



Lawrence Livermore National Laboratory

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Ms. Kimberly Davis Lebak
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Subject: *Lawrence Livermore National Laboratory Safety Conscious Work Environment Self-Assessment Report*

Reference: Letter to T. Gioconda from K. Lebak, dated February 8, 2013, Commitment for Department of Energy Site Safety Science Work Environment Senior Leadership Training and Self-Assessments (COR-MO-2/8/2013-493977)

Dear Ms. Lebak:

Enclosed is the Lawrence Livermore National Laboratory (LLNL) Safety Conscious Work Environment (SCWE) Self-Assessment Report. The SCWE Self-Assessment Report fulfills LLNL's commitment to conduct a self-assessment as requested by the Livermore Field Office in the letter referenced above.

Please contact Erica von Holtz, LLNL SCWE Team Lead, at extension 2-6387 if you have any questions.

Sincerely,

Thomas F. Gioconda
Deputy Director

Enclosure: LLNL Safety Conscious Work Environment Self-Assessment Report

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Lawrence Livermore National Laboratory

**Safety Conscious Work Environment
Self-Assessment**

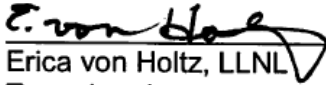
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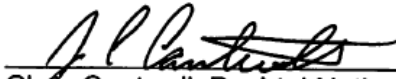
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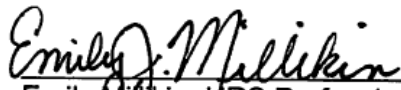
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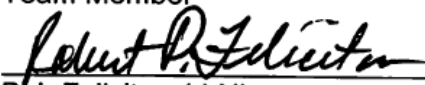
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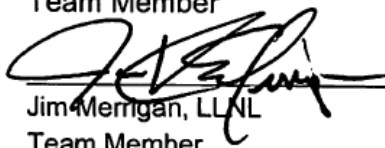
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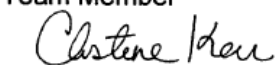
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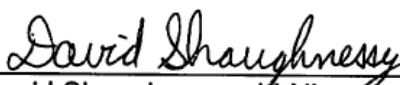
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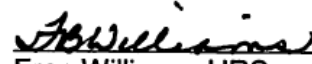
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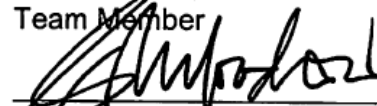
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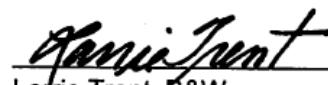
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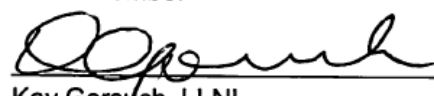
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Executive Summary

On December 21, 2012, Secretary of Energy Chu transmitted to the Defense Nuclear Facilities Safety Board (DNFSB) revised commitments to the implementation plan for Safety Culture at the Waste Treatment and Immobilization Plant. Action 2-5 was revised to require contractors and federal organizations to complete Safety Conscious Work Environment (SCWE) self-assessments and provide reports to the appropriate U.S. Department of Energy (DOE) - Headquarters Program Office by September 2013.

On February 8, 2013, the DOE Livermore Field Office (LFO) requested Lawrence Livermore National Security, LLC (LLNS) conduct an SCWE self-assessment of Lawrence Livermore National Laboratory (LLNL). This report documents results of the self-assessment for LLNL. In addition, completion of this self-assessment fulfills LLNS's commitment in Action 2-5 of the December 27, 2011 letter from Secretary Chu to the Defense Nuclear Facility Safety Board regarding a SCWE self-assessment.

The self-assessment was conducted using a three-phase approach and included the following assessment techniques and methodologies:

- Document review (jointly performed by LLNL and LFO).
- SCWE/safety culture survey.
- Interviews and observations.

The three-phase review was conducted in the spring and summer of 2013 in accordance with contract direction from DOE. Specific techniques used for the review included evaluation of program and process documents, an electronic safety culture survey, face-to-face interviews, and behavioral observations. As required by LFO, the extent to which contract incentive and performance metrics supplement SCWE Focus Areas and attributes was also evaluated along with the Employee Concerns Program (ECP) and Differing Professional Opinion (DPO) processes. Results of the self-assessment are presented below.

Document Review

Over 20 LFO and approximately 50 LLNL documents were reviewed. Results of the review found that programs and processes fully support a positive safety culture. Seven strengths were identified for LLNL that support implementation of the Integrated Safety Management System (ISMS) safety culture focus areas. Two opportunities for improvement (OFIs) were identified for LLNL to further strengthen policies and procedures related to promoting a strong safety culture. Recommendations from the document review were collectively managed along with those from the interview and field observation phase.

SCWE/Safety Culture Survey

A voluntary electronic SCWE/safety culture survey was sent out to all LLNL, supplemental labor, and subcontractor staff. It was completed in its entirety by 3,217 employees, a 44% response rate. Additionally, three hundred respondents partially completed the survey, although they did not submit their responses. The survey results from these partial responses were not included in the initial analysis which focused on the completed and submitted surveys; subsequent evaluation included all the partial responses obtained. Ninety percent (90%) of respondents were LLNS employees. Based on information voluntarily provided by the respondents, the employee organization demographic of those that responded was very similar to the overall representation of LLNL.

The survey questions were mapped into 13 scales. Overall, the median scores for most of the 13 scales reflected positive results. Eight of the 13 scales had a median score of greater than or equal to four, with five being the maximum positive score (Table 1). Overall respondents indicated that:

- LLNL management places great emphasis on safety issues.
- Employees are very well informed of potential risks in their work environment.
- Positive attention is given to the values/behaviors important to safety.
- There is a positive cohesiveness in their work group.

Survey respondents:

- Perceive that communication is accurate.
- Have a great desire for interaction.
- Are satisfied with the overall communication process.
- Are satisfied with their overall jobs.

In five scales the median scale score was less than four: work coordination, employee commitment to LLNL, trust in the communication process, emphasis placed on behaviors important for an effective SCWE, and perception of workplace hazard consequence. The scores for those areas indicated where an opportunity for improvement may exist, and lines of inquiry specific to those scales were integrated into the interview questions used in phase three of the self-assessment, the interview and observation phase. **Note:** This survey was conducted immediately following a voluntary separations process during which 399 employees opted to leave the laboratory. This could have had some influence on the survey results.

Interviews and Observations

A total of 258 interviews and 7 observations were conducted. Personnel interviewed and observed were found to be open and honest and appreciated the opportunity to voice their opinion. Results of the interviews and observations indicated the following:

- Of the nine SCWE attributes, four were found to be implemented and effective and five were found to be partially implemented and partially effective in various degrees.
- The Leadership Focus Area could improve in strengthening characteristics of safety leadership and management engagement with more time in the field.
- The Employee/Worker Engagement Focus Area was found to be strong for LLNL with respect to teamwork and mutual respect.
- The Organizational Learning Focus Area could be improved by building trust and improving interactions when responding to issues raised by employees.
- During interviews it was found that several employees were not aware of the National Nuclear Security Administration (NNSA) Employee Concerns Program or DOE Differing Professionals Opinion process. This merits further investigation to better understand the root of the ineffectiveness of the DPO communication.

Final recommendations of the report identified the following:

- Address the balance of safety versus safe performance of work.
- Address management time in the field (including communicating clear expectations).
- Continue efforts to re-enhance the Laboratory's identity for the future.
- Improve communication up and down all levels of the organization (improve flow down).
- Improve management response in the moment when an issue is raised.
- Provide workers feedback in response to issues raised.
- Publish and communicate a strategy for infrastructure improvements.
- Evaluate the feasibility of developing and implementing metrics specifically related to implementation and effectiveness of SCWE attributes within LLNL's Management Assurance System.

The purpose of this self-assessment was accomplished. All objectives of the self-assessment and extent of condition review from DOE contractual direction were met. Of the nine SCWE attributes, four were found to be implemented and effective and five were found to be partially implemented and partially effective in ensuring a healthy SCWE exists.

The safety culture at LLNL is on a proper continuous improvement path with successes and challenges requiring focus.

Acronym List

CAP	Corrective Action Plan
CAS	Contractor Assurance System
COMP	Computations
CRAD	Criteria, Review, and Approach Document
DNFSB	Defense Nuclear Facilities Safety Board
DOE	U.S. Department of Energy
DPO	Differing Professional Opinion
ECP	Employee Concerns Program
EFCOG	Energy Facilities Contractors Group
ENG	Engineering
FMD	Facility Management Department
GS	Global Security
HPAC	Human Performance Analysis Corporation
IAED	Independent Audit and Ethics Department
IAP	Institutional Assessment Planning
ICAM	Issues and Corrective Action Management
ITS	Issues Tracking System
IP	Internet protocol
ISMS	Integrated Safety Management System
L	Learning
LCO	Limiting Condition of Operation
LFO	Livermore Field Office
LLNL	Lawrence Livermore National Laboratory
LLNS	Lawrence Livermore National Security, LLC
LOTO	Lock-Out/Tag-Out
M&O	Maintenance and Operation
MAS	Management Assurance System

MOVI	Management Observations, Verifications, and Inspections
MPR	Monthly Performance Review
MUSD	Maintenance & Utility Services Department
N&PS	NIF and Photon Science
NNSA	National Nuclear Security Administration
NIF	National Ignition Facility
O&B	Operations & Business
OEC	Operations Executive Council
OFI	Opportunities for Improvement
OL	Organizational Learning
ORPS	Occurrence Reporting and Processing System
PAD	Principal Associate Director
PEP	Performance Evaluation Plan
PFD	Protective Force Division
PIP	Program Implementation Plan
PIR	Problem Identification Report
PLS	Physical and Life Sciences
PO	Performance Objective
PSTS	Professional Scientific and Technical Staff
SCWE	Safety Conscious Work Environment
SME	Subject Matter Expert
SMST	Senior Management Safety Team
WCI	Weapons and Complex Integration
WE	Employee/Worker Engagement
WTP	Waste Treatment and Immobilization Plant

1.0 Introduction

The U.S. Department of Energy (DOE) issued DOE Guide 450.4-1C, *Integrated Safety Management System Guide*, in 2011 to assist the DOE complex with information related to development, implementation, approval, monitoring, evaluation, and improvement of the Integrated Safety Management System (ISMS). Defined within the guide are the ISMS Core Functions, Guiding Principles, and definition of safety culture along with safety culture focus areas and attributes. The guide emphasizes that a positive safety culture is an integral aspect of an effective ISMS.

On December 21, 2012, Secretary of Energy Chu transmitted to the Defense Nuclear Facilities Safety Board (DNFSB) revised commitments to the implementation plan for safety culture at the Waste Treatment and Immobilization Plant (WTP). Action 2-5 was revised to require contractors and federal organizations to complete Safety Conscious Work Environment (SCWE) self-assessments and provide reports to the appropriate headquarters program office by September 2013.

On February 8, 2013, the National Nuclear Security Administration (NNSA) Livermore Field Office (LFO) requested Lawrence Livermore National Security, LLC (LLNS) conduct an SCWE self-assessment of Lawrence Livermore National Laboratory (LLNL). This report documents results of the self-assessment for LLNL. In addition, completion of this self-assessment fulfills LLNS's commitment in Action 2-5 of the December 27, 2011 letter from Secretary Chu to the Defense Nuclear Facility Safety Board regarding a SCWE self-assessment.

2.0 Purpose and Scope

The purpose of this self-assessment was to evaluate whether programs and processes associated with an SCWE are in place in accordance with existing guidance at LLNL and whether they are effective in supporting and promoting SCWE focus areas and associated attributes. In addition, the self-assessment evaluated whether contract incentives and performance measures achieve balanced priorities and include safety culture elements. The scope of the review focused on LLNL programs and processes (with the exception of the document review which included LFO) and included a review of processes such as the DOE Differing Professional Opinion (DPO) and the NNSA Employee Concerns Program (ECP).

3.0 Self-Assessment Strategy and Methodology

The self-assessment was conducted using a three-phase approach and included the following assessment techniques and methodologies:

- Document review.
- SCWE/safety culture survey.
- Interviews and observations.

Specific techniques used for the review included evaluation of program and process documents, an SCWE electronic survey, face-to-face interviews, and behavioral observations. Appendix A contains the approved Self-Assessment Plan. Appendix B contains the complete analysis of the LLNL SCWE electronic survey. Appendix C contains the analysis of information gained during the interview and observation phase of the review. Appendix D contains the lines-of-inquiry used during the interview process.

The self-assessment team comprised personnel in accordance with contractual direction. Team members included an LLNL senior management team leader, an external advisor, an external team executive, a nuclear safety culture subject matter expert (SME), and four two-person teams consisting of both external and internal assessors. Additionally, LLNL SCWE team members included: a psychologist, a statistician, and administrative support. All of the team members participated in one or more phases of the self-assessment and all team members concurred on this report.

3.1 Document Review

Phase one of the self-assessment consisted of reviewing programs and processes at LLNL to determine whether they defined and encouraged the implementation of SCWE focus areas and attributes as listed within DOE G 450.4-1C. The document review was conducted April 11, 2013 through April 16, 2013. The scope of the review included both LLNL and LFO documents that were qualitatively identified as being associated with one or more of the SCWE attributes. To support the review Criteria, Review, and Approach Documents (CRADs) were developed based upon the following:

- DOE G 450.4-1C, Attachment 10, Safety Culture Focus Areas and Associated Attributes.
- LFO direction.
- The Energy Facilities Contractors Group (EFCOG) Assessing Safety Culture in DOE Facilities.

The CRADs were organized by the three primary safety culture focus areas:

- Leadership
- Employee/Worker Engagement

- Organizational Learning.

Criteria developed for the CRADs addressed all attributes associated with an SCWE, and additional criteria were added as determined to be relevant to the review by the assessment team because of the mission and function of the Laboratory. Programs and processes identified for review included (but were not limited to) Management, Human Resources, Work Control, and Safety and Health.

3.2 SCWE/Safety Culture Survey

Phase two of the self-assessment consisted of development and implementation of an SCWE/Safety Culture Survey. The safety culture survey used was one developed by the Human Performance Analysis Corporation (HPAC) and was provided to LLNS by the DOE since they had used that tool at several other sites in the DOE complex. LLNL used SurveyMonkey®.com (“SurveyMonkey”), a web-based platform to administer and capture the survey results. The survey was sent to all LLNS, supplemental labor, and contractor staff (7,332). Personnel were invited to participate in the SCWE/Safety Culture Survey through e-mail to ensure that there was only one response per employee. E-mail addresses were provided by the LLNL Public Affairs Office. The survey was conducted June 17, 2013 through June 30, 2013.

The Safety Culture Survey administered to LLNS employees consisted of 61 survey questions from HPAC, 5 additional survey questions added by LLNL, and 9 demographic questions. Each survey question had possible answers of 1 – 5. By design, the survey questions relative responses were different throughout the survey. For example, a response of a “5” could be considered a negative or a positive response, depending on the scale and question. Prior to analyzing the survey data, all questions were adjusted so that a response of “1” was a negative response and a response of “5” was a positive response. A response of “3” was considered a neutral response.

LLNL took a number of steps to ensure employees were aware of the SCWE/Safety Culture Survey and to encourage participation. LLNL issued a Newsline article on May 22, 2013. The article notified LLNS employees that a survey would be administered beginning June 17 and that the survey would be distributed through an e-mail titled “LLNL Safety Culture Survey Invitation.” After the initial e-mail on June 17, 2013 a number of Newsline articles were posted prior to June 30 reminding employees of how much time was left to complete the survey. LLNL also utilized the capability of SurveyMonkey to periodically send reminders to those who had not yet taken the survey. To respond to any questions regarding the survey, or to report problems encountered when attempting to complete the survey, LLNL developed and provided a generic e-mail address in the invitation to participate in the survey, the preamble to the survey, and in all Newsline articles.

The survey results were managed anonymously and confidentially. SurveyMonkey has a privacy feature that allows the survey organizer to omit e-mail addresses and internet protocol (IP) addresses from the downloaded data. LLNL had one dedicated survey organizer, a member of the LLNL SCWE assessment team, and that individual signed a Confidentiality of Response Data Plan and Declaration that stated he would not disclose any information that could link any survey response back to its origin.

3.3 Interviews and Observations

Phase three of the self-assessment consisted of conducting interviews and behavioral observations at LLNL. The interview and observation process was performed from July 22, 2013 through August 2, 2013. The interview methodology consisted of a combination of one-on-one and focus group interviews. The interview selection process utilized the following methodology:

- Identification of all personnel working at LLNL, including supplemental labor and sub-contractors.
- Development of a list of representatively selected job categories employed at LLNL.
- Selection of a representative set of facilities and job categories (to include nuclear, hazardous and non-hazardous facilities).
- Development of a comprehensive listing of employees in each of the job categories and representative facilities selected.
- Use of a random number generator applied to the comprehensive listing of employees in each of the job categories and representative facilities selected in order to generate the final list of interviewees. (**Note:** an additional number of interview candidates were selected as alternates in the event the original candidates were not available.)

The methodology also included work observations in the form of pre-job briefs, work control/planning, management reviews, and oversight forums. Interview sampling populations included:

- 10% of nuclear facility personnel.
- 5% of hazardous facility personnel.
- 3% of low-hazard facility.

Interviews were conducted using two-person assessor teams; one external assessor paired with an internal assessor. Each of the two-person team members fulfilled either the role of interview questioner or interview note-taker. Interviews were conducted with both management and non-management personnel.

All levels of LLNL management were interviewed (e.g., senior managers, work activity managers, SCWE-related activity oversight managers, functional area managers, and SCWE-related process leaders). SCWE self-assessment management team members (i.e., Team Lead

and Advisor) conducted one-on-one interviews with LLNL senior managers and were not involved in the interview of non-management personnel to minimize any potential of a “chilling” effect. The DOE and the LFO shadowed the LLNL interview process. Their observations were limited to the management interviews, again to minimize any potential of a “chilling” effect. The LLNL SCWE Team Executive, accompanied by one or more SCWE self-assessment management team members, participated in the majority of scheduled work observations.

Personnel interviews and work observations were performed to a set schedule and a pre-established set of interview questions developed by the LLNL SCWE Team Advisor and Team Lead. Those questions were developed to address each of the SCWE attributes. In addition, interview questions also addressed median responses from the survey that were less than four on the response scale (total of five responses).

A team of 15 people conducted interviews and observations. Individuals were assigned to one of five interview/observation teams. Interview groups included senior management, managers and supervisors, individual workers, and focus groups of workers and supervisors. For those selected for participation in a focus group interview, participants were provided the option of being interviewed in a one-on-one setting to address potential “chilling” effects.

Prior to commencing the self-assessment interview and work observation process, specific instruction on how to conduct the interviews, using established interview questions, was provided to the team members by the SCWE Team Advisor.

4.0 Self-Assessment Results

A summary of the results from all three phases of the self-assessment are presented below. A complete summary of the document review process can be found in *Livermore Field Office, Lawrence Livermore National Laboratory, Safety Conscious Work Environment Self-Assessment Document Review*, April 2013, LLNL-MI-636242. Appendix B contains the LLNL SCWE Survey Report, and Appendix C contains the analysis of information gained during the interview and observation phase of the review. Appendix D contains the lines-of-inquiry used during the interview process.

4.1 Document Review

As earlier noted, the document review phase of the SCWE self-assessment was jointly conducted with LFO and LLNL. Over 20 LFO and approximately 50 LLNL documents were reviewed. Results of the review found programs and processes for both organizations fully support a positive safety culture. Seven strengths were identified for LLNL that support implementation of the ISMS safety culture focus areas. Two opportunities for improvement (OFIs) were identified for LLNL to further strengthen policies and procedures related to promoting a strong safety culture:

- Additional emphasis on documentation identifying success of the individual as part of the strategic goals and objectives.

- Worker participation in development of corrective action responses to identified problems.

Recommendations from the document review will be collectively managed along with those from the interview and observation phase.

4.2 Electronic Survey

An electronic survey was sent out to all LLNL, supplemental labor, and subcontractor staff. It was completed in its entirety by 3,217 employees, a 44% response rate. Additionally, three hundred respondents partially completed the survey, although they did not submit their responses. The survey results from these partial responses were not included in the initial analysis which focused on the completed and submitted surveys; subsequent evaluation included all the partial responses obtained. Ninety percent (90%) of respondents were LLNL employees. Based on information voluntarily provided by the respondents, the employee organization demographic of those that responded was very similar to the overall representation of LLNL.

Because completion of the demographics information was optional, approximately 19% of the respondents who completed questions 1 through 66 declined to answer some or all the demographic questions. Based on the responses that were provided, 90% of the respondents were LLNL employees, and 92% of all respondents work at the main site (Site 200). All the major organizations and job families were represented.

Overall, the median scores for most of the 13 scales reflected positive results. Eight of the 13 scales had a median score of greater than or equal to four, with five being the maximum positive score (Table 1). Overall respondents indicated that:

- LLNL management places great emphasis on safety issues.
- Employees are very well informed of potential risks in their work environment.
- Positive attention is given to the values/behaviors important to safety.
- There is a positive cohesiveness in their work group.

Survey respondents:

- Perceive that communication is accurate.
- Have a great desire for interaction.
- Are satisfied with the overall communication process.
- Are satisfied with their overall jobs.

As shown in Table 1, 5 of the 13 scales had a median score of less than 4; one of the 13 scales had a median score less than 3, the hazard scale.

Table 1. Median Scores for the 13 Survey Scales

		Scale	Meaning of Positive Score (score of 5)	Median Score
Median <4	Median <3	Hazard	Highest perceived hazard	2.3
		Coordination	Perception that work is highly coordinated	3.3
		Commitment	High commitment to the organization	3.7
		Communication – trust	Greater trust in the communication process	3.8
		SCWE	Greater emphasis placed on behaviors important for an effective SCWE	3.9
Median = 4		Cohesion	High work group cohesiveness	4.0
		Communication – accuracy	Greater perceived accuracy of communications	4
		Communication – interaction	Greater desire for interaction	4
		Communication – satisfaction overall	Greater satisfaction of overall communication process	4
		Job satisfaction	Greater satisfaction with overall job	4
Median > 4		Safety	Higher attention to the values/behaviors important to safety performance	4.3
		Management emphasis placed on environmental issues	Highest perceived hazard, emphasis or awareness from management	5
		Employee awareness of environmental issues	Highest perceived hazard, emphasis or awareness by employee	5

The hazard scale is the only scale where the rating of negative or positive responses does not apply. The hazard scale characterizes the employee’s opinion as to the level of hazards in their work environment. Overall, 66% of respondents perceive low hazards in their work at LLNL, with a hazard score of less than three. Engineering (ENG) and NIF and Photon Science (N&PS) had the highest median hazard score and Computations (COMP) and GS had the lowest median hazard score. There is a statistical difference in the perception of hazards across directorates and many pairwise differences were detected. Refer to Appendix B for more information.

For the coordination, commitment, communication trust, and SCWE scales, less than 50% (21%, 47%, 48% and 47%, respectively) of respondents scored a four or above for each scale. Statistical differences exist among directorates for both the coordination and commitment scales. There is no statistical difference in scores for trust in the communication and the SCWE scales process across directorates.

For those scales with median scores less than four, there were some common differences among the demographics:

- Male employees perceive greater hazards and place more emphasis on behaviors important for an effective SCWE compared to females.
- Akima employees perceive greater hazards, work to be more coordinated, and are more committed to the organization than LLNS employees.
- Employees that have worked at LLNL for fewer years perceive work to be more coordinated, are more committed to the organization, and have more trust in the communication process than employees that have worked at LLNL for a longer period of time.
- Students/Apprentices and Administrative and Specialist employees perceive work to be more coordinated, are more committed to the organization, and have more trust in the communication process than Facilities employees.
- Students/Apprentices perceive work to be more coordinated, are more committed to the organization, and have more trust in the communication process than Protective Force Division employees.
- Professional Scientific and Technical Staff are more committed to the organization and have more trust in the communication process than Protective Force Division employees.
- Employees at other locations perceive work to be more coordinated, are more committed to the organization, have more trust in the communication process and place greater emphasis on behaviors important for an effective SCWE compared to employees at Site 300.
- Employees at other locations perceive work to be more coordinated, are more committed to the organization, and place greater emphasis on behaviors important for an effective SCWE compared to employees at Site 200.
- Employees at Site 200 are more committed to the organization and have more trust in the communication process than employees at Site 300.

The safety scale had a positive median score of 4.3. Seventy percent (70%) of respondents scored a four or above. There is a statistical difference in the attention to values/behaviors important to safety performance among directorates. Pairwise comparisons revealed that Operations and Business (O&B) provides greater attention to values/behavior important to safety performance than COMP.

Overall, survey respondents are satisfied with their jobs with a median score of 4.0. Sixty-seven percent (67%) of respondents scored a four or a five. There is no statistical difference in job satisfaction across directorates. All but four groups among the nine demographic variables had a median job satisfaction score of four. Respondents 65 and older and respondents of American Indian decent had a score of five, the highest score possible. Protective Force Division employees and Facilities employees had a score of three.

An opportunity for improvement may exist where the median scale score was less than four, work coordination, employee commitment to LLNL, trust in the communication process, emphasis placed on behaviors important for an effective SCWE, and perception of workplace hazard consequence. These areas for improvement were integrated into the interview questions used in phase three of the self-assessment. **Note:** This survey was conducted immediately following a voluntary separation, during which 399 employees opted to leave the laboratory. This could have had some influence on the survey results.

4.3 Interviews and Observations

A total of 258 interviews and 7 observations were conducted. Results of the interviews and observations were compiled into a spreadsheet for future analysis. Analysis of the data was conducted in the following manner:

- Three teams of two team members were assigned three attributes each to evaluate.
- One additional team of two people was assigned to evaluate the grading of each attribute reviewed.
- Each team was provided the spreadsheet used to compile the interview information to analyze and develop conclusions. The interviewees were not identified on the spreadsheet to ensure anonymity and an unbiased evaluation.
- The interview and observation teams collectively met to finalize the analysis and recommendations.

The complete analysis of each attribute is provided in Appendix C. A summary of is presented below:

- Analysis of interview results - organized by focus area (per Attachment 1 of contract direction).
- Evaluation of grading results.
- Results from the work observations.

Of the nine SCWE attributes, four were found to be implemented and effective and five were found to be partially implemented and partially effective.

4.3.1 Leadership (L)

Interviews and observations associated with the Leadership Focus Area included the following attributes:

- Demonstrated safety leadership (L1)
- Management engagement and time in the field (L3)
- Open communication and fostering an environment free from retribution (L5)
- Clear expectations and accountability (L6).

Analysis of data associated with these attributes identified the following conclusions:

Positive Feedback	Feedback for Areas Needing Improvement
Workers believe their immediate supervisors and managers demonstrate safety leadership through their actions, behaviors, assigned responsibilities and expectations.	Some workers believe that management above their immediate supervisors do demonstrate safety leadership but are not sincere and at times see their actions and behaviors as a “check the box” exercise.
Workers believe their management listens to them and encourages their feedback and acknowledges employee ownership and involvement in the safety of their work.	Workers believe that demonstrated leadership actions and behaviors of their supervisors, managers and upper levels of management change when faced with approaching milestones and priorities.
Workers believe their immediate supervisors and managers are engaged and spend time in the field interacting with them.	Some workers indicated that levels of management, above their supervisors, were only fulfilling roles of demonstrated leadership because it was procedurally required.
Managers acknowledge they should spend more time in the field – which was recognized by the team as a positive acknowledgement.	Continue to communicate the importance of NIF’s success to the lab’s success and the ability to attract future missions and new work, building upon the existing theme of “One Lab”.
Most people feel free to raise concerns and are aware there are multiple avenues by which to raise issues (i.e., Ombudsmen, blogging).	With staff reductions occurring, people may not report a problem in their new work assignments.
Employees have no fear of retribution or retaliation and recognize the expectation to stop work/raise a concern if needed.	Employees may not want to speak up and draw too much attention to themselves in this resource reduction environment.
Employees provided examples of their roles, responsibilities, expectations, as well as where the information could be found.	Workers believe the IWS process is complex and not easily used in getting the work completed.
	Several employees were not aware of the NNSA Employee Concerns or DOE Differing Professional Opinion (DPO) process.
	Some employees were not knowledgeable of key safety roles and responsibilities related to their specific job function.

Attributes L1 and L3 were found to be partially implemented and partially effective. Attributes L5 and L6 were found to be implemented and effective. The Leadership Focus Area could improve in strengthening characteristics of safety leadership and management engagement with more time in the field. Taking into consideration interview and observation results, specific team recommendations for improving Leadership (as a path forward) included the following:

- Address the balance of safety (in terms of compliance) versus safe performance of work.
- Address management time in the field (including communicating clear expectations).
- Continue efforts to re-establish the Laboratory’s identity.

4.3.2 Employee/Worker Engagement (WE)

Interviews and observations associated with the Employee/Worker Engagement focus area consisted of one SCWE attribute: Teamwork and mutual respect (WE2). Analysis of data associated with these attributes identified the following conclusions:

Positive Feedback	Feedback for Areas Needing Improvement
Teamwork and mutual respect was rated strong by majority of interviewees and even stronger within the individual work groups.	Communicate “why” when priorities result in delays or cancellation of their projects/work.
Work activities are generally well coordinated.	

The WE2 attribute was rated implemented and effective. The Employee/Worker Engagement Focus Area was found to be strong for LLNL with respect to teamwork and mutual respect. Taking into consideration interview and observation results, specific team recommendations for improving Employee/Worker Engagement (as a path forward) included the following:

- Improving communication up and down all levels of the organization (improve flow down).

4.3.3 Organizational Learning (OL)

Interviews and observations associated with the Organizational Learning Focus Area included the following attributes:

- Credibility, trust, and reporting errors and problems (OL1)
- Effective resolution of reported problems (OL2)
- Performance monitoring through multiple means (OL3)
- Questioning attitude (OL5).

Analysis of data associated with these attributes identified the following conclusions:

Positive Feedback	Feedback for Areas Needing Improvement
Employees believe their supervisors and managers speak about important matters at the Lab and, they tell the truth, especially in the area of safety.	In the areas of causal analysis and fact-finding following a mishap, management's intention is not to find blame, but the processes in place often lead to conclusions of blame.
A majority of people think that when incidents or accidents occur, management takes an objective approach to determining the causes without focusing on blaming individuals.	In general, people feel that their immediate supervisors are responsive to employee concerns and reported problems, but upper level managers are not.
Many employees believe the senior leadership provides accurate and timely information to the work force and understand the importance of communication even when information is unknown or uncertain.	Upper management communication mechanisms/tools either are not visible or are not consistently used.
Safety issues get addressed and resolved timely, particularly if there are safety and health issues.	Backlog of identified maintenance and facilities issues that are perceived to demonstrate ineffective resolution of problems.
Fact-finding activities usually ensure all levels of the workforce are able to contribute.	Backlog of open problems hinders employees from wanting to bring up more – nothing will be done about them either.
Management tries to prioritize problems to be worked.	Little communication to the employees of the status of projects that will be worked on and the list of those that will be listed for future action.
Managers articulated a strong response to performance monitoring citing numerous examples of oversight activities.	At times, workers needed the interviewers to define oversight activities.
Many examples of a questioning attitude were provided with the majority appropriately addressed.	The majority of workers only identified management walk-throughs and could not validate managers conducting oversight or performance monitoring.
Examples of hazards were provided by the majority; many identified multiple controls.	About half felt they were not acknowledged when they demonstrated a questioning attitude.
	Funding for resolution of issues that are not safety related has been difficult to obtain. .
	There is a perception with some employees that there is lack of responsiveness when an issue is raised and there are, in some cases, employees who still have negative feelings to raised issues because of the lack of response and/or acknowledgement.

Attributes OL1, OL2, and OL3 were found to be partially implemented and partially effective. Attribute OL5 was found to be implemented and effective. The Organizational Learning Focus Area could be improved by building trust and improving interactions when responding to issues raised by employees. Taking into consideration interview and observation results, specific team recommendations for improving Organizational Learning (as a path forward) included the following:

- Improve management response in the moment when an issue is raised.
- Provide workers feedback in response to issues raised.
- Publish and communicate a strategy for infrastructure improvements.

During interviews it was found that several employees were not aware of the NNSA ECP or the DOE DPO process. However, despite not being aware of those programs, employees did feel that they had multiple avenues through which they can raise their concerns and have them addressed.

4.3.4 Interview Grading Results

As part of the interview process each interviewee was asked to grade how that attribute is implemented and practiced at the Laboratory. The grading scale was from one to five with one being the lowest (equivalent to an F in school) and five being the highest (equivalent to an A). In the cases of focus group interviews each individual was requested to provide a grade. The scores were then averaged across the three organizational levels of senior managers, manager/supervisor, and non-supervisor. Evaluation of the grading results identified the following:

- Teamwork and mutual respect (Employee/Worker Engagement) along with exhibiting a questioning attitude (Organizational Learning) were graded as highest amongst all focus areas and attributes.
- Management time in the field (Leadership), effective resolution of reported problems and performance monitoring through multiple means (both Organizational Learning) were graded the lowest amongst the focus areas and attributes.
- Senior Management evaluated laboratory performance better than non-supervisors.

4.3.5 Observations

A total of seven activities were attended by the interview team to evaluate whether SCWE attributes were exhibited during these activities (e.g., accountability, desired SCWE behaviors, effectiveness training). Those activities included work planning evolutions, safe-plan of action meetings, and governance meetings. Several SCWE characteristics were observed that support the above conclusions. Overall evaluation of the results was positive.

- There was a free and open exchange of communication and ideas at all of the meetings – respect to the individual was observed.
- Employees were not reluctant to raise a concern or issue.
- Accountability of associated responsibilities was observed.
- A best practice was observed in a pre-job meeting when the work supervisor inquired as to whether an employee was fit to perform their task.

4.4 Performance Measures and Contract Incentives

A review of the performance measures and contract evaluation process was conducted to determine whether they support balanced priorities and include safety culture elements. Below are the results of the evaluation.

4.4.1 Contact Incentives

The LLNL is managed by LLNS for the DOE/NNSA. The current LLNS contract is evaluated annually per the *Fiscal Year 2013 NNSA Strategic Performance Evaluation Plan (PEP) for Management and Operation of the Lawrence Livermore National Laboratory by Lawrence Livermore National Security, LLC, Contract Number: DE-AC52-07NA27344, Performance Period: October 01, 2012 through September 30, 2013 (PEP)*. To earn award term the contractor must meet Performance Objectives one through five (at the very good level) and experience no significant safety or security incident during the performance period. Table 2 identifies the Performance Objectives and breakdown of award fee allocated.

Table 2. LLNS Performance Evaluation Plan Fee Allocation Summary

Performance Category	Performance Objective	Percent Fee Allocation
Programs	PO-1: Nuclear Weapons Mission	40
Programs	PO-2: Broader National Security Mission	10
Programs	PO-3: Science Technology, and Engineering Mission	10
Operations & Mission Execution	PPO-4: Security, Infrastructure, Environmental Stewardship, and Institutional Management	30
Operations & Mission Execution	PO-5: Contractor Leadership	10

Review of the PEP found some evidence of evaluation criteria that indirectly integrates and promotes some SCWE attributes; most notably in the section pertaining to Security,

Infrastructure, Environmental Stewardship, and Institutional Management (PO-4). Specifically there are two criteria that support an effective SCWE:

- Deliver efficient, effective, and responsive environment, safety, and health management and processes.
- Achieve affirmation of a comprehensive, transparent, and integrated Contractor Assurance System (CAS).

Outside of formal contractual mechanisms, the NNSA has developed an Environmental, Safety, and Health Program Implementation Plan (PIP) for fiscal year 2013. Contained within the PIP is Strategic Goal 3-1: Promote and Institutionalize a Safety Conscious Work Environment (SCWE). Included within 3-1 are the following objectives:

- M&O Contractor Senior leadership complete training on safety culture attributes and management behaviors.
- M&O Contractors complete SCWE self-assessments and provide report to NA-00 via site offices.
- M&O Contractors submit proposed site-specific safety culture sustainment tools to NA-00 via Site Offices.

Though the PIP further instills SCWE practices and principles into LLNL operations; it is currently not contractually required. However, LLNL was contractually-driven to perform the SCWE self-assessment and will implement continuous improvement initiatives related to improving implementation of the ISMS principles and functions (which includes safety culture).

4.5 Performance Metric Insights and SCWE

The LLNL institutional measures and metrics are developed and revised in accordance with the LLNL Multi-Year Performance Strategy. For the institutional measures and metrics, line organizations and functional and subject areas determine goals and thresholds for targets and metrics. A review of the measures and metrics found LLNL does not have a metric specifically related to SCWE or the Employee Concerns Program; however, the institutional metrics address many programs and processes that implement SCWE attributes.

Per direction received from LFO, LLNL evaluated the existing measures and metrics program to respond to specific questions related to SCWE and required to be considered as part of the SCWE extent of condition review for DOE. Below is a summary of this evaluation.

Q1: What insight does Performance Assurance System data (issues management data) provide regarding SCWE and whether the organization learns from safety concerns?

A1: The LLNL Issues and Corrective Action Management (ICAM) system includes an expedited Issues Tracking System (Quick ITS) option that permits any employee to enter a concern.

The ITS system automatically updates (rapid response) the employee and the employee's assurance manager on the status of the concern until final disposition.

Numerous organizations use employee led "learning" teams or review teams with substantial employee participation. The teams input is incorporated in the formal Corrective Action Plans (CAPs) in ITS.

The Maintenance & Utility Services Department (MUSD) requests workers to note any issues with a completed work order. Safety issues are forwarded to the MUSD safety manager who reviews and resolves the issues. In October of 2011, MUSD increased first-line supervisor walk-downs of job sites. The number of work order feedbacks reporting safety issues significantly declined. The metric is tracked monthly and is accessible via the institutional dashboard and the Management Assurance System (MAS) portal. The portal was established to promote transparency with the field office as well as providing one-stop access for employees.

A monthly "Stalls and Falls" meeting with Senior Operations Managers (Operations Excellence Council (OEC), chaired by the Operations & Business Principal Associate Director (PAD), and Deputy Director serves as the alternate chair, was established in August of 2011 to address issues with timely and quality completions of corrective actions as well as management actions being taken in response to any institutional (LLNL) indicators at caution (yellow) or alert (red). The ITS home screen dynamically displays the current status. The institutional dashboard captures data monthly. The monthly "Stalls and Falls" meeting material is maintained on the OEC website. Information is captured monthly as input to the Director's Monthly Performance Review (MPR) and quarterly in the MAS Report. All information is accessible on the MAS portal that is open to both LLNL and LFO employees.

Q2: What evidence (evaluation of trends in operations and management information/metrics) exists to show decision making reflects a safety first attitude?

A2: Institutional metrics at caution or alert 12 months prior are reviewed quarterly (and monthly in the Monthly Performance Review, MPR) to report on current status and assess the effectiveness of management actions taken. The review is documented in the MAS Quarterly report and is accessible via the institutional dashboard and MAS portal. As of June 2013, 11 of 13 institutional metrics at caution or alert in July 2012 were meeting or exceeding expectations. Seven of the 13 metrics are related to management assurance or safety. All seven are meeting or exceeding expectations.

Unplanned Limiting Condition of Operation (LCO) entries are managed at the organizational level. At LLNL, the LCO process is a tool used to address a condition with predetermined actions. LCO entries are not tracked.

Events and issues are assessed and characterized in respect to (Conduct of Operations) DOE O 422.1 section 2P specific requirements. ConOps related events are tracked as a

metric in the institutional dashboard and adverse trends are summarized in the MAS monthly input to the MPR. ConOps related issues are trended. Adverse issue trends are discussed with cognizant engineers or SMEs and reported at the monthly Conduct of Operations Stakeholders Advisory Group meeting.

Employees are notified via Newline four times a year (per the DOE Order) about the availability of the DOE process to file a Differing Professional Opinion. The notification includes contacts and links. The Employee Voice Program provides a hotline managed by an outside vendor. The Program is managed by the Ethics Office in the Independent Audit and Ethics Department (IAED). The Investigations Work Group, chaired by the Deputy Director, meets monthly to discuss these concerns and how they were addressed.

The institutional dashboard tracks assessments completed quarterly by type and by internal or external. In the past six months, the field office has issued 7 Problem Identification Reports (PIRs) containing three strengths and four weaknesses. In December, there were 38 PIR items (1 deficiency, 37 weaknesses) related to CAS effectiveness LCON-5s of 31 functional areas. The institutional dashboard tracks assessments completed quarterly by type and as internal or external assessments. The MAS quarterly also characterizes the nature of the assessments. The information is accessible on the MAS portal and is accessible to both LLNL and LFO personnel.

Q3: What evidence (evaluation of trends in CAS performance indicators) exists to show how effectively the organization monitors the SCWE aspects of the safety culture?

A3: Although specific SCWE attributes are not monitored, programs and processes which support the attribute are monitored for effectiveness. The suite of LLNL formal assessments include independent assessments and audits, joint functional and line assessments, and management-self assessments. The Institutional Assessment Planning (IAP) tool is used to determine which required and risk based assessments need to be performed. Requirements, Issues, deficiencies, events, metrics and performance analysis are evaluated to determine the needed assessments. Assessment, issue, deficiency and corrective action metrics tracked include timeliness, quality, number, extensions and internally identified. Overall reportable events are trended and explicitly tracked for conduct of operations, electrical safety and radiation safety. The above information is reported in the institutional dashboard, the MAS quarterly, the rolling 12 month quarterly Occurrence Report Performance Analysis and the Annual Performance Analysis of Issues and is accessible via the MAS portal. This information is also discussed in biweekly safety calls to the corporate partners. Performance and any issues are reported at the OEC and the MPR. The monthly Senior Management Safety Team (SMST) meeting, chaired by the Director, focuses on safety performance, issues, concerns and initiatives.

Q4: What evidence (evaluation of trends in CAS performance indicators) exists that demonstrates managers/supervisors perform first hand observations of the work environment, listen to workers and make changes where necessary?

A4: Management observations, verifications and inspections (MOVIs) resulting in an issue that is required to be included in ITS per procedure are reported in ITS. MOVIs with no reportable findings are entered into ITS at the discretion of the organization. In the 12 months ending June 30, 864 MOVIs were completed (ITS). Most principal directorates require senior management walk-downs as part of their safety and security contract with the Director. The number and nature of these walk downs are discussed, tracked, and acted upon at directorate organizational operations review boards and/or Safety and Security directorate meetings. Observations are shared at the OEC meetings. LLNL is ISO 14001 and OHSMS 18001 certified. Safety objective number 5 is to demonstrate management commitment to occupational safety and health. One of the measures of this commitment is the execution of directorate Safety and Security contracts. The Facility Management Department (FMD) tracks and records all safety walk-downs in the institutional dashboard. On average, the FMD completes 18-20 walk-downs per month.

Q5: What evidence (evaluation of facility performance metrics) exists that demonstrates the organization maintains nuclear facilities in a manner that supports both production and safe performance of work?

A5: At LLNL the highest category for a nuclear facility is three. Nuclear Safety Basis metrics include Documented Safety Analysis/ (DSA/DSR) review, Unreviewed Safety Question (USQ) process and Implementation Verification Review (IVR) process. The overall Nuclear Safety Function metrics include metrics on criticality safety, maintenance, configuration management, cognizant systems engineers, nuclear material, readiness reviews and conduct of operations (Occurrence Reporting and Processing System [ORPS] and sub-ORPS events). The metrics are tracked monthly and reviewed with the field office quarterly in a 'zipper' meeting. Meeting information is accessible via the institutional dashboard and MAS portal. All metrics indicate satisfactory performance, and no adverse trends.

Lock-Out/Tag-Out (LOTO) events are also tracked. A LOTO practicum has been established to improve LOTO performance across all facilities and completion of the practicum is tracked. Deferred maintenance is tracked and reported on a quarterly basis for mission critical facilities. Corrective and preventive maintenance timely completions and backlog are tracked for all facilities and specifically for nuclear facilities. Metrics and supporting information are available through the institutional dashboard and through the MAS portal.

It is recommended LLNL evaluate the feasibility of developing and implementing a metric specifically related to implementation and effectiveness of SCWE attributes.

5.0 Conclusions and Recommendations

The self-assessment was successfully conducted and all objectives were met. The self-assessment was accomplished using a three-phase approach that included the use of multiple assessment techniques and appropriately addressed all SCWE Focus Areas and associated attributes. In addition, the assessment evaluated the extent to which contract incentives and performance metrics supplement the SCWE, along with the ECP and DPO processes. All objectives of the self-assessment and extent of condition review from DOE contractual direction were met.

The document review successfully identified the extent to which programs and processes currently promote balanced priorities and a SCWE. Results of the review identified two opportunities for improvement that will further strengthen the existing SCWE at LLNL.

The voluntary electronic survey was successfully executed with over 3,217 employees participating. Median scores of the survey reflected positive results with five areas identified for integrating with the interviews and observation phase of the review.

The interview and observation phase provided additional insight into perceptions of management, supervisors, and workers with respect to SCWE focus areas and attributes. Seven recommendations were generated for further action in FY 2014. Personnel interviewed and observed were found to be open and honest and appreciated the opportunity to voice their opinion. Of the nine SCWE attributes, four were found to be implemented and effective and five were found to be partially implemented and partially effective in ensuring a healthy SCWE exists.

Final recommendations of the self-assessment include the following:

- Address the balance of safety versus safe performance of work.
- Address management time in the field (including communicating clear expectations).
- Continue to re-enhance the Laboratory's identity for the future.
- Improve communication up and down all levels of the organization (improve flow down).
- Improve management response in the moment when an issue is raised.
- Provide workers feedback in response to issues raised.
- Publish and communicate a strategy for infrastructure improvements.
- Evaluate the feasibility of developing and implementing metrics specifically related to implementation and effectiveness of SCWE attributes within LLNL's Management Assurance System.

The purpose of this self-assessment was accomplished. All objectives of the self-assessment and extent of condition review from DOE contractual direction were met. Of the nine SCWE

attributes, four were found to be implemented and effective and five were found to be partially implemented and partially effective in ensuring a healthy SCWE exists.

The safety culture at LLNL is on a proper continuous improvement path with successes and challenges requiring focus.

6.0 References

EFCOG/DOE *Safety Culture Task Team, Assessing Safety Culture in DOE Facilities*, EFCOG Meeting Handout, January 23, 2009

Fiscal Year 2013, NNSA Strategic Performance Evaluation Plan (PEP) Template for Laboratory by Lawrence Livermore National Security, LLC, Contract No: DE-AC52-07NA27344, Performance Period: October 01, 2012 through September 30, 2013

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T. Gioconda, to K. Davis Lebak, *Lawrence Livermore National Laboratory and National Nuclear Security Administration, Livermore Field Office, Safety Conscious Work Environment Self-Assessment Plan*, Letter No. ES&H-2013-102, May 15, 2013

U.S. Department of Energy, *Integrated Safety Management System Guide*, DOE G 450.4-1C, September 29, 2011

U.S. Department of Energy, *Plan for Independent Oversight Evaluation of Line Self-Assessments of Safety Conscious Work Environment, Office of Safety and Emergency Management Evaluations*, Office of Enforcement and Oversight, Office of Health, Safety, and Security, April 2013

Appendix A
**LLNL Safety Conscious Work Environment Self-Assessment
Plan**



Ms. Kimberly Davis Lebak
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Livermore, CA 94551

May 20, 2013

ES&H-2013-102

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Subject: *Lawrence Livermore National Laboratory and National Nuclear Security Administration,
Livermore Field Office, Safety Conscious Work Environment
Self-Assessment Plan*

Dear Ms. Lebak:

Enclosed for your approval is the Lawrence Livermore National Laboratory and National Nuclear Security Administration, Livermore Field Office, Safety Conscious Work Environment (SCWE) Self-Assessment Plan. The SCWE Self-Assessment Plan provides detail on the basis, scope, methodology, and the schedule for conducting the assessment.

Please contact Erica von Holtz, LLNL SCWE Team Lead, at 422-6387 if you have any questions.

Sincerely,

Thomas F. Gioconda
Deputy Director

Copy:
Frances Alston
Jim Merrigan
Peter Rodrik
Erica von Holtz



**Lawrence Livermore National Laboratory
National Nuclear Security Administration
Livermore Field Office**

Safety Conscious Work Environment Self-Assessment Plan

May 15, 2013

Approved by:



Thomas F. Gioconda
Deputy Director
Lawrence Livermore National Laboratory

5-16-13

Date

Approved by:

Kimberly Davis Lebak

Date

Manager

NNSA Livermore Field Office

1.0 INTRODUCTION

On December 5, 2011, Secretary Chu issued a memorandum that re-emphasized nuclear safety as a core value of the Department of Energy. The Secretary stated that a strong safety culture is embedded in the Department's objective of management and operational excellence. The memorandum further stated that the U.S. Department of Energy (DOE) was embarking on a broad assessment of safety culture within the Department to better understand areas for improvement. Secretary Chu referenced DOE Guide 450.4-1C, as providing detailed information to assist sites in managing a strong safety culture.

The DOE Guide 450.4-1C, *Integrated Safety Management System Guide*, was published to assist the Department and site contractors on information related to development, implementation, approval, monitoring, evaluation, and improvement of Integrated Safety Management Systems (ISMS). Defined within the guide are the ISMS Core Functions and Guiding Principles, along with defining a positive safety culture as an integral aspect of an effective ISMS.

This document describes the plan for conducting the joint Safety Conscious Work Environment Self-Assessment for the Lawrence Livermore National Security, LLC (LLNS) and National Nuclear Security Administration (NNSA) Laboratory Field Office (LFO).

2.0 SAFETY CONSCIOUS WORK ENVIRONMENT SELF-ASSESSMENT BASIS

2.1 Safety Culture Focus Areas and Attributes

The DOE and the Energy Facility Contractors Group (EFCOG) have collaborated to develop guidance for achieving a strong safety culture. That guidance includes the following definition of safety culture:

Safety culture 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 the workers, public, and the environment.

The guidance identifies three safety culture focus areas and several attributes associated with each focus area that have the greatest potential for achieving excellence in both safety and production performance.

Leadership

- Demonstrated safety leadership
- Management engagement and time in field
- Open communication and fostering an environment free from retribution
- Clear expectations and accountability

Employee/Worker Engagement

- Teamwork and mutual respect

Organizational Learning

- Credibility, trust and reporting errors and problems
- Effective resolution of reported problems
- Performance monitoring through multiple means
- Questioning attitude

A supplemental information topic: Performance Measures and Contract Incentives, as identified in the DOE G 450.4-1C, Attachment 10, *Safety Culture Focus Areas and Associated Attributes*, will be assessed in conjunction with three focus areas identified above.

Performance Measures and Contract Incentives

- Contract incentives achieve a reasonable balance between cost/schedule and safety pressures
- Performance metric insights into SCWE

3.0 SAFETY CONSCIOUS WORK ENVIRONMENT SELF-ASSESSMENT SCOPE

The scope of the LLNL/LFO Safety Conscious Work Environment (SCWE) self-assessment will include all:

- Personnel performing work at LLNL Site 200 and Site 300, including management, exempt and non-exempt employees, supplemental labor, bargaining units, contractors; and
- All LFO personnel.

The scope will address the SCWE self-assessment elements contained in the following:

- DOE G 450.4-1C, Attachment 10, *Safety Culture Focus Areas and Associated Attributes*; and
- The *Energy Facilities Contractors Group (EFCOG) Assessing Safety Culture in DOE Facilities*.

4.0 SAFETY CONSCIOUS WORK ENVIRONMENT SELF-ASSESSMENT METHODOLOGY

The proposed self-assessment for LLNL and LFO is comprised of primarily three components: document review of SCWE-related processes, safety culture survey, and a safety conscious work environment self-assessment. Each component is discussed below.

4.1 Safety Conscious Work Environment Self-Assessment Document Review

A review of documents supporting the implementation of LLNL/LFO's SCWE-related processes will be conducted prior to beginning the SCWE self-assessment interview process. SCWE-related processes to be reviewed will include institutional- and organization-specific (if applicable) processes used to:

- Identify and correct problems (e.g., contractor assurance issues management process);
- Raise employee concerns (e.g., employee concerns program, ombudsman, differing professional opinion program); and
- Address work environment concerns and disciplinary actions.

Additionally, documents to be reviewed include:

- SCWE-related DOE assessment findings and observations;
- Self-assessments usage in evaluating SCWE-related processes and areas of concern;
- Effectiveness of root cause analysis in addressing significant issues, causal analysis in general, and their associated corrective actions; and
- Determination of the participation of workers in work planning and feedback.

4.2 Safety Culture Survey

The NNSA-provided safety culture surveys will be administered separately to all LLNS and LFO employees.

LFO employees will complete an NNSA-provided safety culture survey, which will be administered through NNSA Headquarters. The results of the survey will be analyzed and reported-out by NNSA Headquarters.

LLNL employees will complete an NNSA-provided safety culture survey, which will be administered and analyzed internally by LLNL. Two weeks will be allotted for LLNL employees to complete the survey. An additional two weeks will be allotted for LLNL to accumulate, analyze and finalize the survey data results.

LLNL will use an NNSA-provided safety culture survey with minor modifications to ensure the survey content is better understood by LLNL employees. The survey modifications will include:

- Substituting the "LLNL" acronym for the term "organization" when appropriate. This is intended to provide clarification;
- Adding a new set of five questions at the end of the survey. This is intended to clarify a set of original questions included in the survey; and

- Using a one-to-five response range as opposed to the initial one-to-seven from the original NNSA safety culture survey response range. This is intended to simplify the response options and to align the survey response range with the survey response range applied to the LFO.

The safety culture survey will be performed prior to conducting the on-site safety conscious work environment self-assessment.

4.3 Safety Conscious Work Environment Self-Assessment

4.3.1 Self-Assessment Team Composition (See Attachment)

LLNS has a unique opportunity to partner with its LFO customer, leverage the talent and experience of their corporate partnerships and LLNS personnel in executing the self-assessment. Consistent with the SCWE guide document requirements, LLNS and LFO has comprised a dynamic and knowledgeable self-assessment team, integrating personnel from these talent pools.

- Team Lead - LLNS senior management
- Advisor – LLNS parent organization team member
- Executives – LLNS parent organization team member and a NNSA team member
- Safety Culture SME – LLNS parent organization team member
- Team assessors comprised of:
 - Three LLNS parent organization personnel with SCWE self-assessment experience
 - One SCWE independent contractor with SCWE self-assessment experience
 - Four LLNS personnel experienced in safety culture/management (e.g., HPI, Grass-roots Safety Committee, Shingo-trained behavioral assessment, safety discipline)
 - Two LFO personnel with safety oversight experience

4.3.2 Safety Conscious Work Environment Self-Assessment Interviews

A specific set of self-assessment interview questions will be developed to address each of the lines of inquiry identified in the SCWE guidance document. Where applicable, appropriate NRC and INPO safety culture best management practices will be addressed in the development of the self-assessment interview questions. Safety culture survey and document review results will be considered in the development and focus of self-assessment interview questions.

The SCWE self-assessment interview process will be managed by a senior LLNS manager with experience in safety and data collection. Interviews will be conducted employing:

- Face-to-face discussions with individuals;
- Focus group interviews; and
- Observation of worker behavior in the work environment.

In order to obtain the most benefit from the self-assessment team expertise, internal and external assessors will partner to conduct the self-assessment interviews.

4.3.2.1 Safety Conscious Work Environment Self-Assessment Interview Strategy

LLNL is a complex, multi-programmatic research and development site with slightly more than five percent of its workforce involved in nuclear-related activities. A tailored SCWE self-assessment interviewing strategy addressing the Laboratory's diverse work environment is required to obtain a defensible measure of SCWE process implementation.

4.3.2.1.1 The LLNL interviewing strategy is designed to ensure:

(a) Appropriate levels of LLNL management are addressed:

- Senior line managers
- Oversight managers
- SCWE-related process leaders
- Work activity managers
- Functional area managers

(b) Major organizations are included:

- NIF & Photon Sciences
- Global Security
- Engineering
- Operations & Business
- Weapons Complex Integration
- Physical & Life Sciences
- Computation
- Director's Office

(c) Major personnel groups/work environments are represented:

- Scientists & engineers/lab environment
- Administrative/office environment
- Managers/supervisors/all work environments
- Crafts/shop & field environments
- Post doctorate candidates/students/ lab environment
- ES&H/security oversight/all work environments

(d) LLNL sampling percentages reflect hazard significance of activities/facilities:

- Nuclear 10%
- Hazardous 5%
- Non-hazardous 3%

4.3.2.1.2 The LFO interviewing strategy is designed to ensure:

(a) Appropriate levels of LFO management are addressed:

- Senior line managers
- Team leaders

(b) All LFO organizations are included.

(c) Major personnel groups/work environments are represented:

- Program staff/office environment
- Oversight staff/field environment
- Managers/supervisors/all work environments

(d) A minimum of 25% of LFO employees will be interviewed.

It is estimated that approximately 200 LLNS employees and 25 LFO employees will be interviewed over ten working days to complete the SCWE self-assessment on-site interviews and direct observations of work behaviors.

By employing this interviewing strategy, combined with interviews of key organizational and programmatic managers and leaders, a representative cross-section measurement reflective of LLNL's safety culture will be ensured.

5.0 SAFETY CONSCIOUS WORK ENVIRONMENT SELF-ASSESSMENT SCHEDULE

April 8 – May 2	Perform document review of SCWE-related processes
June 17 – 30	Administer site-wide safety culture survey
July 1 – 12	Analyze and finalize safety culture survey results
July 22 – August 2	Conduct on-site SCWE interviews and work observations
August 5 – 16	Analyze and report SCWE self-assessment results

6.0 FINAL PRODUCT

A final, approved LLNL/LFO SCWE self-assessment report will be provided to the LFO to communicate the results of the LLNL SCWE self-assessment.

Attachment – SCWE Self-Assessment Team

SCWE Self-Assessment Team	
Team Leadership	
LLNL Team Lead	
	Erica von Holtz – LLNL
Advisor	
	Frank McCoy – URS
Executives	
	Chris Cantwell – BSII
	Susie Mellington – NNSA
SME	
	Emily Milliken – URS
Assessors	
Parent Organizations	
	Dave Allen – BSII
	Fran Williams – URS
	Michael Coyle – Consultant
	Larrie Trent – B&W
NNSA/LFO	
	Christopher Amaden
	Nadine Remington
LLNL	
	Kurt Dreger
	Bob Felicitas
	David Shaughnessy
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Mr. Thomas F. Gioconda
Deputy Director
Lawrence Livermore National Security, LLC
Lawrence Livermore National Laboratory
7000 East Avenue, L-001
Livermore, CA 94551

Subject: Approval of the Lawrence Livermore National Laboratory Safety Conscious Work Environment Self-Assessment Plan

Reference: ES&H-2013-102 (T. Gioconda/K. Lebak), *Lawrence Livermore National Laboratory and National Nuclear Security Administration, Livermore Field Office, Safety Conscious Work Environment Self-Assessment Plan*, dated May 20, 2013

Dear Mr. Gioconda:


The Livermore Field Office (LFO) has reviewed the above Reference. The plan delineates a well thought-out approach consistent with both industry accepted practices and the Department of Energy's guidance. The proposed Safety Conscious Work Environment Self-Assessment Plan is approved based on incorporating the following change concerning our initial concept of a joint Lawrence Livermore National Security, LLC (LLNS)/LFO review.

Subsequent to our discussions and decision earlier this year to conduct a joint LFO/LLNS review, the National Nuclear Security Administration (NNSA) Headquarters (HQ), as part of a broader NNSA Safety Culture Assessment, administered both an employee survey and series of focused interviews to the NNSA federal staff including LFO employees. Recognizing a joint review with the Laboratory would now result in duplicative assessment activities at LFO, I have decided to utilize our participation in the NNSA HQ assessment for meeting the LFO SCWE self-assessment objectives. As a result, LLNS should continue with the plan noting that the remaining assessment activities will no longer be administered for the LFO organization. In addition, the NNSA participants listed in the plan will continue to shadow the LLNS assessment activities. LFO representatives will continue to work with LLNS representatives to coordinate schedules and protocols for shadowing the assessment.

I will continue to support the ongoing efforts towards improving organizational culture within

our respective organizations and their intended positive impacts on safety, security, and mission accomplishment. If you should have any additional questions, please contact Pete Rodrik at (925) 423-4339.

Sincerely,


Kimberly Davis Lebak
Manager

cc:

P. Hill

P. Rodrik

F. Alston

J. Merrigan

E. Von Holtz

Appendix B

Complete Analysis of the LLNL Safety Culture Survey Results 2013

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1.0 Introduction

Seven thousand three hundred and thirty two (7,332) LLNL employees were invited to participate in a voluntary LLNL Safety Culture Survey in July 2013. The Safety Culture Survey was developed, tested and provided to LLNL for use by the Human Performance Analysis Corporation. The original survey consisted of 61 questions related to a number of topics, safety and a Safety Conscience Work Environment (SCWE) being two of the main topics. LLNL added nine demographic questions to the survey and five additional questions.

The Safety Culture Survey is one part of three for a self-assessment of LLNL's SCWE. The first phase of the self-assessment consisted of a document review. The survey, the second phase, was administered to infer conclusions about the LLNL population from a sample of employees that chose to complete the survey. The survey results were provided to the SCWE team conducting the third phase of the self-assessment in the form of one-on-one and focus group interviews, as well as field observations. The survey results were used by the SCWE team to refine and/or develop new interview questions pertaining to those areas where an opportunity for improvement may exist. The results of the Safety Culture Survey are discussed in the following sections.

2.0 Methods

2.1 Survey Administered

LLNL used SurveyMonkey.com ("SurveyMonkey"), a web-based platform to administer the Safety Culture Survey and capture the results. The survey was sent to LLNL employees through e-mail to ensure that there was only one response per employee. LLNL employee e-mail addresses were provided to a SCWE team member by the LLNL Public Affairs Office. The survey was open for approximately two weeks, from June 17, 2013 through June 30, 2013. The start of the survey was postponed for two weeks at the direction of Lab management to allow approximately 400 LLNL employees to physically leave the Lab. These employees elected to separate from the Lab as part of the Self-Select Voluntary Separation Program (SSVSP).

LLNL took a number of steps to ensure LLNL employees were aware of the Safety Culture Survey and to encourage participation in the survey. LLNL issued a Newsline article on May 2 and again on May 22, 2013 notifying LLNL employees that a survey would be administered beginning June 17 and that the survey would be administered through an e-mail entitled "LLNL Safety Culture Survey Invitation." After the initial e-mail sent on June 17, 2013 inviting LLNL employees to participate in the survey, a number of Newsline articles were posted prior to June 30 reminding employees of how much time was left to complete the survey. LLNL also utilized the capability of SurveyMonkey to periodically send reminders to those who had not yet taken the survey. These reminders were sent on June 24, 25, 26, 27, and June 28 to all employees that had yet to respond. A reminder was also sent by e-mail on June 28 to those employees who had started the survey but had not yet completed the survey. On Friday, June 28, 2013, an e-mail was sent from the Public Affairs Office for the Director of LLNL reminding LLNL employees about the survey and encouraging participation.

The survey e-mails sent to LLNL employees also provided a link to comment on the survey or ask questions about the survey. A generic e-mail address was created and was provided in both the invitation to take the survey and the preamble of the survey. All comments submitted were responded to by LLNL SCWE team members.

The survey results were anonymous and confidential. SurveyMonkey has a privacy feature that allows the survey organizer to omit e-mail addresses and IP addresses from the downloaded data. LLNL had only one dedicated survey organizer, a member of the LLNL SCWE assessment team. The survey organizer is the only individual who has access to individual survey taker responses, including e-mail and IP addresses. The survey organizer signed a Confidentiality of Response Data Plan and Declaration stating that he would not download any data that could link to an LLNL individual nor would he disclose to anyone any information that could be used to link a person's name, e-mail address, IP address, or any other attribute to his/her unique survey responses.

2.2 Analysis Methods

The Human Performance Analysis Corporation (HPAC) that developed and tested the Safety Culture Survey used by LLNL provided LLNL with information needed to conduct the analysis of the survey data. The Safety Culture Survey administered to LLNL employees consisted of 61 original survey questions, five additional survey questions added by LLNL, and nine demographic questions. Each survey question had possible answers of 1 – 5. By design, the survey questions rating were different throughout the survey. For example, a response of a “5” could be considered a negative or a positive response, depending on the scale and question. Prior to analyzing the survey data, all questions were adjusted so that a response of “1” was a negative response and a response of “5” was a positive response. A response of “3” was considered a neutral response.

The HPAC grouped the 61 questions into 13 different scales listed in Table 1. Six scales consist of one survey question: Management emphasis placed on (work) environmental issues, Employee awareness of (work) environmental issues, Communication Accuracy, Communication Interaction, Communication Satisfaction Overall, and Job Satisfaction. As defined by the HPAC, responses for the other seven scales were averaged so each respondent has an average score for the following scales: Commitment, Coordination, Cohesion, Hazard, Safety, SCWE, and Communication Trust. The meaning of a positive score, defined by the HPAC, is listed in Table 1.

Table 1. Summary of the 13 Scales from the Safety Culture Survey

No.	Scale	Questions (Q) in Scale	Meaning of a Positive Score (score of 5)
1	Commitment	Q1-Q3	High commitment to the organization
2	Coordination	Q4 – Q9	Perception that work is highly coordinated
3	Cohesion	Q10 – Q14	High work group cohesiveness
4	Hazard	Q15 – Q17	High perceived hazard
5	Management emphasis placed on (work) environmental issues	Q18	High perceived hazard, emphasis or awareness from management
6	Employee awareness of (work) environmental issues	Q19	High perceived hazard, emphasis or awareness by employee
7	Safety	Q20 – Q46	High attention to the values/behaviors important to safety performance
8	Safety Conscience Work Environment (SCWE)	Q47 – Q53	Greater emphasis placed on behaviors important for an effective SCWE
9	Communication – trust	Q54 – Q57	Greater trust in the communication process
10	Communication – accuracy	Q58	Greater perceived accuracy of communications
11	Communication – interaction	Q59	Greater desire for interaction
12	Communication – satisfaction overall	Q60	Greater satisfaction of overall communication process
13	Job satisfaction	Q61	Greater satisfaction with overall job

Boxplots were used to graphically compare scores by demographic variables such as payroll directorate. A boxplot is a graphical way to summarize scores. The boxplot provides a five number summary, the minimum score, first quartile, median score, third quartile, and the maximum score. The central box spans the quartiles, with a line in the box that represents the median score. Lines extend from the box out to the smallest and largest scores that are not suspected outliers.

Normality for statistical testing could not be assumed. Therefore, distribution-free, nonparametric, statistical tests were used to compare scale scores from the nine demographic variables. Medians as well as the distribution among scales and demographics were tested for differences using the Kruskal-Wallis nonparametric test. The Kruskal-Wallis test was first used

to test if at least two groups within each demographic were statistically different. If so, pairwise tests were performed on all possible pairwise combinations within each demographic. For multiple comparisons, the significance level was adjusted for family wise error rate.

In statistical testing there is a null hypothesis (population medians are equal/same distribution) and an alternate hypothesis (at least two medians are different/at least two distributions are different). To conduct statistical tests of scale scores for each of the demographics, the responses to the survey provide a sample of data to infer conclusions about the target population. The target population is LLNL employees, including Akima and subcontractors. Oftentimes, it is beneficial to calculate (or at least estimate) the probability of making the correct conclusion when, in fact, there exists differences in the population, this is called “statistical power.” Although non-parametric tests were used to test medians, power was calculated under a normal assumption to provide an idea of what the power would be for the statistical tests performed for the scale scores by demographic. Typically, a power of 0.80 or higher is desired. For all scales where statistical testing was used, with at least a median difference of 0.2 detected, the power was estimated to be 0.995 or greater. This is a good indication that the statistical tests performed on the scale scores from the sample data is representative of the entire LLNL population, including Akima and subcontractors.

It is also desired that the probability of rejecting the null hypothesis, when the null hypothesis is true, is small, 0.05 or less (Type I error). For statistical tests performed, the probability, called significance level, used was 0.01; however, if a test met a significant level of 0.05, it is noted.

3.0 Results

3.1 Summary of Survey Respondents

Of the 7,332 LLNL employees that were invited to participate, questions 1-66 were completed in their entirety by 3,217 employees, a 44% response rate. Respondents that completed questions 1 – 66, but did not complete some or all of the demographic questions are included as complete responders. As shown in Figure 1, 90% of the 3,217 respondents were LLNL employees, 8% Akima employees, and 2% subcontractor employees. (Figure 1). Ninety two percent (92%) of all survey respondents work at Site 200, 3% at Site 300 (n=99), and 2% at other locations (figure not shown).

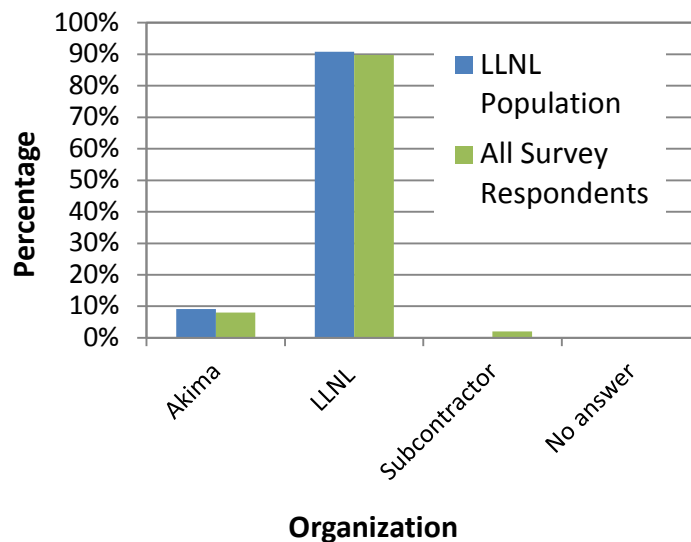


Figure 1. LLNL Population and Survey Responses by Organization

An additional three hundred respondents failed to complete at least one of the 66 survey questions. These respondents were initially omitted from the survey analysis based on feedback provided from some respondents that stopped the survey part way through. However, median scores were calculated including the partial responses and omitting the partial responses and the median scores for each of the 13 scales were the same. Demographic questions were not completed by any of the partial responders.

For the next sections that provide summaries by demographic questions, it should be noted that approximately 19% of the survey respondents declined to answer some or all of the demographic questions. Also, LLNL could only retrieve demographic information for the current population of LLNL employees, not for Akima and subcontractor employees. Most of the following sections include two graphs side by side. The left graph shows the percent of the LLNL population by a demographic variable compared to the percent of LLNL employees that responded to the survey. The right graph shows the overall breakdown of survey respondents by a demographic variable, including Akima employees and subcontractors.

3.1.1 Summary by Payroll Directorate

Survey respondents were from all different directorates. Employees from the Global Security (GS), NIF and Photon Science (N&PS), Operations and Business (O&B), and Weapons and Complex Integration (WCI) directorates had a greater percentage respond to the survey than their respective percentages of the LLNL population.

For the category of “payroll directorate,” the greatest discrepancies between the LLNL population and those that responded to the survey are in the Engineering (ENG) and Physical and Life Science (PLS) directorates. ENG has 25% of the LLNL population on their payroll, whereas 16% of LLNL survey respondents selected ENG as their payroll directorate. PLS has 16% of the LLNL population on their payroll, whereas 12% of LLNL survey respondents selected PLS as their payroll directorate.

Overall, 19% of all survey respondents did not provide an answer to the payroll directorate demographic question; 52% of those were Akima and subcontractor employees.

Less than 0.5% of employees at LLNL are on the payroll for the Science and Technology (S&T) directorate. This directorate grouping was not necessarily accounted for in the payroll directorate demographic question.

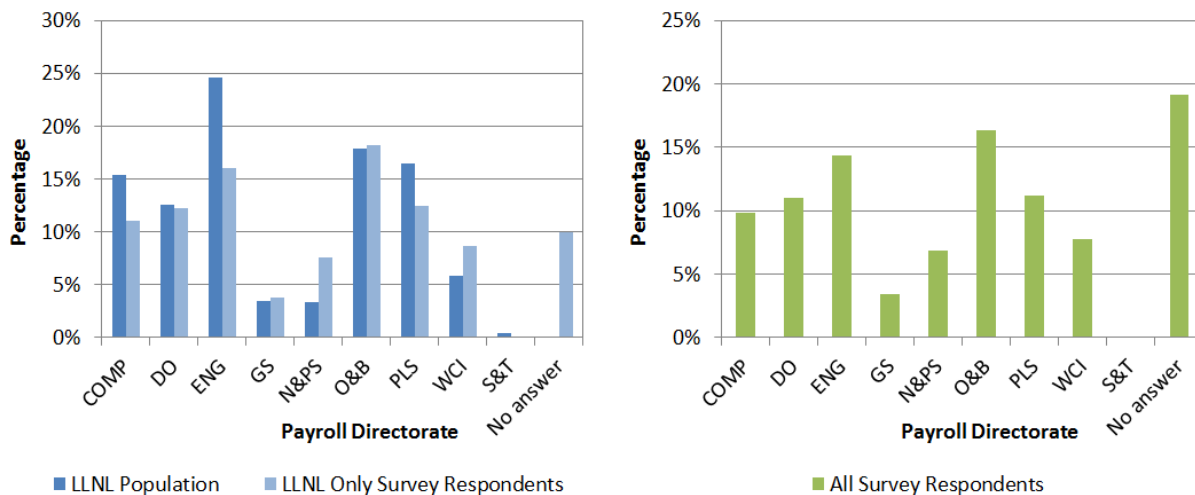


Figure 2. LLNL Population, LLNL Survey Responses, and Overall Survey Responses by Payroll Directorate

3.1.2 Summary by Employee Category

Figure 3 shows the percent of LLNL employees by employee category compared to the percent of all survey respondents, including Akima employees and subcontractors.

A greater percentage of managers/supervisors responded to the survey than their percentage of the LLNL population.

For the category of “employee category,” the greatest discrepancy between the LLNL population and those that responded to the survey is non-managers. Seventy seven percent (77%) of the LLNL population are categorized as non-managers, whereas 66% of all survey respondents identified themselves as non-managers.

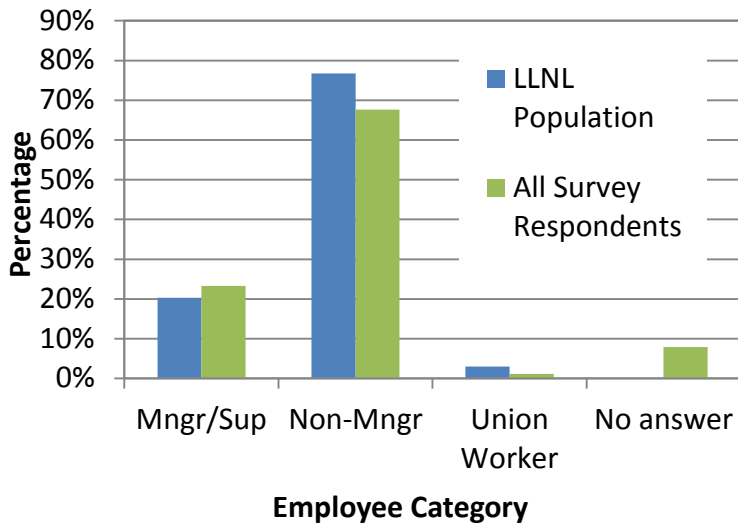


Figure 3. LLNL Population, and Survey Responses by Employee Category

3.1.3 Summary by Years Worked at LLNL

Seventy eight percent (78%) of all survey respondents have worked at LLNL five or more years; 63% for 10 or more years. LLNL employees that have worked at LLNL for more than 20 years had a greater percentage respond to the survey than their percentage of the LLNL population (Figure 4).

For the category of “years worked at LLNL,” the greatest discrepancy between the LLNL population and those that responded to the survey is those that have worked at LLNL between 10 and 20 years. Thirty four percent (34%) of the LLNL population have worked at LLNL for 10 to 20 years, whereas 29% of LLNL survey respondents have worked at LLNL for 10 to 20 years.

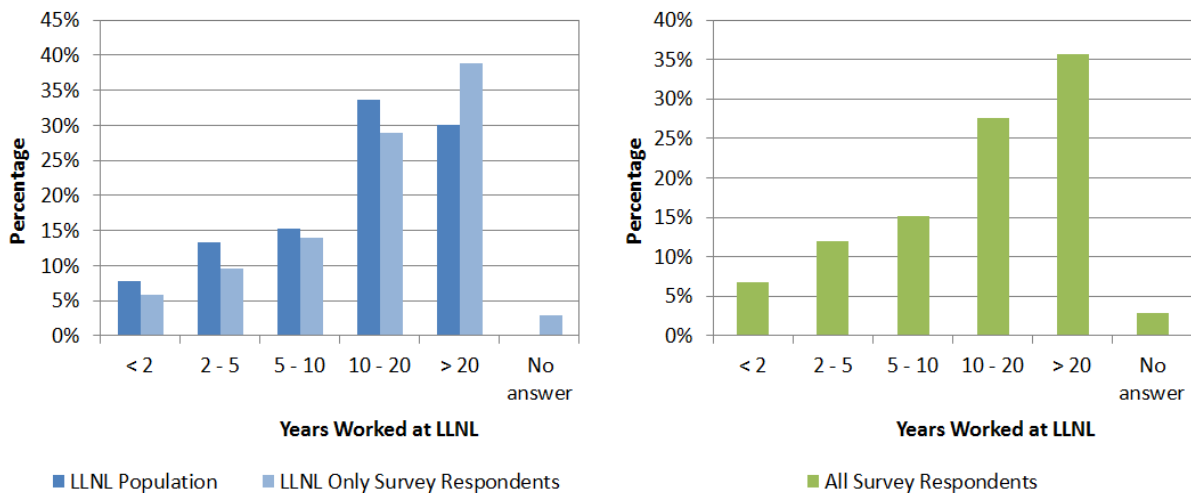


Figure 4. LLNL Population, LLNL Survey Responses, and Overall Survey Responses by Years Worked at LLNL

3.1.4 Summary by Age

Seventy six percent (76%) of all survey respondents are between the ages of 35 and 64. Employees who are 55 and older had a greater percentage respond to the survey than their percentage of the LLNL population (Figure 5).

For the category of “age,” the greatest discrepancy between the LLNL population and those that responded to the survey is between the ages of 35 and 54. Sixty two percent (62%) of the LLNL population are between the ages of 35 and 54, whereas 50% of LLNL survey respondents are between the ages of 35 and 54.

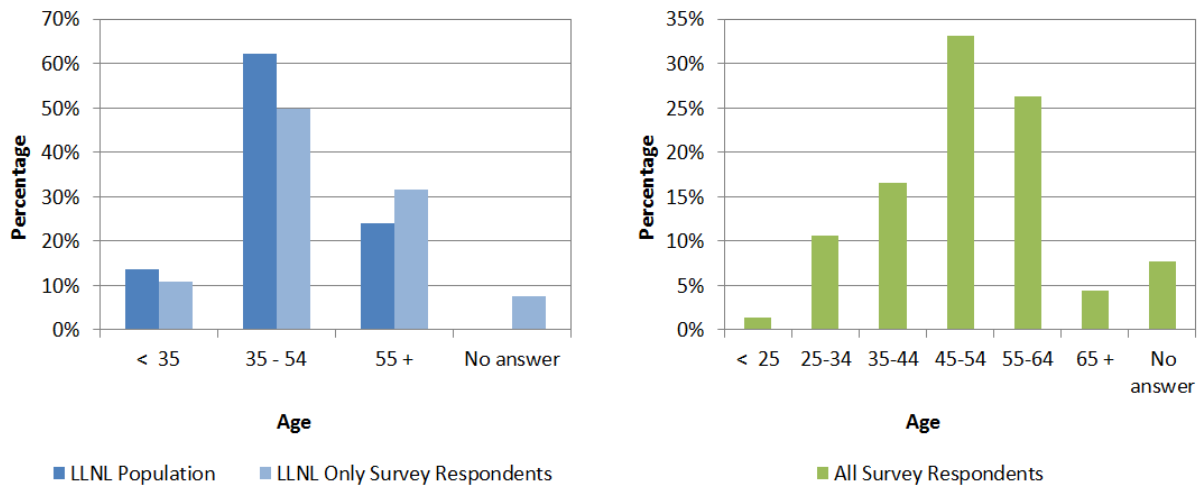


Figure 5. LLNL Population, LLNL Survey Responses, and Overall Survey Responses by Age

3.1.5 Summary by Gender

For the category of “gender,” 63% of all survey respondents are male. Females had a greater percentage respond to the survey than their percentage of the LLNL population (Figure 6). However, for males, 71% of the LLNL population are male, whereas 63% of LLNL survey respondents are male.

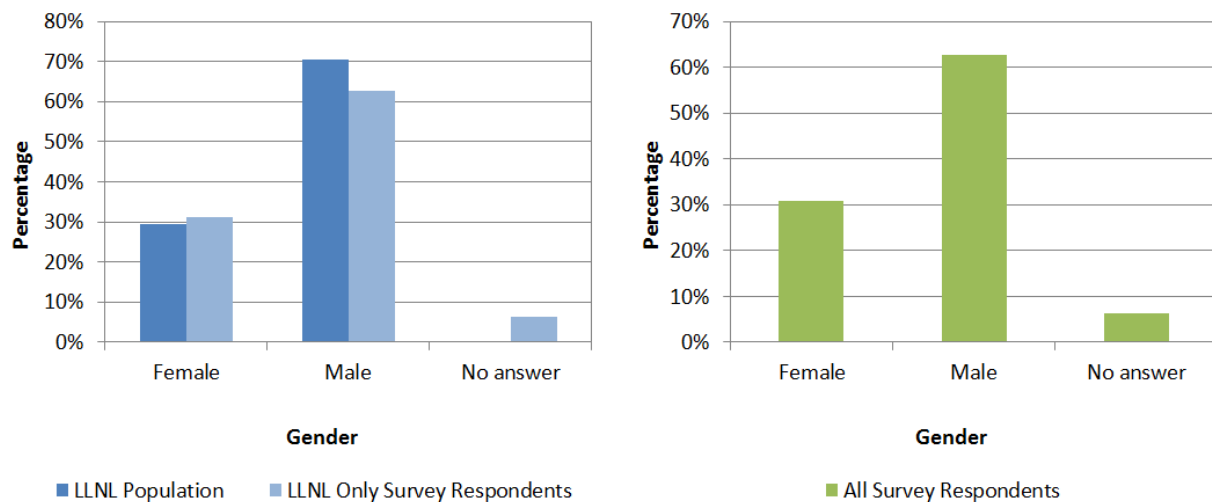


Figure 6. LLNL Population, LLNL Survey Responses, and Overall Survey Responses by Gender

3.1.6 Summary by Job Family

Thirty nine percent (39%) of all survey respondents are Professional Scientific and Technical Staff (PSTS). Employees from three job families had a greater percentage respond to the survey than their percentage of the LLNL population, Administrative and Specialist, Technical Associates, and PSTS (Figure 7).

For the category of “job family,” the greatest discrepancies between the LLNL population and those that responded to the survey are between the Non-exempt Administrative employees and Students/Apprentices. Six percent (6%) of the LLNL population are Non-exempt Administrative employees, whereas 3% of LLNL survey respondents are Non-exempt Administrative employees. Five percent (5%) of the LLNL population are categorized as Students/Apprentices, whereas 2% of LLNL survey respondents are Students/Apprentices.

Three percent (3%) of the LLNL population are post doctorate employees. This category was not necessarily accounted for in the job family survey demographic question. The same applies for non-career retirees.

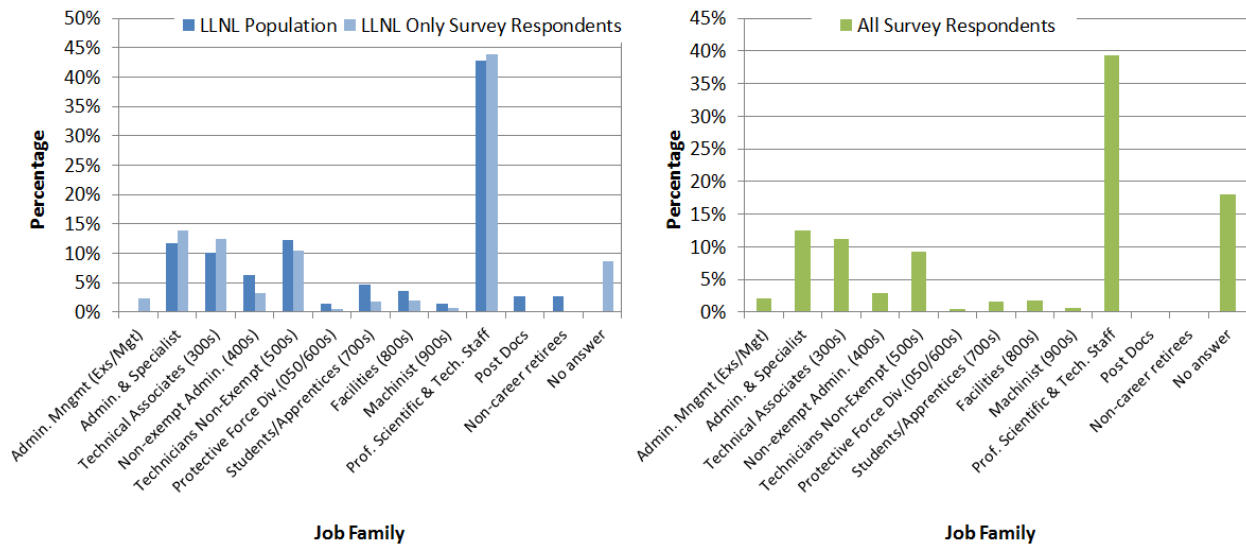


Figure 7. LLNL Population, LLNL Survey Responses, and Overall Survey Responses by Job Family

3.1.7 Summary by Ethnicity

Sixty six percent (66%) of all survey respondents are Caucasian/White. Employees from none of the ethnicities had a greater percentage respond to the survey than their percentage of the LLNL population (Figure 8).

For the category of “ethnicity,” the greatest discrepancies between the LLNL population and those that responded to the survey are between Caucasians/Whites and those that chose more than one race. Seventy three percent (73%) of the LLNL population are Caucasian/White, whereas 67% of LLNL survey respondents were Caucasian/white. Five percent (5%) of the LLNL population are more than one race, whereas no LLNL survey respondents indicated they are more than one race.

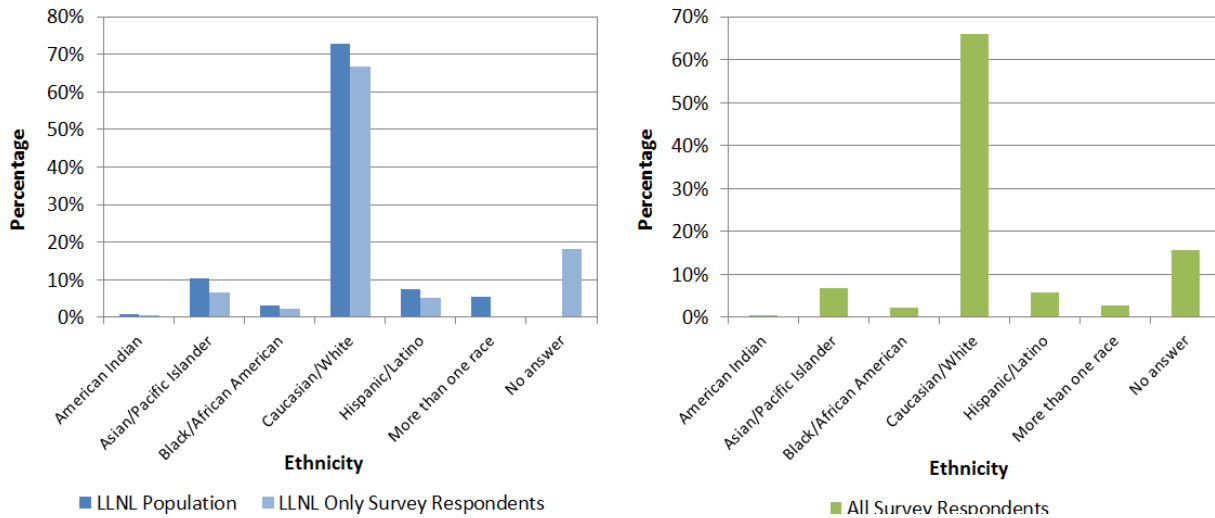


Figure 8. LLNL Population, LLNL Survey Responses, and Overall Survey Responses by Ethnicity

3.2 Results of Analysis

Table 2 shows the median scores for each of the 13 scales. Overall, the median scores for most of the 13 scales reflect positive results. Eight of the 13 scales had a median score of greater than or equal to four, five being the maximum positive score possible. Five of the 13 scales had a median score of less than four, hazard, coordination, commitment, communication –trust and SCWE. One of the 13 scales had a median score less than three, the hazard scale. These five scales will be discussed in more detail in the following sections, along with the safety scale and the overall job satisfaction scale. For graphical representation using boxplots, the color coding from Table 2 is applied, blue for scores above four, green for scores equal to four, yellow for scores less than four, and red for scores less than three.

Table 2. Median Scores for the 13 Survey Scales

		Scale	Meaning of Positive Score (score of 5)	Median Score
Median <4	Median <3	Hazard	Highest perceived hazard	2.3
		Coordination	Perception that work is highly coordinated	3.3
		Commitment	High commitment to the organization	3.7
		Communication – trust	Greater trust in the communication process	3.8
		SCWE	Greater emphasis placed on behaviors important for an effective SCWE	3.9
Median = 4		Cohesion	High work group cohesiveness	4.0
		Communication – accuracy	Greater perceived accuracy of communications	4
		Communication – interaction	Greater desire for interaction	4
		Communication – satisfaction overall	Greater satisfaction of overall communication process	4
		Job satisfaction	Greater satisfaction with overall job	4
Median > 4		Safety	Higher attention to the values/behaviors important to safety performance	4.3
		Management emphasis placed on environmental issues	Highest perceived hazard, emphasis or awareness from management	5
		Employee awareness of environmental issues	Highest perceived hazard, emphasis or awareness by employee	5

3.2.1 The Hazard Scale

The hazard scale was the only scale of 13 that had a median score of less than three. However, this is the only scale where the rating of negative or positive responses does not clearly apply. The hazard scale characterizes the employee’s opinion of the level of hazards and their potential consequences in their work environment. Overall, 67 of respondents perceive low hazards in their work at LLNL, with a hazard score of less than three.

The hazard scale consisted of three survey questions:

1. Question 15: If poor performance was to occur, how likely is it that serious injury and/or the loss of life would result?
2. Question 16: If poor performance was to occur, how likely is it that serious and potential expensive damage would result?
3. Question 17: How much danger or chance for danger is there in your work?

Sixty six percent (66%) of respondents said that if poor performance was to occur, it is not at all likely or not likely that serious injury and/or the loss of life would result (Question 15). Forty seven percent (47%) of respondents said that if poor performance was to occur, it is not at all

likely or not likely that serious and potential expensive damage would result (Question 16). Sixty five percent (65%) of respondents said there is no danger or not much danger in their work (Question 17).

There is a statistical difference in the perception of hazards across directorates. Figure 9 displays hazard scale scores by each directorate. Observationally, it appears that ENG and N&PS perceive more hazards in their work than other directorates and COMP and GS perceive fewer hazards in their work than other directorates. Each directorate was tested against one another and a number of pairwise comparisons were statistically different. The results are detailed in Table 3.

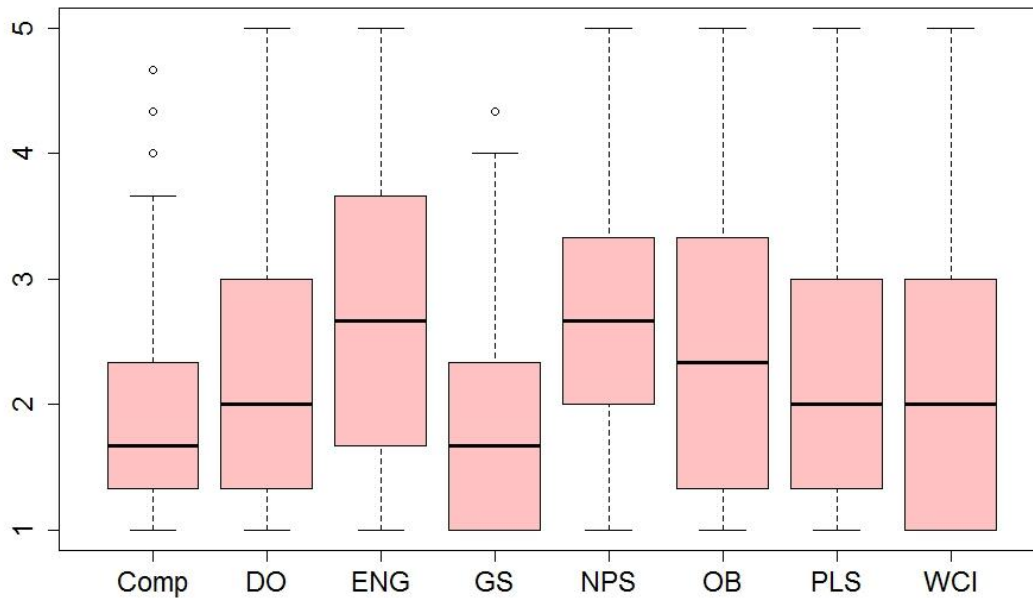


Figure 9. Boxplot of Hazard Scale Scores by Directorate

Hazard scale scores were tested against the other eight demographic questions; scores were statistically different between seven of the eight demographic questions, all but ethnicity. Table 3 summarizes the median scores by demographic question and the main statistical differences within each demographic. To summarize Table 3, the following groups perceive greater hazards in their work environment:

- Akima employees compared to LLNL employees.
- Union workers compared to managers and non-managers.
- Employees that have worked at LLNL more than 20 years compared to employees that have worked here less than two years.
- Employees that are 45 - 54 years old compared to employees 65 and older.
- Males compared to females.
- Employees at Site 300 compared to employees at Site 200.

Table 3. The Hazard Scale of Medians and Differences for Demographics

Demographics	N	Median Hazard Score	Significant Differences (alpha = 0.01)
Organization			Akima vs. LLNL Employee
<i>Akima employee</i>	258	2.7	
<i>LLNL Employee</i>	2888	2.3	
<i>Subcontractor employee</i>	64	2.3	
<i>Missing/Prefer not to answer</i>	7		
Employee Category			Union workers vs. Managers and Non-Managers
<i>Manager/Supervisor</i>	749	2.3	
<i>Non-Manager</i>	2177	2.3	
<i>Union Worker</i>	36	3.8	
<i>Missing/Prefer not to answer</i>	255		
Payroll Directorate			<ul style="list-style-type: none"> • COMP vs. all directorates except GS and WCI • DO vs. N&PS, ENG, and COMP • ENG vs. WCI, PLS, GS, COMP and DO • GS vs. O&B, N&PS, and ENG • N&PS vs. all directorates except ENG and O&B • O&B vs. WCI, COMP and GS • PLS vs. N&PS, ENG, and COMP • WCI vs. O&B, N&PS and ENG
<i>COMP</i>	318	1.7	
<i>DO</i>	353	2.0	
<i>ENG</i>	462	2.7	
<i>GS</i>	110	1.7	
<i>N&PS</i>	220	2.7	
<i>O&B</i>	527	2.3	
<i>PLS</i>	360	2.0	
<i>WCI</i>	251	2.0	
<i>Missing/Prefer not to answer</i>	616		
Years Worked			> 20 yrs vs. < 2 yrs
<i>Less than 2 years</i>	217	2.0	
<i>2 yrs - 5 yrs</i>	384	2.3	
<i>5 yrs - 10 yrs</i>	487	2.3	
<i>10 yrs - 20 yrs</i>	887	2.3	
<i>Greater than 20 yrs</i>	1148	2.3	
<i>Missing/Prefer not to answer</i>	94		

Demographics	N	Median Hazard Score	Significant Differences (alpha = 0.01)
Age			45-54 vs. 65 +
<i>Less than 25</i>	43	2.0	
<i>25-34</i>	341	2.3	
<i>35-44</i>	534	2.2	
<i>45-54</i>	1064	2.3	
<i>55-64</i>	844	2.3	
<i>65 and older</i>	143	1.7	
<i>Missing/Prefer not to answer</i>	248		
Gender			Male vs. Female
<i>Female</i>	996	2.0	
<i>Male</i>	2017	2.3	
<i>Missing/Prefer not to answer</i>	204		
Job Family			There are a number of pairwise differences. Below highlights a few differences:
<i>Administrative Management (Exs/Mgt)</i>	69	2.0	
<i>Administrative and Specialist (A&S)</i>	403	1.7	
<i>Technical Associates (300s)</i>	359	3.0	
<i>Non-exempt Administrative (400s)</i>	95	1.7	
<i>Technicians Non-Exempt (500s)</i>	300	2.7	
<i>Protective Force Division (PFD) (050/600s)</i>	16	4.0	
<i>Students/Apprentices (700s)</i>	52	1.7	
<i>Facilities (800s)</i>	55	3.7	
<i>Machinist (900s)</i>	23	3.7	
<i>Professional Scientific & Technical Staff (PSTS)</i>	1265	2.0	
<i>Missing/Prefer not to answer</i>	580		
Ethnicity			No groupings are statistically different
<i>American Indian</i>	18	1.7	
<i>Asian/Pacific Islander</i>	223	2.3	
<i>Black/African American</i>	73	2.3	
<i>Caucasian/White</i>	2125	2.3	
<i>Hispanic/Latino</i>	185	2.3	

Demographics	N	Median Hazard Score	Significant Differences (alpha = 0.01)
More than one race	90	2.3	
Missing/Prefer not to answer	503		
Location			Site 300 vs. Site 200
Site 200	2958	2.3	
Site 300	99	3.3	
Other Location	67	2.3	
Missing/Prefer not to answer	93		

The job family demographic is better displayed graphically, due to the number of options respondents had to choose from and the number of pairwise differences detected. Figure 10 displays the hazard scale scores by each job family. The Protective Force Division (PFD) appears to perceive greater hazards in their work environment than other job families. PFD tested significantly different than all other job families except for Facilities and Machinist.

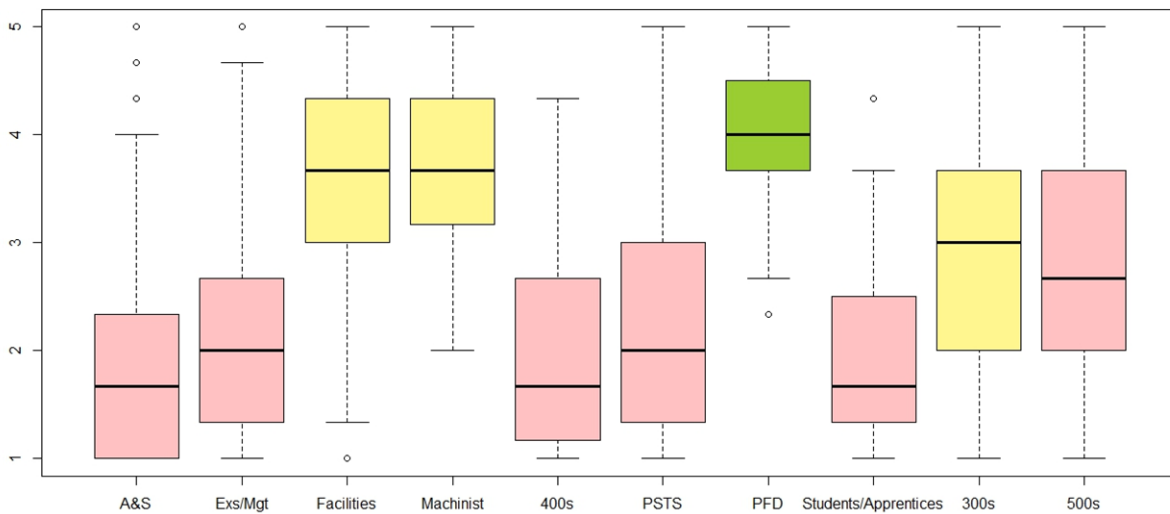


Figure 10. Hazard Scale Scores by Job Family

3.2.2 The Coordination Scale

The coordination scale had a median score of 3.3. Figure 11 displays the coordination scale scores for all respondents. Twenty one percent (21%) of respondents scored a four or above.

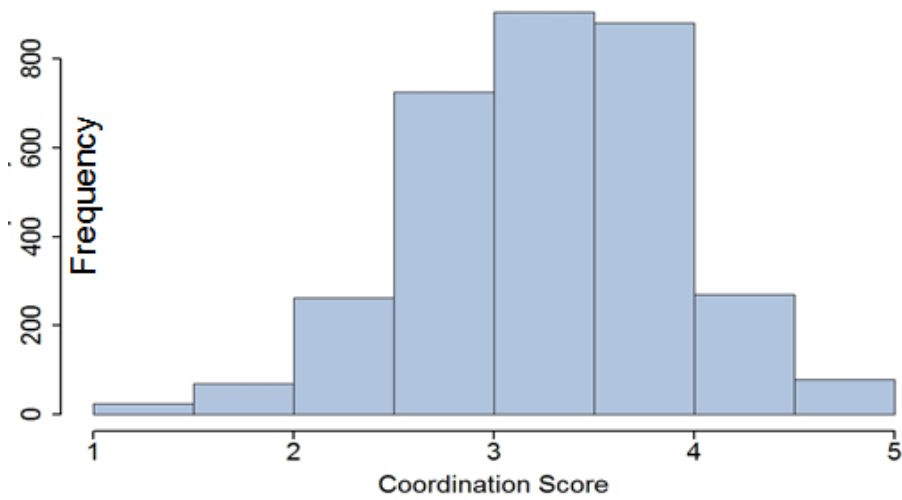


Figure 11. Histogram of the Coordination Scale Scores

There is a statistical difference in the perception that work is coordinated across directorates. Figure 12 displays coordination scale scores by each directorate. Observationally, it appears that the O&B directorate perceives work to be less coordinated than other directorates. Each directorate was tested against one another. Statistically, O&B perceives work to be less coordinated than all directorates except for the DO and GS.

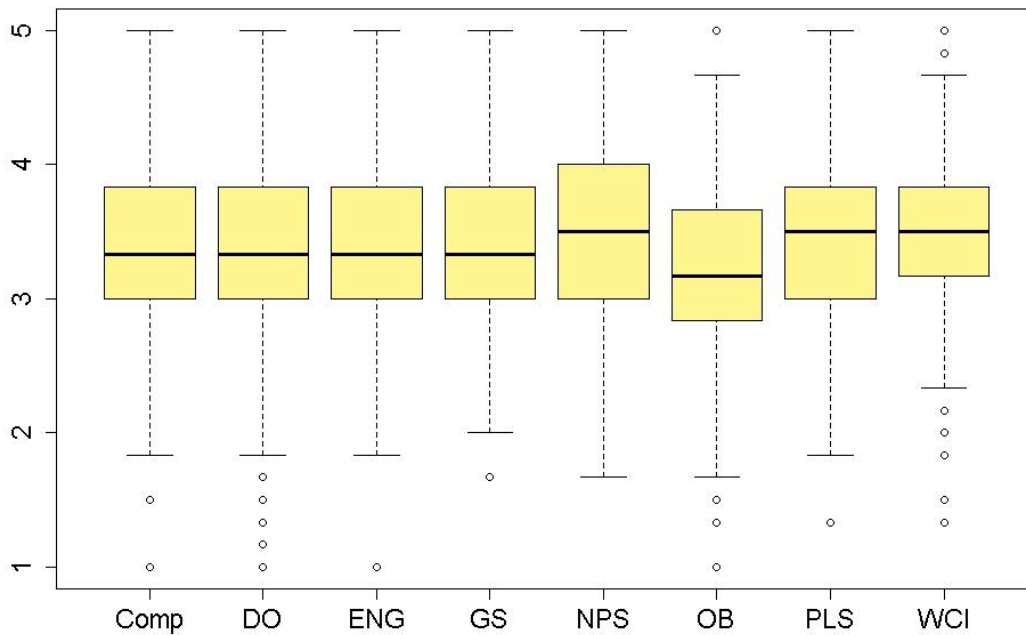


Figure 12. Coordination Scale Scores by Directorate

Coordination scale scores were tested against the other eight demographic questions; scores were statistically different between six of the eight demographic questions, all but gender and ethnicity. Table 4 summarizes the median scores by demographic question and the main statistical differences within each demographic. To summarize Table 4, the following groups perceive that work is more coordinated:

- Akima employees compared to LLNL employees.
- Non-managers compared to managers/supervisors.
- Employees that have worked at LLNL for less than 2 years compared to all other employees.
- Employees less than 34 years old, and 65 and older compared to employees between the ages of 45 - 54 .
- Administrative and Specialist employees compared to Facilities employees.
- Technical Associates compared to Facilities employees.
- Non-exempt Administrative employees compared to Facilities employees.
- Technician Non-exempt employees compared to Facilities employees.
- Students/Apprentices compared to Facilities employees.
- PSTS compared to Facilities employees.
- PSTS compared to Technical Associates.
- Students/Apprentices compared to PFD employees.
- Employees at other locations compared to employees at Site 200 and Site 300.

Table 4. The Coordination Scale of Medians and Differences for Demographics

Demographics	N	Median Coordination Score	Significant Differences (alpha = 0.01)
Organization			Akima vs. LLNL employees
<i>Akima employee</i>	258	3.5	
<i>LLNL Employee</i>	2888	3.3	
<i>Subcontractor employee</i>	64	3.3	
<i>Missing/Prefer not to answer</i>	7		
Employee Category			Non-Managers vs. Managers/Supervisors
<i>Manager/Supervisor</i>	749	3.3	
<i>Non-Manager</i>	2177	3.5	
<i>Union Worker</i>	36	3.2	
<i>Missing/Prefer not to answer</i>	255		

Demographics	N	Median Coordination Score	Significant Differences (alpha = 0.01)
Payroll Directorate			O&B vs. all directorates except DO and GS
<i>COMP</i>	318	3.3	
<i>DO</i>	353	3.3	
<i>ENG</i>	462	3.3	
<i>GS</i>	110	3.3	
<i>N&PS</i>	220	3.5	
<i>O&B</i>	527	3.2	
<i>PLS</i>	360	3.5	
<i>WCI</i>	251	3.5	
<i>Missing/Prefer not to answer</i>	616		
Years Worked			< 2 yrs vs. all other groups
<i>Less than 2 years</i>	217	3.7	
<i>2 yrs - 5 yrs</i>	384	3.3	
<i>5 yrs - 10 yrs</i>	487	3.3	
<i>10 yrs - 20 yrs</i>	887	3.3	
<i>Greater than 20 yrs</i>	1148	3.3	
<i>Missing/Prefer not to answer</i>	94		
Age			<ul style="list-style-type: none"> • < 25 vs. 45 – 54 • 25 – 34 vs. 45 – 54 • 65 + vs. 45 – 54
<i>Less than 25</i>	43	3.7	
<i>25-34</i>	341	3.5	
<i>35-44</i>	534	3.3	
<i>45-54</i>	1064	3.3	
<i>55-64</i>	844	3.3	
<i>65 and older</i>	143	3.5	
<i>Missing/Prefer not to answer</i>	248		
Gender			No groupings are statistically different
<i>Female</i>	996	3.3	
<i>Male</i>	2017	3.3	

Demographics	N	Median Coordination Score	Significant Differences (alpha = 0.01)
<i>Missing/Prefer not to answer</i>	204		
Job Family			<ul style="list-style-type: none"> • Facilities vs. A&S, 300s, 400s, 500s, 700s, and PSTS • PSTS vs. 300s • 700s vs. PFD
<i>Administrative Management (Exs/Mgt)</i>	69	3.2	
<i>Administrative and Specialist (A&S)</i>	403	3.3	
<i>Technical Associates (300s)</i>	359	3.3	
<i>Non-exempt Administrative (400s)</i>	95	3.3	
<i>Technicians Non-Exempt (500s)</i>	300	3.3	
<i>Protective Force Division (PFD) (050/600s)</i>	16	3.1	
<i>Students/Apprentices (700s)</i>	52	3.7	
<i>Facilities (800s)</i>	55	2.8	
<i>Machinist (900s)</i>	23	3.3	
<i>Professional Scientific & Technical Staff (PSTS)</i>	1265	3.5	
<i>Missing/Prefer not to answer</i>	580		
Ethnicity			No groupings are statistically different
<i>American Indian</i>	18	3.6	
<i>Asian/Pacific Islander</i>	223	3.5	
<i>Black/African American</i>	73	3.3	
<i>Caucasian/White</i>	2125	3.3	
<i>Hispanic/Latino</i>	185	3.5	
<i>More than one race</i>	90	3.3	
<i>Missing/Prefer not to answer</i>	503		
Location			Other location vs. Site 200 and Site 300
<i>Site 200</i>	2958	3.3	
<i>Site 300</i>	99	3.2	
<i>Other Location</i>	67	3.8	
<i>Missing/Prefer not to answer</i>	93		

3.2.3 The Commitment Scale

The commitment scale had a median score of 3.7. Figure 13 displays the commitment scale scores for all respondents. Forty seven percent (47%) of respondents scored a four or above.

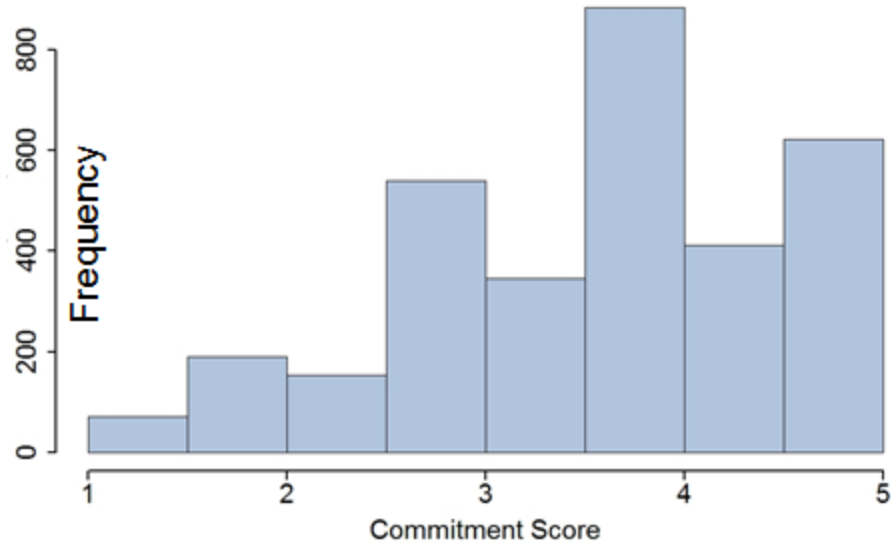


Figure 13. Histogram of the Commitment Scale Scores

There is a statistical difference in commitment to the organization across directorates. Figure 14 displays the commitment scale scores by each directorate. Observationally, it appears that the N&PS directorate is more committed to the organization than other directorates. However, due to a large number of pairwise comparisons, the differences could not be detected when adjusting for family wise error rate. Median scores by directorate are provided in Table 5.

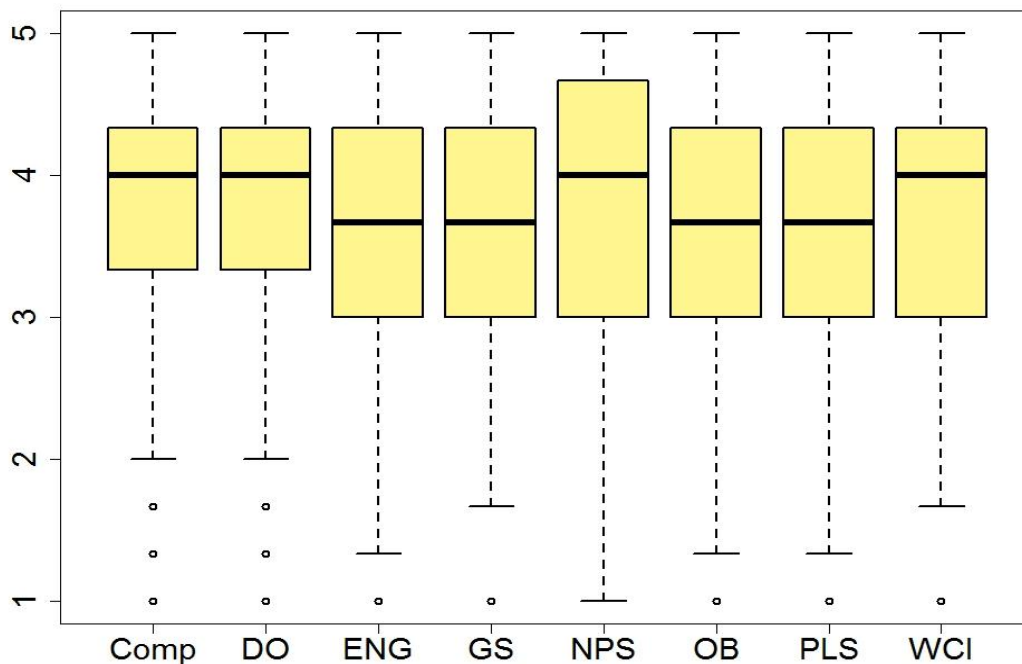


Figure 14. Boxplots of the Commitment Scale Scores by Directorate

Commitment scale scores were tested against the other eight demographic questions; scores were statistically different between six of the eight demographic questions, all but employee category and ethnicity. Table 5 summarizes the median scores by demographic question and the main statistical differences within each demographic. To summarize Table 5, the following groups are more committed to the organization:

- Akima employees compared to LLNL employees.
- Employees that have worked at LLNL for less than 2 years compared to all other employees except for employees that have worked at LLNL for 2 – 5 years.
- Employees that have worked at LLNL for 2 - 5 years compared to employees that have worked at LLNL more than 9 years.
- Females compared to males.
- Administrative and Specialist employees compared to Students/Apprentices and Facilities employees.
- Students/Apprentices compared to Technical Associates, PFD employees, Technicians Non-exempt employees, and Facilities employees.
- Non-exempt Administrative employees compared to PFD employees and Facilities employees.
- Professional Scientific & Technical Staff compared to PFD employees and Facilities employees.
- Employees from other locations compared to employees from Site 200 and Site 300.
- Employees from Site 200 compared to employees from Site 300.

Table 5. The Commitment Scale of Medians and Differences for Demographics

Demographics	N	Median Commitment Score	Significant Differences (alpha = 0.01)
Organization			Akima vs. LLNL Employees
<i>Akima employee</i>	258	4.0	
<i>LLNL Employee</i>	2888	3.7	
<i>Subcontractor employee</i>	64	3.8	
<i>Missing/Prefer not to answer</i>	7		
Employee Category			Statistically different at an alpha of 0.05 level, not 0.01
<i>Manager/Supervisor</i>	749	3.7	
<i>Non-Manager</i>	2177	3.7	
<i>Union Worker</i>	36	3.3	
<i>Missing/Prefer not to answer</i>	255		
Payroll Directorate			Overall, there is a significant difference between at least two directorates, but due to a large number of pairwise comparisons, the difference could not be detected when adjusting for family wise error rate.
<i>COMP</i>	318	4.0	
<i>DO</i>	353	4.0	
<i>ENG</i>	462	3.7	
<i>GS</i>	110	3.7	
<i>N&PS</i>	220	4.0	
<i>O&B</i>	527	3.7	
<i>PLS</i>	360	3.7	
<i>WCI</i>	251	4.0	
<i>Missing/Prefer not to answer</i>	616		
Years Worked			<ul style="list-style-type: none"> • < 2 yrs vs. all other groups except 2 – 5 yrs • 2 – 5 yrs vs. 10 – 20 yrs • 2 – 5 yrs vs. > 20 yrs
<i>Less than 2 years</i>	217	4.0	
<i>2 yrs - 5 yrs</i>	384	4.0	
<i>5 yrs - 10 yrs</i>	487	3.7	
<i>10 yrs - 20 yrs</i>	887	3.7	
<i>Greater than 20 yrs</i>	1148	3.7	
<i>Missing/Prefer not to answer</i>	94		

Demographics	N	Median Commitment Score	Significant Differences (alpha = 0.01)
Age			< 25 vs. all other groups except 65+
<i>Less than 25</i>	43	4.3	
<i>25-34</i>	341	4.0	
<i>35-44</i>	534	4.0	
<i>45-54</i>	1064	3.7	
<i>55-64</i>	844	3.7	
<i>65 and older</i>	143	4.0	
<i>Missing/Prefer not to answer</i>	248		
Gender			Females vs. males
<i>Female</i>	996	4.0	
<i>Male</i>	2017	3.7	
<i>Missing/Prefer not to answer</i>	204		
Job Family			<ul style="list-style-type: none"> • A&S vs. 700s and 800s • 700s vs. 300s, 500s, 800s, and PFD • 400s vs. PFD and 800s • PSTS vs. PFD and 800s
<i>Administrative Management (Exs/Mgt)</i>	69	4.0	
<i>Administrative and Specialist (A&S)</i>	403	3.7	
<i>Technical Associates (300s)</i>	359	3.7	
<i>Non-exempt Administrative (400s)</i>	95	4.0	
<i>Technicians Non-Exempt (500s)</i>	300	3.7	
<i>Protective Force Division (PFD) (050/600s)</i>	16	2.7	
<i>Students/Apprentices (700s)</i>	52	4.3	
<i>Facilities (800s)</i>	55	3.0	
<i>Machinist (900s)</i>	23	3.0	
<i>Professional Scientific & Technical Staff (PSTS)</i>	1265	4.0	
<i>Missing/Prefer not to answer</i>	580		
Ethnicity			No groupings are statistically different
<i>American Indian</i>	18	3.8	
<i>Asian/Pacific Islander</i>	223	4.0	
<i>Black/African American</i>	73	3.7	

Demographics	N	Median Commitment Score	Significant Differences (alpha = 0.01)
<i>Caucasian/White</i>	2125	3.7	
<i>Hispanic/Latino</i>	185	4.0	
<i>More than one race</i>	90	3.7	
<i>Missing/Prefer not to answer</i>	503		
Location			<ul style="list-style-type: none"> • Site 200 vs. Site 300 • Other location vs. Site 300 • Other location vs. Site 200
<i>Site 200</i>	2958	3.7	
<i>Site 300</i>	99	3.3	
<i>Other Location</i>	67	4.3	
<i>Missing/Prefer not to answer</i>	93		

3.2.4 The Communication – Trust Scale

The communication trust scale had a median score of 3.8. Figure 15 displays the communication trust scale scores for all respondents. Forty eight percent (48%) of respondents scored a four or above.

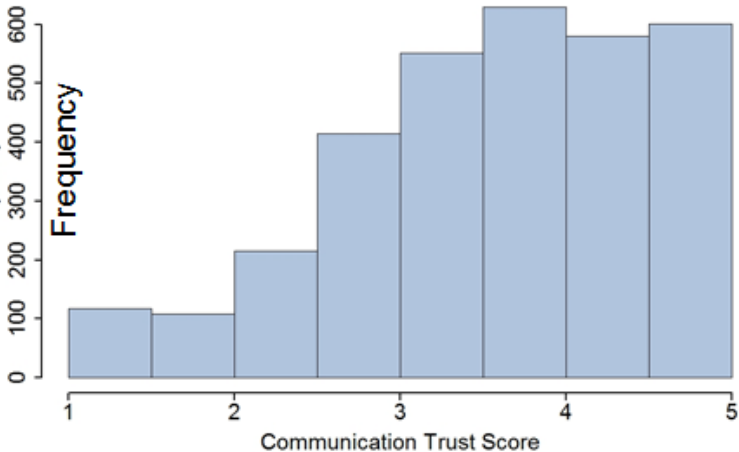


Figure 15. Histogram of the Communication Trust Scale Scores

There is no statistical difference in trust in the communication process across directorates. Communication trust scale scores were tested against the other eight demographic questions; scores were statistically different between four of the eight demographic questions. Table 6 summarizes the median scores by demographic question and the main statistical differences within each demographic. To summarize Table 5, the following groups have greater trust in the communication process:

- Employees that have worked at LLNL for less than 2 years compared to all other employees except for employees that have worked at LLNL for 2 – 5 years.
- Employees that have worked at LLNL for 2 - 5 years compared to employees that have worked at LLNL more than 9 years.
- Administrative and Specialist employees compared to Students/Apprentices and Facilities employees.
- Students/Apprentices compared to all job families except for Administrative Management employees, Non-exempt Administrative Management and PSTS.
- PSTS compared to PFD employees.
- Employees from other locations compared to employees from Site 300.
- Employees from Site 200 compared to employees from Site 300.

Table 6. The Communication Trust Scale of Medians and Differences for Demographics

Demographics	N	Median Communication Trust Score	Significant Differences (alpha = 0.01)
Organization			No groupings are statistically different
<i>Akima employee</i>	258	4.0	
<i>LLNL Employee</i>	2888	3.8	
<i>Subcontractor employee</i>	64	3.5	
<i>Missing/Prefer not to answer</i>	7		
Employee Category			No groupings are statistically different
<i>Manager/Supervisor</i>	749	4.0	
<i>Non-Manager</i>	2177	3.8	
<i>Union Worker</i>	36	3.9	
<i>Missing/Prefer not to answer</i>	255		
Payroll Directorate			No groupings are statistically different
<i>COMP</i>	318	4.0	
<i>DO</i>	353	3.8	
<i>ENG</i>	462	3.8	
<i>GS</i>	110	3.8	
<i>N&PS</i>	220	4.0	
<i>O&B</i>	527	3.8	
<i>PLS</i>	360	4.0	

Demographics	N	Median Communication Trust Score	Significant Differences (alpha = 0.01)
<i>WCI</i>	251	4.0	
<i>Missing/Prefer not to answer</i>	616		
Years Worked			<ul style="list-style-type: none"> • < 2 yrs vs. all other groupings except 2 – 5 yrs • 2 – 5 yrs vs. 10 – 20 yrs and > 20 yrs
<i>Less than 2 years</i>	217	4.3	
<i>2 yrs - 5 yrs</i>	384	4.0	
<i>5 yrs - 10 yrs</i>	487	3.8	
<i>10 yrs - 20 yrs</i>	887	3.8	
<i>Greater than 20 yrs</i>	1148	3.8	
<i>Missing/Prefer not to answer</i>	94		
Age			Overall, there is a significant difference between at least two age groups, but due to a large number of pairwise comparisons, the difference could not be detected when adjusting for family wise error rate.
<i>Less than 25</i>	43	4.3	
<i>25-34</i>	341	4.0	
<i>35-44</i>	534	4.0	
<i>45-54</i>	1064	3.8	
<i>55-64</i>	844	3.8	
<i>65 and older</i>	143	4.0	
<i>Missing/Prefer not to answer</i>	248		
Gender			No groupings are statistically different
<i>Female</i>	996	3.9	
<i>Male</i>	2017	3.8	
<i>Missing/Prefer not to answer</i>	204		
Job Family			<ul style="list-style-type: none"> • 700s vs. all other job families except Exs/Mgt, 400s, and PSTS • PSTS vs. PFD
<i>Administrative Management (Exs/Mgt)</i>	69	3.8	
<i>Administrative and Specialist (A&S)</i>	403	3.8	
<i>Technical Associates (300s)</i>	359	3.8	
<i>Non-exempt Administrative (400s)</i>	95	3.8	
<i>Technicians Non-Exempt (500s)</i>	300	3.8	
<i>Protective Force Division (PFD) (050/600s)</i>	16	3.0	

Demographics	N	Median Communication Trust Score	Significant Differences (alpha = 0.01)
<i>Students/Apprentices (700s)</i>	52	4.3	
<i>Facilities (800s)</i>	55	3.8	
<i>Machinist (900s)</i>	23	3.5	
<i>Professional Scientific & Technical Staff (PSTS)</i>	1265	4.0	
<i>Missing/Prefer not to answer</i>	580		
Ethnicity			No groupings are statistically different
<i>American Indian</i>	18	3.9	
<i>Asian/Pacific Islander</i>	223	4.0	
<i>Black/African American</i>	73	3.8	
<i>Caucasian/White</i>	2125	4.0	
<i>Hispanic/Latino</i>	185	3.8	
<i>More than one race</i>	90	3.9	
<i>Missing/Prefer not to answer</i>	503		
Location			<ul style="list-style-type: none"> • Other locations vs. Site 300 • Site 200 vs. Site 300
<i>Site 200</i>	2958	3.8	
<i>Site 300</i>	99	3.5	
<i>Other Location</i>	67	4.0	
<i>Missing/Prefer not to answer</i>	93		

3.2.5 The Safety Conscience Work Environment (SCWE) Scale

The SCWE scale had a median score of 3.7. Figure 16 displays SCWE scale scores for all respondents. Forty seven percent (47%) of respondents scored a four or above.

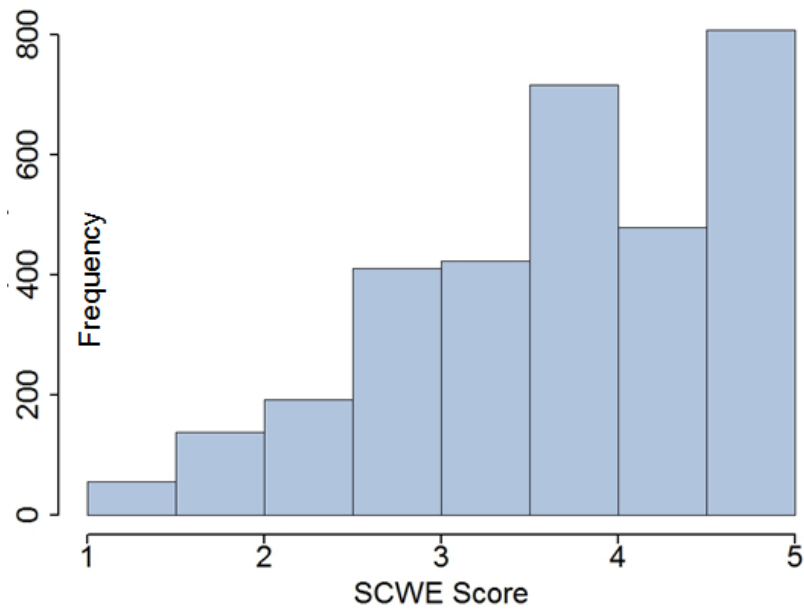


Figure 16. Histogram of the SCWE Scale Scores

The SCWE scale consisted of seven survey questions. All questions have the same score rating, with a “1” as strongly disagree and a “5” as strongly agree. Figure 17 displays scores for each question from the SCWE scale. Most of the questions from the SCWE scale appear to have similar distributions. Survey respondents provided more positive responses for question 47, “I am responsible for identifying problems.” Scores for all other questions from the SCWE scale ranged from one to five, with 75% of scores between three and five. The median score for question 47 from the survey, was five (strongly agree), with scores ranging from three to five, not considering outliers.

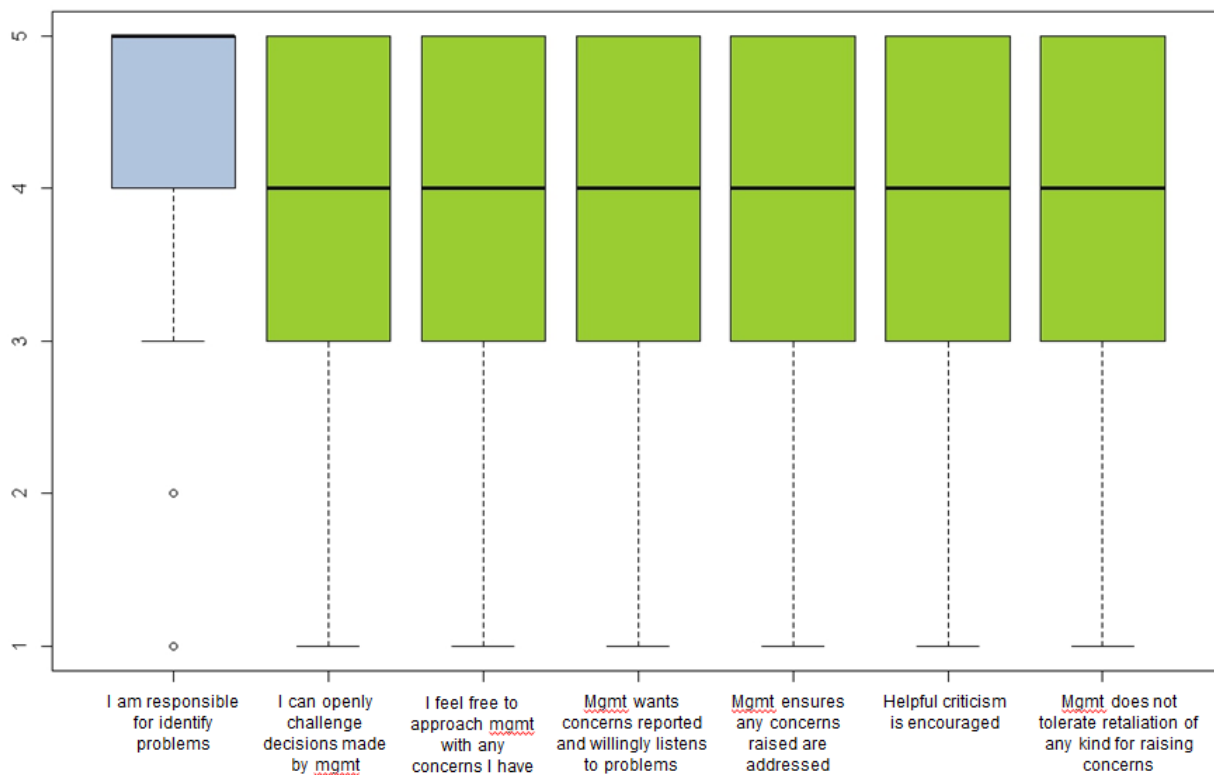


Figure 17. Boxplots of questions making up the SCWE Scale

There is no statistical difference in the emphasis placed on behaviors important for an effective SCWE across directorates. SCWE scale scores were tested against the other eight demographic questions; scores were statistically different for five of the eight demographic questions. No difference (at alpha = 0.01) was detected between the SCWE score and payroll directorate, gender, organization, and ethnicity. Table 7 summarizes the median scores by demographic question and the main statistical differences within each demographic, if a significant difference was detected. To summarize Table 7, the following groups place greater emphasis on behaviors important for an effective SCWE:

- Managers/Supervisors compared to non-managers.
- Employees that have worked at LLNL for less than 2 years compared to employees that have worked at LLNL between 10 and 20 years.
- Employees that are 65 and older compared to employees between the ages of 25 and 64.
- Males compared to females.
- Employees at other locations compared to employees at Site 200 and Site 300.

Table 7. The SCWE Scale of Medians and Differences for Demographics

Demographics	N	Median SCWE Score	Significant Differences (alpha = 0.01)
Organization			No groupings are statistically different
<i>Akima employee</i>	258	3.9	
<i>LLNL Employee</i>	2888	3.9	
<i>Subcontractor employee</i>	64	3.7	
<i>Missing/Prefer not to answer</i>	7		
Employee Category			Manager/Supervisor vs. Non-manager
<i>Manager/Supervisor</i>	749	4.1	
<i>Non-Manager</i>	2177	3.9	
<i>Union Worker</i>	36	3.6	
<i>Missing/Prefer not to answer</i>	255		
Payroll Directorate			No groupings are statistically different
<i>COMP</i>	318	3.9	
<i>DO</i>	353	3.9	
<i>ENG</i>	462	3.9	
<i>GS</i>	110	4.0	
<i>N&PS</i>	220	4.0	
<i>O&B</i>	527	3.7	
<i>PLS</i>	360	3.9	
<i>WCI</i>	251	4.0	
<i>Missing/Prefer not to answer</i>	616		
Years Worked			Less than 2 yrs vs. 10 yrs - 20 yrs
<i>Less than 2 years</i>	217	4.0	
<i>2 yrs - 5 yrs</i>	384	3.9	
<i>5 yrs - 10 yrs</i>	487	3.9	
<i>10 yrs - 20 yrs</i>	887	3.7	
<i>Greater than 20 yrs</i>	1148	3.9	
<i>Missing/Prefer not to answer</i>	94		

Demographics	N	Median SCWE Score	Significant Differences (alpha = 0.01)
Age			65 + vs. 25 - 64
<i>Less than 25</i>	43	3.9	
<i>25-34</i>	341	3.7	
<i>35-44</i>	534	3.9	
<i>45-54</i>	1064	3.9	
<i>55-64</i>	844	3.9	
<i>65 and older</i>	143	4.3	
<i>Missing/Prefer not to answer</i>	248		
Gender			Statistically different at an alpha of 0.05 level, not 0.01
<i>Female</i>	996	3.7	
<i>Male</i>	2017	3.9	
<i>Missing/Prefer not to answer</i>	204		
Job Family			Overall, there is a significant difference between at least two job families, but due to a large number of pairwise comparisons, the differences could not be extracted
<i>Administrative Management (Exs/Mgt)</i>	69	4.0	
<i>Administrative and Specialist (A&S)</i>	403	3.7	
<i>Technical Associates (300s)</i>	359	3.9	
<i>Non-exempt Administrative (400s)</i>	95	3.7	
<i>Technicians Non-Exempt (500s)</i>	300	3.7	
<i>Protective Force Division (PFD) (050/600s)</i>	16	3.1	
<i>Students/Apprentices (700s)</i>	52	3.9	
<i>Facilities (800s)</i>	55	3.4	
<i>Machinist (900s)</i>	23	3.4	
<i>Professional Scientific & Technical Staff (PSTS)</i>	1265	4.0	
<i>Missing/Prefer not to answer</i>	580		
Ethnicity			No groupings are statistically different
<i>American Indian</i>	18	3.7	
<i>Asian/Pacific Islander</i>	223	3.9	
<i>Black/African American</i>	73	3.6	

Demographics	N	Median SCWE Score	Significant Differences (alpha = 0.01)
<i>Caucasian/White</i>	2125	4.0	
<i>Hispanic/Latino</i>	185	3.7	
<i>More than one race</i>	90	3.8	
<i>Missing/Prefer not to answer</i>	503		
Location			Other location vs. Site 200 and Site 300
<i>Site 200</i>	2958	3.9	
<i>Site 300</i>	99	3.4	
<i>Other Location</i>	67	4.4	
<i>Missing/Prefer not to answer</i>	93		

3.2.6 The Safety Scale

The safety scale had a median score of 4.3. Figure 18 displays safety scale scores for all respondents. Seventy percent (70%) of respondents scored a four or above.

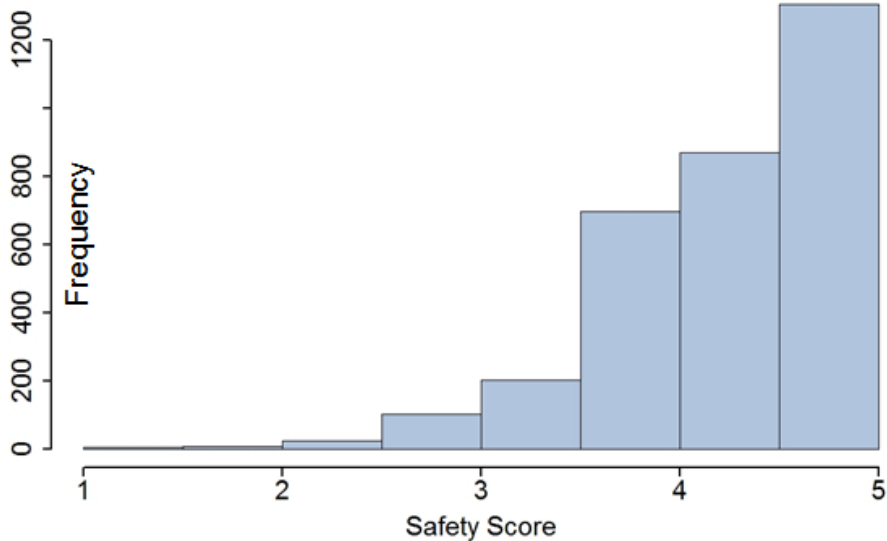


Figure 18. Histogram of the Safety Scale Scores

The safety scale consisted of 27 survey questions; only one of the 27 questions has a different score rating, question 46. For question 46 in Figure 19, a score of “5” means does not help at all and a score of “1” means helps a great deal. For all other questions, a score of “5” means helps a great deal. There are seven questions from Figure 19 that had more variety in responses and all had scores ranging from one to five. Some respondents did not think that the following items helped them do their job well in their organization (score of one):

- Paying attention to potential danger (148 of 3217 respondents).
- Having training formally signed off (421 of 3217 respondents).
- Challenging an order if it might not work (110 of 3217 respondents).
- Having clearly defined job boundaries (102 of 3217 respondents).
- Suspending operations as needed (212 of 3217 respondents).
- Reporting problems (92 of 3217 respondents).

The median response for question 31, “Having training formally signed off” was a three, the lowest median of all questions making up the safety scale.

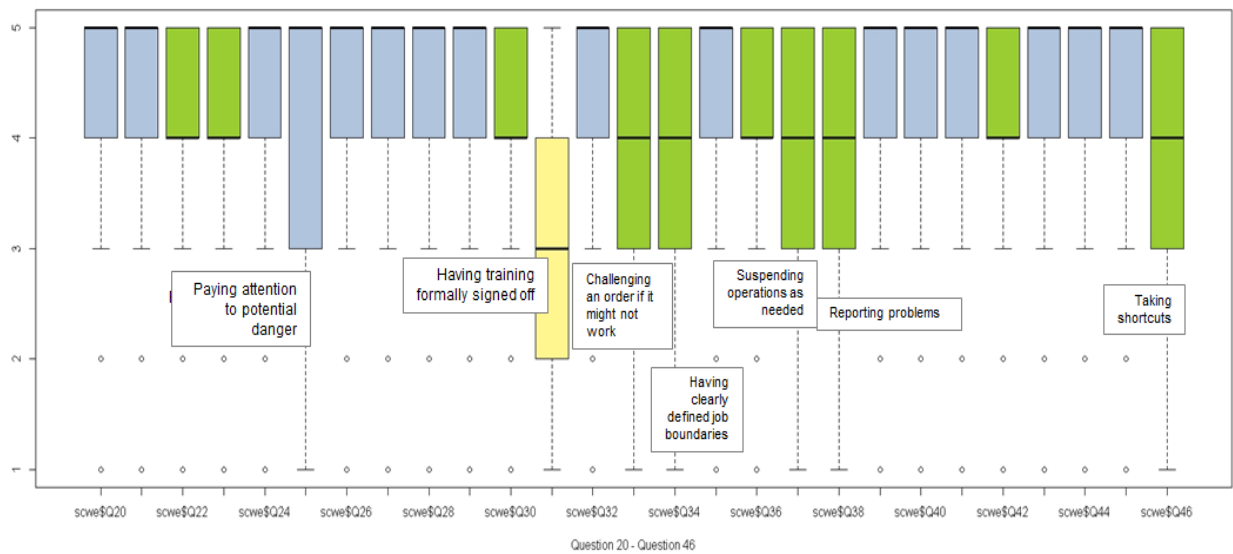


Figure 19. Boxplots of questions making up the Safety Scale

There is a statistical difference in the attention to values/behaviors important to safety performance among directorates. Figure 20 displays safety scale scores by each directorate. Observationally, it appears that the distribution of scores by directorate is similar, with COMP having the lowest median safety score and O&B with the highest median safety score. Based on pairwise comparisons, the only statistical difference detected was between COMP and O&B.

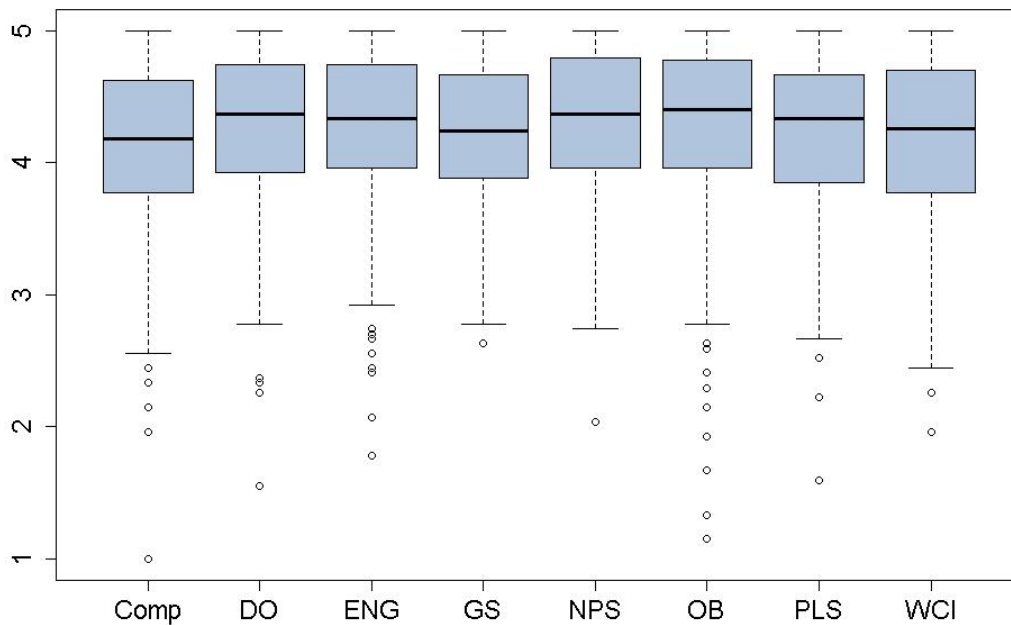


Figure 20. Safety Scale Scores by Directorate

Safety scale scores were tested against the other eight demographic questions; scores were statistically different between five of the eight demographic questions. No difference (at alpha = 0.01) was detected between the safety score and age, employee category, and years worked at LLNL. Table 8 summarizes the median scores by demographic question and the main statistical differences within each demographic, if a significant difference was detected. To summarize Table 8, the following groups have higher attention to the values/behaviors important to safety performance:

- Akima employees compared to LLNL employees.
- Females compared to males.
- Technical Associates compared to PSTS.
- Technicians Non-Exempt compared to PSTS.
- Administrative and Specialist compared to PSTS.
- Asian/Pacific Islanders compared to Caucasians/whites.
- Employees at other locations compared to employees at Site 200.

Table 8. The Safety Scale of Medians and Differences for Demographics

Demographics	N	Median Safety Score	Significant Differences (alpha = 0.01)
Organization			Akima employee vs. LLNL employee
<i>Akima employee</i>	258	4.6	
<i>LLNL Employee</i>	2888	4.3	
<i>Subcontractor employee</i>	64	4.3	
<i>Missing/Prefer not to answer</i>	7		
Employee Category			Statistically different at an alpha of 0.05 level, not 0.01
<i>Manager/Supervisor</i>	749	4.4	
<i>Non-Manager</i>	2177	4.3	
<i>Union Worker</i>	36	4.5	
<i>Missing/Prefer not to answer</i>	255		
Payroll Directorate			O&B vs. COMP
<i>COMP</i>	318	4.2	
<i>DO</i>	353	4.4	
<i>ENG</i>	462	4.3	
<i>GS</i>	110	4.2	
<i>N&PS</i>	220	4.4	
<i>O&B</i>	527	4.4	
<i>PLS</i>	360	4.3	
<i>WCI</i>	251	4.3	
<i>Missing/Prefer not to answer</i>	616		
Years Worked			No groupings are statistically different
<i>Less than 2 years</i>	217	4.3	
<i>2 yrs - 5 yrs</i>	384	4.3	
<i>5 yrs - 10 yrs</i>	487	4.4	
<i>10 yrs - 20 yrs</i>	887	4.3	
<i>Greater than 20 yrs</i>	1148	4.4	
<i>Missing/Prefer not to answer</i>	94		

Demographics	N	Median Safety Score	Significant Differences (alpha = 0.01)
Age			Statistically different at an alpha of 0.05 level, not 0.01
<i>Less than 25</i>	43	4.3	
<i>25-34</i>	341	4.3	
<i>35-44</i>	534	4.3	
<i>45-54</i>	1064	4.4	
<i>55-64</i>	844	4.4	
<i>65 and older</i>	143	4.3	
<i>Missing/Prefer not to answer</i>	248		
Gender			Female vs. Male
<i>Female</i>	996	4.5	
<i>Male</i>	2017	4.3	
<i>Missing/Prefer not to answer</i>	204		
Job Family			<ul style="list-style-type: none"> • 300s vs. PSTS • 500s vs. PSTS • A&S vs. PSTS
<i>Administrative Management (Exs/Mgt)</i>	69	4.3	
<i>Administrative and Specialist (A&S)</i>	403	4.4	
<i>Technical Associates (300s)</i>	359	4.4	
<i>Non-exempt Administrative (400s)</i>	95	4.5	
<i>Technicians Non-Exempt (500s)</i>	300	4.4	
<i>Protective Force Division (PFD) (050/600s)</i>	16	4.4	
<i>Students/Apprentices (700s)</i>	52	4.3	
<i>Facilities (800s)</i>	55	4.3	
<i>Machinist (900s)</i>	23	4.1	
<i>Professional Scientific & Technical Staff (PSTS)</i>	1265	4.2	
<i>Missing/Prefer not to answer</i>	580		
Ethnicity			Asian/Pacific Islander vs. Caucasian
<i>American Indian</i>	18	4.4	
<i>Asian/Pacific Islander</i>	223	4.5	
<i>Black/African American</i>	73	4.4	

Demographics	N	Median Safety Score	Significant Differences (alpha = 0.01)
<i>Caucasian/White</i>	2125	4.3	
<i>Hispanic/Latino</i>	185	4.5	
<i>More than one race</i>	90	4.3	
<i>Missing/Prefer not to answer</i>	503		
Location			Other location vs. Site 200
<i>Site 200</i>	2958	4.3	
<i>Site 300</i>	99	4.4	
<i>Other Location</i>	67	4.7	
<i>Missing/Prefer not to answer</i>	93		

3.2.7 The Job Satisfaction Scale

The job satisfaction scale had a median score of 4.0. This scale consisted of one question, “Overall, taking everything into consideration, how satisfied are you with your job?” Figure 21 displays job satisfaction scale scores for all respondents. Sixty seven percent (67%) of respondents scored a four or a five.

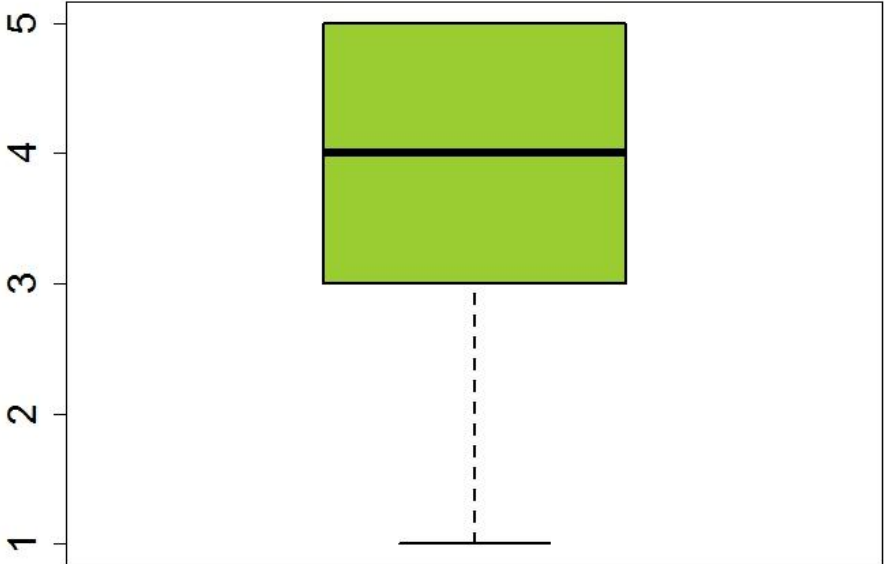


Figure 21. Boxplot of Job Satisfaction Scale Scores

There is no statistical difference in job satisfaction across directorates. Job satisfaction scale scores were tested against the other eight demographic questions; scores were statistically different between four of the eight demographic questions. A table of differences for job

satisfaction is not provided in this section because every group among the nine demographic variables had a median score of four except for four groups. Respondents 65 and older and respondents of American Indian decent had a median score of five, the highest score possible. PFD employees and Facilities employees had a median score of three. The following groups are more satisfied with their overall jobs:

- Employees that have worked at LLNL for less than two years compared to all other employees except for employees that have worked at LLNL for 2 – 5 years.
- Employees that are 65 and older compared to employees between the ages of 25 and 64.
- Students/Apprentices compared to PFD employees.
- Employees at other locations compared to employees at Site 200 and Site 300.

For four of the demographic variables, graphical representation of the differences is provided. For some of these demographics the medians are the same, but it is really the distributions that are statistically different.

Figure 22 shows overall job satisfaction by years worked at LLNL. Although the median job satisfaction score for all grouping is four, Figure 22 shows that the distribution of scores varies less for employees that have worked at LLNL for less than two years. As stated above, job satisfaction for employees that have worked at LLNL for less than two years was statistically different than all other groups except for those that have worked at LLNL two to five years. Median job satisfaction scores for employees that have worked here five or less years were not statistically different when adjusting for family wise error rate. This is probably because the sample size for employees that have worked at LLNL for two to five years was smaller than the other groups that tested statistically different.

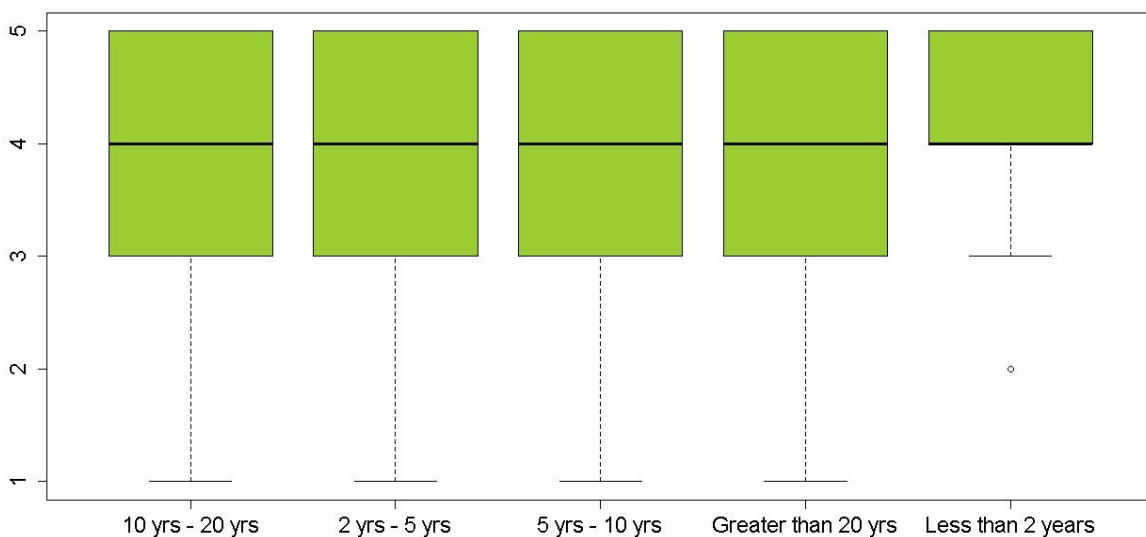


Figure 22. Boxplots of Job Satisfaction Scale Scores by Years Worked at LLNL

Figure 23 shows overall job satisfaction by employee age. Although median job satisfaction scores for four of the five age groups are the same, the distribution of scores varies less for employees that are less than 34 years old and 65 and older. As stated above, job satisfaction was statistically different for employees 65 and older compared to all age groups except for employees less than 25 years old. In summary, younger employees and employees 65 and older are the most satisfied with their overall jobs.

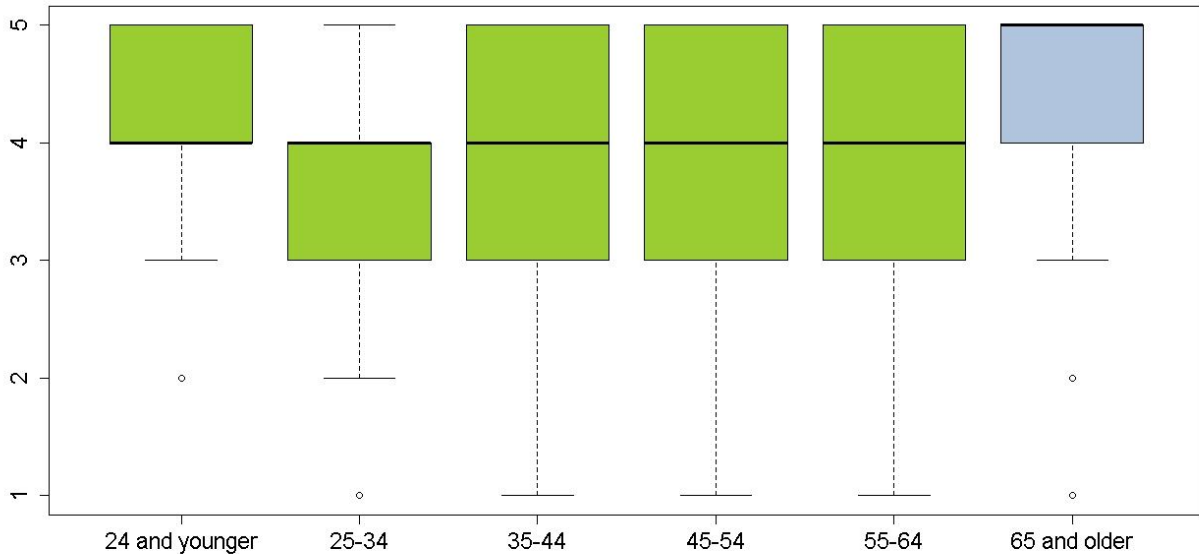


Figure 23. Boxplots of Job Satisfaction Scale Scores by Age

Figure 24 shows overall job satisfaction by location. Although median job satisfaction scores for all locations are four, Figure 24 shows the distribution of scores varies less for other locations compared to scores for Site 200 and Site 300. As stated above, employees at other locations are more satisfied with their overall jobs compared to Site 200 and Site 300 employees. Employees at Site 200 had the largest range of scores; 2% of Site 200 respondents scored a one (completely unsatisfied) and 12% scored either a one or two.

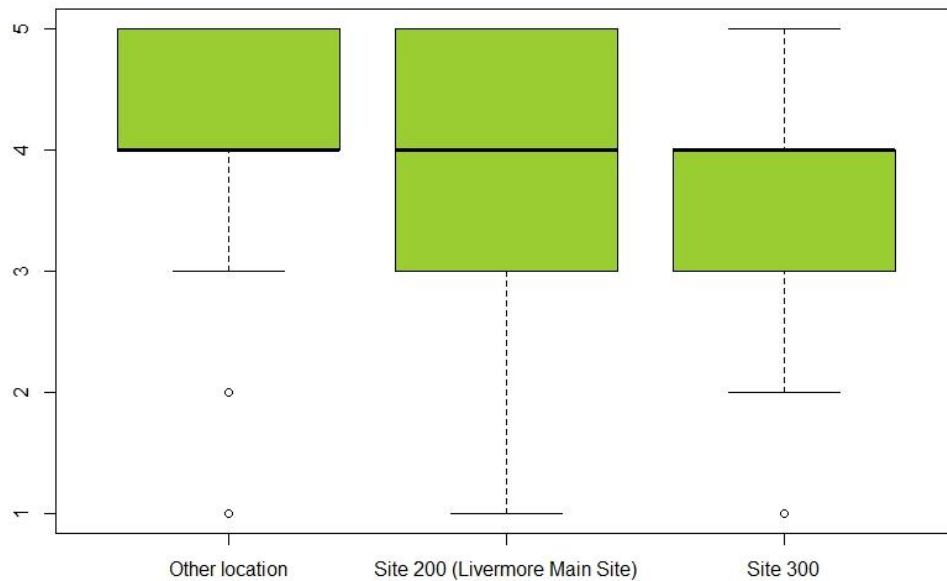


Figure 24. Boxplots of Job Satisfaction Scale Scores by Location

Figure 25 shows overall job satisfaction by job family. All job families had a median score of four except for PFD employees and Facilities employees. Figure 25 shows that Students/Apprentices have the least varying distribution compared to all job families. As stated above, Students/Apprentices are more satisfied with their overall jobs compared to PFD employees.

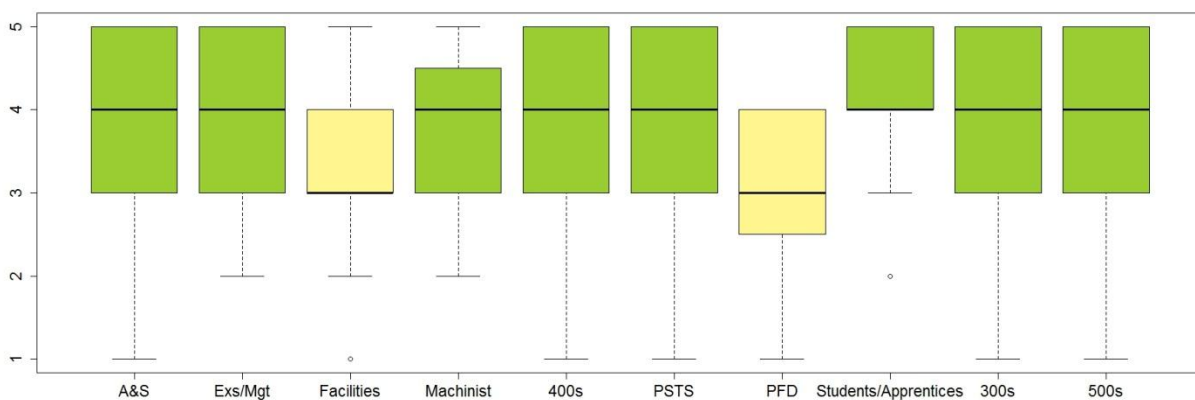


Figure 25. Boxplots of Job Satisfaction Scale Scores by Job Family

4.0 Conclusion

Seven thousand three hundred and thirty two (7,332) LLNL (including Akima and subcontractor) employees were invited to participate in a voluntary Safety Culture Survey in June 2013. The survey was open to LLNL employees for approximately two weeks. The survey was completed in entirety by 3,217 employees, a 44% response rate. Ninety percent (90%) of respondents were LLNL employees. Based on information voluntarily provided by the respondents, the employee organization demographic of those that responded was very similar to the overall representation of LLNL.

Survey respondents were collected from all LLNL directorates. Employees from GS, N&PS, O&B, and WCI had a greater response percentage to the survey than their organization's relative percentage of the LLNL population. The greatest discrepancies between the LLNL population and those that responded to the survey are in the ENG and PLS directorates. ENG has 25% of the LLNL population on their payroll, whereas 16% of LLNL survey respondents selected ENG as their payroll directorate. PLS has 16% of the LLNL population on their payroll, whereas 12% of LLNL survey respondents selected PLS as their payroll directorate.

Overall, the median scores for most of the 13 scales reflect positive results. Eight of the 13 scales had a median score of greater than or equal to four, five being the maximum positive score. Overall respondents think that:

- LLNL management places great emphasis on safety issues.
- They are very well informed of potential risks in their work environment.
- Positive attention is given to the values/behaviors important to safety.
- There is a positive cohesiveness in their work group.

Survey respondents:

- Perceive that communication is accurate.
- Have a great desire for interaction.
- Are satisfied with the overall communication process.
- Are satisfied with their overall jobs.

Five of the 13 scales had a median score of less than four, hazard, coordination, commitment, communication trust and Safety Conscience Work Environment (SCWE). One of the 13 scales had a median score less than three, the hazard scale.

The hazard scale is the only scale where the rating of negative or positive responses does not apply. The hazard scale characterizes the employee's opinion of hazards and potential associated consequences in their work environment. Overall, 66% of respondents perceive low

hazards in their work at LLNL, with a hazard score of less than three. ENG and N&PS had the highest median hazard score and COMP and GS had the lowest median hazard score. There is a statistical difference in the perception of hazards across directorates and many pairwise differences were detected. Refer to Section 3.2.1 for more information.

The coordination scale had a median score of 3.3. Twenty one percent (21%) of respondents scored a four or above. There is a statistical difference in the perception that work is coordinated across directorates. Statistically, O&B perceives work to be less coordinated than all directorates except for the Director's Office (DO) and GS.

The commitment scale had a median score of 3.7. Forty seven percent (47%) of respondents scored a four or above. There is a statistical difference in commitment to the organization across directorates. Due to a large number of pairwise comparisons, the differences could not be detected when adjusting for family wise error rate.

The communication trust scale had a median score of 3.8. Forty eight percent (48%) of respondents scored a four or above. There is no statistical difference in the trust in the communication process across directorates.

The SCWE scale had a median score of 3.7. Forty seven percent (47%) of respondents scored a four or above. There is no statistical difference in the emphasis placed on behaviors important for an effective SCWE across directorates.

For those scales with median scores less than four, there were some common differences among the demographics:

- Male employees perceive greater hazards and place more emphasis on behaviors important for an effective SCWE compared to females.
- Akima employees perceive greater hazards, work to be more coordinated, and are more committed to the organization than LLNL employees.
- Employees that have worked at LLNL for fewer years perceive work to be more coordinated, are more committed to the organization, and have more trust in the communication process than employees that have worked at LLNL for a longer period of time.
- Students/Apprentices and Administrative and Specialist employees perceive work to be more coordinated, are more committed to the organization, and have more trust in the communication process than Facilities employees.
- Students/Apprentices perceive work to be more coordinated, are more committed to the organization, and have more trust in the communication process than Protective Force Division employees.
- Professional Scientific and Technical Staff are more committed to the organization and have more trust in the communication process than Protective Force Division employees.

- Employees at other locations perceive work to be more coordinated, are more committed to the organization, have more trust in the communication process and place greater emphasis on behaviors important for an effective SCWE compared to employees at Site 300.
- Employees at other locations perceive work to be more coordinated, are more committed to the organization, and place greater emphasis on behaviors important for an effective SCWE compared to employees at Site 200.
- Employees at Site 200 are more committed to the organization and have more trust in the communication process than employees at Site 300.

The safety scale had a median score of 4.3. Seventy percent (70%) of respondents scored a four or above. There is a statistical difference in the attention to values/behaviors important to safety performance among directorates. Pairwise comparisons revealed that O&B provides greater attention to values/behavior important to safety performance than COMP. Also, the following groups have higher attention to the values/behaviors important to safety performance:

- Akima employees compared to LLNL employees
- Females compared to males
- Technical Associates compared to PSTS
- Technicians Non-Exempt compared to PSTS
- Administrative and Specialist compared to PSTS
- Asian/Pacific Islanders compared to Caucasians/whites

Overall, survey respondents are satisfied with their jobs with a median score of 4.0. This scale consisted of one question, "Overall, taking everything into consideration, how satisfied are you with your job?" Sixty seven percent (67%) of respondents scored a four or a five. There is no statistical difference in job satisfaction across directorates. Every group among the nine demographic variables had a median job satisfaction score of four except for four groups. Respondents 65 and older and respondents of American Indian decent had a score of five, the highest score possible. PFD employees and Facilities employees had a score of three.

An opportunity for improvement may exist where the median scale score was less than four, work coordination, employee commitment to LLNL, trust in the communication process, emphasis placed on behaviors important for an effective SCWE, and perception of workplace hazard consequence. These areas were included as part of phase three of the SCWE self-assessment, the focus group interviews.

Appendix C

Summary of LLNL SCWE Interview and Observations

Demonstrated Safety Leadership (L1)

The majority of responses to questions and ratings provided under this attribute were positive. The majority of those interviewed believe that supervisors and managers do demonstrate safety leadership. Demonstrated Safety Leadership was one of the attributes with a high disparity in perception between managers and workers. On a scale of 1-5 with 5 as outstanding performance, the average was 3.9. Workers believe that their immediate management (supervisors and their supervisor's immediate manager) demonstrated effective safety leadership; however, "safety weakens when you crawl up the pyramid of managers." The gap in perception is as follows; senior managers (4.3), managers/supervisors (4.3) and workers (3.7).

The range in perception was demonstrated through the following responses:

- "Absolutely."
- "It's a mixed bag."
- "Managers and supervisors are like apples and oranges."
- "Almost zero."

Multiple examples were provided of supervisors and managers visibly demonstrating commitment to safety through their actions and behaviors include:

- Senior Manager Safety and Security Contracts with the Director.
- Formal and informal management walkabouts.
- "Safety Moments" to kick-off meetings.
- Safety Leadership Team and Grassroots Safety Teams.
- Plan of the Day meetings.
- Breakfast meetings with employees.
- Management involvement in work planning meetings.

The majority of interviewees believed their managers and supervisors listen to them and encourage their feedback and do acknowledge employee ownership and involvement in the safety of their work. The majority agreed that supervisors and immediate management respond quickly to issues tied to safety. However, management's response to non-safety related concerns "fell on deaf ears" and perceived that managers do not provide an adequate response in addressing the issue.

Interviewees' perception regarding their confidence, trust, and inspiration in their managers to be proud to be in their organization varied between managers and workers. The majority did respond that they did embrace the safety values of their managers. Examples regarding leaders inspiring confidence and pride are demonstrated through the following responses:

- “Absolutely.”
- “Managers don’t always communicate a consistent message that people are important.”
- “Yes, our lower leaders inspire confidence and pride, but upper leaders don’t.”
- “Don’t know what senior management’s goals are.”
- “Some do, some are driven by the schedule.”
- “Most leaders are average in communicating what their values are.”
- “No! We survive in spite of our leadership. They discourage and destroy our work.”
- “There is a loss of the excitement of science and research and loss of identify as a Laboratory family; the work now seems to be just a job with focus on fee.”

In some interviews managers and workers expressed an apparent imbalance between safety and safe performance of work (e.g., statements such as “safety overkill,” “work free safe zone,” “requirements impede mission accomplishment and the requirements aren’t always sensible”). In some of those cases, workers also indicated that they felt more at risk from what they believed to be unnecessary and inappropriate controls.

Table C-1 Demonstrated Safety Leadership Analysis Summary

Positive Observations
1. Many examples were given where workers believe their immediate supervisors and managers do demonstrate safety leadership and value safety through their actions and behaviors.
2. Examples were given where workers believe that management levels above their immediate supervisors and managers do demonstrate safety leadership through efforts of their assigned responsibilities and expectations.
3. Workers also believe that management listens to them and encourages their feedback and acknowledges employee ownership and involvement in the safety of their work.
Relevant Outliers
1. Upper levels of management only show up when something has gone terribly wrong or it’s something that in the end is going to draw attention to the fact that they have been in the field.
2. There were examples identifying managers providing subtle retaliation for reporting injury or stopping or pausing work.
3. Employees believe that management values safety and a SCWE. However, in contrast, a limited number of examples were indicated where management was believed to stress schedule over safety.

Table C-1 Demonstrated Safety Leadership Analysis Summary (*continued*)

Items in Need of Attention
1. Workers believe that management levels above their immediate supervisors and managers demonstrate safety leadership but are not sincere and see their actions and behaviors as a “check the box” exercise.
2. Workers believe that demonstrated leadership actions and behaviors of their supervisors, managers, and upper levels of management change when faced with approaching milestones and priorities. Management is under pressure to perform; LLNL is expected to do more with fewer resources.
3. The majority of workers and supervisors indicated a good relationship and positive performance of those they reported to immediately. However, an equal amount indicated that levels of management above their supervisors and managers were only fulfilling roles of demonstrated leadership because it was procedurally required and as such interpreted their actions and behaviors as a check the box exercise.
Recommendation(s)
1. Address the balance of safety versus safe performance of work.
2. Re-establish the Laboratory’s identity.

This attribute was found to be partially implemented and partially effective. (PI/E)

Management Engagement and Time in the Field (L3)

The majority of feedback received indicated that there was a disparity in perception on how much managers were engaging the workers. On a scale of 1-5 with 5 as outstanding performance, the average was 3.6. Workers made the distinction that they believe their supervisors and immediate managers are engaged and in the field. Worker expectations varied for the engagement of higher levels of management in the field. Senior managers graded themselves higher than both the workers and supervisor/line managers indicating a perception that senior managers felt that their field presence was adequate. Senior managers did acknowledge they should spend more time in the field. The gap in perception is as follows; senior managers (4.0), managers/supervisors (3.7) and workers (3.6).

Multiple examples of management engagement and having a field presence include:

- Breakfast/coffee meetings with employees.
- Informal management walkthroughs.
- One-on-one meetings with direct reports.
- Defining work in the IWS process.
- Responding and taking ownership of an issue or concern.
- Involvement in work planning meetings.

Worker responses also indicated their engagement was primarily from their supervisors and the next level of management. It is at this level of management that workers felt their managers provide a positive response to their issues and concerns. Various comments given by both management and workers as to why senior managers are not in the field include:

- “Senior leaders try, but in the last 6 months we’ve been distracted.”
- “All of us in management are stuck in our office and don’t get out enough.”
- “I am not visible in the field and I count on my direct reports to be involved in the field.”
- “Why do we care if managers are in the field? I don’t want to see management in the field.”
- “Supervisors are there. Managers are not.”
- “Managers come into the field only if there is a problem.”
- “Management walk-throughs are more of a “check the box” instead of a real commitment to engaging the workers.”
- “The scale is inversely proportionate the further you go up the management ladder as worker engagement falls off quickly.”

Table C-2 Management Engagement and Time in the Field Analysis Summary

Positive Observations
1. Many examples were given where workers believe their immediate supervisors and managers are engaged and spend time in the field interacting with them.
2. Examples were given where workers believe that management levels above their immediate supervisors and managers spend time in the field performing their assigned responsibilities and expectations.
3. Managers acknowledge they should spend more time in the field.
Relevant Outliers
1. Examples and comments of upper levels of management that show up in the field only when they have to perform their inspections/checklist activities, otherwise we don't see them. If it's to their advantage they will show up.
2. Employee expectations vary for the amount of engagement of higher levels of management in the field. Why do we care if managers are in the field? I don't want to see management in the field.
3. Senior leaders try, but in the last 6 months we've been distracted.
Items in Need of Attention
1. Workers believe that management levels above their immediate supervisors and managers are in the field as a "check the box" exercise only to fulfill required inspections and observations.
Recommendation(s)
1. Address management time in the field with defined and communicated expectations that are successfully executed and monitored.

This attribute was found to be partially implemented and partially effective (PI/E).

Open Communication and Fostering an Environment Free From Retribution (L5)

Responses indicated that all levels of the organization believed that there is open communication that fosters an environment free from retaliation. The average rankings for this attribute were 4.5 for senior managers, 4.3 for other managers and supervisors, and 3.7 for non-supervisors. There was some disparity between the manager rankings and the workers rankings which indicates that there is some reservation and concern on the part of the workers that is different from what the managers feel. However, when all of the rankings are combined the average for this attribute is 3.8. This ranking means that the evidence from our interviews demonstrates that expectations described in the attribute are routinely demonstrated in a repeatable, reliable manner. Processes are aligned with outcomes and performance is monitored to ensure that desired results are achieved.

The conclusion is that open communication and fostering an environment free from retaliation are the norm. Many responses included:

- We can raise any concerns we want to.
- There are many avenues we can use to raise concerns.
- We have no fear of retribution or retaliation.
- We are expected to raise any safety concerns.

Most people who were interviewed had no hesitation in stating that they could raise concerns, particularly safety concerns. They raised their concerns to their immediate supervisor or manager or to their work group. Their supervisors or managers immediately respond to their “safety” concerns or issues and as they can to other concerns. About half of the interviewees stated that their behavior of raising concerns was positively acknowledged.

In this interview session we asked them to describe the most important safety related issue or concern that is currently on their mind and what action had been taken to resolve it. Some noted that with the recent loss of personnel they were being asked to assume more work that they were not normally performing. This made them nervous that they might miss something that could cause them or a coworker an injury. Also they talked about the obsolete equipment and equipment that needed maintenance that could set them up for an accident. They could bring these concerns up but they did not expect much would change due to the limited budget.

When asked if they could offer suggestions for process improvement they noted that they are always striving for efficiency and process improvements. Some things they can't implement because of cost constraints but they bring them up and try to get what they can implemented.

When reviewing other contributing attributes to this topic such as disciplinary actions and are they taken in a fair and consistent manner at LLNL no real negative comments were made.

They mentioned that this was not very visible to them. Some more subtle things that could create a chilling effect were noted as follows:

- Reporting an injury causes too much investigation and personal embarrassment.
- Raising a concern sometimes will delay a project for months because of the subsequent investigation and issue resolution.
- With recent staff reductions, personnel may not feel comfortable in stating that they really can't handle all of the new work they must assume.
- This may not be a good time to draw "too much" attention to yourself when Lab resources are being considered for reduction.
- Reporting a minor injury (slight cut that just needs a band aid) is not worth all of the hassle and subsequent paperwork and follow-up.

Table C-3 Open Communication and Fostering an Environment Free From Retribution Analysis Summary

Positive Observations
1. People feel free to raise concerns.
2. Many people know they can raise concerns through many avenues.
3. People have no fear of retribution or retaliation.
4. You are expected to raise any safety concern.
Relevant Outliers
1. Reporting an injury causes too much investigation and personal embarrassment.
2. Raising a concern sometimes will delay a project for months because of "too much" response.
Items in Need of Attention
1. With staff reductions just occurring, people may not report a problem in their new work assignments.
2. No one wants to speak up and draw too much attention to themselves in this resource reduction environment.
3. More care to ensure that names of individuals are not included in incident analysis reports.
4. Using a very complex IWS process that people cannot use easily in getting the work done.
Recommendation(s)
None at this time.

This attribute was found to be implemented and effective (I/E).

Clear Expectations and Accountability (L6)

The majority of responses to questions and ratings provided under this attribute were positive. On a scale of 1-5 with 5 as outstanding performance, the average was 3.9. Managers and ES&H disciplines provided the strongest knowledge of their job descriptions, responsibilities, authorities, and accountabilities including where they were documented. Workers believe they understood their safety responsibilities and could be found in their IWSs, Operational Safety Plans (OSPs), and Facility Safety Plans (FSPs) as they applied to their day to day work activities; however, they could not identify where their key safety-related roles and responsibilities for their job titles were documented. Workers pointed to the annual performance appraisal process as a process where managers reviewed their safety performance and referencing the process as superficial in nature and typically one that was a cut and paste exercise. Some managers and workers expressed concern that accountability appears to be inconsistent and/or lacking.

Managers and workers provided a strong positive response and expectations that workers “pause” or “stop work” when instructions cannot be followed or unexpected conditions arise. Managers overwhelmingly believe that there is no hesitation from employees to pause or stop work and that workers feel empowered to stop or pause work as appropriate. Workers are expected by management to do so with follow-up by supervisors and managers to positively acknowledge the worker when they do. Workers provided numerous examples of work that was paused or stopped to notify their supervisor or manager when they had questions or concerns in the workplace.

Table C-4 Clear Expectations and Accountability Analysis Summary

Positive Observations
1. Many examples were given where workers did “pause or stop work” activities in the course of performing their work without the fear of retaliation.
2. Many examples were given regarding their roles, responsibilities and expectations as well as where the information could be found.
3. Employees understand their specific Roles, Responsibilities, Accountabilities, and Authorities (R2A2s) in implementing them as applicable to their involvement of work.
Relevant Outliers
1. Workers and managers see the one line annual review of their safety performance review as a superficial exercise.
Items in Need of Attention
1. Less than adequate knowledge of R2A2s as it relates to the employee’s overall assigned R2A2.
Recommendation(s)
None at this time.

This attribute was found to be implemented and effective (I/E).

Teamwork and Mutual Respect (WE2)

The large majority of responses to the questions and ratings under this attribute were positive. On a scale of 1 – 5 with 5 being outstanding performance, the average grade was a 4.0 with little difference between senior managers, managers/supervisors and workers (4.3, 4.1 and 4.0 respectively). This was the highest score given for the attributes.

The conclusion is that open communication and teamwork are the norm. Many responses included:

- “Absolutely.”
- “It’s what we do.”
- “It’s our culture.”
- “It’s kinda Livermore’s secret sauce.”

Multiple examples of people being brought together from multiple levels of the organization to work issues of technical and safety importance were provided including:

- Safety Basis Working Group
- IWS reviews
- design reviews
- OEC
- IORB
- Assurance Manager Meetings
- Plan of the Day (PODs)
- Start of shift brief

The majority of interviewees believe that individuals listen to each other and work through issues respectfully acknowledging differing viewpoints. A few examples of “lively discussions” were provided with most of them coming to a successful resolution with all in agreement. There was acknowledgment that some are ‘quieter’ than others and the teams need to ensure they hear their thoughts and that their experience and knowledge is not missed. As noted above, although team work at LLNL is strong, it appears to be even stronger within a work group. This was evidenced by the SCWE assessment team in focus group interviews of work groups. Individuals listened to each other and were respectful of differing opinions and experiences.

The majority of interviewees believe that people performing different work activities try to avoid creating problems or interference with each other. Examples of systems and processes in place to help avoid problems or interference were provided and include:

- Morning meetings

- POD
- Plan of Work (POW)
- Safe Plan of Action (SPA)
- Facility Point of Contact (FPOC) role
- Daily activities list

The system of planning work was judged to be effective by the majority of interviewees.

When the coordination of work discussion was extended to LLNL (versus a “project”) more examples of interference were provided. One quote described coordination of activities as, it “works very well in our stovepipes of excellence. Where we have issues is when we cross organizations.” Based on a few comments, there may be more coordination and interference issues in multi-user facilities, and with construction and subcontractors. These organizations may warrant further evaluation.

Based on comments from the interviews, there is a perception among a few of those interviewed that the priorities aren’t always understood or agreed to. It is the SCWE interview team’s opinion that this is especially true when their project doesn’t get the #1 priority and their work is cancelled or pushed out. In addition, there is a perception amongst a few that “NIF always gets what it wants when it needs it at the expense of everything else.”

Table C-5 Teamwork and Mutual Respect Analysis Summary

Positive Observations
1. Teamwork and mutual respect rated strong by majority of interviewees.
2. Even stronger in individual work groups.
3. Work activities are generally well coordinated.
Relevant Outliers
1. Multi user facilities, subcontractors, and construction struggle with integration and coordination of activities more than others,
2. People don’t always agree with priorities when their project isn’t #1,
3. Some resentment expressed that “NIF always gets what it needs when it needs it at the expense of everyone/everything else.”
Items in Need of Attention
1. Communicate “why” when priorities result in delays or cancellation of their projects/work,
2. Continue to communicate the importance of NIF’s success to the Lab’s success and the ability to attract future missions and new work.
Recommendation(s)
1. Improve communication up and down all levels of the organization.

This attribute was found to be implemented and effective (I/E).

Credibility, Trust, and Reporting Errors and Problems (OL1)

Question responses and the grading of this attribute varied by level of position. The average grade on a scale of 1-5 with 5 being the highest was 3.7, which is in the middle of the pack when compared to the other attributes reviewed. However, grades assigned by senior management and supervisors/workers were dramatically different. Senior managers graded this area a 4.5 on average, whereas supervisors and workers each graded it a 3.7 on average.

The grading disparity may be due to the fact that most workers stated they trust their immediate supervisors and the messages coming from the Lab Director, but they have much less trust of the managers in between them and the Lab Director. At the same time, although senior managers perceive they are trusted by the workforce, that perception is not shared at the lower levels.

The Lab Director's communication in particular was noted as trustworthy. Many workers expressed that he understands the importance of communication even when information is unknown or uncertain.

Many workers believe that when their immediate supervisors speak about important matters at the Lab, they tell the truth, especially in the area of safety. In general, people feel that their immediate supervisors are responsive to employee concerns and reported problems, but upper level managers are less so.

A majority of workers think that when incidents or accidents occur, management takes an objective approach to determining the causes without focusing on blaming individuals. Many managers at all levels expressed that finding blame is not part of the causal analysis process and not part of the Lab's safety culture. However, some workers believe that blame is occasionally attributed to individuals, and once the identity of a person involved in an incident is out it can cause harm to reputation. This could result in the unintended consequence of underreporting. A higher level manager explained that in the areas of causal analysis and fact-finding following a mishap, management's intention is not to find blame, but the processes in place often leads to conclusions of blame.

In summary, the grade for this attribute is "partially implemented and partially effective". This grade means that the evidence demonstrates that the expectations described in the attribute are not routinely demonstrated in a repeatable, reliable manner. Processes are partially in alignment with outcomes due to limited resources and competing priorities.

Table C-6 Credibility, Trust, and Reporting Errors and Problems (OL1) Analysis Summary

Positive Observations
1. Many people think that when their supervisors and managers speak about important matters at the Lab, they tell the truth, especially in the area of safety.
2. A majority of people think that when incidents or accidents occur, management takes an objective approach to determining the causes without focusing on blaming individuals.
3. Many employees believe the senior leadership provides accurate and timely information to the work force and understand the importance of communication even when information is unknown or uncertain.
Relevant Outliers
1. Some people believe that senior leadership is not forthcoming with truthful information because of overwhelming political forces and pressure from regulators.
Items in Need of Attention
1. In the areas of causal analysis and fact-finding following a mishap, management's intention is not to find blame, but the processes in place and <u>pressure from regulators</u> often leads to conclusions of blame.
2. In general, people feel that their immediate supervisors are responsive to employee concerns and reported problems, but upper level managers are not.
3. Upper management does not have a visible and consistent communication tool.
Recommendation(s)
None at this time.

This attribute was found to be partially implemented and partially effective (PI/E).

Effective Resolution of Reported Problems (OL2)

Responses indicated that senior managers graded this attribute of SCWE quite a bit higher than other managers and supervisors as well as the non-supervisory personnel. In fact, the middle managers and supervisors graded this lower than the other two groups. The average rankings for this attribute were 4.0 for senior managers, 3.4 for other managers and supervisors, and 3.6 for non-supervisors. This difference may indicate that the middle managers are a little more dissatisfied than the other two groups with the inability to get reported problems resolved. It should be emphasized however that when it comes to “safety” problems all responders stated clearly that these are worked to resolution in a timely manner, particularly anything related to life and health. The overall average ranking for this attribute was 3.4, the lowest average ranking of any of the other attributes.

In summary, the grade for this attribute is “partially implemented and partially effective.” This grade means that the evidence demonstrates that the expectations described in the attribute are not routinely demonstrated in a repeatable, reliable manner. Processes are partially in alignment with outcomes due to limited resources and competing priorities. Monitoring performance as discussed in the interviews indicate a large backlog of maintenance and infrastructure problems that are awaiting resources.

All interviewees believed that “safety” issues are timely addressed. And “safety” issues, particularly those related to life and health, get rapid resolution. However, other issues may get addressed but not get resolved in a timely manner. For example, reported problems that involve equipment and facilities may just stay in the system a long time without resolution. Some interviewees commented that they just have more infrastructure issues than current resources available to address them.

Most interviewees believe that all levels of the workforce are brought in to contribute to the fact-finding efforts. Appropriate people that need to be involved due to their connection with the issue, their skills, or their capabilities are able to contribute to the fact-finding.

There was not much discussion about a formal Corrective Action Management and Performance Improvement program. Knowledge of this system and how it works was not presented during the interviews although we did not ask specific questions related to these formal systems. No one brought them up as we discussed this attribute. Some interviewees did mention that their supervision was in the area working with them to prevent problems with the process and their work or to help resolve an issue that had come up. How this is formally documented or tracked was not readily apparent to them. There was also not much said about their Lessons Learned program but again they were not asked specifically about this program.

Table C-7 Effective Resolution of Reported Problems Analysis Summary

Positive Observations
1. Safety issues get addressed and resolved timely, particularly if there are life and health issues.
2. Fact-finding activities usually ensure all levels of the workforce are able to contribute.
3. Management tries to prioritize problems to be worked.
Relevant Outliers
1. Fact-finding sometimes ends up feeling like finger pointing even when it is not intended.
2. Occasionally the need for some people for fact-finding is not recognized; they may be part of the matrix organization and only infrequently work in the area.
Items in Need of Attention
1. Backlog of identified maintenance and facilities issues that dramatically demonstrate ineffective resolution of problems.
2. Backlog of open problems hinder employees from wanting to bring up more – nothing will be done about them either.
3. No communication to the employees of the status of projects that will be worked on and the list of those that will be listed for future action.
Recommendation(s)
1. Improve management response in the moment when an issue is raised.
2. Provide workers feedback in response to issues raised.
3. Publish and communicate a strategy for infrastructure improvements.

This attribute was found to be partially implemented and partially effective (PI/E).

Performance Monitoring Through Multiple Means (OL3)

The responses to the questions and ratings under this attribute were mixed. The average score on a scale of 1-5 with 5 being the highest was 3.7. This represents the second lowest grade for the attributes. Managers provided the strongest answers attesting to the fact that they are involved in oversight activities and performance improvement. They see themselves as setting an example for safety and maintaining a strong focus on the safe conduct of work. Examples cited include:

- Metrics/Leading indicators
- Walk throughs
- Assessments
- Management reviews
- CAS
- Operations review boards
- Customer surveys
- Functional management reviews

Workers were mixed in their answers. Responses covered the entire spectrum from “We’re getting beat to death with assessments” to “we don’t see management.” Workers were generally unaware of oversight and performance improvement activities at the Laboratory. About half could only point to one example of managers being involved in oversight and performance improvement via walk-throughs. Many articulated that they don’t see their manager frequently and don’t know what their managers do with respect to oversight and performance improvement other than walk-throughs. The interviewees indicated there is a general lack of understanding of metrics – including those that are related to SCWE focus areas. Most did; however, agree that when there is a problem, management gets involved.

Table C-8 Performance Monitoring Through Multiple Means Analysis Summary

Positive Observations
1. Managers articulated a strong response citing numerous examples of oversight activities.
Relevant Outliers
1. A small number of managers view oversight activities as being conducted too frequently and resulting in “overkill.”
2. Some managers say the right things but don’t “walk the walk.”
Items in Need of Attention
1. At times, workers needed the interviewers to define oversight activities.
2. The majority of workers only identified management walk-throughs.
3. The majority of workers couldn’t validate managers’ performance monitoring activities.
Recommendation(s)
None at this time.

This attribute was found to be partially implemented and partially effective (PI/E).

Questioning Attitude (OL4)

Managers' responses indicated that they themselves are questioning results and decisions and that they are receptive to and encourage a questioning attitude. Several examples were provided. Many examples were provided by the workers where individuals or their teammates have been skeptical of deviations and/or results and questioned them. Several said that due to the nature of their work, "this is what we do." In the majority of cases, interviewees felt the issues were appropriately addressed. The average grade was a 4.0 which is the highest grade for the attributes. Grades were consistent between senior managers, managers/supervisors and workers (4.3, 4.0 and 4.0 respectively). There were a few examples of budget constraints having a negative impact on the timeliness of the resolution. Personnel and/or organizations were not always acknowledged for demonstrating a questioning attitude. When they were, it was very much appreciated and led to them being willing to raise other questions; when they weren't acknowledged or when they felt criticized, they indicated they were reluctant to question in the future. Matrixed organizations/personnel often provided two different answers; one for the payroll organization and one for the organization they are matrixed to. In almost all instances, their scores were higher and comments more positive for their matrixed management.

Managers' responses are somewhat inconsistent with workers experience in that the managers believe they are encouraging and positively acknowledging a questioning attitude yet workers don't always feel acknowledged or encouraged.

Those that have been harmed for raising concerns in the past have a difficult time getting beyond how it made them feel. They expressed reluctance to raise issues or concerns in the future and often attributed a lack of trust for supervision/management as a result. This was the case even when it occurred years before.

Multiple examples of hazards associated with their work along with the controls that protect them from that hazard were provided.

Office workers (admins, computer analysts, financial analysts for example) struggled with this question a little bit but offered examples like ergonomics; slips, trips and falls; and driving to and from work. They were familiar with some of the controls but didn't view safety in their work environment as garnering the same attention or needing the same attention as other areas of the Laboratory.

Other responses were appropriately specific to their assignment and included:

- Biological
- Chemical
- High Explosives
- Criticality
- Radiation exposure

- Beryllium
- Electrical work
- Being shot

Controls were described in varying levels of detail specific to the hazard.

Table C-9 Questioning Attitude Analysis Summary

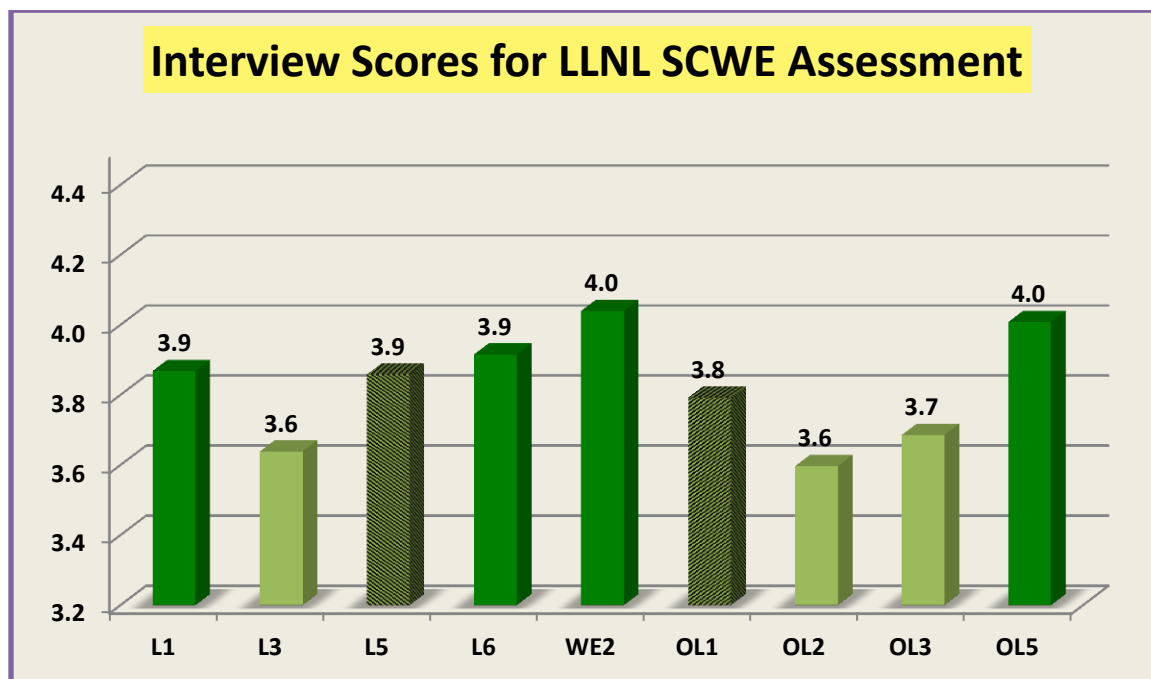
Positive Observations
1. Many examples of a questioning attitude were provided with the majority addressed appropriately.
2. Examples of hazards were provided by the majority; many identified multiple controls.
Relevant Outliers
1. Budget constraints sometimes prevent timely or any resolution of issues.
2. Three felt they were ignored when they demonstrated a questioning attitude.
3. The majority of managers and workers interviewed believe they understand the hazards and controls associated with their organization. There were a few examples cited that indicated an over-confidence or reliance on controls to the extent they eliminate the hazard, leading to a complacency that the controls would never fail and as a result, there would be no consequence.
4. It was not clear if office workers are appropriately aware of and focused on the risks associated with performance of their job.
Items in Need of Attention
1. About half felt they were not acknowledged when they demonstrated a questioning attitude.
2. Funding for resolution of safety issues that appear to not be resolved in a timely fashion.
3. The term "Questioning Attitude" was not universally understood.
4. Inadequate response to raising questions and concerns are remembered for years.
Recommendation(s)
None at this time.

This attribute was found to be implemented and effective (I/E).

Overall Grading of Each Attribute

As part of the interview process each interviewee was asked to grade how that attribute is implemented and practiced at the Laboratory. The grading scale was from one to five with one being the lowest (equivalent to an F in school) and five being the highest (equivalent to an A). In the cases of focus group interviews each individual was requested to provide a grade. The scores were then averaged across the three organizational levels of Senior managers, manager/supervisor, and Non-supervisor.

The chart in Figure C-1 shows the distribution of average grades from all levels of the organization for the nine attributes.



- L1 – Demonstrated Safety Leadership
- L3 – Management Engagement and Time in the Field
- L5 – Open Communication and Fostering an Environment Free from Retribution
- L6- Clear Expectations and Accountability
- WE2 – Teamwork and Mutual Respect
- OL1 – Credibility, Trust, and Reporting Errors and Problems
- OL2 – Effective Resolution of Reported Problems
- OL3 – Performance Monitoring Through Multiple Means
- OL5 – Questioning Attitude

Figure C-1 Average Grades from All Levels for the Nine Attributes

In addition to noting that three attributes (L2, OL2, and OL3) scored lower than the others, further analysis of the results showed an overall difference in scoring between various levels in the organizations, as shown in Figure C-2.

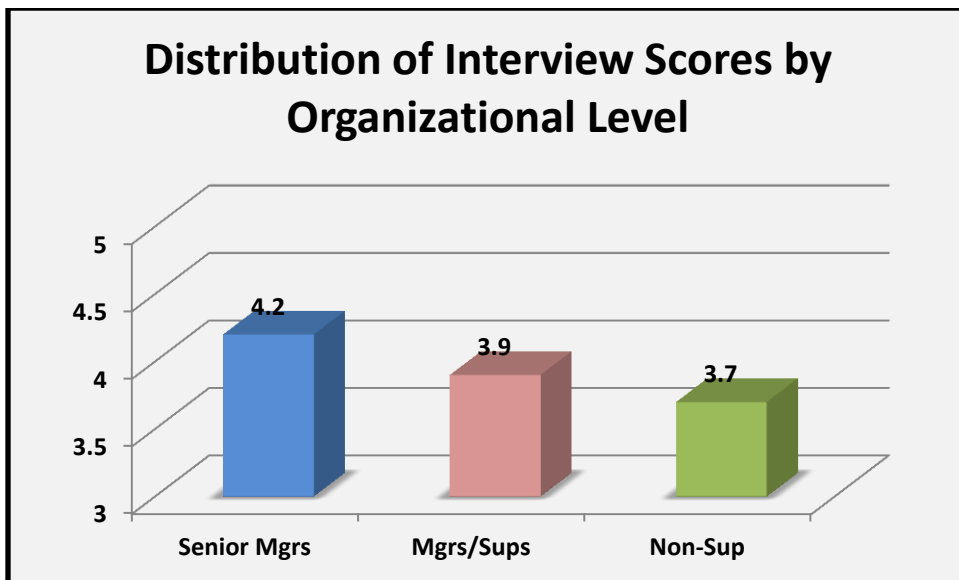


Figure C-2 Overall Difference in Scoring

For two attributes (L5 and OL1) the divergence between organizational levels was especially prominent. The chart below shows the relative scoring for these five attributes.

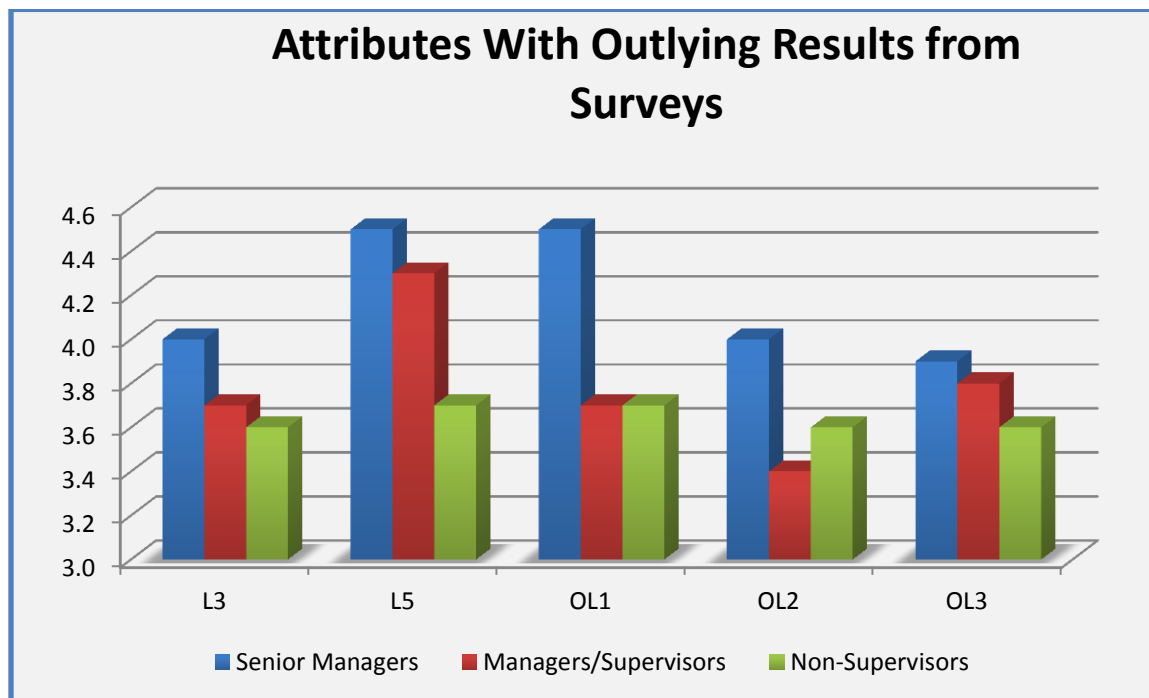


Figure C-3 Organizational Level Divergence

Work Observations and Conclusions

Work Observation 1: Radioactive and Hazardous Waste management (RHWM) Work Permit Review

The purpose of this meeting was a required review of a procedure that governs the replacement of HEPA and pre-filters in the industrial ventilation system that serves various Laboratory facilities. Representatives from all aspects of the work activity were present. Attendees included employees who actually perform the work, facility management, and ES&H support personnel. Each step in the work permit was covered to ensure it was still accurate. A change was made based on worker input to the establishment of Contamination and Buffer areas. Adjustments to the radiological control limits were made with a productive discussion and a consensus on the final decision. Review of the meeting identified the following:

- All involved stakeholders in the process were present from the worker to the facility manager.
- There was a free and open exchange of ideas and comments.
- There was a sense of mutual respect among participants.
- Support groups such as Radiation Protection were treated as team members.
- There was open discussion and a clear consensus at the end of the meeting and approval of the permit.

Work Observation 2: Operational Excellence Committee Meeting

The purpose of this meeting was to conduct a review of open OEC action items, the Stalls & Falls Monthly Report, Institutional Dashboard Metric Changes, and ISMS Effectiveness Review. Attendees at the meeting included management. It was evident during the meeting that the forum was open and respectful.

Work Observation 3: NIF SPA – Filter Change Out

The purpose of this meeting was to conduct an SPA in preparation of replacing a small filter in the NIF target area. Half of the meeting involved the review of the actual work steps by the lead individual. The individual who was to conduct the activity as well as the supporting Radiation Safety technician were present. Once the work tasks were covered the radiation and safety controls were covered. Review of the meeting identified the following:

- The SPA was conducted in a formal fashion but in an open manner with exchanges between all those involved.
- The worker had clarifying comments and raised the issue that lighting was restricted in the work area and that supplemental lighting would be used.
- It was clear that all three individuals were knowledgeable about how to conduct a SPA and were comfortable with the process and sharing input.

- There did not appear to be any reluctance to raise an issue.
- As a best practice the worker was asked if he was ok for the task (fit for duty). He responded that he was. While this step is incorporated in many organization's pre job steps it is seldom seen in practice.
- One concern noted was that during the discussion of the Radiation Work Permit (RWP) the other team members were discussing another issue. This may have been driven by the fact that we were observing and the H&S individual was going over the content with us.

Work Observation 4: ES&H Monthly Management/ORB Meeting

The purpose of this meeting was to serve as a monthly review of the financial status in the directorate, current state, projected end of year status, and a review of budget guidance for the coming fiscal year. The data provided showed a projected end of year performance with a very slight budget over run. There were no concerns voiced that this would be a challenge to accomplishing the remaining 2013 scope of work. The remainder of the meeting focused on the status of existing and emerging issues and corrective actions.

Team members covered the status of open issues and any challenges to completion. Alternative approaches to administratively managing issues (combining issues to one rollup that would close them all) were discussed. While there were many actions to complete before the end of the fiscal year there was confidence that all were achievable. In several instances managers brought forward resource concerns due to the VSSP and solutions were discussed on how to still meet the target closure dates. Review of the meeting identified the following:

- It was clear that the process was capturing action items from a number of sources (events, causal analysis, and assessments) and establishing milestones toward completion.
- Individual managers were taking accountability for the closure actions and were freely discussing progress.
- It was not clear in the meeting how progress toward resolving the issues was to be communicated to stakeholders. This process may be in place but was not addressed in the meeting.
- A follow-on discussion addressed how the list of corrective actions will be managed if there are no available resources to support the closure actions. There is a plan for prioritizing actions and determining which ones would be deferred although the plan has not been exercised at this point.
- Employees' identified on the agenda and reporting out did so in a professional manner offering and encouraging a question attitude. It appeared the agenda allowed adequate time for the meeting's agenda.
- A round table was conducted allowing each participant of the meeting to speak on related and unrelated topics associated with their areas of responsibility.

Work Observation 5: Human Performance Improvement (HPI) Tailgate (TG) Meeting

The purpose of this meeting was a Sharing of Lessons Learned, review of web based HPI training, status HPI Practitioner Training, re-structuring of the HPI Website, and general open forum. Attendees at the meeting represented a significant portion of the Laboratory organizations and they were clearly focused on furthering the incorporation of HPI principles and tools into the Lab processes. Review of the meeting identified the following:

- The team is clearly motivated to help the Lab improve and see the incorporation of HPI principles as an effective approach.
- Discussions were open and honest with no hesitation to speak up or offer an opinion.
- The senior management sponsor (AD ES&H) was present and participated in the meeting in a very positive way. It was not clear if other senior line managers provide active support and engagement.
- A number of events were discussed openly in light of behavioral or HPI principals.
- The HPI effort seems to be in a rebuilding mode; very qualified and passionate people that are looking for ways to positively impact the Laboratory processes.

Work Observation 6: ES&H Radiation Protection Functional Area Manager (FAM)

The purpose of this meeting was a daily dosimetry morning meeting (the schedule called it a pre-job brief). Attendees at the meeting included four workers and their team lead. The meeting lasted five minutes. Safety was the first topic on the agenda. No issues were raised.

A discussion was initiated on procuring two pair of tweezers. Although not important to most employees, tweezers are critical to processing dosimeters because the film is thin and easily damaged. New procurement rules were discussed to ensure they followed the process.

Everyone's input was solicited and listened to and a decision was made regarding a path forward. No other items were discussed and the workers started work. Review of the meeting identified the following:

- It would be easy to cancel the meeting/hold it less frequently since it is a small group and their work is routine. Continuing to hold the meeting provides an opportunity for safety and other issues to be discussed and for everyone to touch base on work activities for the day.
- The discussion was inclusive, differing viewpoints were respectfully acknowledged and a decision was made.

Work Observation 7: Facilities & Infrastructure (F&I) Safety Leadership Team

The purpose of this meeting was to discuss F&I injury statistics and recent injuries, review LLNL recent incidents, observations from the LOTO Functional Management Review (FMR), and other relevant topical items. Review of the meeting identified the following:

- Topics were openly and freely discussed.
- Injury prevention was a large part of the discussion since the F&I/MUSD injury rates are high.
- The incident of hitting the overhead communication line with an excavator arm was discussed high-lighting the spotter on the job attending to a wild life protection activity rather than watching for the lines above the excavator. Not clear that the work permit for the job included the above lines hazard.
- Discussed differences in the LOTO process around the Lab and the findings of a recent LOTO FMR. Attendees indicated additional follow-up is needed in this area.
- No comments were cut-off and everyone could voice their thoughts and opinions.

Appendix D

LLNL Safety Conscious Work Environment Assessment Lines of Inquiry and Observational List

Revised July 26, 2013

Introductory Information:

1. Ask the interviewee to introduce him- or her-self explaining what they currently do at the Laboratory and briefly describing other experience they have.
2. Explain that the purpose of the interview is to solicit their opinions regarding the extent to which a Safety Conscious Work Environment (SCWE) exists at LLNL.

In the line of questioning we will also help you better understand what constitutes a SCWE?

This is not a test – there is no right or wrong answer to any of the questions.

This is not a judgment of you – rather it is a means to understand through your eyes, how the laboratory is managed within a SCWE context.

Finally there is no attribution of any of the provided information to you personally. The information will be combined with that of all other interviewees to provide a consolidated view of how well each of the nine SCWE-related safety culture attributes are demonstrated within the laboratory. This is done to help laboratory management understand where their focus for improvement can be of most value.

Try to enable the discussion to become more of a conversation than an interview. A key factor in enabling a successful outcome is for the interviewee to feel at ease and not threatened.

Leadership - Demonstrated safety leadership (L1)

1. How do your supervisor and managers visibly demonstrate commitment to safety through their actions and behaviors? How?
2. How well do your supervisor and managers listen to you and consider potential concerns in the workplace?
3. How do your leaders inspire confidence that makes you proud to be a part of their organization? Do you understand and embrace their values? Can you provide examples? [SCWE survey]

4. OTHER CONTRIBUTING ATTRIBUTES

- *Everyone from the executive leader to the front-line employee understands and accepts their safety responsibilities as integral to mission accomplishment.*
- *Managers make sure safety practices and policies enhance work activities and procedures.*
- *Senior managers acknowledge and address external influences to minimize adverse safety impact.*
- *Managers and supervisors clearly understand their work activities and performance objectives, and how to safely conduct their work activities to accomplish their performance objectives.*
- *The organizational mission and operational goals clearly identify that production and safety goals are intertwined with safety as a priority.*

5. Ask the interviewee to grade how well this principle, **Demonstrated Safety Leadership**, is demonstrated at the laboratory:

Grading will be on a scale of 1 to 5 with:

- 5 being fully demonstrated in an outstanding manner (a school grade of A)
- 4 being demonstrated somewhere between 5 and 3 (a school grade of B)
- 3 being demonstrated in a satisfactory manner (a school grade of C)
- 2 being marginally/partially demonstrated between 3 and 1 (a school grade of D)
- 1 being not demonstrated at all – unsatisfactory (a school grade of F)

This is part not science so keep to one significant digit. The compilation of data will be averaged for each principle to give a composite grade between 1 and 5. Remember this is a relative ranking that, based on employee input, informs management of the most important areas to focus on for improvement.

Leadership - Management engagement and time in field (L3)

1. In what ways do your supervisor and managers visibly and actively get involved in monitoring in-field performance and understanding and solving problems to resolve safety issues? Can you provide examples of where their observations and intervention resulted in either a positive or negative change affecting safe performance of work?

2. OTHER CONTRIBUTING ATTRIBUTES
 - *Supervisors and managers set an example for safety through personal commitment to continuous learning and direct involvement in quality training.*

3. Ask the interviewee to grade how well this principle, **Management Engagement and Time in Field**, is demonstrated at the laboratory:

Grading will be on a scale of 1 to 5 with:

- 5 being fully demonstrated in an outstanding manner (a school grade of A)
- 4 being demonstrated somewhere between 5 and 3 (a school grade of B)
- 3 being demonstrated in a satisfactory manner (a school grade of C)
- 2 being marginally/partially demonstrated between 3 and 1 (a school grade of D)
- 1 being not demonstrated at all – unsatisfactory (a school grade of F)

Leadership - Open communication and fostering an environment free from retribution (L5)

1. Do you feel that you can raise safety concerns or identify errors or unintended failures without fear of retaliation? Is your answer the same or different for concerns that don't necessarily have a safety impact? To whom can you raise concerns and how can you raise them? How does your management respond to the identified issues? Do they positively acknowledge this behavior?
2. Describe the most important safety related issue or concern that is on your mind and actions that have been taken or contemplated to resolve it.
3. Do you feel free to offer suggestions for process improvement? Do you have examples? Is there positive acknowledgement by your management when you do so?
4. OTHER CONTRIBUTING ATTRIBUTES
 - *Disciplinary actions are taken in a fair and consistent manner at LLNL.*
 - *Management and supervision visibly and proactively identify situations where people may feel uncomfortable, disenfranchised or ostracized and take action to prevent the perception of a chilling effect.*
5. Ask the interviewee to grade how well this principle, **Open Communication and Fostering an Environment Free from Retribution**, is demonstrated at the laboratory:

Grading will be on a scale of 1 to 5 with:

- 5 being fully demonstrated in an outstanding manner (a school grade of A)
- 4 being demonstrated somewhere between 5 and 3 (a school grade of B)
- 3 being demonstrated in a satisfactory manner (a school grade of C)
- 2 being marginally/partially demonstrated between 3 and 1 (a school grade of D)
- 1 being not demonstrated at all – unsatisfactory (a school grade of F)

Leadership - Clear expectations and accountability (L6)

1. What describes your job and work scope? What are your responsibilities, authorities, and accountabilities for **SAFE** performance of work? Where are these documented? How does your supervision and management review your performance relative to fulfillment of responsibilities and expectations for safe performance of work?
2. How do you know what safety requirements apply to your work?
3. What is your response when you cannot perform a work activity consistent with your governing instructions? What is your response when you encounter conditions during the performance of work that were not expected? Can you provide examples of response in each of these cases? Have you been positively acknowledged by supervision and management for responding appropriately?
4. OTHER CONTRIBUTING ATTRIBUTES
 - *Supervision and management demonstrate accountability by recognizing excellent performance as well as less-than-adequate performance.*
 - *Accountability considers intent and organizational factors that may contribute to undesirable outcomes and individuals and organizations are held accountable in the context of a just culture.*
5. Ask the interviewee to grade how well this principle, **Clear Expectations and Accountability**, is demonstrated at the laboratory:
Grading will be on a scale of 1 to 5 with:
 - 5 being fully demonstrated in an outstanding manner (a school grade of A)
 - 4 being demonstrated somewhere between 5 and 3 (a school grade of B)
 - 3 being demonstrated in a satisfactory manner (a school grade of C)
 - 2 being marginally/partially demonstrated between 3 and 1 (a school grade of D)
 - 1 being not demonstrated at all – unsatisfactory (a school grade of F)

Employee/Worker Engagement - Teamwork and mutual respect (WE2)

1. In what ways are people brought together from multiple levels of the organization to work issues of technical and safety importance? Are open communication and teamwork the norm?
2. How well do individuals listen to each other while working through issues to ensure they understand the meaning, intent and viewpoints that are being communicated? Are differing viewpoints respectfully acknowledged? Can you provide examples?
3. How well do people performing different work activities try to avoid creating problems or interference with each other? Can you provide examples?
4. How well coordinated are activities at LLNL? Are they integrated to fit well in a logical sequence and avoid overlap and interference in space and timing? Can you provide examples? [SCWE survey]

5. OTHER CONTRIBUTING ATTRIBUTES

- *When resolving issues, the LLNL organization focuses on the problem rather than on individuals associated with the issue.*
- *Good news and bad news are both valued and shared at LLNL.*

6. Ask the interviewee to grade how well this principle, **Teamwork and Mutual Respect**, is demonstrated at the laboratory:

Grading will be on a scale of 1 to 5 with:

- 5 being fully demonstrated in an outstanding manner (a school grade of A)
- 4 being demonstrated somewhere between 5 and 3 (a school grade of B)
- 3 being demonstrated in a satisfactory manner (a school grade of C)
- 2 being marginally/partially demonstrated between 3 and 1 (a school grade of D)
- 1 being not demonstrated at all – unsatisfactory (a school grade of F)

Organizational Learning - Credibility, trust and reporting errors and problems (OL1)

1. Do you believe the actions of your managers and supervisors demonstrate a commitment to high integrity and ethical practices? Do they foster trust? Can you provide examples?
2. Are mistakes and errors used as an opportunity to learn or leading to an opportunity to blame?
3. How well do supervisors and managers provide accurate, relevant, and timely information on matters important to employees? Please describe how.
4. Do you feel your supervisors and managers respond to your questions in an open, honest manner? *[SCWE survey]*
5. OTHER CONTRIBUTING ATTRIBUTES
 - *There is a high level of credibility and trust in the organization that is continuously nurtured.*
 - *Supervisors and managers communicate and reinforce the value of self-identification/self-reporting of errors and positively acknowledge this value.*
6. Ask the interviewee to grade how well this principle, **Credibility, Trust and Reporting Errors and Problems**, is demonstrated at the laboratory:

Grading will be on a scale of 1 to 5 with:

- 5 being fully demonstrated in an outstanding manner (a school grade of A)
- 4 being demonstrated somewhere between 5 and 3 (a school grade of B)
- 3 being demonstrated in a satisfactory manner (a school grade of C)
- 2 being marginally/partially demonstrated between 3 and 1 (a school grade of D)
- 1 being not demonstrated at all – unsatisfactory (a school grade of F)

Organizational Learning -Effective resolution of reported problems (OL2)

1. Do you believe issues are being timely addressed by management? Are explanations for either accepting or rejecting an issue provided to the individual(s) identifying the issue?
2. Do fact-finding activities ensure all levels of workforce are able and encouraged to contribute? Have you participated in fact-finding activities and, if yes, provide an example of your participation including a contribution you made to identify issues or improvement actions.
3. OTHER CONTRIBUTING ATTRIBUTES
 - *Corrective Action Management and Performance Improvement programs effectively identify, evaluate, manage, resolve, and close issues, deficiencies, and improvement opportunities with layers of defense, transparency and traceability.*
 - *Supervisors and managers actively seek out and correct error traps and examine recurrent errors as indicators of latent organizational weaknesses.*
 - *Lessons, both internal and external to the laboratory, are effectively shared for purposes of learning.*
 - *Performance improvement processes require direct worker participation. Individuals are encouraged, recognized, and rewarded for offering innovative ideas to improve performance and to solve problems.*
4. Ask the interviewee to grade how well this principle, **Effective Resolution of Reported Problems** is demonstrated at the laboratory:

Grading will be on a scale of 1 to 5 with:

- 5 being fully demonstrated in an outstanding manner (a school grade of A)
- 4 being demonstrated somewhere between 5 and 3 (a school grade of B)
- 3 being demonstrated in a satisfactory manner (a school grade of C)
- 2 being marginally/partially demonstrated between 3 and 1(a school grade of D)
- 1 being not demonstrated at all – unsatisfactory (a school grade of F)

Organizational Learning -Performance monitoring through multiple means (OL3)

1. Do you see managers throughout the organization being involved in oversight activities and performance improvement and setting an example for safety? Do you see them maintaining a strong focus on the safe conduct of work? How?

2. OTHER CONTRIBUTING ATTRIBUTES
 - *Management assessments and independent assessments are conducted at all levels of the organization.*
 - *Information obtained from performance assessments and monitoring is integrated and analyzed for collective significance.*
 - *The organization maintains an awareness of its safety culture maturity. It actively and formally monitors and assesses its safety culture on a periodic basis*
 - *Key performance indicators related to safe work accomplishments are used, trended and acted upon at all levels of the organization.*

3. Ask the interviewee to grade how well this principle, **Performance Monitoring Through Multiple Means**, is demonstrated at the laboratory and in doing so, explain that these other attributes also describe how this principle is demonstrated:

Grading will be on a scale of 1 to 5 with:

- 5 being fully demonstrated in an outstanding manner (a school grade of A)
- 4 being demonstrated somewhere between 5 and 3 (a school grade of B)
- 3 being demonstrated in a satisfactory manner (a school grade of C)
- 2 being marginally/partially demonstrated between 3 and 1(a school grade of D)
- 1 being not demonstrated at all – unsatisfactory (a school grade of F)

Organizational Learning -Questioning Attitude (OL5)

1. Can you provide examples where you or teammates have been appropriately skeptical of deviations and/or results and questioned them? Were these issues appropriately addressed? Were personnel and organizations positively acknowledged for a questioning attitude?

2. Describe the most important hazard associated with your work and the controls that protect you from that hazard [SCWE survey]? What might happen if poor performance resulted in those controls not being able to protect you, the environment or someone else?

3. OTHER CONTRIBUTING ATTRIBUTES
 - *Individuals cultivate a constructive, questioning attitude and healthy skepticism when it comes to safety.*
 - *Individuals question deviations, and avoid complacency or arrogance based on past successes.*
 - *Team members support one another through both awareness of each other's actions and constructive feedback when necessary.*
 - *Supervisor and managers encourage and cultivate the use of a questioning attitude*

4. Ask the interviewee to grade how well this principle, **Questioning Attitude**, is demonstrated at the laboratory and in doing so, explain that these other attributes also describe how this principle is demonstrated:
Grading will be on a scale of 1 to 5 with:
 - 5 being fully demonstrated in an outstanding manner (a school grade of A)
 - 4 being demonstrated somewhere between 5 and 3 (a school grade of B)
 - 3 being demonstrated in a satisfactory manner (a school grade of C)
 - 2 being marginally/partially demonstrated between 3 and 1 (a school grade of D)
 - 1 being not demonstrated at all – unsatisfactory (a school grade of F)

Concluding Questions:

If you were king/queen for the day, what three things at the Laboratory would you change?

Is there anything else you would like to discuss?

Safety Conscious Work Environment Principle

Example Relative Ranking Self-Evaluation Graphic

Safety Conscious Work Environment Principle	Negative	Neutral	Positive
	1	2	3
L1-Demonstrated safety leadership	Relative Ranking 4 5		
L3-Management engagement and time in field	Relative Ranking 4 5		
L5-Open communication and fostering an environment free from retribution	Relative Ranking 4 5		
L6-Clear expectations and accountability	Relative Ranking 4 5		
WE2-Teamwork and mutual respect	Relative Ranking 4 5		
OL1-Credibility, trust and reporting errors and problems	Relative Ranking 4 5		
OL2-Effective resolution of reported problems	Relative Ranking 4 5		
OL3-Performance monitoring through multiple means	Relative Ranking 4 5		
OL5-Questioning attitude	Relative Ranking 4 5		

List of Field Observations

- RHWM Permit Review
- Operational Excellence Committee Meeting
- NIF SPA-Filter Change Out
- ES&H Monthly Management Meeting/ORB Meeting
- HPI TG Meeting
- F&I Safety Leadership Team Meeting
- ES&H Radiation Protection FM