

**Safety Culture Public Meeting
November 29-30, 2005
Meeting Summary**

U.S. Nuclear Regulatory Commission (NRC) staff made several presentations at this meeting. These presentations and related discussions are summarized below. The presentation slides are available on the NRC safety culture website at:
<http://www.nrc.gov/what-we-do/regulatory/enforcement/ml053320395.pdf>.

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Introduction

Meeting participants were asked for their goals for the meeting. Responses provided by stakeholders include: enhance the Reactor Oversight Process (ROP) to better address safety culture, focus on the time frame for the activities, provide a clearer picture of industry activities related to safety culture, and discuss effective processes to evaluate and respond to safety culture performance issues. The NRC staff's goals for the meeting were to ensure proposed activities are consistent with the ROP framework and principles, provide for an open dialogue with stakeholders, ensure the end product is effective and will be consistently applied, and learn more about stakeholder concerns.

Background

There have been several drivers for the NRC's activities on safety culture, including the Commission Staff Requirements Memorandum (SRM) for SECY-04-0111, August 30, 2004, Davis-Besse Lessons Learned recommendations, General Accounting Office (GAO) recommendations, and congressional encouragement. Recently, SECY-05-0187, "Status of Safety Culture Initiatives and Schedule for Near-Term Deliverables," dated October 19, 2005, was issued. The Commission has changed that paper into a notation vote paper, and the Commission will issue an SRM. Following the October 26, 2005 public meeting, the staff has taken a fresh approach and refocused its activities. The staff reviewed current NRC programs to identify features that have a bearing on safety culture and potential approaches discussed at the October 26, 2006 public meeting.

Objectives & Scope

The objectives of the NRC safety culture activities are to: 1) provide better opportunities for the NRC staff to diagnose safety culture weaknesses and take appropriate actions before they result in a degraded cornerstone, 2) provide the NRC staff with a structured process to determine the need to specifically evaluate a licensee's safety culture after performance problems have resulted in a degraded cornerstone, and 3) provide the NRC staff with a systematic safety culture evaluation process and a tool to review a licensee's self-assessment. Regarding the scope, the direction in SRM-SECY-04-0111 disapproved several options described in the SECY paper; these were discussed.

Regarding the scope of the activities, stakeholders commented that the Commission placed constraints in the August 2004 SRM that could limit the effort. The NRC responded that

stakeholders should feel free to identify such constraints during the meeting where applicable, and the staff would document their concerns. Several stakeholders believed that the March 2006 deadline was unrealistic. The NRC responded that the staff would continue to follow the previous direction until further direction is received.

Definitions of Safety Culture

The staff presented definitions of safety culture by the International Nuclear Safety Advisory Group (INSAG-4) which has been previously referenced by the NRC, the Institute of Nuclear Power Operations (INPO), and the Hungarian and Swiss regulators. The comparisons showed that there is substantial similarity between the definitions.

Some stakeholders wanted to use the INPO definition because the industry has built a framework around INPO's principles and definitions, and creating a new definition may cause confusion. NRC staff pointed out that the INPO definition places emphasis on values and behaviors modeled by leaders, which would be difficult for NRC to review and is more appropriate for industry evaluation. There was discussion that the only major difference between the INSAG and INPO definitions is that INSAG more appropriately includes the phrase "issues receive attention warranted by their significance."

Given the large amount of similarity between definitions the staff indicated they plan to use the INSAG definition.

Components of Safety Culture

The NRC presented a comparison of the NRC proposed components and subcomponents, the INPO principles and attributes, and the International Atomic Energy Agency (from the Safety Culture Assessment Review Team (SCART) Draft Guidelines) characteristics of safety culture. The staff found that in general NRC components and subcomponents were related to a corresponding component or sub-component from INPO or International Atomic Energy Agency (IAEA), with some terminology differences. One area that NRC does not include is practices related to leadership development and selection, which is outside of NRC purview. Also, INPO and IAEA use the term "trust", while the NRC has long referred to this safety culture attribute as Safety Conscious Work Environment (SCWE).

NRC will review INPO terminology when finalizing the components and subcomponents to achieve greater commonality.

Current Activities Related to Safety Culture

NRC presented the current regulatory oversight related to cross-cutting aspects. Many enhancements were made to the ROP after the Davis Besse event. The NRC staff presented the method and results of their review of current NRC activities especially inspection procedures, against the safety culture components and subcomponents. The activities were reviewed for level of coverage (direct, indirect, or none) for each subcomponent.

The review found that most NRC inspection procedures can be tied directly or indirectly to one or more of the safety culture components and subcomponents, and most aspects of safety

culture subcomponents are currently covered by NRC activities. However, the level of coverage varies significantly between the sub-components.

In the interest of time, the presentation on international initiatives was dropped from the agenda.

INPO Safety Culture Initiatives

An INPO representative gave a presentation on current safety culture initiatives in the industry. He discussed that there were 16 corrective actions resulting from the incident at Davis Besse which touched all four INPO cornerstones, and that INPO formed a committee to coordinate the implementation of these corrective actions.

Three major INPO activities were described:

(1) *Safety culture evaluation.* The Significant Operating Event Report following the Davis Besse incident included one recommendation/action to train everyone at stations on the Davis Besse case. Another recommendation was to do self-assessments at every station, geared towards attributes of safety culture identified in the Davis Besse root-cause analysis. The third recommendation was direction for plants to identify any on-going unexplained phenomena. The first two recommendations are evaluated in every evaluation INPO does at a plant. The self-assessment recommendation involved doing periodic self assessments (not just one). INPO has six safety culture touch points where INPO specifically discusses safety culture during the plant evaluation process.

(2) *Organizational effectiveness evaluations.* INPO recognized that it needed to improve on identification of the organizational effectiveness aspects of operations that were important at Davis Besse. INPO started with a 1990s accountability model for the industry. It worked well in some respects, but did not take a systems view of the organization, which was important at Davis Besse. INPO developed a new high-performing organizational model for nuclear power plants. The model lays out what senior management/leaders have to do, what middle management have to do, and what workers have to do. These cover not only safety culture, but a broader view of organizational effectiveness. In addition, INPO added another model related to the processes used at the plant, which is used as background knowledge rather than for judgments about management style. Among other things, the models are used to ask questions of plant personnel (e.g., why they did one thing versus another), and as a basis for INPO's pre-evaluation questionnaire.

(3) *Analysis effort.* All of INPO's event analyses are screened for safety culture aspects. An operating data evaluation department was created at INPO. Data reviewed is all-inclusive, including all NRC reports and INPO reports for the past five years (sent by stations), all root-cause analyses, self-assessments, and condition reports, the number of which range between 6,000 and 20,000 over the course of one to two years. INPO analyzes this data, e.g., through word-searches, string-searches, artificial intelligence evaluations, and the evaluations are reported back to the plants in the form of follow-up issues that need to be addressed. INPO believes the process has been effective in raising issues before plant visits.

Discussion of Enhancements

The goal of this discussion was to identify *what*, if anything, should change to enhance the NRC's look at safety culture and to improve *how* NRC looks at safety culture. One participant raised the issue that we first need to discuss *gaps* in the current system that need to be filled before we discuss enhancements.

NRC staff offered that one way to view enhancements that are needed is that the enhancements are a complement to what NRC does now in inspections (as presented earlier in terms of direct and indirect coverage of safety culture subcomponents in current inspection procedures.) Areas for potential enhancement include: 1) where the procedures are at a very high-level – enhanced guidance that is more specific could be provided; 2) for plants that move to the right (indicating degrading performance) in the action matrix, supplemental procedures could be enhanced to help inspectors determine whether safety culture played a part in degraded performance.

NRC staff also asked how it can better leverage industry efforts when looking into safety culture, understanding that there are issues regarding transparency, and understanding that industry and the NRC play different roles.

The discussion resulted in the following potential enhancements:

- (1) Need to improve routine procedure guidance to inspectors
- (2) Not enough guidance on safety culture in supplemental procedures (e.g., 95001,002,003)
- (3) Not enough guidance in special inspection procedures (e.g., event follow-up)
- (4) Don't have safety culture conclusions as part of NRC assessments
- (5) Should look at the Problem Identification & Resolution (PI&R) procedure to see how licensees follow up on safety culture findings from INPO and licensee self assessments
- (6) Better leverage industry efforts
- (7) NRC needs to identify at an earlier stage (earlier than degraded cornerstone) safety culture declines (enhanced treatment of cross-cutting issues)
- (8) Need a policy statement and guidance on safety culture
- (9) Need greater transparency into industry efforts (see #6)
- (10) Enhance cross-cutting issues (see #7)
- (11) Need a more proceduralized process for following when significant performance problems exist.
- (12) Need to better consider information from allegations, chilling effect letters, enforcement, etc., in ROP

There was some convergence on enhancements (2),(3),(5), (6) and (7) above.

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In addition, NRC staff asked that further consideration be given to the following enhancements:

- (11) Procedure for safety culture inspection for degraded cornerstone plants (Inspection Procedures 95002, 95003)
- (12) Consider insights from allegations, chilling effects, in ROP.

Staff explained that consideration of enhancement (12) would address the problem of not having a structured, formal, transparent way of incorporating allegation information into the assessment process. Enhancement (12) would not change what is currently done but simply provide a better linkage among existing processes.

Possible Approaches to Address Safety Culture Enhancements

The NRC presented 10 options for enhancing the ROP to better address safety culture, all of which were proposed by stakeholders and staff at or since the October 26 meeting. The options were characterized in terms of the following four-element model:

- *Information Source*: what safety culture related information would be obtained, and how?
- *Documentation*: where would safety culture related information be documented?
- *Assessment*: what decisions would be based on that information?
- *Follow-up*: what inspections or other actions would result from those decisions?

At the end of the presentation participants were given the opportunity to suggest another option(s) or a composite option using the above model.

Discussion on Composite Approach

The NRC staff presented a proposed composite approach (“Option G”) for enhancing the ROP based on the previous day’s discussion. Using the four-element model, Option G was described at a high level as follows:

Information, would remain largely unchanged from what is currently being done. The Allegations program would remain unchanged. Plant status activities would also remain unchanged. The way inspectors identified cross-cutting aspects of findings would stay the same. However, there would be an enhancement to 75112 PI&R from a safety culture perspective in order to address more fully those safety culture components which are currently covered only indirectly by 75112. The *documentation* aspect, would also remain the same. *Assessment* would need small changes: adjustment of the cross-cutting issues, specifically Work Planning and Human Performance, to more closely align them with what is important to safety culture, and revision to include outputs of the allegation process in the assessment process. See attachment for more details.

NRC staff clarified that INPO assessments and self-assessments would fit into the PI&R inspection where NRC looks at generic inputs, and the follow-up process. Currently the agency does an assessment of cross cutting issues which may result in a letter to the licensee, after which a variety of actions are possible (meet with the licensee, have a public meeting, etc.).

Participants agreed that although the devil was in the details, they saw Option G as being far closer to their way of thinking than all the other options that had previously been presented.

Future Work

Stakeholders agreed that it would be appropriate to have another public meeting during which details regarding Option G would be discussed. The following tasks were proposed as future work:

- (1) 71152 enhancements – what specifically do we need to enhance with respect to PI&R?
- (2) Settle on a common terminology as well as safety culture components
- (3) Adjustment of the Cross Cutting Areas
- (4) Enhancement of the event response procedures
- (5) Enhancement of the supplemental Inspection Procedures (9500x)
- (6) Changes to the assessment process (i.e. inspection manual chapter 0305)
- (7) Potential changes to Inspection Manual Chapter (IMC) 0612 and other relevant documents
- (8) Historical look at problem plants using the new process as a potential evaluation method for Option G
- (9) Consideration of issuing a summary report of the NRC's assessment of current ROP coverage of safety culture
- (10) Consideration of training options for inspectors. What are the characteristics that will make up the safety culture training?
- (11) Capture Option G in narrative form

The NRC staff and stakeholders agreed to assign the above tasks as follows:

Tasks (2) and (11) would be addressed first, and discussed during a meeting that would occur on December 8th. Industry would take the lead, and a subgroup of NRC staff and stakeholders would meet to discuss these tasks. Draft documents would be circulated among the stakeholders.

Tasks (1), (3), (5) and (6) would be addressed at the December 15th meeting and NRC staff would take the lead on these. Staff would also work on a framework and acceptance criteria for the Option G evaluation method (task 8) and provide a draft to be discussed during the December 15th meeting. Staff would also try to address task (9), although this would be a lower priority. On December 15th the remaining tasks would be assigned.

Conclusion

NRC staff and meeting stakeholders present concluded that substantial progress had been made in the following three areas: 1) gaining clarity on definitions of safety culture and its components, 2) identifying needed enhancements to the ROP to better address safety culture and 3) reaching convergence on Option G for addressing those enhancements.

Stakeholders stated that they understood the need to be driven by schedule, but that the quality of work should not suffer because of the schedule. Another stakeholder echoed the comment and added that while work had progressed rapidly, it might happen that as details are worked out it would become necessary to take a step back to make sure all the stakeholders were able to work through the details.

Commissioner Merrifield concluded the meeting by congratulating everyone on their hard work and the level of progress that had been made in the last few days. He commented that the Commission was still working on their latest thoughts with regard to safety culture. Commissioner Merrifield thanked those present for participating on an issue that was important to everyone.