Energy Facility Contractors Group (EFCOG)
Safety Culture Task Team

White Paper

Proposed Safety Culture Measures and Monitoring

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SUMMARY

This document includes both high level recommendations for Safety Culture (as outlined in Department of Energy [DOE] Guide 450.4-1C) metrics, their uses and limitations relative to mission performance and contractor assurance, as well as examples of several monitoring strategies from the contractor community throughout the DOE complex.

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We also want to thank the many individuals who provided their general feedback and suggestions.

Proposed Metrics

There is no "perfect set" of metrics for use by all contractor facilities and laboratories. However, there are some high-level metrics that all organizations should consider, which can be used for monitoring the health of their culture. Basic metrics include:

- Attrition rates, or "are people staying or leaving?" This information is part of an organization's human resources information system (HRIS), managed by Human Resources (HR).
- Injury rates, or "are people getting injured on the job and are they willing to report their injury, no matter how minor?" This includes first aid, days away, restricted, or transferred (DART), and total recordable case (TRC) rates.
- Avenues for raising issues or concerns, or "are people asking questions or identifying problems?" This can include any established or required avenue or feedback mechanism for raising issues or concerns, including the Employee Concerns Program (ECP), Labor Relations, HR, Stop Work process, Differing Professional Opinions (DPO), or a zero-threshold corrective action management program.

All of these measures are lagging indicators, and none of them can determine if a facility has a good or bad culture. They can determine if self-reported or observed behaviors are changing (i.e., reported first aids or use of the corrective action system) over time. They can also be the basis for further enhancement such as:

- Attrition and retention rates can be compared against industry average, as well as by demographics. Is there a challenge with retaining college hires in technical fields? Is the ratio of employees in under-represented groups increasing or decreasing, in what capacity, and are they hired or promoted into job classifications appropriate for their qualifications? Is there internal movement (i.e., do employees seem to be leaving a department to work in other organizations within the company or leaving the company altogether)? Annual surveys for morale or job satisfaction can help provide more insights, as can exit interview data.
- Injury rates can be compared to either industry averages or best in class and compared to themselves over time. If these rates are higher than expected or desired, or change over time, then further investigation using techniques such as surveys, focus groups, interviews, or work observations can provide insight into the reason for improving or declining performance.
- Once multiple avenues are identified for raising issues or concerns, they can be compared against each other to determine if usage of these avenues waxes or wanes (e.g., is DPO becoming more popular as fewer people go to ECP?) or if the ratio of anonymous issues is changing. Surveys, focus groups, and interviews can be used to gather more information as to why employees might use or not use a venue or use one over another.

Note: The absence or a significant decrease in the number of issues raised does not automatically mean that there is a chilled work environment. Current events or software problems such as a

broken user interface can effectively stop issues from being raised, and it is important to determine WHY the performance indicators are showing a change in behavior.

Ultimately, the Energy Facility Contractor's Operating Group (EFCOG) Safety Culture Task Group recommends first identifying the facility's existing data set, understanding its limitations, and looking for enhancements rather than attempting to create a predetermined "perfect culture metrics set."

Proposed Monitoring Systems and Strategies

The following Examples are from prime contractors within the DOE complex.

At Example 1 site, the process for monitoring its nuclear safety and quality culture (NSQC - also referred to as safety culture), was adapted from Nuclear Energy Institute (NEI) report, NEI-09-07, *Fostering a Healthy Nuclear Safety Culture,* and from other materials and guidance documents, and has been tailored to meet the needs of the Project.

The Project Director is the sponsor for safety culture at the Project. It is the Project Director's policy that Project Management model and the workforce adopt and demonstrate the attributes of a strong safety culture. Nuclear safety and quality are a shared commitment to perform Project work with a high degree of discipline in execution that includes meticulous attention to detail in all activities from engineering to commissioning.

A healthy safety culture is achieved and sustained by embracing the principles of a safety conscious work environment (SCWE). Each member of the Project team is responsible to question safety or quality conditions that do not seem right, to raise issues or concerns appropriately, and to pursue resolution. The Project Director and the senior management team are committed to maintaining a zero-retaliation environment in which everyone is responsible for and feels free to report any concern. Senior management demonstrates their commitment to zero tolerance for retaliation by signing a Zero Tolerance for Retaliation poster which is displayed in conference rooms throughout the Project. Additionally, senior management also cascades SCWE Workshop training on a yearly basis in which behaviors that promote or discourage a SCWE are reviewed and discussed and their commitment to Zero Tolerance for Retaliation is reinforced (refer to OPEXShare – *Safety Conscious Work Environment (SCWE) Workshop Implementation Best Practice*).

At the Project, a culture-focused employee survey is distributed to Project employees every two years and safety culture assessments are also conducted at least every two years. Survey and assessment results are communicated to the workforce and action plans are developed to address the improvement opportunities that are identified. The improvement actions are maintained in a spreadsheet which is updated on a quarterly basis. The improvement actions are also reviewed by the Monitoring Panel on a periodic basis (Monitoring Panel is described below).

In between surveys and assessments, the Project has an NSQC Monitoring Panel that meets a minimum of three times per year, but typically meets on a quarterly basis to monitor the Project's safety culture. The panel comprises experienced individuals with diverse backgrounds.

Typically, panel members are chosen for their knowledge of the input and data streams to be reviewed. Additionally, the panel's membership represents an adequate cross section of the Project to support effective evaluation of safety culture. Panel members are provided an orientation by the Nuclear Safety Culture Manager. The orientation reviews the charter for the panel, the procedure governing *Implementing and Monitoring NSQC*, and NEI-09-07, *Fostering a Healthy Nuclear Safety Culture.* The chair and the Nuclear Safety Culture Manager prepare the agenda for the meeting. Panel members are assigned pre-work prior to the meeting. Specifically, panel members are requested to perform an evaluation of the safety culture attributes in DOE G 450.4-1C, *Integrated Safety Management System Guide*, Attachment 10 (i.e., rate the attributes and provide comments that justify their ratings) based on the Project's performance during the previous quarter. This pre-work is consolidated into a package and reviewed collectively by the panel. Self-critical interactive discussion by panel members occurs and a rating is agreed to for each safety culture attribute. The primary output from the meeting is an evaluation (rating of Excellent, Very Good, Good, Needs Improvement, Does Not Meet Requirements) of the Project's performance in terms of the three safety culture focus areas and fifteen safety culture attributes and any recommended actions to address weaknesses identified by the panel.

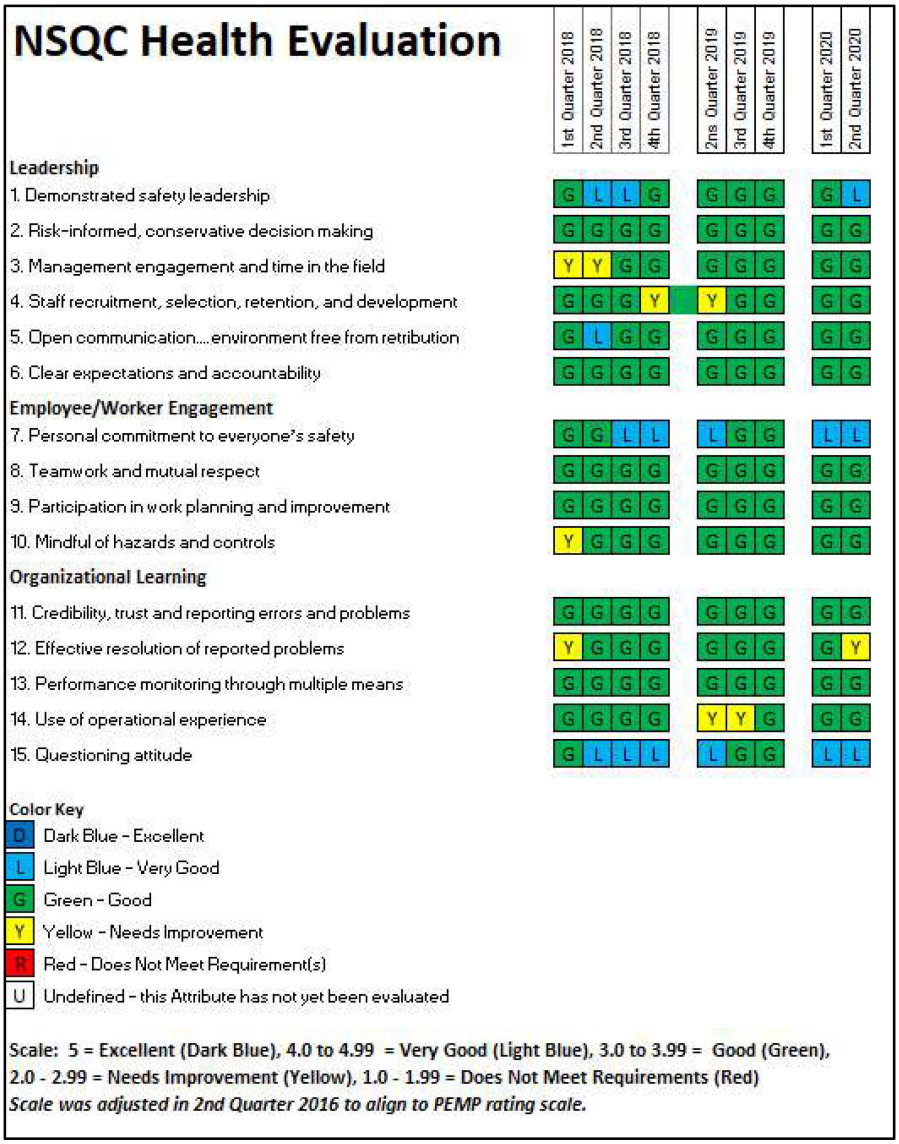
The panel's activities are documented in meeting minutes and actions are also captured and tracked. The Monitoring Panel outcomes and recommended actions are communicated to the Project Director and senior management, which provides the opportunity for senior management to provide their input and feedback.

Safety culture related metrics have also been established and are included as an input to the Monitoring Panel. The metrics used by the panel have been grouped into the safety culture focus areas of Leadership, Employee/Worker Engagement, and Organizational Learning. The specific safety culture metrics established are depicted in Figure 1 and include:

Leadership	**Employee/Worker Engagement**	**Organizational Learning**
Non-Manual Turnover	Procedure Use & Adherence	Employee Concerns
Employee Recognition	Safety Recordables	Anonymous Employee Concerns
Employee Relations	Safety less than adequate (LTA)	Assessments
Management Engagement		Lessons Learned
		Corrective Action Management
		Program Metrics

Monitoring safety culture is an ongoing process, and the Project continues to stay involved in safety culture industry working groups and activities to stay abreast of enhancements in safety culture monitoring and continuously improve its safety culture monitoring activities.

Figure 1
Example 1 Site
Nuclear Safety and Quality Culture Dashboard



Note: Data is not representative of actual data. Example only.

At Example 2 site, the goal of the Performance Analysis (PA) Process is to monitor project performance, with the goal of identifying potential weaknesses or recurring issues and events in order to manage risk and prevent more serious or significant occurrences. As part of the Contractor Assurance Program, performance analysis is used to analyze, correlate, and evaluate data to identify improvements, areas of potential future problems, and recurring problems. The performance analysis process directs the gathering and critical evaluation of functional areas' indices, metrics, and data both qualitative and quantitative to deliver a health grade for program performance and reliability (see Figure 2). The Performance Analysis Report (PAR), issued quarterly, discusses the status of key contractor assurance indicators such as:

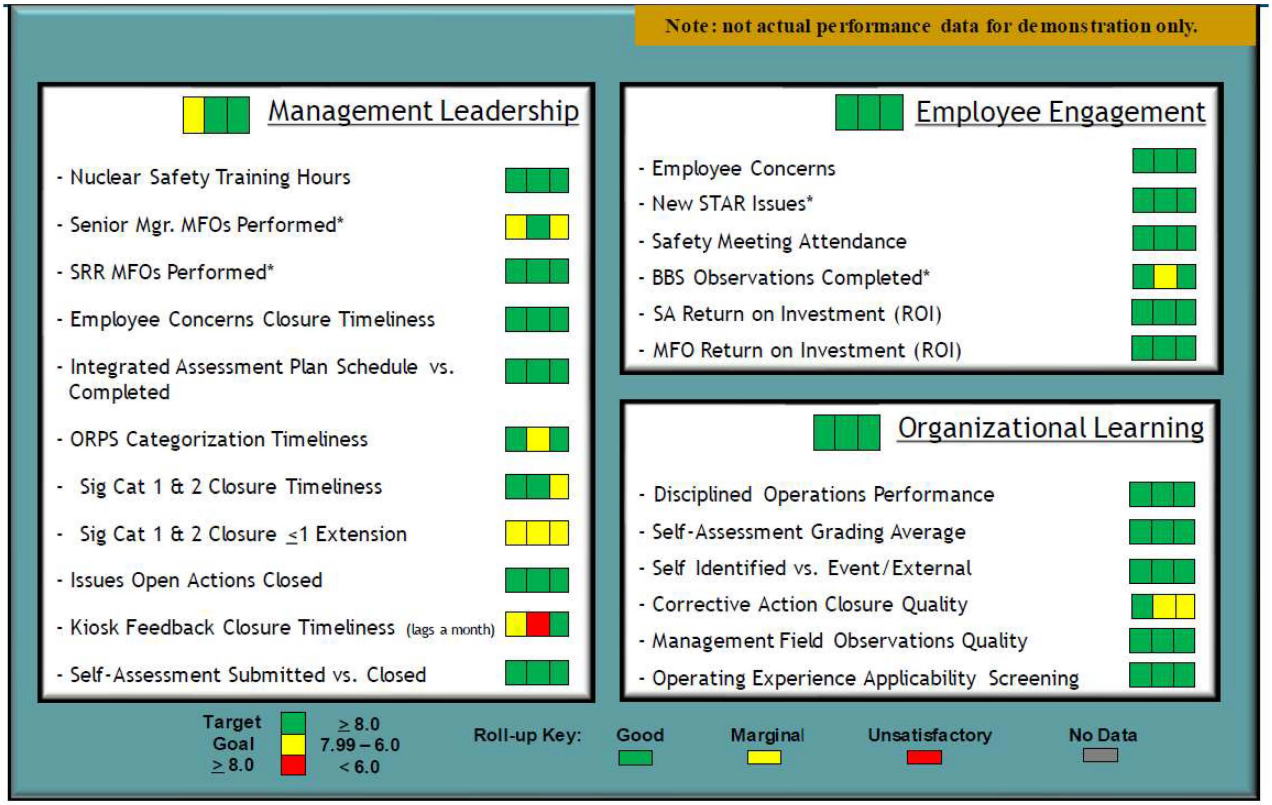
- Functional Area Health Dashboard,
- Contractor Assurance System Dashboard,
- Nuclear Safety Culture Dashboard, and

- Performance Objectives, Measures, and Commitments.

These quarterly Performance Analysis information and improvement areas are reviewed by Project middle management members of the Performance Analysis Advisory Group (PAAG) and endorsed by the Project executive team through the Executive Safety and Quality Board (ESQB) prior to being transmitted to the local DOE office. Indicator trends are discussed routinely with senior management during PAAG and ESQB reviews. To monitor the health of safety culture, the Project has established a set of 23 leading and lagging indicators, which are also reviewed on a quarterly basis by the members of the PAAG who also function as members of the Nuclear Safety Culture Monitoring Panel (NSCMP). Endorsement or additional recommendations from the NSCMP is then presented to the executive team through the ESQB. Data from these reviews is used by senior management to monitor safety culture performance.

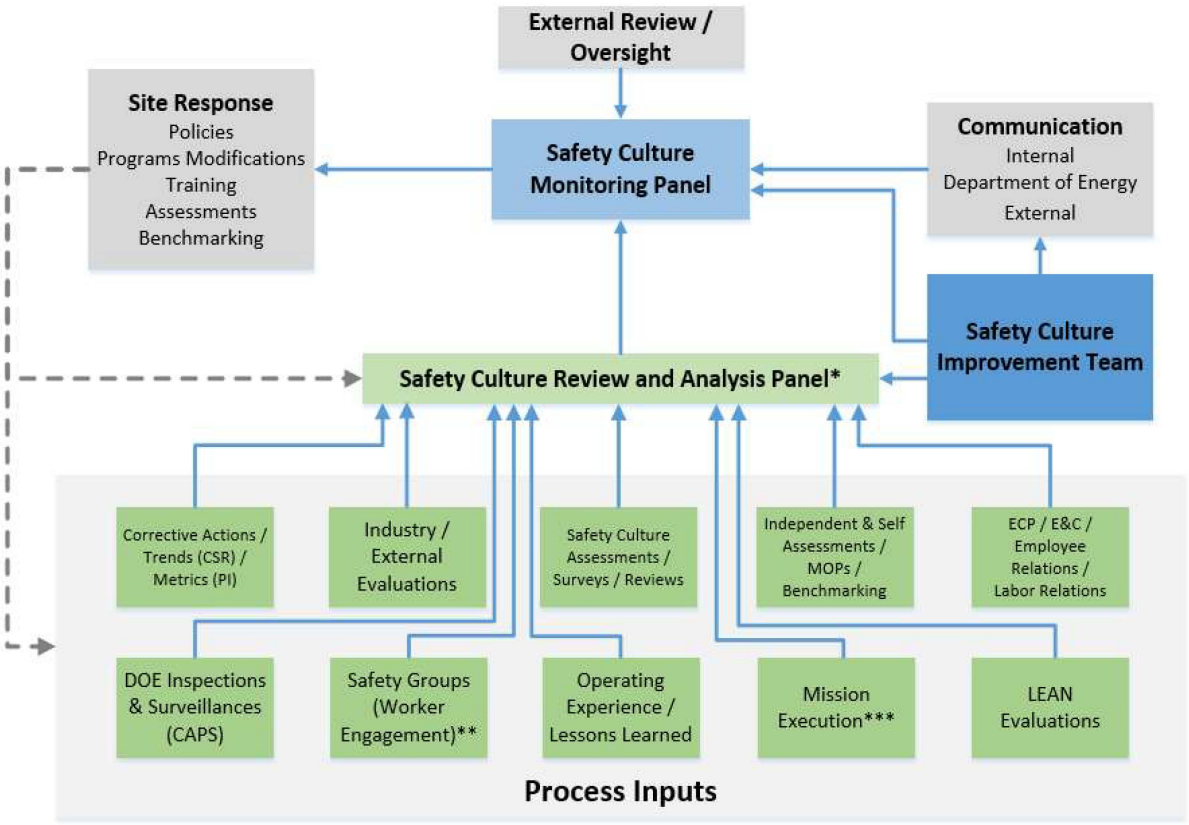
Performance Trending typically includes statistical trending processes, and cognitive trending, and is a function that benefits both prevention and detection of problems. Performance Measures and Indicators include periodic reporting of performance data and associated measures including both lagging and leading indicators.

Figure 2
Example 2 Site
Nuclear Safety Culture Dashboard



At Example 3 site, the Safety Culture Sustainment Plan (a standing procedure), delineates the process by which Safety Culture working groups accept and evaluate both qualitative and quantitative data sources (see Figure 3). This includes, but is not limited to, the monthly performance indicators (PIs), internal and external assessment results, trending, and other data. This process is adapted from the NEI 09-07 model and is intended to be a holistic look at the state of the culture.

Figure 3
Example 3 Site
Adapted Monitoring Model



Standing inputs include the Contractor Assurance Systems (CAS), including issues management, trending, PIs, etc.; avenues for raising concerns including Employee Concerns and Labor Relations; and other organizations and programs determined to have information or processes that are related to or support the safety culture. The process for evaluating information from these sources is:

1. Data is made available for evaluation by the Safety Culture Review and Analysis Panel (SCRAP) on a semi-annual or as-needed basis. This includes cognitive trending by process input representatives or subject matter experts (SMEs).
2. The SCRAP reviews the inputs, requests additional information as needed, and develops recommendations.

3. Recommended actions are presented to the Safety Culture Monitoring Panel (SCMP) for approval. These may be bound by fiscal year (FY) or be multi-year efforts.
4. Actions are tracked to completion.
5. The process repeats to assess efficacy.

Note: High level information, especially the results of external assessments or reviews, are also provided to the Safety Culture Improvement Team (SCIT), who may also develop recommendations and take action. Examples include development of communications for the workforce. Beyond inputs provided by the organizations and programs outlined in the Monitoring Process, there are several measure maintained by the Safety Culture program:

- Safety Culture Evaluations (periodic external review).
- Trending analysis based on a crosswalk of trend codes to Safety Culture focus areas and attributes (included in Quarterly Trend Report).
- Metrics dashboard (currently retired).
- Annual self-assessment (standing lines of inquiry (LOIs) as part of the Integrated Safety Management System (ISMS) Safety Management Program (SMP) assessment).
- Other data sources are continually under consideration.

Further reading

- The 2017 Guide to Monitoring and Improving Safety includes more guidance on metrics. Please see Section 6.0 and Appendix C for more information.
- EFCOG periodically discusses performance metrics. For further information, refer to the EFCOG website at: https://efcog.org/