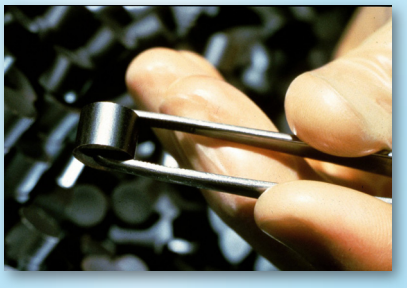
U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

SAFETY CULTURE



An Educational Resource About The NRC's Safety Culture Policy Statement

NRC Licensees, Applicants and Vendors

The Commission expects that individuals and organizations establish and maintain a positive safety culture. This includes 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.

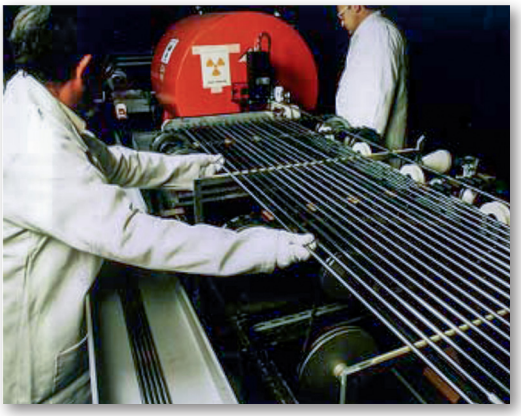
Agreement States and Their Licensees

The Organization of Agreement States supports the use of this educational resource by its members and licensees. The Commission encourages the Agreement States, Agreement State licensees and other organizations interested in nuclear safety to support the development and maintenance of a positive safety culture.

U. S. NUCLEAR REGULATORY COMMISSION

MISSION

The mission of the NRC is to license and regulate the Nation's civilian use of byproduct, source, and special nuclear materials to protect public health and safety, promote the common defense and security, and protect the environment.



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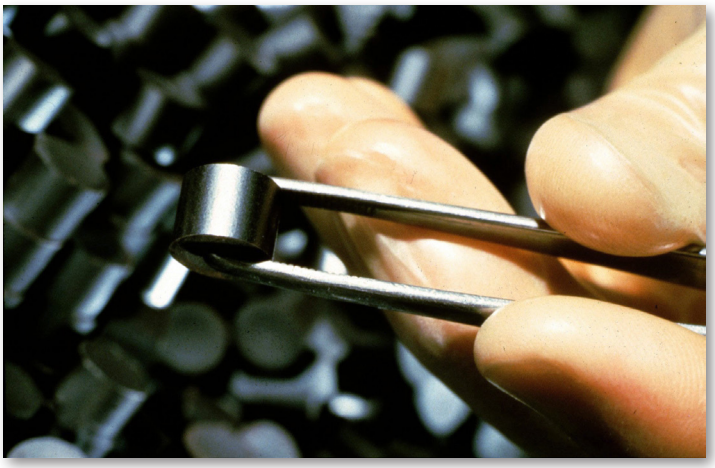

INTRODUCTION

The U.S. Nuclear Regulatory Commission (NRC) published the Safety Culture Policy Statement (SCPS) in 2011, and developed numerous educational tools to facilitate understanding of the importance of a positive safety culture. The SCPS and the education tools—including the nine Safety Culture Trait Talks, Safety Culture Case Studies, and a Safety Culture Journey—can be found on the Web site at http://www.nrc.gov/about-nrc/safety-culture.html.

This educational resource provides an extra level of understanding of the SCPS and the nine safety culture traits by focusing on the educational tools collectively rather than individually. To facilitate this comprehensive understanding of the SCPS and traits, this document includes a brief overview of the SCPS, with the *Federal Register* notice (FRN) of the Final Safety Culture Policy Statement attached in the appendix. It also includes reformatted Safety Culture Trait Talks, which describe each safety culture trait, including why each trait is important, examples of attitudes and behaviors that apply to each trait, and an illustrative scenario showing how each trait could play a role in organizational events. Finally, the authors reformatted and included one Safety Culture Case Study and one Safety Culture Journey to further illustrate the importance of a positive safety culture. The Case Study discusses an accident that resulted, in part, from the absence of positive safety culture traits. The Journey illustrates this same organization's response to the accident depicted in the case study and demonstrates the efforts it made to improve its safety culture. To help reflection and dialogue, each Trait Talk, Case Study, and Journey includes a series of questions, with space provided to take notes and record answers.

The NRC encourages all applicants for and holders of licenses and certificate holders, the Agreement States and their licensees, and vendors and suppliers to establish and maintain a positive safety culture. This educational resource applies to all of these communities as the lessons learned from one organization's accident, and the actions taken in response to the accident, can always be considered and applied to another. Finally, each of the nine safety culture traits and their behaviors and attitudes are applicable to a wide range of organizations as well.

The NRC will continue to provide information about the importance of a positive safety culture. If you have a question or would like to make a suggestion, please contact the NRC, Office of Enforcement, Safety Culture Team, at external_safety_culture.resource@nrc.gov.

OVERVIEW

Background: The 1986 nuclear accident at the Chernobyl nuclear power plant in Ukraine revealed the impact that weaknesses in safety culture can have on safety. Since then, the influence of safety culture has been further demonstrated by a number of significant events in the United States and internationally. Assessments of these events revealed that the absences of the traits of a positive safety culture was an underlying cause or increased the severity of the event.

The NRC addressed aspects of safety culture in two previously issued policy statements. The "Policy Statement on the Conduct of Nuclear Power Plant Operations," (published in 1989) states the NRC's expectations that licensed operators and managers of nuclear power plants conduct themselves professionally to ensure safety. In 1996, the NRC published "Freedom of Employees in the Nuclear Industry to Raise Safety Concerns without Fear of Retaliation," a policy statement that applies to the regulated activities of all NRC licensees and their contractors. It provides the expectation that licensees and employers subject to NRC authority establish and maintain work environments where employees feel free to raise safety concerns without fear of retaliation (referred to as a safety conscious work environment). A safety conscious work environment is included in the SCPS as one of the traits: Environment for Raising Concerns.

Safety Culture Policy Statement: In 2011, the NRC published the SCPS (76 FR 34773; June 14, 2011) (see Appendix) which sets forth the 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.

This policy statement 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.

Because safety and security are the primary pillars of the NRC's regulatory mission, consideration of both is an underlying principle of the Safety Culture Policy Statement. Organizations should ensure that personnel in the safety and security sectors appreciate the importance of each, emphasizing the need for integration and balance to achieve both safety and security in their activities.

Industry experience has shown the value of establishing and maintaining a positive safety culture. It is important to remember that individuals and organizations performing regulated activities bear the primary responsibility for safety and security. The Safety Culture Policy Statement is not a regulation; therefore, it is the regulated entities' responsibility to consider how to apply this policy statement to its regulated activities.

DEFINITION AND TRAITS

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. A trait, in this case, is a pattern of thinking, feeling, and behaving that emphasizes safety, particularly in goal conflict situations, e.g., production vs. safety, schedule vs. safety, and cost of the effort vs. safety. It is the Commission's expectation that all organizations and individuals overseeing or performing regulated activities involving nuclear materials should take the necessary steps to promote a positive safety culture by fostering these traits. 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.*

TRAIT TALK OVERVIEW

The Safety Culture Trait Talks were developed to offer a better understanding of the nine safety culture traits found in the SCPS and how they apply to you—whether you are an NRC employee interacting with an external stakeholder, 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. 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.

The nine individual Trait Talks are available on the Web site, as noted in the Introduction. However, for purposes of this document, they have been reformatted and included in the following pages. Each Trait Talk contains information on why the trait is important and what it looks like. In addition, each Trait Talk includes a fictional scenario based on a different licensee or community:

TRAIT	LICENSEE OR COMMUNITY SCENARIO
Leadership Safety Values and Actions	Power Reactors
Work Processes	Radiography
Questioning Attitude	Medical/Brachytherapy
Problem Identification and Resolution	Power Reactors
Environment for Raising Concerns	Research Reactors
Effective Safety Communication	Fuel Cycles
Respectful Work Environment	Gauges
Continuous Learning	Construction
Personal Accountability	Vendors

It is important to remember that a scenario that depicts a certain community or organization can be applicable to any organization. The important piece to understand is how the presence or absence of safety culture traits can mitigate the consequences of, or contribute to, an event or accident. Reflection on these scenarios should focus on how the safety culture traits are visible in your own organization and what traits might be weak or missing. For example, don't assume that "this can't happen here" because your organization doesn't have the same work processes. Rather, consider how your organization's work processes could potentially allow an event or accident to occur because of a lack of focus on safety culture.

Note: In the following pages, the superscripts refer to the Sources of Information on page 51.

LEADERSHIP SAFETY VALUES AND ACTIONS

What Is The Definition Of Leadership Safety Values And Actions?

The NRC's SCPS defines Leadership Safety Values and Actions as when leaders demonstrate a commitment to safety in their decisions and behaviors.

Why Is This Trait Important?

Leaders perform essential functions in organizations. The quality and actions of leadership have widespread consequences for an organization's safety culture and its performance. Leaders have significant power to affect an organization's safety culture through the priorities they establish, the behaviors and values they model, the reward systems they administer, the trust they create, and the context and expectations they establish for interpersonal relationships, communication, and accountability. Leaders also exert significant influence on change initiatives. They have the power and responsibility to set strategy and direction, align people and resources, motivate and inspire people, and ensure that problems are identified and solved in a timely manner. A lack of commitment or clear communication about what is important to the organization can create a conflict for employees who must then decide between competing messages. This leads employees to their own interpretations, thereby potentially negatively affecting the organization's safety culture. It is clear that behavior matters and leadership behaviors that support a positive safety culture are critical.

Leaders at all levels play an important role in establishing the organization's environment and safety culture. This is evident in the manner in which competing goals that occur at every level of the organization are managed. There may be conflicting demands from a cost and schedule perspective versus safety and quality. The organization's members may face these competing goals on a daily basis. These decisions may occur at all levels of the organization, not just at the top. Each employee may encounter his or her version of these conflicts and will be faced with making decisions as he or she engages in activities to resolve them. The organization's safety culture plays a significant role in guiding employees' decisions; in other words, what they view as the organization's priorities. Is the organization's priority safety or production? This is one of the important junctions where leadership at the top of the organization is critical in setting the standards and establishing overarching safety priorities that all employees understand take precedence over all competing demands.[1]

What Does This Trait Look Like?

Resources: Leaders ensure that personnel, equipment, procedures, and other resources are available and adequate to support safety.

Leaders ensure that staffing levels are sufficient and personnel are qualified for the work they are performing. Leaders ensure that facilities are maintained and tools, equipment, procedures, and other resources are readily available to support work performance. Finally, leaders ensure that sufficient corporate resources are allocated for maintenance, equipment, and personnel to ensure safe and reliable operation.

Field Presence: Leaders are commonly seen in working areas of the organization observing, coaching, and reinforcing standards and expectations. Deviations from standards and expectations are corrected promptly.

Leaders ensure sufficient oversight of work activities. They practice visible leadership in the field by coaching, mentoring, reinforcing standards, and reinforcing positive decisionmaking practices and behaviors. Leaders discuss their observations in detail with the group they observed and provide useful feedback about how to improve individual performance. They model safe behaviors and high standards of accountability as a way to encourage others.

Incentives, Sanctions, and Rewards: Leaders ensure incentives, sanctions, and rewards are aligned with safety policies and reinforce behaviors and outcomes that reflect safety as the overriding priority.

Leaders ensure disciplinary actions are appropriate, consistent, and support safety and a safety conscious work environment. They reward individuals who identify and raise issues affecting safety and praise behaviors that reflect a positive safety culture. Leaders foster an environment that promotes accountability and hold individuals accountable for their actions. Leaders consider potential chilling effects when taking disciplinary actions and other personnel actions, and they take compensatory actions when appropriate.

Strategic Commitment to Safety: Leaders ensure priorities are aligned to reflect safety as the overriding priority.

Leaders develop and implement cost and schedule goals in a manner that reinforces the importance of safety. Information from independent oversight organizations is used to help establish priorities that align with safety. Leaders establish strategic and business plans that reflect safety as the overriding priority and ensure that corporate priorities also align with safety priorities.

Change Management: Leaders use a systematic process for evaluating and implementing change so that safety remains the overriding priority.

Leaders use a systematic process for planning, coordinating, and evaluating the safety impacts and potential negative effects on the willingness of individuals to raise safety concerns, when making major changes. This includes decisions concerning changes to organizational structure and functions, leadership, policies, programs, procedures, and resources. Leaders ensure safety is maintained when planning, communicating, and implementing change and ensure that significant unintended consequences are avoided. Leaders ensure that individuals understand the importance of, and their role in, the change management process.

Roles, Responsibilities, and Authorities: Leaders clearly define roles, responsibilities, and authorities to ensure safety.

Leaders ensure roles, responsibilities, and authorities of executives, senior managers, and corporate managers are clearly defined, understood, and documented. They appropriately delegate responsibility and authority to promote ownership and accountability. Leaders ensure that recommendations from review boards and independent oversight organizations do not override senior leaders' ultimate responsibility for decisions affecting safety.

Constant Examination: Leaders ensure that safety is constantly scrutinized through a variety of monitoring techniques, including assessments of safety culture.

Leaders ensure that board members and members of independent oversight organizations meet with different levels of management and staff to develop an understanding of the status of the organization's safety culture. They use a variety of monitoring tools—including employee surveys, self- and independent assessments, external safety review board member feedback, and employee concern investigations—to regularly monitor safety culture. Leaders support and participate in candid assessments of workplace attitudes and safety culture and act on issues that affect trust in management and detract from a healthy safety culture.

Leader Behaviors: Leaders exhibit behaviors that set the standard for safety.

Leaders "walk the talk," modeling correct behaviors, especially when resolving apparent conflicts between safety and production. They act promptly when a safety issue is raised to ensure it is understood and appropriately addressed. Leaders maintain high standards of personal conduct that promote all aspects of a positive safety culture, and actively seek out the opinions and concerns of workers at all levels. Leaders encourage personnel to challenge unsafe behavior and unsafe conditions, and motivate others to practice positive safety culture behaviors.[2]

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

Senior management at a nuclear power plant developed a new incentive program after noticing substantial schedule delays during outages at the plant. The incentive program included bonuses for meeting schedule goals during outages. During an outage, a supervisor signed off on work without completing an independent verification, which was not required but recommended by procedure. The supervisor made this decision because there were no qualified workers available at the time and waiting for the next shift of workers would have caused a schedule slip, affecting the potential outage bonus. The supervisor defended the decision to management by stating that a peer check was completed, and considered sufficient to verify the work performed.

Over time, peer checks were substituted for a number of independent verifications during outages because it saved time, helped the team stay on-schedule, and resulted in larger bonuses at the end of the outage. After several years of this practice, a short in a breaker that was replaced during an outage inadvertently caused a loss of power to an entire train of equipment, which then caused a reactor trip. One of the primary cooling pumps on the active train was out of service at the time of the loss of power. It had been scheduled for repair during the outage but was rescheduled because waiting for the parts to repair the pump would have extended the outage. As a result, the plant had to rely on emergency systems to cool the reactor core because both of the primary cooling pumps were unavailable.

The root cause analysis of the event found that an independent verification of the breaker replacement was not completed because common practice had been to accept a peer check as adequate verification of the work performed. Management's focus on meeting schedule goals, and acceptance of peer checks in place of recommended independent verifications, contributed to a reactor trip that challenged the plant's safety systems.[3]

Thinking about this scenario, consider the following questions:

1. How does this scenario apply to the safety culture trait of Leadership Safety Values and Actions?

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2. What kinds of leadership behaviors would have reinforced safety as the overriding priority?

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3. How could management have handled this situation differently?

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Now that you have read this Trait Talk on *Leadership Safety Values and Actions*, consider the following questions:

1. How does this trait apply to my organization?

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2. Are there other attributes and examples that better fit my organization?

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3. What impact does this trait have on the safety culture in my organization?

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4. How does this increase my understanding of the safety culture in my organization?

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5. How could I improve the performance of this trait in my organization?

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WORK PROCESSES

What Is The Definition Of Work Processes?

The NRC's SCPS defines Work Processes as when the process of planning and controlling work activities is implemented so that safety is maintained.

Why Is This Trait Important?

The process of designing and controlling work to ensure safety is an important part of an organization, and how effectively an organization manages and implements their work processes is a reflection of their safety culture. For example, effective work processes in a positive safety culture will have a well-designed workflow that includes the assignment of responsibilities to leaders, work groups, and individuals. Work activities will be prioritized, coordinated across workgroups, and communicated effectively. Policies and procedures will incorporate the appropriate risk insights and be effectively planned, executed, verified, and documented. The rigorous development, management and adherence to work processes helps ensure the safe use of nuclear materials and reflects a positive safety culture.

Many organizations operating high-risk technologies (such as in industries using nuclear materials) employ collaborative decisionmaking, develop detailed procedures, and require verification of steps during procedure implementation under normal operations. The development and implementation of emergency operating procedures is equally as rigorous. Other high reliability organizations, however, may base activities around individual expertise and professionalism, autonomy, and rapid team-based response, particularly during off-normal conditions. Both perspectives can be important for the design and implementation of work processes. For example, organizations may require strict adherence to normal and emergency operating procedures. However, flexibility may be necessary when responding to off-normal conditions.

The need for procedural compliance during normal or emergency operations and the allowance for flexibility and individual autonomy during periods of offnormal conditions pose a dilemma for many organizations. One of the biggest management challenges may be how to realize the benefits of both approaches given that these two perspectives on controlling work processes can create internal inconsistencies.[1]

What Does This Trait Look Like?

Work Management: The organization implements a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority. The work process includes the identification and management of risk commensurate to the work.

Work is effectively planned and executed by incorporating risk insights, job-site conditions, and the need for coordination with different groups or job activities. The work process appropriately prioritizes work and incorporates contingency plans, compensatory actions, and abort criteria as needed. Leaders consider the impact of changes to the work scope and the need to keep personnel apprised of the work status. The work process ensures individuals are aware of the nuclear safety risks associated with work in the field, and other parallel station activities. Insights from probabilistic risk assessments are considered in daily work activities and change processes. Work activities are coordinated to address conflicting or changing priorities across the whole spectrum of activities contributing to nuclear safety. The work process limits temporary modifications.

Design Margins: The organization operates and maintains equipment within design margins. Margins are carefully guarded and changed only through a systematic and rigorous process. Special attention is placed on maintaining fission product barriers, defense-in-depth, and safety-related equipment.

The work process supports nuclear safety and the maintenance of design margins by minimizing long-standing equipment issues, preventive

maintenance deferrals, and maintenance and engineering backlogs. The work process ensures focus on maintaining fission product barriers, defense-in-depth, and safety-related equipment. Design and operating margins are carefully guarded and changed only with great thought and care. Safety-related equipment is operated and maintained well within design requirements.

Documentation: The organization creates and maintains complete, accurate, and up-to-date documentation.

Activities are governed by comprehensive, high-quality programs, processes, and procedures. Design documentation, procedures, and work packages are complete, thorough, accurate, and current. Components are labeled clearly, consistently, and accurately. The backlog of document changes is understood, prioritized, and actively managed to ensure quality.

Procedure Adherence: Individuals follow processes, procedures, and work instructions.

Individuals follow procedures. Individuals understand and use human error reduction techniques. Individuals review procedures and instructions prior to work to validate that they are appropriate for the scope of work and that required changes are completed prior to implementation. Individuals manipulate equipment only when appropriately authorized and directed by approved procedures or work instructions. Individuals ensure that the status of work activities is properly documented.[2]

What Is A Scenario In Which This Trait Could Play A Role?

Two radiographers were performing nondestructive testing operations of pipe welds at a temporary job site using a 2.4 TBq (65 Ci) iridium -192 radioactive source in a radiography camera. In between shots, the first radiographer briefly entered the restricted area without conducting a radiation survey. Upon exiting the restricted area, he noticed that a piece of equipment had fallen onto the guide tube, putting a crimp in the tube. After the next shot, without conducting a radiation survey, both radiographers entered the restricted area to set up for the next operation thinking that the source had been properly retracted into the shielded position. However, the crimp in the guide tube from the fallen equipment prevented the source from retracting back to the shielded position. The second radiographer's ratemeter sounded an alarm indicating that radiation exposures greater than the preset amount were being exceeded, while the first radiographer's ratemeter did not alarm. Because the first radiographer's ratemeter did not alarm, they both assumed that the second radiographer's ratemeter was not functioning properly. They continued operations and did not notify the radiation safety officer of the incident. The radiation safety officer became aware of the incident when he identified an overexposure of both workers from the personnel dosimetry reports that he received a few weeks later.

There is a high potential dose hazard associated with industrial radiographic operations. The process of planning and controlling work activities so that safety is maintained (work processes) was lacking in this scenario. Although the regulations require it, the radiographers did not conduct a radiation survey to ensure that the source was properly retracted into the shielded position in the camera. The radiographers failed to investigate the discrepancy between the two ratemeters. Also, the radiographers did not properly follow procedures for notification of the radiation safety officer of the incident or the potential overexposure because they believed that the ratemeter that sounded was faulty.[3]

Thinking about this scenario, consider the following questions:

1. How does this scenario apply to the safety culture trait of Work Processes?

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2. What kinds of actions and behaviors would have reinforced safety as the overriding priority?

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3. How could management have handled this situation differently?

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Photo courtesy of Daviolmack via Wikipedia

Now that you have read this Trait Talk on *Work Processes*, consider the following questions:

1. How does this trait apply to my organization?

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2. Are there other attributes and examples that better fit my organization?

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3. What impact does this trait have on the safety culture in my organization?

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4. How does this increase my understanding of the safety culture in my organization?

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5. How could I improve the performance of this trait in my organization?

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QUESTIONING ATTITUDE

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.[1]

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.[2]

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.[3]

Thinking about this scenario, consider the following questions:

1. How does this scenario apply to the safety culture trait of Questioning Attitude?

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2. What kinds of actions and behaviors would have reinforced safety as the overriding priority?

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3. How could this situation have been prevented?

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Now that you have read this Trait Talk on *Questioning Attitude*, consider the following questions:

1. How does this trait apply to my organization?

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2. Are there other attributes and examples that better fit my organization?

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3. What impact does this trait have on the safety culture in my organization?

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4. How does this increase my understanding of the safety culture in my organization?

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5. How could I improve the performance of this trait in my organization?

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PROBLEM IDENTIFICATION AND RESOLUTION

What Is The Definition Of Problem Identification And Resolution?

The NRC's SCPS defines Problem Identification and Resolution as when issues potentially impacting safety are promptly identified, fully evaluated, and promptly addressed and corrected commensurate with their significance.

Why Is This Trait Important?

Problem identification and resolution is an important element of safety culture. Leaders are responsible for identifying and diagnosing organizational or technical deficiencies, taking corrective action, and anticipating emerging issues. All members of an organization support problem identification and resolution by promptly raising and reporting concerns (for example, by working through a corrective action program). The extent and manner in which organizations identify and resolve problems serve as an example how the organization prioritizes safety. The ability and willingness of workers and managers to identify and address problems is also important for continuous learning, another trait of a positive safety culture.

An effective problem identification and resolution program uses the organization's corrective action program, operating experience, and self-assessment results to ensure safe operations. The corrective action program should have a transparent process for evaluating, prioritizing, and resolving issues. Leaders should ensure that they and the rest of the organization fully understand safety-related issues. Without full understanding, the organization cannot appropriately prioritize and resolve these issues so that they do not occur again. In addition, an effective problem identification and resolution program leads to a strong safety conscious work environment. In such an environment, the organization removes barriers to a free flow of information to ensure that all employees feel free to raise safety-related concerns.

Organizations can approach problem identification and resolution with different mindsets. One mindset focuses on finding existing problems and correcting weaknesses, typically through the organization's corrective action program. However, an organization with a positive safety culture also has a problem identification and resolution program that anticipates issues, reviews operating experience, and tracks emerging industry themes and trends. Organizational learning is most successful when issues are anticipated and addressed before they become weaknesses to be corrected.[1]

What does this trait look like?

Identification: The organization implements a corrective action program with a low threshold for identifying issues. Individuals identify issues completely, accurately, and in a timely manner in accordance with the program.

Individuals recognize deviations from standards and understand how to enter issues into the corrective action program. They ensure that issues, problems, degraded conditions, and near misses are promptly reported and documented in the corrective action program at a low threshold. Individuals describe the issues entered in the corrective action program in sufficient detail to ensure they can be appropriately prioritized, trended, and assigned for resolution.

Evaluation: The organization thoroughly evaluates problems to ensure that resolutions address causes and extents of conditions commensurate with their safety significance.

The organization ensures that issues are properly classified, prioritized, and evaluated according to their safety significance. Extent-of-condition and extent-of-cause evaluations are completed in a timely manner, commensurate with the safety significance of the issue. The organization ensures that apparent and root cause investigations identifying primary and contributing causal factors are completed as required. Issues are investigated thoroughly according to their safety significance, and root cause analyses are rigorously applied to identify and correct the fundamental cause of significant issues. The underlying organizational and safety culture contributors to issues are evaluated thoroughly and are given the necessary time and resources to be clearly understood. Managers conduct

effectiveness reviews of significant corrective actions to ensure that the resolution addressed the causes effectively.

Resolution: The organization takes effective corrective actions to address issues in a timely manner commensurate with their safety significance.

The organization ensures that corrective actions are completed in a timely manner. Deferrals of corrective actions are minimized, and when required, due dates are extended using an established process that appropriately considers safety significance. The organization ensures that appropriate interim corrective actions are taken to mitigate issues while more fundamental causes are being assessed. Corrective actions resolve and correct the identified issues, including causes and extents of conditions, and prevent the recurrence of significant conditions adverse to quality. Trends in safety performance indicators are acted on to resolve problems early.

Trending: The organization periodically analyzes information from the corrective action program and other assessments in the aggregate to identify programmatic and common cause issues.

The organization develops indicators that monitor both equipment and organizational performance, including safety culture. Managers use indicators that provide an accurate representation of performance and early indications of declining trends, and routinely challenge the organization's understanding of declining trends. Organizational and departmental trend reviews are completed in a timely manner in accordance with program expectations.[2]

What Is A Scenario In Which This Trait Could Play A Role?

A maintenance worker at a nuclear power plant found water leaking through the roof of the auxiliary building and into the emergency shutdown panel during a heavy rainstorm. He notified the control room supervisor, cleaned up the water, and wrote a condition report. The power plant management assigned the condition report a priority 4 (the lowest level). After the plant identified the degraded condition of the roof, management issued a work order to repair the roof. However, other layers of management never approved the work to proceed. Shortly afterwards, the plant started a program to maintain building integrity in all weather conditions; however, the plant never made plans or took actions to properly prioritize, identify and correct the roof leakage.

Two years later, the maintenance worker found water pooling around the power supply breakers for the feed water pump in the auxiliary building. Three months after that, the maintenance worker found water dripping onto the high-pressure safety injection pump. After both incidents, the maintenance worker notified the control room supervisor, mopped up the water, covered the equipment with a protective material as needed, and wrote a condition report. Each time, plant management assigned the condition a priority level of 4. The worker identified that the source of the water was from the roof of the auxiliary building and asked his supervisor why the roof was not repaired. The supervisor said work orders were written each time, but they were never approved or scheduled due to other priorities. The supervisor was not sure about the status of the program to ensure building integrity and had never seen any plans or schedules to repair roof leaks. Further, when the supervisor asked his manager about the ongoing degraded roof issues, the manager discovered that there were 43 open work orders to repair roof leaks, and none of these orders had ever been approved, scheduled, or completed.

Recently, water from a heavy rainstorm again leaked through the auxiliary building roof and into the switchgear room. This time the water caused an electrical ground short near a current transformer, which then tripped the reactor coolant pump. This led to a reactor trip due to a low reactor coolant system flow signal.

The auxiliary building provides structural support and separation to safety- and nonsafety-related equipment, and is designed to provide protection against external events such as rain, wind, and snow. However, the plant's failure to resolve the leakage through its problem identification and resolution and corrective action program left the safety systems unprotected. The weak safety culture and problem identification and resolution in this plant directly led to the reactor trip.[3]

Thinking about this scenario, consider the following questions:

1. How does this scenario apply to the safety culture trait of Problem Identification & Resolution?

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2. What kinds of actions and behaviors would have reinforced safety as the overriding priority?

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3. How could this situation been handled differently?

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Now that you have read this Trait Talk on *Problem Resolution & Identification*, consider the following questions:

1. How does this trait apply to my organization?

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2. Are there other attributes and examples that better fit my organization?

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3. What impact does this trait have on the safety culture in my organization?

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4. How does this increase my understanding of the safety culture in my organization?

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5. How could I improve the performance of this trait in my organization?

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ENVIRONMENT FOR RAISING CONCERNS?

What Is The Definition Of Environment For Raising Concerns?

The NRC's SCPS defines Environment for Raising Concerns as maintaining a safety-conscious work environment where personnel feel free to raise safety concerns without fear of retaliation, intimidation, harassment, or discrimination.

Why Is This Trait Important?

Fostering an environment for raising concerns is an important attribute of a positive nuclear safety culture. Organizations should have a work environment where employees are encouraged to raise safety concerns and where those concerns are reviewed promptly, given the proper priority based on their potential safety significance, and appropriately resolved, with timely feedback to the originator of the concerns and to other employees as appropriate.

Employees should feel free to raise safety concerns to their management without fear of harassment, intimidation, retaliation, or discrimination. The organization is prohibited by law from taking adverse retaliatory actions against employees because they raised concerns. When allegations of discrimination or retaliation arise, the appropriate level of management must be involved to review the facts, evaluate or reconsider the action, and, where warranted, remedy the matter. In addition to the hardship caused to the individual employee, the perception by fellow workers that raising concerns has resulted in retaliation can generate a chilling effect that may discourage other workers from raising concerns. Any reluctance on the part of employees to raise concerns can be detrimental to nuclear safety.

The organization should clearly identify the processes that employees may use to raise concerns, such as discussing issues with their supervisor or filing deficiency reports for problem identification and resolution. However, it is important to recognize that some employees may not always be comfortable raising concerns through the normal channels, such as with their immediate supervisor. From a safety perspective, no method of raising potential safety concerns should be discouraged. Therefore, the organization should focus on achieving and maintaining an environment where employees feel free to raise their concerns directly to their supervisors, as well as ensuring that alternate means of raising and addressing concerns are accessible, credible, and effective. These alternative approaches may include an "open-door" policy that allows the employee to bring a concern to a higher-level manager, an ombudsman program, or an employee concerns program.

An organization that reinforces an environment for raising concerns typically has well-developed systems for prioritizing problems and directing resources, effective communications for openly sharing information and analyzing the root causes of identified problems, and management that promotes employee confidence in raising and resolving concerns.[1]

What Does This Trait Look Like?

Safety Conscious Work Environment (SCWE) Policy: The organization effectively implements a policy that supports individuals' rights and responsibilities to raise safety concerns and does not tolerate harassment, intimidation, retaliation, or discrimination for doing so.

Individuals feel free to raise nuclear safety concerns without fear of retribution, with confidence that their concerns will be addressed. Executives and senior managers set and reinforce expectations for establishing and maintaining a safety-conscious work environment. Policies and procedures reinforce that individuals have the right and responsibility to raise nuclear safety concerns and define the responsibilities of leaders to create an environment in which individuals feel free to raise safety concerns. Leaders are trained to take ownership when receiving and responding

to concerns, recognizing confidentiality if appropriate, and ensuring they are adequately addressed in a timely manner. Individuals are trained that behaviors or actions that could prevent concerns from being raised, including harassment, intimidation, retaliation, or discrimination, will not be tolerated and are violations of law and policy. All claims of retaliation are investigated and any necessary corrective actions are taken in a timely manner, including actions to mitigate any potential chilling effect.

Alternate Process for Raising Concerns: The organization effectively implements a process for raising and resolving concerns that is independent of line management influence. Safety issues may be raised in confidence and are resolved in a timely and effective manner.

Executives establish, support, and promote the use of alternative processes for raising concerns and ensure corrective actions are taken. Leaders understand their role in supporting alternate processes for raising concerns. Processes for raising concerns or resolving differing professional opinions that are alternatives to the corrective action program and operate outside the influence of the management chain are communicated and accessible to individuals. Alternative processes are independent, include an option to raise concerns confidentially, and ensure these concerns are appropriately resolved in a timely manner. Individuals receive feedback in a timely manner. Individuals have confidence that issues raised will be appropriately resolved. Individuals assigned to respond to concerns have the appropriate competencies.[2]

What Is A Scenario In Which This Trait Could Play A Role?

A research scientist in the nuclear physics program at a research laboratory moved a high activity radioactive source to temporary storage area of the irradiation pool. He was not aware that, three days prior to moving the source, maintenance workers had removed a small section of the concrete shielding from the irradiation pool wall. This allowed the source to emit radiation through the unshielded section of the pool wall and create an unplanned high radiation area. The procedures for moving the source did not clearly require cross-checking with maintenance activities.

During the investigation of this incident, the research scientist told the investigator that he previously raised concerns to his supervisor about the adequacy of procedures for moving the source and ensuring that the source was appropriately shielded. Further, he noted that he had told the supervisor on numerous occasions that many of the procedures dealing with the safety of laboratory activities may be insufficient. After this incident, he told the supervisor that he was going to notify the facility administration about his concerns and the supervisor's lack of response. The supervisor told the scientist that because of significant budget cuts in research programs, and subsequent reduction in staff, he did not have the resources to review and revise all of the procedures and he did not want to draw any more attention to the program. In addition, the supervisor said that if the scientist raised this concern with the administration, his "future employment" would be discussed. A few days later, the scientist discussed his concerns with the administration officials, and two weeks later, the scientist was laid off due to budget cuts. The remaining research staff was aware of the circumstances surrounding their colleague's termination. The supervisor told staff members that any concerns they have should never be "taken up the chain of command."

Continuing budget cuts and their colleague's termination have resulted in the remaining research staff members being concerned about their jobs, the future of the research programs, and their safety while working at the research facility. Staff members have expressed reluctance to raise any concerns to their supervisor or the administration, and they continue to be worried about the adequacy of procedures and policies. This chilling effect prevents the staff from feeling free to raise nuclear safety concerns without fear of retaliation, and weakens the facility's safety culture.[3]

Thinking about this scenario, consider the following questions:

1. How does this scenario apply to the safety culture trait of Environment for Raising Concerns?

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2. What kinds of actions and behaviors would have reinforced safety as the overriding priority?

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3. How could this situation been handled differently?

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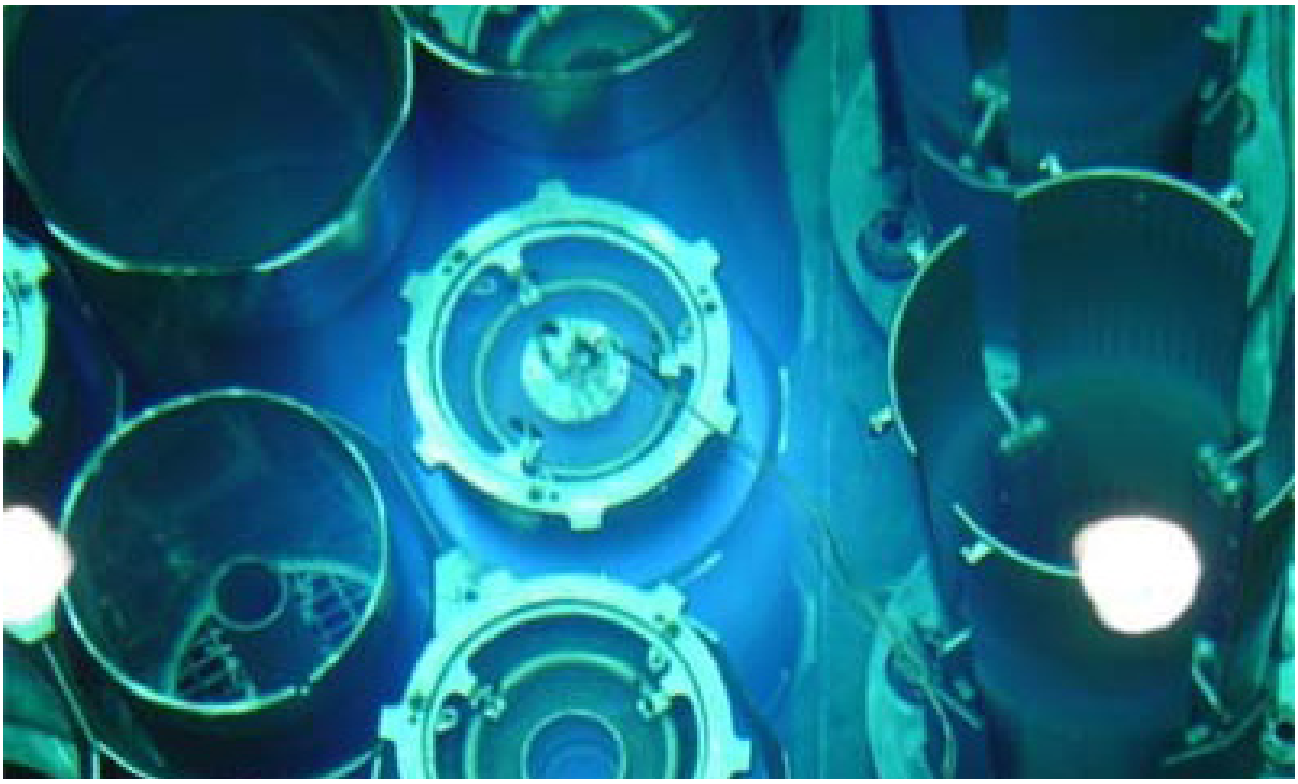

Experimental gamma irradiation source similar to the source referenced in the Trait Talk example.

Now that you have read this Trait Talk on *Environment for Raising Concerns*, consider the following questions:

1. How does this trait apply to my organization?

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2. Are there other attributes and examples that better fit my organization?

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3. What impact does this trait have on the safety culture in my organization?

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4. How does this increase my understanding of the safety culture in my organization?

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5. How could I improve the performance of this trait in my organization?

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EFFECTIVE SAFETY COMMUNICATION

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.[1]

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.[2]

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.[3]

Thinking about this scenario, consider the following questions:

1. How does this scenario apply to the safety culture trait of Effective Safety Communication?

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2. What kinds of communications would have reinforced safety as the overriding priority?

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3. How could this situation been handled differently?

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Now that you have read this Trait Talk on *Effective Safety Communication*, consider the following questions:

1. How does this trait apply to my organization?

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2. Are there other attributes and examples that better fit my organization?

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3. What impact does this trait have on the safety culture in my organization?

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4. How does this increase my understanding of the safety culture in my organization?

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5. How could I improve the performance of this trait in my organization?

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RESPECTFUL WORK ENVIRONMENT

What Is The Definition Of Respectful Work Environment?

The NRC's SCPS defines Respectful Work Environment as when trust and respect permeates the organization.

Why Is This Trait Important?

Trust and respect are among the most frequently discussed concepts in studies of organizational and safety culture. Trust and respect are fundamental to positive interpersonal relationships and central components of effective working relationships. The nature and level of trust and respect between workers and their managers and supervisors affect all aspects of their relationship and influence their attitudes and behaviors. Studies of organizations have found that trust in management is positively related to employee job performance, organizational citizenship behavior, and engagement in safety behaviors. Distrust of management tends to lower levels of engagement and reduce feelings of personal responsibility for safety.

At an individual level, trust involves the willingness of one person to depend on another person, with a relative sense of security. The perception that an individual is competent, has integrity, and is predictable increases the likelihood that he is trusted and respected. Trust and respect affect the persuasive power of an individual. Efforts to influence others are more likely to succeed when those attempting to influence are trusted and respected. In addition, successful work groups, teamwork, and collaboration require respect for others' opinions and differing views. When differences are respected, they can be a source of motivation and innovation for an organization; lack of respect can destroy trust and weaken safety culture.

At an organizational level, trust and respect instill confidence that the organization is just and fair, which promotes open communication and accurate reporting, enhances organizational learning, and promotes the development of shared perceptions and norms. In studies of safety culture, higher levels of trust and respect are associated with positive safety attitudes, reduced risky behavior, and increased personal responsibility for safety.

Open communication, fairness, and management accountability are the most frequently identified mechanisms that build trust and respect in an organization. Leaders earn trust and respect when employees can see that they are fair, deal directly with problems and issues, and encourage and value all ideas and opinions. A strong safety culture requires mutually respectful, trusting relationships between and within workgroups and between all levels in the organization.[1]

What Does This Trait Look Like?

Respect is Evident: Everyone is treated with dignity and respect.

The organization regards individuals and their professional capabilities and experiences as its most valuable asset. Individuals at all levels of the organization, within and between workgroups, treat each other with dignity and respect. They do not demonstrate or tolerate bullying or humiliating behaviors. Leaders monitor for behaviors that can have a negative impact on the work environment and address them promptly. They ensure policies and expectations are enforced fairly and consistently for individuals at all levels of the organization. Individuals treat decision-makers with respect, even when they disagree with a decision. Leaders ensure facilities are conducive to a productive work environment and housekeeping is maintained.

Opinions are Valued: Individuals are encouraged to voice concerns, provide suggestions, and raise questions. Differing opinions are respected.

The organization encourages individuals to offer ideas, concerns, suggestions, differing opinions, and questions to help identify and solve problems. Leaders are receptive to ideas, concerns, suggestions, differing opinions, and questions. The organization promotes robust discussions, recognizing that differing opinions are a natural result of differences in expertise and experience. Individuals value the insights and perspectives provided by quality assurance, the employee concerns program, and independent oversight organization personnel.

High Level of Trust: Trust is fostered among individuals and work groups throughout the organization.

Leaders promote collaboration among work groups. Leaders respond to questions and concerns in an open and honest manner. Leaders, sensitive to the negative impact of a lack of information, share important information in an open, honest, and timely manner such that trust is maintained. They ensure that status and important work milestones are communicated throughout the organization. Leaders acknowledge positive performance and address negative performance promptly and directly with the individual involved. Confidentiality is maintained as appropriate. Leaders welcome performance feedback from throughout the organization and modify their behavior when appropriate.

Conflict Resolution: Fair and objective methods are used to resolve conflicts.

The organization implements processes to ensure fair and objective resolution of conflicts and differing views. Leaders ensure conflicts are resolved in a balanced, equitable, and consistent manner, even when outside of defined processes. Individuals have confidence that conflicts will be resolved respectfully and professionally.[2]

What Is A Scenario In Which This Trait Could Play A Role?

An authorized gauge user was conducting on-the-job training for a new employee on the licensee's practice of placing the portable density gauge inside the extended cab of a pickup truck when staying overnight at a hotel, as is often required when working at temporary job sites. During this on-the-job instruction, the new employee stated that simply placing the gauge case inside the extended cab of a pickup truck would only provide one barrier, the locked vehicle door. The new employee suggested the gauge case also be secured to the inside of the pickup truck. Since the authorized gauge user conducting the on-the-job training had many years of experience, he discounted the new employee's comment as inconsequential.

Several weeks later, one of the licensee's gauges was stolen from the cab of a pickup truck parked overnight at a hotel. The new employee, now an authorized gauge user, stated that he placed the gauge case inside the extended cab of the pickup truck, as previously instructed, and locked the vehicle's doors using the key fob as he walked inside the hotel. The side window of the pickup truck had been left in a partially raised position. Since there were no signs of forced entry, it was concluded that the theft was a crime of opportunity and that the thief may have simply unlocked the door by reaching inside the vehicle through the window. Once the thief was inside the vehicle, the unsecured gauge case did not delay or deter the thief's removal of the gauge. The new employee notified management of the theft and informed them that he had raised a concern involving the failure to secure the gauge case to the authorized gauge user who had provided his on-the-job training. Because the on-the-job trainer discounted the new employee's recommendation to secure the gauge case to the inside of the pickup truck, the new employee explained that he did not feel it would be appropriate to go around the trainer to raise the concern directly to the radiation safety officer or management.

As a result of this incident, the licensee conducted an analysis and determined that the root cause of the violation was the licensee's failure to fully understand how to implement the requirement of securing the gauge. The licensee's practice was focused on the visibility of the gauge case as opposed to properly securing the gauge case. A contributing cause of the incident was the licensee's employee leaving the passenger side window in a partially open position. The new employee again stated he did not feel that it would be respectful to the trainer if he continued to question the practice since the trainer was senior to him, and he did not feel he could trust the radiation safety officer or management not to provide negative feedback to the trainer.[3]

Thinking about this scenario, consider the following questions:

1. How does this scenario apply to the safety culture trait of Respectful Work Environment?

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2. What kinds of communications would have reinforced safety as the overriding priority?

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3. How could this situation been handled differently, and what might have been the outcome?

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Now that you have read this Trait Talk on *Respectful Work Environment*, consider the following questions:

1. How does this trait apply to my organization?

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2. Are there other attributes and examples that better fit my organization?

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3. What impact does this trait have on the safety culture in my organization?

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4. How does this increase my understanding of the safety culture in my organization?

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5. How could I improve the performance of this trait in my organization?

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CONTINUOUS LEARNING

What Is The Definition Of Continuous Learning?

The NRC's SCPS defines Continuous Learning as opportunities to learn about ways to ensure safety are sought out and implemented.

Why Is This Trait Important?

Continuous learning contributes substantially to a positive safety culture. Continuous learning organizations are characterized by an enhanced ability and willingness of individuals to apply their individual learning in the workplace and to share and transfer it to their team members and coworkers. At the individual and team level, continuous learning includes obtaining knowledge, determining how that knowledge applies to the work of the individual and the team, as well as sharing that knowledge and ensuring that it is retained in the organization. To capture and sustain the benefits from individual and team learning, learning organizations develop leadership that prioritizes and motivates the desired learning and behaviors that are effective in ensuring that knowledge is shared and retained within an organization.

Organizations committed to continuous learning reflect an organizational perspective that specifically addresses learning requirements at the individual, group, and organizational levels. Leadership at all of these levels must focus on learning, teaching, and changing an organization into a learning organization. Continuous learning requires that leaders and managers trust and respect their workers. An environment that supports continuous learning is one that encourages an employee to ask questions, demonstrates appreciation for raising differing views, allows time for understanding, and encourages communication and collaboration.

Learning organizations are committed to learning from their mistakes and those of others, and they take appropriate action to address lessons learned. They evaluate operating experiences and ensure that lessons learned are shared throughout an organization. They evaluate their own programs and policies for opportunities for improvement, benchmark other organizations, and understand the importance of training. Organizations focusing on continuous learning ensure that opportunities to improve safety are identified and shared, and by doing so, build a strong safety culture.[1]

What Does This Trait Look Like?

Operating Experience: The organization systematically and effectively collects, evaluates, and implements relevant internal and external operating experience in a timely manner.

A process is in place to ensure a thorough review of operating experience provided by internal and external sources. Operating experience is implemented and institutionalized effectively through changes to processes, procedures, equipment, and training programs. Operating experience is used to understand equipment, operational, and industry challenges and to adopt new ideas to improve performance. Operating experience is used to support daily work functions, with emphasis on the possibility that "it could happen here." Operating experience is shared in a timely manner.

Self-Assessment: The organization routinely conducts self-critical and objective assessments of its programs and practices.

Independent and self- assessments, including nuclear safety culture assessments, are thorough and effective and are used as a basis for improvements. The organization values the insights and perspectives assessments provide. Self-assessments are performed on a variety of topics, including the self-assessment process itself. They are performed at a regular frequency and provide objective, comprehensive, and self-critical information that drive corrective actions. Targeted self-assessments are performed when a more thorough understanding of an issue is required. A balanced approach of self-assessments and

independent oversight is used and periodically adjusted based on changing needs. Self-assessment teams include individual contributors and leaders from within the organization and from external organizations when appropriate.

Benchmarking: The organization learns from other organizations to continuously improve knowledge, skills, and safety performance.

The organization uses benchmarking as an avenue for acquiring innovative ideas to improve nuclear safety. The organization participates in benchmarking activities with other nuclear and nonnuclear facilities. The organization seeks out best practices by using benchmarking to understand how others perform the same functions. Benchmarking is used to compare standards to the industry and to make adjustments to improve performance. Individual contributors are actively involved in benchmarking.

Training: The organization provides training and ensures knowledge transfer to maintain a knowledgeable, technically competent workforce and instill nuclear safety values.

The organization fosters an environment in which individuals value and seek continuous learning opportunities. Individuals, including supplemental workers, are adequately trained to ensure technical competency and an understanding of standards and work requirements. Individuals master fundamentals to establish a solid foundation for sound decisions and behaviors. The organization develops and effectively implements knowledge transfer and knowledge retention strategies. Knowledge transfer and knowledge retention strategies are applied to capture the knowledge and skill of experienced individuals to advance the knowledge and skill of less experienced individuals. Leadership and management skills are systematically developed. Training is developed and continuously improved using input and feedback from individual contributors and subject-matter experts. Executives obtain the training necessary to understand basic operations and the relationships between major functions and organizations.[2]

What Is A Scenario In Which This Trait Could Play A Role?

Before a concrete pour at a nuclear power plant under construction, an engineer discovered that steel reinforcing bars were not spliced correctly in some locations. Work was halted and the rebar was reworked before the concrete pour. However, since the rebar was only spliced incorrectly in a "few" locations, the engineer gave verbal feedback to the concrete crew foreman on shift at the time of the discovery, but did not initiate a corrective action program condition report. The foreman of the concrete crew then had a brief discussion with his crew about the acceptable method of rebar splicing for the project. However, because the foreman believed that the issue was "skill of the craft," no further training was necessary. He did not generate a corrective action report, request that work procedures be revised to specify the correct rebar splicing instructions, or provide feedback to the qualification training program. He intended to inform the concrete crew foreman of the other shift, but forgot during the hectic shift turnover.

Two months later, during another concrete pour, quality assurance inspectors discovered that several rebar splices were incorrect. However, this time the concrete pour had already begun. The pour was stopped and the condition was assessed. Extensive re-work was required to correct the rebar splices and remove the poured concrete sections. This work could not be performed expeditiously, and the entire concrete batch was lost.

Upon review of the issue, the licensee discovered that problems with rebar splicing were not uncommon in the construction industry, and there were similar occurrences at nuclear construction projects both in the United States and at foreign sites. Also, concrete subcontractors often work on construction projects in different areas of construction, and they frequently work at sites with different requirements—sometimes during the same week. Continuous learning, through the use of benchmarking and lessons learned programs, may have prevented this incident.[3]

Thinking about this scenario, consider the following questions:

1. How does this scenario apply to the safety culture trait of Continuous Learning?

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2. What kinds of communications would have reinforced safety as the overriding priority?

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3. How could this situation been handled differently?

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Now that you have read this Trait Talk on *Continuous Learning*, consider the following questions:

1. How does this trait apply to my organization?

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2. Are there other attributes and examples that better fit my organization?

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3. What impact does this trait have on the safety culture in my organization?

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4. How does this increase my understanding of the safety culture in my organization?

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5. How could I improve the performance of this trait in my organization?

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PERSONAL ACCOUNTABILITY

What Is The Definition Of Personal Accountability?

The NRC's SCPS defines Personal Accountability as all individuals take personal responsibility for safety.

Why Is This Trait Important?

Personal accountability reflects the belief that leaders and employees are responsible and have ownership for their performance and the roles they play in nuclear safety. Personal accountability is not finger pointing, blame, or punishment.

In organizations with positive safety cultures, individuals have a strong sense of accountability for the safe operation of the facility, their own safety, and for the safety of their coworkers and the public. Leaders can develop personal accountability within their organization by empowering employees. They must give employees the skills and training needed to communicate, explain, and do their jobs well. They must set performance objectives with specific behaviors and outcomes and evaluate performance and give timely feedback.

Furthermore, leaders should encourage accountability through rewards rather than discourage through punishment. When leaders model, acknowledge, and reward positive accountability behaviors, employees are more likely to be motivated to invest in safe operations personally.

Everyone must take personal ownership for his or her actions and decisions for accountability to become a fundamental part of an organization's safety culture. Reinforcement can come from supervisors and managers, but also from coworkers, the public, and an individual's own personal values and standards. Accountability can motivate mindfulness, attention to detail, and self-assessment, and can result in fewer accidents and incidents.

An ongoing challenge in fostering personal accountability is to identify who is responsible for the factors that affect safety within an organization and how to make appropriate accountability assignments. For example, responsibility can be assigned to ensure that training is completed, procedures are updated, and decisions are made. Accountability systems in an organization involve identifying who is held accountable for which actions and by whom. Alignment in these accountability systems within an organization can create effective communications, teamwork, strong safety performance, and motivated employees and can lead to a positive safety culture.[1]

What Does This Trait Look Like?

Standards: Individuals understand the importance of adherence to nuclear standards. All levels of the organization exercise accountability for shortfalls in meeting standards.

> *Individuals encourage each other to adhere to high standards. They demonstrate a proper focus on nuclear safety and reinforce this focus through peer coaching and discussions. Individuals hold themselves personally accountable for modeling nuclear safety behaviors and individuals across the organization apply nuclear safety standards consistently. Individuals actively solicit and are open to feedback and they help supplemental personnel understand and practice expected behaviors and actions.*

Job Ownership: Individuals understand and demonstrate personal responsibility for the behaviors and work practices that support nuclear safety.

> *Individuals understand their personal responsibility to foster a professional environment, encourage teamwork, and identify challenges to nuclear safety. They understand their personal responsibility to raise nuclear safety issues,*

including those identified by others. Individuals take ownership for the preparation and execution of assigned work activities. They actively participate in pre-job briefings, understanding their responsibility to raise nuclear safety concerns before work begins. Individuals ensure that they are trained and qualified to perform assigned work and understand the objective of the work activity, their role in the activity, and their personal responsibility for safely accomplishing the overall objective.

Teamwork: Individuals and work groups communicate and coordinate their activities within and across organizational boundaries to ensure nuclear safety is maintained.

Individuals demonstrate a strong sense of collaboration and cooperation in connection with projects and operational activities. They work as a team to provide peer-checks, verify certifications and training, ensure detailed safety practices, actively peer coach new personnel, and share tools and publications. Individuals strive to meet commitments.[2]

What Is A Scenario In Which This Trait Could Play A Role?

A welder at a vendor facility inadvertently dropped a spool of weld wire into a puddle while carrying it to the controlled storage area at the end of his shift. When weld wire is exposed to water, the flux inside absorbs moisture. Once the welding wire is wetted or absorbs an excessive amount of moisture, no process can "dry out" the welding wire. Dropping a spool of weld wire in a puddle would make it unacceptable for use in welding safety-related components. Wetted weld wire can potentially result in welding defects such as porosity. Wetted weld wire also can contribute to hydrogen cracking, which might not be detected unless the inspection of the welds is conducted at least 48 hours after the weld is completed.

However, the quality inspector responsible for checking in the wire believed that the spool would dry out, and attached a handwritten note "DO NOT USE SPOOL" to prevent issuance while it was still wet. The quality inspector accepting the wetted wire did not enter the issue into either the nonconformance or corrective action programs, as required. Within a few days, the wire developed spots of surface rust. Numerous quality inspectors, including the lead inspector, who had access to the controlled storage area and responsibility to issue and receive the wire on a daily basis, observed the spool of wire with the handwritten note. Many knew that it had been wetted or that it had visible rust spots. No personnel took the appropriate action to write a nonconformance or corrective action report. Because the issue was not documented in the corrective action system, the spool was not segregated from the spools ready for issue, the cause of the rust had not been determined, and an investigation had not been performed to determine whether any nonconforming wire had actually been used in a safety-related welding application.

The vendor did not document or investigate the issue until a U.S. Nuclear Regulatory Commission inspector discovered the spool of weld wire during a walkdown. The wire was intended for use on nuclear safety-related welds for modular subassemblies for a domestic plant. Ultimately, the vendor determined that the spool of wire had not been used for production work after it was wetted, even though it was on the shelf and could have potentially been used. This incident may have been prevented if the vendor personnel had exhibited personal accountability for their behaviors and work practices.[3]

Thinking about this scenario, consider the following questions:

1. How does this scenario apply to the safety culture trait of Personal Accountability?

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2. What kinds of communications would have reinforced safety as the overriding priority?

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3. How could this situation been handled differently, what might have been the outcome?

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Now that you have read this Trait Talk on *Personal Accountability*, consider the following questions:

1. How does this trait apply to my organization?

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2. Are there other attributes and examples that better fit my organization?

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3. What impact does this trait have on the safety culture in my organization?

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4. How does this increase my understanding of the safety culture in my organization?

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5. How could I improve the performance of this trait in my organization?

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SAFETY CULTURE CASE STUDY

Overview

The NRC developed the Case Studies to provide real-life events where review of the circumstances surrounding the events and the results of the investigations found clear examples of the role that safety culture played in contributing to, or lessening, the loss of life and damage associated with the event. These Case Studies represent a breadth of industries, including energy, medical, and transportation, and can be found on the Web site at http://www.nrc.gov/about-nrc/safety-culture.html.

The Case Studies aid in understanding the importance of developing and maintaining a positive safety culture. They highlight the significance of safety culture in the analysis and identification of root causes of an event and enhance safety by raising awareness of safety culture and by applying lessons learned.

The Case Study included here, "June 2009 Collision of Two Washington Metropolitan Area Transit Authority Metrorail Trains near Fort Totten Station, Washington, DC," includes a description of the event that occurred, probable cause, lessons learned, and an analysis of the event in terms of the safety culture traits. This Case Study was chosen because it complements the subsequent Safety Culture Journey on the same event and organization. Readers can gain a more in-depth understanding of safety culture by considering this Case Study and Journey together.

It is important to remember that a Case Study that depicts a certain community or organization can be applicable to any organization. When reviewing the Case Study, consider how an event in your own organization could occur if you are experiencing similar weak, or absent, safety culture traits.

June 2009 Collision of Two Washington Metropolitan Area Transit Authority Metrorail Trains near Fort Totten Station, Washington, DC

What Happened?

On Monday, June 22, 2009, at about 4:58 p.m. eastern daylight time, WMATA Metrorail train 112 struck the rear of stopped Metrorail train 214. The powerful impact caused the rear car of train 214 to telescope into the lead car of train 112, resulting in a loss of occupant survival space in the lead car of about 63 feet (about 84 percent of its total length). Nine people aboard train 112, including the train operator, were killed. Emergency response agencies reported transporting 52 people to local hospitals.[1]

Probable Cause

- "A failure of track circuit modules caused the automatic train control system to lose detection of one train (train 214) allowing a second train (train 112) to strike it from the rear."[2]
- WMATA failed to institutionalize and employ across the system an enhanced track circuit verification test procedure that was developed following a near collision in Rosslyn, VA, in 2005. If this test procedure had been institutionalized and used systemwide, it would have identified the faulty track circuit before the accident.[1]
- Other major contributing factors were "WMATA's lack of a safety culture" and WMATA's failure to replace or retrofit 1000-series railcars, which were shown in a 2004 accident to exhibit poor crashworthiness.[1]

SCPS Traits	Evidence of Weak Safety Culture Traits[1]
Leadership Safety Values and Actions	At a monthly board meeting on June 25, 2009, WMATA provided a safety culture presentation to its Board of Directors. The presentation focused on WMATA's commitment to correct recognized hazards, such as parking lot injuries and improper door operations. It did not address safety or train operations or audit findings and corrective action plans. The NTSB was concerned that senior management may have placed too much emphasis on investigating these types of hazards to the exclusion of passenger safety during transit.
Problem Identification and Resolution	"In 2006, the NTSB recommended that WMTA accelerate the retirement of the 1000-series cars or retrofit them with crashworthiness collision protection comparable to the 6000-series cars. In 2007, that recommendation was classified 'Closed—Unacceptable Action' based on WMATA's response that it was not feasible to retrofit the 1000-series cars and that they would remain in service until replacement with the 7000-series cars in 2014," as originally planned. This issue was identified and evaluated but not addressed or corrected commensurate with the potential risk. The NTSB report recommends replacing all 1000-series railcars as soon as possible with cars that have crashworthiness collision protection at least comparable to the 6000-series railcars.
Personal Accountability	The June 25, 2009, WMATA safety presentation defined a preventable accident as "an accident that occurred because the employee failed to do everything reasonably expected of a trained professional to avoid involvement in an accident." (NTSB/RAR-10/02) Based on this definition, NTSB concluded that "WMATA placed much of the blame for causing and much of the responsibility for preventing accidents on frontline employees. Placing blame on frontline employees is not likely to improve the safety of the system as a whole."
Work Processes	As the result of a 2005 audit, the Federal Transit Administration issued nine deficiency findings and one recommendation to comply with the Code of Federal Regulations. After 2 years, the audit findings were still open and WMATA did not have a process to identify and address system safety deficiencies.
Continuous Learning	The 2005 near collision in Rosslyn, VA, afforded a prime opportunity to learn about ways to ensure safety. WMATA developed an enhanced track circuit verification test to identify track circuits with the potential to lose train detection; however, the test was never institutionalized and circuit monitoring tools fell into disuse, indicating that WMATA either did not recognize the severity of the risk posed or did not communicate that hazard to all departments of the agency. The results of the hazard assessment and procedures for addressing the identified risk should have been integrated into the training and guidance materials for all affected personnel.
Environment for Raising Concerns	NTSB found examples of a deficient reporting culture within WMATA resulting from fear of retaliation. As a result of these findings, NTSB recommended that WMATA develop and implement a nonpunitive safety reporting program to collect and review reports from staff at all levels throughout the organization and share the results of these reviews with all divisions of WMATA.
Effective Safety Communication	In response to the 2005 event in Rosslyn, VA, WMATA developed and issued technical bulletins requiring the use of an enhanced circuit verification test procedure; however, none of the WMATA technicians interviewed as part of the investigation was familiar with the enhanced procedure. NTSB concluded that WMATA failed to recognize that the near collision in Rosslyn represented an unacceptable hazard and did not ensure that the communication reached all affected divisions in the organization for resolution.
Respectful Work Environment	WMATA required all trains to be operated in automatic mode during the morning and evening rush periods. The operator of train 214 had been reprimanded previously for operating his train in manual mode; however, on the day of the accident, he changed from automatic to manual mode because he did not want to rely on the automated system to properly position the train along the platform. His actions are indicative of the distrust between WMATA management and its employees. "Disciplinary practices perceived as unfair can motivate individuals to hide safety-related information or adopt behaviors to avoid blame."
Questioning Attitude	The NTSB report states that managers had an apparent tendency to tolerate failures and malfunctions in the automatic train control system. This may explain why WMATA officials had designated track circuit alarms in the Metrorail Operations Control Center as requiring no specific response and why neither technicians nor maintenance officials placed a high priority on addressing a loss of train detection. NTSB concluded that this complacency likely influenced the inadequate response to malfunctions.

What Can Organizations Learn From This Accident?

This accident reinforces the need for, and importance of, promoting a positive safety culture by routinely evaluating NRC safety culture activities and initiatives and making enhancements and adjustments to ensure that your organization remains proactive and appropriately focused in this important area. Key lessons from this case study include the following:

- Leaders and individuals should be committed to the core values and behaviors that emphasize safety over competing goals to ensure protection of people and the environment.
- Problems that have been identified as potential safety threats, but that have not been fully evaluated and addressed, should be escalated until resolved.
- Personnel should be encouraged to raise concerns without fear of retaliation.
- Processes and procedures should be standardized, implemented, maintained, and communicated.
- Personnel, equipment, tools, procedures, and other resources needed to ensure safety and security should be available.

Now that you have read through this Safety Culture Case Study, consider the following questions:

1. What could have been done differently to prevent this event?

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2. What impact did safety culture have on the event's outcome, including whether it could have helped to prevent the event all together?

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3. What can I learn from this case?

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4. How does this increase my understanding of safety culture?

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5. How do the lessons learned from this case study apply to my organization or community?

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SAFETY CULTURE JOURNEY

Overview

How did the organization assess its safety culture and identify weaknesses? What corrective actions and new initiatives did it take? How can it sustain a positive safety culture? The NRC was asked these questions many times after stakeholders, vendors, and others involved in safety regulation reviewed the Safety Culture Case Studies. In response to these questions, the NRC developed the Safety Culture Journey—a case study of an organization's efforts to improve its safety culture.

Safety culture is a dynamic process that can change with new leadership, situations, and organizational conditions. Building and sustaining a positive safety culture that can withstand organizational challenges requires time, vigilance, and initiative. An organization's response to accidents or events typically includes assessment of its safety culture, identification of weaknesses, and implementation of corrective actions and new initiatives. An organization must continue to be diligent, plan for the future, and put goals in place to keep the focus on safety. The journey it takes reflects its commitment to safety as its highest priority.

The Safety Culture Journey offers a brief synopsis of an event and highlights how the organization assessed its safety culture and identified weaknesses, and what corrective actions and new initiatives the organization took. Many of these initiatives reflect the traits of a positive safety culture as described in the SCPS, and this analysis is also included. Finally, the Journey discusses the strategies the organization put in place to sustain a positive safety culture.

The Safety Culture Journey included here is "The Washington Metropolitan Area Transit Authority" because it is the followup to the previous case study included in this education resource on the same subject. These two studies, read together, provide an in-depth look at an event, as well as the followup actions taken to improve the organization's safety culture. Please note that the Safety Culture Journey summarizes actions taken during a discrete period of time, in this case between 2009 and 2013. Events, initiatives, or actions occurring after this time period may continue to challenge the organization's safety culture, which reflects the continuous journey that is safety culture.

After reading this Safety Culture Journey, reflect on how the safety culture traits are visible in your own organization and what actions you might take to move forward on your safety culture journey. The lessons learned by the organization depicted in this Safety Culture Journey and the actions taken in response to the accident may work in your organization as well, although they may need to be modified to fit. Remember that assessments, strategic plans, or educational initiatives are universal action items that are not specific to any one organization.

The Washington Metropolitan Area Transit Authority

On Monday, June 22, 2009, the Washington Metropolitan Area Transit Authority (WMATA) Metrorail train 112 struck the rear of stopped Metrorail train 214 at the Fort Totten station. Nine people aboard train 112 were killed and 52 people were injured. One major contributing factor to this accident was "WMATA's lack of a safety culture."[1,2] Since the accident, WMATA has conducted safety culture assessments, implemented new initiatives and prioritized safety culture in its strategic plan. The journey demonstrates how an organization's weak safety culture can contribute to a serious accident, how safety culture can be assessed and improved, and how a positive safety culture can be fostered and sustained through strategic planning and leadership commitment to safety as the highest priority.

How did the organization assess their safety culture and identify weaknesses?

Since the Metro accident in 2009, there has been an investigation, audit, reports and surveys. These assessments provided WMATA with the information needed to decide what actions to take. Although the following list of reports is not comprehensive, it demonstrates WMATA's continuous focus on safety culture.[3]

- On March 4, 2010, the Federal Transit Administration (FTA) issued its audit of the Tri-State Oversight Committee (TOC) and WMATA. The report highlighted key deficiencies in the safety and oversight programs at WMATA and TOC in the aftermath of the Ft. Totten collision, and recommended that WMATA fundamentally change its organization and culture.[3]
- The National Transportation Safety Board (NTSB) investigated the accident and released its report on July 27, 2010. This report included the 11 findings and 10 recommendations from the FTA's 2010 audit, and it provided evidence of an ineffective safety culture within the organization. NTSB issued a total of 34 recommendations in connection with this accident.[1]
- During 2010, the WMATA Office of the Inspector General (OIG) performed a control self -assessment (CSA) of employee safety. The CSA results indicated that employees did not believe WMATA provided them with a safe working environment because of unmitigated hazards, inadequate training and ineffective internal and external communication.[3]
- During July 2010, over 9,000 WMATA employees completed a safety culture survey and the organization reported the results in October 2010. The findings identified numerous weaknesses in safety culture. Among them: Employees were concerned about retaliation from peers; reported safety concerns were not consistently addressed across Metro; and when safety issues were appropriately addressed, employees felt Metro did not close the loop with employees.[5]
- In February 2011, WMATA issued a safety progress report to its Board of Directors that included the following goal: "Many recommendations, one central theme-Metro must instill a strong, unified and pervasive safety culture and thereby improve the safety of our employees, customers and communities we serve."[6]
- From September through October 2012, WMATA administered an Employee Engagement Survey to measure the progress in creating a safety culture and identify WMATA strengths and opportunities for improvement. The results indicated that WMATA has made significant progress in strengthening its safety culture. The most important finding was that employees were reporting significant progress in implementing Metro's safety culture:
- The scores of the survey indicated that employees:
- know how to report safety issues or concerns
- feel they have the training to do the job safely and can provide ideas and suggestions for improving safety
- assert that their direct supervisor regularly provides safety communication
- report that their co-workers take safety policies and procedures seriously
- believe effective action would be taken if a safety violation was reported
- assert they are comfortable in reporting safety violations and concerns[7]

What Corrective Actions and New Initiatives Did They Take?

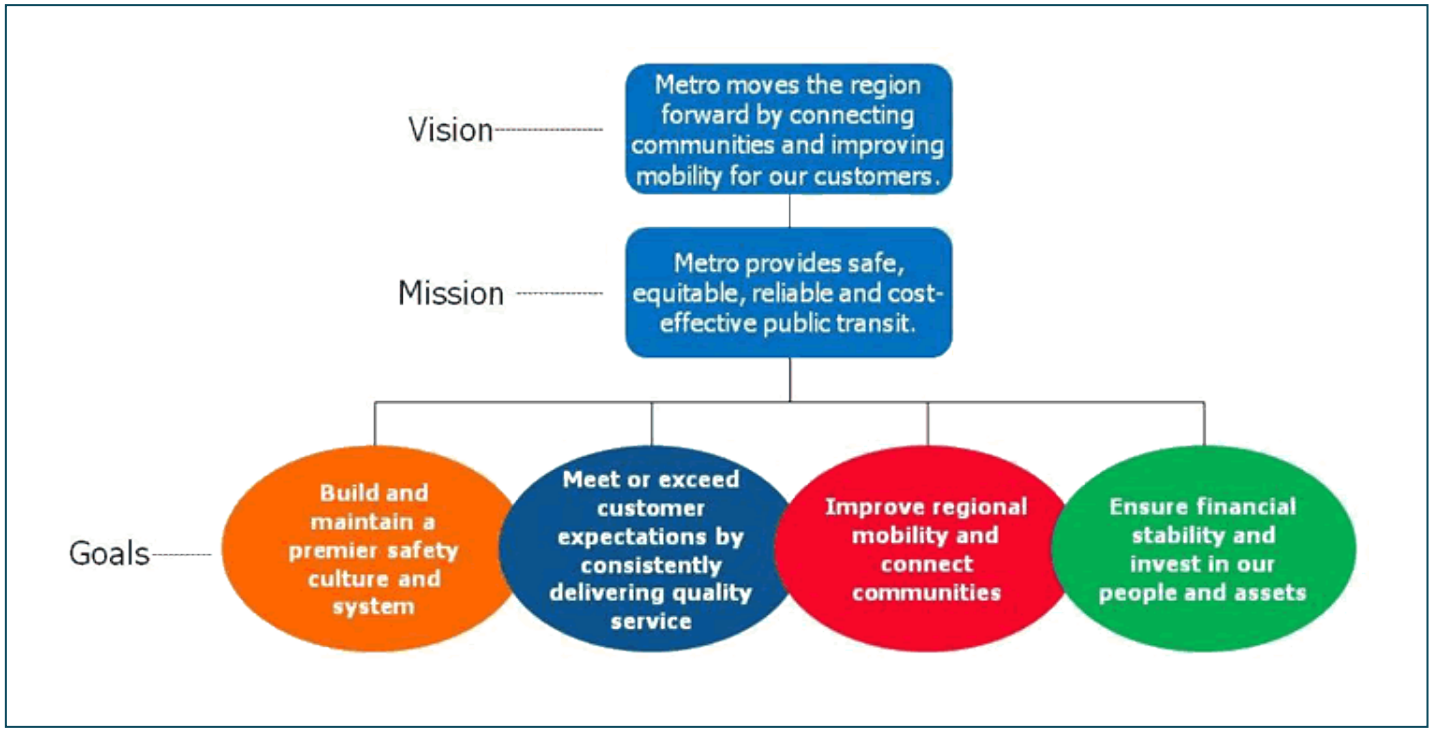
In response to the 2009 accident and subsequent investigation, audits and surveys, WMATA implemented changes to its organization and developed new programs and policies.[3,4] These initiatives reflect the traits of a positive safety culture as described in the NRC's Safety Culture Policy Statement (SCPS). Although some initiatives could reflect several SCPS traits, only the most relevant trait associated with each key initiative is listed. In addition, because one trait may best represent several initiatives, all nine SCPS traits may not be represented in the following chart.

SCPS Traits	Initiatives
Leadership Safety Values and Actions	Metro's Board took the lead in building a safety - first culture by establishing the Safety and Security Committee that provides public information on WMATA's safety program activities and initiatives, safety performance, as well as the results of investigations into accidents and incidents.
Leadership Safety Values and Actions	WMATA's Chief Safety Officer is a direct report to the General Manager and Chief Executive Officer (GM/CEO) and is an active and involved member of the Executive Leadership Team. Since 2010, the Safety Department has doubled in size and increased it authority and technical capacity. The Safety Department's annual budget has more than tripled since 2010 to $17.4 million.
Work Processes	WMATA updated its Metrorail Safety Rules and Procedures Handbook (MSRPH), and developed a new Roadway Worker Protection (RWP) program. Both initiatives represent a positive change in the way WMATA conducts its operations and maintenance.
Problem Identification and Resolution	WMATA re-established and strengthened its safety committee structure to ensure that safety concerns are identified at the field level, evaluated and resolved at the managerial level, and that conflicts and differenced of opinion are decided at the executive level.
Environment for raising Concerns	WMATA initiated a safety hotline that includes an anonymous, Web-based reporting application that runs 24/7.
Environment for Raising Concerns	WMATA strengthened its whistleblower policy, making it non-punitive.
Questioning Attitude	WMATA gave employees the right to challenge their safety on the job through a "Good Faith Challenge" process.
Personal Accountability	WMATA created the "Champions of Safety" program to recognize employees who maintain safe work practices.
Effective Safety Communication	All WMATA executive management communications with employees have been reviewed to ensure that safety is included and prioritized, and is the first agenda item for most executive meetings and briefings.
Leadership Safety Values and Actions	WMATA's GM/CEO conducts one-on-one monthly meetings with members of the Executive Leadership Team to reduce communication silos and promote proactive ownership of safety issues.
Continuous Learning	WMATA's Executive Safety Committee has been re-established and reviews WMATA's safety performance to discuss the results of investigations into accidents, incidents and unusual occurrences.

How can WMATA Sustain a Positive Safety Culture?

In 2013, WMATA issued their 2013-2025 strategic plan, which states the following: "Continuous attention to improving safety culture has resulted in employees who are now highly engaged, have clarity about their mission, and have the authority and information to do their jobs well. Finally, the strategic plan clearly articulates that everyone must do their part in creating and sustaining a culture of safety and security, and affirms that safety is the first priority." Goal 1 of this plan, "Build and Maintain a Premier Safety Culture and System," reflects their focus on safety culture and includes the following:[4]

- **Keep safety Metro's first priority:** Metro will continue its efforts to return to and keep the system equipment and infrastructure in good condition. Metro will use data-driven and science-based methods to allocate resources, use system safety practices and principles and environmental design to enhance safety, and seek to meet or exceed national safety and security standards for transit.
- **Create a shared climate of safety:** Metro will work with employees, riders, jurisdictional partners, and the general public to make sure that everyone does their part in creating and sustaining a culture of safety and security in stations, vehicles, support facilities, and access points. Metro will enhance its communications feedback loops to bring critical safety information to empowered agents quickly to prevent accidents before they happen.
- **Expect the unexpected:** Metro will continue to support the region's emergency transit management and security readiness protocols and seek to make transit emergency protocols widely—and easily—understood. Metro will maintain regional evacuation capability and prepare for any event that requires wide-scale response. On a smaller scale, Metro will continue to improve incident response timing, planning, preparation, and investigation.



Now that you have read through this Safety Culture Journey, consider how the actions, initiatives and lessons learned could apply to your organization and ask yourself the following questions:

1. Has my organization been on a similar journey?

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2. What did my organization do differently?

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3. What can I learn from this organization's experience?

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4. How does this information increase my understanding of safety culture?

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5. How could I improve safety culture in my organization?

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Sources of Information

Sources of Information for Safety Culture Trait Talk:

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 reactor as well as non-reactor 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.

Sources of Information for Safety Culture Case Study:

The information included in these case studies was taken from official investigative reports and other documents, assessments and reports that were publicly available when the specific case study was developed The NRC has not conducted a formal analysis of the events discussed herein for, or in conjunction with, NTSB, WMATA, or any other organization. The NRC compiled the factual information presented from publicly available sources.

1. NTSB Number RAR-10/02

2. NTSB News-SB-10-29

Sources of Information for the Safety Culture Journey:

The information included in the Safety Culture Journey was taken from assessments, documents and reports that were publicly available when the specific Safety Culture Journey was developed. The NRC has not conducted a formal analysis of the events discussed herein for, or in conjunction with, NTSB, WMATA, or any other organization. The NRC compiled the factual information presented from publicly available sources:

1. Railroad Accident Report, NTSB Number RAR-10/02

2. Safety Culture Communicator case study 1: June 2009 Collision of Two Washington Metropolitan Area Transit Authority Metrorail Trains Near Fort Totten Station, Washington, DC

3. Rail Transit Safety Program: Safety and Maintenance Audit of the Washington Metropolitan Area transit Authority (WMATA) Final Audit Report November 28, 2012, Federal Transit Administration, Office of Safety and Security.

4. MOMENTUM The Next Generation of Metro Strategic Plan 2013–2025

5. Safety Culture Survey Report, October 28, 2010

6. Safety Progress Report, WMATA, Safety and Security Committee, February 24, 2011

7. Board Action/Information Summary: Employee Engagement Survey, Washington Metropolitan Area Transit Authority, December 6, 2012

APPENDIX

Safety Culture Policy Statement
76 FR 34773; June 14, 2011
Nuclear Regulatory Commission

[NRC–2010–0282]

Final Safety Culture Policy Statement

AGENCY: Nuclear Regulatory Commission.

ACTION: Issuance of final safety culture policy statement.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC or the Commission) is issuing this Statement of Policy to set forth its expectation that individuals and organizations performing or overseeing 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. The Commission 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*. This policy statement 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.

DATES: This policy statement becomes effective upon publication in the *Federal Register*.

ADDRESSES: You can access publicly available documents related to this document using the following methods:

• *NRC's Public Document Room (PDR):* The public may examine and have copied, for a fee, publicly available documents at the NRC's PDR, Room O1–F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852.

• *NRC's Agencywide Documents Access and Management System (ADAMS):* Publicly available documents created or received at the NRC are available online in the NRC Library at *http://www.nrc.gov/reading-rm/adams.html*. From this page, the public can gain entry into ADAMS, which provides text and image files of the NRC's public documents. If you do not have access to ADAMS or if there are problems in accessing the documents located in ADAMS, contact the NRC's PDR reference staff at 1–800–397–4209, 301–415–4737, or by e-mail to *pdr.resource@nrc.gov.*

• *Federal rulemaking Web site:* Public comments and supporting materials related to this document can be found at *http://www.regulations.gov* by searching on Docket ID NRC–2010– 0282. Address questions about NRC dockets to Carol Gallagher, telephone: 301–492–3668; e-mail: *Carol.Gallagher@nrc.gov.*

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SUPPLEMENTARY INFORMATION:

I. Background

A. Previous Policy Statements and Events Involving Safety Culture

The NRC has long recognized the importance of a safety-first focus in nuclear work environments for public health and safety. The Commission's emphasis on a safety-first focus is reflected in two previously published NRC policy statements. The 1989, "Policy Statement on the Conduct of Nuclear Power Plant Operations" (54 FR 3424; January 24, 1989), applies to all individuals engaged in activities that affect the safety of nuclear power plants, and provides the Commission's expectations of utility management and licensed operators with respect to the conduct of operations. The 1996, "Freedom of Employees in the Nuclear Industry to Raise Safety Concerns Without Fear of Retaliation" (61 FR 24336; May 14, 1996), applies to the regulated activities of all NRC licensees and their contractors and subcontractors, and provides the Commission's expectations that licensees and other employers subject to NRC authority establish and maintain safety-conscious work environments in which employees feel free to raise

safety concerns, both to their management and to the NRC, without fear of retaliation. This Safety Culture Statement of Policy, in conjunction with the previous policy statements, is intended to emphasize the importance the NRC places on the development and maintenance of a positive safety culture for all regulated activities.

The accident at the Chernobyl nuclear power plant in 1986, brought attention to the importance of safety culture and the impact that weaknesses in safety culture can have on safety performance. Since then, the importance of a positive safety culture has been demonstrated by a number of significant, high-visibility events worldwide. In the United States, incidents involving the civilian uses of radioactive materials have not been confined to a particular type of licensee or certificate holder, as they have occurred at nuclear power plants and fuel cycle facilities and during medical and industrial activities involving regulated materials. Assessments of these incidents revealed that weaknesses in the regulated entities' safety cultures were an underlying cause of the incidents or increased the severity of the incidents. The causes of these incidents included, for example, inadequate management oversight of process changes, perceived production pressures, lack of a questioning attitude, and poor communications. One such incident indicated the need for additional NRC efforts to evaluate whether the agency should increase its attention to reactor licensees' safety cultures. This resulted in important changes to the NRC's Reactor Oversight Process (ROP). Commission paper SECY–06–0122, dated May 24, 2006, (ADAMS Accession No. ML061320282) describes the NRC's safety culture activities at that time and the outcomes of those activities.

Following the terrorist attacks of September 11, 2001, the Commission issued orders enhancing security at facilities whose operations, if attacked, could have an impact on public health and safety. During the early years of implementation of these security enhancements, several violations of the Commission's security requirements were identified in which the licensee's failure to cultivate a positive safety culture impacted the effectiveness of the licensee's security program. The most visible of these involved security officers sleeping in a "ready room" while on shift at a nuclear power plant. Most of the weaknesses involved inadequate management oversight of security, lack of a questioning attitude within the security organization, complacency, barriers to raising concerns about security issues, and inadequate training of security personnel.

B. Commission Direction

In February 2008, the Commission issued Staff Requirements Memorandum (SRM), SRM–COMGBJ– 08–0001 (ADAMS Accession No. ML080560476), directing the NRC staff to expand the Commission's policy on safety culture to address the unique aspects of security and to ensure the resulting policy is applicable to all licensees and certificate holders. The Commission directed the staff to answer several additional questions, including: (1) Whether safety culture as applied to reactors needed to be strengthened; (2) how to increase attention to safety culture in the materials area; (3) how stakeholder involvement can most effectively be used to address safety culture for all NRC and Agreement State licensees and certificate holders, including any unique aspects of security; and (4) whether publishing the NRC's expectations for safety culture and for security culture would be best accomplished in one safety/security culture statement or in two separate statements while still considering the safety and security interfaces.

In response to Commission direction, the NRC staff reviewed domestic and international safety-culture-related documents and considered NRC lessons learned. Additionally, the staff sought insights and feedback from external stakeholders. This was accomplished by providing information in a variety of forums, such as stakeholder organization meetings, newsletters, and teleconferences, and by publishing questions developed to address Commission direction in the February 9, 2009, *Federal Register* notice (FRN) (74 FR 6433) entitled "Safety Culture Policy Statement Development: Public Meeting and Request for Public Comments" (ADAMS Accession No. ML090260709).

In February 2009, the NRC held a public workshop on the "Development of a Policy Statement on Safety Culture and Security Culture" in which a broad range of stakeholders participated,

including representatives from the Agreement States (Meeting Summary: ADAMS Accession No. ML090930572). The staff developed draft characteristics (subsequently referred to as "traits") of a positive safety culture and presented them at the workshop. Mindful of the increased attention to the important role of security, the staff also sought input from the workshop participants on whether there should be a single safety culture policy statement or two policy statements addressing safety and security independently while considering the interface of both. Before providing its recommendations to the Commission, the staff developed a draft definition of safety culture in which it modified a definition from the International Atomic Energy Agency's advisory group, the International Nuclear Safety Group, to make it applicable to all NRC-regulated activities and to address security.

Based on its review and stakeholder feedback, in SECY–09–0075, "Safety Culture Policy Statement," dated May 16, 2009 (ADAMS Accession No. ML091130068), the NRC staff provided a single draft safety culture policy statement for Commission approval. The draft policy statement acknowledged the importance of safety and security, and the interface of both, within an overarching culture of safety. Additionally, in response to the Commission's questions, the staff: (1) Concluded that the NRC's oversight of safety culture as applied to reactors has been strengthened, is effective, and continues to be refined in accordance with the existing ROP self-assessment process; (2) described actions taken and planned for increasing attention to safety culture in the materials area; and (3) described actions taken and planned for most effectively obtaining stakeholder involvement to address safety culture, including any unique aspects of security, for all NRC and Agreement State licensees and certificate holders.

In SRM–SECY–09–0075 (ADAMS Accession No. ML092920099), the Commission directed the staff to: (1) Publish the draft safety culture policy statement for no fewer than 90 days; (2) continue to engage a broad range of stakeholders, including the Agreement States and other organizations with an interest in nuclear safety, to ensure the final policy statement presented to the Commission reflects a broad spectrum of views and provides the necessary foundation for safety culture applicable to the entire nuclear industry; (3) make the necessary adjustments to encompass security within the statement; (4) seek opportunities to comport NRC terminology, where possible, with that of existing standards and references maintained by those that the NRC regulates; and (5) consider incorporating suppliers and vendors of safety-related components in the safety culture policy statement.

C. Development of the Final Policy Statement

On February 2–4, 2010, the NRC held a second safety culture workshop to provide a venue for interested parties to comment on the draft safety culture policy statement. The additional goal of the workshop was for panelists representing a broad range of stakeholders to reach alignment, using common terminology, on a definition of safety culture and a high-level set of traits that describe areas important to a positive safety culture. The workshop panelists represented a wide range of stakeholders regulated by the NRC and/ or the Agreement States, including medical, industrial, and fuel cycle materials users, and nuclear power reactor licensees, as well as the Nuclear Energy Institute, the Institute of Nuclear Power Operations (INPO), and members of the public. The workshop panelists reached alignment with input from the other meeting attendees on a definition of safety culture and a high-level set of traits describing areas important to a positive safety culture.

Following the February 2010, workshop, the NRC staff evaluated the public comments that were submitted in response to the November 6, 2009, FRN (74 FR 57525). Additionally, the staff participated on panels and made presentations at various industry forums in order to provide information to stakeholders about the development of the safety culture policy statement and/ or to obtain additional input and to ascertain whether the definition and traits developed at the workshop accurately reflect a broad range of stakeholders' views. These outreach activities included, for example, participation in a Special Joint Session on Safety Culture at the Health Physics Society Annual Meeting, and presentations on the development of the safety culture

policy statement at the Annual Fuel Cycle Information Exchange, the Conference of Radiation Control Program Directors' Annual National Conference on Radiation Control, the Institute of Nuclear Materials Management's Annual Meeting, the Second NRC Workshop on Vendor Oversight for New Reactors, and the Organization of Agreement States Annual Meeting. In response to Commission direction in SRM–SECY– 09–00075, the staff focused attention on attending meetings involving the Organization of Agreement States and other materials licensees.

In July 2010, the NRC held a public teleconference with the panelists who participated in the February 2010, workshop to discuss the status of outreach activities associated with the development of the policy statement. At the July 2010, meeting, the panelists reiterated their support for the definition and traits developed at the February 2010, workshop as a result of their outreach with their industry colleagues. This position aligns with the comments the staff received during the various outreach activities. In September 2010, the staff held an additional teleconference to provide information on the initial results of a validation study conducted by INPO, which was conducted, in part, to see whether and to what extent the factors that came out of INPO's safety culture survey support the February 2010, workshop traits. The factors support the traits developed at the workshop.

Based on its review and stakeholder feedback, the staff published the revised draft safety culture policy statement (ADAMS Accession No. ML102500563) on September 17, 2010 (75 FR 57081), for a 30-day public comment period. Because public comments reflected some misunderstanding regarding the Commission's use of a policy statement rather than a regulation or rule, the September 2010, FRN provided clarification, pointing out that the Commission may use a policy statement to address matters relating to activities that are within NRC jurisdiction and are of particular interest and importance to the Commission. Policy statements help to guide the activities of the NRC staff and can express the Commission's expectations of others; however, they are not regulations or rules and are not accorded the status of a regulation or rule within the meaning of the Administrative Procedure Act. The Agreement States, which are responsible for overseeing their materials licensees, cannot be required to implement the elements of a policy statement because such statements, unlike NRC regulations, are not a matter of compatibility. Additionally, policy statements cannot be considered binding upon, or enforceable against, NRC or Agreement State licensees and certificate holders.

This Statement of Policy has been developed to engage individuals and organizations performing regulated activities involving nuclear materials and share the Commission's expectations regarding the development and maintenance of a positive safety culture.

The NRC held a public meeting in September 2010, in the Las Vegas Hearing Facility, Las Vegas, Nevada, which was simultaneously broadcast in the Commission Hearing Room, Rockville, Maryland, and over the internet via Web streaming in order to allow remote participation. The goals of the September 2010, FRN and meeting were to provide additional opportunities for stakeholders to comment on the revised draft policy statement, including the definition and traits developed at the February 2010, workshop, and to discuss the information gathered from the outreach activities that had occurred since the February 2010, workshop. Additionally, a representative from INPO presented information on the validation study INPO conducted as part of INPO's efforts to help establish a technical basis for the identification and definition of areas important to safety culture. A member of the Office of Nuclear Regulatory Research also presented findings related to the oversight of the INPO study.

II. Public Comments

The November 2009, FRN and the September 2010, FRN generated 76 comments from affected stakeholders and members of the public. The staff's evaluation concluded that many of the comments were statements of agreement on the information included in the draft and revised safety culture policy statements and did not require further action. A few of the commenters raised issues that the staff considered during the development of the policy statement, but ultimately concluded that the issues were

either not applicable to the policy statement, for example, that "by virtue of its all encompassing applicability, the policy must be taken as a strategic utterance;" or either misunderstood or disregarded the concept of a policy statement in this application, for example, that a policy statement is "largely inadequate for purposes of establishing broad-reaching performance standards." The remaining comments informed the NRC staff's development of the final policy statement. These were grouped into the following themes:

1. The NRC should adopt the definition and traits developed during the February 2010, workshop. This theme encompassed additional comments indicating that retaining the term "security" in the definition and traits of a positive safety culture may be confusing to many licensees, particularly materials licensees.

2. The traits from the February 2010, workshop should be included in the Statement of Policy in order to provide additional clarity as to its intent.

3. More guidance is needed on the NRC's expectations as to how the policy statement will be implemented. This encompassed the additional theme that stakeholders would like to be actively involved in the process of developing this guidance and that the continued use of workshops with the various licensees would be helpful.

4. A discussion should be included in the policy statement that addresses the diversity of the regulated community. Additionally, the Commission should acknowledge the efforts already underway as the regulated community addresses the Statement of Policy.

5. How does the NRC plan to "enforce" adherence to the policy statement?

6. Comments on the draft policy statement were generally supportive of including vendors and suppliers of safety-related components in the Statement of Policy, but reflected concern about jurisdictional issues, as well as the impact that including vendors and suppliers in the Statement of Policy might have on licensees' ability to work with these entities.

7. During its evaluation of the public comments on the draft safety culture policy statement, the staff felt that a trait addressing complacency should be added to the February 2010, workshop traits. Several months later, the results of an INPO study indicated that the trait "Questioning Attitude" had strong support with operating nuclear plant personnel. This trait resonated with the staff as an approach for addressing complacency for all regulated activities. At the September 2010, public meeting, as part of a larger presentation providing the results of the INPO validation study, the staff added a question about whether to include this trait. Additionally, the September 2010, FRN specifically asked whether complacency should be addressed in the Statement of Policy. Although the responses to this question varied, the staff concluded it should be considered in a positive safety culture and included the concept of complacency in the Statement of Policy under the trait, "Questioning Attitude." "Questioning Attitude" is described in the final Statement of Policy as a culture "in which individuals avoid complacency and continuously challenge existing conditions and activities in order to identify discrepancies that might result in error or inappropriate action."

This policy statement is being issued after careful consideration of the staff's evaluation of the public comments received on the November 2009, and September 2010, FRNs; the public meetings held in February 2009, and February, July, and September 2010; the views expressed by stakeholders during the Commission briefing in March 2010; and the informal dialogue with the various stakeholders during the staff's additional outreach efforts from the February 2010, workshop until the second public comment period ended on October 18, 2010.

The following paragraphs provide the specific information that was used in the development of the final policy statement, including the changes that were made to the November 2009, FRN:

1. The Statement of Policy adopts the February 2010, workshop definition and traits of a positive safety culture. The term "security" is not included in either the definition or the traits. The Commission agrees that an overarching safety culture addresses both safety and security and does not need to single out "security" in the definition. However, to ensure that security is appropriately encompassed within the Statement of Policy,

a preamble to the traits has been added and the robust discussion of security, including the importance of considering the interface of safety and security that was included in the draft Statement of Policy, has been retained in the Statement of Policy.

2. The Commission agrees that including the traits in the Statement of Policy will serve to clarify the intent of the policy. The draft policy statement published in the November 2009, FRN did not include the characteristics (now described as "traits') in the actual Statement of Policy. The staff developed the draft characteristics based on a variety of sources, including the 13 safety culture components used in the ROP. The characteristics included significantly more detail than the traits included in the Statement of Policy. The staff's basis for the original decision to include the characteristics in another section of the draft policy statement but not in the actual draft Statement of Policy was three-fold: first, it would keep the Statement of Policy brief and concise; second, it would maintain the Statement of Policy at a high level; and third, it would not invalidate the characteristics' standing as part of the draft policy statement to place them in another section of the draft policy statement. The November 6, 2009, FRN that contained the draft policy statement specifically requested comments on whether the characteristics should be included in the Statement of Policy. Some commenters indicated that they would prefer not to include the traits in the actual Statement of Policy or that they agree with the original decision to include the traits in their own section of the policy statement. However, several commenters indicated that adding the traits to the Statement of Policy itself would help to clarify the Commission's expectations. Because the traits in question were developed by the stakeholders at the February 2010, workshop to provide a high-level description of the areas important to a positive safety culture, the level of detail that was included in the draft characteristics is not present in the traits. Thus, even with inclusion of the traits, the Statement of Policy remains brief and concise; in addition, this approach provides high-level detail that was not in the draft Statement of Policy. Including the traits in the Statement of Policy rather than as part of the policy statement visually supports their standing as part of the Commission's expectation that these are areas that members of the regulated community should consider as they develop a positive safety culture. Finally, as the Statement of Policy points out, the list of traits was not developed for inspection purposes nor does it represent an all-inclusive list of areas important to a positive safety culture.

3. Implementation is not directly addressed in this policy statement, which sets forth the overarching principles of a positive safety culture. This discussion is not included because the Commission is aware of the diversity of its regulated community (which includes, for example, industrial radiography services; hospitals, clinics and individual practitioners involved in medical uses of radioactive materials; research and test reactors; large-scale fuel fabrication facilities; as well as operating nuclear power plants and the construction of new facilities where operations will involve radioactive materials with the potential to affect public health and safety and the common defense and security) and recognizes that implementation will be more complex in some settings than others. The NRC program offices responsible for licensing and oversight of the affected entities intend to work with their constituents, who bear the primary responsibility for safely handling and securing regulated materials, to address the next steps and specific implementation issues. Nevertheless, before implementation issues are addressed, the regulated community can begin assessing their activities to identify areas for enhancement. For example, industry representatives could begin to identify tacit organizational and personal goals that, at times, may compete with a safety-first focus and develop strategies for adjusting those goals. Some monetary incentive or other rewards programs could work against making a safe decision. Current training programs may not address safety culture and its traits or how those traits apply to dayto- day work activities. Identification of both strengths and weaknesses related to safety culture in the regulated community will be helpful in understanding implementation strategies.

4. The final Statement of Policy includes a statement that the Commission recognizes the diversity of the various organizations that are included in the Statement of Policy and the fact that some organizations have already spent significant time and resources in the development of programs and policies to support a positive safety culture. The Commission will take these efforts into consideration as the regulated community addresses the Statement of Policy.

5. Because there seemed to be some questions about the Commission's use of a policy statement rather than a regulation, the staff provided a brief discussion of the differences in the September 17, 2010, FRN, pointing out that policy statements, while not enforceable, guide the activities of the NRC staff and express the Commission's expectations. The Commission reiterates the conclusion of the discussion provided in the September 2010, FRN that while the option to consider rulemaking exists, the Commission believes at this time, that developing a policy statement is a more effective way to engage stakeholders.

6. Vendors and suppliers of safetyrelated components have been included in this Statement of Policy. A few stakeholders have raised concerns about how implementation would be carried out, particularly in cases where vendors and suppliers are located outside of NRC jurisdiction. However, the Commission believes that vendors and suppliers of safety-related components should develop and maintain a positive safety culture in their organizations for the same reasons that other NRCregulated entities should do so.

7. The final Statement of Policy adds the trait "Questioning Attitude" to the traits developed at the February 2010, workshop as an appropriate vehicle for addressing complacency.

III. Statement of Policy

The purpose of this Statement of Policy is to set forth the Commission's expectation that individuals and organizations 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. This includes 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. The Commission encourages the Agreement States, Agreement State licensees and other organizations interested in nuclear safety to support the development and maintenance of a positive safety culture, as articulated in this Statement of Policy.

Nuclear Safety Culture is defined 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.* Individuals and organizations performing regulated activities bear the primary responsibility for safety and security. The performance of individuals and organizations can be monitored and trended and, therefore, may be used to determine compliance with requirements and commitments and may serve as an indicator of possible problem areas in an organization's safety culture. The NRC will not monitor or trend values. These will be the organization's responsibility as part of its safety culture program.

Organizations should ensure that personnel in the safety and security sectors have an appreciation for the importance of each, emphasizing the need for integration and balance to achieve both safety and security in their activities. Safety and security activities are closely intertwined. While many safety and security activities complement each other, there may be instances in which safety and security interests create competing goals. It is important that consideration of these activities be integrated so as not to diminish or adversely affect either; thus, mechanisms should be established to identify and resolve these differences. A safety culture that accomplishes this would include all nuclear safety and security issues associated with NRCregulated activities.

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, e.g., production, schedule, and the cost of the effort versus safety. It should be noted that although the

term "security" is not expressly included in the following traits, safety and security are the primary pillars of the NRC's regulatory mission. Consequently, consideration of both safety and security issues, commensurate with their significance, is an underlying principle of this Statement of Policy.

The following are traits of a positive safety culture:

(1) *Leadership Safety Values and Actions*—Leaders demonstrate a commitment to safety in their decisions and behaviors;

(2) *Problem Identification and Resolution*—Issues potentially impacting safety are promptly identified, fully evaluated, and promptly addressed and corrected commensurate with their significance;

(3) *Personal Accountability*—All individuals take personal responsibility for safety;

(4) *Work Processes*—The process of planning and controlling work activities is implemented so that safety is maintained;

(5) *Continuous Learning*—Opportunities to learn about ways to ensure safety are sought out and implemented;

(6) *Environment for Raising Concerns*—A safety conscious work environment is maintained where personnel feel free to raise safety concerns without fear of retaliation, intimidation, harassment, or discrimination;

(7) *Effective Safety Communication*—Communications maintain a focus on safety;

(8) *Respectful Work Environment*— Trust and respect permeate the organization; and

(9) *Questioning Attitude*—Individuals avoid complacency and continuously challenge existing conditions and activities in order to identify discrepancies that might result in error or inappropriate action.

There may be traits not included in this Statement of Policy that are also important in a positive safety culture. It should be noted that these traits were not developed to be used for inspection purposes.

It is the Commission's expectation that all individuals and organizations, performing or overseeing regulated activities involving nuclear materials, should take the necessary steps to promote a positive safety culture by fostering these traits as they apply to their organizational environments. The Commission recognizes the diversity of these organizations and acknowledges that some organizations have already spent significant time and resources in the development of a positive safety culture. The Commission will take this into consideration as the regulated community addresses the Statement of Policy.

Dated at Rockville, Maryland, this 8th day of June 2011.
For the Nuclear Regulatory Commission.
Annette L. Vietti-Cook,
Secretary of the Commission.
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