Safety Culture Observations Tool
Guidance

Purpose and scope of the document

Based on identified needs, this document aims specifically at providing practical guidance for collecting and reporting observations that can be related to Safety Culture (SC) in a systematic and structured way. This guidance document will then give a framework for the understanding, the recording and the labelling steps of the observation process. Jointly with the FANC, this process will be followed by an analysis step and communications to the licensee.

The document does not intent to supersede international standards relating to Safety Culture evaluation ([1] - [19]) but provides a user support (Bel V and FANC).

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1. Understanding Safety Culture

1.1 What is Safety Culture?

The INSAG 4 states that “Safety culture is that assembly of characteristics and attitudes in organizations and individuals which establishes that, as an overriding priority, nuclear plant safety issues receive the attention warranted by their significance” (§6 [1]). As a main strength, this definition highlights an important feature of SC, i.e. its two fundamental sides: SC is both structural (organisational structure, roles and responsibilities, documentation, policy statement…) and attitudinal (perceptions, social norms, way of thinking, and patterns of behavior).

On the one hand, that means that SC observations must take into account visible “artefacts” (system or material elements and behaviors), tacit “espoused values” (guiding principles as goals, beliefs, norms) and invisible “basic assumptions” (basis on which people act upon) [17]. Obviously, the tacit and invisible dimensions are complicated if not impossible to be observed directly. But, in parallel, the closer we can observe these dimensions the deeper we can explore Safety Culture.

On the other hand, that also means that SC observations must take into account different levels and all types of activities:

- Individual level: questioning attitude, individual awareness, accountability, reporting, rigorous and prudent approach…
• Group level: communication, teamwork, decision making, supervision/peer check…

• Organizational level: definition of responsibilities, definition and control of practices, qualification and training, review functions, management commitment, procedures, safety policies, resources…

Taking stock of these first statements, we can say that Safety Culture is not immediately visible but could be observed everywhere and everytime! As an underlying and prevailing framework, SC shapes in a stable way how people perceive a situation, make sense of it and act. In other words, observing SC outcomes implies to adopt a global (or holistic) point of view: facts or statements drawn out during specific interactions with licensees (meetings, inspections, assessments, walk-down, informal contacts…) are part of a broader human system. Considering the individual, group and organisational levels, an observation must then be a tool matching artefacts with deeper cultural layers.

1.2 What is a good or a bad Safety Culture?

Safety Standards and guidelines in the field ([1] – [19]) develop different list of key attributes indicating what is a good Safety Culture. Many statements as questioning attitude, trust between management and operators or cross-functional and interdisciplinary teamwork are obviously attributes considered as characteristics of a strong SC. Conversely, we can identify some warning signs of a bad SC such as a lack of systematic approach, weak reporting practices or resource mismatch.

But as we said earlier SC must be understood in a global way (the system as a whole). As a consequence, good or bad SC could not be so clear cut on the work place. For instance, in the case of lack of “compliance with regulations, rules and procedure”, it’s first important to report the fact. But, adopting a SC point of view it is more important to understand why people did not follow the rule: does it mean that we are facing a bad behaviour or a bad rule issue?

We can go further in the questioning. From an individual perspective, does it mean that we are facing an understanding problem (lack of training, knowledge of work process…) or a fitness problem (adaptation of the procedure to a specific task)? Concerning the group level we can raise issues concerning the legitimized level of compliance within a group (department, team, site…). In terms of organization, the questions could be, for instance, oriented towards the commitment of management or a failure in the documentation process.

In this line of thinking, providing an observation is not only establishing a link between a statement and a dedicated attribute. The framework proposed by the Safety Guide GS-G-3.5 [14] gives a good structure to identify and classify observations into general Safety Culture dimensions. But the important point is trying to describe what is behind the link and seeking to shed light on the underlying reasons as to why the rules were ignored. Then, observations are not context-free. What is at stake is a deep understanding of the work situation.
Viewed from this perspective, SC is reflected in the dynamic of interactive relationships between person, behaviors and the organization system [19].

1.3 Why Safety Culture observations are important?

From a safety point of view, culture has a strong and deep impact on individuals’ standard of behaviors, groups’ practices or identity and organisational performance. Exerting a considerable influence on safety, Safety Culture must therefore be considered as a major barrier of a defence in depth system ([3] §73).

More conceptually, the SC observation process completes a compliance based-approach with a proactive and holistic way of thinking. In other words, SC gives the opportunity to tackle and evaluate tacit and informal dimensions of an organisation (attitudes, beliefs…).

2. SC Observations process within FANC-Bel V

Obviously, the process starts with an observation made by an inspector or a safety analyst. An observation could be made during any contact with a licensee\(^1\) and each time it is needed. These observations are filled in an observation sheet as presented below (see 3.2.3.).

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\(^1\) Inspections (routine, topical and reactive), meetings with licensees, training activities, formal and informal discussions with plant staff at various levels, document review, review of event reports (including low level) and corrective actions implemented, observation of activities and conditions in the field…
Gathering observations aims at identifying Safety Culture issue in order to feed a regulatory response to potential problems. A Safety Culture observation is then fully integrated in inspection activities and must be seen as an input of the oversight process.

<table>
<thead>
<tr>
<th>Inspectors / Safety Analyst</th>
<th>SC coordinator</th>
<th>Aims</th>
<th>Impacts on oversight process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Each month Observations</td>
<td>Observations analysis</td>
<td>• Improve observation (description and classification)</td>
<td>• Possible direct reporting to the licensee</td>
</tr>
<tr>
<td>Each quarter Synthetic report</td>
<td></td>
<td>• Identify early sign of SC issue • Presentation to the monthly FANC-Bel V meeting</td>
<td>• In depth analysis • Focus inspections on specific dimensions</td>
</tr>
<tr>
<td>Each Year Detailed report</td>
<td></td>
<td>• Identify persistent sign of SC issue • Discussion with the licensee</td>
<td>• Feeding annual inspections programme • Follow-up of licensee actions</td>
</tr>
<tr>
<td>Pluri-annual Tendency report</td>
<td></td>
<td>• Identify deep-seated SC issue • Discussion with the licensee</td>
<td></td>
</tr>
</tbody>
</table>

On a monthly basis the “Safety Culture coordinator” analyzes observations (with a quality of description and classification perspective) and gives a feed-back to the observation maker. In case of an important SC discrepancy, a direct reporting to the licensee could be considered.

On a quarterly basis, the “Safety Culture coordinator” provides a synthetic report (monthly meeting FANC-Bel V). The aim of this report is to identify early signs of problem. Then, it could be decided to analyze a plant’s performance more deeply in order to understand the underlying causes of a problem or to focus inspections on specific dimensions.

On an annual basis, the “Safety Culture coordinator” provides a detailed report on the observations (with a safety perspective). The aim is to identify persistent signs of problem. These statements feed the next annual inspection programme. A synthesis is presented to the licensee. The discussion objective is to be sure that the licensee understands the regulator’s concerns.

In terms of RB evaluation, SC observations are then central pieces of a broader oversight process trying to identify and analyse SC dimensions.
3. **Guidelines for Safety Culture observations**

3.1 **What is an observation?**

As we said, observations must focus on facts – *i.e.* informations based on real occurrences: behaviors, statements, discrepancies… – and take into account the context (work situation). The first objective is therefore to answer to the “What happened?” question. An observable fact could be either organizational (a resource mismatch, a backlog, a staffing problem…) or behavioural (a statement concerning cooperation, a lack of verification or communication, a relevant decision, a practise…).

For instance, an observation could be made in various functional areas: Management, Organisation & Administration, Training and qualification, Operations & Chemistry, Maintenance, Technical support (incudes engineering & plant modifications, reactor core management and fuel handling), Operational experience feedback, Radiation protection, Emergency planning and preparedness… Different levels of responsibilities are also concerned: corporate directors, station directors and senior managers at nuclear facility level, middle-level managers (operative nuclear facility level), first line supervisors (team level), shop floor level (operators, maintenance staff…), contractors.

Secondly, an observation has also to be enhanced with answers to some other generic questions (where, when, who…) in order to describe the context of the observed fact as far as possible. Fact and context description will then take place in an “Observation sheet” (see 3.2.3), giving a framework to introduce informations concerning the facility, the type of intervention during which the observations has been made (inspection, meeting, etc), the topic (matter of inspection/discussion) or the date of observation and possibly the reference report. More fundamentally, a SC observation also implies the description of the context, the identification of SC attributes (see appendix), an appreciation (positive or negative) and an argumentation developing the reasons why the observed fact is linked to safety culture.

3.2 **How to provide observations?**

3.2.1 **Describing the fact and the context**

What is particularly important is to describe the observed fact and context with your own perception and words. As a rule, the SC attributes are not necessary for the fact and context description. Actually, linking a fact to an SC attribute is a next stage. Then, as a first step, the objective is to provide sufficient information about the work situation\(^2\) such as:

- The operation/activity,
- The process,

\(^2\) Obviously, the context elements are easier to draw out in the case of a field observation.
• People involved (function, department, contractors…)
• Problem to be solved,
• Document really used or not,
• Management role,
• The communicational context (one way communication, participation…),
• Work conditions (stress, workload…),
• …

As a case in point, we can relate a factitious example describing the fact (§1) and the context (§2):

“During a routine inspection in the main control room of the unit 5 (28/11/2012), it has been observed a discrepancy between the level of the tank ICS C07 (Intermediate Cooling System) indicating 86% and the X-DOC-15 procedure referencing a Technical Specifications criterion of $56\% < N < 80\%$ (TS 16.XXX).

The observation has been made at the beginning of the morning shift in the control room. The unit operated at full power. Questioned about the tank level, the operator in charge stated that it was not important: “I never take this level into account. It’s always like this… I think”. Rapidly, the chief operator opened the Technical Specifications and stated that the tank maximum level was not reported in the TS. Only the minimum level was reported.”

### 3.2.2 Identifying SC attributes and argumentating

The second step consists of identifying and classifying a fact within a set of SC attributes. These attributes are presented in appendix 5. Based on the fact and context description, the aim is obviously to link an observation with a main SC attribute. As already mentioned, the classification step is important to identify early signs of safety problems (or strenghts), to follow a trend and define SC issues to be investigated in depth.

Coming back to our example, it seems that various directions could be followed. First, we can notice that a simple focus on the first paragraph could conduct us to identify a compliance issue (attribute C2). We can obviously go deeper in the case. On the one hand the operator did not show ownership (attribute C3) or a questioning attitude (attribute E1) concerning the check of the tank level. One the other hand, playing his supervisory role (maybe a bit late), the chief operator showed his involvement (attribute B2).

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3 The names of individuals are not compulsory but could be an add value in a long term perspective. Anyway, Safety Culture observations are not “witches chasing”: the names of individuals will never be reported in analyses or synthetic report to the licensee.
We have then to make a choice on the main SC issue to be drawn out. The question is not to pick up the “best” attribute from the list: the one best way does not exist. What is at stake is to define what you consider as the main Safety Culture issue. Manifestly, in this case, it seems that the way the operator checks the tank level have to be highlighted. Following a discussion with the Safety Culture coordinator, an attribute is proposed, for instance C3.

Linking a fact to an attribute must not be considered as an end but as an entry point to further questions. It follows that it is also important to argue why an observation is a SC issue from your point of view. In other words the argumentation step aims at gathering your interpretation and addressing additional issues (e.g. potential causes or consequences). The argumentation step implies that a fact could be linked to several (secondary) attributes.

Concerning our case, an argumentation could be found in either technical or behavioural dimensions. Secondary attributes could be found in the individual level (e.g. E6, “competences development”), the group level (e.g. D4, “cooperation and teamwork”) or the organisational level (e.g. D2, “process for reviewing procedure”).

All these data could then be transcribed in a SC observation sheet.
### 3.2.3 Filling in the SC observation sheet

<table>
<thead>
<tr>
<th>Facility</th>
<th>Type</th>
<th>Topic</th>
<th>Initials</th>
<th>Date</th>
<th>Fact</th>
<th>Context</th>
<th>Main attribute</th>
<th>Value</th>
<th>Argumentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPP ...</td>
<td>Routine</td>
<td>Inspection</td>
<td>WXZ</td>
<td>28/11/12</td>
<td>During a routine inspection in the main control room of the unit 5 (28/11/2012), it has been observed a discrepancy between the level of the tank ICS C07 (Intermediate Cooling System) indicating 86% and the X-DOC-15 procedure referencing a Technical Specifications criterium of 56% &lt; N &lt; 80% (TS 16.XXX).</td>
<td>The observation has been made at the beginning of the morning shift in the control room. The unit operated at full power. Questioned about the tank level, the operator in charge stated that it was not important: “I never take this level into account. It’s always like this... I think”. Rapidly, the chief operator opened the Technical Specifications and stated that the tank maximum level was not reported. “</td>
<td>C3</td>
<td>-</td>
<td>The observation addresses some questions concerning the instructor competences: in technical terms (knowledge of the installation) and behavioural terms (questioning attitude, cross-checking, supervision techniques). We could also considered a lack of matching between TS and operational procedures</td>
</tr>
</tbody>
</table>

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4 Explanation of column headings:
- **Facility**: name of installation/organisation
- **Type**: type of intervention (inspection, meeting, other)
- **Topic**: subject matter of inspection/discussion; for SCK identification of part of installation (BR2, LHMA …)
- **Initials**: initials of author of observation
- **Date**: date of observation
- **Fact**: description of observed fact (only factual information, no appreciation of observed fact); see 3.1.
- **Context**: description of context of observed fact (also factual); see 3.1.
- **Main SC attribute**: identification of main attribute of safety culture to which observed fact could be linked; see 5.
- **Value**: appreciation of SC observation (positive = sign of strong safety culture; negative = sign of weak safety culture)
- **Argumentation**: reasons why observed fact is linked to main SC attribute (identified above) and considered to be a sign of strong/weak safety culture;
- **Secondary attribute**: identification of other SC attributes resulting from identification of potential causes (only when there are strong indications, no wild guessing!); see 5.
- **Reference report**: reference of intervention report linked with observed fact
4. References


5. Appendixes

5.1 Safety Culture Assessment Framework

5.1.1 Safety culture characteristics and attributes

A. Safety is a clearly recognized value
A1. The high priority given to safety is demonstrated in communication and decision making and reflected in documentation
A2. A proactive and long term approach to safety issues is shown in decision making
A3. Safety conscious behaviour is socially accepted and supported
A4. Safety is a primary consideration in the allocation of resources

B. Leadership for safety is clear
B1. Commitment to safety is evident at all levels of management including corporate management
B2. There is visible leadership showing the involvement of management in safety related activities
B3. Management seeks the active involvement of individuals in improving safety
B4. Relationships between management and individuals are built on trust

C. Accountability for safety is clear
C1. Roles, responsibilities and accountability for safety are well defined and clearly understood
C2. There is a high level of compliance with rules and procedures
C3. Ownership for safety is evident for all individuals and reflected in work environment and plant conditions
C4. An appropriate relationship with the regulator ensures that the accountability for safety remains with the licensee

D. Safety is integrated into all activities
D1. Consideration of all types of safety including nuclear, radiological, industrial, environmental and physical safety is evident
D2. Processes from implementation to review ensure that an adequate level of safety is maintained
D3. Safe working conditions exist with regard to time pressures, workload and stress
D4. Cooperation and teamwork ensure that an adequate level of safety is maintained
D5. Factors affecting human performance are considered

E. Safety is learning driven

E1. A questioning attitude prevails at all organizational levels
E2. Open reporting of deviations and errors is established and supported
E3. Operating experience (both internal and external to the facility) contribute to continuous improvement
E4. Internal and external assessments, including self-assessments contribute to continuous improvement
E5. Safety performance indicators are tracked, trended, evaluated and acted upon
E.6 There is systematic development of individual competences including leadership
5.1.2 Safety culture attributes and corresponding guiding indications

A. Safety is a clearly recognized value

A1. The high priority given to safety is demonstrated in communication and decision making and reflected in documentation

- Corporate policies emphasize the overriding importance of nuclear safety
- Clear safety goals and objectives within safety policy and management system
- Safety goals defined in the safety policy document are translated into day-to-day reality at each level of the organisation.
- Strategic and business plans, at corporate and plant level, are aligned to the safety goals and objectives of the organization
- The progress toward accomplishment of safety goals and objectives is reviewed and results are recorded.
- Effective safety communication - Communications maintain a focus on safety
- Questions about safety are part of everyday work conversations
- Decision-making reflects “safety first”- Personnel are systematic and rigorous in making decisions that support safe and reliable plant operation
- Operators are vested with the authority and understand the expectation, when faced with unexpected or uncertain conditions, to place the plant in a safe condition
- Managers, supervisors and staff clearly understand and respect each other’s roles in decision-making
- Plant personnel apply a rigorous approach to problem-solving. Conservative actions are taken when understanding is incomplete.
- Senior leaders support and reinforce conservative decisions
- Candid dialogue and debate are encouraged when safety issues are being evaluated. Robust discussion and healthy conflict are recognized as a natural result of diversity of expertise and experience.
- When previous operational decisions are called into question by new facts, the decisions and associated underlying assumptions are reviewed to improve the quality of future decisions.
- The plant is operated according to requirements and specifications. Pressure to reduce outages and accelerate plant start-up, do not compromise this aim.

A2. A proactive and long term approach to safety issues is shown in decision making

- Consideration of potential safety issues in longer term planning
- Effective implementation of ageing management programs
Decisions when production requirements interfere with scheduled training, when training modules are missed by plant staff or contractors

- Tendency to focusing on the short-term and being highly reactive
- The operating organization is permanently focused on safety enhancement.

A3. Safety conscious behaviour is socially accepted and supported

- A safety-conscious work environment is maintained where personnel feel free to raise safety concerns without fear of retaliation, intimidation, harassment or discrimination.
- Existence of policy for prohibiting harassment and retaliation for raising safety concerns
- Management efforts to promote safety conscious work environment
- Attention to safety conscious attitudes in performance appraisals / Staff who actively contribute to safety are positively recognized / Recognition of exemplary performance to individuals and teams
- Appropriate management/supervisor response to unsafe acts
- Signs of fear of retribution if errors are reported or safety concerns are raised

A4. Safety is a primary consideration in the allocation of resources

- Plant managers and other plant personnel have the appropriate resources to carry out their assigned responsibilities and accountabilities, in particular those that are safety related.
- Staffing levels are consistent with the demand related to maintaining safety and reliability.
- Qualification of staff and contractors is adapted to task assignments
- Staff weaknesses are identified and addressed by training or other support
- Realistic objectives and timescales are set, and these are the properly resourced.
- There is a minimal backlog of events to be analyzed, maintenance or modification activities and their significance is low.
- Plans for enhancement or improvements are prioritized.
- The possible detrimental effects on safety due to organisational changes are considered, such as inadequate resources to maintain all the components of the plant at a high level of reliability, understaffing, over reliance on external sources of expertise that cannot be guaranteed in the long term, reduced resources for training and retraining of staff...
- Maintenance staff can be supplemented as necessary, so that duties relevant to nuclear plant safety and system reliability may be carried out without undue haste or pressure.
B. Leadership for safety is clear

B1. Commitment to safety is evident at all levels of management including corporate management

- Executive and senior managers are the leading advocates of nuclear safety and demonstrate their commitment both in word and action.
- Leaders throughout the organization set an example for safety.
- The nuclear safety message is communicated frequently and consistently.
- Safety policy and management expectations for safety are effectively communicated to plant staff and contractors
- Selection and evaluation of managers and supervisors consider their abilities to contribute to a strong nuclear safety culture

B2. There is visible leadership showing the involvement of management in safety related activities

- Managers and supervisors practice visible leadership in the field by placing “eyes on the problem”, coaching, mentoring, and reinforcing standards. Deviations from management expectations are corrected promptly.
- Managers and supervisors provide appropriate oversight during safety-significant activities or plant evolutions
- Surveillance by managers and supervisors that procedures are being used and followed in accordance with expectations
- There is evidence that supervisors discuss safety issues with their teams
- Managers and supervisors are personally involved in high-quality training that consistently reinforces expected worker behaviours
- There is evidence that managers address problems and safety issues and contribute to problem solving
- Management is involved in investigation of safety problems and incidents
- There is evidence of management action to correct poor procedures

B3. Management seeks the active involvement of individuals in improving safety

- Staff members and contractors are encouraged to deliver ideas for improvement
- Involvement of plant staff in workshops, safety circles, risk assessments, procedure improvements, improvements of plant design …
Management is responsive to constructive criticism and feedback from the plant staff.

Managers develop, in partnership with staff, the means of translating the safety goals of the organization into day-to-day reality.

B4. Relationships between management and individuals are built on trust

- There is evidence of a respectful work environment – Trust and respect permeate the organization – People are treated with dignity and respect
- A high level of trust is established in the organization, fostered through timely and accurate communication
- There is a free flow of information in which issues are raised and addressed
- Personnel can have confidence their concerns will be addressed - Employees are informed of steps taken in response to their concerns
- Differing opinions are welcomed and respected. When needed, fair and objective methods are used to resolve conflict and unsettled differing professional opinions.
- Supervisors are recognized as an important part of the management team, crucial to translating safety culture in practical terms
- The effects of impending (organisational) changes are anticipated and managed such that trust in the organization is maintained
- Signs of lack of trust throughout the organization
- Social unrest & conflicts

C. Accountability for safety is clear

C1. Roles, responsibilities and accountability for safety are well defined and clearly understood

- The line of authority and responsibility for nuclear safety is defined from the board of directors to the individual contributor. Each of these positions has clearly defined roles, responsibilities, and authorities, designated in writing and understood by the incumbent.
- The line organisation, starting with the chief executive officer, is the only source of direction. Other parties such as oversight organizations and committees, review boards and outside advisors are not allowed to dilute or undermine line authority and accountability.
- Plant management maintains the primary responsibility for safety when utilizing external organizations.
- Roles and responsibilities of contractors are clearly defined in contractual documents.
All personnel (including contractors) understand the importance of adherence to nuclear safety standards. All levels of the organization exercise healthy accountability for shortfalls in meeting standards.

Board members and corporate officers periodically take steps to reinforce safety, including visiting sites to assess management effectiveness first-hand.

When unexpected events or conditions arise personnel (staff members and contractors) seek appropriate guidance before proceeding.

C2. There is a high level of compliance with rules and procedures

- Personnel are held accountable for implementing accepted standards of performance.
- Personnel understand the required standards for procedure compliance.
- There is adequate understanding by plant personnel of rules and procedures.
- There is a high level of trust of staff members and contractors in procedures.
- Personnel behaviour complies with explicit management expectations.
- Plant staff applies prescribed human performance tools (two/three-way communication, use of procedures, pre-job/post-job briefings…)
- Procedures and instructions are constantly improved through regular use and critical reconsideration by plant staff.
- Personnel and contractors are encouraged to identify procedural problems and to provide feedback. A process is in place that ensures these problems are promptly resolved, once they are identified.
- Safety rules and requirements related to radiation protection, conventional safety, fire protection etc. are strictly followed.
- Fire door status is controlled, and accumulated fire hazard materials such as wood, paper, trash, oil leakages, etc. are not tolerated.
- Procedures for the storage, replacement and ordering of chemicals and other hazardous products are properly followed.
- There is evidence of routine failures to follow procedures & instructions.

C3. Ownership for safety is evident for all individuals and reflected in work environment and plant conditions

- All individuals take personal responsibility for safety.
- Plant staff understand and demonstrate their individual responsibility for quality work.
- There is evidence of rigorous & prudent behaviour.
- Personnel are safety conscious in the conduct of their work and use safety equipment as appropriate.
- Operators are attentive and responsive to plant parameters and conditions (monitoring for abnormal trends of plant parameters, reasons for and response to alarms, equipment tagout and control of work in progress, adherence to temporary instructions, awareness of temporary modifications…).

- The number of control room alarms including process computer alarm messages is minimized.

- An accurate transfer of pertinent information occurs at shift turnovers.

- Field operators document deficiencies in material condition, component leakage, excessive vibration, unfamiliar noise, inadequate labelling, foreign parts and deficiencies requiring maintenance or other action.

- Cleanliness and good housekeeping are evident throughout the plant.

- Work-site cleanliness, orderliness, lighting, accessibility and escape routes are satisfactory.

- Hazardous areas are identified and barriered as needed.

- Staff members and contractors understand safety implications if their work is not carried out properly.

- Condition of plant equipment is satisfactory (quality of paint, leakages, tidiness, labelling of equipment, quality of isolation tags…).

- Storage conditions of spare equipment is satisfactory.

- Condition of decontamination coatings is satisfactory.

- Status of working place after finishing of intervention is satisfactory.

- Personnel, including contractors, understand the reasons for contamination control measures and the importance of full compliance with requirements.

- Plant staff doesn’t intervene and correct co-workers when they observe rules not being flowed or standards not being met.

C4. An appropriate relationship with the regulator ensures that the accountability for safety remains with the licensee.

- Attitudes of management and plant personnel towards the regulator (readiness to provide information, openness to suggestions from regulator, preparation of inspections and meetings with regulator, trustful atmosphere and open climate of conversation…).

- Complete, accurate and forthright information is provided to regulatory organizations.

- Effective communication channels exist throughout the operating organization to assure compliance with regulatory requirements.

- Proactive and timely communication towards the regulator (reporting of deviations and events, reporting of problems in meeting deadlines of actions/action plans…).
Information sharing is voluntary and does not have to be forced by national authorities.

- Agreed time delays for implementing regulatory commitments are respected (requested actions following inspection, implementation of action plans …).
- Access of regulator to areas of plant is assured.
- The regulator is consulted when needed to obtain clarification and regulatory guidance.
- The plant management makes its opinion known to the regulatory body if it considers that any action requested by the regulatory body could have an adverse effect on safety.

D. Safety is integrated into all activities

D1. Consideration of all types of safety including nuclear, radiological, industrial, environmental and physical safety is evident

- The licensee has implemented an integrated management system.
- Consideration of different types of hazards is evident in all procedures documenting processes as well as in working procedures.
- The special characteristics of nuclear technology (reactivity control, continuity of core cooling, integrity of fission product barriers…) are taken into account in all decisions and actions.
- Design and operating margins are carefully guarded and are changed only with great thought and care. Special attention is placed on maintaining defence-in-depth.
- Safety equipment is meticulously maintained well within design requirements.
- Insights from probabilistic risk analyses are considered in daily plant activities and plant change processes.
- Use of risk analysis, toolbox meetings etc. prior to start of work which consider all types of hazards.
- Accurateness of staffs’ perception of hazards and risks - Staff members and contractors are able to explain the specific hazards in their work area
- Awareness with staff members and contractors of particular cautions and safety limits they have to observe in their job - Awareness of what would happen if safety precautions are not respected
- Adequate consideration of safety is shown in quality of safety documentation, of safety evaluation reports
- Employee mastery of reactor and power plant fundamentals, as appropriate to the job position, establishes a solid foundation for sound decisions and behaviours
- Industrial safety problems are routinely reported.
Industrial safety practices (hard hats, scaffolding, safety belts, ear protection, safety glasses, confined space entries and unique hazards) are appropriate.

Industrial safety in the laboratory (protection against fire, solvents, hazardous chemicals) as well as the availability and use of protective equipment, instructions and facilities such as eyewash and showering facilities is satisfactory.

Signs of inadequate risk assessment

Signs of overconfidence

There is evidence of safety reviews or safety assessments which have not taken account of all relevant hazards.

There is evidence of situations where conflicting requirements (e.g. between safety and security considerations) have not been properly addressed.

D2. Processes from implementation to review ensure that an adequate level of safety is maintained

- Processes for planning and controlling work ensure that individuals, supervisors and work groups communicate, coordinate and execute their work activities in a manner that supports safety
- Plant activities are governed by comprehensive, high-quality processes and procedures - Procedures are usable, identify and address the main risks, and provide necessary and sufficient information for personnel to complete their work safely.
- Adequate process for reviewing procedures
- Appropriate control of temporary changes to procedures (limitation of area of application and of period of validity)
- The change management process provides a formal, systematic approach to review proposed changes and their influence on safety. Change management practices are in agreement with this process.
- There is an effective implementation of the ALARA principle in work planning and execution.
- Understanding by plant staff of prescribed work processes and procedures
- Understanding by staff members and contractors of safety implications related to work processes
- Quality of internal safety reviews of planned work
- QA findings often ignored or not addressed
- Responsibilities for procedure review not clear

D3. Safe working conditions exist with regard to time pressures, workload and stress
A suitable working environment is provided and maintained to allow work to be carried out safely and satisfactorily without imposing unnecessary physical and psychological stress on personnel.

The plant policy on limits to overtime work supports safe operation.

Management attitudes to overtime work are appropriate – Records of overtime are kept, trended and acted upon – Planned overtime is kept within regulated limits

Access to the main control room is controlled, presence of unnecessary personnel is limited and working conditions in the control room are quiet - Controls are established which minimize distractions to the shift personnel and enable the crew to remain alert to changing plant conditions.

Management is overwhelmed.

There is a high level of staff turnover.

There is evidence of excessive hours of work, excessive scope of work - Frequent overtime is required to support normal operations

There are signs of stress or fatigue.

There is evidence of a high level of absenteeism for operational and maintenance staff.

Routine work not done

Delays and/or deteriorating quality of reports

Deadlines are consistently not met / There is evidence of project slippage

Remarks by plant staff regarding missing work capacity

Feelings of plant staff about quality of work environment (job satisfaction)

D4. Cooperation and teamwork ensure that an adequate level of safety is maintained

Mechanisms enabling the cross-functional and interdisciplinary cooperation and teamwork are formalised in procedures, with clear responsibilities assigned.

Plant staff communicates appropriately with co-workers and supervisors (at job or shift turnover, when problems occur during task …). There is adequate information of workers on the next shift about plant status and pending safety issues.

There is evidence of cooperation and adequate (horizontal) communication between functional organizations. There is good coordination among the various department groups and an effective interface with the other plant departments.

Organisation of opportunities (e.g. workplace forums) to discuss issues of mutual interest between functional organizations (e.g. operations and maintenance)

Involvement of outside stakeholders when problems are being solved and decisions are being made

Effective communication of experience of staff members to other individuals and groups
There is evidence of separation between sites and HQ (corporate goals are subordinate to local goals, policies and standards are not uniformly applied, disharmonious relationships, lack of awareness of safety issues at corporate level)

D5. Factors affecting human performance are considered

- Consideration is given to technical problems, human factors and organizational aspects in a coordinated and integrated manner.
- Sufficient attention to the human factors aspect of work activities - Human Factors that influence safety and the effectiveness of personnel are identified and addressed.
- Inclusion of human factors in training of managers and supervisors.
- Causes of unsatisfactory human performance are analysed and addressed.
- Management regularly reviews personnel performance and safety attitudes.
- Involvement of human factors specialists in safety assessments/reviews (including design reviews), event investigations etc.
- Departmental interfaces are analysed to evaluate the efficiency of the entire organization and the adequacy of operational decision-making.
- The process of selection, training and job rotation is well planned to provide the necessary staff motivation.
- Management takes adequate measures to motivate workers to comply with requirements.
- There is too much focus on technical issues and insufficient consideration of human factors.

E. Safety is learning driven

E1. A questioning attitude prevails at all organizational levels

- Individuals demonstrate a questioning attitude by challenging assumptions, investigating anomalies, and considering potential adverse consequences of planned actions.
- All employees are watchful for conditions, activities or behaviour that can have an undesirable effect on plant safety. Such circumstances are promptly identified and resolved.
- Evidence of application of the STAR principle – Personnel do not proceed in the face of uncertainty.
- Group-think is avoided through diversity of thought and intellectual curiosity. Opposing views are encouraged and considered.
- Expectations regarding the questioning attitude are sufficiently reinforced by managers and supervisors.
The importance of questioning attitude is sufficiently emphasized during training.

E2. Open reporting of deviations and errors is established and supported

- The licensee has established processes that allow and encourage individuals to report abnormal conditions, concerns and events, including near misses.
- Reporting of deviations, events, precursors, etc. is carried out by all levels of personnel, sections, departments, etc. throughout the plant organization. This reporting includes equipment failures, human performance problems, procedure deficiencies and documentation inconsistencies.
- All personnel, including contractors, have been trained in the reporting of abnormal conditions and are aware of their responsibilities.
- Low level events and near misses are not reported.

E3. Operating experience (both internal and external to the facility) contributes to continuous improvement

- Opportunities to learn about ways to ensure safety are sought out and implemented / Continuous improvement attitude
- Operating experience is highly valued, and the capacity to learn from experience is well developed - The attitude that “it can happen here” is encouraged- There are no indications of an attitude “it can’t happen here”.
- Problem identification and resolution - Issues potentially impacting safety are promptly identified and fully evaluated and addressed and corrected in a timely manner commensurate with their significance.
- Expertise in root cause analysis is applied effectively to identify and correct the fundamental causes of events.
- Does plant staff get sufficient feedback on reported events and unsafe conditions? - Individuals are well informed of the underlying lessons learned from significant industry and plant events, and they are committed to not repeating these mistakes - Operating experience information is readily accessible to staff members and contractors.
- Processes are in place to ensure sharing of experience of senior staff with new and junior staff members
- There is evidence of use of internal and external operating experience - The organisation learns and applies relevant lessons.
- Processes are established to identify and resolve latent organizational weaknesses that can aggravate relatively minor events if not corrected.
- Openness to the outside nuclear community: Awareness of management and staff of safety related events in similar facilities - There is evidence of contributions to international safety reporting systems.
The effectiveness of the OEF process is reviewed periodically. Opportunities for improvement are identified and implemented.

- Rate of repeat events or errors
- Incidents are not analysed in depth and lessons are not learned
- Significant time delays for analysing incidents
- Increasing backlog of corrective actions

E4. Internal and external assessments, including self-assessments contribute to continuous improvement

- A mix of self-assessments, management review and independent oversight reflects an integrated and balanced approach. This balance is periodically reviewed and adjusted as needed.
- Use of external assessments / peer reviews / independent opinions - Receptiveness to outside views/suggestions
- The insights and fresh perspectives provided by quality assurance, assessment and independent oversight are valued.
- Plant management response to internal, external and self-assessments is positive.
- Support and consideration by plant staff and management of internal safety department
- Frequent use of debriefings, after action reviews
- Periodic safety culture assessments are conducted and used as a basis for improvement.
- Effectiveness of internal inspections and reviews by internal safety department
- Effectiveness of internal/external safety committees
- Existence and effectiveness of (safety) improvement plans
- Senior managers (including corporate) are periodically briefed and initiate actions on the basis of results of oversight activities.
- Failure to deal with findings of internal audits
- Failure to deal with findings of independent external safety reviews
- Signs of complacency or denial when confronted with evidence of degrading safety performance
- Findings of the regulatory inspections are not addressed in the corrective action program.

E5. Safety performance indicators are tracked, trended, evaluated and acted upon

- The licensee/operating organisation has a sufficient range of indicators to provide a clear picture of its safety performance.
- Targets for safety performance are set.
- Safety performance indicators are tracked and trended.
- The organization is alert to detect and respond to indicators that may signal declining performance. Actions are taken by management when safety performance does not match goals.
- The pitfalls of focusing on a too narrow set of performance indicators are recognized.
- Effective communication to staff and contractors about safety performance.

E.6 There is systematic development of individual competences including leadership

- Training upholds management standards and expectations. Beyond teaching knowledge and skills, trainers are adept at instilling nuclear safety values and beliefs.
- Training programs are adequate (scope, content, frequency…) and kept up-to-date. Operating experience is considered when defining and reviewing training programs and establishing training material.
- Managers and supervisors receive training in leadership, communication and supervisory skills.
- Attendance of plant staff to training courses is adequate.
- Training instructors possess the necessary competences and skills (technical and pedagogic) for the roles assigned.
- The effectiveness of training is evaluated / Training is assessed by participants in terms of scope & usefulness.
- Training needs and resources allocated to training are regularly assessed.
- Consideration of training demand in regular evaluation interviews.
- Training measures are taken when introducing new tasks, new technologies …
- Implementation of career development programmes
- Specific training of staff members and contractors in the areas of process safety, radiological protection and industrial safety practices
- Occurrence of frequent errors and mistakes