# IAEA SAFETY STANDARDS

**for protecting people and the environment**

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# Leadership, Management and Culture for Safety

# DS513

## DRAFT SAFETY GUIDE

Revised Safety Guide

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# 1. INTRODUCTION

## BACKGROUND

1.1. Principle 3 of IAEA Safety Standards Series No. SF-1, Fundamental Safety Principles [1] states that "**Effective leadership and management for safety must be established and sustained in organizations concerned with, and facilities and activities that give rise to, radiation risks.**"

1.2. IAEA Safety Standards Series No. GSR Part 2, Leadership and Management for Safety [2] establishes requirements for leadership, management, and culture for safety based on the interrelated concepts of all three elements. GSR Part 2 [2] also advocates a systemic approach that considers the system as a whole and in which the interactions between people, technology and organization are duly considered. Effective implementation of GSR Part 2 [2] is an important step in achieving the fundamental safety objective to protect people and the environment from harmful effects of ionizing radiation.

1.3. This Safety Guide provides recommendations on how to meet the requirements established in GSR Part 2 [2]. It considers that leadership, management, and culture for safety are interrelated concepts that support each other to achieve effective implementation.

1.4. This Safety Guide supersedes IAEA Safety Standards Series No. GS-G-3.1, Application of the Management System for Facilities and Activities.[1]

## OBJECTIVE

1.5. The objective of this Safety Guide is to provide recommendations on how to meet the requirements established in GSR Part 2 [2].

1.6. This Safety Guide is mainly intended for regulatory bodies and operating organizations, to assist them in the application of the requirements of GSR Part 2 [2]. It will also be of interest to other organizations involved in ensuring safety, such as technical service providers and the supply chain.

## SCOPE

1.7. The scope of this Safety Guide is the same as for GSR Part 2 [2]. Specifically, it applies to all facilities and activities that give rise to radiation risks (see para. 1.11 of GSR Part 2 [2]). Furthermore, the scope includes the entire lifetime of facilities and the duration of activities, for all operational states and for accident conditions, and in a nuclear or radiological emergency (see para. 1.13 of GSR Part 2 [2]).

1.8. All the recommendations in this Safety Guide are generally applicable: nevertheless, judgement and the use of a graded approach are needed for the application of specific recommendations to different facilities and activities. Recommendations specific to the

[1] INTERNATIONAL ATOMIC ENERGY AGENCY Application of the Management System for Facilities and Activities, IAEA Safety Standards Series No. GS-G-3.1, IAEA, Vienna (2006).

management of radioactive waste are provided in IAEA Safety Standards Series No. GSG-16, Leadership, Management and Culture for Safety in Radioactive Waste Management [3].

1.9. The terms used in this Safety Guide are to be understood as reproduced and explained in the IAEA Nuclear Safety and Security Glossary [4].

STRUCTURE

1.10. The structure of this Safety Guide reflects that of GSR Part 2 [2], as follows:

- Section 2 provides recommendations on how to meet Requirement 1 on responsibility for safety.
- Section 3 provides recommendations on how to meet Requirement 2 on leadership for safety.
- Section 4 provides recommendations on how to meet Requirements 3–5 on responsibility for integration of safety into the management system.
- Section 5 provides recommendations on how to meet Requirements 6–8 on the management system.
- Section 6 provides recommendations on how to meet Requirement 9 on the management of resources.
- Section 7 provides recommendations on how to meet Requirements 10 and 11 on the management of processes and activities.
- Section 8 provides recommendations on how to meet Requirement 12 on culture for safety.
- Section 9 provides recommendations on how to meet Requirements 13 and 14 on measurement, assessment and improvement.

1.11. The Appendix presents a safety culture framework, containing the traits and attributes that are present in organizations with a strong safety culture.

## 2. RESPONSIBILITY FOR SAFETY

2.1. Requirement 1 of GSR Part 2 [2] states that "**The registrant or licensee — starting with the senior management — shall ensure that the fundamental safety objective of protecting people and the environment from harmful effects of ionizing radiation is achieved.**"

2.2. Senior management should provide an official and documented commitment to the achievement of the fundamental safety objective and communicate this consistently within the organization and to interested parties.

2.3. Senior management should ensure that they are aware of regulatory requirements as they apply to the facilities and activities under their control. Additionally senior management should understand the need to apply relevant international codes and standards for safety.

2.4. The arrangements for achieving the fundamental safety objective should take into account any interfaces between safety and security with the basic objective that safety is not compromised by security and vice versa, as required by para. 4.10 of GSR Part 2 [2].

2.5. To ensure that the fundamental safety objective is achieved, the operating organization should provide specific training and coaching for personnel at all levels (including managers) to ensure an understanding of the following:

(a) The radiations risks associated with specific facilities and/or activities, and their potential consequences;
(b) The processes for managing radiation risks relevant to their responsibilities;
(c) The interdependencies between different processes (in terms of radiation risks) and the need for effective risk management.

2.6. Senior management should express expectations regarding leadership, management and safety culture commensurate to the risks of the facility or activity.

# 3. LEADERSHIP FOR SAFETY

3.1. Requirement 2 of GSR Part 2 [2] states that "**Managers shall demonstrate leadership for safety and commitment to safety.**"

3.2. Footnote 4 in GSR Part 2 [2] states:

> "'Leadership' is the use of an individual's capabilities and competences to give direction to individuals and groups and to influence their commitment to achieving the fundamental safety objective and to applying the fundamental safety principles, by means of shared goals, values and behaviour. 'Management' is a formal, authorized function for ensuring that an organization operates efficiently, and that work is completed in accordance with requirements, plans and resources. Managers at all levels need to be leaders for safety."

3.3. Paragraph 3.1 of GSR Part 2 [2] states (citation omitted):

> "The senior management of the organization shall demonstrate leadership for safety by:
>
> (a) Establishing, advocating and adhering to an organizational approach to safety that stipulates that, as an overriding priority, issues relating to protection and safety receive the attention warranted by their significance;
>
> (b) Acknowledging that safety encompasses interactions between people, technology and the organization;
>
> (c) Establishing behavioural expectations and fostering a strong safety culture;

(d) Establishing the acceptance of personal accountability[2] in relation to safety on the part of all individuals in the organization and establishing that decisions taken at all levels take account of the priorities and accountabilities for safety."

3.4. The organizational approach should encompass the commitment to the establishment, implementation, assessment and continual improvement of programmes for leadership and culture for safety. Related policies, strategies, plans and actions should clarify and support this organizational approach and should collectively establish clear expectations for all individuals in the organizations.

3.5. The organization's expectations for leadership should be structured in a safety culture framework that defines the traits of a strong safety culture. This framework should be consistent with the safety culture framework described in the Appendix. A graded approach should be used in the establishment and application of such a framework, taking into account the type of facility or activity and the associated radiation risks.

3.6. Paragraph 1.2 of GSR Part 2 [2] states:

> "[L]eadership for safety…and a systemic approach (i.e. an approach relating to the system as a whole in which the interactions between technical, human and organizational factors are duly considered) are essential to the specification and application of adequate safety measures."

This systemic approach should ensure a holistic view of safety performance and the organization's overall performance. A graded approach should be applied to ensure that the overall approach is commensurate with the particular organization.

3.7. Paragraph 3.2(c) of GSR Part 2 [2] states that "Managers at all levels in the organization…shall ensure that their leadership includes…[d]evelopment of individual and institutional values and expectations for safety throughout the organization by means of their decisions, statements and actions". Senior management should demonstrate and act as role models in the promulgation of these values and expectations.

3.8. Paragraph 5.2(f) of GSR Part 2 [2] states:

> "Senior managers and all other managers shall advocate and support…using a systemic approach (i.e. an approach relating to the system as a whole in which the interactions between technical, human and organizational factors are duly considered."

These interactions should be taken into account in the organization's decision making process. The systemic approach should be complemented by specific assessments of individual elements as needed. This systemic approach should be applied as relevant by interdisciplinary teams that include members with diverse perspectives and expertise from different levels of management and staff.

3.9. Paragraph 3.2(a) of GSR Part 2 [2] states:

[2] While 'responsibility' (see Section 2 of this Safety Guide) is more related to managers completing specific tasks, 'accountability' highlights how a person takes personal ownership and feels a moral obligation to achieving the results of a specific task.

> "Managers at all levels in the organization…shall ensure that their leadership includes…[s]etting goals for safety that are consistent with the organization's policy for safety, actively seeking information on safety performance within their area of responsibility and demonstrating commitment to improving safety performance".

Senior management should apply a long term view when formulating and aligning policies, goals, strategies, plans and objectives, and should also actively promote that a high level of safety performance is necessary to sustain a high level of the organization`s overall performance.

3.10. Managers at all levels should seek the active involvement and consensus of all individuals within the organization (and, where appropriate, within external organizations, such as contractors) in the establishment and application of behavioural expectations. The communication methods used by managers to ensure staff awareness and commitment should support mutual and candid feedback on behavioural expectations.

3.11. Managers at all levels should be role models in terms of personal accountability by ensuring their actions demonstrate their words, ensuring safety is evidently the overriding priority in all work, holding themselves accountable for actions and decisions, and taking personal ownership of the results of their decisions and actions.

3.12. Managers at all levels should follow a risk-informed decision making process commensurate to the risks of the facility or activity.

3.13. Managers at all levels should implement actions to help ensure that all individuals make safety conscious choices so that actions are determined to be safe before proceeding.

3.14. Managers at all levels should be personally involved in relevant training and coaching to ensure the understanding of and to reinforce personal accountability for safety by all members of the organization.

3.15. Managers at all levels should engage in frequent formal and informal communication with staff to remain aware of any concerns by staff in relation to safety. Managers should also frequently be present in the workplace to consistently observe and mentor staff to encourage a focus on safety. Managers should use various communication tools and monitor their effectiveness to engage individuals in enhancing safety performance.

3.16. Managers at all levels should ensure that 'safe' (i.e. retaliation-free) means to raise safety concerns are available to staff (sometimes referred to as a 'blame-free culture'). Additionally, managers should:

(a) Ensure that staff are aware of the means available for raising concerns and actively encourage staff to raise safety concerns.
(b) Ensure that any concerns raised are addressed in a timely manner and provide feedback on how the issue was resolved.
(c) Respond with urgency to any concern that indicates a serious safety issue.
(d) Encourage questions and ideas from individuals during formal or informal team meetings as well as during tasks in the workplace to assist in creating and maintaining a questioning attitude to safety, and in identifying and resolving safety issues thus enhancing safety performance.

(e) Provide recognition, as appropriate, of individuals who have raised safety concerns to reinforce and encourage such behaviour. Safety conscious behaviours should be recognized and taken into account within individual and collective performance evaluations.
(f) Promote collective learning by maintaining a focus on lessons learned, benchmarking and operating experience.

3.17. Managers at all levels should communicate the basis for safety-related decisions to allow staff to understand why specific decisions were made and how these decisions affect their work.

# 4. MANAGEMENT FOR SAFETY: RESPONSIBILITY FOR INTEGRATION OF SAFETY INTO THE MANAGEMENT SYSTEM

4.1. Requirement 3 of GSR Part 2 [2] states that "**Senior management shall be responsible for establishing, applying, sustaining and continuously improving a management system to ensure safety.**"

4.2. Senior management should be fully committed to the management system and should use it as a single framework for overall control of the organization. Senior management should foster the long term commitment and engagement of managers at all levels and of all individuals to the management system, through a process of participation and consultation.

4.3. Paragraph 4.1 of GSR Part 2 [2] states that "Senior management shall retain accountability for the management system even where individuals are assigned responsibility for coordinating the development, application and maintenance of the management system". If senior management assign staff members to coordinate parts of management system, clearly defined authorities and responsibilities should be established to achieve the following:

(a) Coordination of the development, implementation and improvement of the management system;
(b) Assessment and reporting of the effectiveness of the management system;
(c) Integration of the various processes in the management system to meet safety objectives.

4.4. Senior management should take actions to implement the following:

(a) To establish a work environment that supports effective implementation of the management system;
(b) To cultivate a work environment in which all elements of the management system are implemented in daily work;
(c) To ensure that managers and individuals assigned to coordinate work on the management system are given the authority to raise issues relating to the management system with senior management.

4.5. If any parts of the management system are developed or updated by an external organization, senior management should ensure that those parts are consistent with the organization's overall management system. The responsibilities and authority for those parts should remain with senior management.

4.6. Paragraph 4.2 of GSR Part 2 [2] states that "Senior management shall be responsible for establishing safety policy." Senior management should ensure that the safety policy is documented and should disseminate this safety policy (or set of policies containing the safety policy) across the organization. The safety policy should have the following features:

(a) It should stipulate the responsibilities for safety;
(b) It should state clearly that the demands of the organization's overall performance and project schedules do not override safety;
(c) It should include a commitment to comply with all regulatory requirements;
(d) It should promote the enhancement of safety performance;
(e) It should include a commitment to develop, maintain and improve the management system in order to support the achievement of safety objectives;
(f) It should stipulate the role of leadership for safety at all organizational levels;
(g) It should promote a strong safety culture;
(h) It should include a commitment of management to provide adequate financial, material and human resources;
(i) It should include a commitment to the highest safety performance by all individuals, including suppliers.

4.7. In the application of a graded approach, the safety policy may be customized to reflect the level of risk of the facility or activity, for example based on whether it is required to be authorized by registration or licensing (see paras 3.8 and 3.9 of IAEA Safety Standards Series No. GSR Part 3, Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards [5].

4.8. Senior management should ensure the participation and consultation of managers at all levels and all staff in the development of the safety policy, to enhance individual accountability.

4.9. Requirement 4 of GSR Part 2 [2] states that "**Senior management shall establish goals, strategies, plans and objectives for the organization that are consistent with the organization's safety policy.**" These goals, strategies, plans and objectives should be such as to ensure that regulatory requirements are met.

4.10. The organization's goals, strategies, plans and objectives should be developed, implemented and aligned in such a manner that their collective impact on safety is understood and managed. A process for their evaluation should be part of the management system.

4.11. Senior management should ensure that the organization's goals, strategies and plans are formulated to enable the various levels of the organization to define and monitor specific safety objectives.

4.12. Senior management should ensure that all individuals within the organization understand the goals, strategies, plans and objectives set by senior management and feel personally engaged in and accountable for meeting them.

4.13. Paragraph 4.5 of GSR Part 2 [2] states:

> "Senior management shall ensure that goals, strategies and plans are periodically reviewed against the safety objectives, and that actions are taken where necessary to address any deviations."

The frequency and methodology for such reviews should be clearly communicated to all staff within the organization to ensure that they understand the process(es) involved. Any resulting actions should be documented and implemented as part of a corrective action or improvement programme (see Section 9 of this Safety Guide).

4.14. In accordance with the application of a graded approach, the goals, strategies, plans and objectives, as well as the programmes for their review and improvement, should be documented to a level of detail that reflects the complexity of the facility or activity and the associated radiation risks.

4.15. Requirement 5 of GSR Part 2 [2] states that "**Senior management shall ensure that appropriate interaction with interested parties take place.**"

4.16. Paragraph 4.6 of GSR Part 2 [2] states that "Senior management shall identify interested parties for their organization and shall define an appropriate strategy for interaction with them." This strategy should be consistent with other strategies within the organization.

4.17. Senior management should undertake the following:

(a) Decide on the topics that are to be communicated to interested parties on a regular basis, and also on an infrequent basis, including emergencies. Regular topics should include the organization's safety performance, its overall performance, and the environmental impact, as appropriate.
(b) Understand the potential impact on the organization from the interaction with interested parties and ensure that the necessary resources for dealing with this impact are provided.

4.18. Paragraph 4.7 of GSR Part [2] states:

> "Senior management shall ensure that the processes and plans resulting from the strategy for interaction with interested parties include:
>
> (a) Appropriate means of communicating routinely and effectively with and informing interested parties with regard to radiation risks associated with the operation of facilities and the conduct of activities;
>
> (b) Appropriate means of timely and effective communication with interested parties in circumstances that have changed or that were unanticipated;
>
> (c) Appropriate means of dissemination to interested parties of necessary information relevant to safety".

In the communications with interested parties clear and unambiguous language should be used. Communication with interested parties should be performed based on honesty, openness, trust and fairness.

4.19. Senior management should monitor whether the involvement of interested parties is adequately implemented. The results of this monitoring should be used as an input for the continual improvement of interaction with interested parties.

4.20. Senior management should ensure that the staff designated to interact with interested parties, are appropriately informed and updated on the decisions and activities of the

organization and relevant risk information. The designated staff should be aware that their communications might affect how the organization is perceived.

4.21. In the application of a graded approach, the strategy for interaction with interested parties should be proportionate to the nature of the facility or activity and its associated radiation risks. This strategy should be documented in a level of detail that reflects the complexity of the facility or activity and the associated radiation risks. For a facility or activity with a low risk or of low complexity, there is likely to be only a limited need for involvement of interested parties. The training of staff involved in communication with interested parties should reflect the scope of interaction and be customized in accordance with the graded approach.

# 5. MANAGEMENT FOR SAFETY: THE MANAGEMENT SYSTEM

5.1. Requirement 6 of GSR Part 2 [2] states:

> "The management system shall integrate its elements, including safety, health, environmental, security, quality, human-and-organizational-factor, societal and economic elements, so that safety is not compromised."

The management system should be a single framework for overall control of the organization, including management of all relevant processes.

5.2. Paragraph 4.8 of GSR Part 2 [2] states that "The management system shall be developed, applied and continuously improved. It shall be aligned with the safety goals of the organization." Senior management should oversee this alignment to ensure that the objectives of the organization are achieved in a safe, efficient and effective manner. An effective management system supports the achievement of high levels of performance, including safety and the continual improvement of safety culture.

5.3. If an external project management organization is used to manage large projects (e.g. the development of a new facility or the major refurbishment of an existing facility), the project management should be consistent with the operating organization's management system.

5.4. When establishing the management system, the organization should undertake the following:

(a) Identify regulations, standards and the organization's management and technical practices that apply to its facilities, products, processes and activities to ensure that all the relevant requirements are adequately met (see also para. 4.12 of GSR Part 2 [2]);
(b) Consider national and international recommendations on management systems and other relevant safety related codes and standards;
(c) Establish priorities and time frames for the implementation of the elements of the management system.

5.5. Paragraph 4.11 of GSR Part 2 [2] states:

> "The organizational structures, processes, responsibilities, accountabilities, levels of authority and interfaces within the organization and with external organizations shall be clearly specified in the management system."

Senior management should ensure that the management system clearly describes the division of responsibilities and the working relationships between all organizational units participating in the organization's activities.

5.6. The management system should apply to all relevant individuals, each of whom should be made aware of the importance of complying with the requirements of the management system.

5.7. The interface between safety, security and other elements of the management system should be considered at each level of interaction and decision making.

5.8. In the management system, all goals, plans and objectives of an organization are required to be considered in a coherent manner (see para. 4.9 of GSR Part 2 [2]). As part of this, the organization should undertake the following:

(a) Identify interdependences between these goals, plans and objectives and their potential to impact on each other;
(b) Assign priorities to the goals, plans and objectives, and implement arrangements to ensure that these priorities are respected in decision making.

5.9. Paragraph 4.10 of GSR Part 2 [2] states that "Arrangements shall be made in the management system for the resolution of conflicts arising in decision making processes." If conflicts between the elements of the management system are identified they should be solved by a structured, transparent and well communicated decision making approach. Senior management should encourage the involvement of individuals by active participation in decision making at all levels.

5.10. For a less complex facility or activity with a low radiation risk, the management system may be simpler and less formal, but should still integrate all the necessary elements. Documentation may be limited to those tasks with a higher risk and to processes that are related to meeting regulatory requirements.

5.11. Paragraph 4.13 of GSR Part 2 [2] states:

> "Provision shall be made in the management system to identify any changes (including organizational changes and the cumulative effects of minor changes) that could have significant implications for safety and to ensure that they are appropriately analysed."

These provisions should ensure that all changes (i.e. technical modifications and organizational changes), are methodically identified, analysed, and controlled. For each change, the impact on the objectives of the organization — including those relating to safety, health, the environment, security and quality — should be considered within the context of applying a graded approach.

5.12. The interactions between changes should be considered, to eliminate or minimize any adverse consequences on safety.

5.13. Senior management should ensure that individuals with the authority to approve changes are clearly designated. Senior management should ensure that staff are made aware of changes to the management system and that they understand and comply with all relevant requirements.

5.14. Senior management should establish criteria for the evaluation of technical modifications and organizational changes based on a graded approach. If the evaluation of a significant change is conducted by an independent external organization, then the methodology, team structure and respective competences (including training) should be specified.

5.15. Senior management should consider the safety aspects of organizational changes and ensure that there is no adverse impact. This includes any transitional arrangements as well as the final changes, which should be designed to enhance safety.

5.16. Senior management should ensure that individuals are aware of how their responsibilities will change both during and after organizational changes. Consideration should be given to the need for temporary additional resources and for compensatory measures to manage the impacts during a transitional phase.

5.17. Monitoring of changes should provide early insights of any negative effects on safety performance, thereby ensuring that there is sufficient time to take appropriate action before safety is compromised.

5.18. Senior management should ensure that changes are communicated to all relevant staff and, if necessary, interested parties, in order that they all know and understand the objectives of the changes.

5.19. The organization should ensure that the management system contains provisions for dealing with technical modifications or organizational changes that might affect any third-party approvals, authorizations, accreditations or certifications. These provisions should include the processes for notification, reauthorization, reaccreditation or recertification, as appropriate

5.20. Requirement 7 of GSR Part 2 [2] states that "**The management system shall be developed and applied using a graded approach.**"

5.21. Paragraph 4.15 of GSR Part 2 [2] states [citations omitted]:

> The criteria used to grade the development and application of the management system shall be documented in the management system. The following shall be taken into account:
>
> (a) The safety significance and complexity of the organization, operation of the facility or conduct of the activity;
>
> (b) The hazards and the magnitude of the potential impacts (risks) associated with the safety, health, environmental, security, quality and economic elements of each facility or activity;
>
> (c) The possible consequences for safety if a failure or an unanticipated event occurs or if an activity is inadequately planned or improperly carried out."

5.22. The application of a graded approach should be reflected in the resources devoted to the development and application of the management system in different facilities and activities. This may include the following:

(a) The effort devoted to the management system and the level of detail of documentation;

(b) The type and level of planning, analysis, verification and assessment associated with the management system;
(c) The number of personnel engaged in the development and application of the management system and their level of qualification and training.

5.23. Managers at all levels should ensure that the activities in support of the management system are performed to the extent indicated by the application of a graded approach, such that safety objectives are achieved in an effective, proportionate and consistent manner.

5.24. Requirement 8 of GSR Part 2 [2] 8 states that "**The management system shall be documented. The documentation of the management system shall be controlled, usable, readable, clearly identified and readily available at the point of use**."

5.25. Senior management should ensure that the documentation of the management system is appropriate to the organization and to its facilities and activities, and is flexible enough to accommodate changes. For a less complex facility or activity with a low radiation risk, the scope of the documentation and its level of detail may be adjusted accordingly. Some of the management system processes and arrangements may be undertaken on a less formal basis, provided that the organization can demonstrate that these practices and arrangements are applied consistently. Quality manuals, operating procedures or similar documents may be considered as the equivalent of management system documentation.

5.26. Senior management should decide on the structure of documentation of the management system, which should be appropriate to the organization. This structure should support clarity and avoid repetition of information. As an example, a three level structure of documentation might be applied: level 1 providing an overview of the management system, level 2 providing a description of processes and level 3 providing detailed instructions and guidance.

5.27. Senior management (or the appointed process owner[3]) should identify the need for specific documents for the management system and provide guidance to the relevant parts of the organization to ensure that the documents are prepared in a consistent manner. The guidance should cover the scope and content of the documents, when they are applied, how they are controlled, and which standards and codes apply to them.

5.28. Using a graded approach, senior management should decide on the level of control to be applied to different types of document that support the management system. For example, different levels of control might be applied to the following:

(a) Documents that define the management system;
(b) Regulatory requirements;
(c) Drawings and process descriptions;
(d) Procedures and work instructions;

[3] A process owner is a person (or a team) assigned by senior management for the development and administration of a process

(e) Assessment reports;
(f) Data file specifications and computer codes;
(g) Contracts with suppliers.

5.29. Senior management should also ensure that a graded approach to the document control process for the management system in respect of the following:

(a) Preparation, review, approval, and issue of documents;
(b) Distribution and availability of specific documents at the necessary locations;
(c) Revision of documents.

5.30. The content of documents for the management system should be determined with the participation of the individuals who will use them and whose work will be affected by the documents. These individuals should also be consulted during subsequent revisions of the documents.

5.31. Paragraph 4.19 of GSR Part 2 [2] states that "All records shall be readable, complete, identifiable and easily retrievable." In general, the management system documentation should use a language that is coherent, clear and understandable.

5.32. The document control process should include provisions for a periodic review of documents that comprise the management system, taking into account the current status of the facility or activity. Documents should be updated as necessary, and then are required to be reviewed and approved in the same way as the initial documents (see para. 4.18 of GSR Part 2 [2]).

5.33. Paragraph 4.19 of GSR Part 2 [2] further states that "Records shall be specified in the management system and shall be controlled." The process for the control of records should ensure that regulatory requirements are met.

5.34. Senior management (or the appointed process owner) should ensure that records are managed as follows:

(a) They are registered upon receipt, and categorized according to criteria established by the organization;
(b) They are checked to ensure that they are readable and complete;
(c) The are made available and stored in a safe and secure environment with controlled access and in appropriate storage media with a clearly specified retention time.

5.35. The transfer of information from one type of media to another should include procedures for the control and verification that the information has been transferred as specified.

# 6. MANAGEMENT FOR SAFETY: MANAGEMENT OF RESOURCES

6.1. Requirement 9 of GSR Part 2 [2] states that "**Senior management shall determine the competences and resources necessary to carry out the activities of the organization safely and shall provide them.**"

6.2. Senior management should ensure that management of resources includes the following:

(a) The effective, efficient, and timely provision of resources throughout the duration of an activity or lifetime of a facility;
(b) A consideration of the organization`s goals, strategies, plans and objectives in relation to safety;
(c) A consideration of the regulatory requirements and standards in relation to safety.

6.3. Paragraph 4.23 of GSR Part 2 [2] states:

> "Senior management shall ensure that competence requirements for individuals at all levels are specified and shall ensure that training is conducted, or other actions are taken, to achieve and to sustain the required levels of competence."

Managers at all levels should contribute to the analysis of training needs, the review and approval of training programmes, the delivery of selected parts of the training and the evaluation of training effectiveness. Managers at all levels should ensure that appropriate periodic retraining or requalification is provided, to demonstrate that individuals continue to be capable of performing their assigned tasks.

6.4. Senior management should ensure that the organization develops and retains fundamental core competences. Core competences should be built up by means of engagement with industry experts, professional associations, research centres, and universities on a national and international level.

6.5. Paragraph 4.22 of GSR Part 2 [2] states:

> "Senior management shall determine which competences and resources the organization has to retain or has to develop internally, and which competences and resources may be obtained externally, for ensuring safety."

If external competences and resources are used, the organization should have sufficient knowledge to undertake the following:

(a) Identify the specific needs for external competences and resources:
(b) Specify the objective, scope, and relevant requirements for activities conducted by external organizations or individuals;
(c) Monitor activities conducted by external organizations or individuals;
(d) Understand, evaluate and use the outcomes of activities conducted by external organizations or individuals.

6.6. Adequate contractual arrangements for activities conducted by external organizations or individuals should be established.

6.7. To support the achievement and development of collective and individual competences, managers within the organization should consider the need for the following:

(a) A knowledge of the facility and/or activity, and the associated radiation risks;
(b) A knowledge of the management system and related documentation including the organizational structure, responsibilities and levels of authorities, process description, work procedures and instructions;
(c) A knowledge of regulatory requirements;
(d) An understanding of organization`s values and behavioural expectations, and the organization's safety culture framework.

6.8. Senior management should ensure the timely specification and acquisition of the competences necessary (e.g. for specific tasks) and should make provisions for the timely delivery of training and qualification.

6.9. Paragraph 4.23 of GSR Part 2 [2] states that "An evaluation shall be conducted of the effectiveness of the training and of the actions taken." The evaluation of training effectiveness should include individual performance, training organization performance, and the effectiveness of the training process.

6.10. The organization should apply a graded approach to the evaluation of different elements of the training programme (e.g. analysis of training needs, review and approval of the training programme, evaluation of its effectiveness) for example by ensuring that an appropriate level of detail is employed.

6.11. Senior management should analyse and plan for the organization's future competence needs. This should include consideration of the following:

(a) The future needs related to the organization's strategy, goals, plans and objectives;
(b) Any planned refurbishments of a facility (e.g. owing to equipment ageing or obsolescence), or organizational changes (e.g. owing to the departure of management or staff);
(c) Predicted future demographic and economic conditions;
(d) Future changes to regulatory requirements that could affect the organization.

6.12. Managers at all levels should contribute to the development of staff competences and should pay special attention to positions that are critical to safety. Managers should take actions to develop, maintain and improve the staff knowledge, skills and abilities necessary for safety and for understanding the safety consequences of inadequate or incorrect work.

6.13. Managers at all levels should create a respectful working environment that has a positive influence on the motivation, satisfaction, and performance of individuals.

6.14. Paragraph 4.27 of GSR Part 2 [2] states that "The knowledge and the information of the organization shall be managed as a resource." Senior management should treat knowledge and information as fundamental resources that are essential for achieving the goals, strategies, plans and objectives of the organization. To manage knowledge and information, senior management should undertake the following:

(a) Identify the organization's information and knowledge needs, for example as they are necessary in establishing and meeting the organization's goals, strategies, plans and objectives;
(b) Identify and ensure access to internal and external sources of information and knowledge;
(c) Establish management system processes to ensure the preservation of organizational knowledge.

# 7. MANAGEMENT FOR SAFETY: MANAGEMENT OF PROCESSES AND ACTIVITIES

7.1. Requirement 10 of GSR Part 2 [2] states that "**Processes and activities shall be developed and shall be effectively managed to achieve the organization's goals without compromising safety.**" Senior management should ensure that these processes and activities are identified, developed, documented and managed in accordance with a graded approach. This should be based on the nature of the organization's activities, the associated radiation risks (including from unintended events) and the regulatory requirements that apply.

7.2. Managers at all levels should support a common understanding of what is a process, what is process management, which processes should be established, and how these processes interrelate.

7.3. The processes of the organization should be identified by senior management based on comprehensive review of the activities being conducted in the organization and in consultation with the relevant organizational units and staff.

7.4. When establishing a process, the organization should consider factors such as the following:

(a) The risks associated with the process;
(b) The effects of the process on safety, health, environmental, security, quality and socio-economic elements;
(c) The associated regulatory requirements;
(d) The resources and competences needed within the organization to implement the process:
(e) The associated information and knowledge management needs;
(f) The interrelation with other processes.

7.5. Processes should be developed using a structured approach, for example using the following categories:

(a) Core processes, the outputs of which are critical to the mission of the organization;
(b) Management processes, which provide direction and governance for an organization;
(c) Supporting processes, which provide the resources and infrastructure necessary for the other processes.

7.6. The following approach should be used to develop the processes of an organization:

(a) Identifying the processes necessary for the organization;
(b) Creating a logical structure of the processes specifying the sequence of and the interactions between the processes (see also para. 7.9);

(c) Developing a process description, including inputs and outputs;
(d) Addressing regulatory requirements and relevant codes and standards;
(e) Identifying the resources needed for each process;
(f) Identifying the indicators to measure and assess the effective implementation of each process.

7.7. For each process, the following should be performed, as appropriate:

(a) Selecting a process owner (see footnote 3);
(b) Selecting a team that can contribute to defining and developing the process;
(c) Specifying individuals and organizational units who will review the process and its documentation;
(d) Specifying the criteria and methods for process validation;
(e) Specifying the individuals and organizational units who will approve the process and its documents;
(f) Specifying the distribution of the process documents and records.

7.8. Paragraph 4.32 of GSR Part 2 [2] states:

> "Each process or activity that could have implications for safety shall be carried out under controlled conditions, by means of following readily understood, approved and current procedures, instructions and drawings. These procedures, instructions and drawings shall be validated before their first use and shall be periodically reviewed to ensure their adequacy and effectiveness. Individuals carrying out such activities shall be involved in the validation and the periodic review of such procedures, instructions and drawings."

Each process that could have implications for safety should be subject to review or validation by the responsible organizational unit, as well as by other affected organizational units and by an independent organizational unit (within or outside the organization) before the process is implemented.

7.9. Paragraph 4.29 of GSR Part 2 [2] states

> "The sequencing of a process and the interactions between processes shall be specified so that safety is not compromised. Effective interaction between interfacing processes shall be ensured. Particular consideration shall be given to interactions between processes within the organization, and to interactions between processes conducted by the organization and processes conducted by external service providers."

If the implementation of processes is outsourced to external organizations (e.g. processes relating to security, safety assessment or the calibration of equipment), the interaction of such processes with those implemented within the organization should be managed as part of the organization's management system. Management of the interactions should include:

(a) Agreement on the outputs from the organization that will serve as inputs to the outsourced process and the outputs from the outsourced process that will serve as inputs to the organization;
(b) Arrangements for the transfer of information between the organization and the provider of the outsourced process;

(c) Arrangements for monitoring and measurement of the outsourced process to be performed by the organization.

7.10. Requirement 11 of GSR Part 2 [2] states that "**The organization shall put in place arrangements with vendors, contractors and suppliers for specifying, monitoring and managing the supply to it of items, products and services that may influence safety.**"

7.11. Paragraph 4.33 of GSR Part 2 [2] states:

> "The organization shall retain responsibility for safety when contracting out any processes and when receiving any item, product or service in the supply chain[11].
>
> [11]The supply chain, described as 'suppliers', typically includes: designers, vendors, manufacturers and constructors, employers, contractors, subcontractors, and consigners and carriers who supply safety related items. The supply chain can also include other parts of the organization and parent organizations."

Managers within the organization should ensure that all relevant staff are aware that the final responsibility for safety remains with the organization itself, even when suppliers are used for safety related items, products and services.

7.12. Senior management should ensure that the organization`s objectives and processes for procurement and supply chain management are established and are based on a graded approach.

7.13. Managers should establish coordination and interaction with suppliers to promote and facilitate safety and safety culture, quality, economical and other important aspects, with the aim of continual improvement of supply related processes. Clearly specified lines of communication should be established.

7.14. When the organization outsources processes associated with supply chain management to an external organization, senior management should ensure that the external organization complies with applicable management system requirements.

7.15. Paragraph 4.36 of GSR Part 2 [2] states:

> "The organization shall make arrangements for ensuring that suppliers of items, products and services important to safety adhere to safety requirements and meet the organization's expectations of safe conduct in their delivery."

Senior management should ensure that relevant staff within the organization are capable of assessing the safety implications of items, products and services provided by suppliers. This should include:

(a) Understanding product or service specifications, including their relevance to safety;
(b) Specifying requirements for items, products and services, including the quality assurance requirements that apply;
(c) Monitoring and assessing items, products and services to ensure that they meet the needs of the organization;
(d) Where necessary, demonstrating to the regulatory body that items, products and services meet safety requirements.

7.16. Paragraph 4.35 of GSR Part 2 [2] states that "The management system shall include arrangements for qualification, selection, evaluation, procurement, and oversight of the supply chain." The organization should develop processes for qualification, evaluation and selection of suppliers, for procurement and for oversight of supplier's performance . These processes should be communicated to potential suppliers and should include the following:

(a) A description of how the supply specifications were developed (e.g. design requirements, quality requirements, economic aspects);
(b) A description of the qualification, evaluation and selection process to be used by suppliers, including relevant approval criteria and how the results are administrated and communicated;
(c) A description of the contracting process;
(d) A description of the oversight of suppliers (e.g. audits, inspections, witnessing and hold points, document review and approval);
(e) A description of the receipt and acceptance criteria for items, products and services.

7.17. Managers at all levels should ensure that processes and activities to monitor and assess supplier performance are implemented. Managers should also promote the sharing of experience between the organization and suppliers.

7.18. Organizations and individuals conducting procurement and related activities should ensure that the information provided to suppliers is coherent, clear and understandable, and fully describes the product and service requirements and the organization's expectations of safe conduct.

7.19. Paragraph 4.34 of GSR Part 2 [2] states [footnote omitted]:

> "The organization shall have a clear understanding and knowledge of the product or service being supplied. The organization shall itself retain the competence to specify the scope and standard of a required product or service, and subsequently to assess whether the product or service supplied meets the applicable safety requirements."

7.20. The organization should apply a graded approach to the management of the supply chain. As such, the different elements of the procurement process (e.g. qualification, selection, evaluation, oversight of supplier's performance) and activities conducted during procurement should be implemented in a way and at a level of detail that is commensurate with the safety significance of the item, product or service being supplied.

# 8. CULTURE FOR SAFETY

8.1. Requirement 12 of GSR Part 2 [2] states:

> "Individuals in the organization, from senior managers downwards, shall foster a strong safety culture. The management system and leadership for safety shall be such as to foster and sustain a strong safety culture."

8.2. Senior management should foster a strong safety culture by demonstrating a clear commitment to safety through their own management practices. They should ensure that their attitudes and behaviours are coherent and consistent and, most importantly, aligned with safety.

8.3. Paragraph 5.2(a) of GSR Part 2 [2] states:

> "Senior managers and all other managers shall advocate and support…[a] common understanding of safety and of safety culture, including: awareness of radiation risks and hazards relating to work and to the working environment; an understanding of the significance of radiation risks and hazards for safety".

8.4. Senior management should establish, apply and support direct and open communication with all individuals, including suppliers, to promote and enhance a strong safety culture. Managers at all levels should use frequent communications (formal and informal) to convey the values related to safety to all individuals, including suppliers, and to explain how these values should be incorporated into organizational work practices.

8.5. The organizational policies, goals, strategies, plans, objectives and processes described in the management system should foster safety culture by being designed so that they help ensure that individuals are motivated, able to act in accordance with the expectations set for them and that an ownership of safety is evident at the organizational and individual levels.

8.6. Senior management should ensure that performance indicators and other measures of performance have no negative impact on the behaviours necessary to ensure safety.

8.7. Managers at all levels should promote safe working practices and conditions and discourage unsafe practices and behaviours. Various methods (e.g. training, rewards, staff promotion) should be used to create and support a working environment where safety conscious behaviour is recognized, encouraged and valued.

8.8. Managers at all levels should assume personal accountability for ensuring that safety is the overriding priority. As well as being personally accountable for fostering a strong safety culture in areas under their control, managers should also understand the interfaces with other areas that have an impact on safety.

8.9. Managers should promote a strong safety culture in a visible and ongoing manner. Actions may include the following:

(a) Engaging in periodic communications with staff where safety culture is discussed;
(b) Maintaining a presence in the workplace, such as performing walk-downs of the facility and making observations of tasks where staff can be coached on the desired behaviours and attitudes;
(c) Communicating clear expectations regarding personal accountability, teamwork, questioning attitudes, and safety focused decision making in meetings at all levels.

8.10. The organization should take measures to ensure that individuals and teams of staff understand what safety culture means, why it is important and how it applies to their daily work practices and their working environment. Individuals and teams should:

(a) Understand that safety and the organization's overall performance mutually support each other;
(b) Understand that safety conscious behaviour is expected and needs to be formally and informally supported;
(c) Be accountable for safety;
(d) Be actively involved in improving safety;
(e) Promote safe behaviours in all situations;
(f) Coach others in safe behaviour
(g) Support each other in achieving goals by communicating and coordinating activities within and across organizational boundaries;
(h) Understand the value of diverse thinking in optimizing protection and safety, and support such thinking.

8.11. Managers at all levels should know and understand the organization's safety culture framework (see para. 3.4 and the Appendix), which defines the traits of a strong safety culture. They should ensure that this understanding is shared by all individuals.

8.12. Paragraph 5.2(c) of GSR Part 2 [2] states that "Senior managers and all other managers shall advocate and support…[a]n organizational culture that supports and encourages trust, collaboration, consultation and communication". Managers at all levels should set the expectation that trust and respect are key drivers of a strong safety culture and should therefore be considered as organizational values. Trust and respect in the workplace should be clearly demonstrated by the actions of managers. Differing opinions should be encouraged, discussed, and thoughtfully considered.

8.13. Paragraph 5.2(d) of GSR Part 2 [2] states:

> "Senior managers and all other managers shall advocate and support…[t]he reporting of problems relating to technical, human and organizational factors and reporting of any deficiencies in structures, systems and components to avoid degradation of safety, including the timely acknowledgement of, and reporting back of, actions taken".

8.14. The management system should include tools and processes for reporting and resolving safety concerns. These should not be only major concerns but also minor concerns, as they might become major later. Individuals should be encouraged to report concerns in a timely manner. Managers at all levels should implement and clearly explain the measures that support an individual's rights and responsibilities to raise safety concerns to increase openness and decrease fear of raising concerns, thereby building a trusting and continually learning organization.

8.15. Managers at all levels should ensure that safety concerns are resolved as appropriate. The effectiveness of corrective actions should be assessed, and lessons should be shared and used to strengthen safety performance.

8.16. The organization should develop its capacity to learn not only from failures but also from success (see also para. 6.6 of GSR Part 2 [2]). The organization should employ a variety of approaches to stimulate learning and improve safety and the overall performance of the organization.

8.17. Paragraph 5.2(e) of GSR Part 2 [2] states that "Senior managers and all other managers shall advocate and support…[m]easures to encourage a questioning and learning attitude at all levels in the organization and to discourage complacency with regard to safety".

8.18. The organization should seek and make use of operating experience from within the organization and from other organizations. External operating experience should be considered and, if relevant, adapted to the specifics of the facility or activity.

8.19. Managers at all levels should always be aware of the possibility of failures, unforeseen problems and unlikely events, even when past outcomes were successful. Managers should be aware that success can breed complacency, which should be avoided on both an individual and organizational level.

8.20. Managers should establish means for communicating about concerns or issues in relation to the interface of safety culture with security culture. Opportunities for complementary support should be identified. Cooperation and teamwork to ensure that the needs of both safety and security are met should be supported and encouraged.

8.21. In application of a graded approach to a less complex facility or activity with a low radiation risk, expectations concerning safety culture may be communicated informally; safety conscious decisions and actions can be credited as fostering of strong safety culture; and an undocumented process for reporting and resolution of safety concerns may be acceptable if they are applied consistently.

# 9. MEASUREMENT, ASSESSMENT AND IMPROVEMENT

9.1. Requirement 13 of GSR Part 2 [2] states:

> "**The effectiveness of the management system shall be measured, assessed and improved to enhance safety performance, including minimizing the occurrence of problems relating to safety.**"

Senior management should support the establishment of a continual learning approach in the measurement, assessment and improvement of the effectiveness of the management system.

9.2. The method of assessment of the effectiveness of the management system should take into account the purpose of the assessment, the organizational structure and the management system itself, and be applied using a graded approach. The assessment should be designed with the following aims:

(a) To identify strengths, weaknesses, opportunities and threats (i.e. SWOT analysis);
(b) To identify signs of complacency;
(c) To analyse trends;
(d) To identify areas for improvement.

For a less complex facility or activity with a low radiation risk, the management system review and process assessment methodologies may be simpler and less formal.

9.3. Paragraph 6.4 of GSR Part 2 [2] states:

> "Independent assessments and self-assessments of the management system shall be regularly conducted to evaluate its effectiveness and to identify opportunities for its improvement. Lessons and any resulting significant changes shall be analysed for their implications for safety."

Senior management should ensure both self-assessments and independent assessments[4] of the management system.

9.4. Process owners should periodically conduct self-assessments of processes and their effectiveness. These self-assessments should involve all organizational units and individuals that significantly contribute to the process.

9.5. Paragraph 6.6 of GSR Part 2 [2] states:

> "Senior management shall conduct a review of the management system at planned intervals to confirm its suitability and effectiveness, and its ability to enable the objectives of the organization to be accomplished, with account taken of new requirements and changes in the organization."

Senior management should use outcomes of these reviews to improve safety and the organization's overall performance. The results of the assessment related to the effectiveness of processes (see para. 9.4) should be provided as an input to these periodic management system reviews. Resulting actions from the management system review should be tracked, monitored and reported at regular intervals to ascertain their progress and to observe whether they are effective.

9.6. Paragraph 6.3 of GSR Part 2 [2] states:

> "The causes of non-conformances of processes and the causes of safety related events that could give rise to radiation risks shall be evaluated and any consequences shall be managed and shall be mitigated. The corrective actions necessary for eliminating the causes of non-conformances, and for preventing the occurrence of, or mitigating the consequences of, similar safety related events, shall be determined, and corrective actions shall be taken in a timely manner."

Non-conforming items should be properly identified, recorded, segregated, controlled, and reported. Their impact on safety should then be evaluated. Non-conformances should be

[4] Independent assessments are defined as "Assessments such as audits or surveillance carried out to determine the extent to which the requirements for the management system are fulfilled, to evaluate the effectiveness of the management system and to identify opportunities for improvement. They can be conducted by or on behalf of the organization itself for internal purposes, by interested parties such as customers and regulators (or by other persons on their behalf), or by external independent organizations.

Notes:

(a) This definition applies in management systems and related fields.

(b) Persons conducting independent assessments do not participate directly in the work being assessed.

(c) Independent assessment activities include internal and external audit, surveillance, peer evaluation and technical review, which are focused on safety aspects and areas where problems have been found.

(d) An audit is used in the sense of a documented activity performed to determine by investigation, examination and evaluation of objective evidence the adequacy of, and adherence to, established procedures, instructions, specifications, codes, standards, administrative or operational programmes and other applicable documents, and the effectiveness of their implementation." [4]

monitored until they have been resolved and their causes eliminated. Feedback to the individuals who identified the non-conformances should be provided.

9.7. Senior management should ensure that responsibilities for the management of non-conformances are allocated in the management system. Senior management should also ensure that individuals who implement management system processes are aware of their duty to identify and report non-conformances and to propose corrective actions.

9.8. Senior management should ensure that appropriate training is provided on reporting non-conformances and proposing corrective actions.

9.9. Senior management should ensure that individuals have the opportunity to identify improvements and suggest them via the management system.

9.10. Non-conformances and events to evaluated should include the following:

(a) Deviations from approved processes or documentation.
(b) Supply of products or services that do not meet requirements. The process to control non-conformances should include provisions to prevent the inadvertent use of products or services that do not conform.
(c) Failures of individuals to implement work instructions.
(d) Inadequate documentation containing incorrect or incomplete information.
(e) Inadequate training of individuals to perform the safety related tasks for which they have been given responsibility.

9.11. In the application of a graded approach, the different elements of the non-conformance management process (e.g. recording, reporting) may be implemented at varying levels of detail. The evaluation of non-conformances should be performed based on their safety significance by trained and experienced individuals.

9.12. Non-conformances and their causes should be analysed for trends to identify recurring events, generic issues and weaknesses before they generate a significant effect.

9.13. Non-conformances should be regarded as opportunities for improvement, and they should be used for the improvement of the management system and its processes.

9.14. The results of corrective actions should be monitored at regular intervals to ascertain whether they are effective. Corrective actions implemented to prevent recurrence should be reviewed for effectiveness in eliminating the root cause. Individuals who are responsible for implementing a corrective action should be provided with the necessary authority and resources.

9.15. Requirement 14 of GSR Part 2 [2] states that "**Senior management shall regularly commission assessments of leadership for safety and of safety culture in its own organization.**" A thorough assessment of both leadership and safety culture should be performed periodically in order to monitor and evaluate trends and changes. The assessments of leadership for safety and of safety culture for should be conducted together.

9.16. The self-assessments and independent assessment of leadership and of safety culture (see paras 6.9 and 6.10 of GSR Part 2 [2]) should aim at improving safety performance. The assessments should provide comprehensive feedback on the status of values, beliefs,

assumptions and daily work practices, and how this status influences safety. Cultural factors having a negative impact on safety should be monitored and addressed. Cultural factors having a positive impact on safety should be clearly recognized and measures should be taken by senior management to ensure that these factors are sustained.

9.17. A graded approach should be applied: for example, for a less complex facility or activity with a low radiation risk, the assessments of leadership for safety and of safety culture may be informal.

9.18. Paragraph 6.9 of GSR part 2 [2] states:

> "Senior management shall ensure that self-assessment of leadership for safety and of safety culture includes assessment at all organizational levels and for all functions in the organization. Senior management shall ensure that such self-assessment makes use of recognized experts in the assessment of leadership and of safety culture."

Senior management should ensure that both self-assessments and independent assessments are managed by individuals and groups with sufficient expertise and experience in assessing leadership for safety and safety culture, including in the use of appropriate methods.

9.19. Multiple methods should be used in the assessment of leadership and safety culture. The assessment methods used, such as surveys or questionnaires, document review, interviews, observations and focus groups, should complement each other. The data collected should be representative of all functions and all levels of the organization.

9.20. Managers at all levels should ensure the following:

(a) They are actively involved and encourage all individuals to participate in the assessments of leadership and safety culture;
(b) The resources necessary for an effective assessment, including resources for planning, implementation and reporting, are provided;
(c) Sufficient resources to address issues discovered during the assessment are provided.

9.21. The results of self-assessments and independent assessments should be thoroughly reviewed and discussed by senior management. Senior management should clearly demonstrate that they take ownership of the findings and support cross-functional actions that impact all relevant organizational units and functions.

9.22. Paragraph 6.11 of GSR Part 2 [2] states that (citation omitted) "The results of self-assessments and independent assessments of leadership for safety and of safety culture [1] shall be communicated at all levels in the organization." Senior management should ensure the effective communication of the results of assessments and the actions that will be taken to address the findings. The actions should be followed up and their effectiveness reviewed until the expected effect has been achieved.

# Appendix

## SAFETY CULTURE FRAMEWORK

A.1 This appendix presents a safety culture framework which attempts to enhance the alignment of different safety culture models used in different States. This safety culture framework describes the traits and attributes that are present in organizations with a strong safety culture. A graded approach should be used in the application of this framework, taking into account the type of facility or activity and the associated radiation risks.

This appendix is based upon the work previously done; A Harmonized Safety Culture Model was published as IAEA Working Document in 2020, see harmonization_05_05_2020-final_002.pdf (iaea.org).

| Safety Culture Traits | Safety Culture Attributes |
|---|---|
| IR.<br>Individual Responsibility<br><br>All individuals are personally accountable for safety.<br><br>All individuals feel it is their duty to know the standards and expectations and rigorously fulfil those standards and expectations. There is personal ownership for safety. All individuals have a commitment to promoting safety both individually and collectively. | IR.1 Adherence:<br>Individuals understand and accept the importance of standards, processes, procedures, expectations and work instructions. Individuals at all levels of the organization adhere to standards and expectations.<br><br>IR.2 Ownership:<br>Individuals demonstrate personal commitment to safety in their behaviours and work practices. They promote safe behaviours in all situations and coach others when necessary.<br><br>IR.3 Collaboration:<br>Individuals and work groups help each other achieve goals by communicating and coordinating their activities within and across organizational boundaries. Individuals understand and accept the value of diverse thinking in optimizing safety. |
| QA.<br>Questioning Attitude<br><br>Individuals remain vigilant for assumptions, anomalies, conditions, behaviours or activities that might adversely impact safety, and appropriately voice those concerns.<br><br>Individuals are watchful for and avoid complacency. They recognize that minor issues might be warning signs of something more significant. Individuals are aware of conditions and alert to potential vulnerabilities, and report them. | QA.1 Recognition of unique risks:<br>Individuals understand the unique risks associated with facilities and activities They understand that the technologies may be complex and might fail in unforeseen ways with significant consequences.<br><br>QA.2 Avoidance of complacency:<br>Individuals recognize and plan for the possibility of mistakes, unforeseen problems and unlikely events, even when past outcomes were successful. Individuals recognize that complacency often comes with success and continually strive to avoid it in themselves and others.<br><br>QA.3 Questioning in the case of uncertainty:<br>Individuals stop when uncertain and seek advice. The situation and risks are evaluated and managed before proceeding.<br><br>QA.4 Recognition and questioning of assumptions:<br>Individuals question assumptions and are prepared to offer different perspectives when they believe something is not correct. |

| Safety Culture Traits | Safety Culture Attributes |
|---|---|
| | |
| CO.<br>Communication<br><br>Communications support a focus on safety.<br><br>Leaders use formal and informal communication to frequently convey the importance of safety. The organization maintains a variety of communication channels, including direct interaction between managers and workers. Effective dialogue is encouraged. Effective communication in support of safety is broad and includes workplace communication, reasons for decisions and expectations. | CO.1 Free flow of information:<br>Individuals communicate openly and candidly, both up, down, and across the organization. The flow of information up the organization is considered to be as important as the flow of information down the organization.<br><br>CO.2 Transparency:<br>Communication with regulatory bodies and other organizations (e.g. for audits and other independent oversight) and the public is appropriate, professional and accurate.<br><br>CO.3 Reasons for decisions:<br>Leaders ensure that the reasons for technical and administrative decisions are communicated to the appropriate individuals in a timely manner.<br><br>CO.4 Expectations:<br>Leaders frequently communicate and reinforce the expectation that safety is prioritized over competing goals.<br><br>CO.5 Workplace communication:<br>Communication about safety is included in all work activities so that everyone has the information necessary to work safely and effectively. |
| LR.<br>Leader Responsibility<br>Leaders demonstrate a commitment to safety in their decisions and behaviours. Leaders are role models for safety. | LR.1 Strategic alignment:<br>Leaders establish and promote organizational priorities that place safety above competing goals. Leaders take a long term approach to the organization and align policies and actions. They emphasize that high levels of safety are necessary to sustain high levels of production.<br><br>LR.2 Leader behaviour: |

| Safety Culture Traits | Safety Culture Attributes |
|---|---|
| Executive and senior managers are the leading advocates of safety and demonstrate their commitment both in word and action. Leaders throughout the organization set an example for safety. Corporate policies emphasize the overriding importance of safety. | Leaders throughout the organization set an example for safety.<br><br>LR.3 Employee engagement:<br>Leaders develop an aligned and engaged workforce that creates a positive environment in support of safety. Leaders seek the active involvement of individuals at all levels in identifying and resolving safety issues. Factors affecting work motivation and job satisfaction are considered when making decisions.<br><br>LR.4 Resources:<br>Leaders ensure that personnel, equipment, procedures and other resources are available and adequate to support safety. Human resources policies, including those relating to recruitment, succession planning and promotions, place a high priority on behaviour and decisions aligned with safety.<br><br>LR.5 Field presence:<br>Leaders are frequently present in all areas of the organization, observing work and material conditions. They ask questions, communicate, coach, and reinforce standards and expectations. Leaders listen to and act upon the concerns of and feedback from the workforce.<br><br>LR.6 Rewards and sanctions:<br>Leaders ensure that rewards and sanctions encourage attitudes and behaviours that promote safety. Individuals are answerable not only for results but also how they achieve the results.<br><br>LR.7 Change management:<br>Leaders use a systematic process for communicating and implementing change so that safety is not compromised. The rationale for the change is clearly communicated. The impact of the change on safety is assessed before, during and after the change.<br><br>LR.8 Authorities, roles and responsibilities:<br>Leaders ensure that authorities, roles and responsibilities are clearly defined and understood. |

| Safety Culture Traits | Safety Culture Attributes |
|---|---|
| DM.<br>Decision making<br>Decision making is systematic, rigorous, thorough and prudent.<br><br>Leaders support conservative decision making and the ability to recover quickly from unforeseen circumstances. Leaders follow the decision making process. Responsibility for decision making is clear. | DM.1 Systematic approach:<br>Individuals use a consistent, systematic approach to evaluate relevant factors, including risk, when making decisions. Using a systematic approach, high quality information is collected from all relevant sources.<br><br>DM.2 Conservative approach:<br>Individuals make prudent choices over those that are simply allowable. Actions are determined to be safe before proceeding, rather than proceeding until proven unsafe.<br><br>DM.3 Clear responsibility:<br>Authority and responsibility for decisions is specific and well defined.<br><br>DM.4 Resilience:<br>Prudent decision making is always used, but in anticipation of unforeseen situations when no procedure or plan applies, organizations develop the ability to adapt. |
| WE.<br>Respectful Work Environment<br>Trust and respect permeate the organization.<br><br>A high level of trust is cultivated in the organization. Differing opinions are encouraged, discussed and thoughtfully considered. Employees are informed of steps taken in response to their concerns. | WE.1 Respect is evident:<br>All individuals are treated with dignity, respect and openness, and their contributions are recognized.<br><br>WE.2 Opinions are valued:<br>Individuals are encouraged to ask questions, voice concerns and provide suggestions. Differing opinions are solicited and respected.<br><br>WE.3 Trust is cultivated:<br>Trust is fostered among individuals and work groups throughout the organization. Openness and honesty are fostered between individuals, between work groups, and throughout the entire organization.<br><br>WE.4 Conflicts are resolved:<br>Fair and transparent methods are used to resolve conflicts. Conflicts are resolved in a timely manner.<br><br>WE.5 Facilities reflect respect: |

| Safety Culture Traits | Safety Culture Attributes |
|---|---|
| | Housekeeping and material conditions reflect respect for both people and equipment. Facilities are conducive to a productive work environment and housekeeping is maintained. |
| CL.<br>Continuous Learning<br>Learning is highly valued.<br><br>The organizational capacity to learn is well developed. The organization employs a variety of approaches to stimulate learning and improve performance, including human, technical and organizational aspects. Individuals and teams are highly competent and seek opportunities for improvement. | CL.1 Constant examination:<br>Safety is regularly monitored and assessed through a variety of techniques, including independent assessments and self-assessments of its programmes and processes. Safety culture is regularly assessed and enhanced.<br><br>CL.2 Learning from experience:<br>The organization systematically and effectively collects, evaluates and implements relevant internal and external lessons in a timely manner. Lessons are also shared with relevant organizations.<br><br>CL.3 Training:<br>The organization provides effective training and ensures knowledge transfer to maintain a knowledgeable and competent workforce.<br><br>CL.4 Leadership development:<br>Competent leaders are developed through the leadership training and succession management processes.<br><br>CL.5 Benchmarking:<br>The organization learns from the practices of other organizations, including those in other industries. |
| PI.<br>Problem Identification and Resolution<br>Issues potentially impacting safety are systematically identified, fully evaluated and promptly resolved according to their significance. | PI.1 Identification:<br>A method for collecting issues is implemented. The issues collected are not only major issues but also minor issues, as they could become major issues. Individuals identify issues in a timely manner. Self-reporting is expected and valued by the organization.<br><br>PI.2 Evaluation:<br>Issues are thoroughly evaluated to determine underlying causes and whether the issue exists in other areas. Issues are evaluated in an appropriate time frame. |

| Safety Culture Traits | Safety Culture Attributes |
|---|---|
| Identification and resolution of a broad spectrum of issues, including human performance and organizational issues, are used to strengthen safety and improve performance. | PI.3 Resolution:<br>Identified issues are corrected as appropriate. The effectiveness of the corrective actions is assessed to ensure issues are adequately addressed. Important lessons are shared.<br><br>PI.4 Identifying trends:<br>Issues are analysed to identify possible patterns and trends. A broad range of information is evaluated to obtain an overall view of causes and results. |
| RC.<br>Raising Concerns<br>Personnel feel free to raise safety concerns without fear of retaliation, intimidation, harassment or discrimination.<br>The organization creates, maintains and evaluates policies and processes that allow personnel to raise concerns freely. | RC.1 Supportive policies are implemented:<br>The organization clearly states and effectively implements a policy that supports an individual's rights and responsibilities to raise safety concerns. The organization does not tolerate harassment, intimidation, retaliation or discrimination for raising concerns.<br><br>RC.2 Confidentiality is possible:<br>The organization implements at least one method for raising and resolving concerns that is confidential and independent of line management influence. Timely feedback is provided to the concerned individual. |
| WP.<br>Work Planning<br>The process of planning and controlling work activities is implemented so that safety is maintained.<br><br>Work is managed in a deliberate process in which work is identified, selected, planned, scheduled, executed and reviewed. The entire organization is involved in and fully supports the process. All relevant parts of the organization work together to support the process of controlling work. | WP.1 Work management:<br>There is a systematic approach of selecting, scheduling, coordinating and completing work activities, in which safety is emphasized. The identification and management of relevant factors, including safety, are taken into consideration in the work process.<br><br>WP.2 Safety margins:<br>Work is planned and conducted such that safety margins are preserved. Safety margins are understood and carefully maintained, and changed only through a systematic and rigorous process.<br><br>WP.3 Documentation and procedures:<br>Documentation, including procedures, is complete, accurate, accessible, user-friendly, understandable and up-to-date. Changes are tracked. |

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