

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



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**Office of Safety and Emergency Management Evaluations
Office of Enforcement and Oversight
Office of Health, Safety and Security
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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 culture¹ 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

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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. 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.

B.6 References

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