U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

SAFETY CULTURE TRAIT TALK

Issue 6 **December, 2014**

Trait Talk *was developed to provide you with a better understanding of the nine safety culture traits found in the U.S. Nuclear Regulatory Commission's (NRC) Safety Culture Policy Statement (SCPS) and how they apply to you—whether you are an NRC licensee, a vendor or contractor employee, an organization interested in the safe and secure use of nuclear materials, or others involved in nuclear safety regulation. Please see page 4 of Safety Culture Trait Talk for more information on the SCPS.*

Experience has shown that certain personal and organizational traits are present in a positive safety culture. A trait, in this case, is a pattern of thinking, feeling, and behaving that emphasizes safety, particularly in goal conflict situations, for example, in situations where production, schedule, or just the cost of effort may conflict with doing the job safely. The NRC identified nine traits of a positive safety culture in the SCPS, although the agency recognizes that additional traits may also be important. In addition, please note that the traits were not developed to be used for inspection purposes.

Each Trait Talk includes a fictional scenario based on a different licensee or community. The scenario used in this Trait Talk is based on the fuel cycles community.

As you read through Trait Talk, consider the following questions:

1. *How does this trait apply to my organization?*
2. *Are there other attributes and examples that better fit my organization?*
3. *What impact does this trait have on the safety culture in my organization?*
4. *How does this increase my understanding of the safety culture in my organization?*
5. *How could I improve the performance of this trait in my organization?*

Effective Safety Communication

One of the traits of a positive safety culture as described in the U.S. Nuclear Regulatory Commission's Safety Culture Policy Statement.

What Is The Definition Of Effective Safety Communication?

The NRC's SCPS defines Effective Safety Communication as communications that maintain a focus on safety.

Why Is This Trait Important?

Effective safety communication is vital to maintaining a safety culture. When employees regularly communicate with each other in an open, respectful manner, they are also more willing to give and receive feedback. Effective communication also supports teamwork and coordination between groups.

Employees learn about, and become part of, an organization's safety culture through communication. Lack of clear communication from management can result in situations where managers say one thing but do another. Employees then spend time and energy trying to interpret the conflicting messages. In such situations, employees will generally interpret a manager's behavior as the more valid indicator of the organization's values and priorities. Persistent mismatches between formal and informal communications can lead employees to disregard or develop a cynical view of formal communications. This can lead to ineffective formal communications from management and a weakened safety culture.

Top-down communication is most effective when senior managers communicate directly with immediate supervisors and immediate supervisors communicate with their staff. Ensuring that supervisors are informed about organizational issues, and then allowing them to communicate these issues to their staff, helps create and reinforce the supervisor's power. Research shows that when employees perceive their supervisor as having power, employees have greater trust in their supervisor, greater desire to communicate with their supervisor, and are more likely to believe the information coming from their supervisor.

Upward communication from workers to managers, and information exchange among workers, is essential for organizational learning and safe operations. An employee's perceptions about support for safety can strongly influence his or her willingness to speak up. Some common barriers to upward communication include fear of retaliation, concerns that the communication will be filtered as it goes up the chain of command, perceptions that management is resistant to critical feedback, and fear of creating interpersonal conflict. These communication barriers, if unaddressed, can have a negative impact on information exchange, organizational learning, and ultimately safe performance. To facilitate effective upward communication, it is important for managers to create an environment that is supportive, encouraging, and accepting of both positive and negative feedback, so employees always feel free to speak up.

WHAT DOES THIS TRAIT LOOK LIKE?

Work Process Communications: Individuals incorporate safety communications in work activities.

Communications within work groups are timely, frequent, and accurate. Work groups and supervisors communicate with other work groups and supervisors during the performance of their work activities. Individuals communicate with each other such that everyone has the information necessary to accomplish work activities safely and effectively. Communications during shift turnovers and pre-job briefings provide information necessary to support nuclear safety. Work groups integrate nuclear safety messages into daily activities and meetings.

Bases for Decisions: Leaders ensure that the bases for operational and organizational decisions are communicated in a timely manner.

Leaders promptly communicate expected outcomes, potential problems, planned contingencies, and abort criteria for important decisions. Leaders share information on a wide range of issues with individuals and periodically verify their understanding of the information. Leaders take steps to avoid unintended or conflicting messages that may be conveyed by decisions. Leaders encourage individuals to ask questions if they do not understand the basis of a management decision. Executives and senior managers communicate the reasons for resource allocation decisions, organizational changes, and other decisions affecting the organization as a whole, including the safety implications of those decisions.

Free Flow of Information: Individuals communicate openly and candidly, both up, down, and across the organization and with oversight, audit, and regulatory organizations.

Leaders encourage the free flow of information. Individuals share information openly and candidly. Leaders respond to individuals in an open, honest, and non-defensive manner. Individuals provide complete, accurate, and forthright information to oversight, audit, and regulatory organizations. Leaders actively solicit feedback, listen to concerns, and communicate openly with all individuals. Leaders candidly communicate the results of monitoring and assessments throughout the organization and with independent oversight organizations.

Expectations: Leaders frequently communicate and reinforce the expectation that nuclear safety is the organization's overriding priority.

Executives and senior managers communicate expectations regarding nuclear safety so that individuals understand that safety is the highest priority. Executives and senior managers implement a strategy of frequent communication using a variety of tools to reinforce that nuclear safety is the overriding priority. Executives and senior managers reinforce the importance of nuclear safety by clearly communicating its relationship to strategic issues, including budget, workforce planning, equipment reliability, and business plans. Leaders communicate desired safety behaviors to individuals, providing examples of how behaviors positively or negatively affect nuclear safety. Leaders routinely verify that communications on the importance of nuclear safety have been heard and understood. Leaders ensure supplemental personnel understand expected behaviors and actions necessary to maintain nuclear safety.

WHAT IS A SCENARIO IN WHICH THIS TRAIT COULD PLAY A ROLE?

Fuel fabrication facilities monitor many of the processes of plant operations that use special nuclear material from the control room. This monitoring allows qualified operators to identify process deviations or system problems when processes are not working as intended or there are equipment malfunctions. During one shift, an operator noticed a slight decrease in the solution level inside the extraction column of the uranium recovery process. The operator was not properly trained for recognizing the possible scenarios and the required actions for seeing such level fluctuation in the panel. The operator sent an employee for a visual check of the extraction system equipment. That employee found a small amount of liquid on the floor near the extraction column level control valve and assumed it was a leaking valve stem near the control valve. The employee communicated to the control room that everything was okay. During the next shift, a second operator continued to see a level deviation in the monitor of the extraction column process area and notified his supervisor. The supervisor immediately inspected the system components and identified a leak in the extraction column piping which resulted in a spill of high-enriched uranium solution with the potential of causing an inadvertent criticality accident.

A criticality accident is an uncontrolled, sustained, nuclear chain reaction that occurs in an unsafe geometry containing fissile material. The sudden release of heat, neutrons, and gamma radiation associated with an inadvertent criticality accident may be lethal to nearby personnel. Criticality safety and the prevention of accidental criticality depend on a number of factors which are not production parameters: material enrichment, geometry, reflection, moderation, and other conditions. After communicating with the responsible individuals, the spill was handled in accordance with plant procedures and no inadvertent criticality occurred.

The lack of communications in this scenario resulted in an increased potential for a criticality accident. The risk of an inadvertent criticality accident could have been significantly lower had the operator in the first shift communicated the need for additional training and communicated the level fluctuation he identified to the supervisor. The risk of a potential occupational exposure could also have been significantly lower had the employee who first inspected the system notified the operator and supervisors about the small spill so it could have been immediately addressed. Communications that maintain a focus on safety are essential for the safe handling of special nuclear material and for the protection of the workers, the public and the environment.

Thinking about the scenario discussed above, consider the following questions:

1. How does this scenario apply to the safety culture trait Effective Safety Communication?
2. What kinds of communications would have reinforced safety as the overriding priority?
3. How could this situation have been handled differently?

WHO CAN I CONTACT WITH A QUESTION OR SUGGESTION?

The NRC looks forward to continuing to provide you with information about the traits of a positive safety culture. If you have a question or would like to make a suggestion, please contact the U.S. Nuclear Regulatory Commission, Office of Enforcement, Safety Culture Team, at external_safety_culture.resource@nrc.gov.

Sources of Information:

1 "Why is this trait important?" was derived, in part, from a literature review (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13023A054) prepared by Pacific Northwest National Laboratories for the NRC Office of Nuclear Regulatory Research.

2 "What does this trait look like?" was derived from the Safety Culture Common Language effort (ADAMS Accession No. ML13031A343), under the direction of the Office of Nuclear Reactor Regulation. Panelists from the NRC, nuclear power industry, and the public created attributes of a positive nuclear safety culture, and examples of each attribute that a nuclear power organization should demonstrate in maintaining a positive safety culture. Although these attributes and examples were created specifically for the reactor community, they may also be applicable to various other communities and organizations. For purposes of Trait Talk, the examples were partially rewritten to increase applicability to nuclear as well as non nuclear communities.

3 "What is a scenario in which this trait played a role?" was developed specifically for Safety Culture Trait Talk for educational purposes only. The scenario is fictional and any resemblance to actual events, people, or organizations is purely coincidental.

WHAT IS THE NRC'S SAFETY CULTURE POLICY STATEMENT?

There are many definitions of safety culture. Most of these definitions focus on the idea that in a positive safety culture individuals and organizations emphasize safety over competing goals, such as production or costs, ensuring a safety-first focus. The NRC's SCPS defines nuclear safety culture as ***the core values and behaviors resulting from a collective commitment by leaders and individuals to emphasize safety over competing goals to ensure protection of people and the environment.*** Experience has shown that certain personal and organizational traits are present in a positive safety culture. The following traits were included in the NRC's SCPS, although additional traits may also be important in a positive safety culture:

Leadership Safety Values and Actions	Problem Identification and Resolution	Personal Accountability
Leaders demonstrate a commitment to safety in their decisions and behaviors.	*Issues potentially impacting safety are promptly identified, fully evaluated, and promptly addressed and corrected commensurate with their significance.*	*All individuals take personal responsibility for safety.*
Work Processes	**Continuous Learning**	**Environment for Raising Concerns**
The process of planning and controlling work activities is implemented so that safety is maintained.	*Opportunities to learn about ways to ensure safety are sought out and implemented.*	*A safety conscious work environment is maintained where personnel feel free to raise safety concerns without fear of retaliation, intimidation, harassment or discrimination.*
Effective Safety Communications	**Respectful Work Environment**	**Questioning Attitude**
Communications maintain a focus on safety.	*Trust and respect permeate the organization.*	*Individuals avoid complacency and continually challenge existing conditions and activities in order to identify discrepancies that might result in error or inappropriate action.*

The NRC's SCPS provides the NRC's expectation that individuals and organizations performing regulated activities establish and maintain a positive safety culture commensurate with the safety and security significance of their activities and the nature and complexity of their organizations and functions. Because safety and security are the primary pillars of the NRC's regulatory mission, consideration of both safety and security issues, commensurate with their significance, is an underlying principle of the SCPS.

The NRC's SCPS applies to all licensees, certificate holders, permit holders, authorization holders, holders of quality assurance program approvals, vendors and suppliers of safety-related components, and applicants for a license, certificate permit, authorization, or quality assurance program approval subject to NRC authority. In addition, the Commission encourages the Agreement States (States that assume regulatory authority over their own use of certain nuclear materials), their licensees, and other organizations interested in nuclear safety to support the development and maintenance of a positive safety culture within their regulated communities. The SCPS is not a regulation; therefore, it is the organization's responsibility, as part of its safety culture program, to consider how to apply the SCPS to its regulated activities.

The NRC's SCPS, which includes the definition of nuclear safety culture and the nine traits of a positive safety culture, can be found on the NRC's Safety Culture Web site. The Web site includes additional safety culture information, as well as the NRC safety culture case studies, which describe how the presence or absence of safety culture traits affects the outcome of the events.