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

SAFETY CULTURE TRAIT TALK

Issue 3 **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 materials 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?*

Questioning Attitude

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 Questioning Attitude?

The NRC's SCPS defines Questioning Attitude as when individuals avoid complacency and continuously challenge existing conditions and activities in order to identify discrepancies that might result in error or inappropriate action.

Why Is This Trait Important?

The NRC has identified complacency as a key contributor to many incidents involving nuclear materials, such as the Davis-Besse nuclear power plant reactor vessel head degradation event and the Pennsylvania cancer treatment center event in which a patient died of radiation exposure. Avoiding complacency is essential to ensuring nuclear safety and can be achieved by instilling a questioning attitude in every employee. From the operator at a nuclear power plant challenging an assumption, to the medical physicist in a cancer treatment center questioning an unexpected change in treatment parameters, having a questioning attitude is vital for the safe use of nuclear materials and a positive safety culture.

It is each individual's responsibility to continuously assess his or her duties, procedures, and job site to identify inconsistencies or abnormalities. Challenging assumptions, stopping work in the face of uncertainty, and proactively anticipating what may go wrong during a prejob brief reflect a questioning attitude and a positive safety culture. Employees should routinely and actively ask the following questions as they perform their jobs: Am I doing the right thing? How could we do this better? Are we using the right assumptions? Are we putting our people, plant, or patients at risk? What new practices could we implement that would minimize complacency and encourage a questioning attitude?

Recognizing that external and internal conditions change over time, leaders must also continuously assess the organization or operation in its entirety, look beyond the individual task, and ask questions to ensure they understand what is currently happening and what might go wrong. As leaders ask questions and encourage others to do the same, the importance of having a questioning attitude will be reinforced throughout the organization. Leaders should consistently reward employees for asking questions and routinely discuss actual situations where a questioning attitude helped achieve a positive outcome.

A positive safety culture requires the collective commitment by both leaders and employees to emphasize safety over competing goals. A questioning attitude supports that commitment.

WHAT DOES THIS TRAIT LOOK LIKE?

Nuclear is Recognized as Special and Unique: Individuals understand that complex technologies can fail in unpredictable ways.

The organization ensures that activities that could affect nuclear materials are conducted with particular care, caution, and oversight. Individuals recognize the special characteristics and unique hazards of nuclear technology, including radioactive byproducts, and the importance of features designed to maintain nuclear safety. Executives and senior managers ask probing questions to understand the implications and consequences of anomalies, and challenge managers to ensure degraded conditions are fully understood and appropriately resolved, especially those involving equipment important to nuclear safety.

Challenge the Unknown: Individuals stop when faced with uncertain conditions. Risks are evaluated and managed before proceeding.

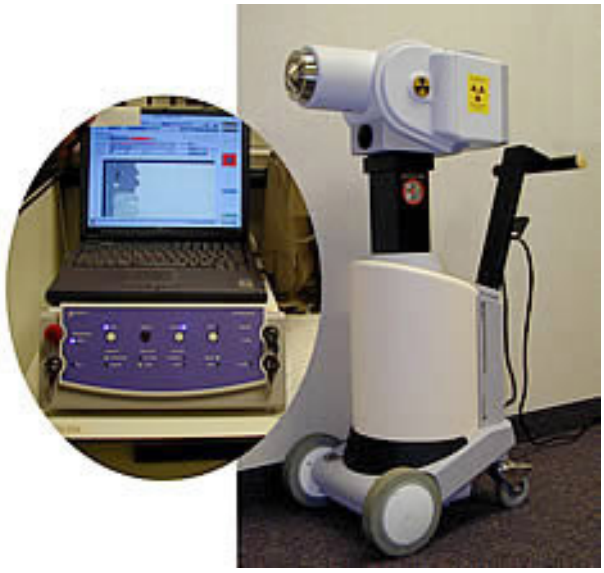
Leaders reinforce expectations that individuals take the time to do the job right the first time, seek guidance when unsure, and stop if an unexpected condition or equipment response is encountered. Individuals maintain a questioning attitude during pre-job briefings and job-site reviews to identify and resolve unexpected conditions. Individuals challenge unanticipated test results rather than rationalizing them. For example, abnormal indications are not automatically attributed to indication problems but are thoroughly investigated before activities are allowed to continue. Individuals stop work activities when confronted with an unexpected condition, communicate with supervisors, and resolve the condition prior to continuing work activities. When appropriate, individuals consult system and equipment experts. If a procedure or work document is unclear or cannot be performed as written, individuals stop work until the issue is resolved.

Challenge Assumptions: Individuals challenge assumptions and offer opposing views when they think something is not correct.

Leaders solicit challenges to assumptions when evaluating nuclear safety issues. Individuals ask questions to fully understand the bases of operational and management decisions that appear to be contrary to nuclear safety, and managers question assumptions, decisions, and justifications that do not appear to consider impacts to nuclear safety sufficiently.

Avoid Complacency: Individuals recognize and plan for the possibility of mistakes, latent problems, and inherent risk, even while expecting successful outcomes.

The organization is aware that latent conditions can exist, addresses them as they are discovered, and considers the extents of the conditions and their causes. Prior to authorizing work, individuals verify procedure prerequisites are met rather than assuming they are met based on general work site conditions. Individuals perform a thorough review of the work site and the planned activity every time work is performed rather than relying on past successes and assumed conditions, and they consider potential undesired consequences of their actions prior to performing work and implement appropriate error reduction tools. Leaders ensure specific contingency actions are discussed and understood during job planning and pre-job briefings.



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

A hospital was conducting a cancer treatment with a high-dose rate brachytherapy remote afterloading system using an iridium-192 source. Just prior to the cancer treatment, the hospital had replaced the source and upgraded the software. When entering the data into the treatment system, the medical physicist was unable to electronically transfer the patient's treatment plan from the planning system to the treatment system due to an error message. After several failed attempts by staff, the medical physicist entered the treatment plan manually into the treatment systems control console, rather than question why he was seeing the error message. Due to a bug in the software upgrade, the treatment system software created an unexpected source step size change in the treatment parameters. When the medical physicist entered the data manually for the source dwell times, the software automatically changed the entered data to the default parameters for the source step size. The medical physicist faced an unexpected condition with the software error, and failed to recognize the change in the source step size. The patient was then treated with a mispositioned source. The medical physicist failed to verify that the treatment computer system was correct after data entry and prior to treatment. As a result, the patient received a radiation dose to tissue outside the treatment area and an underdose to the treatment site. In addition, the hospital failed to follow its procedure of performing an independent review of the treatment plan prior to patient treatment.

This scenario illustrates equipment (software) errors as the initial precipitating event. Had the medical physicist used a questioning attitude, he could have identified the equipment failure and the hospital could have corrected this failure before treating the patient.

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

1. How does this scenario apply to the safety culture trait Questioning Attitude?
2. What kinds of actions and behaviors would have reinforced safety as the overriding priority?
3. How could this situation have been prevented?

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.