

## **Safety Culture Enhancements**

### **Background**

The U.S. Nuclear Regulatory Commission (NRC) has taken significant actions to incorporate safety culture into the Reactor Oversight Process (ROP). These efforts have included (1) revising ROP guidance documents and inspection procedures to define key safety culture aspects and prescribe when a self- or independent assessment of a licensee's safety culture is warranted based on licensee performance, (2) interacting with external stakeholders during the development phase, including providing the opportunity to comment on the draft ROP documents that incorporated the safety culture changes, (3) conducting training for inspectors on the safety culture ROP changes, and (4) implementing a multioffice ROP staff team to monitor the implementation of the safety culture enhancements, resolve implementation issues, interface with internal and external stakeholders, and evaluate and act on lessons learned. The safety culture enhancements to the ROP went into effect on July 1, 2006.

The end of calendar year (CY) 2007 marked the completion an 18-month initial implementation period, during which the staff monitored and evaluated the effectiveness of the enhancements. This enclosure provides information on the results of this initial implementation assessment in accordance with the staff's commitment to do so in SECY-06-0122, "Safety Culture Initiative Activities to Enhance the Reactor Oversight Process and Outcomes of the Initiatives," dated May 24, 2006. The need to implement additional modifications to increase the effectiveness of the ROP safety culture enhancements was determined based on the lessons learned from this initial implementation.

### **Lessons-Learned Evaluation Considerations and Inputs**

The objectives of the lessons-learned evaluation relative to the safety culture enhancements were to identify the changes needed in ROP guidance documents to improve their effectiveness and efficiency and to interact, as appropriate, with internal and external stakeholders, including the industry, public, and nongovernment organizations, to obtain and consider their input and comments on potential changes.

The safety culture lessons-learned evaluation considered (1) staff monitoring of safety culture activities over the 18-month initial implementation period, (2) a staff audit of inspection reports on cross-cutting aspects, (3) a staff review of the implementation of guidance on cross-cutting issues and aspects, (4) Nuclear Energy Institute (NEI) and Regional Utility Group (RUG) survey results, (5) the Palo Verde Inspection Procedure 95003, "Supplemental Inspection for Repetitive Degraded Cornerstones, Multiple Degraded Cornerstones, Multiple Yellow Inputs, or One Red Input," lessons-learned report, (6) ROP self-assessment internal and external survey results, (7) ROP feedback forms, and (8) further staff evaluation of the cross-cutting components and aspects.

The responses to the most recent ROP external survey indicate that more experience with the safety culture enhancements is needed before judging their effectiveness in focusing NRC and licensee attention on safety culture performance issues. Nonetheless, the staff believes that it is appropriate to evaluate all of the lessons learned insights available at this time to identify aspects where the ROP guidance can be further enhanced with respect to safety culture.

To date, some lessons-learned recommendations have resulted in changes to ROP guidance documents. The staff has considered other lessons-learned recommendations and is in the process of implementing them. Finally, the staff is considering or will consider other lessons learned and will identify and implement changes to address them in the near future. The following sections describe the various sources of lessons-learned input and their status.

### **Lessons-Learned Evaluations Considered and Changes Implemented**

Early in the implementation of the ROP safety culture enhancements, NRC staff received feedback from the ROP monthly public meetings, where the staff meets with industry representatives and obtains feedback on the implementation of the ROP from the licensees' perspectives, including the implementation of the ROP safety culture enhancements. In particular, the staff became aware of some instances of miscommunication between the inspector and the licensee relative to which cross-cutting aspect of the finding was being assigned. (Cross-cutting aspects are subelements of safety culture components that inspectors review to determine if they are a significant contributor to the performance deficiency.) In addition, internal stakeholders identified that the ROP inspection database did not readily capture cross-cutting aspects for inspection findings. To address these issues, the agency made an inspection guidance change to Inspection Manual Chapter (IMC) 0305, "Operating Reactor Assessment Program," to assign a unique alpha-numeric designator for each cross-cutting aspect so that the cross-cutting aspect could be clearly identified in verbal and written communications. The staff also made changes to the ROP inspection database to both retrofit the cross-cutting aspect designators to prior findings (from July 1, 2006) and to capture the cross-cutting aspect designator for future inspection findings.

The staff actions have resulted in improved communications between the inspectors and the licensees, as confirmed by subsequent NEI and Region IV Utility Group (RUG IV) survey feedback discussed later in this enclosure. The changes also allowed improved reactor program system (RPS) data tracking of cross-cutting aspect information for findings to allow sorting and data analysis of inspection findings in support of the ROP mid-cycle and end-of-cycle assessments.

### **Guidance Changes in Process from Lessons-Learned Evaluations Considered and Identified**

The NRC performed other activities that provide valuable insights to the safety culture lessons-learned evaluation. The staff performed an audit of a sample of 54 inspection reports from all regions representing a variety of report types. The inspection reports were examined to evaluate how cross-cutting aspects (i.e., aspects of the safety culture components) for inspection findings were assigned and documented. The audit group concluded that overall inspectors appropriately applied guidance for assigning cross-cutting aspects; however, weaknesses were identified in the documentation of the findings. Additionally, inconsistencies in program guidance (e.g., IMC 0305 and IMC 0612, "Power Reactor Inspection Reports") for assigning and documenting cross-cutting aspects were identified.

The staff is developing several enhancements of IMC 0612 in response to the audit recommendations. Revisions to the guidance and definitions in IMC 0305 and IMC 0612 will be proposed to provide greater clarification about the relationship between performance deficiencies and cross-cutting aspects. The staff will propose further guidance in IMC 0612 to

promote greater consistency in the way that inspection reports document and support cross-cutting aspects. The staff is drafting the IMC 0612 guidance so that inspectors provide positive documentation that they considered assignment of a cross-cutting aspect in those cases when they did not assign one to a finding. Further guidance is being drafted on assigning cross-cutting aspects for performance deficiencies with multiple parts or examples. Finally, the staff will propose additional guidance to enable inspectors to make more uniform decisions on whether cross-cutting aspects reflect current licensee performance. The proposed changes to the inspection guidance are subject to management reviews that may result in subsequent changes to the inspection guidance. In addition, the agency plans to discuss the proposed changes with public stakeholders.

Another staff review group which included representatives from each of the regions, the Office of Enforcement, and the Office of Nuclear Reactor Regulation evaluated implementation practices across the four NRC regions with regard to the assignment of cross-cutting aspects to inspection findings, how cross-cutting aspects are assessed in the review process, and the identification of substantive cross-cutting issues (SCCIs). The review group performed peer observations of regional inspection debriefs and mid-cycle assessments.

The review determined that the regions are implementing the program in accordance with IMC 0612 and 0305. The review group identified that during the early stages of implementation there were some issues associated with clearly documenting cross-cutting aspects, however, there are indications showing improvement in this area. In addition, recent data is revealing that the difference between the regions on the number of findings with cross-cutting aspects is narrowing which is indicative of improved consistency among the regions. While there were some differences noted in how the regions prepared for and conducted the assessments, the differences were not significant and had no impact on the overall process.

The peer observations of mid-cycle assessments identified the need to enhance IMC 0305 to clarify that a cross-cutting theme needs to involve four or more inspection findings with the same cross-cutting aspect. The cross-cutting issue implementation staff review also identified redundancy in the first two criteria for an SCCI in the problem identification and resolution and human performance cross-cutting areas in IMC 0305, Section 06.07, "Substantive Cross-Cutting Issues." The staff will revise IMC 0305 to clarify that a cross-cutting theme is a set number of inspection findings with the same cross-cutting aspect and will clarify the SCCI criteria to eliminate confusion and redundancy.

### **Industry Safety Culture Surveys**

NEI and the industry ROP Task Force administered a 19-question survey in August 2007 to determine whether the implementation of the ROP guidance document revisions to better address safety culture continue to meet key ROP principles.

The survey received 30 licensee respondents. NEI provided its final survey results on October 24, 2007 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML072980787).

The staff review of the NEI survey results concluded that more than 85 percent of the licensee respondents indicated that cross-cutting aspects are being properly identified at exit meetings

and in the inspection reports and inspectors are identifying the basis for their selection of cross-cutting aspects and are following the guidance in IMC 0612.

The NEI survey identified the following items:

- The majority of respondents acknowledged that safety culture and the identification of cross-cutting aspects were difficult at first. Inspectors did not always identify cross-cutting aspects during exit meetings, although they appeared in the inspection reports. However, the respondents also noted that this has changed, and the majority agrees that this is no longer a problem.
- The majority of respondents viewed that the assignment of cross-cutting aspects and the IMC 0612 guidance can be somewhat subjective. They noted that when licensees have a dialogue with the inspectors, it helps to gain a common understanding of the assigned cross-cutting aspect.
- The majority of respondents stated that they are more likely to challenge the characterization of green findings because of the associated cross-cutting aspect assignment.
- Some respondents noted considerable variability between plants in the number of inspection findings that are assigned cross-cutting aspects.

NEI communicated the following recommendations on behalf of the industry:

- Work with the NRC to clarify the guidance in IMC 0612 for the assignment of cross-cutting aspects and examples.
- Continue to monitor for consistent application of the safety culture enhancements.

In addition to the NEI survey, RUG IV performed a survey and provided the results to the NRC (in a letter dated October 30, 2007). The RUG IV survey included feedback from 13 reactor sites in Regions 1, 3, and 4. The survey included several nonsite-specific examples where cross-cutting aspects were felt not to be indicative of current performance and several examples where a finding was issued as more than minor where the belief was the issue met the criteria for minor. RUG IV stated that it had no examples where it believed that the NRC inappropriately identified an SCCI for a site. During a meeting with the NRC, RUG IV expressed an overall view similar to the NEI feedback that the NRC is now applying cross-cutting aspects more consistently and in accordance with inspection program guidelines.

In conclusion, the results of the industry surveys indicate that the majority of the industry respondents feel that the NRC is properly implementing the ROP safety culture changes regarding the assignment of cross-cutting aspects and SCCIs.

## **Lessons-Learned Evaluations Considered or to Be Considered and Changes to Be Evaluated**

One of the major ROP safety culture enhancements was an extensive modification to Inspection Procedure 95003. The staff added guidance to the inspection procedure to describe how the NRC will evaluate a licensee's third-party safety culture assessment and how the NRC will perform its own independent assessment of the licensee's safety culture. The NRC issued the revised inspection procedure in October 2006, and it was used for the first time at the Palo Verde site in 2007. As part of the inspection procedure implementation, Region IV, which led the inspection, issued a lessons-learned report. The lessons-learned report will serve as a major input to the overall assessment to further enhance the ROP safety culture guidance documents, including Inspection Procedure 95003, to enhance their efficiency while maintaining their effectiveness in accomplishing their intended objectives. The staff will consider changes to the inspection procedure to redefine the primary focus of the NRC safety culture assessment to be determining the adequacy of the licensee's third-party safety culture assessment. If the staff's review of the third-party assessment methodology determines that it is adequate, NRC safety culture assessment resources can be better targeted to focus on areas of identified weaknesses rather than performing an independent assessment.

Several staff groups are working on evaluating the safety culture lessons-learned information to identify further enhancements for the inspection and assessment guidance. In particular, the staff is evaluating the threshold for the number of inspection findings with the same cross-cutting aspect necessary to consider whether an SCCI exists. The staff is examining the need to revise Inspection Procedure 71152, "Problem Identification and Resolution," to add more guidance regarding safety conscious work environment inspections. The staff will assess the descriptions of the cross-cutting components and cross-cutting aspects in IMC 0305 and consider modifying them as appropriate. The staff continues to evaluate input from the ROP self-assessment internal and external surveys, ROP feedback forms, and other experience gained during the 18-month implementation period.

## **Conclusion**

Results of reviews to date indicate that the staff is appropriately implementing guidance associated with the safety culture enhancement. Some recommendations have resulted in changes to ROP guidance documents and other changes are in progress. The staff is continuing to review the safety culture lessons learned information and plans to develop additional proposed changes to the inspection program guidance. The staff plans to interact with internal and external stakeholders and issue the bulk of the revised ROP guidance documents by August 2008. The staff recognizes that some limited situations could arise during the lessons-learned evaluation where the work on the inspection program guidance could extend beyond August 2008.