

## GUIDE YVL A.3

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# LEADERSHIP AND MANAGEMENT FOR SAFETY

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Definitions

## Authorisation

According to Section 7 r of the Nuclear Energy Act (990/1987), the Radiation and Nuclear Safety Authority (STUK) shall specify detailed safety requirements for the implementation of the safety level in accordance with the Nuclear Energy Act.

## Rules for application

The publication of a YVL Guide shall not, as such, alter any previous decisions made by STUK. After having heard the parties concerned STUK will issue a separate decision as to how a new or revised YVL Guide is to be applied to operating nuclear facilities or those under construction, and to licensees' operational activities. The Guide shall apply as it stands to new nuclear facilities.

When considering how the new safety requirements presented in the YVL Guides shall be applied to the operating nuclear facilities, or to those under construction, STUK will take due account of the principles laid down in Section 7 a of the Nuclear Energy Act (990/1987): The safety of nuclear energy use shall be maintained at as high a level as practically possible. For the further development of safety, measures shall be implemented that can be considered justified considering operating experience, safety research and advances in science and technology.

According to Section 7 r(3) of the Nuclear Energy Act, the safety requirements of the Radiation and Nuclear Safety Authority (STUK) are binding on the licensee, while preserving the licensee's right to propose an alternative procedure or solution to that provided for in the regulations. If the licensee can convincingly demonstrate that the proposed procedure or solution will implement safety standards in accordance with this Act, the Radiation and Nuclear Safety Authority (STUK) may approve a procedure or solution by which the safety level set forth is achieved.

With regard to new nuclear facilities, this Guide shall apply as of 1 April 2019 until further notice. With regard to operating nuclear facilities and those under construction, this Guide shall be enforced through a separate decision to be taken by STUK. This Guide replaces Guide YVL A.3 (02.06.2014).

Translation. Original text in Finnish.

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## 1 Introduction

101. According to the Nuclear Energy Act (990/1987) [1], the nuclear facility shall have a management system. The licensee is responsible for the nuclear facility's safety as well as for the planning, implementation, maintenance, functionality, effectiveness, and continuous improvement of the management system. [2019-03-15 ]

102. Section 9 of the Nuclear Energy Act (990/1987) prescribes as follows:

*It shall be the licensee's obligation to assure the safe use of nuclear energy. This obligation cannot be delegated or transferred to another party. The licensee shall ensure that the products and services of suppliers and subcontractors that affect the safety of the nuclear facility meet the safety requirements of this Act.*

*It shall be the licensee's obligation to assure such physical protection and emergency planning and other arrangements, necessary to ensure limitation of nuclear damage, which do not rest with the authorities.*

*A licensee whose operations generate or have generated nuclear waste (licensee under a waste management obligation) shall be responsible for all nuclear waste management measures and their appropriate preparation, as well as for their costs (waste management obligation). [2019-03-15 ]*

103. The assurance of safety presupposes high quality operation from nuclear facility systems, structures, components, and organisations affecting safety as well as special attention being given to safety-significant factors and their interconnections. Safety, factors affecting safety, and the interconnections between the different factors form a system where the changing of one factor may have extensive consequences. Safety shall therefore be considered as a whole.

[2013-11-15 ]

104. Under Section 25 of Radiation and Nuclear Safety Authority Regulation on the Safety of a Nuclear Power Plant (STUK Y/1/2018) [3], *when designing, constructing, operating and decommissioning a nuclear facility, a good safety culture shall be maintained. Safety shall take priority in all operations. The decisions and activities of the management of each organisation participating in the abovementioned activities shall reflect its commitment to operational practices and solutions that promote safety. Personnel shall be encouraged to perform responsible work, and to identify, report, and eliminate factors endangering safety. Personnel shall be given the opportunity to contribute to the continuous improvement of safety.*

*Organisations participating in the design, construction, operation and decommissioning of a nuclear facility shall employ a management system for ensuring safety and the management of quality. The objective of such a management system shall be to ensure that safety is prioritised without exception, and that quality management requirements correspond to the safety significance of the activity and function. The management system shall be systematically assessed and further developed.*

*The management system shall cover all organisational activities impacting the nuclear facility's safety. For each function, requirements significant to safety shall be identified, and the planned measures described in order to ensure conformity with requirements. The operating methods of the organisation shall be systematic and instructed.*

*Systematic procedures shall be in place for identifying and correcting deviations significant in safety terms. [ – – ]*

Corresponding principles are presented in Radiation and Nuclear Safety Authority Regulation on the Safety of Disposal of Nuclear Waste (STUK Y/4/2018) [4]. [2019-03-15 ]

105. In the management system, the consideration of factors affecting safety is ascertained by combining different management systems such as safety and quality management. Safety shall refer to nuclear and radiation safety, also covering safety, security and emergency response arrangements and nuclear safeguards at all stages of the use of nuclear energy. [2019-03-15 ]

106. Removed. [2019-03-15 ]

107. The quality vocabulary used in this guide complies with SFS-EN ISO 9000:2015 [5]. [2019-03-15 ]

## 2 Scope of application

201. This guide presents the general requirements of safety and quality management that affect the contents, implementation, maintenance, assessment, and improvement of the management system of an organisation applying for a construction or operating licence for a nuclear facility or one constructing or operating a nuclear facility. [2019-03-15 ]

202. The management system requirements set forth in this guide apply to all the stages in the life cycle of a nuclear facility and for the entire duration of activities during normal operation, anticipated operational occurrences and accidents, and any subsequent periods of institutional control that may be necessary. Life cycle stages mean the siting, and plant design, construction, commissioning, operation, and decommissioning of a nuclear facility and final disposal of nuclear waste. [2019-03-15 ]

203. The requirements of this guide apply, to the appropriate extent, to the plant supplier, suppliers contributing to nuclear fuel fabrication, safety-significant design and expert organisations, testing and inspection organisations, component and material manufacturers, and other safety-significant suppliers. If a requirement only concerns the licensee or the nuclear facility, it is specifically mentioned. [2019-03-15 ]

204. The requirements of this guide are specified in several other YVL Guides.

- Guide YVL A.4 "Organisation and personnel of a nuclear facility" sets forth detailed requirements for personnel and individual competence.
- Guide YVL A.5 "Construction and commissioning of a nuclear facility" provides specified requirements for the management system of a construction project.
- Guide YVL A.6 "Conduct of operations at a nuclear power plant" sets forth requirements pertaining to the nuclear power plant's operating stage.
- Guide YVL A.7 "Probabilistic risk assessment and risk management of a nuclear power plant" presents requirements relating to the application of the PRA.
- Guide YVL A.11 "Security of a nuclear facility" specifies management system requirements pertaining to nuclear security.
- Guide YVL A.12 "Information security management of a nuclear facility" specifies management system requirements for information security.
- Guide YVL B.1 "Safety design of a nuclear power plant" specifies requirements related to the design of nuclear facilities for management systems and quality management.

Furthermore, several field of technology-specific YVL guides establish detailed requirements for quality management, quality assurance, and quality plans. [2019-03-15 ]

## 3 Management system

### 3.1 Planning, implementation, maintenance, and improvement of the management system

301. A management system shall be planned and implemented to incorporate an organisation's operations, and it shall be continuously maintained and improved. The system shall be a well-balanced whole aligned with the goals of the organisation, which shall ascertain the fulfilment of nuclear and radiation safety requirements. Organisation shall integrate all management systems (integrated management system). The management shall promote ways for the entire personnel to participate in the implementation of safety goals and continuous development of safety. [2019-03-15 ]

302. In the management system, the organisational structure and the responsibilities, authorities, and decision-making procedures of the personnel shall be defined and their safety implications shall be taken into account and justified. The internal interfaces of the organisation and its interfaces with other organisations shall be described. [2019-03-15 ]

303. The management system shall contain procedures to identify, assess, and manage safety risks relating to the activities. [2019-03-15 ]

304. Removed. [2019-03-15 ]

305. The safety significance of functions shall be taken into account when planning and implementing the management system or any modifications to it. Procedures shall be in place to identify and assess the multiplier effects of minor modifications. The applicability of significant changes shall be assessed prior to their execution, and the effect of such changes shall be assessed and followed. [2019-03-15 ]

306. The licensee shall submit safety-significant changes to the management system to STUK for approval before their implementation. Minor changes shall be submitted to STUK for information before their implementation. [2019-03-15 ]

307. The licensee shall ensure operation in accordance with the objectives. The entire personnel, as well as the suppliers working at the nuclear facility, shall follow the management system and the procedures presented therein. [2019-03-15 ]

308. Radiation and Nuclear Safety Authority Regulation on the Safety of a Nuclear Power Plant (STUK Y/1/2018) 25 § prescribes that the licensee shall have a group of experts, independent of the other parts of the organisation, that supports the responsible manager and convenes on a

regular basis to handle safety-related issues and issue recommendations thereon if necessary.  
[2019-03-15 ]

309. The International Atomic Energy Agency (IAEA) has published a document containing requirements for the management system [6], which shall be taken into account when developing the management system and safety culture. In addition, the IAEA has published guidelines that supplement the requirements to support the assessment and development of the management system. [2013-11-15 ]

### **3.2 Safety culture**

310. The organisation shall have a good safety culture:

- Nuclear and radiation safety take priority in decision-making.
- The safety significance of issues is considered holistically.
- Work activities are conducted in a professional manner and individuals take responsibility.
- Working conditions are well-organised.
- Mutual respect and trust permeate the organisation.
- The atmosphere is open, blame-free and vigilant in order to identify, report, investigate and resolve factors endangering safety.
- The management demonstrates the importance of safety and their commitment to its continuous improvement in the work practices. The management system shall support the development of a good safety culture.

[2019-03-15 ]

311. The personnel shall be provided training to support the understanding of the features of good safety culture. [2019-03-15 ]

311a. Training shall be provided for the personnel of safety-significant suppliers in order to support a person's awareness and understanding of the nuclear and radiation safety requirements of his or her work and their safety significance and provide the skills to act in the right manner when detecting a deviation. [2019-03-15 ]

312. Managers and supervisors shall actively contribute to the development of values, attitudes and working methods that promote safety. Managers and supervisors shall set expectations for behaviour and promote safe working methods through their example. Requirements for the operation of managers and supervisors are also given in Guide YVL A.4 "Organisation and personnel of a nuclear facility". [2019-03-15 ]



313. The nuclear facility management shall have available safety culture expertise in order to facilitate the development and maintenance of a good safety culture in the organisation.

[2019-03-15 ]

314. The safety culture shall be developed in a target-oriented and planned way.

[2013-11-15 ]

315. In connection with the analysis and investigation of operational events, the organisational factors that contributed to the sequence of events shall be identified. [2019-03-15 ]

316. Removed. [2019-03-15 ]

317. Removed. [2019-03-15 ]

318. The management system shall contain procedures to make the management aware of the situation of the safety culture in their organisation, changes to it and, in particular, the potential deterioration of the safety culture. [2019-03-15 ]

318a. The licensee's management system shall contain procedures to ensure the good safety culture of safety-significant suppliers, to assess the safety culture and to respond to its development needs. [2019-03-15 ]

### **3.3 Management of human and organisational factors**

319. The interaction between human, technology and organisation affects safety. The management system shall contain systematic procedures to identify and manage human and organisational factors affecting safety. [2019-03-15 ]

320. Human and organisational factors shall be handled together with technical matters, and their management shall be integrated in the functions and processes. [2019-03-15 ]

321. The personnel's individual competence shall be developed as regards the identification and management of human and organisational factors and potential errors. The licensee's organisation shall possess special expertise on human and organisational factors.

[2019-03-15 ]

### **3.4 Safety and quality policy**

322. The management system for a nuclear facility shall contain a policy level statement on safety and quality based on the licensee's business idea. [2013-11-15 ]

323. The policy shall put safety first in the licensee's operation and decision-making. The policy shall also present the general objectives relating to safety and quality as well as the commitment to the improvement of nuclear and radiation safety, good safety culture, high quality, and continuous improvement. [2013-11-15 ]

324. The organisation's safety and quality policy shall be communicated to the personnel so that it is understood and complied with. [2013-11-15 ]

325. The licensee's safety and quality policy shall be communicated to the suppliers affecting nuclear and radiation safety. [2019-03-15 ]

### **3.5 Graded approach in the management system**

326. The management system shall be developed and applied with consideration to the safety significance of the operation. The principles of observing risk-based decision-making and safety significance shall be described. [2019-03-15 ]

326a. The assessment of safety significance shall take into account, for example, the following:

- safety significance and complexity of the organisation and operation
- safety significance, exactingness, complexity, uniqueness and novelty of the product or function and the resulting lack of experience
- risks related to the plant or operation, including the probabilistic risk assessment (PRA).

[2019-03-15 ]

327. The quality of products and services shall be conformed with consideration to their safety significance. The higher their safety significance is, the more extensive and stricter the quality management procedures of products and services shall be. [2019-03-15 ]

### **3.6 Documentation of the management system**

328. The management system shall be documented. The documentation shall include a description of the management system and the organisational structure. Furthermore, the documentation shall include the organisational policies, authorities, and responsibilities, the requirements for individual competences and qualifications, the management and decision-making procedures, the processes and the related guidelines, and communication with the interest groups. The structure of the management system's documentation and the hierarchy of its parts shall be defined. The organisation shall document how the management system meets the regulatory requirements related to it. [2019-03-15 ]

329. Procedures for quality and safety management shall be described and documented in the management system. [2013-11-15 ]

330. The language used in the management system shall be readable and readily understandable to the personnel. [2013-11-15 ]

## 4 Leadership for safety

### 4.1 Licensee's responsibility

401. Responsibility for safety rests with the licensee, starting with the management. The licensee shall ensure that the activities complies with the procedures of the management system. [2019-03-15 ]

402. The licensee is obliged to ensure that the regulatory requirements and guides are complied with. This shall also be taken into account during the procurement of products and services having a bearing on the nuclear and radiation safety of the nuclear facility. It shall be ensured that organisations contributing to the plant delivery or plant modifications understand and comply with the delivery-related requirements. The licensee shall communicate the requirements to the product suppliers by contractual means (contract documents) and ensure and control the fulfilment of the requirements throughout the supply chain. [2019-03-15 ]

403. The licensee shall assess and ensure the suitability of its parent company's procedures before their application at the nuclear facility. [2013-11-15 ]

### 4.2 Responsibility of the management

404. The management is responsible for ensuring safe operation. Leadership and the management system shall create conditions and procedures for safe operations. The management shall ensure that the management system is established, implemented, assessed, and continuously improved. Furthermore, the management shall ensure that the activities comply with the procedures specified in the management system. [2019-03-15 ]

405. The nuclear facility's management shall designate an individual from the management with the responsibility and authority to

- co-ordinate the development and implementation of the management system
- attend to the regular assessment and continuous improvement of the management system
- report on the management system's functionality and development needs with an eye to safety and safety culture in particular
- resolve conflicts relating to the requirements and processes of the management system.

[2013-11-15 ]

406. The management shall demonstrate their commitment to safety. The justifications for

safety-related decisions shall be communicated clearly. The importance of safety-related procedures shall be communicated to the personnel. [2019-03-15 ]

#### **4.3 Responsible manager of the nuclear facility**

407. Under Section 7 k of the Nuclear Energy Act (990/1987), the licensee shall appoint a responsible manager and his or her deputy [ – – ] and further it is the responsible manager's task to ensure that the provisions, licence conditions and regulations issued by the Radiation and Nuclear Safety Authority (STUK) concerning the safe use of nuclear energy, the arrangements for security and emergencies, and nuclear safeguards are complied with. Requirements pertaining to the responsible manager are specified in Guide YVL A.4. [2019-03-15 ]

408. Under the Nuclear Energy Act (990/1987), a responsible manager shall have adequate authority as presupposed by his task. The nuclear facility's organisational structure and ways of working shall enable the responsible manager to attend to the duties defined in Section 7 k of the Nuclear Energy Act (990/1987). [2019-03-15 ]

409. Performance of work and the flow of information shall be organised to make the responsible manager continuously aware of all the essential factors affecting the safety of the facility and that they are handled as required by their safety significance. [2013-11-15 ]

410. The responsible manager's deputy shall also have up-to-date knowledge of the facility's operation and factors affecting safety. [2019-03-15 ]

#### **4.4 Planning and follow-up of activities**

411. The management shall establish strategies and plans as well as set goals for the organisation. These shall support the implementation of a safety and quality policy. The strategies, ways of working and goals shall be unambiguous and consistent, and they shall be communicated to the personnel. Clear plans of action and procedures as well as adequate resources shall be in place to achieve the goals. [2019-03-15 ]

411a. The management shall identify the safety-significant shareholders, define a strategy for working with them and take them into account in decision-making. [2019-03-15 ]

412. The management system shall include procedures for the planning and follow-up of activities. [2013-11-15 ]

413. The set goals shall be measurable and their achievement shall be followed. [2013-11-15 ]

## 5 Management of resources

### 5.1 Resources

501. The management shall ensure the availability of adequate resources for the planning, carrying out, assessment, and continuous improvement of activities. [2019-03-15 ]

502. The management system shall have in place procedures for competence management in the organisation. [2019-03-15 ]

503. The management system shall have in place procedures for the coordination and control of the human resources of the line organisation and projects. [2013-11-15 ]

504. Direct operational activities of a nuclear facility shall be taken care of within the licensee's organisation. [2019-03-15 ]

505. The management shall define which competences and resources shall be found inside the organisation and which ones can be outsourced. The organisation shall have adequate expertise and clear procedures for the definition and management of outsourced services as well as for the assessment of activities and outcomes. [2019-03-15 ]

506. The nuclear facility's organisation shall be able to function under all circumstances, including operational occurrences and simultaneous accidents at one or several plant units. Personnel resources shall be planned so that they are also sufficient during prolonged accidents. [2019-03-15 ]

507. The organisation's structure of the nuclear facility, tasks, the number of necessary personnel, qualification requirements, and recruitment shall be planned already during the facility's design stage. [2019-03-15 ]

508. The management system shall include procedures to ensure that the personnel have the adequate individual competence and qualifications necessary in the tasks specified for them and that the personnel understand the safety implications of their work. [2013-11-15 ]

509. The contract personnel working at the nuclear facility are subject to the same requirements as the personnel employed by the facility. [2013-11-15 ]

## **5.2 Working environment**

510. The infrastructure and working environment of the organisation shall be appropriate. The personnel shall have the necessary equipment available so that the work can be performed safely and the goals set for work can be achieved. [2019-03-15 ]

## 6 Procedures

### 6.1 Processes

601. The processes of the management system shall be defined, planned and implemented in a controlled manner. The development of each process shall ensure that the requirements, interfaces, interaction with other processes, and the risks relating to the activities have been identified and taken into consideration. The process flow and phases as well as the measurement and assessment procedures necessary for continuous improvement shall be specified and described. [2019-03-15 ]

602. The responsibilities and procedures for process implementation, evaluation, and development shall be specified process by process. [2013-11-15 ]

603. Written instructions shall be provided for the procedures and the activities. Human factors shall be taken into account as early as possible when defining and planning the processes and the activities contained in them. [2019-03-15 ]

604. For each process, the necessary inspection, testing, verification, and validation phases, the acceptance criteria for each phase, and the responsibilities for the performance of the activities shall be specified. It shall also be specified if these activities are to be performed by individuals other than those responsible for the process. [2019-03-15 ]

605. The work performances shall be planned. Work shall be carried out under controlled conditions using only the approved instructions and procedures as well as the appropriate equipment. Each individual shall be responsible for the quality of his or her work. The personnel shall be given adequate training and instructions prior to starting work. [2013-11-15 ]

606. The management system shall have established procedures for the control of outsourced processes and activities. [2013-11-15 ]

607. Process implementation and effectiveness shall be continuously followed and periodically assessed. The processes and guidelines shall be continuously improved. [2013-11-15 ]

608. The management system processes shall be specified so that they take into account all areas affecting radiation and nuclear safety. The mutual compatibility of the processes shall be ensured. [2019-03-15 ]

609. In defining and establishing the processes, the requirements specific to each stage of the nuclear facility shall be observed as regards, e.g., documentation, instructions, management of interfaces, transfer of responsibilities, research and analysis, and training. [2019-03-15 ]



610. The requirements and guidelines in the IAEA publications [6–15] shall be taken into account in defining and establishing processes for the different stages in the life cycle of the nuclear facility. [2013-11-15 ]

611. Removed. [2019-03-15 ]

## **6.2 Document management**

612. The documents shall be managed by systematic procedures. Document management shall cover documents needed in the operation of the facility and organisations, such as documentation for the nuclear facility as well as the documents for design, construction, commissioning, operation, decommissioning, nuclear waste management and final disposal of nuclear waste. In addition, procedures and requirements shall be defined for the documentation of activities and events and for storing and archiving the resulting documents. With regard to the documents pertaining to final disposal, additional attention shall be paid to maintaining the readability of the documents and their availability to different organisations even after a very long period of time. [2019-03-15 ]

613. The document management procedures shall be described. They include, among other things, the identification, preparation, drawing up, review, approval, implementation, revision, distribution, archival, and disposal of documents. The documents to be kept permanently or temporarily and their storage periods shall be defined. The materials and recording methods used shall meet the requirements for long-time storage and availability, if necessary. The document management system shall also take into account the information security requirements. [2019-03-15 ]

614. In drawing up, reviewing, and approving a document, the independence principle shall be applied. The drawing up, revision, review, and approval of a document shall be based on a defined authorisation. The management system shall guide the personnel towards the use of appropriate documents. [2013-11-15 ]

615. The documents to be updated and the updating procedures shall be specified, taking into account the documents' safety significance and regulatory requirements. [2019-03-15 ]

### **6.3 Ensuring the conformity of products**

616. The requirement specifications of products shall conform with the applicable regulations, guides, and standards. [2013-11-15 ]

617. Prior to a product's approval, realisation, or commissioning, its conformity shall be assured by the necessary inspection, testing, verification, and validation. The methods and tools used shall be suitable for their purpose. Approval of the product documentation shall be attached to a product approval document. [2019-03-15 ]

618. Products must be identifiable to ensure their correct use. Where traceability is a requirement, a control procedure to identify products shall be arranged and documented. [2013-11-15 ]

619. Products shall be handled, transported, stored, maintained, and used according to instructions in order to avoid their damaging, loss, deterioration, or inadvertent misuse. [2013-11-15 ]

### **6.4 Control of records**

620. The records generated during activities and the procedures pertaining to their management shall be defined. The records shall be specified, identifiable, readable, and easily traceable. [2013-11-15 ]

621. The retention times of records, associated test pieces, and testing materials shall be defined. The recording media, the manner of recording, and the storage conditions shall ensure readability for the duration of the retention period specified for each record. In specifying the retention period, the nuclear facility's life cycle and the long duration of nuclear waste management shall be considered. [2013-11-15 ]

### **6.5 Purchasing and control of the supply chain**

622. Systematic procedures shall be in place for the purchasing of the nuclear facility and its systems, structures, components, supplies, and services so as to ensure the conformity and validity of the purchased products and services. [2019-03-15 ]

623. Systematic procedures shall be in place for defining the requirements for purchased products and services. [2019-03-15 ]

624. Adequate quality requirements shall be established for products and services. Compliance with the quality requirements and achievement of the required quality level shall be ensured.

There shall be adequately qualified personnel to specify the quality requirements and to control the products and suppliers. [2019-03-15 ]

625. Systematic procedures shall be in place for resolving and reporting deviations from the purchasing requirements. [2013-11-15 ]

626. The requirements for the selection of suppliers and the selection procedures shall be defined. These shall include the requirements pertaining to the supplier's management system and its quality management. [2013-11-15 ]

627. Appropriate procedures shall be in place for supplier assessment and selection. Records shall be kept of the assessments. Prior to ordering, the supplier's ability to deliver the product or service and the related documentation in compliance with the requirements shall be evaluated. Where necessary, an assessment shall be used to ensure the supplier's capability to deliver a product or service compliant with the requirements prior to the starting work. [2019-03-15 ]

628. Documented information shall be kept of suppliers approved on the basis of assessment. The approval of suppliers of products or services important to safety shall be for a fixed duration only. The periods of validity shall be defined in the purchasing procedures. [2019-03-15 ]

(Translation corrected 2019-11-04)

629. Suppliers of safety-significant products and related services shall have in place a management system that is appropriate certified (for example, ISO 9001 or ISO 19443) or independently evaluated by an expert third party. Requirements for the management system of manufacturers of serially manufactured products are presented in the E series Guides. [2019-03-15 ]

629a. With regard to deliveries of products in safety class 1 and 2 and related services, the management system of the supplier shall comply with the management system requirements set forth in this guide and be compatible with the other standards used in the operation. The management system can be supplemented in the quality plan for justified reasons by applying the procedure presented in paragraph 630. [2019-03-15 ]

630. The quality plan (see the annex) shall present the quality management procedures used for ensuring that the quality management requirements specified in the YVL guides and those set by the licensee are realised in the purchasing process. The supplier selection procedures shall define when a supplier supplying safety-classified products or related services shall present a quality plan including the quality management procedures to complement its management system. [2019-03-15 ]

631. The experiences of the products and services shall be evaluated for possible further actions and the supplier shall be given feedback, where necessary. [2019-03-15 ] (Translation corrected 2019-11-04)

632. The purchasing procedures shall define the conditions for the supplier's use of subcontractors and for the communication and relaying of requirements within the supply chain. [2013-11-15 ]

633. The management system shall define procedures for the licensee to ensure that, when purchasing sets of equipment involving several fields of technology, the contractual relationships and responsibilities within the entire supply chain are unambiguously defined. [2013-11-15 ]

634. The licensee shall have in place procedures and competent personnel to assess, approve, control and guide suppliers of safety-significant products and services. The procedures shall cover the entire supply chain and lifetime stages of the product or service. The licensee shall also incorporate the oversight rights of authorities into the supervision procedures. [2019-03-15 ]

634a. The licensee shall define in supplier assessment and approval procedures when the supplier assessment is to be based also on proof obtained by auditing. [2019-03-15 ]

634b. The licensee shall ensure by follow-up audits in connection with delivery control that the operations of a safety-significant supplier comply with the requirements, that the supplier has capability to deliver a product and service complying with the requirements and that the supplier complies with the imposed quality management requirements. [2019-03-15 ] (Translation corrected 2019-11-04)

635. For all purchases, the documentation to be attached to a product and control during product manufacture shall be defined. [2019-03-15 ]

635a. The actions to assess, control and guide suppliers important for nuclear or radiation safety shall be planned. Competence essential for delivery shall be utilised in the planning. Supplier-specific measures concerning the supplier chain and the delivery shall be taken into account as a whole in the planning. These plans shall be documented, they shall be maintained based on experiences gained, and STUK shall be reserved the opportunity to examine them. [2019-03-15 ]

636. The purchasing procedures shall contain procedures for the purchasing of type-approved, serial products for safety-significant components. The procedures shall define the validation of

the suitability and conformity of the products as well as the documentation to be attached to the product. [2013-11-15 ]

637. Suppliers shall draw up a delivery-specific quality plan for the supply of safety-significant products and services. Through the use of a quality plan, it can be ensured that a product supplier has correctly understood the requirements of quality management applicable to the delivery and demonstrates that the supplier has in place procedures to fulfil the requirements. [2019-03-15 ]

638. A shared quality plan may be used for all products and services that have the same quality management requirements and the same implementing organisations guided by the quality plan. In case of minor differences between the quality management objectives of different products and services, the differences may be specified in a shared quality plan. [2019-03-15 ]

639. The contents of a quality plan for deliveries is described in an Annex to this Guide. Field of technology-specific YVL guides set forth detailed requirements for the contents of quality plans and their submission to the Radiation and Nuclear Safety Authority. The standard ISO 10005, for example, can be applied to the drawing up of a quality plan. [2013-11-15 ]

640. The management system shall include procedures to reliably prevent the purchasing and commissioning of suspect items. [2019-03-15 ] (Translation corrected 2019-10-02)

## **6.6 Communication**

641. The management system shall include procedures and means for communicating matters related to nuclear and radiation safety and quality, within the organisation and to interest groups. [2019-03-15 ]

641a. The organisation shall ensure that the employees are able to communicate work-related matters. [2019-03-15 ]

642. Communications shall be implemented in a systematic manner. Changed and unexpected situations shall also be taken into account in communications. [2019-03-15 ]

## **6.7 Managing organisational changes**

643. In developing the organisation's structure or ways of working, it shall be ensured that the changes implemented support the achievement of safety goals and that the implementation process is controlled. [2013-11-15 ]

644. Objectives shall be set for organisational changes. The safety implications and risks of the changes shall be assessed. The planning and implementation of changes shall be proportioned to the outcome of the assessment. The different phases of a change shall be documented. [2019-03-15 ]

645. Organisational changes that significantly affect the organisation's procedures shall also be subject to an independent evaluation. [2019-03-15 ]

646. The implementation of changes shall be planned and supervised. The management shall ensure adequate communication during the different phases of organisational change. The justifications for and method of implementing the changes shall be documented. [2013-11-15 ]

647. Safety-significant organisational changes shall also be evaluated after implementation. The evaluation verifies if the safety objectives set for the change are met. [2013-11-15 ]

## **6.8 Project management**

648. The management system shall have documented procedures for project leadership, management, and progress assessment. There shall be a set of instructions for drawing up the project plan as well as the risk management, resource, and quality plan for the project. [2013-11-15 ]

649. A project shall be set up for the construction of new nuclear facilities, operating licence renewals, periodic safety assessments and, if considered necessary, plant modifications or other modification projects. The projects shall be described in a project plan and complemented, where necessary, with a project-specific resource, risk-management, and quality plan. [2013-11-15 ]

650. The licensee shall submit the project plans for modification projects important to safety, the associated human resource and quality plans, and the safety and quality-related risk management plans, to STUK for information. [2019-03-15 ]

651. Project management shall comply with the applicable standards. [2013-11-15 ]

## **7 Assessment and improvement**

701. The characteristics of an developed management system are collecting information pertaining to the quality of activities and safety management, its active monitoring and analysis, regular self-assessment and independent assessment. It also requires continuous improvement of the management system and procedures based on these characteristics. [2019-03-15 ]

702. The licensee shall ensure the systematic and continuous monitoring of safety indicators in order to ensure maintaining the level of safety and improving it where necessary. [2013-11-15 ]

703. In timing self-assessments, independent assessments, and management reviews, the object of assessment and its impact on nuclear and radiation safety shall be taken into account. [2013-11-15 ]

704. The licensee shall regularly assess the realisation of the safety and quality policy as well as the functionality and adequacy of the procedures related to ensuring safety in order to manage nuclear and radiation safety. The number of assessments shall exceed the number of periodic safety assessments. [2013-11-15 ]

705. Assessments of the management system shall be planned as a whole, and the coordination of the methods employed as well as the utilisation of the assessment results shall be systematic. [2013-11-15 ]

706. The licensee shall follow domestic and international R&D pertaining to the management, development, and safety culture of organisations, in order to support the assessment and improvement. [2019-03-15 ]

707. The licensee shall conduct comparative assessment of operations in relation to organisations external to the company or group. Every now and then, a comparative assessment shall be applied in relation to equivalent foreign organisations as well. [2013-11-15 ]

### **7.1 Monitoring and measuring processes**

708. The effectiveness of the management system shall be monitored, measured and assessed to ensure the capability of the organisation to achieve the intended results and the identification of areas for improvement. [2019-03-15 ]

## **7.2 Self-assessment**

709. The management and all organisational levels shall carry out regular self-assessment of their own work performances against pre-defined criteria. Experts in the topic shall be utilised in self-assessment of safety culture and leadership. [2019-03-15 ]

710. The organisation shall have in place a procedure for measuring the personnel's awareness of the significance and importance of their duties and of how the individuals affect the achievement of safety and quality objectives. [2019-03-15 ]

711. The personnel shall be able to contribute to the assessment and improvement process and their feedback shall be collected and processed. [2013-11-15 ]

## **7.3 Internal auditing and independent assessment**

712. The management system shall include the requirements and procedures for regular, independent assessment of the system's conformity, performance, and effectiveness. Areas to be assessed in particular shall include the effectiveness of processes as regards the achievement of objectives and the realisation of the strategies and plans, the results of work performances and leadership, the organisation's safety culture, and the quality of products. [2019-03-15 ]

713. Internal audits may be conducted by a unit within the organisation with sufficient authority and independence for discharging its responsibilities. Individuals participating in independent assessments shall not assess work for which they are responsible and they shall have expertise related to the object of assessment. Procedures of standard ISO 19011 can be followed in auditing the management system. [2019-03-15 ]

714. Assessments conducted by independent external experts or appropriate certifications shall also be used to improve the effectiveness of the management system. [2019-03-15 ]

715. The licensee shall submit to STUK for information a summary of the periodic assessments and non-conformance management under subsection 7.2–7.5. [2019-03-15 ]



#### **7.4 Management review**

716. The management shall conduct a review of the management system at regular intervals in order to ensure the management system's applicability and effectiveness. The reviews shall include the objectives of the management system, including the safety and quality policy, that pertain to nuclear and radiation safety and quality as well as an assessment of opportunities for improvement and needs for change. As input data for the reviews, the following shall be used: the results of independent audits, process assessments, realisation of safety and quality objectives, status of corrective and preventive action, follow-up measures taken after previous management reviews, suggestions for improvement, and changes that could affect the management system. [2019-03-15 ]

#### **7.5 Non-conformances, corrective and preventive action**

717. The management system shall include procedures for the identification, processing, and handling of non-conforming processes and products. [2013-11-15 ]

718. The conformity of processes and products shall be monitored. The significance of any identified non-conformances shall be evaluated. Their causes shall be extensively studied and the necessary corrective and preventive action determined. The facility's structure, the procedures used, or the management system shall be improved, where necessary. The effectiveness of corrective actions and development projects for improving the operation shall be monitored and evaluated systematically. [2013-11-15 ]

719. Every employee shall be given the opportunity to report non-conformances and defects they observe in products, the performance of work, and the management system, to propose improvements, and obtain information about the handling of their propositions. The management shall promote an open atmosphere that facilitates the identification and handling of non-conformances and improvement needs. [2013-11-15 ]

720. There shall be instructions on the handling of non-conformances, shortcomings, and proposed improvements as well as on producing associated documented information. The individuals assessing non-conformances shall be independent of the matters under scrutiny. They shall have adequate individual competence and good knowledge of the matter assessed. [2019-03-15 ]

## 7.6 Improving

721. The organisation shall define, collect, and analyse appropriate information about its operation, including learning from successes. This procedure helps demonstrate the applicability and effectiveness of the management system and identify areas for improving effectiveness. [2019-03-15 ]

722. The results of assessments of the effectiveness, quality of performance, and safety management of the management system shall be reviewed and the necessary improvements implemented systematically and in the order of importance without an undue delay. The action plans shall include provision of the necessary resources. [2013-11-15 ]

723. The progress of improvements shall be monitored. Furthermore, their completion and effectiveness shall be verified. [2013-11-15 ]

## 8 Oversight by the Radiation and Nuclear Safety Authority

### 8.1 General

801. The prerequisites for the use of nuclear energy are presented in the Nuclear Energy Act (990/1987) and Nuclear Energy Decree (161/1988) [1, 2]. In its statements on the construction and operating licences, STUK will assess the acceptability of the licence applicant's management system. [2013-11-15 ]

802. STUK oversees the management systems of the licensee and the nuclear facility as well as their implementation and effectiveness by document review, by observing operation, and by inspecting the operation of the licensee and the other organisations subject to STUK's oversight. STUK will assess the management system's functionality and coverage also on the basis of the results of assessments required under 7.3, which the licensee is responsible for. STUK may also obtain information in connection with other activities, e.g., by observing the training arranged by the licensee. [2019-03-15 ]

### 8.2 Decision-in-principle

803. Under Section 24 of the Nuclear Energy Decree (161/1988), during the decision-in-principle stage, STUK may request for any reports it considers necessary. [2019-03-15 ]

804. Under Section 12 of the Nuclear Energy Act (990/1987), STUK will draw up, at the request of the Ministry of Employment and the Economy, a preliminary safety assessment based on the application for a decision-in-principle. In its safety assessment, STUK will present any observations indicating insufficient prerequisites for constructing a new nuclear facility in accordance with the safety regulations of the Nuclear Energy Act (990/1987). The assessment is based on STUK Regulations [3, 4] issued under Section 7 q of the Nuclear Energy Act (990/1987). In its safety assessment, STUK will also comment on the management system. [2019-03-15 ]

### **8.3 Construction licence**

805. Under Section 35 of the Nuclear Energy Decree (161/1988), the licence applicant shall submit a description of quality management during the construction of the nuclear facility, the content of which is described in more detail in Guide YVL A.1. [2019-03-15 ]

806. In its statement to the Ministry of Trade and Industry concerning the construction licence application, STUK will give its opinion on the conformity of the organisations of the licence applicant and the construction project, as well as on the project management system. [2013-11-15 ]

### **8.4 Construction and commissioning**

807. During the plant's construction and commissioning, STUK oversees the overall functionality of the licensee's management system and conducts, at its discretion, inspections focused on different fields of activity. STUK oversees the control, carried out by the licensee, of the suppliers' and their subcontractors' activities and the evaluation, also carried out by the licensee, of the functionality of their management systems. Inspection of system functionality is included in the periodic inspection programme during construction whose contents and schedule are determined by the construction and commissioning schedule of the facility. The functionality of the systems is also assessed during the review of documents submitted to STUK and during other regulatory work by STUK. [2013-11-15 ]

### **8.5 Operating licence**

808. Under Section 36 of the Nuclear Energy Decree (161/1988), when applying for an operating licence for a nuclear facility, the licence applicant shall submit a quality management programme for the operation of the nuclear facility. The requirements for its content are described in Guide YVL A.1. [2019-03-15 ]

809. Removed. [2019-03-15 ]

810. In its statement on the operating licence application to the Ministry of Employment and the Economy, STUK will give its opinion on the conformity of the licence applicant's management system. [2013-11-15 ]

## 8.6 Operation

811. During the operation of the nuclear facility, STUK will oversee the overall functionality of the management systems of the licensee and the organisation operating the facility and conduct, at its discretion, inspections focused on different fields of activity. Furthermore, STUK oversees the evaluation, carried out by the licensee and the organisation operating the nuclear facility, of the suppliers' and subcontractors' management systems and the control of operations. [2013-11-15 ]

812. Inspections of the management system are included in the periodic inspection programme. The inspections deal with, e.g., observations made by STUK during its previous inspections and reviews. [2013-11-15 ]

813. The functionality of the management system is also assessed during the review of documents submitted to STUK and during other regulatory work by STUK. [2013-11-15 ]

## 8.7 Decommissioning

814. During the plant's decommissioning, STUK will oversee the overall functionality of the licensee's management system and conduct, at its discretion, inspections focused on different fields of activity. Furthermore, the licensee and the organisation decommissioning the nuclear facility shall evaluate the management systems of suppliers and subcontractors and supervise their activities under STUK's oversight. Inspections of the functionality of the systems shall be included in the decommissioning inspection programme whose contents and schedule are determined by the decommissioning schedule of the facility. The functionality of the systems is also assessed during the review of documents submitted to STUK and during other regulatory work by STUK. [2019-03-15 ]

## 9 ANNEX Quality plan contents

A01. A quality plan complementing the management system and pertaining to a delivery shall specify, to the appropriate extent, the following information:

- responsibilities and obligations of the supplier as well as interfaces with other suppliers or organisations contributing to the delivery in question
- standards and guidelines to be complied with in the delivery
- supply organisation and assurance of sufficient resources and competence
- potential division or phasing of delivery
- initial data of the delivery and the resulting documents and records
- reviews relating to delivery and its division or phasing, including the content of the reviews, performing party, acceptance criteria, and the responsibilities and decision-making procedures to be followed
- procedures for subcontractor supervision
- procedures for the management of the technical configuration and modifications
- delivery-specific processes of the supplier's management system and their potential delivery-specific additions
- consideration of safety significance in accordance with subsection 3.5 of Guide YVL A.3
- ensuring a good safety culture in the delivery
- management of human and organisational factors in the delivery
- updating procedures for the quality plan.

[2019-03-15 ]

## 10 References

1. The Nuclear Energy Act (990/1987). [2013-11-15 ]
2. The Nuclear Energy Decree (161/1988). [2013-11-15 ]
3. Radiation and Nuclear Safety Authority Regulation on the Safety of a Nuclear Power Plant (STUK Y/1/2018). [2019-03-15 ]
4. Radiation and Nuclear Safety Authority Regulation on the Safety of Disposal of Nuclear Waste (STUK Y/4/2018). [2019-03-15 ]
5. SFS-EN ISO 9000:2015, Quality management systems. Fundamentals and vocabulary, 2015. [2019-03-15 ]
6. IAEA Safety Requirements, No. GSR Part 2, Leadership and Management for Safety, June 2016. [2019-03-15 ]
7. IAEA Safety Requirements, No. GSR Part 7, Preparedness and Response for a Nuclear or Radiological Emergency, November, 2015. [2019-03-15 ]
8. IAEA Safety of Nuclear Power Plants: Design. No. SSR-2/1, March 2016. [2019-03-15 ]
9. IAEA Safety of Nuclear Power Plants, Commissioning and Operation, SSR-2/2, February 2016. [2019-03-15 ]
10. IAEA Safety Requirements, No. NS-R-3, Site Evaluation for Nuclear Installations, February 2016. [2019-03-15 ]
11. IAEA Safety Requirements, No. SSR-3, Safety of Research Reactors, November 2016. [2019-03-15 ]
12. IAEA Safety Requirements, No. SSR-5, Disposal of Radioactive Waste for protecting people and the environment, April 2011. [2019-03-15 ]
13. IAEA Safety Requirements, No. GSR Part 6, Decommissioning of Facilities, July 2014. [2019-03-15 ]
14. IAEA Safety Requirements, No. GSR Part 5, Predisposal Management of Radioactive Waste General Safety Requirements, May 2009. [2013-11-15 ]
15. IAEA Specific Safety Requirements, No. SSR-5 Disposal of Radioactive Waste, May 2011. [2019-03-15 ]
16. ISO-IEC-EN 17021:2015, Conformity assessment. Requirements for bodies providing audit and certification of management systems, 2015. [2019-03-15 ]

17. ISO 19011:2011, Guidelines for auditing management systems, 2011. [2013-11-15 ]



# Definitions

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## **Subcontractor**

Subcontractor shall refer to a supplier that is not in a direct contractual relationship with the licensee or licence applicant.

## **Auditing**

Auditing shall refer to a systematic, independent and documented process to objectively evaluate the audit evidence obtained to determine the extent to which the agreed auditing criteria are met. (SFS-EN ISO 9000:2015)

## **Appropriate certification**

Appropriate certification shall refer to the certification of a quality system based on auditing in which the accreditation of the certification body has been done against the requirements of standard EN ISO/IEC 17021 and the accreditation is covered by the Multilateral Agreements (MLA) or Mutual Recognition Arrangements (MRA) entered into by FINAS.

## **Leadership**

"Leadership" shall refer to a manager using their skills and capabilities to direct the operation of employees and groups and have an impact on their commitment, values and behaviour.

"Management" shall refer to authorised actions to guide the organisation and ensure work performance.

## **Management system**

Management system shall refer to a system that is used to establish policy and objectives and to achieve those objectives.

## **Independent assessment of the management system**

Independent assessment of a management system shall refer to an assessment performed by an internal or external party independent of the management, implementation and development of the item assessed. In general, independence can be demonstrated by indicating that the assessor is not responsible for the function being assessed.

## **Management**

Management shall also refer to a person or group orienting and guiding the organisation. Management includes top and middle management.

### **Qualification**

Qualification is normally used as a synonym for “validation” in YVL-guides. Qualification shall refer to confirmation, through the provision of objective evidence, that the requirements for a specific intended use or application have been fulfilled.

### **Validation**

Validation shall refer to confirmation, through the provision of objective evidence, that the requirements for a specific intended use or application have been fulfilled.

### **Third party**

Third party shall refer to an individual or organisation that is independent of the individuals or organisations responsible for the design, manufacturing, supply, installation, procurement, ownership, operation or servicing of the item analysed.

### **Quality management system**

Quality management system shall refer to a management system to direct and control an organisation with regard to quality. (SFS-EN ISO 9000:2015).

### **Competence**

Competence shall refer to a person’s knowledge and skills, suitability for his or her position, attitude towards and understanding of the safety significance of his or her work, and an ability to apply such competence to duties of safety significance.

### **Project**

Project shall refer to a unique process consisting of a set of coordinated and controlled activities with start and finish dates, undertaken to achieve an objective conforming to specific requirements, including the constraints of time, cost and resources. (SFS-EN ISO 9000:2015)  
Projects include for example construction projects of new nuclear facilities or plant modification projects launched to implement extensive modifications.

### **Process**

Process is a set of interrelated or interacting activities which transforms inputs into outputs.

### **Qualification (personnel)**

Qualification shall refer to a demonstrated ability to apply knowledge and skills.(SFS-EN ISO 9000:2015)

### **Supplier**

Supplier shall refer to an organisation or person manufacturing or providing a product or service. (SFS-EN ISO 9000:2015)

## **Product**

Product shall refer to a result of a process. Examples of products include a nuclear facility, plant modification, system delivery, single component or part thereof, plan or design, processed material, or information product. A service is not a product.