



Independent Assessment of Fire Department Safety Culture at the Y-12 National Security Complex

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Acronyms

AC	Assistant Chief
BARS	Behavioral Anchored Rating Scales
BC	Battalion Chief
CNS	Consolidated Nuclear Security, LLC
DC	Division Chief
DOE	U.S. Department of Energy
EA	Office of Enterprise Assessments
ECP	Employee Concerns Program
FC	Fire Chief
FD	Fire Department
FF	Firefighter
HAZMAT	Hazardous Materials
ITM	Inspection, Testing, and Maintenance
NNSA	National Nuclear Security Administration
NPO	NNSA Production Office
OCI®	Organizational Culture Inventory
PE	Performance Excellence
SCWE	Safety Conscious Work Environment
SME	Subject Matter Expert
SOG	Standard Operating Guide
VSET	Value Stream Element Team
Y-12	Y-12 National Security Complex

INDEPENDENT ASSESSMENT OF FIRE DEPARTMENT SAFETY CULTURE AT THE Y-12 NATIONAL SECURITY COMPLEX

Executive Summary

The U.S. Department of Energy (DOE) Office of Enterprise Assessments (EA) conducted an independent assessment of fire department (FD) safety culture at the Y-12 National Security Complex (Y-12) from March 21 to April 1, 2022. Y-12 is managed and operated by Consolidated Nuclear Security, LLC (CNS) and overseen by the National Nuclear Security Administration (NNSA) Production Office (NPO). The objective of the assessment was to provide information on the status of safety culture within the Y-12 FD with particular emphasis on firefighter (FF) perceptions of management attention to employee concerns and recommendations. Additionally, the assessment gathered information on CNS and NPO employee perceptions of the effectiveness of their respective programs, processes, and activities to promote DOE safety culture values at the FD.

EA identified the following strengths related to the FD cultural environment:

- CNS leadership champions a commitment to organizational values and mission success through the Performance Excellence model, which establishes the strategy and methodology used to foster fundamental changes in the work environment culture.
- FFs consider peer communication and communications between FFs and FD line supervisors (i.e., lieutenants, captains, and Battalion Chiefs) as effective mechanisms for sharing pertinent operational information and raising immediate safety concerns.

EA also identified several areas in need of attention related to the FD cultural environment, as summarized below:

- The current FD culture is characterized by feelings of distrust and disrespect between FFs and FD management (i.e., management above the Battalion Chief level), along with an associated fear of retribution for reporting concerns to FD management.
- Significantly differing perceptions exist between FFs and FD management about the FD's inspection, testing, and maintenance (ITM) role for facility fire protection equipment.
- FFs with residential firefighting backgrounds shared that they do not feel comfortable with their knowledge and capability to handle some of the industrial emergency responses at Y-12.
- The organizational demographic distributions used in previously conducted CNS culture assessments were not of adequate granularity to identify the cultural challenges within the FD as found during this assessment.
- NPO has not performed focused oversight of FD safety culture.

EA also identified the following recommendations for CNS and NPO:

- CNS should consider incorporating leadership qualities for building harmonious FD relationships into the FD management hiring process, include FD managers in the CNS Enterprise Leadership and CNS Change Management Principles training, incorporate relational factors presented in CNS leadership training into FD management performance evaluations, and facilitate a workshop with FD union representatives to further explore the relational issues addressed in this report.
- CNS should consider incorporating an FD change management initiative into the *Transition Change Management Plan for Performance Excellence* to provide future contract executive management key FD issues to be addressed, steps already taken or in process, options for the future vision and identity of the FD, and areas of consensus as well as differing opinions.

- CNS should consider performing an independent assessment of the effectiveness of the FD's knowledge, skills, and abilities; knowledge preservation efforts; resource levels; organization; facility coordination; scheduling; and procedures to safely and efficiently execute both Y-12 emergency response and ITM functions.
- NPO should consider establishing expectations that future contractor culture assessments include organizational demographic distributions of sufficient granularity to differentiate data trends of important sub-organizations such as the FD.
- NPO should consider establishing processes to perform focused Federal oversight of safety culture for sub-organizations such as the FD.

In summary, all levels of the FD expressed a strong commitment to providing high quality emergency services in support of Y-12's vital national security missions. However, qualitative and quantitative data obtained during the assessment demonstrate a significant divergence between FF and FD management perceptions of the cultural environment at the FD. Systematic analysis of this data shows a current culture characterized by feelings of distrust and disrespect, along with an associated fear of retribution for reporting concerns. Such an environment impedes an organization's ability to improve by continuously learning from past experiences. The analysis and recommendations provided in this report offer insights to assist CNS and NPO with understanding organizational values that may be driving current FD safety culture perceptions and identifying potential improvement actions.

INDEPENDENT ASSESSMENT OF FIRE DEPARTMENT SAFETY CULTURE AT THE Y-12 NATIONAL SECURITY COMPLEX

1.0 INTRODUCTION

The U.S. Department of Energy (DOE) Office of Nuclear Safety and Environmental Assessments, within the independent Office of Enterprise Assessments (EA), conducted an assessment to ascertain site perceptions of the effectiveness of Consolidated Nuclear Security, LLC (CNS) and National Nuclear Security Administration (NNSA) Production Office (NPO) activities to promote a healthy safety culture at the Y-12 National Security Complex (Y-12) Fire Department (FD). Remote assessment planning and document collection activities began in February 2022; remote interviews occurred from March 14-18, 2022; onsite assessment activities were conducted from March 21-25, 2022; and survey data was collected from March 21 to April 1, 2022.

The FD consists of approximately 100 personnel responsible for: (1) providing fire, rescue, medical, and hazardous materials (HAZMAT) emergency services to Y-12 and surrounding areas through existing mutual aid agreements, and (2) planning and executing the inspection, testing, and maintenance (ITM) work activities for credited fire protection structures, systems, and components across Y-12. In November 2021, the DOE Office of Inspector General issued inspection report DOE-OIG-22-04, *Allegations Related to the Y-12 National Security Complex Fire Department*, which resulted in a recommendation to the NNSA Administrator to “conduct an independent assessment of the Fire Department’s culture and develop and implement an action plan to support an environment where Fire Department personnel did not fear raising concerns to management.” Based on this recommendation, NPO asked EA to conduct an independent assessment of FD safety culture.

In accordance with the *Plan for the Independent Assessment of Fire Department Safety Culture at the Y-12 National Security Complex – February 2022*, the assessment provides information and insights about the effectiveness of CNS programs, processes, and activities to promote a safety culture at the FD where safe performance of work and involvement of workers in all aspects of work performance are core values that are strongly and consistently held by managers and workers. The assessment primarily focused on FD organizational behaviors and perceptions of FD employees related to maintaining a safe working environment free from harassment and fear of retaliation. The assessment also evaluated the effectiveness of DOE oversight activities conducted by NPO related to Y-12 FD safety culture.

The following nomenclature is used throughout the report to delineate the groups of FD personnel involved in the assessment:

- Firefighters (FFs) refer to non-supervisory FD positions.
- FD line supervisors refer to lieutenants, captains, and Battalion Chiefs (BCs).
- FD management refers to Division Chiefs (DCs), Assistant Chiefs (ACs), and the Fire Chief (FC).
- FD employees refer collectively to FFs, FD line supervisors, and FD management.

2.0 METHODOLOGY

The DOE independent oversight program is described in and governed by DOE Order 227.1A, *Independent Oversight Program*, which is implemented through a comprehensive set of internal protocols, operating practices, assessment guides, and process guides. As identified in the assessment plan, the criteria used to guide the assessment were based on the objectives of EA Criteria and Review

Approach Document (CRAD) 30-08, Rev. 0, *Safety Culture Assessment*. In addition, EA used elements of CRAD 30-07, Rev. 0, *Federal Line Management Oversight Processes*, to collect and analyze data on NPO oversight activities. This report uses the term “recommendation” as defined in DOE Order 227.1A. The members of the assessment team, the Quality Review Board, and management responsible for the assessment are listed in appendix A.

The methodology is fully described in appendix B and summarized here. To assess key organizational behaviors, maximize FD employee participation, and ensure adequate depth and validity in the results obtained, EA employed multiple qualitative and quantitative methods. These methods included: functional analysis of organizational structures; review of documentation on administrative procedures, employee concerns programs (ECPs), and safety committee meetings; interviews with NPO and CNS leadership and FD management; 16 focus groups representing all FD shifts consisting of either three to seven FFs or three to seven FD line supervisors below the BC level; behavioral anchored rating scales (BARS) distributed to select interviewees and all focus group participants; a safety conscious work environment (SCWE) survey and an Organizational Culture Inventory (OCI®) survey distributed to all FD personnel and select site leadership in higher tier organizations with responsibility over the FD. BARS and SCWE survey quantitative results and in-depth analyses are included in appendix C, while key OCI® results are summarized in section 3.

3.0 RESULTS

3.1 Safety Leadership

This portion of the assessment addressed CNS leadership’s commitment to organizational values and mission success, FD staffing levels, and FD management’s efforts to foster an SCWE and build a resilient organization focused on mitigating harm.

Commitment to Organizational Values and Mission Success

CNS leadership described their efforts to champion organizational values and mission success through the Performance Excellence (PE) model. The CNS *Strategic Framework for Achieving Performance Excellence* establishes the strategy and methodology used to foster fundamental changes in the work environment culture. CNS leadership explained that PE is broader than safety culture and emphasizes successful mission execution through the safe, secure, and correct performance of all work. FD employees at all levels expressed common perspectives that plant safety is a priority and is managed such that few plant emergencies occur. Similarly, FD employees generally agreed that the FD is prepared to respond to potential site emergencies. CNS leadership’s successful championing of safe work performance was evident among FD employees who made comments such as, “This is the safest place that I have ever worked,” “Typically, the plant goes above and beyond OSHA [Occupational Safety and Health Administration],” and “Our firefighters always watch out for each other.”

One component of PE is the development of value stream organizations, which are based on the premise that “those who do the work are invaluable in identifying frustrations in the work they do and need to be part of identifying the improvements to the work.” CNS has successfully implemented this premise through using value stream element teams (VSETs), addressing important worker performance frustrations to improve operations throughout Y-12. This effort is supported by NPO and established as a goal in the CNS contract evaluation plan (*CNS Performance Evaluation and Measurement Plan*). However, well-established VSETs effectively used for process improvements in other Y-12 Emergency Services functional areas such as corrective maintenance have not been similarly leveraged to address longstanding FD employee frustrations described in this report. As another component of PE, CNS has adopted and implemented a

validated methodology to conduct culture assessments, providing leadership insights into the culture of the organization. However, the organizational demographic distributions used in previous CNS culture assessments were not of adequate granularity to identify the conditions within the FD as found during this EA assessment.

Staffing Levels

Using the demographics from the OCI® culture survey, the FD employee population appears broadly distributed in years of experience. The demographic data showed: 34% between 0-5 years, 36% between 5-15 years, and 24% greater than 15 years (6% was undeterminable because the respondents chose not to disclose demographic information). This broad years-of-experience distribution insulates CNS from substantial knowledge loss due to projected retirements and supports potential knowledge transfer, preservation, and mentoring efforts.

However, FFs shared different perspectives during focus groups about the adequacy of FD staffing levels, with several expressing confusion over the basis used to determine FD staffing levels. Some focus group participants stated that National Fire Protection Association guidelines should determine FD shift staffing requirements. Other participants stated that commitments in facility safety basis documents determine FD shift staffing requirements. FD management interviewed did not express awareness of FF confusion over the basis used for FD staffing levels or FF perceptions of potential staffing inadequacies for emergency response.

Further, many focus group participants emphasized that ITM demands on department staffing resources detract from what they consider adequate attention to training and preparedness to be able to respond to emergencies should the need occur. Overall, many FFs and some FD line supervisors viewed ITM as one of their greatest sources of frustration. In contrast, the majority of FD management interviewed perceived ITM as a valuable service provided by the FD.

BARS ratings for the Resource Allocation behavior show a high level of dissatisfaction among FD employees. Resource Allocation refers to “the manner in which the facility distributes its resources, including personnel, equipment, time, and budget.” From the five BARS rating alternatives, 63.3% of participants chose either the worst or next to the worst behavioral descriptors for how the FD currently allocates resources (see appendix C for detailed analysis of BARS results referenced throughout this section).

Fostering a Safety Conscious Work Environment

FD employees identified multiple formal and informal mechanisms available to report concerns. Formal mechanisms include the emergency reporting system (used to identify equipment problems needing corrective maintenance), an issues management system (for reporting issues), an electronic logbook (used to share operational information), and the conduct of “hotwashes” (meetings of shift personnel involved in an emergency event). Informal mechanisms include various social practices. For example, during focus groups, FFs noted that “We can voice our concerns on the spot or later with the captain or battalion chief” and “Key people get together to discuss off normal occurrences. They document contributing factors such as tools/resources that were not available and corrective actions needed to prevent future occurrences. They also document events that were handled very well.” Most of the SCWE survey participants agreed with the statement “I am responsible for identifying problems.”

Despite FD management providing these mechanisms for reporting concerns, FFs shared consistent perspectives that FF-reported concerns are not valued by FD management. This perception was more pronounced in comments about ITM work than for emergency response functions. This sentiment was echoed through numerous FF comments during focus groups, such as “We are always told to have a

questioning attitude but then if we do, they tell us to continue doing it the old way” and “When you identify a problem and recommend a solution it is put on the back burner or lost in the mix because there are so many hurdles to go through.”

The SCWE and OCI[®] survey results reinforced the FF perspectives expressed during focus groups. Responses to the SCWE survey show that many of the survey participants did not feel comfortable raising issues to FD management and that the majority of participants did not believe that management is interested in hearing their input (see Figure C.2). Responses to the OCI[®] survey and subsequent data analysis also reflected FF discomfort for raising issues.

Building a Resilient Organization Focused on Mitigating Harm

FD management has established formal processes to consistently achieve safe work performance. Standard operating guides (SOGs) are used by FFs and FD line supervisors as guidelines to supplement their individual knowledge and experience in responding to specific emergency response situations. During focus groups, FFs and FD line supervisors generally accepted the use of SOGs stating, for example, “Emergency response works because we have guidelines. Guidelines do not have to be followed verbatim.” ITM procedures have also been developed to capture subject matter expert (SME) knowledge and promote performance of consistent and compliant ITM work. Positive comments about ITM procedures included “We have slowly migrated to broad ITM procedures, and this has been an improvement.”

In contrast, some FFs and FD line supervisors expressed during focus groups more negative perspectives on SOG and ITM procedure use. While SOGs are generally designed to serve as guidance during emergency response, some FFs and FD line supervisors perceived that FD management expects verbatim compliance and that warranted deviations from the SOG based on actual conditions would still result in blame and negative feedback. For example, FF and FD line supervisor comments included “Guidelines allow you to deviate for a specific emergency, though in reality you have to jump through hoops to justify why you went against guidelines.” Some FFs responsible for ITM work perceived that they have little input to procedure development and that their recommendations for improvement are not addressed. Comments included, for example, “We are frustrated with procedure issues; we voice concerns to supervisors and keep having [the] same problem over and over;” “Procedures do not flow right, they keep changing them and not fixing the problems;” and “We need to simplify procedures, streamline [the] procedure review process, and include our input on procedures.”

3.2 Employee Engagement

This portion of the assessment addressed the clarity of organizational roles, responsibilities, and authorities; the personnel expertise needed to support the mission; respectful engagement in crucial conversations; and employee involvement in work planning and improving work practices.

Clarity of Organizational Roles, Responsibilities, and Authorities

FFs and FD line supervisors generally perceived their roles, responsibilities, authorities, and accountabilities for safety and emergency response as well defined and clearly understood. However, the majority of FFs indicated that roles and responsibilities for ITM scheduling and coordination lack clarity, causing confusion, stress, and difficulties in knowing who is in charge of authorizing and assigning ITM work. For example, FFs stated “During day shift there are two captains and lots of other Battalion Chiefs, Assistant Chiefs, the Fire Chief; everyone is communicating directly with FFs and not coordinating between each other or the BC; we have a difficult time getting knowledge of who has responsibility for scheduling to allow us to get our jobs done; we are not sure who is supposed to coordinate all of this

coordination; and Division Chiefs (DCs) are supposed to be more administrative and not operations, but they frequently bleed over to operations, and this leads to confusion. Everyone wants to be our boss.”

FF frustration with roles and responsibilities is echoed by the BARS ratings for the Roles and Responsibilities behavior, which show a relatively high level of dissatisfaction among participants. Out of the five rating alternatives, 58.3% of participants chose either the worst or next to the worst alternative to describe the clarity of their organization’s roles and responsibilities. The lack of clarity in roles and responsibilities and role conflict is also noted in the OCI[®] survey results; FD role clarity rated lower than benchmark organizations. This condition was even more pronounced in survey responses received from participants in the 0-5 years of FD experience demographic.

Identifying and Developing Employee Expertise to Meet Mission Needs

FFs and FD line supervisors agree that individual and team situational awareness during emergencies is a valued strength within the organization. Illustrative comments include “The FD does a good job spotting problems because that is our job; we are watching for changing conditions, evaluating them as they occur; and we watch out for each other.”

Despite these positive comments, self-identified newer FFs stated during focus groups that they are not confident that they have sufficient, detailed understanding of facility hazards. Many of these FFs stated that they came from municipal FD organizations, with little experience in responding to industrial challenges such as those found in Y-12 facilities containing unique hazards and processes. These newer FFs also expressed concerns about whether they have the requisite collective expertise to respond to all possible contingencies. The main training mechanism for familiarization with Y-12 buildings was described as primarily web-based with little hands-on training. These newer FFs expressed their desire to “have tours and a better knowledge of what hazards these facilities have so they have a better idea of how to respond in emergencies” and that they “need to be trained on classified areas more than once or twice a year to keep our proficiencies up to speed.”

FFs and FD line supervisors further expressed concerns regarding plans to transfer knowledge from senior FD employees, who have specialized expertise and unique knowledge of facilities and processes, before they retire. During focus groups, FFs and FD line supervisors were generally unaware of knowledge preservation efforts ongoing in Y-12 technical or operational organizations or the FD. CNS senior executives mentioned plant-wide knowledge preservation efforts that were ongoing but did not note specific efforts directly related to the FD.

Respectful Engagement in Crucial Conversations

FFs reported that peer communication and communication between FFs and FD line supervisors are primarily face to face. This form of communication was considered respectful, effective, and the best mode of communication to ensure that meaning, intent, and viewpoints were understood, and that differing points of view were acknowledged. This perspective was stated numerous times during focus groups through comments like “We feel pretty comfortable with BC communications; we can voice our concerns on the spot or later with the Captain or BC; I have never felt a safety concern, and the BC over a shift oversees everything to make sure it is done safely.”

In contrast, communication with FD management was predominantly viewed among FFs as strained and hampered. The strain in communications between FFs and FD management was illustrated during focus groups by similar comments that “we’re hesitant to report issues/problems up the chain.” FFs indicated that FD management-level communication is made more difficult due to shift work and primarily relies on electronic modes, such as email. Comments received included “Conflicting messages,

misunderstanding, or delays are attributed to these challenges;” “It is difficult to get information clearly from other shifts that may impact our shift. Day shift and rotating shift don’t communicate well which complicates transfer of information;” and “Shift turnovers are so rushed it is difficult to make sure we exchange and understand what we need to know when assuming responsibility for the task.”

BARS ratings reflect these verbally expressed perceptions, showing a relatively high level of dissatisfaction among FD employees with the Communication behavior, which includes both top-down and bottom-up communication networks. Out of five rating alternatives, 53.6% of respondents chose either the worst or next to the worst alternative to describe how well their organization handles this behavior. SCWE survey responses to “Management wants concerns reported and willingly listens to problems” and “Helpful criticism is encouraged” were largely unfavorable. The OCI® survey responses and subsequent analysis also indicated that the FD culture does not place a high priority on positive interpersonal relationships.

Employee Involvement in Work Planning and Improving Work Practices

FFs and FD line supervisors responsible for emergency response reported that they are actively involved in identifying and planning work and improving response practices. They attribute this involvement to the fact that emergency response preparation and conduct is controlled internally by the FD. During focus groups, most FFs and FD line supervisors stated that internal coordination for emergency response is effective, pointing to incident command as a strength.

While emergency response work planning and improvement was characterized during focus groups as effective, the majority of FFs and some FD line supervisors stated that coordination for ITM was one of the most frustrating aspects of FD work. Frustrations resulted from attempting to coordinate with multiple organizations, receiving blame when work could not be completed, and poor internal FD management coordination. Frustration with organizational coordination was exhibited by comments like “Simple tasks once performed solely by [the] FD now have multiple organizations involved with lockout tagout, long procedures, etc., and it’s glaring if someone would just come see it.” Frustration with receiving blame when work could not be completed was demonstrated by comments such as “We are not sure who is supposed to coordinate all of this coordination but if we don’t get the job done, we in the FD get the blame even though there was a lot of preparation work required by others; we are in charge of putting fire protection systems back into service; and it’s ‘our problem’ when it’s not ready even though it’s not our fault if they don’t have parts.” Frustration with FD management was evidenced by comments like “We used to have one captain responsible for work planning, getting parts, and executing ITM jobs; now we have about eight people for simple work across multiple organizations; FD line supervisors and FD management need to coordinate better on scheduling the work because we can’t determine what we are supposed to do without talking to three or four line supervisors and managers; and we go to a meeting one day and reach agreement but then changes are made.”

3.3 Organizational Learning

This portion of the assessment addressed shared organizational learning, training and development opportunities, and continuous work performance learning.

Shared Organizational Learning

FFs and FD line supervisors perceived that learning from emergency response activities is considered beneficial, with significant peer and direct supervisory feedback via hotwashes and informal interactions after emergency responses or incidents. Corrective actions from such learning are captured, and resolution is tracked by an issues management system.

However, FFs expressed during focus groups that they receive predominantly negative feedback from both FD management and external organizations when involved in adverse events, either during emergency response or while performing ITM activities. Several FFs further characterized the feedback as directed toward blaming individuals or FD actions/omissions, thus impeding organizational learning. Comments received during focus groups included “They focus on one thing that is wrong while ignoring the 15 that were done right” and “You don’t have much opportunity to discuss what worked well and what did not. We do it among ourselves.” Additionally, a lack of credibility and trust is said to be hindering questioning attitudes and reporting of errors. Specifically, some FFs stated that they do not “like, respect, or trust” some FD management. Other FFs expressed beliefs that some FD managers are “unfair, incompetent, dishonest, threatening, retaliatory, secretive.”

BARS ratings reflect a relatively high level of dissatisfaction among FD employees with the Organizational Learning behavior. Organizational Learning refers to the degree to which facility personnel and the organization use knowledge gained from past experience to improve future performance. Out of five rating alternatives, 60% of FD employees chose either the worst or next to the worst alternative to describe how well their organization currently handles this behavior. OCI® survey responses and subsequent data analysis indicate that the FD exhibits a culture that fails to reward successes but nevertheless punishes mistakes.

Training and Development Opportunities

FD employees expressed during focus groups and interviews that emergency response training has improved over the past few years, evolving from informal sharing of in-house knowledge to more formalized training patterned on professional firefighting certification models. New specialized training in certain areas has been well received by FFs and FD line supervisors; emergency response to nuclear facilities and HAZMAT events were cited as examples. Supporting comments included “We are much better off with HAZMAT training now; and this year we were trained on how to fight fires involving nuclear hazards.”

FFs and FD line supervisors identified additional training needed in several areas, including basic awareness of the facilities for which the FD is responsible, emergency response to unique Y-12 process facilities, specialized facility knowledge for officers assigned as FD points of contact, safety and technical training related to ITM, work planning and coordination, and apparatus driving in accordance with National Fire Protection Association guidance. Supporting comments included “There is not [sic] onsite capability for certain important skill and knowledge training such as rope rescue, trench rescue, or confined space” and “FD does a bad job communicating/orienting/training new hires. Sometimes people never get to see a building until they get called to it.” There was a general sentiment during focus groups that a more systematic approach that begins with job task analysis and tailored training would provide for more efficient and effective skill/knowledge development and retention than the current approach characterized as mostly “one size fits all.”

Continuous Work Performance Learning

During focus groups, FFs and FD line supervisors characterized learning from work performance as primarily informal with formal, individual performance reviews only provided for BCs, DCs, ACs, and the FC. FFs reported generally receiving positive feedback from their immediate FD line supervisors for emergency response jobs well done. Similarly, FFs reported face-to-face discussions with their line supervisors as the primary mechanism for receiving constructive feedback or opportunities for improvement following emergency responses.

However, the majority of FFs commented during focus groups that learning from ITM work performance is predominantly negatively focused on “what went wrong.” Some illustrative comments include “Always get negative feedback first, no matter how many things you did well;” “We did 100 jobs in Feb and only 2 did not get done. I got an email that only asked why the 2 did not get done and nothing about the other 98 completed ones;” “Delayed negative feedback, something happens on a Tuesday and gets the negative feedback a week later before the weekend. Most of the time you get no feedback, or it is bad;” “No news is good news if you do get some it is usually negative. If it is good feedback, we don’t get it. If it is bad, we hear it from everywhere;” and “Not a whole lot of positive, it would be nice once in a while.”

3.4 Federal Oversight

This portion of the assessment addressed NPO’s communication of safety culture expectations, oversight of FD safety culture, and handling of FD employee concerns.

NPO’s Communication of DOE Safety Culture Values and Expectations

NPO routinely engages with CNS to ensure that PE values and expectations are effectively coordinated and communicated to the broader CNS organization. Through the site’s Disciplined Operations Council, NPO and CNS senior leadership meet on a recurring basis to discuss successes and opportunities for improving a culture of excellence at Y-12. Interviewed NPO leadership identified that the focus on common operational objectives encouraged better coordination between CNS and NPO council participants, allowing for more open dialogue on site PE strategy. NPO effectively engages with CNS to develop and implement PE culture awareness training and communications for broad distribution throughout the NPO and CNS organizations. CNS routinely offers “Foundations of Performance Excellence” training to all levels of NPO and CNS personnel, which is well attended and includes keynote messages on PE from senior NPO leadership. All NPO and CNS personnel also have access to weekly safety shares located on the Y-12 website. These safety shares highlight relevant lessons learned in rotating safety subject areas and are generally provided at the beginning of various meetings and during pre-job briefs throughout a given week.

Oversight of Fire Department Safety Culture

NPO oversight activities for the FD primarily include observations and assessments of ITM programs, emergency response drills, training, and other fire protection program performance areas. Detailed evaluations of these oversight activities were outside the scope of this assessment and will take place in a future planned fire protection program assessment. Interviewed NPO management mentioned that they have incorporated select safety culture aspects into FD oversight activities.

However, NPO personnel revealed that NPO has not performed focused oversight of FD safety culture in the past despite recurring FD employee concerns raised since 2015 and do not have plans in place to conduct focused safety culture oversight activities. Interviewed NPO personnel also mentioned that because safety aspects are inherently integrated into other oversight activities, focused safety culture oversight activities are generally considered low priority.

Disposition of Fire Department Employee Concerns

NPO ECP personnel closely coordinate with their CNS counterparts to routinely promote the use of site ECPs by both Federal and contractor site personnel, effectively monitor CNS employee concerns evaluations and trends, and ensure that previous FD employee concerns have been appropriately dispositioned. Both NPO and CNS employ multiple methods to communicate the availability of site

ECPs, including coordinated email messages to all site personnel several times a year, ECP awareness posters distributed throughout the complex, and presentations provided by NPO ECP management at all-hands meetings. NPO ECP personnel also identified an effective working relationship with their CNS counterparts that has allowed for transparent communications, timely data sharing, and well-coordinated assessments of reviewed FD employee concern evaluations. EA reviewed FD employee concerns that were submitted to CNS from 2015 to the present and dispositioned, and then evaluated by NPO. NPO ECP management assigned relevant Federal SMEs to review and verify CNS substantiation determinations based on the nature of the complaint. Federal SMEs appropriately referenced applicable site requirements and procedures and provided a logical justification to verify the CNS determinations.

4.0 CONCLUSIONS

The conclusions provided in this section represent overarching FD cultural perspectives and themes, derived from systematic analysis of qualitative information shared during focus groups and interviews and amplified by quantitative data obtained from BARS, SCWE survey, and OCI[®] survey responses. Overall, the data collected during the assessment indicate that while all levels of the FD are committed to providing high quality professional emergency services, significant areas of divergence exist between FD management and FF perceptions of the FD cultural environment and organizational identity. Organizational identity refers to how an organization perceives itself when considering fundamental questions such as “Who are we?” “What are we doing?” and “What do we want to be in the future?” Based on the analysis of the data, a summary of the primary areas in need of attention identified by EA is provided below.

Trust and Respect

The FD work environment is weak in trust and mutual respect necessary for effective and harmonious working relationships between FFs and FD management. Formal and informal mechanisms exist for FD employees to report safety and performance issues. However, FFs perceive that their reported concerns are neither valued nor acted upon by FD management. Such perceptions may hinder reporting of issues and impede the organization’s ability to improve by continuously learning from past experiences.

FD Inspection, Testing, and Maintenance Role

Significantly differing perceptions exist between FD management and FFs about the FD’s ITM role for facility fire protection equipment. In general, FD management tended to view ITM as a distinguishing value-added service to Y-12, yet the majority of FFs and some FD line supervisors viewed ITM as one of their greatest sources of frustration. CNS and NPO leadership and FD management predominantly perceived combining emergency response and ITM functions as an optimal use of resources. The majority of FFs, however, emphasized negative impacts of ITM demands on FD resources, which they perceived as detracting from adequate attention to training and preparedness for emergencies. FD employees at all levels expressed general uncertainty as to whether the FD will continue to evolve into a fully integrated professional industrial FD managing both emergency response and ITM activities, or whether the dual roles will be reorganized into separate organizational units. Either decision would potentially necessitate significant change-management challenges. According to CNS and NPO, the knowledge and ability to manage such changes reside within the current organization. Until one of these decision paths is chosen and enacted, it is unlikely that substantive culture improvements in this area can occur.

Knowledge, Skills, and Abilities for Y-12 Industrial Emergency Responses

While FFs generally shared they were knowledgeable of Y-12 facilities and processes, some FFs with mainly residential firefighting backgrounds shared similar sentiments that they do not feel comfortable with their knowledge and capability to handle some of the industrial emergency responses at Y-12. This discomfort is most pronounced for some mission critical process facilities that involve unique hazards. The main facility familiarization training was described as primarily web-based with little hands-on training. FFs expressed their desire to tour and obtain greater knowledge of the hazards present in these facilities. Focused training on unique facility hazards may better prepare FFs for emergency response.

Assessments to Detect FD Cultural Challenges

CNS has adopted and implemented a valid methodology for conducting culture assessments to provide leadership with insight into the culture of Y-12 organizations. However, the organizational demographic distributions used in previously conducted sitewide culture assessments were not of adequate granularity to identify the conditions within the FD as found during this assessment. NPO personnel also identified that NPO has not performed focused oversight or assessments of FD safety culture in the past and that, since safety aspects are inherently integrated into other FD oversight activities, focused safety culture oversight and assessment activities are generally considered low priority. Lack of sub-organization response data in culture assessments and reliance only on other oversight activities to form the basis of FD safety culture oversight may cause key FD organizational safety culture focus areas to go unevaluated and trends to be missed.

5.0 RECOMMENDATIONS

EA identified the following recommendations for consideration by NPO and CNS. These recommendations are suggestions for senior line management's consideration to develop subsequent interventions, as necessary, to support a strong safety culture. Recommendations do not require formal resolution through a corrective action process and are not intended to be prescriptive or mandatory. Rather, they are suggestions derived from the aggregate results of an assessment that may assist senior line management in improving the effectiveness of programs or site management.

Consolidated Nuclear Security, LLC

- Consider implementing the following approaches to address the lack of trust between FFs and FD management.
 - Include leadership qualities for harmonious FD relationships in criteria and planning for selecting and hiring FD management.
 - Include FD managers in the CNS Enterprise Leadership and CNS Change Management Principles training.
 - For those FD members who are part of the CNS formal performance review system, review the performance plans and performance evaluation criteria to determine whether and how the relational factors included in CNS leadership training are addressed in FD management performance evaluations.
 - Conduct a facilitated workshop with FD union representatives to further explore the relational issues addressed in this report.

- Consider incorporating an FD change management initiative into the *Transition Change Management Plan for Performance Excellence* (the contract transition plan). Potential actions for such an initiative include, for example:
 - Identify a strategic working group, championed by an independent CNS executive, that includes FD employees, other site emergency services personnel, and key plant personnel. Group members should have prior experience with or training on the PE model including VSETs for support organizations and change management.
 - As the goal for the initial deliverables of this working group and in coordination with the PE change management working group, deliver to future contract executive management (1) a statement of the issues to be addressed, (2) steps taken or in process, (3) options for the future vision and identity of the FD, and (4) areas of consensus as well as differing opinions.
 - Benchmark comparable industrial FDs to learn how other organizations within and outside of DOE have created organizational identities that are of benefit to employees as well as the organization's PE goals.
- Consider performing an independent assessment of the effectiveness of the FD's knowledge, skills, and abilities; knowledge preservation efforts; resource levels; organization; facility coordination; scheduling; and procedures to safely and efficiently execute both Y-12 emergency response and ITM functions.

NNSA Production Office

- Consider establishing expectations that future contractor culture assessments include organizational demographic distributions of sufficient granularity to differentiate data trends of important sub-organizations such as the FD.
- Consider establishing processes to perform focused Federal oversight of safety culture for sub-organizations such as the FD.

Appendix A Supplemental Information

Dates of Assessment

Onsite Assessment: March 21-25, 2022

Office of Enterprise Assessments (EA) Management

John E. Dupuy, Director, Office of Enterprise Assessments
William F. West, Deputy Director, Office of Enterprise Assessments
Kevin G. Kilp, Director, Office of Environment, Safety and Health Assessments
David A. Young, Deputy Director, Office of Environment, Safety and Health Assessments
Kevin M. Witt, Director, Office of Nuclear Safety and Environmental Assessments
Charles C. Kreager, Director, Office of Worker Safety and Health Assessments
Jack E. Winston, Director, Office of Emergency Management Assessments
Joseph J. Waring, Director, Office of Nuclear Engineering and Safety Basis Assessments

Quality Review Board

William F. West, Advisor
David A. Young, Chair
Thomas C. Messer
Joseph Lewis
Michael A. Kilpatrick

EA Site Lead for Y-12 National Security Complex

Thomas E. Sowinski

EA Assessment Team

Thomas E. Sowinski, Team Lead
Kevin M. Witt
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William E. Carnes
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Robert H. Peters
Thomas R. Staker

Appendix B

Overview of Safety Culture Assessment Methodology

During this assessment, the Office of Enterprise Assessments (EA) used multiple methods to evaluate key organizational behaviors to ensure adequate depth and validity in the results obtained. A description of each method is provided below.

Functional Analysis

EA performed a functional analysis to: (1) clearly identify relevant organizational units, (2) gain an understanding of each organizational unit's functions and interfaces, (3) examine the way in which information flows within and between these organizational units, and (4) identify the key supervisory and managerial positions of each organizational unit. Information to support the functional analysis was primarily obtained through the review of administrative procedures, charters and meeting minutes of safety culture teams, organization charts, interoffice memoranda, corrective action reports, and documented employee concerns.

Interviews and Focus Groups

EA developed a database of safety culture questions to be used for interviews and focus groups; these questions were informed by the functional analysis portion of the assessment. EA selected relevant subsets of the questions to provide a predefined focus for each interview and focus group. Select key Consolidated Nuclear Security, LLC (CNS) and National Nuclear Security Administration Production Office (NPO) leadership participated in the interviews. EA conducted 16 focus groups across all shifts, with each focus group primarily consisting of either three to seven firefighters or three to seven Y-12 Fire Department (FD) line supervisors below the Battalion Chief level (i.e., captains and lieutenants) to maximize participant engagement.

Behavioral Anchored Rating Scales

Behavioral anchored rating scales (BARS) provide the opportunity to quantitatively summarize qualitative data associated with interviewees' perceptions of key organizational behaviors. EA administered BARS to all individuals who participated in structured interviews and/or focus groups. Each interviewee and focus group participant was administered BARS associated with four of nine different organizational behaviors in a structured manner so that all nine behaviors were representatively sampled. All BARS issued by EA were completed and returned.

Organizational Culture Inventory Survey

The primary purpose of administering a survey is to quantitatively and objectively measure topics related to the behaviors of interest. For the assessment, EA used the Organizational Culture Inventory (OCI[®]) survey to help assess culture and work environment in the FD. The OCI[®] tool has a notable pedigree of effective use in assessing safety and performance culture for a variety of organizations including the nuclear power sector, health care, police departments, and FDs. Select CNS leadership and all FD employees were invited to participate in the current culture survey. Select CNS leadership and FD management were also invited to participate in an additional ideal culture survey to provide their perceptions of optimal organizational culture expectations. Of the 99 FD employees and site leadership invited to take the current culture survey, 70 completed the survey with 65 of the 70 participants being directly employed within the FD. Thus, the overall survey response rate was 71%, which was adequate for the assessment. Of the 14 FD management and site leadership invited to take the ideal culture survey, 9 completed the survey with 7 of the 9 participants being directly employed within the FD.

Safety Conscious Work Environment Survey

EA also conducted a safety conscious work environment (SCWE) survey of the 99 individuals mentioned above (70 completed the survey with 65 being directly employed within the FD) to assess the extent to which the FD has been successful in promoting an SCWE. SCWE characteristics represented in the survey included:

- Individual responsibility for problem identification
- Ability to openly challenge management decisions
- Freedom to approach management with concerns
- Management's desire to have concerns reported and willingness to listen to problems
- Management's willingness to address concerns raised
- Encouragement of helpful criticism
- Management's intolerance of retaliation for raising concerns.

Appendix C Quantitative Results

Table C.1 below presents behavioral anchored rating scales (BARS) results for Y-12 Fire Department (FD) employees including firefighters, FD line supervisors, and FD management. BARS are quantitative measurements that increase the validity and reliability of employee perspectives gained through interviews and focus groups. Each BARS represents one organizational behavior and provides a definition of that organizational behavior, and a 5-point rating scale with behavioral statements “anchored” to each point (see Figure C.1 for an example).

Table C.1: Y-12 FD BARS Response Distribution

(Numbers over 50% in the “% Worst 2 options” column indicates that immediate action is needed.)

BARS Behavior	% Worst 2 options	% In between	% Best 2 options
Attention to Safety	33.3	30	36.7
Coordination of Work	17.9	64.2	17.9
Formalization	13	43.5	43.5
Communication	53.6	28.5	17.9
Organizational Learning	60	20	20
Performance Quality	47.3	32.4	20.3
Problem Identification and Resolution	31	55.2	13.8
Resource Allocation	63.3	30	6.7
Roles and Responsibilities	58.3	22.3	19.4

Each organizational behavior is defined as follows:

- Attention to Safety refers to the characteristics of the work environment that influence site personnel’s perceptions of the importance that the organization places on safety.
- Coordination of Work refers to the planning, integration, and implementation of the work activities of individuals and groups.
- 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.
- Communication refers to the exchange of information, both formal and informal, within the FD. It includes both the top-down and bottom-up communication networks.
- Organizational Learning refers to the degree to which the FD uses knowledge gained from past experience to improve future performance.
- Performance Quality refers to the degree to which FD personnel take personal responsibility for their actions and the consequences of their actions. It also includes commitment to and pride in the organization.
- Problem Identification and Resolution refers to the extent to which the FD encourages personnel to draw upon knowledge, experience, and current information to identify and resolve problems.
- Resource Allocation refers to the manner in which the FD distributes its resources, including personnel, equipment, time, and budget.
- Roles and Responsibilities refers to the degree to which position descriptions and work activities are clearly defined and carried out.

Figure C.1: Example of BARS Questions and Available Ratings

Resource Allocation

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

Best 2 Options		Management and employee committees collectively gather, prioritize, and determine the hierarchy of goals so that all affected parties understand how corporate goals relate to their daily activities. Employees have sufficient resources to implement these goals.
In Between Option		Goals are discussed with employees, established, and then disseminated. Progress relative to these goals is then periodically assessed and publicized. Personnel are able to properly prioritize the correction and prevention of problems and seek appropriate guidance and/or materials when necessary.
		Information on current goal attainment is solicited and new goals are formulated based upon past performance. Most employees are aware of the goals of the organization, but are not sure how the goals affect their own job. Personnel do not always have the support or resources necessary to correct, prevent, or implement procedures designed to achieve specific goals.
Worst 2 Options		
		Senior (high-level) management establishes broad, general goals and informs Fire Department managers of their responsibilities. Employees at lower levels in the organization are not directly contacted about new goals and are not always informed of the measures they need to take in order to complete work directed at achieving goals.
		No functional goals are established by senior (high-level) management and employee behaviors do not match core values of management. There exist numerous barriers to both human and financial resources that are necessary for proper operation of the Fire Department.

Figure C.2 below presents results for the safety conscious work environment (SCWE) survey. The figure shows that responses trended towards the two most negative choices (i.e., “not at all” or “to a slight extent”) for the majority of survey statements.

Figure C.2: Responses to SCWE Survey

