SAFETY CULTURE OVERSIGHT PROPOSAL
DRAFT 12/12/2005

The NRC staff has a task to enhance the Reactor Oversight Process (ROP) to more fully address Safety Culture. The staff provided options for this initiative in SECY 2004-0111, dated July 1, 2004. An August 30, 2004 Staff Requirements Memorandum provided the NRC staff with directions for implementing this change to the ROP.

In accordance with the SRM, the NRC staff has solicited stakeholder input into developing a robust regulatory process that will enable the agency to detect a declining plant safety culture in its early stages. This paper outlines an approach to address the SRM directions developed during a public meeting held November 29 – 30, 2005. This approach relies on industry assessments and INPO evaluations to the extent practical, with NRC staff reviewing results to ensure consistency between these assessments and the staff's perceptions regarding the health of a licensee's safety culture. The process also, consistent with the existing ROP framework, provides a performance-based approach to NRC oversight of a licensee's efforts to assess and maintain a healthy safety culture.

SRM Guidance

In relevant parts, the August 30, 2004 SRM directed the NRC staff to:

1. "...continue to monitor industry efforts to assess Safety Culture and ensure the Commission remains informed of industry efforts and progress. Of particular note was the progress made by INPO to address recent industry issues in this area. As industry works to develop guidance in this area, the staff should use its resources to ensure that it has programs and procedures in place that encourage licensees to establish strong Safety Culture programs."
2. "...enhance the Reactor Oversight Process (ROP) treatment of cross-cutting issues to more fully address Safety Culture. The staff should not use surveys of licensee personnel, but rather should rely on inspector observations and other indicators already available to the NRC. Consequently, the staff should develop tools that allow inspectors to rely on more objective findings. The staff should consider including enhanced problem identification and resolution initiatives as part of this effort."

3. "...ensure that the inspectors are properly trained in the area of Safety Culture. The staff should consider developing an enhanced training program for its inspectors and resident inspectors on Safety Culture that uses both insights from INPO's work in this area and insights from the international community."
4. "...consider if the cross-cutting issues in the enhanced ROP treatment may be more appropriately labeled Safety Management rather than Safety Culture. In making any

changes, the staff should follow the established processes for revising the ROP, in particular the process for involving stakeholders."

5. "... include as part of its enhanced inspection activities for plants in the Degraded Cornerstone Column (referred to as Column Three) of the ROP Action Matrix, a determination of the need for a specific evaluation of the licensees Safety Culture. The staff should interact with our stakeholders to develop a process for making the determination and conducting the evaluation. The staff's methodology for using the treatment of cross-cutting issues to more fully address Safety Culture should require a specific determination for plants in the Degraded Cornerstone Column."

This proposal addresses the process aspects of the SRM, therefore addressing the 2nd, 4th, and 5th above directions from the SRM.

Assumptions

This process includes the following assumptions:

1. Any issues identified with a licensee's safety culture would be documented in accordance with the current ROP guidelines.
2. The three existing ROP cross-cutting issue categories, as currently defined in MC 0305, will be maintained.
3. The Problem Identification & Resolution cross-cutting category will be revised to reflect items that are important to safety culture.
4. To the extent possible, NRC staff and stakeholders will use existing industry terminology that defines important principles and attributes (components and sub-components) of safety culture.
5. NRC staff will use a graduated or graded response to plant performance issues in evaluating a station's safety culture, consistent with the existing ROP.
6. NRC will rely on, to the extent practical, licensee and independent assessments of safety culture.
7. The approach will remain consistent with the existing ROP framework and, to the extent

practical, the existing ROP.
8. Consideration of how NRC staff will utilize the outputs of the allegation process as inputs to the assessment process is addressed outside of this initiative.

Safety Culture Assessment Process

The NRC assesses plant performance continuously and communicates its assessment of plant performance in letters to licensees, typically semi-annually. These assessment letters are available on the NRC website (www.nrc.gov) on the plant performance summary page for each licensee. More detailed information on the NRC's assessment process is available in IMC 0305, "Operating Reactor Assessment Program."

The NRC determines its regulatory response for each licensee in accordance with an Action Matrix that provides for a range of actions commensurate with the significance of the Performance Indicator (PI) and inspection results. For a plant that has all of its PIs and inspection findings characterized as green, the NRC will only implement its baseline inspection program. For plants that do not have all green PIs and inspection findings, the NRC will perform additional inspections and initiate other actions commensurate with the safety significance of the issues.

The proposed assessment process described in this paper addresses how NRC staff will consider safety culture principles and attributes within the ROP Action Matrix (License Response Column, Regulatory Response Column, Degraded Cornerstone Column, Multiple/Repetitive Degraded Cornerstone), up to and including the Multiple/Repetitive Degraded Cornerstone Column (Column 4).

Table 1 provides a summary of changes needed to the existing oversight process in terms of information sources, documentation, assessment, and follow-up.

Licensee Response Column

The Institute of Nuclear Power Operations (INPO) conducted a lessons-learned review as a result of the Davis-Besse head degradation issue. Sixteen improvement items were identified, covering each of the four cornerstone areas that INPO provides for the nuclear industry (evaluation, training and accreditation, operating experience, and assistance). INPO also issued Significant Operating Experience Report (SOER) 02-4 in 2002 as a result of the Davis-Besse head degradation incident. Each station, per the SOER recommendations, performed an assessment of its safety culture. INPO, through its evaluation process, has evaluated implementation of that

recommendation at each licensee station.

The SOER further recommended that, going forward, each licensee periodically conduct a safety culture assessment. Although the frequency of these evaluations may vary, these evaluations provide insights into the health of a station's safety culture at each licensee's facility.

INPO has established "*Principles for Effective Self Assessment and Corrective Action Programs."* This document is an industry standard for conduct of these important programs. Included in the principles for effective self-assessment programs is the following expectation:

> **Station management verifies that the issues are promptly entered into the corrective action program or other tracking system for resolution.**

The principles document further states that:

> ... tracking systems are periodically screened to preclude important problems that should be in the corrective action program from being reported instead to lower-tier tracking systems in which they may receive a lower level of analysis and corrective action.

Therefore, issues such as those likely to significantly affect or be driven by a licensee's safety culture would be handled within the licensee's corrective action program. These licensee assessments, as well as the results, are therefore available to the NRC staff during their Problem Identification & Resolution (PI&R) inspections. These assessments, along with resident and visiting inspector activities, provide the NRC a periodic opportunity to monitor the health of a licensee's safety culture.

In addition to licensee assessments, INPO performs plant evaluations on approximately a 2 year frequency. These evaluations are a comprehensive, INPO and industry peer team evaluation of plant performance that includes an assessment of the plant's adherence to key safety culture principles and attributes. This evaluation is performed as part of an assessment of each station's Organization Effectiveness, in accordance with INPO's Performance Objectives and Criteria.

INPO documents a summary of its evaluation regarding a station's safety culture in the Organizational Effectiveness Area Performance Summary for each plant. INPO's evaluation reports are not public documents. However, per the existing NRC/INPO Memorandum of Understanding, the NRC is afforded the opportunity to review these reports. This review also provides the NRC staff with insights into a plant's safety culture.

The above assessments provide the NRC staff with ongoing insights about a licensee's safety culture, providing for early indication of an eroding safety culture.

For its part, NRC has substantially revised and expanded its baseline inspection process to earlier detect performance that may be indicative of a degrading safety culture, including:

_ The staff revised IMC 0305 "Operating Reactor Assessment Program," on December 21, 2004, to provide more specific guidance for the determination of a substantive cross-cutting issue in the areas of human performance and problem identification and resolution.

_ The staff completed the implementation of several Davis-Besse Lessons Learned Task Force (DBLLTF) recommendations that relate to safety culture, including:

- DBLLTF Recommendation 3.2.5(2), "Revise inspection guidance to provide assessments of: (1) the safety implications of long-standing, unresolved problems; (2) corrective actions phased in over several years or refueling outages; and (3) deferred modifications."
- DBLLTF Recommendation 3.3.1(1), "Provide training and reinforce expectations to NRC managers and staff members to address the following areas... maintaining a questioning attitude in the conduct of inspections..."
- DBLLTF Recommendation 3.3.2(2), "Revise the overall PI&R inspection approach such that issues similar to those experienced at DBNPS are reviewed and assessed. Enhance the guidance for these inspections to prescribe the format of information that is screened when determining which specific problems will be reviewed."
- DBLLTF Recommendation 3.3.4(5), "Review the range of NRC baseline inspections and plant assessment processes, as well as other NRC programs, to determine whether sufficient programs and processes are in place to identify and appropriately disposition the types of problems experienced at DBNPS. Additionally, provide more structured and focused inspections to assess licensee's employee concerns programs and safety conscious work environment (SCWE)."

These changes provide insights into a station's safety culture while appropriately focusing on programs and equipment within the scope of the existing baseline inspection program.

Substantive Cross-Cutting Issues

The NRC monitors plants with substantive cross-cutting issues in accordance with Inspection Manual Chapter (MC) 0305. When a licensee is informed by the NRC that it has a substantive cross-cutting issue, the licensee should place the identified cross cutting issue in its corrective action program, perform an analysis of causes for the issue, and develop corrective actions.

Licensees should also enter the opportunities for improved performance identified during the above evaluation into the plant's corrective action program. The licensee's evaluation may be reviewed by the Region as part of the substantive cross-cutting issue closure process and documented in the next assessment letter.

Substantive cross-cutting issues may be identified by the staff for any licensee, regardless of their position in the Action Matrix. MC 0305 already requires that "If a substantive cross-cutting

issue is discussed in a mid-cycle or annual assessment letter, then the next annual or mid-cycle assessment letter should address the licensee's performance in this area.... The next mid-cycle or annual assessment letter will either state that the issue has been satisfactorily resolved and reference the inspection report that documented the follow-up or summarize the agency's assessment...as well as summarizing the licensee's progress in addressing the issue."

As discussed in MC 0305, the regional office may escalate actions for those plants where a substantive cross-cutting issue has been raised in at least two consecutive assessment letters. Because it is likely that a substantive cross-cutting issue would not be fully addressed within 6 months, for licensee's having the same substantive cross-cutting issue for 2 consecutive annual assessment letters, the staff should consider requesting the licensee to evaluate whether safety culture is a contributing cause to the substantive cross-cutting issue. If requested by the staff, the licensee's assessment should include an evaluation of the potential for Safety Culture principles using INPO's *"Principles for a Strong Nuclear Safety Culture"* which might have contributed to the cause of the issue and determine whether there are opportunities for improved performance relative to these principles.

Event Response

The NRC staff has several special inspection procedures. These procedures include actions taken in response to plant events (e.g., augmented inspection teams). A review of these procedures will be performed to look for opportunities to enhance these procedures with respect to oversight of safety culture.

Regulatory Response Column

As currently discussed in MC 0305, when a licensee's performance falls into the Regulatory Response Column, "the licensee is expected to place the identified deficiencies in its corrective action program and perform an evaluation of the root and contributing causes." The licensee enters the corrective actions identified during the above evaluation into the plant's corrective action program.

In accordance with MC 0305, the licensee's evaluation will be reviewed by the NRC during inspection procedure 95001, "Supplemental Inspection for One or Two White Inputs in a Strategic Performance Area." (no change from current process) This review enables the NRC to 1) consider whether safety culture principles and attributes played a role in declining plant performance (early NRC involvement and early detection of declining safety culture) and 2) ensures licensee actions are adequate to address any issues. No additional specific NRC actions

are considered necessary at this time. NRC staff actions will be in accordance with the existing process for action under the Regulatory Response Column as described in MC 0305.

Degraded Cornerstone Column

As currently discussed in MC 0305, when a licensee's performance falls within the degraded cornerstone column, "the licensee is expected to place the identified deficiencies in its corrective action program and perform an evaluation of the root and contributing causes for both the individual and the collective issues."

The licensee's root cause analysis should be formally assessed, considering applicable safety culture principles and attributes to determine if any of these may have substantially contributed to the cause of the issue and determine whether there are opportunities for improved performance relative to these principles and attributes. The assessment will consider relevant principles covered in the INPO document. The licensee should enter the opportunities for improved performance identified during the above evaluation into the plant's corrective action program. The assessment may be performed by an independent party.

In accordance with MC 0305, the NRC will review the licensee's evaluation during inspection procedure 95002, "Supplemental Inspection for One Degraded Cornerstone Or Any Three White Inputs in a Strategic Performance Area." (no change from current process)

In accordance with MC 0305, "an independent assessment of the extent of condition will be performed by the region using appropriate inspection procedures chosen from the tables contained in Appendix B to Inspection Manual Chapter 2515." (no change from current process)

As part of the NRC inspection follow-up, the NRC will review whether the licensee's evaluation appropriately evaluated the deficiencies, and the root/contributing causes for the deficiencies, and appropriately considered INPO's "Principles for a Strong Nuclear Safety Culture." MC 0305 should be changed to reflect this review.

NRC staff would proceed with the existing process for Degraded Cornerstone Column as described

in MC 0305. For example, per MC 0305, "Following completion of the inspection [95002], the Division Director or Regional Administrator should discuss the performance deficiencies and the licensee's proposed corrective actions with the licensee. The regulatory performance meeting will normally consist of a public meeting between the licensee and the appropriate Division Director (or Regional Administrator). (no change from current process)

Multiple/Repetitive Degraded Cornerstone Column

As currently discussed in MC 0305, when a licensee's performance falls within the multiple/repetitive degraded cornerstone column, "the licensee is expected to place the identified deficiencies in its corrective action program and perform an evaluation of the root and contributing causes for both the individual and the collective issues." This evaluation should consist of a third party assessment.

In addition to the licensee's root cause analysis, the NRC staff would mandate that the licensee perform an independent assessment of the licensee's Safety Culture using INPO's *"Principles for a Strong Nuclear Safety Culture."* Within 60 days of entering the Multiple/Repetitive Degraded Cornerstone Column, the licensee should initiate a plant safety culture assessment, with third party assistance, to determine whether plant management and personnel are operating the plant consistent with INPO's "Principles for a Strong Nuclear Safety Culture". The related assessment report will be made available for NRC review.

In accordance with MC 0305, the licensee's evaluation will be reviewed by the NRC during inspection procedure 95003, "Supplemental Inspection for Repetitive Degraded Cornerstones, Multiple Degraded Cornerstones, Multiple Yellow Inputs, Or One Red Input." NRC should revise IP 95003 so that it provides a more comprehensive, focused review of safety culture. MC 0305 should also be changed to include this activity.

SAFETY CULTURE ROP CHANGES
PROPOSAL

	XISTING	ROPOSED CHANGES
Information Sources	_ Inspectors complete inspections _ Inspectors complete Plant Status activities _ Inspectors identify cross-cutting aspects of findings _ NRC personnel investigate and/or inspect allegations	_ Plant status activities unchanged _ Inspectors identify cross-cutting aspects of findings unchanged _ NRC investigation and inspection of allegations unchanged _ Baseline inspection changes: Inspection Procedure 71152 (Problem Identification & Resolution) to ensure reviews of safety culture aspects and focus on better selection of sample size rather than safety culture components.
Documentation	_ NRC staff issues docketed correspondence	_ Staff still issues docketed correspondence (no change)
Assessment	accordance with MC 0305, NRC managers: _ Identify substantive cross-cutting issues _ Determine the appropriate response for plant performance	_ Adjust cross-cutting issue attributes to more closely align with what is important to safety culture, helping to ensure NRC staff addresses potential safety culture attributes as contributors to significant performance issues. _ Address how outputs of the allegation process are used as inputs to the assessment process (should be done as a separate issue)
Follow-up	accordance with MC 0305, NRC staff responds to performance issues in accordance with: _ The staff's evaluation of substantive cross-cutting issues	_ Revise with respect to substantive cross-cutting issues as follows: In the second annual assessment letter where a substantive cross-cutting issue still exists, a licensee may be asked

	_ The ROP Action Matrix	to perform a self-assessment to look for safety culture implications. _ To better assess plants in Column 2 (Regulatory Response Column), enhance Inspection Procedure (IP) 95-001 to validate that licensees have adequately addressed safety culture issues that may have been identified by their root cause evaluation. _ For plants in Column 3 (Degraded Cornerstone), enhance IP 95-002 to determine whether safety culture is a driver of performance problems. If so, develop an option to have licensees conduct an assessment of those safety culture attributes of concern. _ For plants in Column 4 (Multiple/Repetitive Degraded Cornerstone), enhance IP 95-003 to include an evaluation of safety culture components. Mandate that licensees have conducted an independent assessment of their safety culture and
		provide results to the NRC staff.