

## **SAFETY CULTURE COMPONENTS**

The following safety culture components were developed by the NRC safety culture working group based on the group's research of industry and international documents and the experience of the working group members. The information on safety culture gathered by the working group was screened to ensure that the information in the components is unambiguous, within NRC's regulatory purview, provided insights on the components through existing inspection techniques, and is generally applicable to reactor licensees. The NRC's components were compared to both industry and international safety culture attributes to ensure that the NRC staff fully captured concepts appropriate for NRC oversight. In an effort to utilize language and titles and nomenclature that are common with the industry, the working group compared the NRC's safety culture components to INPO's safety culture attributes and applicable sections of INPO's Performance and Objectives Criteria. Based on this review, some of the NRC's safety culture components were revised to be consistent with INPO's language, where appropriate. To address internal and external stakeholder feedback following the December 8, 2005 and December 15, 2005 public meetings, the working group further revised the safety culture components to enhance the concepts in the components and utilize language that would better facilitate use of the components under the reactor oversight process.

Work Control - Planning and coordinating work activities ensure nuclear safety. When planning work activities, personnel maintain awareness of the potential risks of work activities and recognize the possibility of mistakes and worst-case scenarios. When planning and coordinating work activities appropriately incorporate:

- risk insights,
- job site conditions which may impact human performance, equipment, and personnel nuclear safety
- task sequencing to optimize safety system availability,
- the impact of changes on the plant and human performance,
- the impact of the work on different job activities, and
- the need for planned contingencies, compensatory actions, and abort criteria.

In addition, work activities are planned to limit temporary modifications, operator work-arounds, safety systems unavailability, and reliance on manual actions. Maintenance scheduling is more predictive than reactive to support long-term equipment reliability. Personnel are kept apprised of work status, the operational impact of work activities, and plant conditions that may affect work activities.

Decision-Making - Decisions demonstrate that nuclear safety is an overriding priority. The authority for decisions affecting nuclear safety are formally defined, communicated to applicable personnel, and implemented as designed. Decisions are made using a systematic process, especially when faced with uncertain or unexpected plant conditions, to ensure safety is maintained. Conservative decision-making is demonstrated through using conservative assumptions and options being rejected based upon a requirement to demonstrate that the action is safe rather than a requirement to prove it is unsafe. Decisions consider risk insights and potential consequences and contingencies and maintain design margins and long-term equipment reliability. Interdisciplinary input and reviews are obtained on safety-significant or risk-significant decisions, and the results of decisions are communicated to personnel who have a need to know the information in order to perform work safely, in a timely manner. Effectiveness reviews of safety-significant decisions are conducted to verify the validity of the

underlying assumptions, identify possible unintended consequences, and determine how to improve future decisions.

Work Practices - Human error prevention techniques are communicated, understood, and used commensurate with the risk of the assigned task, such that work activities are performed safely. Error-free human performance is supported by pre- and post-evolution briefings, as appropriate, correct labeling of components, and communications on the status of activities, including any changes. Procedural compliance is defined, communicated, understood and procedures are followed by personnel. There is supervisory and management oversight of work activities such that nuclear safety is supported and human performance, including fitness for duty, is monitored and opportunities for improvement are addressed. Work groups maintain interfaces with offsite organizations, and communicate, coordinate, and cooperate with each other during activities in which interdepartmental coordination is necessary to assure plant and human performance. Personnel do not proceed in the face of uncertainty or unexpected circumstances.

Resources - Personnel, equipment, programs, procedures, and other resources are available and adequate to assure nuclear safety, including those necessary for:

- physical improvements,
- minimization of long-standing equipment issues,
- work packages
- sufficient qualified personnel to maintain work hours within working hours guidelines,
- training of personnel,
- optimization of maintenance and engineering backlogs,
- complete, accurate and up-to-date design documentation,
- simulator fidelity and availability, and
- emergency facilities and equipment

Operating experience - Relevant internal and external operating experience (OE) is systematically collected, evaluated, and communicated to affected internal and external stakeholders in a timely manner. Lessons learned from OE are institutionalized through changes to station processes, procedures, equipment, and training programs. Relevant OE information is reviewed before conducting risk-significant work.

Self- and Independent Assessments - Self- and independent assessments of the organization's activities and practices are conducted to assess performance and identify areas for improvement. Self-assessments are conducted at an appropriate frequency, are of sufficient depth, are comprehensive, are appropriately objective, and are self-critical. Results from assessments are coordinated, communicated to affected personnel, and corrective actions are taken to address issues commensurate with their significance. The effectiveness of oversight groups and programs such as CAP are periodically assessed. Individuals assigned to perform assessments have the necessary training, skills, and authority. Safety indicators which provide an accurate representation of performance are tracked and trended, and appropriate corrective actions are taken.

Corrective Action Program - Safety problems are identified with a low threshold. Such problems are identified completely, accurately, and in a timely manner commensurate with their safety significance. Conditions adverse to quality are properly classified, prioritized, and evaluated for operability and reportability.

Problems are thoroughly evaluated such that the resolutions address the root and contributing causes and extent of conditions. For significant problems, effectiveness reviews of corrective actions are conducted to ensure that the problems are resolved. Skilled, knowledgeable personnel perform causal analyses and event investigations. Problem and corrective action backlogs are kept low enough to permit response to issues of safety significance in a timely manner.

Information from the CAP and other assessments is periodically trended and assessed in the aggregate to identify programmatic and common cause problems. The results of the trending are communicated to applicable personnel and potential conditions adverse to quality are entered into the CAP. Actions to address safety issues and adverse trends are taken in a timely manner, commensurate with their safety significance and complexity. If an alternative process (i.e., a process for raising concerns that is an alternate to the licensee's corrective action program or line management) for raising safety concerns exists, then it results in appropriate and timely resolutions of identified problems.

Willingness to raise concerns - Behaviors and interactions encourage free flow of information related to raising nuclear safety issues, differing professional opinions, and identifying issues in the CAP and through self assessments. Past behaviors, actions, or interactions that may discourage the raising of such issues are actively mitigated. Personnel communicate conditions or behaviors that may impact safety freely and openly. Supervisors are skilled in responding to employee safety concerns in an open, honest manner, and non-defensive manner. Complete, accurate, and forthright information is provided to oversight, audit, and regulatory organizations. Personnel raise nuclear safety issues without fear of retaliation. If an alternative process (i.e., a process for raising concerns that is an alternate to the licensee's corrective action program or line management) for raising safety concerns exists, then it is communicated, accessible, confidential, and independent.

Preventing and detecting retaliation - The zero tolerance policy for harassment and retaliation for raising nuclear safety concerns is consistently enforced. All personnel understand that harassment and retaliation are not tolerated. Claims of discrimination are fully investigated and any necessary corrective actions taken. The potential chilling effects of disciplinary actions are considered and compensatory actions are taken when appropriate.

Safety policies - Formal safety policies and training establish and reinforce that nuclear safety is an overriding priority. These policies and initial and recurring training require and reinforce that individuals understand their rights and responsibilities to raise nuclear safety issues through a variety of avenues, including avenues outside their organizational chain of command and to external agencies. Individuals also understand their responsibility to clearly communicate nuclear safety issues and participate in the resolution of such issues. The policies reflect that individuals shall not be harassed or retaliated against for raising nuclear safety issues, regardless of the avenue they choose. The effectiveness of the formal policies and training is assessed and actions are taken to address any negative trends identified. Formal organizational policies and goals address the proper role of safety considerations in the organization's decision-making. Organizational decisions and personnel behaviors at all levels of the organization reinforce and are consistent with the formal policies. Production, cost and schedule goals are developed, communicated, and implemented in a manner that reinforces the importance of nuclear safety. Senior managers and corporate personnel periodically communicate and reinforce nuclear safety such that personnel understand that safety is of the highest priority.

Accountability - The line of authority and responsibility for nuclear safety is defined. Accountability is maintained for important safety decisions. Management reinforces safety standards, provides oversight in the field, particularly during infrequently performed or safety significant evolutions, and consistently displays behaviors that reflect safety as an overriding priority. Staff demonstrate a proper safety focus and reinforce safety principles among their peers. The system of rewards and sanctions is aligned with strong nuclear safety policies and reinforces behaviors and outcomes which reflect safety as an overriding priority.

Organizational change management - Decisions related to major changes in organizational structures and functions, leadership, policies, programs, procedures, and resources incorporate safety considerations in decision making and are communicated effectively to affected personnel. A systematic process is used for planning, coordinating, and evaluating the safety impact of organizational changes and to identify potential unintended consequences of such changes.

Continuous learning environment - Adequate training and knowledge transfer are available to all personnel on site to ensure technical competency. Personnel benchmark actively, are receptive to feedback, and continuously strive to improve their knowledge, skills, and safety performance. Communication is effective for transmitting information learned from internal and external sources about industry and plant issues.