

() IAEA

Nuclear Safety and Security Programme













After the Fukushima Accident...

..."In spite of all recent efforts there is still room for improvement in understanding the concept of safety culture and implementing it effectively worldwide in the management of all NPPs."

Chairperson, IAEA Ministerial Conference on Nuclear Safety in Vienna, June 2011.

All organizations involved in nuclear activities have a common concern to sustain and improve safety. However, there is substantial diversity among organizations in their understanding of the concept of safety culture and of the actions necessary to influence it in a positive way. This brochure provides the reader with a fundamental understanding of a strong safety culture and how IAEA can assist Member States in strengthening it.

What is Safety Culture?

In some circumstances when a severe event happens, analysis has indicated that the safety margins had been eroding steadily for years. This can result from people gradually accepting declining conditions in safe work practices, and ignoring the risks brought on by this decline that may have unnoticeably drifted towards prioritizing other concerns over safety. Risks might have been played down, because "nothing has happened", which can eventually lead to a severe event occurring.

an Assessing and analysing organization's safety culture aids in understanding the anatomy of accidents and events and assists in uncovering why safety performance can gradually decline. The deepest level of culture is the shared understandings among people. A group's shared understandings can be about how work should be done, e.g. "work procedures should always be followed because they are paramount to safety" or "we are not accountable for safety because that is the duty of the managers". A demonstration of how shared understandings can jeopardize safety is when an organization or a group of people have an attitude based on a shared understanding of "it will not happen here". This creates a false sense of security which can be reinforced by the group dynamicsince "all the others think this is safe, it's probably fine".

Unfortunately, a group is seldom aware of its shared understandings

because they are not directly visible. Shared understandings tend to be a semi-transparent layer within an organization's culture and can take several years to develop, which make them difficult to see when an event occurs; therefore, only visible behaviours are typically reflected upon and analysed. In actuality, behaviours are merely a superficial level of the culture, which equate to "the way we do things around here". This does not mean we cannot identify shared understandings. We can identify these by interpreting the behaviours of individuals within the organization. So, by first investigating the shared understandings about day-to-day safe work practices, and then addressing the shared understandings that can undermine safety, this will allow organizations to work effectively with safety culture improvement efforts.

The IAEA's approach to Safety Culture

The IAEA defines a strong safety culture as "the assembly of characteristics and attitudes in organizations and individuals which establishes that, as an overriding priority, protection and safety issues receive the attention warranted by their significance." The IAEA has developed an international framework for strong safety culture consisting of five overarching safety culture characteristics: 1) safety is a clearly recognized value; 2) leadership for safety is clear; 3) accountability for safety is clear; 4) safety is integrated into all activities; and 5) safety is learning-driven (IAEA Safety Guide GS-G-3.1).

Each of these high level characteristics has a number of attributes that have been identified as essential for achieving a strong safety culture. For example, the safety culture characteristic "accountability for safety is clear" is described by attributes such as "there is a high level of compliance with regulations and procedures" and "ownership' for safety is evident at all organizational levels and for all personnel". These attributes serve as international references of what 'good' looks like when assessing and improving safety culture.

Furthermore. the IAEA has established an integrated approach which promotes a seamless integration between the management system and its safety culture. The safe operations of nuclear organizations are formalized through management systems. However, safe performance depends on the actions of individuals and groups; these actions are influenced by the safety culture of the organization. Following this, The Management System for Facilities and Activities (IAEA Safety Requirements, No. GS-R-3) requires the management system to promote and support a strong safety culture by: "ensuring a common understanding of the key aspects of safety culture within the organization; providing the means by which the organization supports individuals and teams in carrying out their tasks safely and successfully, taking into account the interaction between individuals, technology and the organization; reinforcing a "learning and questioning" attitude at all levels of the organization; and, by providing the means by which the organization continually seeks to develop and improve its safety culture."

Contributors to strong Safety Culture

Strong safety culture is part of the defence-in-depth (i.e., denotes the practice of having multiple, redundant, and independent layers of safety systems in place to protect against a single, critical point of failure — such as the reactor core), and therefore needs to be integrated into everyday activities; it should involve all levels of the organization from the top down. The strive for a strong safety cultures is a continuous journey, as safety culture is continuously evolving and requiring continuous attention to successfully improve, strengthen and sustain it over time.

As explained, shared understandings are key drivers within culture. To take a closer look at how shared understandings are created, group dvnamics and the way people interact with each other need to be reviewed. In a strong safety culture, people feel respected and can freely share their thoughts and worries with regard to safety. Managers and leaders play a central role in creating this environment. In a strong safety culture, everyone feels accountable for safety and is sensitive to minor deviations that could lead to larger safety problems. Therefore, it is important that trust and openness is engendered and strengthened such that they permeate the organization.

Another aspect of a strong safety culture is to be alert to those influences that can impact safety culture. One example is the influence of national culture. Over the past several years, many studies have been conducted on the influence of national culture in the workplace. These studies focused on a number of dimensions, but primarily sought to answer whether people will first act in the interest of what their national culture expects of them, or first act in the interest of maintaining a safe work environment.

When cultures collide (safety versus society, for example), especially in high risk industries (Aviation, Mining, Nuclear Power, Oil and Gas, etc.), accidents can and do happen. For example, by the end of the 1990s. Korean Air had more plane crashes than almost any other airline in the world. Researchers found that Korea's hierarchical culture affected cockpit communications that further contributed to the plane crashes that occurred. The interactions among the crew were not supporting effective communication, as the co-pilots did not find it appropriate to question the captain's actions. It was only when Korean Air had figured out that their safety problem was "cultural", that they were able to identify the specific cultural issues causing the problems and could then apply effective measures to resolve them. According to the latest aviation safety data reports, Korean Air now has one of the safest records worldwide.

Cultural influences like these shape people's understandings, interpretations, perceptions and common expectations with regard to safety in their daily work; and, safety culture—whether it is actively strengthened or left to chance, can be an asset to performing work safely or a liability resulting in serious accidents. Therefore, it is important to identify the strengths and weaknesses before things go wrong and then implement improvement activities proactively.



Safety Culture Self-Assessment Workshop for Senior Managers at PNRA, Pakistan

Safety Culture Improvement Services and Support

The improvement of safety culture is an on-going endeavour that requires long term commitment to succeed. The IAEA offers comprehensive support to licensees and regulatory bodies wishing to systematically improve safety culture. An effective way of doing this is to conduct safety culture assessments and implement improvement activities based upon their findings. These assessments can be conducted by either internal or external teams. The IAEA offers both external safety culture assessments as an optional module of the OSART review mission as well as training courses for developing internal safety culture improvement teams. Safety culture improvement teams are then trained to conduct both safety culture self-assessments and implement improvement activities. Whichever assessment method is chosen, it is of key importance that the organization, including the senior management, is committed to a long

term effort, and that the organization develops process ownership.

The IAEA offers tailored support missions, i.e., workshops and training in the area of safety culture, leadership and management for safety. The following lists a variety of services and topics that the IAEA can provide upon request to Member States:

- Independent Safety Culture Assessment (ISCA) in the frame of OSART;
- Comprehensive training on safety culture self-assessment for both licensees and regulatory bodies;
- Senior management workshop on safety culture assessment and continuous improvements;
- Train-the-trainer training on safety culture oversight;
- Tailored training on safety culture improvement techniques, i.e. safety coaching, mindful communication, safety culture enabling;
- Workshop on the interaction between the individuals, technology and organization- systemic safety in practice;
- Workshop on Managing for the unexpected;
- Workshop on leadership for safety Senior managers, middle managers and supervisors;
- Workshop on leadership for safety
 Effective implementation of coaching programme;
- Training on systemic safety event analyses;
- Workshop on leadership and management for safety - specially designed for embarking countries;
- Workshop on leadership and management for safety for decommissioning phase;

For further information:

Contact: Operational-Safety.Contact-Point@ iaea.org

Write to: Division of Nuclear Installation Safety Department of Nuclear Safety and Security International Atomic Energy Agency Vienna International Centre, PO Box 100 1400 Vienna, Austria



International Atomic Energy Agency Vienna International Centre, PO Box 100 1400 Vienna, Austria Telephone: (+431) 2600-0, Facsimile (+431) 2600-7 www.iaea.org E-mail: Official.Mail@iaea.org