

This Independent Oversight assessment covered EM-HQ including Federal employees and contractor personnel assigned to support EM-HQ. Many of the EM personnel at site offices and contractors supporting EM at major construction projects are covered by the safety culture assessments of WTP and EM's two other ongoing large nuclear design/construction projects.

An experienced HSS manager led the assessment. To ensure a valid and effective assessment of the existing safety culture, HSS used external independent safety culture experts to analyze various sources of data and perform an independent evaluation. The independent safety culture experts have extensive experience in the development and application of safety culture assessment methodologies used by commercial nuclear and other industries. Onsite data collection was conducted by a team consisting of HSS personnel and an external independent safety culture expert. Appendix A provides additional information about the composition of the Independent Oversight team, including the credentials of the independent safety culture experts.

With the guidance of the external independent safety culture experts, the Independent Oversight team selected a methodology for the assessment that provides an objective and systematic measurement of the organizational behaviors that impact safety performance, using multiple data collection tools to assess organizational behaviors. These tools include functional analysis, semi-structured focus group and individual interviews, observations, and behavioral anchored rating scales.

The Independent Oversight team also arranged for the external independent safety culture experts to conduct a culture survey for project personnel using commonly used survey tools and techniques. The culture survey was conducted and analyzed by the external independent safety culture experts. The population sampled in the survey included EM-HQ Federal and contractor employees.

The evaluation was conducted using the same methodology that aligns with the current NRC procedures for independent safety culture assessment, which identifies nine traits that are viewed to be necessary in the promotion of a positive safety culture:

- 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.

HSS tasked the independent safety culture experts to analyze the data collected during the assessment in accordance with their established methodology. Appendix B provides additional information about the methods and framework for the safety culture assessment.

3. Results and Conclusions

The safety culture evaluation performed by the external independent safety culture experts is provided in Appendix B, which provides positive observations and identifies areas in need of attention for each of the nine traits of a healthy safety culture. The independent safety culture experts evaluated the collective results to formulate conclusions about the status of the safety culture to facilitate the identification of improvement strategies. The remainder of this section presents the conclusions of the independent safety culture experts as they apply specifically to EM-HQ.

Efforts by the new senior management of EM-HQ are clearly being recognized by the organization. The reorganization of the Office, the Employee Improvement Teams, the Integrated Project Team Approach and more open communication and accessibility were identified by most interviewees as new and positive initiatives towards changing the work environment.

There is a very narrow focus within EM-HQ as to what safety means. Most interviewees during this assessment assumed industrial safety when discussing safety. The lack of visibility and importance of the DOE ECP combined with a poor sense of ownership and accountability for safety is problematic. Most interviewees believe that EM-HQ's Office of Safety, Security, and Quality Programs (EM-40) is solely responsibility for safety.

There is a strong sense of pressure within EM-HQ of being driven by external stakeholders. Consequently there has been a shift in the relationship with the sites to facilitate the meeting of deliverables. EM-HQ is now focusing on assistance, advocacy, and assessment as compared to its greater emphasis on the oversight function in the past. While some oversight remains through assessments, it is more collaborative than in the past. Combined with their concerns that the Office of Health, Safety and Security has not been as conservative in its policy and oversight roles as it should, there is a perceived sense by some EM-HQ staff that insufficient oversight is being conducted by EM-HQ and DOE HQ in general over the field activities.

The data collected during this assessment indicates a homogeneous organization with respect to the perceptions and beliefs across the EM-HQ Organization. The lack of statistically significant differences across work groups and employee categories on most of the measures being evaluated is indicative of a pervasive culture. Combined with the perception by employees' sense of tenuousness with several managers in acting positions, and the reductions in staffing mandated by budget decisions, the effective implementation of many of the new initiatives (cited above) in EM will be a challenge.

4. Recommendations

A healthy safety culture is most often found within an aligned organization that has effective processes, and motivated people. The following recommendations provide EM-HQ with initial steps that the Independent Safety Culture Evaluation Team believes are necessary to effectively implement and execute actions that will result in improved safe and reliable performance.

1. As the EM Organization transitions into its new structure, it should seek to provide more clarity regarding the roles and responsibilities of each of the Office's units. More formalization around the processes and procedures that are expected would also be beneficial for those trying to implement new initiatives. The oversight function in particular should be clearly identified and defined going forward.

2. EM-HQ Senior Management should make a concerted effort to broaden the understanding of how safety is defined and how it applies to all aspects of the Office's activities. The internalization of a healthy safety culture will only be accomplished when the role of safety is understood as a way of doing business, regardless of what the business is.

3. While not an issue necessarily specific to EM-HQ, as a major office in DOE there should be an effort to support the need for greater visibility, promotion, and acceptance of an Employee Concerns Program (ECP) for HQ.

EM-HQ should evaluate the results of this Independent Oversight safety culture report in its entirety, including the Positive Observations and Areas in Need of Attention provided in Appendix B, and the above conclusions and recommendations. In addressing improvements, the Areas in Need of Attention should be considered and used as examples for an action that would address a behavior that would help several if not all of these points. Developing a massive amount of corrective actions may perpetuate a compliance mentality, which is not conducive to creating and promoting a healthy safety culture; thus efforts to assure that there is a traditional corrective action associated with each Area in Need of Attention may be counterproductive. To the extent that corrective actions are identified for specific recommendations, it is recommended that they be managed in accordance with established causal analysis and issues management processes and initiate appropriate, processes as appropriate.

Appendix A
Supplemental Information

Appendix A
Supplemental Information

Dates of Review

Scoping Visit	March 16, 2012
Onsite Data Collection:	May 14-18, 2012
Survey Open Period	April 11-27, 2012
Closeout:	July 6, 2012

Office of Health, Safety and Security Management

Glenn S. Podonsky, Chief Health, Safety and Security Officer
William A. Eckroade, Principal Deputy Chief for Mission Support Operations
John S. Boulden III, Director, Office of Enforcement and Oversight
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Support

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Independent Safety Culture Experts

Dr. Sonja Haber, Independent Safety Culture Expert
Dr. Deborah A. Shurberg, Independent Safety Culture Expert

Expertise and Credentials of the Independent Safety Culture Experts

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

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

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

The principals are:

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

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

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

Appendix B

An Independent Evaluation of Safety Culture at the U.S. Department of Energy Office of Environmental Management Headquarters

Independent Safety Culture Evaluation Team:

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

Appendix B
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B.1 Introduction

This Appendix describes the results of an independent evaluation of the existing Safety Culture at the Department of Energy (DOE) Headquarters Office of Environmental Management (EM-HQ). The population of the evaluation was all employees, federal and long-term (worked on a regular basis for greater than six months) contractors, assigned to EM-HQ. The evaluation was conducted during April and May 2012. The primary objective of the evaluation was to provide information regarding the status of the safety culture traits at EM-HQ.

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. The detailed results presented in this Appendix support the summary results and recommendations provided in the main report.

B.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 U.S. Nuclear Regulatory Commission (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.

B.3 Scope of Safety Culture Evaluation

The scope of this evaluation was defined to include all employees, federal and long-term contractors, assigned to EM-HQ. The Safety Culture Data Collection Team was on site at EM-HQ during May 2012. 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 April 10 to 27, 2012.

The Safety Culture Data Collection Team was used by the Independent Safety Culture Evaluation Team to assist in collecting onsite data and included HSS personnel from the Office of Enforcement and Oversight and the Office of Environmental Protection, Sustainability Support & Corporate Safety Analysis. The HSS staff had been trained on applying data collection techniques and conducting focus group interviews.

This safety culture evaluation is a 'point in time' snapshot of the EM-HQ. Although the team recognizes that the EM-HQ 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.

B.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.

B.4.1 Functional Analysis

The purposes of the Functional Analysis are to: (1) clearly identify the organizational units of EM-HQ, (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.

Documentation Review

During the Data Collection Team's activities, a wide variety of documents were reviewed including DOE orders, policies, and program documents related to the scope of the evaluation. EM-HQ organizational charts, interoffice memoranda, and applicable standards were also reviewed.

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; Resource Allocation; 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 Questions from electronic survey
- Effective Safety Communication - Communication
- Respectful Work Environment – Communication Trust Scale from electronic survey
- Questioning Attitude – Attention to Safety.

B.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 20 individual interviews and 8 focus groups were conducted as part of the assessment. A total of 59 individuals were involved in one these activities, with 20 individuals being individually interviewed and 39 participating in focus groups. Each interview lasted one hour and each focus group lasted approximately one and a half hours. A few less formal follow-up interviews were conducted to provide further clarification when necessary.

The Behavioral Anchored Rating Scales (BARS) were administered to most individuals who participated in the structured interviews and/or focus groups. 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 234 BARS were collected representing 10 organizational behaviors.

B.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, a few observations were conducted. The data represent observations from the EM Weekly Meeting with the Deputy Assistant Secretaries, an EM-41 Office Director Meeting with Staff, and an EM-1 Operations Meeting.

B.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. Portions of the survey used in this evaluation have been administered previously by the Independent Safety Culture Evaluation Team Lead at over 50 different organizations.

A total population of approximately 406 personnel was invited to participate in the survey of which 285 actually completed the survey, representing a response rate of 70.2%**.** While this response rate is considered to be acceptable for the purposes of drawing representative conclusions regarding perceptions and attitudes about the work environment, there was one DOE-EM-HQ Office which had a response rate of 44.9% (EM-70), as well as two additional DOE- EM Offices which had response rates of 61% and 61.6% (EM-60 and EM-50, respectively). Lower than desirable response rates in these offices indicate that conclusions drawn from the survey data for these three offices should be interpreted cautiously.

B.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. The results are presented in terms of the Safety Culture traits. 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 improvements, the Areas in Need of Attention should be considered and used as examples for an action that would address a behavior that would help several if not all of these points. It is not the intention that each Area in Need of Attention result in a corrective action as would occur with an Area for Improvement. Developing a massive amount of corrective actions only perpetuates a compliance mentality, which is not conducive to creating and promoting a healthy safety culture.

B.5.1 Leadership Safety Values and Actions

Leaders demonstrate a commitment to safety in their decisions and behaviors.

Positive Observations

- Several interviewees provided indications of their perception that the current EM Senior Management is more committed to safety than the previous management was. Examples included:
  - Safety is now listed as the number one goal in EM's Annual Performance Plan; it had previously been listed as the fifth goal;
  - There is a perception that safety has become the first concern, ahead of production.
  - Everyone is encouraged to be responsible for safety.
  - Efforts are being directed at putting a balance on project management to be based on quality and safety versus cost and schedule.

- No undue pressure by management.
- While schedule pressure always exists, it is the response that indicates the appropriate balance; an appropriate response was perceived to be made at IWTU by slowing down the project to better understand the issues.
- Input from the field was requested to engage more people in the overall EM budget position and to encourage thinking about more than just their particular site.

- Interviewees indicated that performance management plans have a safety expectation to be graded.
- Some interviewees indicated that if management is kept informed of deadlines that may be missed, there are no negative repercussions, e.g., correspondence deadlines with the Defense Nuclear Facilities Safety Board.
- Some interviewees perceive the role of EM-HQ to isolate the sites from the time pressures that HQ has; consequently, they believe that the sites do not perceive the pressure for information.
- Interviewees recognize that more resources are needed on the federal side for oversight of safety, work planning and work control at the sites.

Areas in Need of Attention

- Many interviewees expressed a very narrow focus of safety. Examples included:
  - Some Senior Managers indicated that they do not perceive that they have any direct responsibilities for safety and that the site representatives have the interest in following safety issues.
  - There is a pervasive belief that EM-40 owns safety and that the Mission Units do not fully understand their roles and responsibilities with respect to their interactions and integration with the field.
  - There is the perception that there are no safety issues at HQ, only building safety issues.
  - Interviewees in some Mission Units don't perceive that they have a direct impact at the sites with respect to day to day safety operations, but rather have oversight and indirect impact on safety through DOE Orders.
  - Interviewees that do not have direct contact with the field do not perceive a role in addressing safety.
  - Some interviewees did not understand why this assessment was being done at HQ.
  - Some interviewees perceive that HQ is about policy and resources and that work is done by contractors, so safety incidents are by contractors, not by the federal employees.
  - There is the perception that only the EM-40 has the responsibility to implement the recommendations from the DNFSB.
- Statistically significant differences were obtained between the EM-HQ Work Groups on the Perception of Hazard Scale. Respondents in EM-40 had significantly higher scores on this scale than any of the other groups supporting the idea that others perceive EM-40 as responsible for safety.
- Several interviewees indicated that their informal relationship to EM-40 based upon their knowing or having worked with individuals in the office has been the mechanism that has gotten the office involved with appropriate issues, e.g., WTP conference calls on the status of the implementation of the DNFSB's recommendations.
- Some interviewees do not perceive that the Office of Health, Safety and Security has been conservative enough in its policy and oversight roles with respect to safety issues because of the production mentality of the PSOs. An example concerning deposition velocity was described which basically was perceived as HSS not promoting a conservative approach to the issue.
- Some interviewees indicated that EM-HQ has not done a good job at managing differing professional opinions (DPOs) and some have the perception that consensus thinking has become too much of a value. Some individuals described examples of how the DPO process has been perceived to be used to allow the sites to do what they want instead of what might be technically supported.

- Many interviewees perceive that there are too many urgent deadlines on too many things. Some examples provided include
    - Deadlines in support of Recommendation 2011-1 are superseded by demands of EEOC (U.S. Equal Employment Opportunity Commission) which take priority over DOE ECP because of the potential consequences that can be issued to DOE by EEOC for lack of timely action.
    - Response to requests from external stakeholders and senior management. Things have to be done immediately or sooner.
- Many interviewees indicated that the Waste Treatment Plant Project is significantly impacting all decision making within EM and the significant 2 million dollar per day expense of WTP is pulling resources away from other areas.
- Interviewees expressed the belief that there is an honest desire to do a risk based budget but that politics plays the significant role in budget decisions. e.g., the belief that the Paducah decision was more about jobs than risk reduction.
- The Team believes that the minimally acceptable response rate to the survey and issues with getting participation in some interviews and focus groups are indications that the message to participate in the assessment was not communicated well or perceived to be important enough for individuals to act upon.
- Results on the Behavioral Anchored Rating Scale for Attention to Safety indicate that approximately 28% of the EM-HQ Non-Managers that completed this scale had negative perceptions about the value of safety in the organization and an additional 45% of the EM-HQ Non-Managers that completed this scale provided a mid-range score which indicates that they perceive that project management reflects a delicate balance of emphasizing safety, while at the same time making it clear that there is a need to keep the project on schedule. Among EM-HQ Managers completing this scale 82% perceived that safety is clearly understood to be a priority for the organization.
- Results from the Behavioral Anchored Rating Scale on Resource Allocation indicate that 100% of the EM-HQ Non-Manager interviewees that completed this scale are either uncertain or do not perceive that employees have sufficient resources to implement corporate goals nor do they perceive that the employees understand how these goals relate to their daily activities. Among EM-HQ Managers approximately 33% had negative perceptions about the allocation of resources.
- Results from the Behavioral Anchored Rating Scale on Time Urgency indicate that approximately 52% of EM-HQ Managers individuals that completed this scale perceive that most tasks are completed on time without compromising safety or quality. EM-HQ Non-Managers perceived this to a slightly greater extent than Managers did.
- Results on the Attention to Safety Scale on the electronic survey were on the low side of scores compared to a database of other similar organizations' responses to the same questions. This indicates that survey respondents had a more negative perception of the importance that safety has to success in their organization as measured by the perceived value the organization placed on various safety promoting behaviors.

B.5.2 Problem Identification and Resolution

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

Positive Observations

- Multiple mechanisms for identifying problems within EM-HQ were described by interviewees including:
    - Staff Process Improvement Teams,
    - Ombudsman,

- All hands meetings,
- Facility representatives,
- Dialogue with Senior Management,
- Individual dialogues,
- DPO,
- ECP,
- HSS,
- ORPS Reports,
- Suggestion box,
- Leadership by example,
- Email, etc.

- Some interviewees indicated that there was nothing to inhibit the identification of problems.

Some interviewees indicated that while the DPO process at HQ was fairly new for EM, they think it is pretty good. It represents the first time that workers have been encouraged to put in writing differences in opinion regarding decisions that have been made, e.g., Tank and Tank Waste Management – EIS in work for 9 years; DPO on SRS Tank Closure.

Areas in Need of Attention

- Interviewees identified some issues that might inhibit the identification of problems or concerns. These included:
  - A lack of trust;
  - A perception that there is a lack of leadership competence to deal with problems identified;
  - Concern over how a manager will respond to the messenger raising issues;
  - Different priorities within the organization;
  - Some DPOs have not been addressed;
  - A lack of feedback drives behavior not to raise any more issues;
  - The perception that the culture is not conducive to being open about problems;
  - Overload of information and the issues get lost;
  - Perception that if you raise problems you are a whistleblower or troublemaker;
  - Some individuals are not comfortable identifying issues, e.g., at the AM meeting nobody raised the issue that the reorganization is not working, yet people have said that and believe that;
  - Lack of ownership of issues in the field;
  - Being a team player and not wanting to be outside of the group;
  - Group think; and
  - Consensus making behavior.
- Interviewees indicated that they perceive issues with the DPO process that may be inhibiting its effectiveness. These include:
  - People are not as proactive about the DPO process as they should be and that they are happy to have one individual responsible for it;
  - It seems to be a slow process;
  - Some perceive it to be used as a means to get back at management.
- Some interviewees believed that plans are developed to address problems and then they are closed without being fully evaluated or tested, e.g., at WTP there were 17 major issues, 11 secondary issues, plan was developed and then all were closed, including the mixing issue which was never fully tested because of concerns over schedule.
- Interviewees indicated a lot of talk about an open reporting culture and yet several individuals identified that within EM they believe that if you raise an issue above your supervisor it is considered insubordination.
- Data from the Behavioral Anchored Rating Scale on Problem Identification and Resolution indicated that only 50% of the EM-HQ Manager and 33% of the EM-HQ Non-Manager interviewee respondents who completed this scale provided a high rating indicating that they perceived that the

organization encourages project personnel to draw upon knowledge, experience and current information to identify and resolve problems positively.

B.5.3 Personal Accountability

All individuals take personal responsibility for safety.

Positive Observations

- Many interviewees indicated that the reorganization of EM, while still in the learning mode, was creating good opportunities for accountability. Examples included:
  - Empowering individuals at all organizational levels to make decisions;
  - The ADAS' are new positions and have a strong sense of empowerment to take ownership and accountability for day to day activities;
  - EM-HQ has new roles to advise, support and assist the field offices, delegating authority down and out to the field;
  - Creation of the Employee Improvement Teams;
  - Process reviews that will put processes in place that make sense and are usable;
  - Reinstatement of the programmatic role in EM;
  - Communication from Senior Management that will help create trust which in turn will help improve quality, and;
  - Performance elements that will follow DOE Safety Standards.
- Interviewees indicated that the relationship with the union is good right now.
- Many interviewees indicated that, everybody is supportive of the EM Senior Advisor and implementing the approach that is being promoted.

Areas in Need of Attention

- Several interviewees indicated that DOE and the contractors are not always working to the same standards, e.g. SWPF the welds are blemished; the contractor said they were okay, the project office said it was not acceptable.
- Interviewees indicated that EM-HQ has several issues with oversight including;
  - Concern that the sites are structuring oversight based on resources, rather than on what needs to be audited;
  - More reviews and oversight are needed, especially on smaller projects;
  - The role of HSS is often as a resource in assessments and accident investigations, rather than as a true oversight group;
  - The perception that there is a lack of independence from the contractor on the reviews of safety, e.g., external audits versus internal reviews;
  - Lack of ownership and initiative on oversight, e.g., SPRU issues with lack of oversight on contamination incident;
  - The perception that oversight has to be legislated; and
  - The question of who is doing oversight in HQ of HQ.
- Data on the Behavioral Anchored Rating Scale for Performance Quality indicates that about 85% of the EM-HQ Manager and 100% of the EM-HQ Non-Manager interviewees who completed this scale are either negative or uncertain in their perceptions that project personnel take personal responsibility for their actions and the consequences of the actions. Perceptions of Performance Quality across EM-HQ were the lowest of all the behaviors evaluated.
- Accountability is perceived by several groups to be an issue at EM-HQ especially with respect to roles and responsibilities. Some examples include:

- Perception that DOE has not defined what they want with the new reorganization and need to define roles and responsibilities better.
- Perception that nobody in DOE political positions wants to deal with nuclear safety issues.
- DNFSB recommendations are a moving target; previously closed issues are reopened, e.g., WTP, some sites have DNFSB presence, others don't.
- The roles of the Office of Safety in EM and the Office of Health, Safety and Security are perceived to be unclear and there is a lack of leadership around safety and security.
- Across Mission Units, some confusion exists in terms of responsibilities, e.g., EM-10 and EM-20 on the National Environmental Protection Act which has a large impact on the EIS.
- Some interviewees indicated that it is not clear at which level EM-HQ engineers interact with the field offices.
- EM-70 is responsible for workforce planning and yet has not been actively involved in recent efforts.
- Not all Mission Units understand their relationship with the Office of Safety.
- Some interviewees indicated that people within EM have responsibilities but not necessarily the competency to make the decisions and understand the information to make the decisions, e.g. TQP – difficult to figure out what is required of position and the perception that the process is being neglected by DOE-EM Management.

- Data on the Behavioral Anchored Rating Scale for Roles and Responsibilities indicated that 50% of EM-HQ Manager and 68% of EM-HQ Non-Manager interviewees who completed this scale provided a low or mid- rating indicating a perception that employees do not or may not understand their duties, know who to go to when a task needs to be done or clearly understand their role in completing cooperative activities.
- Scores across EM-HQ on the Commitment Scale from the electronic survey were low in comparison to similar organizations that took the same survey.

B.5.4 Work Processes

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

Positive Observations

- Interviewees described and the Team observed that EM-HQ Management holds regularly scheduled meetings to communicate status and discuss issues around the complex. In some cases there are formal agendas, time management of the meeting, and good participation by all parties in the room.
- Interviewees indicated that EM-HQ Security uses HSS policies and standards to conduct its activities.
- Interviewees discussed the development of a new Information Technology System – Environmental Management Electronic Records System (EMERS) to formalize procedures, similar to the Office of Science's Standards-based Management System (SMS).
- Several interviewees indicated that management supports following procedures and holding individuals accountable to do so.
- EM-HQ employees indicated that they were encouraged to set up Project Teams for inter-office coordination.
- In the reorganization EM-30 acquired 3 program elements, with 3 Offices. Initiated interdisciplinary teams for all sites at HQ and they are working across offices – Integrated Project Team approach.
- HQ ECP is more active now in communicating and supporting the field ECPs.
- Interviewees indicated that EM-40 has assigned a POC to each Mission Unit.

Areas in Need of Attention

- Interviewees described a lack of formalization – policy directives, office procedures, agreements which control work and outline roles and responsibilities across the EM Organization. Examples included:
  - Some interviewees indicated that despite working in EM for several years they were not aware that the organization had operating procedures.
  - Several interviewees indicated that they were not sure that the procedures that do exist apply to the work that they do.
  - Some interviewees indicated that even where there are procedures on contract reviews and correspondence, no one really uses them. Most of the procedures are expert based rather than highly circumscribed.
  - Field ECP procedures are being used to develop a HQ ECP Procedure and to review the field procedures.
  - Some offices, e.g., Budget, are perceived to need more procedures.
- Interviewees indicated that a new process for serving customers, issuing tickets, has been implemented in EM -70 that is perceived to be demeaning to the employees that have to use it.
- Several interviewees indicated that they depend upon the EM-40 to ensure that the right things about safety are in the contracts.
- Some interviewees indicated that there are issues in the coordination of work between the site offices and EM-HQ with respect to timely decision-making, e.g., employees' opinion of a prime example was Mound's dislike of their instate agreement; site office wanted a letter from HQ that indicated it was not a site office decision but rather from HQ.
- Many interviewees agreed that the issues with coordination of work are the interfaces between units and that is because they are always reacting to or dealing with items that need their immediate attention.
- Data on the Behavioral Anchored Rating Scale for Formalization indicates that 75% of EM-HQ Manager and 72% of EM-HQ Non-Manager Respondents to this scale have a negative or neutral perception of the extent to which there are well-identified rules, procedures, and/or standardized methods for routine activities as well as unusual occurrences.
- Data on the Behavioral Anchored Rating Scale for Coordination of Work indicates that 72% of the EM-HQ Non-Manager respondents to this scale have a negative or neutral perception of the planning, integration, and implementation of work activities of individuals and groups. Among EM-HQ Managers who responded to this scale 68% had a positive perception about the coordination of work.
- Data from the Coordination of Work Scale on the electronic survey indicated that while there were no statistically significant differences between the different EM-HQ employee categories on this scale, the overall score was lower than for similar organizations that have taken the same survey.

B.5.5 Continuous Learning

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

Positive Observations

- Interviewees indicated that there is an effort to get back to where things can be done more routinely across the sites so that the sites can help each other.
- Some interviewees indicated that EM-HQ does communicate its successes, e.g., recognition of individual employees by Senior Management to staff.
- Interviewees described situations in which lessons learned have been communicated:
  - SPRU did a case study on what led to the contamination event;
  - Good collaboration with the field on the ARRA projects which went well;

- On the Acquisition side there is a retrospective process which describes what worked, what didn't work, lessons for training, internal portal for sharing, define and make changes to process to improve it;
- WIPP M & O Contract was awarded 5 months ahead of schedule by reducing the amount of information that had to be submitted by the contractor.

Areas in Need of Attention

- Interviewees perceive that EM does not do a good job of going back and re-examining situations for the lessons learned, e.g., explosion at Hanford in 1998 shut down the facility; never went back to look at examination of safety and there was another explosion 3 years later.
- Several interviewees identified that there has been a fundamental assumption in EM to go down a path and never re-examine if it is the right one because there won't be a way to deal with changing the direction.
- Some interviewees indicated that the political impact on budgets results in a lack of accountability so there is no motivation to try to learn and do things differently.
- While many interviewees identified the concept of lessons learned, they perceive that the organization is missing opportunities to use this information as part of a learning process.
  - Lessons learned at DWPF at SRS were captured, but people generally don't look at them; the senior individual from DWPF was sent to WTP to run the project but inherited the design so lessons learned could not be applied.
  - Lessons learned are informal; individuals indicated that there is no well-defined process for self-improvement.
- Data on the Behavioral Anchored Rating Scale for Organizational Learning indicated that 100% of EM-HQ Manager and 68% of EM-HQ Non-Manager interviewee respondents provided negative or neutral ratings suggesting that they do not believe that individuals and groups of employees pay close attention to past behaviors and how they can be improved in the future. They do not believe that information about past activities is necessarily formalized and available for future reference.

B.5.6 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.

Positive Observations

- Most interviewees indicated that there are multiple mechanisms available to identify safety concerns, e.g., supervisors, managers, Ombudsman, HR, and Hotline.
- Some interviewees indicated that they don't perceive a fear to raise concerns now and that people are more comfortable with the new management.
- Most interviewees were aware of the EM-HQ Ombudsman.
- Efforts were described to work with the Richland Office on their ECP since the ORP and RL ECP were combined.

Areas in Need of Attention

- Some interviewees indicated that they perceive there is a fear of retaliation among some groups in EM-HQ. Moving people out of their jobs, freezing them out of information, lowering their performance appraisals, and even termination of employment were cited as examples of perceived retaliation.

- Interviewees and observations by the Team indicated that the DOE-HQ ECP does not appear to be an effective program. Examples included:
  - Many interviewees were not clear about whether EM-HQ had its own ECP and if so where it was located.
  - DOE-HQ ECP/EEO information is buried in the Office of Economic Impact and Diversity (ED) and it does not get the recognition, visibility or importance that it should.
  - Many interviewees were not even aware that HQ had an ECP and efforts by the Team to contact the office were basically unsuccessful.
  - DOE-HQ ECP focuses on support and guidance for the field ECPs.
  - DOE-HQ ECP had no direct knowledge of the status of EM-HQ safety culture or EM-HQ safety concerns.
  - DOE-HQ ECP was contacted by EM last year to establish an alternative method to report concerns and that process is still in development by EM and DOE-HQ ECP is not involved.
  - An ECP survey was conducted in 2008 across the DOE Complex and the results were just recently issued to contractors and DOE Field ECP Staff; training on ECP is scheduled for August 2012.
  - There is the belief that the nature of the work at HQ creates less demand for an ECP than the work conducted in the field.
  - There is a perception that there are no real ECP concerns at HQ because the HQ HR process works well and individuals can easily find representatives to address their issues.
  - Previous individuals in the DOE-HQ ECP Office were dedicated to the position on a full-time basis; current staffing is on a part-time basis.
  - There is a lack of knowledge about the status of cases opened during the tenure of previous individuals in the position.
- Among EM-HQ survey respondents, about 75% 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 still lower than is seen in other similar organizations on which survey data is available and indicates that about 25% of the population did not fully agree with this statement.
- The statement on the electronic survey that management does not tolerate retaliation of any kind for raising concerns was agreed to by only 45% of the EM-HQ survey respondents.
- Among EM-HQ survey respondents only 43% of employees feel that they can openly challenge decisions made by management.
- Approximately 50% of EM-HQ survey respondents believe that constructive criticism is encouraged.
- Approximately 58% of the EM-HQ survey respondents agreed with the statement that they feel that they can approach the management team with concerns.
- Among EM-HQ survey respondents 50% agreed with the statement related to management wants concerns reported.
- Approximately 45% of EM-HQ survey respondents agreed with the statement that concerns raised are addressed.
- While there were no statistically significant differences among the EM-HQ Work Groups on any of the Safety Conscious Work Environment Questions from the electronic survey, the EM-1/EM-2/EM-3 and EM-60 Work Groups had consistently more negative responses to the questions.
- There were statistically significant differences between the EM-HQ Employee Categories on several of the Safety Conscious Work Environment Questions with DAS/ADAS and Office Directors exhibiting more positive responses than the other categories of Non-Manager Excepted Service and Non-Manager GS. Differences were obtained on the Responsible for Identifying Problems, Feeling Free to Openly Challenge Management Decisions, and Feeling Free to Approach Management with Concerns.

B.5.7 Effective Safety Communication

Communications maintain a focus on safety.

Positive Observations

- Interviewees identified multiple mechanisms for communication in the EM-HQ Organization, including:
  - Fedcasts;
  - Management meetings;
  - Recurring conversations between management and staff;
  - Efforts to communicate with those in the Cloverleaf Offices;
  - All hand meetings;
  - AM with EM breakfasts;
  - One on one communication;
  - Emails;
  - Open door policy.
- Most interviewees indicated that Senior Management tries to speak with one voice and makes it clear that everyone needs to be involved and work together.
- Some interviewees indicated that they believe that they are beginning to become better informed about what is going on in EM.
- Interviewees described how the ADASs are working on talking across the different offices to develop common processes, make budget decisions, and conduct project and program reviews.
- Observations by the Team indicated that efforts are made to include all parties regardless of their locations in Operations and Management Meetings. Call-in telephone numbers and video conference calls are frequently used for communications.

Areas in Need of Attention

- Several interviewees indicated that there are issues around the effectiveness of communication in EM-HQ. Examples included:
  - A level of informality around the assessment of the effectiveness of communication; it is done primarily by word of mouth.
  - There is the perception that not enough is done to listen or close the loop on communication.
  - Managers do not ask enough follow-on questions, e.g., what do you want to do about this issue?
  - Interviewees describe individuals that have maintained a negative attitude towards everything over many years and present a barrier to implementing effective communication.
  - There is too much information especially from email.
  - There is the perception that the implementation of employee engagement is lagging because all resources go towards the mission and can't be used for other things.
  - Interviewees perceive the lack of trust factor as the biggest issue in communication.
  - Some interviewees indicated that they only know about their own group and don't receive information about other groups.
- The Team and interviewees identified several examples of missed opportunities to enhance the communication process within EM-HQ:
  - Lack of staff meetings within one of the Mission Units over the last several years.
  - Several interviewees indicated that they have not heard from EM-1 or EM-2 about the issues surrounding the need to change behaviors within EM.
- The USEC situation was not communicated in terms of its value for the Department, and specifically EM. Employees did not perceive this as the best decision for EM.
- Data from the Behavioral Rating Scale on Communication indicated that 42% of the EM-HQ Manager and 30% of the EM-HQ Non-Manager interviewee respondents who completed that scale

had positive perceptions about the exchange of information, both formal and informal, between the different units in the EM Organization, including the top-down and bottom-up communication networks.

- Data from the electronic survey on several of the Communication Scales indicated that EM-HQ survey respondents had some of the lowest scores across the DOE database on their opinions about perceived Trust in Communication. Scores on the Communication Accuracy, Desire for Interaction, and overall Satisfaction in Communication were also on the low end of the values obtained from similar organizations on the same scales.

B.5.8 Respectful Work Environment

Trust and respect permeate the organization

Positive Observations

- Some interviewees described good working relationships across the Mission Units within the EM Organization. Issues can usually be worked out before they become too problematic.
- Several interviewees indicated that the reorganization is aimed at improving the working relationships between EM-HQ and the site offices.
- Interviewees indicated that the relationship between EM Senior Management and the union had improved with the new management team.

Areas in Need of Attention

- The overall score for the EM-HQ Organization on the Job Satisfaction Scale of the electronic survey was the lowest score obtained in a database of similar organizations that have taken the same survey. No statistically significant differences between EM-HQ Work Groups or Employee Categories were obtained on the Job Satisfaction Scale indicating a fairly homogeneous perception across the respondents who took the survey.
- Similarly the EM-HQ survey respondents indicated low scores on their perceptions of Trust in Communication regarding the freedom they feel to discuss the problems and difficulties in their jobs with an immediate supervisor without jeopardy. This was the lowest score obtained in the database across similar organizations that have taken the same survey.
- Results from the Communication Trust Scale on the electronic survey indicated no statistically significant differences between work groups or employee categories among EM-HQ survey respondents.
- Results obtained on the Communication-Accuracy Scale from the electronic survey indicated that overall EM-HQ survey respondents have somewhat negative perceptions of the accuracy of information that they receive from other organizational levels (superiors, subordinates, and peers).

B.5.9 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.

Positive Observations

- Interviewees indicated that the new EM Management Team is supportive of their identifying issues and deficiencies and documenting conditions and activities for follow up.

Areas in Need of Attention

- Several interviewees indicated that they believed that EM-HQ was sometimes compromising their oversight activities through schedule and cost pressures.
- Interviewees indicated that a questioning attitude was not always appreciated depending upon the circumstances of the situation, e.g., political decisions that could not be controlled or changed.
- Many interviewees do not perceive the DPO Process as a timely and effective means for questioning decisions and may be why it is not used more frequently at HQ.

B.6 References

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Independent Oversight Assessment of Nuclear Safety Culture at the Pantex Plant

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Independent Oversight Assessment of Nuclear Safety Culture at the Pantex Plant

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Appendices

Appendix A: Supplemental Information A-1

Appendix B: Independent Evaluation of Safety Culture at the Pantex Plant B-1

Acronyms

BARS	Behavioral Anchored Rating Scales
BBS	Behavior Based Safety
DNFSB	Defense Nuclear Facilities Safety Board
DOE	U.S. Department of Energy
DPO	Differing Professional Opinion
ECP	Employee Concerns Program
HRO	High Reliability Organization
HSS	Office of Health, Safety and Security
IPOD	Integrated Plan of the Day
MTC	Metal Trades Council
NES	Nuclear Explosive Safety
NNSA	National Nuclear Security Administration
NRC	Nuclear Regulatory Commission
POD	Plan of the Day
SOAR	Safety Observations Achieve Results
PGU	Pantex Guards Union

1. Introduction

The U.S. Department of Energy (DOE) Office of Enforcement and Oversight (Independent Oversight), within the Office of Health, Safety and Security (HSS), conducted an independent assessment of nuclear safety culture[1] at the Pantex Plant. The primary objective of the evaluation was to provide information regarding the status of the safety culture at the Pantex Plant. The data collection phase of the assessment occurred during June – August 2012.

The Pantex Plant has a long-term mission to safely and securely maintain the nation's nuclear weapons stockpile and dismantle weapons retired by the military. Within DOE, the National Nuclear Security Administration (NNSA) has line management responsibility for the Pantex Plant. At the site level, line management responsibility for the Pantex Plant falls under the NNSA Production Office, which recently combined and replaced NNSA's former Pantex and Y-12 site offices. Under contract to DOE, B&W Pantex is responsible for managing and operating the Pantex Plant.

During the time HSS was performing a series of reviews of the extent of condition of safety culture concerns at nuclear design/construction projects, HSS received information about potential safety culture issues at the Pantex Plant. Specifically, two B&W Pantex employees told Defense Nuclear Facilities Safety Board (DNFSB) staff members about instances of perceived retaliation for raising a safety concern. Subsequently, the DNFSB referred the matter to HSS, and HSS decided to perform a safety culture assessment at the Pantex Plant as part of the ongoing extent of condition evaluations.

The safety culture extent of condition assessments are being performed in accordance with a Secretarial commitment to the DNFSB related to DNFSB Recommendation 2011-1, *Safety Culture at the Waste Treatment and Immobilization Plant*. Specifically, in the Department's Implementation Plan dated December 27, 2011, the Secretary of Energy directed HSS to perform safety culture assessments of major ongoing large nuclear design/construction projects to determine the extent of condition of safety culture concerns identified at the Hanford Site Waste Treatment and Immobilization Plant.

Before starting the assessment, HSS enhanced its capability to assess safety culture processes and capability, through consultation with the U.S. Nuclear Regulatory Commission (NRC), several nuclear power generating utilities, and associated support organizations to benchmark their processes. Recognizing that it has significant expertise in nuclear safety and issues management but limited on-staff expertise in systematic application of behavioral science-based methodologies for performing safety culture assessments, HSS contracted with an external company that specializes in human performance analysis to support the data collection and analysis efforts.

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

2. Scope and Methodology

This Independent Oversight assessment covered all contractor employees at the Pantex Plant, including B&W Pantex employees and subcontractors.

An experienced HSS manager led the assessment. Onsite data collection was conducted primarily by HSS personnel. To ensure a valid and effective assessment of the existing safety culture, HSS used external independent safety culture experts to analyze various sources of data and perform an independent evaluation. The independent safety culture experts have extensive experience in the development and application of safety culture assessment methodologies used by commercial nuclear and other industries. Appendix A provides additional information about the composition of the Independent Oversight team, including the credentials of the independent safety culture experts.

With the guidance of the external independent safety culture experts, the Independent Oversight team selected a methodology for the assessment that provides an objective and systematic measurement of the organizational behaviors that impact safety performance, using multiple data collection tools to assess organizational behaviors. These tools include functional analysis, semi-structured focus group and individual interviews, observations, and behavioral anchored rating scales (BARS).

The Independent Oversight team also arranged for the external independent safety culture experts to conduct a culture survey for plant personnel using commonly used survey tools and techniques. The culture survey was conducted and analyzed by the external independent safety culture experts. The population sampled in the survey included a random sample drawn from B&W Pantex employees and sub-contractors.

The evaluation was conducted using the same methodology that aligns with the current NRC procedures for independent safety culture assessment, which identifies nine traits that are viewed to be necessary in the promotion of a positive safety culture:

- 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.

HSS tasked the independent safety culture experts to analyze the data collected during assessment in accordance with their established methodology. Appendix B provides additional information about the methods and framework for the safety culture assessment.

3. Results and Conclusions

The safety culture evaluation performed by the external independent safety culture experts is provided in Appendix B, which provides positive observations and identifies areas in need of attention for each of the nine traits of a healthy safety culture. The independent safety culture experts evaluated the collective results to formulate the following conclusions about the status of the safety culture at the Pantex Plant, which are intended to facilitate the identification of improvement strategies.

The success and strength of the Pantex Plant lies in the employees' individual patriotic commitment to the mission of the organization. To succeed in this mission, employees want to do the best job they can do and will do whatever they can to seek the approval of the customer for their efforts.

Significant efforts have been placed on the formalization of the processes that are required for the Plant to execute its work. Processes and tools, such as pre-job briefings, change control procedures, peer checking and management of meetings, are implemented on a routine basis. In some cases, these efforts are perceived as excessive (e.g., Hazardous Energy Control) and, in some situations, they are understood as necessary (e.g., verbatim compliance to production procedures).

Efforts to communicate and implement the principles of a High Reliability Organization (HRO) have been ongoing for several years. The Plant has recently undertaken efforts to self-assess the values and beliefs associated with HROs in its survey development work with Texas Tech University. The realization of the HRO principles has not yet been internalized by the Plant, as demonstrated by the lack of effective communication processes, the absence of a learning organization, and the implementation of consequences that deal primarily with providing short-term solutions, rather than considering their impact on the long term goals of the organization.

The belief that the organization places a priority on safety is undermined by employee observations of poor facility conditions, lack of focus on meeting personal needs (work quality of life), and a sense of cronyism. While the employee population is committed to the mission of the organization, there is a strong perception that the organization is not equally committed to its employees. This creates a negative effect on employee morale and commitment to the organization and has created the perception among many employees that the financial bottom line is the only focus that matters.

There is a strong perception that retaliation exists for 'rocking the boat.' The consequences may be subtle (e.g., risk of losing qualifications, punishing an entire group for the actions of one individual, increasing work load because reporting often creates new processes that are put into place) but they may also include being transferred out of a position or job or termination of employment. The perception has created an environment where the raising of questions or identification of problems is not the consistently accepted way of doing business.

The Pantex Plant has not been successful in understanding the organizational and programmatic behaviors that are necessary for a healthy safety culture. The Pantex Plant is managed with a very strong focus on creating processes and looking at individual and local behavior around those processes. Consequently, organizational barriers have been created that will prevent successful implementation of the initiatives needed to enhance safe and reliable performance. The barriers are evident in the differences obtained in the values and perceptions between organizational work groups but more significantly between Senior Management and most of the rest of the organization. The barriers are also evident in the lack of respect, difficulty in effective communication, the non-alignment between the perceptions around the unions and management relationships and the notion of 'need to know' being extended to almost everything.

With the strong processes that have been put in place, coupled with the motivated and committed staff there does exist a strong basis from which improvements to the safety culture can be accomplished. These will only be realized, however, when the organizational and programmatic barriers have been overcome.

4. Recommendations

A healthy safety culture is most often found within an aligned organization that has effective processes, and motivated people. The following recommendations identify some initial steps that the Independent Safety Culture Evaluation Team believes are necessary to effectively implement and execute the actions that will result in improved safe and reliable performance:

- Significant efforts are needed by Pantex Senior Management to gain the respect and trust of the employee population. Behaviors that demonstrate the commitment to the principles and values of an HRO must become obvious and internalized by the Management Team in order to model the efforts that they should expect and want from the employees.

- Management should take prompt actions to improve the quality of work life at the Plant. Small changes would go a long way to engaging the employee population in believing that the organization is committed not only to the mission, the customer and the award fees, but to the employees as well.

- Consider additional efforts to enhance awareness of the employee concerns program (ECP) and differing professional opinion (DPO) process.

NNSA and B&W Pantex should evaluate the results of this Independent Oversight safety culture report in its entirety, including the culture insights provided in Appendix B and the above conclusions and recommendations, in accordance with established issues management processes and initiate appropriate causal analysis, corrective actions, organizational enhancements, and effectiveness reviews as appropriate.

Appendix A
Supplemental Information

Appendix A
Supplemental Information

Dates of Review

Scoping Visit	June 13-14, 2012
Onsite Data Collection:	July 23 – August 2, 2012
Survey Open Period	June 25 – July 13, 2012
Closeout:	August 27-28, 2012

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Dr. Sonja B. Haber, Independent Safety Culture Expert
Dr. Deborah A. Shurberg, Independent Safety Culture Expert

Expertise and Credentials of the Independent Safety Culture Experts

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

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

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

The principals are:

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

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

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

Appendix B

An Independent Evaluation of Safety Culture at the Pantex Plant

Independent Safety Culture Evaluation Team:

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

Appendix B
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B.1 Introduction

This Appendix describes the results of an independent evaluation of the existing Safety Culture at the DOE Pantex Plant. The population of the evaluation was all employees of the Pantex Plant, located near Amarillo Texas. The evaluation was conducted during June, July, and August, 2012. The primary objective of the evaluation was to provide information regarding the status of the safety culture traits at the Pantex Plant.

The evaluation was conducted using the same methodology that aligns with the current U.S. 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. The detailed results presented in this Appendix support the summary results and recommendations provided in the main report.

B.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 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 in the 1991 timeframe 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.

B.3 Scope of Safety Culture Evaluation

The scope of this evaluation was defined to include all contractor employees of the Pantex Plant, including B&W Pantex personnel and subcontractors. The Safety Culture Data Collection Team was on site at the Pantex Plant during portions of June and July 2012. In addition, the Organizational Safety Culture Survey was electronically administered, with the survey being open for completion by employees from June 25 to July 13, 2012.

The Safety Culture Data Collection Team was used by the Independent Safety Culture Evaluation Team to assist in collecting onsite data and was comprised of the HSS Independent Oversight Team. The HSS staff had been trained on applying data collection techniques and conducting focus group interviews.

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

B.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.

B.4.1 Functional Analysis

The purposes of the Functional Analysis are to: (1) clearly identify the organizational units of the Pantex Plant, (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 June 13-14, 2012 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 or focus groups were conducted with 33 individuals associated with the Pantex Plant.

Documentation Review

During the Data Collection Team's activities, a wide variety of documents were reviewed including Pantex program and project plans, Pantex technical and administrative procedures, work instructions, organization charts, interoffice memoranda, applicable DOE regulations and technical standards, corrective action reports, and root cause analyses.

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; Resource Allocation; 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 Questions from electronic survey
- Effective Safety Communication - Communication
- Respectful Work Environment – Communication Trust Scale from electronic survey
- Questioning Attitude – Attention to Safety.

B.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 38 individual interviews and 44 focus groups were conducted as part of the evaluation. A total of 296 individuals were involved in one these activities (38 in interviews and 258 in focus groups). Each interview lasted one hour and each focus group lasted approximately one and a half hours. A few less formal follow-up interviews were conducted to provide further clarification when necessary.

The BARS were administered to most individuals who participated in the structured interviews and/or focus groups. 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 1152 BARS were collected representing 10 organizational behaviors. The data from the BARS is presented as the percentage of

people who had a negative view of the behavior (rating of less than 3), a neutral view of the behavior (a rating of 3) or a positive view of the behavior (a rating of greater than 3). Qualitatively, a neutral view of a behavior is typically treated as a non-positive response and is grouped with negative behaviors as it suggests that personnel are uncertain about the importance of that behavior within the organization.

B.4.3 Behavioral Observations

The use of behavioral observations provides an unobtrusive assessment of particular organizational behaviors and critical processes including work planning, work performance, 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 30 observations were conducted. The data represent observations of work activities, various Maintenance Plan of the Day (POD) Meetings, Integrated Plan of the Day (IPOD) Meetings, various Maintenance work activities, Joint Company and Union Safety Council Meeting, President's Safety Council Meetings, ES&H Senior Staff Meeting, Production Staff Meeting, Executive Issues Review Board, Projects Meeting, and a Safety Observations Achieve Results (SOAR) Meeting.

B.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 50 different organizations.

A 20 percent random sample of the total Pantex Plant population, stratified by Work Groups was invited to participate in the survey. This means that 20% of each Work Group, or a minimum of ten individuals from each Work Group (whichever was larger), was randomly selected to participate in the survey. This yielded a total survey sample size of 701 employees of which 437 actually completed the survey, representing a response rate of 62.3%**.** While this response rate is considered to be an acceptable rate of response from which representative conclusions regarding perceptions and attitudes concerning the work environment can be made, it is lower than desirable. Of note, within the Safeguards and Security Division the response rate to the survey was 31.3% while within the Human Resources Division the response rate was 40.0%. Other Divisions with response rates that were especially low include: Manufacturing Division at 50%, Supply Chain Division at 51.3% and Deputy General Manager Division at 53.8%. The especially low response rates in these Work Groups suggest that caution should be taken in extrapolating the survey data from the respondents in these Work Groups out to the larger Work Group populations.

B.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. The results are presented in terms of the Safety Culture traits. 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 improvements, the Areas in Need of Attention should be considered and used as examples for an action that would address a behavior that would help several if

not all of these points. It is not the intention that each Area in Need of Attention result in a corrective action. Developing a massive amount of corrective actions only perpetuates a compliance mentality, which is not conducive to creating and promoting a 'healthy safety culture.'

B.5.1 Leadership Safety Values and Actions

Leaders demonstrate a commitment to safety in their decisions and behaviors.

Positive Observations

- Most interviewees identified that the General Manager constantly emphasizes that safety, security, and quality must be considered for everything that is done at the Plant.
- Several managers indicated that one of the biggest challenges for the Plant is to try to change a non-nuclear attitude on the part of many of the employees to a more nuclear operations focus and procedure based attitude.
- Examples identified by interviewees and the Team of a management commitment and focus on safety include:
  - Board out front that displays red, yellow or green light to indicate if a safety or security incident has occurred;
  - The Stop Work Authority which anyone in the Plant has the ability to use;
  - Pause campaign to promote the use of a momentary work stoppage to have a discussion and clarification of an identified problem or concern;
  - Formalized meetings that address and discuss safety topics, e.g., President's Safety Council Meeting, Joint Union and Management Safety Meeting;
  - Meetings by various groups at which safety, security and quality are discussed, e.g., Executive Issues Review Board, Utilities morning meetings, ES&H Senior Staff Meeting, SOAR Meetings.
- Some interviewees indicated that management generally does not have a problem missing schedule milestones if it is because of a safety or security issue.
- Some interviewees indicated that management feels a lot of pressure to try to shield workers on the line from production pressures.
- Observations by the Team indicated that while there is much work to be done, there is no direct sense of schedule pressure on the work force and there are always volunteers for overtime if needed.
- Several interviewees indicated that in all likelihood the pressure that employees feel is self-imposed.

Areas in Need of Attention

- Many interviewees indicated that they do not perceive that Pantex Management consistently demonstrates the strongest commitment to safety. Examples included:
  - There is a perception by several interviewees that with budget constraints, safety and training are the first areas to be reduced;
  - Interviewees expressed the belief that support functions, e.g., Fire Department and Security, are viewed as a drain on resources and that production is the main goal;
  - Once Star Status was achieved in the Voluntary Protection Program, there is the perception that the emphasis on that program has diminished;
  - Interviewees indicated that if an action related to safety does not cost anything it will be implemented, e.g., policy on shoe wear, but if money is involved it becomes a battle;
  - Interviewees expressed the belief that the Authorization Basis Group should not be inside the Engineering Division, but outside the line, similar to what was done with the Nuclear Explosive Safety (NES) Group;

- Some interviewees expressed the belief that lightning warnings have been cancelled if something needs to be done in production, e.g. lightning warnings ignored for moves;
- Interviewees described that in the past, Personnel Accountability Drills established a 15 minute criteria to account for all individuals; since B&W has been at Pantex the criteria has changed to 30 minutes and there hasn't been such a drill in some time;
- Some interviewees described that during a recent Plant wide drill with the purpose of ensuring that everyone knew where their outside muster stations were, most individuals did not know where to report and the drill was subsequently cancelled shortly after it was initiated. At least two weeks later, personnel had still not been informed as to where their outside muster stations were located.

- Many interviewees indicated that the Stop Work Authority is not well understood, most individuals do not want to use it, and it requires the Division Manager's approval. Interviewees explained that Management says they want you to use it, but interviewees perceived that if you do, there will be repercussions in the future.
- There is the perception by some interviewees that some of the new managers are not as accepting of the HRO principles as much as the previous management was, e.g., some Division Managers do not want you to talk to them until you talk to their Department Managers.
- Some interviewees expressed their perceptions that the primary emphasis on safety at the Plant is industrial and occupational safety. Management actions or inactions related to nuclear safety, explosive safety and radiation safety have created the perception that production takes priority over safety and that such actions have triggered external inquires like this evaluation.
- Interviewees provided many examples of problems that needed to be fixed to improve quality of the work environment and ensure personnel safety and security, e.g., lack of air conditioning in the Security towers which cannot be used, scalding hot water in the ladies locker room with repetitive efforts to correct, toilets that are unusable for extended periods of time, ceiling openings that allow insects to deposit on desks and office floors.
- Most interviewees indicated that there is a lot of overtime being used because resources are not being replaced when they leave.
- Interviewees indicated that new hires that are in training are counted in the group's resource planning even though they are not qualified to work.
- Interviewees perceive there is a low priority on the maintenance and upkeep of Security equipment, e.g. radio systems are becoming archaic, difficulty in getting personal protective equipment replaced.
- Some interviewees expressed the idea that if management says that a product has to be delivered by a certain date, there will be a product, but it may not be a quality product. Some individuals' performance reviews are perceived to be based upon their meeting schedule dates, even when they have indicated that it is not possible to do so.
- The Team believes that the minimally acceptable response rate to the survey and issues with getting participation in some interviews and focus groups are indications that the message to participate in the evaluation was not communicated well or perceived to be important enough for individuals to act upon. Some interviewees also indicated that many individuals in Security were not interested in supporting efforts for management unless they perceived some direct benefit from the activity.
- Results on the Behavioral Anchored Rating Scale for Attention to Safety indicate that approximately 28% of the Pantex Non-Manager interviewees that completed this scale had negative perceptions about the value of safety in the organization and an additional 30% provided a mid-range score. Such ratings reflect a view that management displays a delicate balance of emphasizing safety, while at the same time making it clear that there is a need to keep up production. Among Pantex Managers completing this scale approximately 68% perceived that safety is clearly understood to be a priority for the organization.
- Results from the Behavioral Anchored Rating Scale on Resource Allocation indicate that 88% of the Non-Manager interviewees that completed this scale are either uncertain or do not perceive that employees have sufficient resources to implement corporate goals, nor do they perceive that the

employees understand how these goals relate to their daily activities. Among Managers approximately 28% had negative perceptions about the allocation of resources and an additional 50% were uncertain in their perceptions about how resources are allocated at the Plant.

- Results from the Behavioral Anchored Rating Scale on Time Urgency indicate that overall about 60% of the individuals that completed this scale perceive that most tasks are completed on time without compromising safety or quality. Only about 50% of Pantex Non-Manager individuals that completed this scale perceive that to be true while 75% of the Managers that completed this scale had a positive perception about Time Urgency.
- Results on the Attention to Safety Scale on the electronic survey were the lowest scores obtained to date compared to a database of other similar organizations' responses to the same questions. This indicates that survey respondents at Pantex had a more negative perception of the importance that safety has to success in their organization as measured by the perceived value the organization places on various safety promoting behaviors. Within the Plant, there were no statistically significant differences between the organizational work groups, but there were statistically significant differences between employee categories on the Attention to Safety Scale. Senior and Department Managers had significantly higher scores on this scale than respondents in all of the non-management employee categories.

B.5.2 Problem Identification and Resolution

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

Positive Observations

- Multiple mechanisms for identifying problems within Pantex were described by interviewees including:
  - Stop Work Authority,
  - Open Door Policy,
  - No More Surprises Program,
  - PULSE,
  - Various meetings,
  - Individual dialogues,
  - DPO,
  - ECP,
  - DOE,
  - Human Resources,
  - Safety Committees,
  - Audits and assessments,
  - Email, etc.
- Some interviewees indicated that there was nothing to inhibit the identification of problems.
- Some interviewees indicated that there are multiple mechanisms for observations for problem identification including, Management By Walking Around, Behavioral Based Safety, Quality Group, Safety Representatives, Executive Issues Review Board.
- Interviewees described that every department has to do self-assessments based upon risk models.
- Interviewees indicated that they make sure that they take care of each other by reporting problems, e.g., snakes, diesel fuel in building where welding was to take place.

Areas in Need of Attention

- Interviewees identified some issues that might inhibit the identification of problems or concerns. These included:
  - A large workload;
  - Individual may not want to take ownership of the problem;
  - Concern over how a manager will respond to the messenger raising issues;
  - Different priorities within the organization;
  - A lack of feedback drives behavior not to raise any more issues;
  - The perception that the culture is not conducive to being open about problems, want to give the appearance that everything is in place, don't make the group or department or plant look bad;
  - Perception that if you raise problems you are a troublemaker, especially if you stop production;
  - Don't want to generate more paperwork;
  - Desire just to get the job done;
  - Very tenured workforce, people may be hesitant to bring things up;
  - Suggestion system has gone quiet; etc.
- Many interviewees indicated that the DPO process is not effective because:
  - It is not well known or advertised;
  - If it has been used the results are not communicated;
  - Unclear when the process should be used and what it applies to, e.g., quality issue between Design and Engineering, Engineering wanted to use DPO, Design said it was not applicable to quality issue (procedure issue); were trying to resolve at the time of this evaluation.
- The most frequently identified issue around problem identification and resolution is the resolution of items that are identified.
  - Several interviewees indicated that the Behavior Based Safety (BBS) observations are not valuable, yet they are required to do a certain number a month; even if problems are identified they won't get fixed.
  - There are multiple and independent databases that are used to enter observation data. Integration to understand commonalities and similar causes to resolve issues appears to be lacking.
  - Interviewees describe that there are no more actions, only reactions; not being proactive, only reactive.
  - There is a strong perception that if the issue identified is not related to production then it will not get fixed or it will take an inordinate amount of time to fix, e.g., two years to get a door stop fixed.
  - There is a belief that the Plant does not do enough causal analysis to really understand how to fix repetitive problems, e.g., Security issue on cell phones is pervasive and repetitive yet no formal causal analysis could be identified.
  - Observations by the Team indicated a lack of any discussion during a meeting on the increase of Problem Event Reports (potential safety precursors) on 27 nuclear safety events, on the spike in precursor events (nuclear, explosive and injuries), on issues with authorization basis, safety basis and unreviewed safety questions, on explosives issues dominated by procedures, and on fire protection deficiencies.
- Many interviewees indicated that work order originators are not routinely provided feedback on their issues when closure is by others.
- Some interviewees indicated that there is a Performance Evaluation Plan objective to keep safety work orders low, below a certain threshold so there is motivation to close those out quickly even if they are not really fixed, e.g. tripping hazard – place a cone over it which mitigates the hazard but doesn't necessarily fix the problem.
- Data from the Behavioral Anchored Rating Scale on Problem Identification and Resolution indicated that only 53% of the interviewee respondents who completed this scale provided a high rating indicating that they perceived that the organization encourages plant personnel to draw upon knowledge, experience and current information to identify and resolve problems positively.

B.5.3 Personal Accountability

All individuals take personal responsibility for safety.

Positive Observations

- Almost all interviewees indicated that they have pride in their work and that they believe they are doing a great patriotic service for their country by working at Pantex.
- Most interviewees indicated that they do what they are supposed to do, that they want to do a good job, and that they want to please the customer.
- Most interviewees believe that people at the Plant are accountable for safety.
- Some interviewees believe that people are held accountable through formalized processes such as pre-job briefings, procedures, qualifications, one on ones.
- Interviewees indicated that a performance management system for non-bargaining unit employees has been recently implemented at B&W Pantex for the first time.
- Senior Management interviewees perceive a cohesive, communicative and team focused management group.
- Both unions at the Plant, the Metal Trades Council, (MTC) and the Pantex Guards Union, (PGU) have safety officers.

Areas in Need of Attention

- Accountability is perceived by several groups to be an issue across the Pantex Organization. Some examples include:
  - The concept of the HRO is being driven largely by a very small group of individuals and there has been a lack of ownership for the consistent implementation of the HRO principles across the Plant.
  - Monetary compensation for safety by individuals was terminated for fear that incidents would not be reported because of the potential loss of compensation, yet interviewees perceive that Senior Managers are compensated for not reporting because they receive safety-related contract bonuses. While plant management has indicated that Senior Managers do not receive either a safety or production related contract bonus, the perception of plant personnel is that they are being compensated with a safety related bonus which in turn is impacting reporting frequencies.
  - Interviewees perceive differential treatment dependent upon organizational level, race and gender, e.g., individuals were told to conduct some battery work without the appropriate paperwork; when the battery blew up the individuals got disciplined while the supervision that instructed them to perform the work was not supportive and was not held accountable.
  - Many interviewees described inconsistent implementation of expectations by supervision and management across the Plant.
  - Some B&W policies at the Pantex Plant are not followed by the DOE Site Office, e.g., shoe policy.
  - Interviewees indicated that there is now more work with fewer people and that individuals are given tasks that they have not been trained for yet they are held accountable for their performance.
  - Human Resources is perceived by many interviewees to be part of the accountability problem because they don't always look at the whole event before attributing blame and disciplining individuals. Interviewees described a lack of an organizational and programmatic evaluation around an event, noting that programmatic evaluation may yield different conclusions.
- Many interviewees indicated that the sick leave behavior among the Security Officers is an example of a lack of accountability not only on the part of the Officers but on the part of Management to allow

the bargaining agreement to support the behavior. The perception of the relationship between the unions and management as described by interviewees from both sides is discrepant.

- Interviewees indicated that many identified problems involve several organizations and it is often not clear who really owns the problem, e.g., procedure problems can cut across 2 to 3 groups (Training, Production, Engineering) and can be difficult to resolve; material moves involve inside and outside groups, usually multiple groups and each group can only resolve their own problems, not those of other groups.
- Data on the Behavioral Anchored Rating Scale for Performance Quality indicates that about 55% of the interviewees who completed this scale are either negative or uncertain in their perceptions that plant personnel take personal responsibility for their actions and the consequences of the actions.
- Data on the Behavioral Anchored Rating Scale for Roles and Responsibilities indicated that 66% of interviewees who completed this scale provided a low or mid-rating indicating a perception that employees do not or may not understand their duties, know who to go to when a task needs to be done or clearly understand their role in completing cooperative activities.
- Scores across Pantex on the Organizational Commitment Scale from the electronic survey were low in comparison to other DOE contractor organizations that took the same survey. Additionally, statistically significant differences within the Pantex Organization were obtained on the Commitment Scale. The General Manager and Supply Chain Management Divisions had more positive scores on the Commitment Scale than the Project, Safeguards & Security, ES&H, Explosives Technology/R&D, Engineering, Special Nuclear Materials Divisions, and the Prefer Not to Respond Group. The Management Employee Categories had significantly more positive scores on the Commitment Scale than all of the other Non-Management Employee Categories.

B.5.4 Work Processes

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

Positive Observations

- Interviewees and observations by the Team indicated that Pantex holds regularly scheduled meetings to communicate status and discuss work around the Plant. In most cases there are formal agendas, time management of the meeting, and good participation by all parties in the room. Meetings include the IPOD, Maintenance PODs, Production Staff Meeting, Shift Turnover Meetings, Readiness Reviews for production procedures, Executive Issues Review Board, etc.
- The Team made multiple observations of pre-job briefings and maintenance activities during the evaluation. Several examples of well executed processes were identified indicating the capability of the organization to implement work according to industry best practices and standards.
- Interviewees discussed that most of the Support Groups were helpful in getting things done. In particular, the Maintenance Group, Radiation Protection Safety, Planning and the BBS Team were identified.
- Several interviewees indicated that management expects verbatim compliance for following procedures, especially on the production lines. If the procedure cannot be followed the stated expectation is to stop work, discuss it with supervision and process engineering and if necessary the procedure change process will be implemented.
- Some interviewees identified that the change control process for technical documents in the Engineering Division has been recognized by the DNFSB as a process to be used as a benchmark for the DOE Complex.
- Interviewees described a very systematic and formalized organizational change management process to implement a new dress code policy for the Plant.
- Human Performance Improvement Coordinator works with the Safety Team and Human Error team from BBS to conduct human performance evaluations.

- Data on the Behavioral Anchored Rating Scale for Formalization indicates that 70% of the interviewee 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. The responses to this scale were the most positive out of all of the behaviors evaluated at Pantex.

Areas in Need of Attention

- Interviewees indicated that perceived issues with formalization included:
  - Inconsistencies in the quality of procedures across the Plant;
  - Needed improvement in the use of post job briefs and the association of the lessons learned from the job into their daily work activities;
  - Processes have become too complicated and in some cases defy logic, and that they are not always followed, e.g., calling a 32 psi water line as hazardous as a high voltage line;
  - Revising and complicating the lockout tagout procedure so that work becomes difficult and time consuming but allows an individual to get qualified on the procedure in 1.5 hours;
  - New Hazardous Energy Control Process has hindered ability to conduct maintenance work, yet contractors do not have to follow the same procedure.
- Interviewees and observations by the Team indicated that there is a lot of emphasis on metrics for processes and in particular comparisons to previous data, but there is not a lot of discussion on how the metrics fit into the Plant goals.
- The coordination of work across the Plant was identified by interviewees as an area in need of improvement. Reasons given included:
  - A lack of qualified workers in some areas can delay work activities, e.g., painters;
  - There is a lack of sharing of labor in a world of limited resources;
  - The Plant has difficulty in keeping engineers and so some things move slowly through that Division;
  - Work packages do not always contain contingency planning, e.g., no planning for the lack of availability of transportation to get parts to a job;
  - A lot of departments at the Plant work in stovepipes (silos) which impacts work and communication across the organization;
  - The weapons programs work independently and often doesn't communicate with other groups, which puts the support groups in a 'traffic controller' role;
  - No real long term planning, basically plan for a couple of days;
  - No integrated POD for the different Maintenance Groups, each work on their own schedule;
  - The IPOD is perceived as a place to discuss 'hot topics' and the goal is to try to stay off the IPOD; and
  - Prioritization of work conflicts are independently managed by each Facility Manager or if necessary by the Department Manager.
- Some interviewees indicated that there is not a uniform sense of respect for Security procedures across the Plant, e.g., piggybacking; Security is not perceived to be a high priority under the same M&O Contractor; there is a military style of management without concern for the reaction of the organization to their directions; and that things are often done to look good so people will believe it must be good, e.g., uniforms, mission statements.
- Data on the Behavioral Anchored Rating Scale for Coordination of Work indicates that overall 55% of the respondents to this scale have a negative or neutral perception of the planning, integration, and implementation of work activities of individuals and groups. Among Managers who responded to this scale 50% had a positive perception about the coordination of work.
- Data from the Coordination of Work Scale on the electronic survey indicated that while there were no statistically significant differences between the different organizational work groups or employee

categories on this scale, the overall score was lower than for similar organizations that have taken the same survey.

B.5.5 Continuous Learning

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

Positive Observations

- Some interviewees indicated that they believe that Pantex does communicate and learn from its successes, e.g., celebrations, giving of gifts, discussions around decisions in the IPOD and other meetings.
- The last success most frequently identified by interviewees was achieving 5 million hours without a Lost Time Accident.
- Interviewees indicated that failures are discussed, there is a lessons learned program and that some information is shared from other sites.
- Interviewees identified that there is a Lessons Learned Coordinator within each department that reviews and provides information both internal and external to the Plant.
- ESTARS is used for reading lessons learned. Recent projects were identified as successful and provided as examples, e.g., use of modular buildings brought in to serve as office buildings, teamwork in the design and construction of a boiler project; timely support from engineering in the installation of electrical panels.
- Interviewees described and the Team observed situations in which lessons learned have been or are routinely communicated:
  - Tailgates each morning;
  - Stand downs after significant events, e.g., electrical event in which several individuals received electrical shocks;
  - Various Maintenance Plan of the Day Meetings discuss lessons learned internal to the Plant, e.g. use of improper electrical cord, and from events external to the Plant, e.g. article in the newspaper on arc flash burn.
  - Interviewees indicated that Plant Management sends both positive and negative lessons learned information and statistics to contractor organizations.

Areas in Need of Attention

- While many interviewees identified the concept of lessons learned, the organization is missing opportunities to use this information as part of a learning process.
  - Most interviewees indicated that they were not formally made aware of the NES event that happened in the December 2011 - January 2012 time frame. Those that were aware of the event had received their information informally and the information was fairly inconsistent across interviewees.
  - During the time of this evaluation, no formal lessons learned had yet been captured and communicated about the NES event, even some that would be at the highest generic level.
  - Some interviewees indicated that the only way they are able to learn about successes or learn from success is to go looking for them on the Plant's website and even then they are not obvious.
  - Several interviewees indicated that they perceive there is less information being transmitted than in the past and that they are getting more by reading other sites' web pages than what they get from Pantex internally.
  - When some interviewees were asked about lessons learned they indicated that there are lots of them but they can't remember any of them.

- Interviewees indicated that the Plant keeps making the same mistakes again because the effectiveness of the corrective actions is never properly evaluated.

- Data on the Behavioral Anchored Rating Scale for Organizational Learning indicated that 52% of interviewee respondents provided negative or neutral ratings suggesting that they do not believe that individuals and groups of employees pay close attention to past behaviors and how they can be improved in the future. They do not believe that information about past activities is necessarily formalized and available for future reference.

B.5.6 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.

Positive Observations

- Most interviewees indicated that there are multiple mechanisms available to identify safety concerns, e.g., Stop Work, Pause Work, open door policy with supervision, Quality Organization, Operations Center, DOE Site Office.
- Some interviewees indicated that they don't perceive a fear to raise concerns or any inhibitors to reporting problems.
- Some interviewees indicated that the ECP did hold information confidential.

Areas in Need of Attention

- Interviewees and observations by the Team indicated that the ECP could be a more effective program. Examples included:
  - Many interviewees were not familiar with the ECP.
  - The ECP Coordinator reports to the Division Manager of Human Resources rather than directly to the General Manager or Corporate Office.
  - The ECP Coordinator does not attend Senior Staff meetings and is not HRP so cannot go to the South End.
  - There is currently only one ECP Coordinator for 3500 employees. Previously there had been 3 individuals.
  - The Pantex ECP has not been benchmarked against nuclear industry standards.
  - Management does not utilize the ECP as much as it should and has not made it as visible as it should be.
- Many interviewees indicated they perceived subtle forms of retaliation or reprimand for raising concerns, self – reporting, or identifying problems. Examples included being transferred out of a job, denied a raise, fear of being terminated, and being removed as a supervisor.
- Interviewees described that the results of a survey conducted by Pantex as part of the NES event investigation indicated that 8 out of 10 employees believe it is a career limiting move to raise concerns.
- On the electronic survey associated with this evaluation the statement that management does not tolerate retaliation of any kind for raising concerns was agreed to by only 65% of the survey respondents.
- Among all survey respondents, about 65% 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 still indicates that about 35% of the population did not fully agree with this statement.
- Among survey respondents only 30% of employees feel that they can openly challenge decisions made by management.

- Approximately 30% of the survey respondents believe that constructive criticism is encouraged.
- Approximately 45% of the survey respondents agreed with the statement that they feel that they can approach the management team with concerns.
- Among survey respondents 45% agreed with the statement related to management wants concerns reported.
- Approximately 40% of the survey respondents agreed with the statement that concerns raised are addressed.
- Statistically significant differences among the Pantex Work Groups were obtained on 3 of the Safety Conscious Work Environment Questions from the electronic survey. Questions addressing feeling free to openly challenge management, approaching management with concerns and management wants concerns reported and willingly listens to problems indicated that the Safeguards and Security Division, the Engineering Division, and Special Nuclear Materials Division had significantly lower perceptions of these behaviors than the other work groups had. In addition, the group Prefer Not to Respond also had statistically significantly lower scores on these questions.
- There were statistically significant differences among Employee Categories on all of the Safety Conscious Work Environment Questions; Senior and Department Managers consistently scored higher on all the questions than the other employee categories. Section Managers and First Line Supervisors had statistically significantly higher scores on several of the questions than all of the non –management employee categories, with the exception of the Bargaining/MTC respondents who had more positive scores on feeling free to openly challenge management.

B.5.7 Effective Safety Communication

Communications maintain a focus on safety.

Positive Observations

- Interviewees identified multiple mechanisms for communication in the Pantex Organization
  - Monday morning staff meetings;
  - Monthly Manager meetings;
  - Weekly meetings;
  - Union/Management meetings;
  - One on one communication;
  - Emails;
  - PULSE;
  - Public Address System;
  - IPOD;
  - TV monitors in cafeteria and other places;
  - Turnovers;
  - Open door policy, etc.
- Many interviewees indicated that the small group meetings being held by the General Manager and Deputy General Manager were positive and something new for this management team.
- Most interviewees indicated that they believe they are well informed within their groups of what is going on.
- Observations by the Team indicated that:
  - The Maintenance PODs, the IPOD and some other meetings started with a safety topic.
  - Most meetings were formal, agenda driven and time managed, e.g., IPOD had 27 groups to acknowledge in 30 minutes.
  - Good interaction and discussion was observed in the Production Staff Meeting.

Areas in Need of Attention

- Several interviewees indicated that there are issues around the effectiveness of communication in the Plant. Examples included:
  - Many interviewees indicated that they want to see more managers in the field.
  - There is the perception that people are talked at and not listened to.
  - Interviewees described communication between supervisors across the Plant as poor.
  - Information is not perceived to flow down well from the top of the organization; lateral and upward communication is perceived more positively.
  - Many interviewees indicated that they only know about their own group and don't receive information about others.
  - Interviewees generally described information at the Plant as being 'stovepiped.'
  - Interviewees indicated a lack of communication between several levels in the organization, e.g., SPOs and management.
  - The size of the plant was often identified as being an impediment to communication.
  - Senior management is described as only being seen at larger group meetings and typically only when there has been problem.
  - There is a perceived cultural gap in the preferred modes of communication across employee age generations, e.g., texting versus face to face.
- The Team and interviewees identified several examples of missed opportunities to enhance the communication process within the Plant:
  - Lack of information around the NES event; only the change in personnel and organizational structure were communicated and that information was described by interviewees as inconsistent across the Plant.
  - Interviewees indicated that there has not been a formal change management process on the Stop Work Procedure since the NES event and the application of that process is highly subjective.
  - Interviewees on the South End were not aware of the survey for this evaluation or for the reasons that it was being conducted; some were not aware that they had email and yet they have been here for several years.
- Many interviewees indicated that communication for everything is on a need to know basis and is also dependent upon what department you work in.
- Data from the Behavioral Anchored Rating Scale on Communication indicated that only 33% of the interviewee respondents who completed that scale had positive perceptions about the exchange of information, both formal and informal, between the different units in the Pantex Organization, including the top-down and bottom-up communication networks.
- Data from the electronic survey on several of the Communication Scales indicated that Pantex survey respondents had some of the lowest scores across the DOE database on their opinions about perceived Trust in and Desire for Communication.
- Statistically significant differences were obtained between Employee Categories on the Perceived Accuracy in and Desire for Communication Scales with Senior and Department Managers having significantly higher scores than all other categories including Section Managers.
- No statistically significant differences were obtained between the Pantex Work Groups on any of the Communication Scales indicating that the low perceptions around the communication process is a pervasive opinion across the organization.

B.5.8 Respectful Work Environment

Trust and respect permeate the organization

Positive Observations

- Some interviewees described efforts by the General Manager to improve relationships and communication through the small group meetings being held across the Plant.

Areas in Need of Attention

- Many interviewees indicated that the quality of the work environment at Pantex was poor. In addition to the facilities and infrastructure being old and in need of upgrading, many interviewees also perceived that B&W Senior Management had little respect or concern for employees. Numerous individuals described examples of intimidation and threat if they were perceived to be creating difficulties.
- Pantex survey respondents indicated low scores on their perceptions of Trust in Communication regarding the freedom they feel to discuss the problems and difficulties in their jobs with an immediate supervisor without jeopardy. This was the lowest score obtained in the database across similar organizations that have taken the same survey.
- Results from the Communication Trust Scale on the electronic survey indicated no statistically significant differences between work groups or employee categories among survey respondents. The lack of differences between groups within the organization indicates that the lack of trust in communication is pervasive throughout the Plant.
- Results obtained on the Communication-Interaction Scale from the electronic survey indicated that overall Pantex survey respondents have the most negative perceptions regarding the desire for interaction from other organizational levels (superiors, subordinates, and peers) in the database across similar organizations that have taken the same survey.
- Statistically significant differences were obtained between Employee Categories on the Communication – Interaction Scale with Senior and Department Managers and Section Managers having significantly higher scores than respondents in the Non-Management Groups with the exception of Bargaining Unit- PGU. No significant differences were obtained on this scale across organizational work groups.

B.5.9 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.

Positive Observations

- Members of the Team observed a questioning attitude on the part of the General Manager during a meeting that was evaluating data and proposing corrective actions to resolve issues where there was an inadequate amount of information and data to fully understand the causes of the problems.
- Observations by the Team of various PODs and work activities generally indicated good participation by the individuals present.

Areas in Need of Attention

- Many interviewees indicated that they perceived that a questioning attitude was most often not encouraged or appreciated. While many individuals acknowledged that Senior Management said they wanted a questioning attitude, multiple examples were provided of individuals being intimidated to raise concerns or identify problems.
- Interviewees indicated that while formal processes exist to promote a questioning attitude the actual use of these processes, e.g., DPO, Stop Work, are not well received by Senior Management and often require their approval to be implemented thereby inhibiting many individuals from actually using them.

B.6 References

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