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	Safety Culture Assessment Criteria and Review Approach Document	
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1.0 PURPOSE

The mission of the U.S. Department of Energy (DOE) Office of Environment, Safety and Health Assessments (EA-30) is to assess the effectiveness of safety and emergency management systems and practices used by line and contractor organizations and to provide clear, concise, rigorous, and independent evaluation reports of performance in protecting workers, the public, and the environment from the hazards associated with DOE activities.

This criteria and review approach document (CRAD) addresses (1) the general independent oversight requirements and responsibilities specified in DOE Order 227.1A, *Independent Oversight Program*, and the specific responsibility to conduct independent oversight and appraisals of high consequence activities specified in DOE Order 226.1B, *Implementation of Department of Energy Oversight Policy*, (2) a recommendation from the General Accounting Office (GAO-16-618 Department of Energy: Whistleblower Protections Need Strengthening) to "develop and implement an independent evaluation process for routinely and accurately measuring contractor employees' willingness to raise safety and other concerns without fear of retaliation", and (3) the EA safety culture independent assessment strategy to:

- Monitor and evaluate DOE contractor safety culture self-assessments and employee survey methodologies.
- Perform in-depth safety culture assessments of select DOE and contractor organizations, as circumstances require.
- Perform limited scope safety culture assessments as part of technical oversight assessments.

The CRADs are available to DOE line and contractor assessment personnel to aid them in performing effective DOE oversight and contractor self-assessments. The current revisions of EA's CRADs are available at http://www.energy.gov/ea/criteria-and-review-approach-documents.

2.0 APPLICABILITY

The following CRAD is approved for use by the Office of Environment, Safety & Health Assessments (EA-30).

3.0 FEEDBACK

Comments and suggestions for improvements on this CRAD can be directed to the Director, Office of Environment, Safety and Health Assessments.

4.0 CRITERIA AND REVIEW APPROACH

Detailed guidance for DOE oversight of safety culture is provided in section 4.1.7 of DOE G 226.1-2A *Federal Line Management Oversight of Department of Energy Nuclear Facilitie*s. The guidance notes that "Traditional assessments focus on technical and process issues using established regulations, codes, standards, and quality assessment tools. In contrast, safety culture assessments are characterized by a focus on human and organizational issues, using general agreement of the results of multiple methods to validate those results, and an emphasis on the influence of perceptions on safety performance…DOE recognizes that various models may be used to assess safety culture. However, all models should be determined to be appropriate for the organization under review and used by individuals who have received training on the use of the model."

EA PROTOCOL EA-30-01 Revision 4, *Office of Environment, Safety and Heath Assessments Protocol for the Development and Maintenance of Criteria and Review Approach Documents*, states that CRADs "are used to establish the depth and detail of an assessment and to provide clarity and consistent guidance to the assessment team, as well as to the organization being assessed," and it is in this sense of clarity and consistency that this CRAD should be understood.

In alignment with DOE G 226.1-2A EA assessments addressing Safety Culture will evaluate perceptions about the effectiveness of organizational factors to support safe mission accomplishment. EA will also evaluate effectiveness in sustaining organizational safety culture consistent with DOE P 450.4A, *Integrated Safety Management Policy,* that "…expects all organizations to embrace a strong safety culture where safe performance of work and involvement of workers in all aspects of work performance are core values of managers and workers. The Department encourages a questioning attitude by all employees and a work environment that fosters such attitude."

The guidance in this CRAD is intended to enable assessors to examine consistencies in attitudes and behaviors indicative of safety culture. Such attitudes and behaviors are identified in Attachment 10 to DOE G 450.4-1C, Integrated *Safety Management System Guide*, as "focus areas and associated attributes" (FAs). These were used as reference criteria for this CRAD. The Objectives and Criteria are intended to serve as stand-alone sections to be used in any combination based on the need of the specific appraisal; the criteria may be similarly tailored. An assessment plan will be developed for each such appraisal, or safety culture criteria may be included in plans for assessment in which aspects of safety culture are deemed to be

helpful supplements to the main topic of inquiry. While writing this CRAD, EA consolidated and amplified attributes from guidance contained in DOE G 450.4-1C.

DOE G 226.1-2A states that DOE oversight elements should use an analytical framework that includes key organizational behaviors to characterize the organization's safety culture. Validated question sets for each factor have been developed for use by assessors to elicit perceptions about the effectiveness of these factors in supporting safe work performance. Data obtained from examining these factors can be correlated to the FAs or other similar models that have been adopted by the assessed organizations for use in describing their safety cultures.

OBJECTIVES

SC.1: Leaders demonstrate safety leadership; conservative decision making; management engagement in the field; effective staff recruitment, selection, retention, and development; open communication and fostering an environment free from retribution; and clear expectations and accountability. (DOE G 450.4-1C, Attachment 10)

Criteria:

1. Managers and line supervisors exhibit commitment to the vision, mission, values and success of the organization and people.
2. Managers, supervisors, and employees demonstrate risk-informed, decision making.
3. Line managers demonstrate their commitment to safety through their actions and behaviors.
4. Line managers demonstrate active engagement with employees involved in work activities.
5. The organization maintains an effective staffing complement to ensure redundancy in essential skills and knowledge as well as the capability to respond in a timely matter to unexpected changes or emergencies.
6. The organization openly and promptly reports errors and incidents.
7. Leaders establish a Safety Conscious Work Environment (SCWE) where employees are not only able but willing to identify and report safety and performance issues through established means without fear of reprisal.
8. Personnel at all organizational levels hold themselves and each other accountable for standards and expectations.
9. Leaders use a systematic process for planning, communicating, and implementing change that engages employees in the change processes.
10. Leaders seek to build resilient organizations, developing the capacities and abilities to adapt based on collective knowledge guided by mitigation of harm.

Lines of inquiry[1] for the criteria are shown in the table below:

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[1] As with Objectives and Criteria, Lines of Inquiry are of a different nature from LOI's in technical assessments that are used to determine compliance. LOIs to support safety culture reviews are framed as central concepts to be considered for what is important about the given attribute, a prompt for inquiry-based learning.

In contrast, the Functional Assessment method employed to plan safety culture assessments involves review of documents for which specific information may be derived to tailor the focus of other methods such as interviews and observations. Examples of questions will be included in EA Desktop Aids to support planning. Interviews will be conducted by tailored Protocols using validated question sets as probes to seek perceptions about organizational factors.

Criterion	Lines of Inquiry[2]
1	• How are organizational production and safety goals balanced to demonstrate commitments consistent with highly reliable organizations? • How do employees understand their work activities to conduct work safely, and how do they remain aware of external influences that may result in changes that could result in safety concerns?
2	• How does decision making reflect a conservative bias focused on proving that work activities are safe before proceeding, rather than proving them unsafe before halting? • Do supervisors or employees tolerate conditions or behaviors that have the potential to reduce operating or design margins?
3	• Does 'safety' holistically include worker safety, technical systems safety, environmental safety, and security, consistent with the ISM principal of Balanced Priorities? • How do leaders' actions and behaviors establish a work environment where the desired safety culture attributes can thrive?
4	• How do supervisors and senior management demonstrate visible leadership by placing eyes on the work, asking questions, coaching, mentoring, reinforcing standards and positive behaviors, and verifying that expectations are met? • What is the process employees use to pause work when procedures developed to protect safety are uncertain? Does management support these decisions?
5	• How does the organization develop and sustain a flexible, resilient, robust technical and support staff sufficient to ensure redundancy in essential skills and knowledge as well as the capability to respond in a timely manner to unexpected changes or emergencies?
6	• How do managers and supervisors recognize errors as mismatches of human, organizational and/or technical factors? • Are employees confident that reporting errors or incidents will be acknowledged with receptivity and gratitude by the organization and fellow employees?
7	• How do line managers promptly and effectively acknowledge and respond to employee concerns, take action to resolve those concerns and evaluate suggestions brought to their attention? • How do leaders proactively seek to identify any instances of inattention to employee concerns, retaliation for reporting, or situations that could be perceived as retaliation, and take remedial action? • How do leaders, through their words and actions, continuously affirm the organizational commitment to an environment of psychological safety in which all employees are respected and encouraged to engage in work that is professionally and personally rewarding?

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[2] An inquiry question is an invitation to think and take action, not to simply recall, summarize, or detail facts (source: Practical Guide to Inquiry Based Learning, Oxford University, 2013):
- comes from genuine curiosity and confusion about the world
- makes you think about something in a way you never considered before
- invites both deep thinking and deep feelings
- leads to more good questions
- asks you to think critically, creatively, ethically, productively, and reflectively about essential ideas in a discipline

8	• How do managers and supervisors recognize excellent performance as well as identify less-than-adequate performance?
9	• How do managers and supervisors communicate the rationale for system or work process changes and assess the impact of the change on safety and performance before, during, and after the change? • What level of change management strategies does management employ to engage employees to fully enact necessary changes?
10	• How do organizations employ a variety of forecasting techniques in their contractor assurance programs (such as horizon scanning, cognitive analysis, strategic scenarios) to prepare for unanalyzed, unexpected events that could impede safe mission accomplishment?

SC.2: Employees demonstrate active engagement through personal commitment to everyone's safety; teamwork and mutual respect; participation in work planning and improvement; and mindfulness of hazards and controls. (DOE G 450.4-1C, Attachment 10)

Criteria:

1. Roles and responsibilities, authorities and accountabilities are clearly defined in writing and are understood and demonstrated by each individual.
2. The organization knows the expertise of its personnel and supports employees to continuously refine and update their expertise.
3. Individuals at all levels of the organization listen respectfully to each other and effectively engage in crucial conversations to ensure meaning, intent and viewpoints are understood, and to ensure differing points of view are acknowledged.
4. Individual employees, subject matter experts and cognizant managers are actively involved in identifying and planning work and improving work practices.
5. Individuals and teams follow approved work practices and procedures, maintain a questioning attitude, and stop work as necessary when unforeseen circumstances arise; subsequent adaptations are in accordance with training and established management systems with safety as the paramount priority.
6. Throughout the processes of work planning and performance, work designers and performers identify and control hazards to prevent or mitigate accidents with particular attention to events with unacceptable consequences.

Lines of inquiry for the criteria are shown in the table below:

Criterion	Lines of Inquiry
1	• What level of understanding exists within the workforce as to their responsibility and authority for safety in planning and performing safe work? • How do individuals outside of the organization (including subcontractors, temporary employees, visiting researchers, vendor representatives, etc.) understand their responsibilities to perform work safely and adhere to the guidance or requirements of their host/client organizations?
2	• Do employees feel that line managers defer to qualified individuals with relevant expertise during operational upset conditions when pre-analyzed procedures may not exist? Provide specific examples.

	• How are qualified and capable people closest to operational upsets empowered to make important decisions, and how are they supported in decisions that prioritize safety over production in coping with upset conditions?
3	• Do employees feel that their supervisors foster constructive relationships through shared goals, shared knowledge, mutual respect, and continuous communication by emphasizing coordination across roles, disciplines, and organizational units?
4	• Do employees feel that design, analysis, continuous improvement, and effective change management of work practices are valued as core organizational competencies? • How is expertise in these competencies evaluated and rewarded?
5	• Are individuals mindful of the potential impact of equipment and process failures on their personal safety, that of their co-workers, and of the systems used to support the organization mission? • How do individuals demonstrate constructive skepticism of simple cause/effect scenarios and are they sensitive to the potential of faulty assumptions and errors? • In instances of high uncertainty or unprecedented situations, how do individuals and teams enlist support of experts within the organization before proceeding?
6	• When discussions of issues occur, do they focus on collaborative problem solving rather than on hierarchy or culpability? • Do individuals appreciate that mindfulness of systemic influences and unforeseen interconnections require personal effort and a continuous questioning attitude?

SC.3: Organizations demonstrate active learning through open reporting errors and problems, effective resolution of reported problems, performance monitoring through multiple means, use of operational experience and questioning attitudes. (DOE G 450.4-1C, Attachment 10)

Criteria:

1. Credibility and trust are achieved and sustained by shared learning to enable safe, successful mission accomplishment.
2. The organization ensures requisite knowledge, skills and abilities through hiring, retention, training, and development opportunities.
3. Organizations share feedback information to facilitate operational awareness and construction/revision of shared mental models.
4. Vigorous corrective and improvement action programs are established and effectively implemented.
5. Results from performance assurance activities are effectively integrated into the performance improvement processes.
6. Learning from work performance is ongoing.
7. Line managers maintain awareness of meaningful performance indicators related to safe work accomplishment, watch carefully for adverse trends or indications, and take prompt action to understand adverse trends and anomalies.
8. A SCWE combined with training, coaching, mentoring, and peer observations support individuals in developing a questioning attitude.
9. The organization ensures the workplace is psychologically safe, so that questions are supported and valued, and individuals do not fear embarrassment, ridicule, or punishment from their peers if they raise a concern or ask a question.

Lines of inquiry for the criteria are shown in the table below:

Criteria	Lines of Inquiry
1	• How are credibility and trust valued as foundational to safe performance of work? • How do managers, supervisors, and employees share information such that it is accurate, relevant, and timely?
2	• How does the organization ensure requisite knowledge, skills and abilities are retained through hiring, retention, training, and development opportunities?
3	• What knowledge management methods and supporting technology are used to collect, preserve, and transfer the history, knowledge, and experience of the workforce? Is the process comprehensive, inclusive, and effective?
4	• Are vigorous corrective and improvement action programs established and effectively implemented providing transparency and traceability of all corrective actions? • How do corrective action programs effectively prioritize issues, enabling rapid response to imminent problems while closing minor issues in a timely manner to prevent them from escalating into major issues? • How does performance assurance encompass all employees and managers, from peer checks to progressive levels of formal assurance, is it robust and frequent, and does it include independent oversight by parent organizations or other external entities?
5	• Do employees feel that managers and supervisors are responsive to value-added employee feedback and subsequently recognize those contributors thus reinforcing learning and trust? • How are results from performance assurance activities effectively integrated into the performance improvement process and do they receive adequate and timely attention? • How are linkages with other performance monitoring inputs examined, are high-quality causal analyses conducted as needed, and are corrective actions tracked to closure with effectiveness verified to prevent future occurrences?
6	• How does the learning environment support balancing the needs of compliance with the exploratory nature of questioning, hypothesis testing, and formulating new insights which are essential to learning? • How does work planning and pre-job preparation include review of past performance, and is it effective and value-added in the eyes of the employees? • Do work processes include use of human performance tools, and are they effectively used by the employees? • How promptly are post-job reviews or incident reviews conducted to assure data quality and to identify improvement opportunities?
7	• How does management employ processes and special expertise to monitor organizational drift using qualitative and quantitative techniques that examine data from multiple perspectives? • How does the organization actively and systematically monitor performance through multiple means, including leader walkarounds, issue reporting, performance indicators, trend analysis, benchmarking, industry experience reviews, self-assessments, peer reviews, and performance assessments? • How is safety culture identified as a cross-cutting performance area, and is it actively and formally monitored and assessed on a periodic basis?

8	• How does the organization promote shared learning from behaviors exhibited by leaders and peers through coaching and mentoring as well as through experience that processes and technology provide? • How do line managers encourage a vigorous questioning attitude toward performance of safe work and foster constructive dialogue and conversation on safety matters? Do employees see value in this? • How do individuals question deviations and use peer reflective interactions to avoid complacency or arrogance based on past successes?
9	• How does workforce development balance attention to the interpersonal skills such as leadership, teamwork, communication, and conflict resolution with attention to technical and administrative subject matter knowledge and expertise? • How do team members support one another through awareness of each other's actions and constructive feedback?

REVIEW APPROACH (tailored to the scope of the specific assessment):

When analyzing the gathered information, assessors should compare results from multiple methods (at least two methods should be used, e.g., record review and meeting observations). Data gathered with each method are analyzed individually identifying positive and negative trends, as well as outliers, segmenting by organizational factors and population demographics. Results of the individual method analyses then are compared similarly.

Record Review
- Organization Charts (detailed with names of managers and supervisors and the numbers of employees in each organizational element)
- Roles and responsibilities of functional organizations and key individuals and any documents related to information flow and planning and operational decision-making processes
- Key planning and operational decision-making policies and procedures
- Historical operational and maintenance performance data to include performance indicators (operational and safety) and improvement initiatives
- Causal analysis/event investigations of significant organizational events
- Contractor Assurance System analysis meeting minutes, critiques, learning reviews, post job review documents relevant to disciplined operations concern
- External inspection, evaluation and peer review results, associated corrective actions and measures of effectiveness
- Safety Culture Sustainment Plans and revisions since development of the original plan developed in response to DFNSB 2011-1
- Improvement initiative status reports
- List of organizational safety culture related meetings that may occur during the assessment
- Contractor management safety culture improvement panels (or similar teams) meeting records, decision records, and project plans
- Contractor safety culture and safety conscious work environment self-assessments
- Contractor-commissioned independent safety culture assessments
- Other documents that the organization thinks may be of interest
- Contractual commitments or incentives related to safety culture – scope, milestones, and performance metrics

- Safety culture Roles and Responsibilities assignments
- Records (with redactions for privacy protection) of employee concerns and Differing Professional Opinions (DPOs)
- Procedures – lessons learned, employee concerns, DPO, issues management, and similar topics
- Past Voluntary Protection Program self-assessments/evaluations
- Board of Directors safety culture related charters, policies, or review reports
- Safety culture related training records and lesson plans/syllabi

Interviews:
- Senior and mid-level Management
- Supervisors
- Foreman
- Employees/workers
- Employee Concerns official
- Differing Professional Opinion program manager
- Issues management coordinators and review board
- Safety culture specialists
- Focus groups
  - Groups of employees with similar experiences (e.g., night shift crew, employees in a particular laboratory, radiation control technicians)
  - Union representatives, if applicable
  - First-line supervisors
  - New employees
  - Employees with more than 30 years of experience

Observations:
- Project meetings
- Corrective action planning meetings
- Pre-job/post-job briefings (consider work evolutions as appropriate)
- "Toolbox Talks", "Tailgates", and other meetings for sharing lessons learned