walter tosto

NUCLEAR SAFETY CULTURE

Dear Collaborator,

The manufacturing of critical components for nuclear installations, as I'm sure you're aware, requires operational excellence and strict controls. However, to operate in a suitable nuclear culture the concept goes far beyond the technical and quality capabilities of the organisation.

Each individual involved in the fabrication of a critical component is fully aware of their own actions and the outcome of what they have produced. This shows a mature **nuclear culture**.

For all of us at each level of the organisation, it's important to grasp and embrace this culture and use it to measure our level of competence. In order to obtain a common nuclear culture it's necessary to constantly exchange information on the quality of the work carried out at each stage of the operation. Consequently, in

order that each one of us can reach an awareness of having contributed in the best possible way, each performed activity is proactively discussed based on the known conditions at the time and without underestimating the consequences of such considerations.

Nuclear culture sets as top priority the **quality certification** of the product and the **reliability** of the certifying system. It's been demonstrated that only when the organisation's management believes and promotes these values first hand, employees implement and consider them to be real improvement factors for their work.

If this is not the case, the operations system will be free to choose priority issues at its complete discretion, which could involve factors related to production, time or current circumstances at the expense of safety and good work.

In order to emphasise safety over competing goals, a collective commitment by leaders and individuals is needed to ensure the protection of people and the environment in which we live.

Luca Tosto
Managing Director
Walter Tosto SpA

Nuclear Safety Culture is the ensemble of core values and behaviours resulting from a collective commitment by leaders and individuals to emphasize safety over competing goals to ensure protection of people and the environment.

Traits of a Positive Nuclear Safety Culture

Experience has shown that certain personal and organisational traits are present in a positive safety culture.

The following are traits of a positive safety culture:

1) Leadership: Safety Values and Actions

2) Work Processes

3) Questioning Attitude

4) Problem Identification and Resolution

5) Environment for Raising Concerns

6) Effective Safety Communication

7) Respectful Work Environment

8) Continuous Learning

9) Personal Accountability

Leadership:
Safety Values and Actions

Leaders demonstrate a commitment to safety in their decisions and behaviours.

Leaders have significant power to affect an organisation's safety culture through:

1) Priority Definition

2) Modelled Behaviours and Values

3) Reward System

4) Creation of Trust

5) Establishment of Context and Expectations for Interpersonal Relationships, Communication and Accountability.

6) Definition of Strategy and Direction

7) Alignment of People and Resources

8) Ability to Motivate and Inspire people

9) Timely Identification and Resolution of Problems

The Cost-Schedule vs. Safety-Quality conflict may occur at every level of the organisation.

The organisation's safety culture plays a significant role in guiding employee's decisions.

Leadership at the top of the organisation is critical in setting the standards and establishing overarching safety priorities that all employees understand take precedence over all competing demands.

Is the organisation's priority safety or production?

Leaders ensure that:

Resources

Personnel, Equipment, Procedures and other Resources are available and adequate to support Safety.

Staffing levels are sufficient; personnel are qualified for the work they are performing; facilities are maintained and tools, equipment, procedures, and other resources are readily available to support work performance; finally, sufficient corportare resources are allocated for maintenance, equipment and personnel to ensure a safe and reliable operation.

Field Presence

Leaders are commonly seen in working areas of the organisation, observing coaching and reinforcing standards and expectations.

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

Incentives, Sanctions and Rewards

Incentives, sanctions and rewards are aligned with safety policies and reinforce behaviours and outcomes that reflect safety as the overriding priority.

Disciplinary actions are appropriate, consistent and support safety and a safety conscious work environment; they reward individuals who identify and raise issues affecting safety; they praise behaviours that reflect a positive safety culture; they foster an environment that promotes accountability and hold individuals accountable for their actions.

Strategic Commitment to Safety

Priorities are aligned to reflect safety as the overriding priority.

They develop and implement cost and schedule goals in a manner that reinforces the importance of safety; they establish strategic and business plans that reflect safety as the overriding priority; corporate priorities are aligned with safety priorities.

Change Management

A systematic process is used for evaluating and implementing change so that safety remains the overriding priority.

In making major changes, a systematic process is used for planning, coordinating and evaluating the safety impacts and potential negative effects on the willingness of individuals to raise safety concerns (this includes decisions concerning changes to organisational structure and funtions, leadership, policies, programs, procedures and resources); safety is maintained when planning, communicating and implementing change and significant unintended consequences are avoided; individuals understand the importance of, and their role in, the change management process.

Roles, Responsibilities and Authorities

Are clearly defined to ensure safety.

Roles, responsibilities and authorities of executives, senior managers and corporate managers are clearly defined, understood and documented; responsibility and authority are appropriately delegated to promote ownership and accountability.

Constant Examination

Safety is constantly scrutinised through a variety of monitoring techniques, including the assessment of a safety culture.

They use a variety of monitoring tools to regularly monitor safety culture, including employee surveys, self-assessment and indipendent assessments, external safety review board member feedback, employee concern investigations; they 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 Behaviours

Leaders exhibit behaviours that set the standard for safety.

They practice what they preach, modelling correct behaviours, 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; they maintain high standards of personal conduct that promote all aspects of a positive safety culture and actively seek out the opinions and concern of workers at all levels; they encourage personnel to challenge unsafe behaviour and unsafe conditions.

Example

DEEP WATER HORIZON

20 April 2010 – Oil rig explodes

11 dead, 17 injured

15 July 2010 – The oil leak was stemmed

Over 4 million barrels of oil discharged in the Gulf of Mexico

Total cost of > 50 billion dollars for BP

Devastating environmental and financial consequences

Lack of a positive safety culture:

 - 2005: BP's Texas City refinery explodes – 15 dead, 170 injured

 - 2006: BP pipeline in Alaska spills 200,000 gallons of crude oil

Explosion caused by a corporate culture embedded in risk-taking and cost-cutting.

Work Processes

Work processes implement a process of planning and controlling work activities that maintain safety.

The process of designing and controlling work to ensure safety is an important part of an organisation.

Effective work processes in a positive safety culture will have:

- Well-designed work flow that includes the assignment of responsibilities to leaders, work groups and individuals

- Policies and procedures that incorporate the appropriate risk insights, effectively planned, executed, verified and documented.

- Prioritised work activities, coordinated across workgroups and communicated effectively.

In general, there are two approaches to controlling work processes:

1) Strict adherence to procedures
   Collaborative decision-making, detailed procedures, verification of steps during procedure implementation

2) Flexibility and individual autonomy during off-normal conditions
   Activities based around individual expertise and professionalism, autonomy and rapid team based response particularly during off-normal conditions

Realising the benefits of both approaches to control work processes is one of the biggest management challenges.

The organisation implements:

Work Management

Equipment is operated and maintained within design margins

A process of planning, controlling and executing work activities including the identification and management of risk

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 prioritises work and incorporates contingency plans, compensatory actions and abort criteria, as necessary. Leaders consider the impact of changes to the work scope and the need to keep personnel apprised of the work status.

Design Margins

Equipment is operated and maintained within design margins

Margins are carefully guarded and changed only through a systematic and rigorous process. The work process supports safety and the maintenance of design margins by minimising long-standing equipment issues , preventive maintenance deferrals and backlogs.

Documentation

Created and maintained complete, accurate and up-to-date

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 labelled clearly, consistently and accurately. The backlog of document changes is understood, prioritised and activeley managed to ensure quality.

Prodecure Adherence

Processes, procedures and work instructions followed by all

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

Example

CHERNOBYL

26 April 1986 – Explosion of reactor n°4

Performance of a test to determine whether, in the event of a loss of station power, the slowing turbine could provide enough electrical power to operate the emergency systems, until the diesel emergency power supply became operative.

The operators did not comply with established operational procedures:

- They disabled automatic shutdown systems, which was not allowed by the system operating manual

- Only 6-8 control rods out of 211 were used, although there was a standard operating order that a minimum of 30 control rods was necessary to retain control of the RBMK-1000 reactor.

In addition to the reactor design deficiencies, the inadequacy of procedures, the lack of communication between operating personnel and a poor safety culture played a role in the accident.

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.

Avoiding complacency is essential to ensuring nuclear safety and can be achieved by instilling a questioning attitude in every employee.

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

It is each individual's responsibility to:

1) Continuously assess duties, procedures and job site to identify inconsistencies or abnormalities

2) Challenge assumptions, stop work in the face of uncertainty and proactively anticipate what may go wrong

3) Routinely ask the following questions in performing the job:
   - Am I doing the right thing?
   - How could we do this better?
   - Are we using the right assumptions?
   - Are we putting our people or equipment at risk?
   - What new practices could we implement that would minimise complacency and encourage a questioning attitude?

"I was navigating by sight because I knew the depths well and I had done this manoeuvre 3-4 times"

Francesco Schettino,
COSTA Concordia Captain

Individuals commit to:

Recognise Nuclear as Special and Unique

The special characteristics and unique hazards of nuclear technology are recognised

The organisation ensures that activities which could affect nuclear materials are conducted with particular care, caution and oversight.

Challenge the Unknown

Work is interrupted when faced with uncertain conditions, risks are evaluated and managed before proceeding

Leaders reinforce expectations that the job is done right the first time, that guidance is sought when unsure and work is interrupted if an unexpected condition or equipment response is encountered. Individuals maintain a questioning attitude and, if a procedure or work document is unclear or cannot be performed as written, stop work until the issue is resolved.

Challenge Assumptions

Assumptions are challenged and opposing views are offered when something does not seem correct

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 sufficiently consider impacts to nuclear safety.

Avoid Complacency

The possibility of mistakes, latent problems and inherent risk is recognised and planned for, even while expecting successful outcomes.

The organisation 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 authorising work, individuals verify procedure prerequisites are met rather than assuming they are. 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. They also consider potential undesired consequences of their actions prior to performing work and implement appropriate error reduction tools. Leaders ensure that specific contingency actions are discussed and understood during job planning.

Example

C-17 GLOBEMASTER III LANDS AT WRONG AIRPORT

20 July 2012 – Boeing C-17 Globemaster III USAF mistakenly landed at the general aviation airport Peter O. Knight in Tampa, Florida.

The intended destination of the C-17 was the MacDill Air Force Base, located just 8km from the Peter O. Knight airport.

Both airports have a runway 22.

The Peter O. Knight runway is only 1038 m long and 30 m wide, whilst the MacDill base runway is 3500 m long and e 45 m wide.

The minimum landing distance required by the C-17 is 1060 m, its wingspan is 51.75 m.

The investigations found that the reason for the mistake was human error due to "fatigue, complacency and a lack of flight discipline".
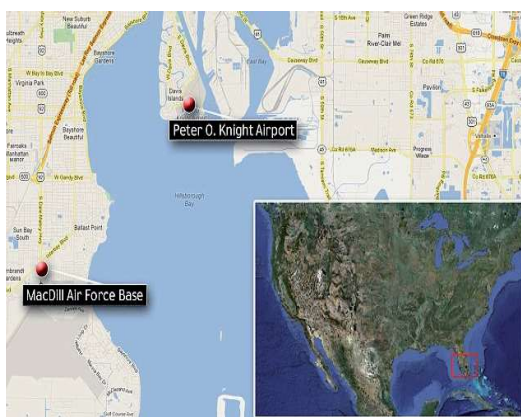
Problem Identification and Resolution

Issues potentially impacting safety are promptly identified, fully evaluated, addressed and corrected immediately commensurate with their significance.

A full understanding of safety-related issues enables the organisation to prioritise and resolve problems leading to a strong safety conscious work environment.

Leaders are responsible for identifying and diagnosing organisational or technical deficiencies, taking corrective action and anticipating emerging issues.

All members of an organisation support problem identification and resolution by promptly raising and reporting concerns.

An organisation with a positive safety culture:

- Finds existing problems and corrects weaknesses, typically through the organisation's corrective action program.

- Has a problem identification and resolution program that anticipates issues, reviews operating experience and tracks emerging industry themes and trends.

How to address problems:

Identification
The organisation implements a corrective action program according to which individuals identify issues completely, accurately and in a timely manner

Individuals recognise deviations from standards and understand how to enter issues into the corrective actions program. They ensure that problems, degraded conditions and near misses are promptly reported and documented in sufficient detail to ensure they can be appropriately prioritised and resolved.

Evaluation

The organisation thoroughly evaluates problems to ensure that resolutions address causes and extents of conditions commensurate with their safety significance

The organisation ensures that:

- Issues are properly classified, prioritised and evaluated according to their safety significance;
- Apparent and root cause investigations identifying primary and contributing causal factors are completed as required;
- The underlying organisational and safety culture contributors to issues are evaluated thoroughly and are given the necessary time and resources to be clearly understood.

Trending

The organisation periodically analyses information from the corrective action program to identify common cause issues

The organisation develops indicators that monitor both equipment and organisational performance, including safety culture. Managers use indicators that provide an accurate representation of performance and early indications of declining trends. Organisational and departmental trend reviews are completed in a timely manner in accordance with program expectations.

Resolution

The organisation takes effective corrective actions to address issues in a timely manner commensurate with their safety significance

The organisation ensures that:

- Corrective actions are completed in a timely manner;
- Deferrals of corrective actions are minimised and, when required, due dates are extended using an established process that appropriately considers safety significance;
- 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.

Example

NCR 65 – MULTI-SHOT FORMING PROCESS INNER SHELL PS1

January 2012 – Multi-shot Forming Process was demonstrated through a dedicated Mock-Up.

12 March 2014 – First cold forming activity for the Inner Shell plate of the PS1 segment, Sector 5 was performed at Walter Tosto.

The forming process produced a transition zone after every forming shot not expressly considered in the RCC-MR code.

WT performed a new cold forming demonstration to prove that:

- the maximum cumulative elongation in the transition zone is <10%
- elongation ≥ 45%
- the transition area is free of defects.

Non-destructive examinations (VT, PT e UT) are perfomed in the transition zone following the completion of all forming activities.

Mechanical tests are carried out in order to compare the mechanical properties before and after forming.

Preventive/corrective actions are implemented.

Environment for
Raising Concerns

A safety-conscious work environment allows personnel to raise safety concerns without fear of retaliation, intimidation, harassment or discrimination.

Fostering an environment for raising concerns is an important attribute of a positive safety culture.

An organisation that reinforces an environment for raising concerns typically has:

- Well developed systems for prioritising problems and directing resources

- Management that promotes employee confidence in raising and resolving concerns

- Effective communications for openly sharing information and analysing the root causes of the problem

Every concern/problem raised is addressed in a timely manner, prioritised commensurate with its safety significance and adequately resolved.

Any allegation of intimidation or retaliation is investigated, fostering an environment in which personnel are encouraged to raise concerns without fear.

The applicable process for raising concerns is clearly defined, including methods to:

1) Discuss issues with immediate supervisors

2) Bring a concern to a higher level through an alternative, accessible, credible and effective approach.

The organisation with a positive safety culture implements:

Safety Conscious Work Environment Policy

The policy supports individuals' right and responsibilities to raise safety concerns; it does not tolerate harassment, intimidation, retaliation and discrimination

Individuals feel free to raise 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 report safety problems. Leaders are trained to take ownership when receiving and responding to concerns, recognising confidentiality when appropriate and ensuring they are adequately addressed in a timely manner. Individuals are trained that behaviours 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.

Alternate Process for Raising Concerns

The process is independent of line management influence

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 all 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 and have confidence that issues raised will be appropriately resolved. Individuals assigned to respond to concerns have the appropriate competencies.

Example

CHALLENGER

28 January 1986 – 73 seconds after liftoff, the Challenger disintegrated over the Atlantic Ocean, killing all 7 crew members.

In the months that followed, NASA specialists discovered that the accident was caused by the failure of the rubber O-ring seals on the solid rocket booster.

The temperature in Florida was exceptionally low and engineers warned their superiors that the rubber O-rings were vulnerable to failure at low temperatures.

The risk was dismissed by NASA in view of the presence of a second, backup O-ring in the event that the primary O-ring failed. An argument that is not valid, however, as the rubber O-ring seals are maximum criticality components.

Effective Safety Communication

Communications maintain a focus on safety.

Effective safety communication is essential to maintaining a safety culture.

An open and respectful communication between employees fosters their willingness to give and receive feedback as well as supporting teamwork and coordination between groups.

An organisation's safety culture is divulged through communication.

To avoid confusion, the behaviour of managers must be in line with the organisation's values and priorities, maintaining coherence between formal and informal communications.

Top-down communication is effective when managers communicate directly with immediate supervisors and immediate supervisors communicate with their staff, reinforcing their credibility and trustworthiness.

Bottom-up communication from workers to managers and information exchange between workers are essential for organisational learning and safe operations.

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 that employees always feel free to speak up.

Effective safety communication implies:

Work Process Communications

Safety Communications are included 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 necessary information to accomplish work activities safely and effectively.

Bases for Decisions

Leaders ensure that the bases for operational and organisational decisions are communicated in a timely manner

Leaders promptly communicate expected outcomes, potential problems, planned contingencies and abort criteria for important decisions; they share information on a wide range of issues with individuals and periodically verify their understanding; they encourage individuals to ask questions if the basis of a management decision is unclear; they communicate the reasons for resource allocation decisions, organisational changes and other decisions affecting the organisation as a whole, including the safety implications of those decisions.

Free Flow of Information

Individuals communicate openly and honestly from top, bottom and across the organisation as well as external organisations

Leaders encourage the free flow of information; they respond to individuals in an open, honest and non-defensive manner; they actively solicit feedback, listen to concerns and communicate openly with all individuals.

Expectations

Leaders frequently communicate and reinforce the expectation that nuclear safety is the organisation's overriding priority

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

Example

ALCOA

ALCOA – World Leader in the production of aluminium.

1987 – The new CEO, Paul O'Neill, began his first speech with "I want to talk to you about worker safety".

One year later the company boasted record high profits.

During the 13 years in which O'Neill was CEO, a reduction of 89% in lost work days to injury and a fivefold increase in annual net income were achieved.

This serves as a demonstration that enacting an effective safety program that fosters an open safety culture and includes up-to-the minute safety notifications, hazard communication and productivity updates can drastically increase worker productivity, lead to fewer safety claims and improve employee morale.

Respectful Work Environment

Trust and Respect permeate the organisation.

A strong safety culture requires mutual trust and respect at all levels.

The nature and level of trust and respect between workers and their managers influence their attitudes, behaviours and feelings of personal responsibility for safety.

Leaders earn trust and respect when employees perceive that they are fair, that they deal with problems directly, that they encourage and value all ideas and opinions.

At an organisational level, trust and respect instill confidence that the organisation is just and fair, which promotes open and accurate communication, enhancing organisational learning and promoting the development of shared perceptions and norms.

At an individual level:
- trust involves the willingness of one person to depend on another person, with a relative sense of security
- the perception of competency, integrity and predictability increases trust and respect towards the individual
- successful teamwork and collaboration require respect for others' opinions and differing views
- respect of differences can be a source of motivation and innovation for an organisation.

Individuals commit to:

Evident Respect

Everyone is treated with dignity and respect

The organisation regards individuals and their professional capabilities and experiences as its most valuable asset. Individuals at all levels of the organisation treat each other with dignity and respect; decision-makers are treated with respect, even when a decision is not agreed upon. Leaders monitor for behaviours that can have a negative impact on the work environment and address them promptly; they ensure policies and expectations are enforced fairly and consistently at all levels; they ensure the facilities are conductive to a productive work environment.

Valued Opinions

Individuals are encouraged to voice concerns

Each individual is encouraged to voice concerns, provide suggestions and raise questions. Differing opinions are respected. The organisation encourages individuals to raise and leaders to receive: ideas, concerns, suggestions, differing opinions and questions to help identify and resolve problems.

High Level of Trust

Trust is fostered among individuals and work groups throughout the organisation

Leaders respond to questions and concerns in an open and honest manner; they 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 organisation; they acknowledge positive performance and address negative performance promptly and directly with the individual involved, maintaining confidentiality as appropriate; they welcome performance feedback from all levels of the organisation and modify their behaviour when appropriate.

Conflict Resolution

Fair and objective methods are used to resolve conflicts

The organisation implements processes to ensure fair and objective resolution of conflicts and differing views. Leaders ensure that 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.

Example

WINDSCALE

10 October 1957 – A fire broke out at the Windscale nuclear reactor facility and plutonium-production plant.

The choice: let the fire burn out and risk spreading radioactivity over a large area of Britain or put the water on the reactor and risk turning into a nuclear bomb.

Deputy general manager Thomas Tuohy personally scaled to the top of the pile reactor building (~25m in height) several times to observe the fire in the pile.

The workers attempted to put the fire out for days and, as a last resource, used water as previously agreed.

The actions of the workers were timely and efficient and demonstrated considerable personal responsibility.

Continuous Learning

Opportunities to learn ways to ensure safety are sought out and implemented.

Continuous learning contributes substantially to a positive safety culture.

An environment that supports continuous learning is one that encourages employees to ask questions, demonstrates appreciation for raising differing views, allows time for understanding and encourages communication and collaboration.

'Learning Organisations' are characterised by an enhanced ability and willingness of individuals to apply their individual learning in the workplace and share and transfer it to their colleagues.

'Learning Organisations':

Are committed to learning from their mistakes and those of others taking appropriate actions to address lessons learned

They evaluate operating experiences and ensure that lessons learned are shared throughout the organisation

Ensure that opportunities to improve safety are identified and shared, thus building a strong safety culture

They evaluate their own programs and policies for opportunities for improvement, benchmark other organisations and understand the importance of training

Continuous Learning entails:

Operating Experience

The organisation systematically and effectively collects, evaluates and implements relevant internal and external operating experience

A process is in place to ensure a thorough review of operating experience provided by internal and external sources. Operating experience is implemented and institutionalised effectively through changes to processes, procedures, equipment and training programs. Operating experience is used to improve performance and support daily work functions, with emphasis on the possibility that 'it could happen here'.

Self-Assessment

The organisation conducts self-critical and objective assessments of its programs and practices

Independent and self-assessments, including nuclear safety culture assessments, are accurate and effective and are used as a basis for improvements. The organisation values the insights and perspectives that the 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.

Benchmarking

The organisation learns from other organisations to continuously improve knowledge, skills and safety performance

The organisation uses benchmarking as an avenue for acquiring innovative ideas to improve nuclear safety and to understand how others perform the same functions. In order to improve performance, benchmarking is used to compare standards in the industry and to make adjustments.

Training

The organisation provides training and ensures knowledge transfer to maintain an informed and technically competent workforce

The organisation fosters an environment in which individuals value and seek continuous learning opportunities. Individuals are adequately trained to ensure technical competency

and an understanding of standards and work requirements; they master fundamentals to establish a solid foundation for sound decisions and behaviours. The organisation 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.

Example

TOYOTA

The ultimate Learning Organisation, a leader in automotive production.

TOYOTA Way: a system designed to provide the tools for people to continuously improve their work

Workers feel involved and motivated to work together with others towards the achievement of a common objective: technicians, skilled workers, quality specialists, sellers, team leaders and labourers are engaged in a continuous process of problem resolution and constant improvement, that in time trains all members in becoming more adept at overcoming challenges.

The Ohno circle: a method to identify opportunities for improvement. Taiichi Ohno, pioneer of the TOYOTA production system, would often draw a circle on the production floor in the middle of a bottleneck area, from which his staff were encouraged to watch the process and ask 'why' over and over. He was convinced that new thoughts and technologies come from a true understanding of the process. During the first hour the process is understood, during the second hour problems become clear, after the third and fourth hours one begins to ask 'why' and finally the root causes and countermeasures are found.

Learn to *understand*, not only to know.

'TOYOTA achieves competitive advantage on the basis of its ability to learn more quickly and more consistently than competitors' – Steven Spear, MIT

Personal Accountability

All individuals take personal responsibility for safety.

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.

In organisations with positive safety cultures, individuals have a strong sense of accountability for the safe operation of the facility, their own safety and the safety of their colleagues.

Leaders should:
1) Empower employees, giving them the skills and training needed to communicate, explain and do their jobs well
2) Set performance objectives with specific behaviours and outcomes, evaluate performance and give feedback
3) Encourage accountability through rewards

Personal accountability involves:

Standards

All levels of the organisation understand the importance of adherence to nuclear standards and exercise accountability for shortfalls in meeting the standards

Individuals encourage each other to adhere to high standards. They demonstrate a proper focus on nuclear safety and reinforce this through peer coaching and discussions. They hold themselves personally accountable for modelling nuclear safety behaviours and individuals across the organisation apply nuclear safety standards consistently. They actively solicit and are open to feedback, helping supplemental personnel understand and practice expected behaviours and actions.

Job Ownership

Individuals understand and demonstrate personal responsibility for the behaviours 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

- are aware of their personal responsibility to raise nuclear safety issues, including those identified by others
- take ownership for the preparation and execution of assigned work activities, raising safety concerns before work begins
- 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 to ensure nuclear safety is maintained

Individuals:
- demonstrate a strong sense of collaboration and cooperation in connection with projects and operational activities
- 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
- strive to meet commitments.

Conflict Resolution

Fair and objective methods are used to resolve conflicts

The organisation 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.

Example

US AIRWAYS FLIGHT 1549
FORCED LANDING ON HUDSON RIVER

15 January 2009 – US AIRWAYS flight 1549 departed La Guardia airport, in Queens, heading to Charlotte in North Carolina.

Less than 2 minutes after takeoff, bird strikes caused the failure of both engines.

The only alternative was an emergency landing on the Hudson river.

The emergency response was prompt and efficient, assisted by the Manhattan ferry services.

The pilot checked the plane twice following evacuation to make sure everyone was out.

The personal accountability of each crew member was critical to ensuring the safety of all 150 passengers.

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Leadership: Safety Values and Actions
Leaders demonstrate a commitment to safety in their decisions and behaviours.

Work Processes
Work processes implement a process of planning and controlling work activities that maintain safety.

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.

Problem Identification and Resolution
Issues potentially impacting safety are promptly identified, fully evaluated, addressed and corrected immediately commensurate with their significance.

Environment for Raising Concerns
A safety-conscious work environment allows personnel to raise safety concerns without fear of retaliation, intimidation, harassment or discrimination.

Effective Safety Communication
Communications maintain a focus on safety.

Respectful Work Environment
Trust and Respect permeate the organisation.

Continuous Learning
Opportunities to learn ways to ensure safety are sought out and implemented.

Personal Accountability
All individuals take personal responsibility for safety.

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