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Guide to Monitoring and Improving Safety Culture

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Guide to Monitoring and Improving Safety Culture

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ACRONYMS AND ABBREVIATIONS

BP	British Petroleum
CAIB	Columbia Accident Investigation Board
CSB	U.S. Chemical Safety Board
DOE	U.S. Department of Energy
EFCOG	Energy Facility Contractors Group
ISM	Integrated Safety Management
ISMS	Integrated Safety Management System
KPI	key performance indicators
NEI	Nuclear Energy Institute
NTSB	National Transportation Safety Board
SCIT	safety culture improvement team
SLT	senior leadership team
SME	subject matter expert
WMATA	Washington Metropolitan Area Transit Authority

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This guide is intended to offer suggestions and examples of how an organization might approach safety culture monitoring and improvement. Not all recommendations or examples in this document will be appropriate for all organizations; organizations should use their best judgment on their own implementation. Likewise, this document should not be used as a guideline for judging an organization's implementation of safety culture monitoring. As such, prescriptive language has been avoided to promote flexibility across a variety of settings. To be most effective and efficient, the culture monitoring process should leverage existing structures and processes as much as possible. As the culture monitoring process matures, organizations may find that key features of the monitoring process can be accomplished more efficiently within other existing processes.

1.0 INTRODUCTION

Instituting processes to monitor and sustain an organization's focus on safety culture makes good business sense, particularly given the hazardous and complex missions present across the U.S. Department of Energy (DOE). These processes help ensure that the investment in safety culture activities is having the desired effect. Improving safety culture enhances organizational performance, which translates to meeting organizational goals and accomplishing the mission.

In September 2015, the Energy Facility Contractors Group (EFCOG) Integrated Safety Management (ISM) Working Group issued *A Guide to Safety Culture Evaluation.* This guide is a practical source of information on conducting a safety culture evaluation including planning, data collection, data analysis, reporting, and continuous improvement. The companion document, *Safety Culture Monitoring & Improvement,* provides DOE contractors with guidance on how to monitor culture changes between assessments and how to continually improve their organization's safety culture.

2.0 BACKGROUND

Failure to monitor an organization's safety culture can have catastrophic consequences. Three high-profile accidents illustrate the importance of establishing an effective safety culture. As these tragedies attest, management involvement is critical for developing an effective culture. When management fails to monitor safety culture, significant property loss and the irreplaceable loss of life can occur.

- **2009 Washington, D.C. Metro collision (NTSB. 2010)** – On June 22, 2009, Washington (D.C.) Metropolitan Area Transit Authority (WMATA) Metrorail Train 112 struck the rear of a Metrorail train that had stopped on the track. The accident cost the lives of the train's operator and eight passengers, and a total of fifty-two people were transported to hospitals due to injuries suffered in the crash. The National Transportation Safety Board (NTSB) investigation revealed that among the contributing causes of the accident were WMATA's poor safety culture and the failure of an automatic train control system. The NTSB chairman characterized the WMATA safety culture as "anemic" at a public hearing regarding the crash. The poor safety culture was exemplified in part by WMATA Metrorail managers' failure to address problems with the train control system. Consequently, the NTSB report concluded that management's failure to appropriately prioritize safe operations "likely influenced the inadequate response to such malfunctions

by automatic train control technicians, operations control center controllers, and train operators."

- **2005 BP refinery explosion (U.S. Chemical Safety Board, 2007)** – On March 23, 2005, explosions and fires at the British Petroleum (BP) refinery in Texas City, Texas, killed 15 people and injured another 180. The U.S. Chemical Safety Board (CSB) investigated the causes of the accident and identified systemic organizational causes in addition to the specific technical causes. Among these organizational causes were significant management failures, including the failure of BP executive management to "implement adequate safety oversight, provide needed human and economic resources, or consistently model adherence to safety rules and procedures." Further, BP executive management and refinery management did not create a positive learning and reporting culture, which emphasizes the importance of reporting safety threats and effectively investigating accidents.

- **2003 Columbia breaks up (National Aeronautical and Space Administration, 2003)** – On February 1, 2003, the Space Shuttle Columbia broke up upon re-entry into the Earth's atmosphere killing Columbia's seven-member crew. In response to the accident, more than 25,000 individuals worked to recover debris from the accident, which was strewn across several Western states. In response to the disaster, the Columbia Accident Investigation Board (CAIB) was convened to ascertain direct and indirect causes. The CAIB reported that while the physical cause of the disaster was a breach in Columbia's Thermal Protection System, there were important organizational causes as well. The CAIB reported that "cultural traits and organizational practices detrimental to safety were allowed to develop. These included: organizational barriers that prevented effective communication of critical safety information and stifled professional differences of opinion; lack of integrated management across program elements; and the evolution of an informal chain of command and decision-making processes that operated outside the organization's rules."

Each of these events is directly linked to leadership failure to establish a strong safety culture. Management must enhance communication regarding safety, ensure that project management is appropriately integrated, and insist that safety rules are followed. Management must demonstrate that it values safety and will not tolerate informal processes that circumvent safe operations. Ultimately, management must create and maintain a robust safety culture that is resilient to organizational drift.

2.1 Integrated Safety Management System and Safety Culture

The purpose of every DOE organization is to successfully accomplish its assigned mission while working within an approved Integrated Safety Management System (ISMS). This system includes the implementing mechanisms, processes, and methods to be used to systematically integrate safety into management and work practices at all levels in the planning and execution of work. It is at this juncture between how work is planned and how work is performed where the importance of safety culture lies.

Safety culture represents the collective response of an organization to its work environment. An organization with a healthy safety culture proactively seeks feedback, responds to issues openly, and engages stakeholders to stay within its approved ISMS.

Because of the relationship between safety culture and mission success, DOE has committed to the safety culture focus areas and attributes (also called "traits" in other industries) described in Attachment 10 of its *Integrated Safety Management System Guide* (U.S. Department of Energy, DOE G 450.4-1C). The Guide defines safety culture as:

> *"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."*

Attachment 10 further describes three safety culture focus areas that are based on a joint DOE-EFCOG initiative that began in 2007 and included commercial nuclear industry experience and research over several decades. The DOE ISMS safety culture focus areas are:

- Leadership
- Employee Engagement
- Organizational Learning

The attributes for each safety culture focus area promote a shift from mere compliance to continuous improvement in safety and production performance, with continual adjustments to stay within the approved ISMS. The three focus areas and their attributes are the foundation upon which this Guide was developed.

2.2 Purpose of Document

This document provides a guide for continuously monitoring safety culture so organizations can take appropriate actions to improve their safety performance and effectively accomplish their mission.

This guide is based, in part, on guidance described in documents generated by nuclear organizations including *Fostering a Strong Nuclear Safety Culture* (Nuclear Energy Institute, NEI 09-07, Revision 1), *Safety Culture* (International Atomic Energy Agency Safety Series No. 75-INSAG-4), *Guide to Safety Culture Evaluation* (Energy Facilities Contractors Group, 2015), Best Practice #181 (Energy Facilities Contractors Group, 2015), other contractor best practices, and related literature on organizational management and culture change.

Because an organization's safety culture is influenced by the work environment, the culture may shift as the work environment changes. Ongoing internal monitoring is a means to self-identify problems and plan specific improvement actions prior to external assessments.

> ***"In our zeal to quantify, analyze, systematize, and proceduralize, we risk overlooking an essential truth; culture is but a construct, a lens through which we may notice and contemplate our fundamental humanity."***
> *Culture is not a property, not a set of attributes we can manipulate, dissect and reconstruct. Culture is rather 'the medium of lived experience'- a manifestation of relationships, psychological processes, and communication - a resultant not an antecedent. The discussion of safety culture is but our most recent attempt to understand the human relationships with our technologies, how we create them, how they in turn shape us. It is not a linear predictable projection, rather an eternal dance of discovery and reinvention. As we seek to understand how we as technical professionals co-create technical marvels to improve the human condition, let us not forget that we design technology so it may serve us, not that we may serve technology. Let us keep humanity as our focus, careful that we not reduce that which makes us human to some mechanistic model, and always honor the mystery of who we are and how we together create our experiences.*
>
> **Earl Carnes, DOE Safety Culture & High Reliability Organization Advisor (retired)**

3.0 OVERVIEW

Although safety culture cannot be measured directly, there are organizational performance indicators and associated organizational behaviors, which, if properly correlated and interpreted, can be used to provide indicators of potential weaknesses that could contribute to failure or to strengths that could be applied to other areas and initiatives. (Cole, et al 2013) The ability to proactively identify weak signals before they become a factor in a significant organizational event can be of great benefit.

The key to safety culture monitoring is to collect qualitative and quantitative data and understand the relationship between human behavior and the observed results. If the operational performance data are trending positively, one would ask, "What are the behaviors people in the organization are exhibiting that should be reinforced?" If the operational performance data are declining, one would ask, "What are the undesirable behaviors that should be modified?" This effort may provide insight on the ability of the organization to self-identify, to report, and to resolve problems. Learning opportunities may be identified through issues management and/or contractor assurance systems and from external reports, including DOE assessments and corporate and industry evaluations.

Data on the reporting and appropriate resolution of issues should also be considered in line with the Leadership and Organizational Learning focus areas.

4.0 LEADERSHIP TEAM

Leaders are the key element to the organization's culture, particularly the safety culture. Leaders create a resilient organization and set the stage for a healthy safety culture. How leaders respond to events defines the real safety culture and shapes it for some time after the event. How they lead by example and what they do to encourage organizational learning correlates with the safe

and successful performance of work to achieve mission goals. With a risk-averse mindset, leaders must understand their systems and processes that control how work is planned and done to ensure that latent conditions are prevented and that workers are not burdened with being the last line of defense. Ensure the right defenses are in place so that consequences of errors do not lead to serious events; this is the essence of capacity and failing safely. Leaders must actively facilitate collection of information on system weaknesses, evaluation of that data, and appropriately act to correct the deltas, always providing feedback to those who supply the information.

To successfully transform performance data into safety culture insight, an organization must have leadership that understands and appreciates the connection between a healthy safety culture and mission success. They must actively participate in, and consistently lead the organization toward, improved performance and safety culture.

To achieve this, organizational leaders need to:

1. Understand that observed safety behaviors are directly influenced by the organization's work environment.

2. Understand the value of a safety culture baseline assessment.

3. Understand how the practices of their organization influence the operating environment.

4. Collect representative operational performance data characterizing key facets of the approved ISMS so when performance degrades, indicators of drift can be detected.

5. Compare the operational data across the safety culture attributes to compare performance to behaviors (determine the health of the organization's safety culture).

6. Directly observe the performance of work to get a sense of the work environment and related behaviors of various work groups.

7. Assimilate the above items and have open discussions about the effect of the results on operational success so that realistic improvement actions can be recommended.

Leaders communicate and demonstrate their commitment to safety and reliable operations through their words and their actions. Without leadership's commitment, a healthy safety culture is not possible. Leadership must ensure the management systems and procedures provide the required level of safety, security, and quality while simultaneously avoiding failure mechanisms and other consequences. Leadership must oversee the development and deployment of management systems and relentlessly drive to obtain accurate, timely, and continuous feedback on the health of management systems.

The Senior Leadership Team (SLT) is defined as the most senior management personnel on-site charged with the safe operation of the organization. For example, the SLT could include high level functional area leaders in areas such as research, operations, support, maintenance, and human resources.

The SLT reviews safety culture data and recommendations to determine if action is necessary. This input may be from a dedicated resource (such as a social science subject matter expert [SME]), existing data reporting systems (such as a company-wide dashboard), or a Safety Culture Improvement Team (SCIT). SLT interactions should occur in a group setting to promote reflective conversation about safety culture. The SLT should gain a thorough understanding of the organization's safety culture, which serves as the basis for their decision-making.

The SLT members should share their own interactions with organization personnel, field observations, and other individual experiences to help the SLT understand the organization's safety culture. The most valuable insight often comes from frank discussion of safety culture based on the SLT members' observations and insights.

The SLT members should also be aware of how their behaviors in line with the focus areas permeate the organization and encourage or discourage open communication and culture of trust. A good activity to measure success in this area is the Best Boss/Worst Boss activity attached to this guide as Appendix A. This activity can be used at all levels of the organization.

The SLT's periodic review of safety culture should be documented. Follow-up actions should be tracked (e.g., through an issues management system or other means). Strengths and improvement opportunities should be communicated to the organization to promote desired behaviors and foster improvement actions.

Leaders in the organization should carefully consider the dangers of unconscious bias in addressing employee issues. These unconscious biases can impact how we respond to employees when they raise issues. See activities on Heightening Awareness of Unconscious Bias and Recognizing and Resolving Employee Issues attached to this guide as Attachment ____ and Appendix B.

Leaders create a resilient organization and set the stage for a healthy safety culture by doing the following.

- Having integrity
- Building trust; it is a force multiplier for success (Covey)
- Asking, listening, evaluating, and acting on concerns staff bring them
- Understanding the state of their organization, systems, and processes
- Constantly looking at their systems and working to improve them
- Valuing near misses for what can be learned
- Understanding the work environment and hazards at the task level and the preparedness of their staff to work safely in them
- Engaging the worker in the design process
- Communicating they are here to do work (mission), but it must be done safely and compliantly
- Understanding why successes happen in your organization. Rewarding and reinforcing those 'whys'
- Avoiding short-term gimmicks for safety issues; getting your people to help identify the deltas and design solutions

5.0 SAFETY CULTURE IMPROVEMENT TEAM

Organizations seeking to promote and improve their safety culture may establish a SCIT. A number of names may be used for this team (e.g., safety culture monitoring panel, safety culture working group). The term SCIT is used in this document.

There is no "one-size-fits-all" solution to monitoring and improving safety culture. SCITs, also called "Safety Culture Monitoring Panels" in NEI 09-07, are a best practice, but culture performance monitoring can be performed by dedicated safety culture personnel. Other existing avenues may be used for monitoring or trending, such as a Trending team. Organizations should perform their own evaluation of whether a SCIT is the best option for their own monitoring processes.

5.1 Team Purpose

The SCIT proactively monitors performance and processes inputs to identify emerging challenges and opportunities for improvement. The level of effort and formality used to conduct culture monitoring and periodic reviews should be tailored to the needs of the organization and be proportional to size, budget, and mission. A complex organization with multiple high risk facilities would likely benefit from a more structured approach, whereas a smaller organization could adopt a less formal approach.

5.2 Team Composition

Allow time for the SCIT team to agree on the most important areas for monitoring and improvement and watch membership for attrition and fatigue. Likewise, management commitment is necessary to ensure SCIT members have adequate time allocated to monitoring duties to prevent burnout.

SCIT members should represent a cross section of functional areas, be familiar with daily work activities, and have knowledge of Safety Culture principles. The team must have a common understanding of organizational goals and objectives and an appreciation of how safety culture influences operational performance. The SCIT must be trusted by the workforce and management. Team members should have broad-based operational experience, and some team members should have the ability to collect, analyze, and interpret data. It is strongly advised to train the team on the content of Attachment 10 (or equivalent) methods of changing behavior and culture and conducting culture evaluations. If an organization is not using a SCIT, a social scientist/organizational development professional may help identify and analyze available data to infer safety culture trends.

5.3 Emergent Issues

Emergent issues may arise between meetings of the SCIT. These could be externally or internally generated issues that indicate dissatisfaction with, for example, the organization's safety focus, responsiveness, corrective action program, or treatment of personnel. The SCIT

ensures that such issues are brought to the attention of the SLT and the organization's applicable internal processes (e.g., differing professional opinions).

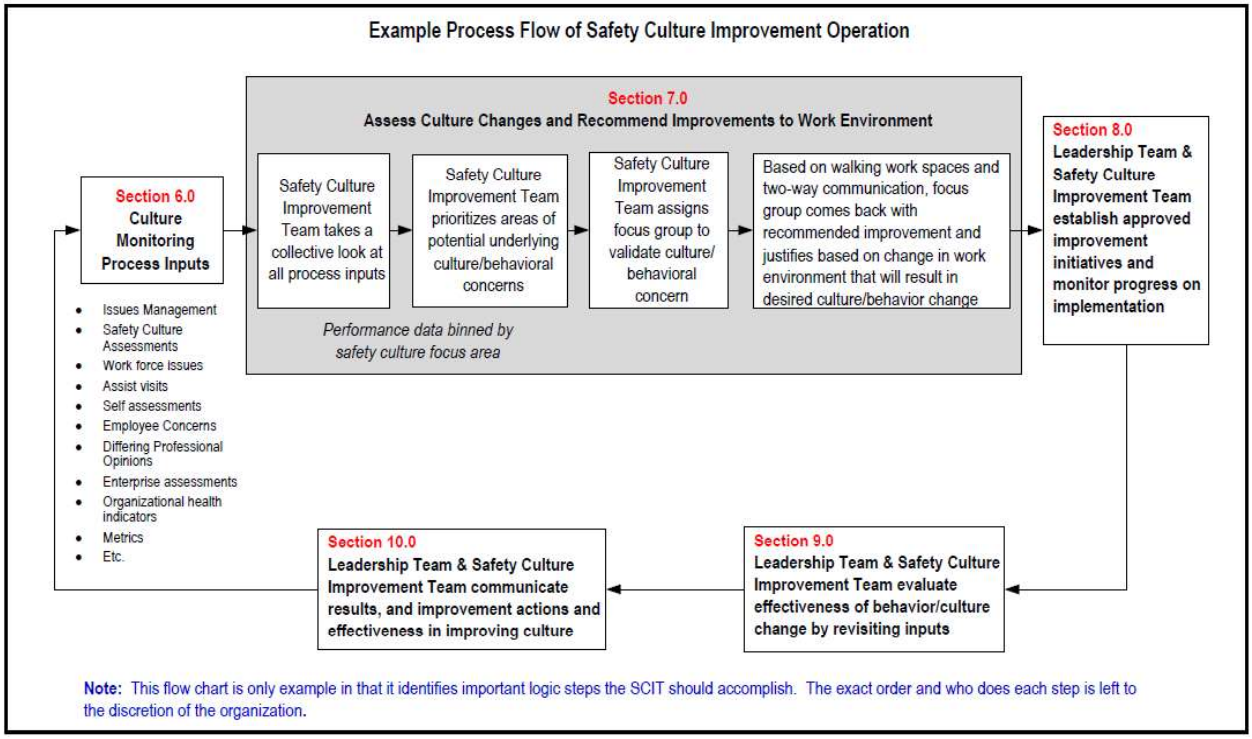
5.4 Team Processes

The SCIT assesses and seeks to improve safety culture with the goal of improving mission performance and reducing risk. To accomplish this it:

- Analyzes data to determine performance areas to focus on (e.g., "What" is not working to expectations of published safety management systems).
- Uses walkarounds and two-way communication to directly observe behaviors related to performance issues (the "why" behind the "what").
- Compares observed behaviors to desired behaviors (as defined by safety culture behavior attributes).
- Identifies gaps to recommend improvements in the work environment to improve behaviors.
- Makes recommendations to the SLT and agrees on actions.
- Reviews the effectiveness of work environment changes toward improving the culture.
- Communicates the results of data analysis and the improvements to the workforce.

Figure 1 depicts the operation of the SCIT. The exact order and who does each step is at the discretion of the organization. The reader is directed to NEI 09-07 for other options for the organization and reporting lines for the SCIT.

Figure 1. Example Process Flow for Safety Culture Improvement.



6.0 BUILDING PERFORMANCE INDICATORS

6.1 Introduction

Performance measurement is an overall management system that is not just concerned with collecting data associated with a goal or standard; a strategic look at data available for overall culture context is necessary. The outcomes of a well-constructed safety culture performance measurement system improve overall organizational performance by tracking progress of strategic organizational initiatives and tracking performance to key behavioral attributes[1]. These actions occur in a continuous cycle, allowing for refinement of goals and objectives as understanding emerges and is applied.

This section provides guidance on selecting and building indicators that show progress toward meeting safety culture objectives. Qualitative and quantitative data streams can be used to understand the critical safety culture objectives of the organization.

Quantitative data is numeric and can usually be expressed in percentiles or charts (e.g., a company's performance indicators or "metrics") – see Section 6.4 for more information. Examples of Quantitative data sources would be:

- Survey results (in aggregate, i.e., 78% of respondents said "yes" to…)
- Safety Performance indicators, such as:
    - days away, restricted, or transferred (DART) rates
    - total recordable case (TRC) rates
- Contractor Assurance System (CAS) data, such as usage rates of the corrective action management system
- Human Resources (HR) information such as hiring or attrition rates

Qualitative data is more ambiguous, and includes information gathered about perceptions and experiences, and is often aggregated and analyzed for themes. Examples of Qualitative data sources would be:

- Survey comments
- Interview or focus group responses and results
- Comments from exit interviews (HR data) or reviews on sites such as Glassdoor.com
- Observations of work activities (such as by a behavior based safety [BBS] team)

Any pre-existing measure maintained by an organization can be evaluated for relevance to safety culture by comparison to the DOE G 450.4-1C Attachment 10 *Focus Areas and Attributes*. However, multiple measures, and types of measures, should be used to evaluate any given attribute or focus area.

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[1]For purposes of this document, it is assumed that the organization has a Contractor Assurance System and Issues Management Program ensuring the pedigree, validity, and fidelity of the data input into the SCIT. For DOE contractors, see DOE O 226.1B *Implementation of Department of Energy Oversight Policy*, Attachment 1, *Contractor Requirements Document*.

Once selected and built, these indicators may be aggregated to form a portfolio of the organization's cultural health and provide insight into cultural strengths and opportunities for improvement. Because culture is a reflection of attitudes and behaviors, it is not possible to measure culture entirely objectively. Nevertheless, there are measurable aspects of conditions that can be trended to determine if cultural issues contributed to the condition. Process weaknesses, discovered through self-assessments, can also provide evidence of possible concerns with the safety culture. Similarly, the attitudes and behaviors of organization personnel can be assessed through surveys, interviews, and behavioral observations.

6.2 Organizational Objectives and Safety Culture Attributes

Planning is necessary to establish a framework that will provide a comprehensive understanding of performance. Meaningful indicators that reflect progress toward organizational objectives must be carefully selected. The SCIT, with input from the SLT, should determine a small number of objectives most important to sustaining and strengthening the organization's culture.

The actions and behaviors that contribute to achieving the objectives must be defined. The safety culture attributes contained in DOE G 450.4-1C, Attachment 10 (or equivalent) should be used to gain this granularity. When properly constructed, the description of the objective and associated attributes will provide insight into the questions that the performance indicators are aimed at answering. For example:

Most contractors are required to implement a contractor assurance system, in line with DOE O 226.1B. A safety culture SME should determine what performance indicators are already being maintained by the organization. Likewise, if the organization already has a data analytics SME or team, or corporate resources for the same, creation or maintenance of safety culture. Cause analysis tools can also be applied to development of safety culture actions.

- Organizational objective: Leaders provide support to accomplish work activities.

- Attribute: Leaders ensure that sufficient resources have been provided so staff can perform their work with distinction. Resources may include manpower, financial support, and accessibility to information and equipment.

Question that performance indicators will answer: Are leaders effectively ensuring that staff members have sufficient manpower, financial support, and accessibility to information and equipment to do their work with desired quality and safety?

6.3 Sources of Data

What type of information do we need to collect and how will we collect it? Data selected should provide useful information that will lead to actions (i.e., don't "collect data to collect data"). The information used to build performance indicators can come from many sources including corrective action programs, training records, human resources activities, safety culture assessments, occurrence reports, workforce surveys, etc. Appendix C provides examples of potential sources of data for safety culture monitoring.

Usually, the organizations or individuals that perform culture monitoring will not own or supply the data and information that supports ongoing monitoring efforts. For example:

The NEI 09-07 model can be referred to for guidance on what departments within an organization may have topical data for monitoring and analysis. It is important to avoid overwhelming the safety culture monitoring process with so much volume that the valuable insights are obscured.

- The Human Resources Department or the Employee Concerns Program may supply some information, while the Safety Department may supply other data. As a result, it is important for those responsible for compiling the information to maintain good working relations with the organizations that supply the information, including actively looking for new or better sources of information.

- The Quality organization might develop a performance indicator for tracking rates of procedure non-compliance. If the indicator was part of an existing culture monitoring mechanism, it would need to be evaluated for impact and inclusion into the aggregate monitoring indicators.

Backup points of contact and succession planning need to be established to maintain repeatability and sustainability of the performance indicator process, with agreement from the appropriate organizations.

6.4 Performance Indicators

Performance indicators should support the safety culture framework and accurately portray the organization's performance. The framework typically contains both leading (prospective) and lagging (retrospective) indicators. Leading indicators are important for providing an early warning of declining performance, and lagging indicators provide a description of actual performance experience. Both have advantages and disadvantages. Effective leading indicators look for missing or degraded barriers (negative) and evidence that people are demonstrating proactive thinking (positive). It is generally difficult to develop effective leading indicators that detect subtle declines in performance that can be easily and quickly reversed. Lagging indicators, such as recordable injuries, tend to be more standardized and can be compared across organizations more easily but are a measure of actual historical performance and therefore are too late to reverse. There is a large body of published literature describing measurement of safety performance, however, little information on indicators of safety culture. Report number: 2010:07 ISSN: 2000-0456, *Indicators of safety culture – selection and utilization of leading safety performance indicators* by Reiman and Pietikäinen is a good resource for selecting and using

safety culture indicators. Appendix C provides examples of potential indicators for monitoring cultural health.

The performance criteria can be determined once the indicators, the source of data, and the monitoring method are established. This can be done by establishing a goal or standard or by determining variance/tolerance bands to represent acceptable or unacceptable performance.

Note: When looking at cultural issues, more salient items might also be telling. For instance, "artifacts" of past processes and programs can provide valuable information as to how well a program has been incorporated into the culture of an organization. These can, of course, be both physical and internal to individuals. For instance are there posters, procedures, policies, or signs that are out of date, or that have been revised without removing the previous version?

6.5 Quantitative and Qualitative Methods

As discussed in Section 6.0, both qualitative and quantitative methods are necessary to develop a rich understanding of cultural health. These data are in numeric or narrative form. Quantitative data (i.e., statistics) strips the emotion from the experience while qualitative data (i.e., words) bring quantitative data to life. Either or both types of data can be used to illustrate the picture and suggest the most promising areas for improvement.

Although by design, culture insight leans more toward qualitative methods, the use of mixed methods is valuable when analyzing cultural data. Obtaining information from diverse sources allows for triangulation of insights to provide a richer, more informed picture of cultural strengths and areas for improvement. For example:

- It is advantageous to have both closed- and open-ended questions in a survey; these will produce both qualitative and quantitative outcomes and, when integrated, allow for a more complete analysis of information.

- An organization will likely recognize that an attrition issue is occurring and easily be able to generate quantitative data to describe the size or impact of the issue. However, the qualitative information obtained from exit interviews will certainly be of more value when trying to define and address contributors to attrition. Considering both quantitative and qualitative data will likely be necessary to determine the full underlying issues and path forward. (Campus Labs, 2017)

7.0 ASSESSING PERFORMANCE INDICATORS AND RECOMMENDING IMPROVEMENTS

Once performance indicators are established and data are collected, how will the data be analyzed? The SCIT assesses performance indicator inputs, determines the direction and magnitude of change and makes recommendations accordingly. This is accomplished using the process sequence identified in Figure 1. Note that the primary value is the logic steps that need to be accomplished, not the precise order of the steps. How, when, and by whom each logic step is accomplished is determined by the organization based on its systems.

Step #1: SCIT receives input from the SMEs from a variety of sources (Section 6.0).

The SMEs provide their opinion of whether or not what they are seeing in performance data is an issue. In some cases, performance data changes may indicate process problems and not necessarily underlying behavior or culture problems.

Input data are categorized by culture attributes (e.g., personal accountability, safety communications, questioning attitude, leadership accountability, respectful workplace, problem identification and resolution, etc.). This can be done by the SMEs collecting the data or by the SCIT.
The culture attributes used for categorization are determined by the organization (e.g., ISM Safety Culture Focus Areas, Institute of Nuclear Power Operators Safety Culture Traits, etc.). These categories will assure the completeness of the data set. Data should be collected to represent each culture attributes. If data for a particular culture attributes are missing, efforts should be undertaken to populate that area.

Step #2: SCIT examines the data for each organizational objective relative to the safety culture attribute (Section 7.0).

When analyzing the performance data, the SCIT should review the questions that were originally asked. Does the data answer the question? How does performance compare to the goal?

Indicators should be monitored for change, including improvement or decline. If an indicator unexpectedly declines, it may mean that there is no data or information to track or analyze. This does not mean that culture has declined or that the indicator is no longer valid. However, this should prompt some evaluation into what has changed in the process that was supplying the source data and whether anything has changed in the organizational culture.

Both data sources and resulting suggestions for improvement can be tied to performance to improve buy-in and better relate to value to cost and schedule, which may be the normative basis on which SCIT members base decisions. Ensure numbers have context, including how or whether they are normalized. While comparison to industry norms is desirable, be cautious about comparing data between contractors.

Example: When monitoring a "Questioning Attitude" (Organizational Learning) indicator comprising issues raised in the Corrective Action Management system, a dramatic increase or decrease isn't necessarily caused by a culture issue. A decrease in issues should be evaluated to verify that a chilled work environment does not exist, but the organization should also explore whether alternative venues for raising issues or concerns has not experienced an influx. In other words, determine if organizational behaviors have changed, but don't assume they have deteriorated. Likewise, if there is a sudden increase in issues raised, verify whether this is because of an increase in worker population (i.e., the number of issues has increased but issues per capita is stable), if there has been a change in management focus and direction for raising issues and tracking them in the Corrective Action Management system, or if there is a challenge to a questioning attitude in the organization.

When analyzing the results of an indicator using survey or focus group information, it is important to be aware that both negative and positive safety culture indicators can be limited to individual departments or work groups. This may be due to the influence of a particular manager, line supervisor, or strong informal leader. This means that demographic information that can be collected without compromising confidentiality, is extremely important.

Example: When performing focus groups and surveys with a random sampling of the organization on the subject of "teamwork and mutual respect" (Employee/Worker Engagement), polarized results (e.g., 80% positive, 20% negative) are best interpreted via demographic information. In other words, if the 20% of dissatisfied workers are concentrated in a specific organization, this will have a different resolution than if the respondents are spread evenly throughout an organization or represent a specific demographic such as recent college graduates or late career professionals. Without demographic information, it is difficult to parse similarities between groups of respondents that provide data that are higher or lower than average.

Note: When soliciting qualitative data, it is important to bound feedback to a certain timeframe (e.g., "in the previous six months") or otherwise framed to address current culture, since negative experiences from the past may be remembered and brought up as if they represent current conditions.

Step #3: SCIT determines whether or not improvement actions or additional initiatives are needed (Section 7.0).

Based on initial monitoring, the SCIT prioritizes areas of potential behavior/culture concerns. The organization's performance indicators may indicate the need to dig deeper on a particular topic or may result in recommendations for improvement, including the type of performance indicators that should be used, how they should be selected, and the kind of actionable information they might be able to produce. (*A Guide to Safety Culture Evaluation*, EFCOG, 2015). However, to truly understand the organizational behavior that resulted in the performance change, focus group discussions need to be held with the affected groups. It is at this level of understanding where true improvement actions can be developed.

Example: It has been reported to management that certain groups are reluctant to raise issues but this is not reflected in the Corrective Action Management system (Organizational Learning: Credibility, trust and reporting errors and problems). To monitor this aspect of safety culture, an option is to determine whether employees have an aversion to raising issues, are using a different avenue to raise issues, etc., and gather any pertinent data from those other avenues that allow for the raising of issues. In other words, capturing a potential chilled "pocket" vs. registering the impact of the other avenue that was used, such as a new suggestion box installed in worker lunchrooms. The former would require a robust response from the organization to mitigate culture risks, while the latter may be addressed simply by providing additional options for soliciting employee suggestions.

Step #4: Owner/focus team provides recommended improvements with justification (Section 7.0).

After the SCIT has reviewed the input data and identified strengths and potential safety culture challenges and the recommendations from the focus groups, it is ready to formulate its recommendations. These recommendations must be directed at changing the work environment so that a positive behavior change will result in the affected organization. The focus groups should identify the expected positive behavior changes that will occur if the improvement is successful to allow later effectiveness reviews.

After the above is completed, the SCIT is ready to communicate their recommendation to the SLT. This communication can be by formal report or other means. This communication should include the scope of the inputs reviewed, specific trends observed over time, any adverse safety culture impacts identified, the organizations involved, and actions being taken to mitigate or address the impacts. The report to the SLT should include trends or potential issues that could be early indications of a safety culture challenge or strength. The panel's analysis and report should address behaviors as well as outcomes.

Step #5: Recommendations get approved and implemented (Section 8.0).

Improvement actions should be designed using organizational change management techniques and processes to improve the probability of success (see Section 8.0). The SLT and SCIT monitor progress on the improvement actions.

Step #6: SCIT monitors culture/behavior concerns to see if improvements are effective (Section 9.0).

Establish guidelines for consistency in how the data is shared, and with whom (e.g., customer and senior management down to workers). Transparency with the workforce is a best practice, especially as it pertains to the results of surveys and resulting actions.

If the analyses and assumptions about relationships between variables are correct, improvement initiatives should yield positive behavior/cultural changes that have a positive impact on performance that is reflected in the performance indicators.

Step #7: SCIT communicates results of improvement actions and their impact on culture change (Section 10.0).

Observed changes should be communicated to the SLT through regular meetings. The meetings should provide the forum at which critical, reflective conversations about safety culture take place. Prior to the meeting input material is prepared in the form of a report or slides. During the meeting collective judgements are formed about the significance of cultural implications. Specific actions, owners, and dates are assigned when practical. In the nominal process, the primary function of the SCIT is to provide the SLT with "enriched intelligence" on the health of the safety culture. This intelligence facilitates the work of the SLT and enables the SLT to judge the organizational health. Thus, the SCIT is not required to gauge the health of individual safety

culture attributes. However, if an organization finds it useful for the SCIT to "grade" every attribute, the organization may certainly do so.

8.0 SAFETY CULTURE IMPROVEMENT INITIATIVES

This section describes how to identify and execute improvement initiatives to enhance the maturity of the organization's safety culture. Through the safety culture monitoring process (Sections 6.0 & 7.0), data have been gathered that will suggest the strengths and weaknesses of the organization. After the evaluation of these data, virtually all managers ask the valid question, "so now what?" Edgar Schein's model for improving organizational culture (Schein, 2009) describes three elements to help answer that question. The remainder of this section discusses these three elements in more detail:.

Verify that adequate "run time" or "soak time" is being given to recommended actions resulting from surveys or metrics and avoid reacting too quickly ("knee jerk" actions without validation on impact to performance).

1. Determine culture strengths to build on.
2. Work on cultural areas that inhibit success.
3. Improve work environment to positively improve the culture.

There are dozens of cultural change models and methods described in business and organizational development literature. If the organization subscribes to one of these roadmaps, social scientists can help with the transformation. Behavioral scientists can help engineers and scientists understand the human aspects of proposed solutions (e.g., emotions, feelings, perceptions) and help bridge the gap between professional disciplines.

Recognize that the track record for successful culture change in American organizations is poor. John P. Kotter, noted professor at the Harvard Business School, examined why most transformation efforts fail (Kotter, 2007). He concluded that organizational change efforts failed when senior leaders made fatal errors in one or more of eight critical areas. To increase the likelihood of success, he encourages organizations to consider the following steps to transform an organization (see Figure 2).

A good starting point for developing safety culture improvement initiatives is to be familiar with the three safety culture focus areas described in Attachment 10 (i.e., Leadership; Employee/Worker engagement; and Learning Organization). The SCIT should identify initiatives to improve or sustain performance in the three focus areas. When developing a change initiative, how to evaluate the effectiveness of the initiative must be understood. Verify that the initiative was implemented as intended and had the desired effect.

Figure 2. Eight Steps to Transforming your Organization.

EIGHT STEPS TO TRANSFORMING YOUR ORGANIZATION (Reference: John P. Kotter, Harvard Business Review, January 2007)
1. Establishing a Sense of Urgency a. Examining market and competitive realities b. Identifying and discussing crises, potential crises, or major opportunities
2. Forming a Powerful Guiding Coalition a. Assembling a group with enough power to lead the change effort b. Encouraging the group to work together as a team
3. Creating a Vision a. Creating a vision to help direct the change effort b. Developing strategies for achieving that vision
4. Communicating the Vision a. Using every vehicle possible to communicate the new vision and strategies b. Teaching new behaviors by the example of the guiding coalition
5. Empowering Others to Act on the Vision a. Getting rid of obstacles to change b. Changing systems or structures that seriously undermine the vision c. Encouraging risk taking and nontraditional ideas, activities, and actions
6. Planning for and Creating Short-term Wins a. Planning for visible performance improvements b. Creating those improvements c. Recognizing and rewarding employees involved in the improvements
7. Consolidating Improvements and Producing Still More Changes a. Using increased credibility to change systems, structures , and policies that don't fit vision b. Hiring, promoting, and developing employees who can implement the vision c. Reinvigorating the process with new projects, themes, and change agents
8. Institutionalizing New Approaches a. Articulating the connections between the new behaviors and corporate success b. Developing the means to ensure leadership development and succession

8.2 Build on Strengths

It is important to recognize and reinforce strengths that have been identified through monitoring the organization's safety culture. It is often easy for management to focus on the cultural aspects needing improvement and ignore the positive aspects. However, failing to emphasize and strengthen the positive culture attributes is a missed opportunity since these attributes contributed to the success already achieved. Additionally, the organization's existing cultural strengths can

be leveraged to help overcome those culture attributes that need attention. The organization can capitalize on what it does well and encourage employee engagement by including the workforce in problem solving and owning the solutions. This process rewards positive behavior and outcomes. Successes are shared with an emphasis on employee contributions and organizational learning is promoted. Examples of ways an organization can build upon its strengths and engage employees to improve mission performance include:

- Share success stories. When a successful outcome is discovered in the organization, help all learn by sharing the success story with those throughout the organization who could benefit from the information.

- Solicit ideas and suggestions. When an employee is struggling with a task, solicit assistance from others who have achieved success with the task to maximize organization learning.

- Engage impacted workers in the solution to the problem. Hold focus groups and provide workers with the problem that needs to be solved. Workers most affected by the problem will typically determine better solutions to the issue based on their perspectives and experience. Worker engagement and ownership allows the workers to solve the problem rather than the solution being handed down by management.

- Reinforce positive safety culture behaviors. When workers are observed exhibiting positive safety culture behavior, they should be recognized by the individual who observed the positive behavior. Feedback can be provided in various ways but should be sincere, specific, immediate, and not associated with any other message. Oftentimes, a sincere "thank you" goes a long way toward reinforcing positive behavior.

- Close the loop. When an employee(s) reports a problem, consider it an opportunity for improvement. Make sure the employee receives feedback on how their comments were used to improve the performance of the organization.

When seeking to impact cultural issues that are inhibiting success, first look for solutions inside your organization. Some parts of the organization may have already solved the problem. For example, a safety culture evaluation at one research organization revealed that there was widespread dissatisfaction with the work planning system. The workforce reported that the system was cumbersome, difficult to implement, did not enhance safety, and was an impediment to conducting experiments. However, there was one exception. The workforce within one research sub-group indicated that they were very satisfied with how work planning was conducted. Senior management took a closer look into this group's work planning methods and learned that they had modified the planning system to streamline the effort and promote team participation. Senior management asked representatives from this organization to lead the effort to revamp work planning for the entire research branch of the organization. Senior leadership looked within and discovered that they already had the solution in one of their groups.

8.3 Work on Cultural Areas that Inhibit Success

The senior leadership team must understand the state of the organization's safety culture, consider the recommendations of the SCIT, and lead the organization as appropriate actions are

taken to address the cultural areas that are inhibiting success. The actions must come from the highest levels of management to demonstrate ownership and leadership. The expectation should be that the improvement actions/recommendations are opportunities to influence culture and are not expected to be a panacea that solves cultural problems instantly.

The first step is to understand the severity and extent of the weaknesses. Weaknesses that have high consequences (e.g., workforce fear of retaliation for raising safety concerns) and are pervasive should be addressed through the formal corrective actions system. These types of cultural problems have legal as well as operational implications and require a rigorous effort to ensure that effective changes are implemented. Accountability tools should be used and periodic feedback should be obtained from individuals that have action items to help them stay on track. If they are overwhelmed, determine what can be done to help them get back on track.

When developing initiatives, solicit input from the affected organizations. If feasible, the affected organization should have the opportunity to devise a response for senior leadership approval. By allowing the affected organization to develop their response, the organization may assume more ownership in solving their problems and improving the potential for success.

Be specific when applying potential solutions. If only one sub-organization is experiencing a problem, avoid forcing the solution on the entire organization. Applying a broad-brush approach when a more focused solution is necessary is often viewed unfavorably by the workforce. One size does not necessarily fit all.

Less severe or pervasive issues (e.g., faint signals) can be addressed through other means. For example, feedback from the workforce sometimes indicates that managers are not visible in the workplace and are believed to be disconnected from the reality of life on the shop floor or in the field (See Attachment 10, DOE ISM Guide, 2011). In one organization, senior leadership mandated the managers spend more time in the field and developed a reporting system to track their performance. Managers dutifully complied and logged entries into the system every month. An analysis of two years of data showed that for more than half of the entries made by managers, there was no evidence that managers actually left their desk and more than 60% of the time there was no evidence that they actually engaged (i.e., had a conversation) with any members of the workforce. Senior management had created a system to increase management time in the field but failed to provide managers with clear expectations and training on how to effectively engage with the workforce when spending time in the field. The organization should encourage the art of conversation and train, equip, and coach managers how to listen and engage the workforce in regular meaningful conversations.

8.4 Improve Work Environment

An organization's leadership must recognize the effect the work environment has on safety culture. A few examples of factors that can affect the work environment include:

- Availability of resources (e.g., people, tools, access to information, etc.)
- Reliability and usability of management systems
- Physical work location (e.g., lighting, heat, ergonomics, safety, etc.)
- Age and maintenance of facilities (e.g., timely repairs, preventive maintenance, etc.)

- Interpersonal behavior (e.g., how employees treat each other, respect, honesty, etc.)
- Support, encouragement, and recognition from leaders (e.g., reaction to reported problems, response to human error, fair performance appraisals, consistent disciplinary actions, etc.)
- Management responsiveness to improving the work environment when workers identify concerns (e.g., ignore, timeliness of response, communication/feedback, etc.)

Below are a few positive and negative examples of the potential impact the work environment can have on an organization's safety culture:

- Prioritize and fund safety improvements. It was recognized that the organization had limited funding for making safety improvements. Management allocated funding and established a cross-organizational team of first line workers to identify and prioritize a list of safety improvements. Several safety improvements were implemented including painting, building maintenance, and installing sidewalks. These improvements made a significant difference in the morale of the workers.

- Feedback for reporting a safety issue. A worker notified management that piping produced water hammer and affected water flow whenever water was used. Management followed up with the worker and indicated they appreciated the individual bringing it to their attention and they were going to determine appropriate improvement actions.

- Failure to take action on a reported safety concern. A worker reported repeatedly through the proper channels that the lighting was out in a building they work in regularly. The lighting was not repaired, which led to worker frustration and eventually resulted in a significant event since the lighting impacted the worker's ability to do their job.

- Failure to provide adequate resources. Management's expectation is that workers use knee protection when involved in tasks requiring prolonged kneeling. Workers obtain their knee protection from the tool crib. The tool crib is out of knee protection. Therefore, workers either do not use knee protection, or improvise and come up with alternate knee protection that is not as effective or may cause other safety hazards.

9.0 EVALUATING EFFECTIVENESS OF CHANGE INITIATIVES

When developing a change initiative, the method for evaluating the effectiveness of the initiative must be considered before the initiative is implemented. When management invests in safety culture initiatives, they deserve an answer to the fundamental question, "did the initiative have the desired impact?" If the answer is no, the initiative should be modified or discontinued. If the answer is yes, the initiative should be recognized as a success story. This fundamental question must be answered to help demonstrate the value of safety culture to the organization.

When evaluating the effectiveness of change initiatives, the SCIT should make evidence-based decisions on what initiatives should be continued, which should be modified, and which should be discontinued.

When developing the evaluation plan for an initiative, a graded approach should be used based on the urgency and seriousness of the problem. For example, an initiative to improve worker willingness to report safety concerns may need to be evaluated sooner rather than waiting for the next safety culture assessment or later than an eminent safety risk, such as scaffolding that lacks fall protection.

When evaluating effectiveness two things should be measured: was the initiative implemented as intended and did it have the intended results. Evaluating the "implemented as intended" simply means "did we execute the things we said we would in our initiative?" Many organizations develop terrific initiatives but then fail to implement them as intended. This requires that activities be measured and tracked so that the results can be reported.

In contrast, evaluating the intended results of the initiative involves verifying that a change in safety culture or behaviors has occurred.

- Are the workforce perceptions of safety culture improving (based on survey and focus group data)?
- Is there consistent safety performance across the organization?
- Are stakeholders satisfied with the organization's safety performance?
- Are other metrics trending in the desired direction?

Examples of data that can be used to evaluate the impact of safety culture initiatives include, but are not limited to:

- Systems, structures, and components
- Ratio of preventive and corrective maintenance
- Percentage of safety critical equipment that fails inspection/testing
- Past process safety performance
- Availability of safety systems
- Number of safety critical equipment that fail to operate as designed
- Human factors
- Sick leave
- Turnover
- Job satisfaction and work motivation scores from surveys
- Amount of procedure violations
- Root causes of events dealing with human behavior
- Past organizational safety performance
- Recurrence of incidents with similar root causes
- Backlog of corrective actions

10.0 SAFETY CULTURE COMMUNICATION

Communication should be occurring throughout the safety culture monitoring and improvement process. Communication from the SCIT is not designed to replace primary communication between management and the workforce. Communication from the SCIT should complement

primary communication channels. This section discusses communication between the SLT and the SCIT, internal organizational communication, and external communication.

Safety culture communications should provide continuity from previous messages. For example, after the results of a safety culture evaluation have been communicated, follow-up actions to address comments show that management values input from the workforce.

After appropriate consideration as to the impact, safety culture communications should be integrated into other, existing operational feedback mechanisms (e.g., contractor assurance system, causal analysis, lessons learned, and safety shares) to provide an organizational behavior component.

Communicating the results of safety culture improvement efforts help everyone embrace the safety culture initiatives and desired culture of the organization during the conduct of their day-to-day work. Communication helps engage the workforce in the safety culture monitoring process and contributes to organizational learning.

Communication should include celebrations of success as well as thoughtful communication of challenges. Over time, frequent, timely, honest, and transparent communication helps build trust and mutual respect between management, the workforce, and stakeholders. Safety culture communication should rely on both formal and informal feedback systems.

A safety culture communication plan helps provide structure so that messages achieve the intended result. It is a chance to connect management's safety culture vision for the organization and how it relates to current conditions and demonstrates management commitment to bring together the vision and conditions. The plan should be flexible and up to date with organizational culture and site conditions. A typical safety culture communication plan is framed by asking questions such as:

- What is the message?
- What is the value of the message?
- Who are the audiences?
- Who will be delivering the message?
- When will the message be delivered?
- What is the medium for delivery?

10.1 SCIT Communication

There should be a formal connection between the SCIT and SLT to facilitate communication and decision-making. The SCIT should invest the time to ensure the SLT sees the value of cultural insight so that the SLT owns/values the process and results. A key value to emphasize is avoiding complacency leading to a major event.

Clear roles must be established for both the SCIT and SLT regarding safety culture communication. At least one member should participate on both the SCIT and SLT to provide continuity and promote efficiency in communication. This person should provide the SLT with insight to into how SCIT results were formulated and answer SCIT questions related to the SLT.

The person should understand the connection between safety culture and successful mission accomplishment and be knowledgeable about how the SCIT achieves those results (i.e., understand the results and communicate the recommendations of the SCIT to improve the chance of mission success). In addition, SLT participation in SCIT activities sends a message that the SLT is committed to, and supportive of, those activities.

When communicating with the SLT and other senior managers, use the communication framework identified earlier:

- Identify the audience – How much does management know about the topic? Some managers will be very familiar with the material being covered, while others may have just basic background knowledge and need more context. What areas are particularly relevant to them?

- Message – What specific message is to be communicated to management? What are the most important points and what is the message? It is important to be direct and efficient in presenting the information; senior management has limited time and a wide range of issues demanding their attention. Stay focused on the core point(s).

- Context – Why does the information matter to management? What is the significance and context? Show how the information relates to organizational goals and historical performance. What are the influencing factors? What are the potential risks, and what opportunities are being presented?

- Quality of Information – What is the certainty of the data and conclusions? When presenting to senior management, data must be accurate and precise. How the information was gathered and what were the potential flaws or gaps? Data can be ambiguous, and any attempt to draw conclusions from incomplete or incorrect data will be challenged.

- Future Actions – When management understands the current status, where does that lead? Be prepared to discuss not only the current information, but also the recommended next steps. How will problems be addressed, and how will opportunities be exploited? When consuming management's time and attention, recognize the value of their time and tell them what they can do to help.

There are a variety of ways to present the SCIT information to senior management. Some examples include:

- Dashboards – A dashboard is a data visualization tool that displays the current status of selected metrics and key performance indicators (KPIs). Dashboards consolidate and arrange numbers, metrics, and other information on a single screen. Dashboards may be general or tailored for specific roles and can display metrics from a single point of view or from a wider perspective. Optimally, dashboards can pull real-time data to maintain a snapshot of the most current information and can be customizable to the exact needs of the customer.

- Scorecards – A performance scorecard is a graphical representation of an organization's progress toward some specified goal or goals. Both dashboards and scorecards measure performance against certain metrics and KPIs, but while a dashboard indicates the status at a specific point of time, a scorecard shows progress over time. Scorecards can be tailored to the needs of the customer and can be utilized to show trends and to identify short and long term effects of organizational changes.

- Reports – A report can provide details on the data sources evaluated during a specific period and resulting analysis that substantiate subsequent actions and initiatives. The reports can also outline planned actions for the next period.

SCIT members serve a dual communication role. The initial communication role is to communicate to senior management/leadership the results of the safety culture monitoring process. The second communication role is to provide clarity to the members' home organizations concerning the results.

10.2 Organizational Communication

Organizations may desire more or less formality and control of communication with the workforce. The tools used to communicate can vary based on the maturity of the organizational culture. Some messages may be tailored to specific sub-organizations and may not be applicable to the entire organization. Communication should provide a balance between celebrating successes and opportunities for improvement.

It is important to recognize direct interpersonal communication between management and the workforce. Routine informal conversations between managers and the workforce are an important method of communication. Management observations in the field are intended to stimulate conversation between managers and members of the workforce. Often, managers need training and coaching so they can have meaningful engagements with the workforce and to create a climate where person-to-person communication openly occurs.

It is important that senior management communicate to the entire organization any planned adjustments necessary to address safety culture areas needing improvement to enhance mission effectiveness. This communication must be structured so that all personnel understand the message. Management must clearly state an expected action, deliverable, and the intended impact of the action.

A key benefit of monitoring safety culture is to stimulate two-way communication between management and the workforce. First communicate what the monitoring is telling the organization and second, identify the specific behaviors that lead to successes and challenges.

Communication vehicles such as e-mails, posters, and newsletters should be used to ensure rapid and wide distribution of safety culture results and meaning to the organization, as well as other communication methods such as hard copies, use of multiple languages, videos, briefings, etc. If the facility has a communication organization, coordinating messaging can be done to promote efficient delivery and message cohesion. A good working relationship with the communication

organization can also keep the SCIT in the loop if other organizations start to issue competing messages.

10.3 External Communication

Stakeholders are parties that have a vested interest in the successful accomplishment of the mission. Therefore, they have an interest in safety culture because it can impact mission success. The list of stakeholders varies from organization to organization but typically includes:

- Customers
- The community surrounding the site
- Corporate entities
- Subcontractors
- Elected officials
- Other contractors and entities (share best practices)
- Regulators
- Organized labor organizations

Communication with stakeholders constitutes external communication and therefore requires a different protocol and degree of rigor. Coordination with your organization's Public Affairs Office (or equivalent) is essential. Requirements may vary depending on where you are within the DOE enterprise (e.g., National Nuclear Security Administration vs. Office of Science). External communication tends to be more formal, requiring review and release by the technical information office and authorized derivative classifiers/review officials.

Examples of how safety culture monitoring results and associated improvements are communicated to stakeholders include:

- Safety culture sustainability plans submitted to DOE
- ISMS declaration (see DOE O 450.2 paragraph 4.c.)
- Informal safety culture forums at large sites where contractors can share information with each other and with DOE representatives
- Performance Evaluation Management Plan
- EFCOG meetings
- Community safety fairs/forums

11.0 EFFECTIVENESS OF THE SCIT

In addition to striving to improve the organization's safety culture, efforts should be undertaken to continually improve the SCIT to make it more effective and to continue to add value to the organization. The first step in the improvement process is to evaluate the SCIT. Examples of process evaluation measures include, but are not limited to:

- If the SCIT planned to meet bi-weekly or monthly, did that actually occur?
- If the SCIT planned to produce monthly safety culture articles for the company newsletter, did that happen?

- Did the SCIT develop and faithfully execute their communication plan?
- Did the SCIT get the data needed to measure safety culture progress?
- Did members of the SCIT show up at the meetings?
- Did the workforce participate in surveys and focus groups at an acceptable rate?
- Was two-way communication used to discover issues requiring improvement?
- Did management/leadership commit the resources to support the SCIT?
- Did the affected organization implement with the intent to get the desired results of the improvement actions?
- Did other supporting organizations deliver the resources requested by the SCIT?

Based on the insight gained by answering the above questions, the SCIT should meet with the SLT to make the necessary modifications and to provide positive feedback on those aspects of the SCIT which are working well.

12.0 RECORDS

The SCIT may generate some records in the course of their activities. These may include:

- Meeting agendas
- Meeting minutes
- Action item lists
- Evidence of activities (e.g., copies of communication pieces)
- Progress Reports
- Annual evaluation reports
- Safety Culture Program Plans

Care should be given to determine the sensitivity of records, especially in the case of qualitative data that includes (or implies) identifiers for sources of feedback in focus groups, interviews, or surveys. Additionally, the self-identification of issues or challenges may be deemed sensitive by the SLT, and appropriate precautions should be taken to label and protect records.

These records should be maintained following quality and records management system requirements for records retention.

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14.0 CONTRIBUTORS

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Appendix A - Best Boss/Worst Boss

This interactive activity is designed to correlate observed management behaviors with the three elements of the Safety Culture Focus Areas in Attachment 10. The activity requires a large whiteboard in the classroom or a prepared activity board (see example below). It also requires one presenter/speaker and one assistant who will write on the board.

First, the presenter asks the participants to think about the very best boss that they ever had. It can be the first boss they had for their first job working at McDonalds in high school or it can be their current manager (no names). What were some of the things that made that manager your best boss ever? The class participants will suggest words or concepts that describe that boss' behaviors. Each word will be written on the board in either column, 1, 2 or 3, at the request of the presenter who will hold a key (1. Leadership; 2. Employee/Worker Engagement; 3. Organizational Learning). **Example:** "she always listened to our ideas." The presenter will quickly consult the key to determine which of the three areas the term fits in and instruct the writer where to write the word. Participants may also say, "he really encouraged us to report things, he always wanted to know what was going on and the only bad question was no question." A word or concept may fit in more than just one column.

Next, the presenter asks the participants to think about their worst boss ever. It can be the very first boss they had working at McDonalds in high school or a more recent experience including their current manager (no mention of names). What are some of the things or characteristics that made that person the very worst boss that they could have ever had. The participants throw out words or concepts that made up the worst boss. Again, each word will be written on the board in either column, 1, 2 or 3, at the request of the presenter who holds the key. **Example:** Participants say my worst boss ever was "never around, we never saw him." The presenter would direct the writer to write "never in the work area" in the bottom section of column 2 ("below the line"). They might also say, "she never got back to us with answers to any questions we asked." The presenter would ask the writer to write "no feedback" below the line in column 3.

1	**2**	**3**
Listened to our ideas **Encouraged problem reporting**	**Listened to our ideas**	**Encouraged problem reporting** **Encouraged questions**
Never in the work area		**No feedback**

When both portions of the lesson are complete, the presenter will then ask the participants how this activity relates to what we are here to study, which is safety culture. At this time, the presenter will reveal the headings that go along with columns 1, 2, and 3, and recap the relationships as follows:

1 Leadership • Demonstrated safety leadership • Risk-informed, conservative decision making • Management engagement and time in field • Staff recruitment, selection, retention, and development • Open communication and fostering an environment free from retribution • Clear expectations and accountability	**2 Employee/Worker Engagement** • Personal commitment to everyone's safety • Teamwork and mutual respect • Participation in work planning and improvement • Mindful of hazards and controls	**3 Organizational Learning** • Credibility, trust, and reporting errors and problems • Effective resolution of reported problems • Performance monitoring through multiple means • Use of operational experience • Questioning attitude
Listened to our ideas **Encouraged problem reporting**	**Listened to our ideas**	**Encouraged problem reporting** **Encouraged questions**
Never in the work area		**No feedback**

The discussion then turns to one of self-reflection for the participants. The presenter will guide this by asking the participants to write down three words/areas/concepts that they know they struggle with and need to improve upon to "seek continuous improvement" as a leader. These are three areas where they fall below the line (pointing to the bottom column on the board). The presenter can also tie this back to the "Ladder of Accountability" and other tools used in the class thus far. This discussion could look something like this: "no matter where your leader fails you, you must take accountability at your level for these three things that you have identified."

To end on a positive note, the presenter will ask them to also write down three words/areas/concepts that they are doing right and take credit for that. This also will be related back to the tools discussed in the class.

Overall, this activity is designed to get them to see the connection between behaviors as leaders and safety culture and a safety conscious work environment. It is designed to be self-reflective and to tie together the many tools taught in the course. This activity should take no longer than 30 minutes.

Appendix B - Unconscious Bias Activity

With your groups of Leaders/Managers divide into six teams.

1. Each team will be assigned a bias (you can preprint one-page handouts for each team with one of the six biases from the list below:)

   Types of Biases

   1. Affinity Bias – we feel an affinity toward that person
   2. Halo Effect – we see one great thing about a person and let the halo glow form our opinion of everything else about that person
   3. Horns Effect – we see one bad thing about a person and let the horns form our opinion of everything else about that person
   4. Similarity Bias or In Group – we naturally want to surround ourselves with people we feel are similar to us or "In our Group"
   5. Contrast Effect – comparing one individual to others
   6. Confirmation Bias – when we make a judgment about another person, we subconsciously look for evidence to back up our own opinions of that person (potentially the most dangerous in addressing employee issues)

2. Each team will discuss the particular bias as assigned and determine:

   1. What are the ways this bias manifests in our workplace?
   2. What are the dangers of this bias as it relates to addressing employee issues?
   3. What are some ideas on how we can be mindful of and combat this bias in our dealings?

3. Discuss with the whole group

A video of this presentation can be found here: https://youtu.be/kYohNw41G-w

For Questions:

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Appendix C - Potential Indicators for Monitoring Cultural Health

Rather than trying to craft the "ideal" safety culture metrics dashboard, the intent of this exercise is to identify "common" data sources to DOE Prime Contractors and discuss use in safety culture monitoring, inherent limitations, and potential enhancements. This would provide guidance for both new safety culture practitioners or organizations creating or enhancing a safety culture program. The two assumptions made by this table are:

1. None of the data listed below can be used as an indicator of a "positive" or "negative" culture by itself; all require further research and investigation for context. Even a precipitous attrition rate may be due to economic factors or aging population over organizational culture.
2. No two organizations will have the exact same "metrics dashboard" for monitoring culture, but all organizations have similar baseline data sources that can be used for safety culture monitoring to build upon.

Data	Source	Type	Use, Limitations, and Enhancements
Attrition Rate	Human Resources	Lagging	Higher than average organizational attrition is an INDCIATOR there may be a culture issue, but investigation should be undertaken to determine drivers. Likewise, low attrition may be an indicator of good culture, and investigation to validate and share good practices may be of value. Auxiliary data (exit interviews, information on internal movements from human resources information system [HRIS] data, etc.). Additional data sources external to the company should also be considered, such as www.glassdoor.com, which provides an avenue for reviews of an company by former employees.
Corrective Actions	Contractor Assurance System	Lagging / Leading	While there is no "ideal" number of issues or questions to be raised in an organization, use rates of a corrective action system can be monitored for changes as an indicator of employee behaviors. When behaviors change, investigation of potential changes to beliefs of employees should occur (focus groups, surveys, etc.) for context. **Note:** This information can be a leading indicator IF volume of issues has outstripped resources available to address the issues. This may precede a drop in use rate as employees become frustrated. Additional data from other avenues for raising issues or concerns, to monitor for ageing or use-rate changes. If ALL avenues decline in use, this can be a strong indicator of a chilled work environment.

Employee Concerns / Differing Professional Opinions (DPO)	Employee Concerns Program (ECP) / DPO	Lagging	Rate of issues taken to an ECP and/or the DPO can be monitored for change, source, rate of anonymous to confidential concerns, etc. Compare to other avenues of raising issues, such as Corrective Actions, for context if numbers change (i.e., see if they're going up or down in multiple avenues for raising issues and concerns). If a theme emerges on a particular topic or in a particular area, conduct focus groups or surveys, and/or compare to HRIS data.
Injury Rates	Industrial Safety	Lagging	Rate of injuries can be an indicator of potential positive or negative organizational culture. Data from Behavior Based Safety (BBS) or other peer-to-peer coaching programs on error precursors to potential injuries.
Lessons Learned / Operating Experience	Contractor Assurance System	Lagging	This can include rates of use (e.g., incorporation into work packages or procedures), rates of readership (feedback, comments, "click rate" if available), or rate of generation.

Ideally, an organization will continue to assess quantitative and qualitative data sources. The list below is suggested sources that may not be universal but could be the basis of additional performance indicators.

- Time to resolve issues raised (any type of issue)
- Ratio of severe to minor issues that are being raised
- Schedule slip for planned work, including "optional" activities such as self-assessments
- Ratio of strengths to deficiencies or weaknesses, or repetition of the same, identified internally or externally (often via assessments)
- Morale, culture, or other surveys or focus groups, and participation rates
- Incidents, near-misses, and error precursors
- Voluntary Protection Program (VPP) assessment results
- Peer or management observations, including discrepancy between formal rules and actual work ("organizational drift")
- Effectiveness of employee communications and indoctrination, including training and onboarding
- Analysis of common safety related findings (trends, root causes, changes, variety of corrective actions, generalizability to other components/equipment) from events and near misses
- Use of employee recognition programs, either by peers or managers