U.S. NUCLEAR REGULATORY COMMISSION
Safety Culture Oversight

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The NRC recognizes that it is important for all organizations performing or overseeing regulated activities to establish and maintain a positive safety culture commensurate with the safety and security significance of their activities and the nature and complexity of their organizations and functions. The NRC's approach to safety culture is based on the premise that licensees bear the primary responsibility for safety. The NRC provides oversight of safety culture through expectations detailed in policy statements, safety culture assessor training for NRC inspectors, the oversight processes, and the Allegations and Enforcement Programs.

1. INTRODUCTION

Beginning in 1989, the NRC published three policy statements about safety culture at nuclear power plants. One described the Commission's expectations for the conduct of operations in control rooms; the second established the Commission's expectation for maintaining a safety-conscious work environment (SCWE), in which workers are able to raise nuclear safety concerns without fear of retaliation. In 2011, the NRC published a Safety Culture Policy Statement (SCPS) to establish the Commission's expectations for licensees to maintain a strong safety culture. The SCPS has informed the NRC's oversight process through the common language initiative.

The NRC provides training to inspectors to become qualified as Safety Culture Assessors for general safety culture assessments or IP 95003 inspections. This qualification requires a firm understanding of both safety culture and inspection skills, and is an essential part of the NRC's oversight of safety culture.

The Reactor Oversight Process (ROP) is the NRC's program for assessing the performance of operating commercial nuclear power reactors. In 2004, the NRC took steps within the ROP to strengthen the agency's ability to detect potential safety culture weaknesses during inspections and performance assessments. In 2006, guidance and procedures for inspecting and assessing aspects of licensees' safety

culture were included in the ROP. In 2014, revisions were made to the ROP based on the common language initiative. The Construction Oversight Process (cROP) was modeled after the ROP.

In addition to the oversight processes, the NRC's Allegation and Enforcement Programs address safety culture through the use of Chilling Effect Letters (CEL) and Confirmatory Orders (CO). CELs are issued when the NRC has concluded that the work environment is "chilled," (i.e., workers perceive that the licensee is suppressing or discouraging the raising of safety concerns or is not addressing such concerns when they are raised). The number and nature of allegations received at the NRC, including allegations related to discrimination for raising safety related concerns help inform the NRC's decision to send a CEL. COs are issued by the NRC to document agreements on specific corrective actions made by the licensee in response to inspection findings.

The information referenced below, including the SCPS, Inspection Manual Chapters (IMC), Inspection Procedures (IP), and NUREGs, can be found in the NRC's Agency-wide Documents Access & Management System (ADAMS), or at specific websites noted within the sections below.

2.   SAFETY CULTURE POLICY STATEMENT

The SCPS sets forth the Commission's expectation that individuals and organizations establish and maintain a positive safety culture commensurate with the safety and security significance of their activities and the nature and complexity of their organizations and functions. The SCPS is not a regulation. It applies to all licensees, certificate holders, permit holders, authorization holders, holders of quality assurance program approvals, vendors and suppliers of safety-related components, and applicants for a license, certificate, permit, authorization, or quality assurance program approval, subject to NRC authority. In addition, the Commission encourages the Agreement States (States that assume regulatory authority over their own use of certain nuclear materials), their licensees, and other organizations interested in nuclear safety to support the development and maintenance of a positive safety culture within their regulated communities. More information on the Agreement States can be found on the NRC's Web page [1].

The SCPS addresses both safety and security. Organizations should ensure that personnel in the safety and security sectors have an appreciation for the importance of each, emphasizing the need for integration and balance to achieve both safety and security in their activities. Safety and security activities are closely intertwined. While many safety and security activities complement each other, there may be instances in which safety and security interests create competing goals. It is important that consideration of these activities be integrated so as not to diminish or adversely affect either; thus, mechanisms should be established to identify and resolve these differences. A safety culture that accomplishes this would include all nuclear safety and security issues associated with NRC regulated activities.

The SCPS defines nuclear safety culture as the core values and behavior resulting from a collective commitment by leaders and individuals to emphasize safety over competing goals to ensure protection of people and the environment.

The SCPS includes a list of nine traits further defining a positive safety culture. These traits describe patterns of thinking, feeling, and behaving that emphasize safety, particularly in goal conflict situations, such as when safety goals conflict with production, schedule or cost goals. The traits listed Fig. 1 below are not all-inclusive. Some organizations may find that one or more of the traits are particularly relevant to their activities. There may also be traits not included in the SCPS that are important in a positive safety culture. More information on the SCPS can be found on the NRC's Web page [2].

Leadership Safety Values and Actions	Problem Identification and Resolution	Personal Accountability
Leaders demonstrate a commitment to safety in their decisions and behaviors.	Issues potentially impacting safety are promptly identified, fully evaluated, and promptly addressed and corrected commensurate with their significance.	All individuals take personal responsibility for safety.
Work Processes	Continuous Learning	Environment for Raising Concerns
The process of planning and controlling work activities is implemented so that safety is maintained.	Opportunities to learn about ways to ensure safety are sought out and implemented.	A safety conscious work environment is maintained where personnel feel free to raise safety concerns without fear of retaliation, intimidation, harassment or discrimination.
Effective Safety Communications	Respectful Work Environment	Questioning Attitude
Communications maintain a focus on safety.	Trust and respect permeate the organization.	Individuals avoid complacency and continually challenge existing conditions and activities in order to identify discrepancies that might result in error or inappropriate action.

FIG. 1. Safety culture traits and definitions.

3.   SAFETY CULTURE COMMON LANGUAGE

Before work began on the 2011 SCPS, the nuclear power industry approached the NRC about starting an effort to develop a shared set of terms to describe safety culture. With insights gained during the development of the SCPS, the Office of Nuclear Reactor Regulation (NRR), along with Institute of Nuclear Power Operations (INPO) and Nuclear Energy Institute (NEI), hosted a series of public workshops beginning in December 2011 to discuss the idea of a safety culture common language. The intent of this initiative, as requested by the industry, was to align terminology between the NRC's inspection and assessment processes within the ROP and the industry's assessment process. This initiative was within the Commission-directed framework for enhancing the ROP treatment of crosscutting areas to more fully address safety culture.

NUREG-2165, "Safety Culture Common Language," documents the outcomes of the public workshops to develop a common language to describe safety culture in the nuclear industry. These workshops included panelists from the NRC, the nuclear power industry, and the public. NUREG-2165 outlines a suggested common language for classifying and grouping traits and attributes of a healthy nuclear safety culture. The results of the common language initiative were 10 traits of a healthy safety culture (the nine traits from the SPCS plus a 10th trait, decision-making), 40 aspects nested under those traits, and numerous examples for each aspect. These common language traits and aspects have been incorporated under the three cross-cutting areas of the ROP. NUREG-2165 can be found on the NRC's Web page [3].

4.   SAFETY CULTURE ASSESSOR TRAINING

Qualification as a Safety Culture Assessor requires the completion of a variety of activities, each of which is designed to help gather information or practice a skill that may be important during inspections. When qualified, the Assessor will have demonstrated the following competencies:

- Understand the legal basis for and the regulatory processes used to achieve the NRC's regulatory objectives.
- Master the techniques and skills needed to collect, analyze, and integrate information using a safety culture focus to develop a supportable regulatory conclusion.
- Demonstrate the personal and interpersonal skills needed to carry out assigned regulatory activities, either individually or as part of a team.

All inspectors are required to complete an inspector qualification interview to evaluate how well an individual can integrate and apply inspector competencies to field situations. Additional information on IMC 1245, Appendix C-12, "Safety

Culture Assessor Training and Qualification Journal" can be found on the NRC's Web page [4].

5.   OVERSIGHT PROCESSES

Reactor Oversight Process (ROP): The NRC's approach to safety culture is based on the premise that licensees bear the primary responsibility for safety. The ROP is the NRC's program for assessing the performance of operating commercial nuclear power reactors. The ROP uses inputs from performance indicators and inspection findings to develop conclusions about a licensee's safety performance. Performance is evaluated systematically and on a continuous basis through planned inspections, and mid-year and end of year assessment meetings.

The ROP stems from the NRC's mission to three strategic performance areas, and seven cornerstones, as in Fig. 2 below. Each cornerstone has corresponding performance indicators and inspection procedures to assess licensee performance. Safety culture is considered within three cross-cutting areas of Human Performance, Safety Conscious Work Environment, and Problem Identification and Evaluation.
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FIG. 2. Reactor oversight framework
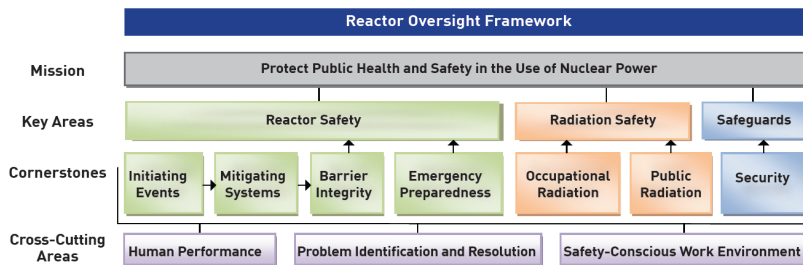
Based on the NRC's assessment of safety performance, licensees are assigned to a column in the ROP Action Matrix, and that placement in the Action Matrix determines the level of NRC oversight for that particular licensee. The NRC's approach to safety culture assessment is a graded process, see Fig. 3. The extent and complexity of a safety culture assessment is generally based on a licensee's placement in the ROP Action Matrix. The scope and complexity increases with increased oversight and the focus of the assessment may be tailored based on the original performance deficiency.   An assessment may focus more heavily on one part of the plant, or on one area of safety culture, such as safety-conscious work environment.
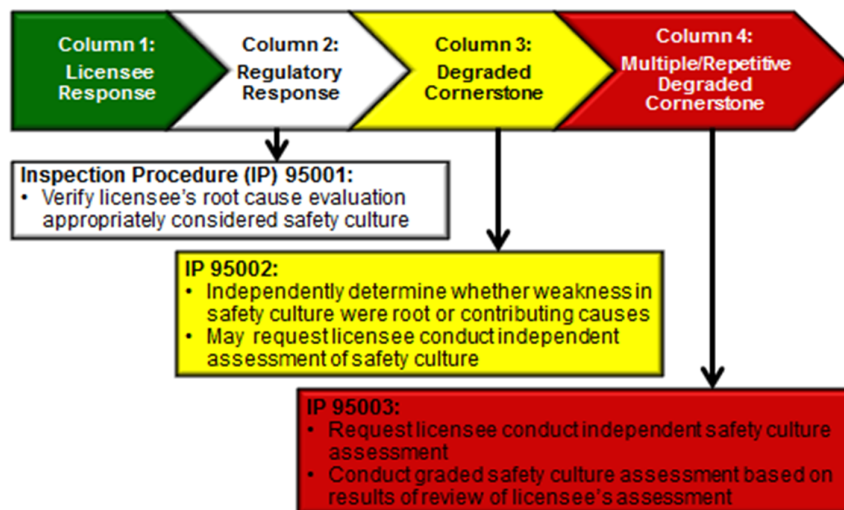
FIG. 3. Reactor oversight process

The NRC's ROP Action Matrix, with the four columns of increasing oversight, is based on performance deficiencies. Licensees in column 1 are subject to NRC's baseline inspection program. As licensees move to columns 2, 3, or 4 they are subject to addition oversight in the form of supplemental inspections.

In column 2, as part of IP 95001, inspectors verify that the licensee's root cause analysis appropriately considered safety culture. IP 95001 can be found on the NRC's Web page [5].

In column 3, as part of IP 95002, the NRC independently determines whether safety culture weaknesses were root or contributing causes and may request that the licensee conduct an independent safety culture assessment. IP 95002 can be found on the NRC's Web page [6].

In column 4, as part of IP 95003, the NRC will request an independent assessment and will perform its own assessment of safety culture. IP 95003 can be found on the NRC's Web page [7].

Qualified NRC safety culture assessors evaluate the licensee's third party safety culture assessment, and then determine the scope of the NRC assessment based on that evaluation. The NRC assessors conduct the assessment on site, and identify and document safety culture themes in the inspection report. The assessors also review the licensee's planned and completed corrective actions to evaluate whether they address the identified safety culture themes, and whether the licensee needs to develop follow-up actions to address any remaining concerns. A detailed description of the ROP can be found on the NRC's Web page [8]. NUREG 1649, "Reactor Oversight Process," can be found on the NRC's Web page [9].

Construction Oversight Process (cROP): The Office of New Reactors (NR) staff completed a revision to cROP based on the ROP assessment program methodology, including the use of safety culture traits and cross-cutting issues, and completed a pilot of the revised cROP in December 2012.

Based on the results of the pilot program, NRO revised the construction oversight process, including the oversight of safety culture as described in IMC 0613, "Documenting 10 CFR Part 52 Construction Inspections," and IMC 2505, "Periodic Assessment of Construction Inspection Program Results," to provide guidance to assess the safety culture of a construction site. IMC 0613 was revised to provide a listing of cross-cutting aspects that can be assigned to inspection findings. Assigned cross-cutting aspects, which are generally associated with the root causes of performance deficiencies, are evaluated to identify cross-cutting themes which are assessed as outlined in IMC 2505. IMC 2505 also includes references to the supplemental inspection procedures, which are used when there is a decline in safety performance at a construction site. These procedures provide NRC inspectors with guidance on how to assess the safety culture at a construction site with escalating levels of efforts commensurate with the significance of a site's performance decline. The supplemental inspection procedures also provide NRC inspectors with the tools to communicate safety culture issues to stakeholders. IMC 0613 and IMC 2505 can be found on the NRC's Web page [10]. Additional information on the cROP can be found on the NRC's Web page [11].

6. ALLEGATIONS AND ENFORCEMENT PROGRAMS

The NRC's Allegations and Enforcement Programs address discrimination against licensee employees for raising safety related concerns, and the potential resulting chilling effect on the employee or coworkers.

Safety Conscious Work Environment (SCWE): The Commission describes a safety conscious work environment (SCWE) as a work environment where employees are encouraged to raise safety concerns and where concerns are promptly reviewed, given the proper priority based on their potential safety significance, and appropriately resolved with timely feedback to the originator of the concerns and to other employees as appropriate. Fostering an environment for raising concerns continues is an important attribute of a positive nuclear safety culture, and is incorporated as one of the traits of a positive safety culture in the NRC's SCPS, as "Environment for Raising Concerns." Additional information on Safety Conscious Work Environment can be found on the NRC's Web page [12].

The NRC places a high value on nuclear industry employees being free to raise potential safety concerns to both licensee management and the NRC, regardless of the merits of the concern. Unlawful adverse actions taken against employees for raising safety concerns may create a "chilling effect" on the employee or other workers who

may wish to raise concerns. That is, the employees may not feel that they are free to raise concerns without fear of retaliation. When the chilling effect is not isolated (e.g., multiple individuals, functional groups, shift crews, or levels of workers within the organization are affected) the NRC refer to the situation as a chilled work environment.

If the NRC suspects there is a chilled work environment in the organization, the licensee may be asked for more information or the NRC will investigate through follow-up inspections. If the NRC is concerned about the licensee's awareness of, or efforts to address a known chilled work environment, a Chilling Effect Letter (CEL) may be issued. A CEL is a public way for the NRC to communicate with the licensee, the public, and the licensee's employees. The intent of such action is, in part, to prompt the licensee to take actions to mitigate the chilling effect that the discriminatory act or other event has caused. The NRC's Allegations Program includes guidance on the NRC's Safety Conscious Work Environment Policy and CELs, and can be found on the NRC's Web page [13].

In addition to the Allegation Program, the NRC's Enforcement Policy ensures, through appropriate enforcement action against a licensee or licensee contractor (and when warranted, against the individual personally responsible for the act of discrimination), that adverse employment actions taken against licensee or contractor employees for raising safety concerns do not have a chilling effect on the individual or others who may wish to report safety concerns. The NRC vigorously pursues actions against licensees or licensee contractors who discriminate against their employees for raising nuclear safety concerns. Acts of discrimination include discharge and other adverse actions that relate to an employee's compensation, terms, conditions, or privileges of employment. The NRC's Enforcement Program includes information on sanctions for discrimination against employees who raise safety concerns, and can be found on the NRC's Web page [14].

Safety Culture Corrective Actions: Through the identification of cross-cutting issues, safety culture assessments in supplemental inspections, or findings of discrimination or chilling effect, the NRC publicly documents the concerns, and the licensee responds to the concerns with planned corrective actions. The NRC may also use its post-investigation alternative dispute resolution (ADR) program to resolve discrimination cases or other wrongdoing through mediation rather than through the NRC's traditional enforcement processes. The ADR program documents agreements between the NRC and the licensee on the licensee's planned actions, which then becomes the basis for Confirmatory Orders (CO). The CO is legally binding, becomes part of the licensing basis for that particular plant, and identifies actions that must be closed out before a licensee can move back to column 1 in the ROP Action Matrix and the baseline inspection program. The NRC conducts follow-up reviews or inspections to close the concerns or verify implementation of the actions. More information on these enforcement actions can be found on the NRC's Web page [15].

More information on the NRC's post-investigation ADR program can be found on the NRC's Web page [16].

7.   CONCLUSIONS

The NRC communicates safety culture expectations through the SCPS, which applies to all organizations overseeing nuclear materials, including licensees, vendors and suppliers and Agreement States. The NRC qualifies inspectors to be safety culture assessors to facilitate the oversight of safety culture. In addition, safety culture oversight is achieved through the ROP and the cROP. Finally, the NRC's Allegation and Enforcement Programs ensure that employees are free to raise safety concerns without fear of retaliation and can issue CELs and COs for SCWE and SC corrective actions.

8.   REFERENCES

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