

SAFETY CULTURE AS APPLIED TO REACTORS

In the February 25, 2008, Staff Requirements Memorandum (SRM) for COMGBJ-08-0001, "A Commission Policy Statement on Safety Culture," the Commission directed the staff to review specific issues related to safety culture in consideration of the safety culture components of the reactor oversight process (ROP) and fuel facility pilot and their potential applicability to other U.S. Nuclear Regulatory Commission (NRC) licensees. This enclosure addresses the following specific SRM question for consideration: whether safety culture as applied to reactors needs to be strengthened.

Conclusion

The staff believes that the current process of considering cross-cutting aspects of inspection findings is effective because it offers insights into a licensee's safety culture. In addition, it is consistent with the original tenets of the ROP. (i.e., It is transparent, objective, understandable, predictable, risk informed, and performance based.) By tagging cross-cutting aspects to inspection findings, the staff has been able to gain insights into performance areas that have the potential to reflect organizational dynamics including safety culture. When recurring aspects were identified, safety culture assessments have been conducted to determine if an organizational safety culture challenge existed. The NRC regulatory response has focused on licensees' corrective action plans and their demonstrated improvement through subsequent safety culture assessments and inspection findings.

The combined focus of the NRC and the nuclear power industry on safety culture has increased attention to this issue across the operating fleet and could have contributed to the relatively low number of units currently in Column 3 (Degraded Cornerstone) or Column 4 (Multiple/Repetitive Degraded Cornerstone) of the ROP Action Matrix. The staff is aware of an increasing number of licensees that are conducting periodic safety culture self-assessments independent of the NRC's regulatory response. These licensees are typically using outside contractors.

The NRC's oversight of safety culture as applied to reactors continues to be refined in accordance with the existing ROP self-assessment process. For example, when the Commission inquired about this issue in SRM-COMGBJ-08-0001, the staff was incorporating improvements to ROP guidance. These improvements were implemented in January 2009 based on lessons learned from the initial 18-month implementation period of the 2006 ROP safety culture enhancements as well as lessons learned from the supplemental inspection at Palo Verde Nuclear Generating Station (Inspection Procedure 95003, "Supplementary Inspection for Repetitive Degraded Cornerstones, Multiple Degraded Cornerstones, Multiple Yellow Inputs or One Red Input" (Agencywide Documents Access and Management Systems (ADAMS) Accession No. ML080040267)), special internal reviews, and feedback from internal and external stakeholders. The staff will continue to solicit feedback from internal and external stakeholders to inform future improvements to the ROP including its implementation of safety culture oversight.

Review

In response to Commission direction and ongoing ROP improvements, the staff evaluated whether safety culture as applied to reactors needed to be strengthened.

The staff implemented ROP safety culture enhancements in July 2006. As discussed in Enclosure 6, the staff monitored and reviewed the enhancements during the initial 18-month implementation period. Based on the lessons learned from this review as well as from supplemental inspections, special internal reviews, and feedback from internal and external stakeholders, the staff concluded that the NRC's independent oversight of safety culture as applied to reactors needed to be further clarified and enhanced. The staff subsequently implemented improvements to its ROP guidance in January 2009.

Subsequent to these ROP modifications, the NRC staff held a public workshop on February 3, 2009, on the development of a policy statement on safety culture and security culture. Ten different organizations including licensees, State regulators, and non-governmental organizations were represented on the workshop panels discussing the three topics. Overall, approximately 160 individuals participated in person, through the Webinar, or by teleconference. Approximately 60 stakeholders participated via Webinar as did one of the workshop panelists. By making the meeting available through the Webinar, a barrier to stakeholder participation in the workshop was lowered. This allowed greater participation by smaller licensees and certificate holders, State government representatives, and other stakeholders. Ten sets of written comments were submitted. The comments received in response to the public meeting and the January 23 and February 9, 2009, *Federal Register* Notices (FRN) are documented in the meeting summary and are provided on the NRC's public safety culture Web site (<http://www.nrc.gov/about-nrc/regulatory/enforcement/safety-culture.html>).

A breakout session during this workshop was specifically dedicated to discussing whether safety culture as applied to reactors needed to be strengthened. In formulating the staff's conclusion in response to this SRM question, the staff considered stakeholder feedback and written comments that were provided during and subsequent to the public workshop based on questions the staff posed on this topic. A summary of written comments is provided below.

The staff believes that the current process of considering safety culture components and aspects is consistent with, and implements, the original tenets of the ROP. The ROP safety culture process has been transparent as cross-cutting aspect assignments and safety culture assessment evaluations are highlighted during inspection exit meetings and are described in inspection reports. Semi-annual assessment reports issued to licensees describe the substantive cross-cutting issues (SCCI). The staff identifies its inspection findings and SCCIs using criteria that include objective elements. The NRC also provides guidance on assigning cross-cutting aspects, making decisions on when to identify an SCCI, and reviewing safety culture assessments. The process has been risk-informed and performance-based because the assignment of a cross-cutting aspect requires an inspection finding of greater-than-minor significance. Collectively, these elements ensure the process is objective, understandable, and predictable. Notwithstanding, the staff recognizes that any evaluation of areas important to a licensee's safety culture will also need to include some measure of subjective or qualitative decision-making to integrate insights that are not amenable to more objective or quantitative treatment.

Summary of Stakeholder Comments on Whether Safety Culture as Applied to Reactors Needs to be Strengthened

During the February 3, 2009, public workshop, panel members representing various stakeholder groups and members of the public provided feedback to the staff. The staff also provided

questions on this issue in FRNs and on the NRC's public safety culture Web page. (Link noted above.) The staff considered inputs from both the workshop discussions and comments submitted in response to the FRN questions in formulating its recommendations for the Commission's safety culture policy statement.

Some stakeholder comments were supportive of the NRC's oversight of safety culture. For example, stakeholders (including the State of California) commented that the NRC's proactive safety culture assessment at nuclear power plants should not be eliminated. Others suggested that, although industry's attempts to improve the self-assessment process at plants are positive, a licensee-controlled self-assessment process should not replace the parallel NRC process for safety culture assessments. Similar comments stated that the industry's self-assessment process should complement rather than replace the NRC's oversight and that the number of lapses at nuclear power plants highlight the importance of having a strong NRC independent safety culture oversight rather than relying on plant self-assessments. One stakeholder (State of California) commented that the industry's proposed licensee-controlled self-assessment approach does not currently consider safety conscious work environment (SCWE) attributes, and another stakeholder commented that the NRC should continue to strengthen its oversight and assessment of safety culture and SCWE at sites in California.

Other stakeholder comments were critical of the ROP safety culture guidance and assessment process. For example, some stakeholders commented that the current ROP safety culture guidance is too narrow, prescriptive, subjective, and complex and that it is not a leading indicator of declining performance. Stakeholders also commented that NRC staff decisions are not consistent, predictable, repeatable, or transparent; and stakeholders commented that the NRC staff focuses additional inspection effort on plants with declining performance rather than on plants in the Licensee Response column of the ROP Action Matrix. One stakeholder (State of California) commented that the NRC's oversight of security measures at commercial nuclear power plants may need to be improved. Some stakeholders also had the impression that the NRC has not conducted an assessment of the effectiveness of the enhanced ROP safety culture guidance and that the NRC has no routine centralized process for collecting, analyzing, and disseminating security-inspection findings that may be common to other plants.

Some stakeholders provided the following recommendations to improve the safety culture assessment processes. One commenter (an Organization of Agreement States/Conference of Radiation Control Program Directors representative) indicated that there is room for safety and security improvement at the reactor facilities and suggested that the NRC should develop policies to promote the culture from within. This commenter also suggested that there should be an emphasis on human performance issues, utility employees should be actively engaged in the process through training, and the use of feedback (e.g., surveys) should be encouraged. Another stakeholder said that the industry safety culture assessments should be conducted more frequently than once every 2 years. The NRC and the nuclear industry should adopt a common language to describe safety culture attributes and principles. The NRC staff should develop clear expectations and directives for establishing an adequate safety culture (including direction on how periodic reviews should be performed) which should be supported by enforcement or incentives. The NRC staff should develop a regulatory issue summary or an NRC regulatory guide that explains these expectations. Some stakeholders (including the State of California) also believed that new regulatory requirements should require a thorough evaluation of a plant's safety culture and SCWE during the NRC staff's review of license renewal applications. Some stakeholders commented that repairing poor safety culture can

take a long time, safety culture can deteriorate more rapidly in some circumstances, and frequent safety culture surveys could lead to survey fatigue which would decrease their meaning and value.

The staff will consider these and other stakeholder comments during the continued development of the safety culture policy statement.

Industry Initiatives to Develop an Alternate Safety Culture Oversight and Assessment Methodology

Before and during the safety culture policy statement public workshop, the Nuclear Energy Institute (NEI) provided a high-level characterization of its proposal to replace the ROP SCCI process. NEI proposed that each site would have a licensee-controlled process to evaluate various sources of safety culture inputs in accordance with the “Principles for a Strong Nuclear Safety Culture” developed by the Institute of Nuclear Power Operations (INPO) to determine if a safety culture issue exists. NEI proposed that the NRC maintain regulatory oversight of safety culture by using Inspection Procedure 71152, “Identification and Resolution of Problems” (ADAMS Accession No. ML073540265), to inspect the licensee-controlled process. NEI also proposed to develop guidance for standardizing safety culture assessments. The proposed guidance would use the Utility Services Alliance safety culture assessment approach and INPO’s “Principles for a Strong Nuclear Safety Culture.” The staff recognizes the value of industry initiatives regarding safety culture and will consider the alternative approaches to a safety culture assessment; however, as noted elsewhere in this paper, the staff also acknowledges the simultaneous need for independent regulatory oversight as part of the overall process.

The staff plans to ask NEI for more details about its proposed safety culture assessment guidelines. The staff recognizes that there may be benefit to both the industry and the NRC if there is an agreed-upon approach defining how licensees should conduct safety culture assessments. NEI plans to submit the guidance to the NRC staff for review in 2009, and the NRC staff will consider endorsing it after careful review and discussions with stakeholders.