

ORGANISATION AND PERSONNEL OF A NUCLEAR FACILITY

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With regard to new nuclear facilities, this Guide shall apply as of 1 August 2014 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.4, 15 November 2013.

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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.*

1 Introduction

101. A sound safety culture is characterised by a full commitment by the management and personnel to compliance with the management system and continuous improvement of performance throughout the life cycle of the nuclear facility. A key prerequisite for the safe use of nuclear energy is that the personnel are aware of the administrative and technical requirements pertaining to nuclear and radiation safety relevant to their duties and have adequate professional competence.

102. Regulations concerning the personnel and availability of the expertise required for the use of nuclear energy are laid down in the Nuclear Energy Act and Decree. Additional requirements pertaining to expertise and the personnel are laid down in the Government Decrees related to the use of nuclear energy [1–6].

Under Section 7 i of the Nuclear Energy Act (990/1987), *the holder of the licence granting the right to use nuclear energy (licensee) shall have a sufficient number of qualified personnel suitable for the related tasks.*

According to Section 19 of the Nuclear Energy Act, one necessary prerequisite for granting a licence for the construction of a nuclear facility is that *the applicant has the necessary expertise available.* Section 20 of the Nuclear Energy Act sets out the general preconditions for granting an operating licence and requires that *the applicant has sufficient expertise available and, in particular, the competence of the operating staff and the operating organisation of the nuclear facility are appropriate.*

103. According to Section 55 of the Nuclear Energy Act, *the Radiation and Nuclear Safety Authority (STUK) shall, in particular, [– –] set qualification requirements for persons involved in the use of nuclear energy and control that the requirements are met.* According to Section 119 of the Nuclear Energy Decree, *the Radiation and Nuclear Safety Authority (STUK) sees to it that the organisation available to the licensee is adequate and serves its purpose, that the persons*

participating in the use of nuclear energy meet the qualification requirements set, and that proper training has been arranged for them.

104. According to Section 30 of the Government Decree on the Safety of Nuclear Power Plants (717/2013), *significant functions with respect to safety shall be designated. Training programmes shall be prepared for the development and maintenance of the professional qualifications of the persons working in such positions, and an adequate command of the functions in question must be verified.*

The licensee shall employ adequate and competent personnel for ensuring the safety of the nuclear power plant. The licensee shall have access to the professional expertise and technical knowledge required for the safe construction and operation of the plant, the maintenance of equipment important to safety, and the management of accidents.

Equivalent requirements are also set out in Section 21 of the Government Decree (736/2008) on the safety of disposal of nuclear waste. Additionally, it is required in the Decree that *the organisation shall have access to the professional expertise and technical knowledge required for the safe operation of a nuclear waste facility and long-term safety of nuclear waste disposal.*

105. According to Section 28 of Government Decree 717/2013, *when designing, constructing, operating, and decommissioning a nuclear power plant, a good safety culture shall be maintained. Nuclear 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.*

Equivalent requirements are also set out in Section 19 of the Government Decree (736/2008) on the safety of disposal of nuclear waste.

106. The qualification requirements for the responsible manager of a nuclear facility and his or her deputy and the qualification procedure are set out in Section 7 k of the Nuclear Energy Act and Sections 122 and 125 of the Nuclear Energy Decree (161/1988). According to Section 7 i of the Nuclear Energy Act, *only a person approved by the Radiation and Nuclear Safety Authority (STUK) for the position in question may act as a nuclear facility operator in the control room of the facility.* According to the same Section, *the licensee shall appoint persons responsible for ensuring emergency arrangements, nuclear security, and nuclear safeguards at the nuclear facility. Only persons specifically approved for each position by the Radiation and Nuclear Safety Authority can be appointed as persons responsible and their deputies.*

The licensee shall ensure that the persons referred to above occupy the positions required for the task, while possessing adequate authority and the genuine prerequisites for bearing the responsibility vested in them.

Requirements regarding the security organisation are set out in Section 7l of the Nuclear Energy Act.

According to Section 122 of the Nuclear Energy Decree, *the duties, powers and responsibilities of the responsible manager of a nuclear facility, his deputy, and the rest of the personnel needed for the operation of the nuclear facility shall be determined in the administrative rules accepted by the Radiation and Nuclear Safety Authority (STUK).*

107. According to Section 113 of the Nuclear Energy Decree, *non-destructive testing of a nuclear facility's structures and components relevant to nuclear safety may only be carried out by a testing organisation approved by the Radiation and Nuclear Safety Authority (STUK).*

108. According to Section 18 of the Radiation Act (592/1991), *an application for a safety licence shall be supplemented with a description of the radiation user's organization (an organization description), specifying the name of the radiation safety officer responsible for safety in the use of radiation.*

Having regard to the nature and scope of use of the radiation and to conditions at the place of use, the organization description shall also provide sufficient information concerning:

1. *the competence of the persons participating in the use of radiation,*
2. *the duties and division of responsibility pertinent to the safe use of radiation,*
3. *other arrangements to ensure safety at the place of use of radiation.*

STUK shall stipulate the qualifications required of a radiation safety officer and of other persons working in the user's organization, and shall investigate compliance with the said stipulations. [7] More detailed provisions concerning the radiation operating organisation and the competence of and radiation protection training for the personnel employed by such an organisation are set out in STUK Guides ST 1.4 [8] and ST 1.8 [9].

109. The International Atomic Energy Agency IAEA has published a number of documents addressing organisational issues and guides discussing personnel and qualifications [10–16], which STUK recommends to be used to support development efforts.

2 Scope of application

201. The present Guide sets forth the requirements applicable to the organisation, personnel, competence, and people management necessary for the use of nuclear energy. Additionally, the Guide defines the competence requirements and qualification procedures for positions that require specific approval by STUK. Furthermore, the present Guide also describes the regulatory oversight related to the organisation and human resource management of a nuclear facility.

202. This Guide applies to the licensee's personnel and, where applicable, to suppliers.

203. This Guide applies to all nuclear facilities, except where specifically indicated that the requirements only apply to nuclear power plants.

204. This Guide applies to all the stages in the lifecycle of a nuclear facility, and the requirements

are applicable to both the licensee and the licence applicant, as appropriate. In the case of a licence applicant, STUK may, upon request, provide the exact date as of which the requirements shall apply.

205. Requirements pertaining to organisational changes and changes to the ways of working are set out, for example, in Guides YVL A.3, A.5, and B.1.

206. Competence requirements and qualification issues are also addressed in other relevant YVL guides, such as YVL A.3, YVL A.5, YVL A.10, YVL A.11, YVL B.1, YVL B.5, YVL C.5, YVL D.1 YVL E.1, YVL E.4, and YVL E.5.

3 Organisation and competence management that promote safe operation

3.1 Competences and organisational structure

301. The licensee shall define and document the competences necessary for the safe use of nuclear energy. Guide YVL A.3 sets out general requirements for the licensee's competences and organisation.

302. The licensee shall employ a sufficient number of competent personnel for ensuring the safety of the facility and for taking care of the security arrangements and emergency arrangements. To accomplish this, the personnel shall, among other things, be familiar with the design bases and safety requirements of the facility and be able to ensure the conformity of the nuclear facility concerned.

303. The licensee shall demonstrate that the organisation of the nuclear facility will ensure the safe, reliable and appropriate operation of the facility under all conditions, including emergencies and disturbances that may affect several facilities for a prolonged period of time. The structure and ways of working of the organisation shall contribute to the management of human errors.

More detailed requirements concerning the operating organisation are set out in Guide YVL A.6.

304. The organisational structure, duties, powers, and responsibilities of the personnel as well as the procedures related to decision making shall be documented in an organisation manual, which is to be submitted to STUK for information. For the operation stage, the administrative rules shall be prepared [2]. The organisation manual and administrative rules shall be kept up-to-date at all times.

305. The licensee shall define the requirements for any tasks and work important to safety carried out by suppliers at the nuclear facility, as well as supervise and approve such tasks and work.

306. The licensee shall provide its in-house personnel and the supplier's personnel with the necessary training before any work is carried out at the nuclear facility. Among other things, the training shall provide all the necessary information on the nuclear facility's operating environment and on any special requirements for the performance of work due to the environment. Verifiable methods shall be used to confirm that the content of the training is understood by the participants.

307. The personnel of a nuclear facility shall have the necessary basic knowledge of nuclear, radiation, fire, and chemical safety; security arrangements and emergency arrangements at the facility; and occupational safety. This shall also apply to individuals working at the construction sites of nuclear facilities under construction and the personnel of suppliers whose performance affects nuclear and radiation safety.

3.2 Human resources planning and resource requirements

308. The licensee shall have in place a long-term plan for ensuring sufficient personnel resources and competences for functions important to safety. Alternates shall be assigned and successor plans prepared for individuals involved in key functions at the nuclear facility, in particular for those in expert and managerial positions.

309. The licensee shall file timely applications with STUK for the approval of persons appointed for positions that require a specific approval and for their deputies (annexes A–E) [Sections 7 i and 7 k of the Nuclear Energy Act, Section 18 of the Radiation Act].

310. The licensee shall, at regular intervals, assess the work performance of the individuals holding positions that require a specific approval and evaluate the need to develop their competence and duties.

311. The licensee shall, on a regular basis, evaluate and ensure the sufficiency of the personnel necessary for the safe operation of the nuclear facility as well as their competence and suitability for duties important to safety and document such evaluations.

312. The licensee shall have systematic procedures in place for ensuring that the personnel have the necessary mental and physical preconditions for performing their duties. The licensee shall in medical examinations ensure that the personnel trained for positions important to safety are suitable for their appointed duties and the related responsibilities. Medical examinations shall be repeated at regular intervals.

313. If any material changes are made to the number of personnel, the risks associated with such changes shall be assessed. Any such changes shall be justified and carefully planned in advance, and the potential safety implications of the change shall be evaluated. Once a change has been implemented, the correctness of the assessments shall be verified. The general requirements for organisational changes are set out in Guide YVL A.3.

314. The licensee shall have a systematic and documented recruitment procedure in place to ensure that the persons being recruited are competent and suitable for the duties and that the qualification requirements are met. The time needed for the induction of new employees shall be taken into account in recruitment.

3.3 Competence development

315. The licensee shall define and document the general principles for competence development.

316. The licensee shall have a systematic and documented competence development process in place, which takes into account the understanding of the safety significance of the issues concerned, the overriding priority of safety, and the knowledge obtained from operating experience and self-assessments. Competence development is applicable to the entire personnel necessary for the use of nuclear energy.

317. The competence development process shall generate development plans and measures. The competence development plan shall be regularly updated, and it shall give due consideration to the different stages in the lifecycle of the nuclear facility and the general progress in the industry.

318. The competence development process shall proceed systematically from the definition of the competences required for the successful performance of the work duties to the preparation and implementation of development plans. Implementation includes the preparation of training materials, follow-up on the development measures, and assessment of performance.

319. The licensee shall ensure that knowledge and competence are duly shared; the atmosphere prevailing in the organisation shall promote such sharing and effective procedures are in place to support sharing.

320. The licensee shall make active use of the various means to develop the competences of the personnel and the organisation.

3.4 Competence development programmes and competence assessment

Competence development programmes

321. The competence development programmes of a nuclear facility shall comprise basic, continuing, and refresher training based on the principle of continuous improvement of competences. The development programmes shall ensure that the necessary competences are attained and main-

tained in respect of all functions and duties important to safety.

322. Function-specific training programmes shall be prepared for all individuals involved in functions important to safety. The programmes shall comprise the basic and refresher training required for the functions.

323. The competence development programmes and training shall ensure that the personnel are aware of the safety significance of the functions they perform. The training shall emphasise the overriding priority of safety and the importance of meeting the safety requirements.

324. The licensee shall prepare an induction programme for the nuclear facility recruits to help them become familiar with their duties and working environment in a systematic and controlled manner. The induction programme shall also cover the responsibilities and obligations of the personnel as well as safe work practices and emergency response. The necessary induction training programme shall also be prepared for those who are transferring to new duties within the nuclear facility.

325. The personnel shall be trained for emergency situations. More detailed requirements for emergency response are set out in Guide YVL C.5.

Function-specific training requirements

326. The maintenance and technical support personnel, including suppliers, shall be provided with practical training that prepares them for the performance of tasks and duties important to nuclear and radiation safety.

327. Advanced training in operating experience feedback shall be provided to the experts in operating experience feedback, and basic training shall be provided to all personnel serving in functions important to safety. Operating experience feedback is addressed in Guide YVL A.10.

328. Operating personnel and, where applicable, the technical support personnel present at the facility shall be trained on a regular basis and given hands-on instruction in the use of the

emergency operating procedures and the abnormal operating procedures, and the procedures for severe accident management. At a nuclear power plant, this shall be provided by means of a full-scale replica training simulator.

329. To prepare for the management of severe accidents, the operating personnel shall practise the transition from the emergency operating procedures and the abnormal operating procedures to those dealing with severe accident management.

330. The measures specified in the abnormal operating and severe accident management instructions necessary for restoring the critical safety functions shall be practised at regular intervals.

Competence assessment and verification of qualifications

331. The licensee shall define and document the competences required of the personnel necessary for the safe use of nuclear energy. The licensee shall have documented procedures in place for the assessment and verification of competences.

332. The licensee shall define the functions for which a demonstration of competence is required at predefined intervals.

The qualifications, competence, competence development, and performance of duties shall be assessed systematically whenever a person is appointed to a new position or transfers to another position as well as at regular intervals specified in the management system of the licensee.

333. When a person approved for a specific position advances to another position for which specific approval is also required, or if a person is absent from his or her position for a prolonged period of time, his or her competence and suitability for the position shall be reassessed.

334. Functions important to safety may only be performed by qualified persons with sufficient knowledge and skills and the proper attitude towards safety. The licensee shall ensure that all those involved in safety related functions, including suppliers, have sufficient competence and qualifications.

335. Operators of a nuclear facility who control and monitor the operation of the facility shall have an approval granted by STUK valid for a pre-determined period of time. The licensee shall apply documented criteria as the basis of approval when assessing a person's competence and suitability as an operator. Specific requirements for the approval process of nuclear power plant control room operators are presented in annex E of this Guide. STUK can provide separate instructions for other nuclear facilities, if necessary.

336. The licensee shall regularly assess the impact of competence development measures on the safety of the facility and the performance of the organisation as well as how the competence development targets are met.

3.5 Competence development resources

337. The licensee is responsible for ensuring that the personnel of the nuclear facility have adequate competence and qualifications; the licensee shall also define and ensure the availability of the necessary resources for competence development and training.

338. The training personnel at the nuclear facility shall have sufficient expertise in the subject matter being taught. The training personnel shall also have expertise in assessing performance and development. Training should draw upon pedagogical skills.

339. The licensee shall ensure that the training acquired from outside the in-house organisation satisfies the training requirements and needs defined by the organisation.

340. The facilities used for training shall be adequate to support the learning process and be appropriate in view of the subject matter being taught. Training materials and equipment shall be adequate and up-to-date in view of the subject matter. The language skills of the participants shall be taken into account in the training.

341. The licensee shall have up-to-date registers for managing information related to the training of personnel and for recording information

as to whether the individuals performing duties important to safety meet the competence and qualification requirements.

342. A full-scale replica training simulator covering normal operation, anticipated operational occurrences, and design basis accidents including, where possible, design extension conditions and severe accidents, shall be available for the training of control room operators. The simulator training shall cover design extension conditions and severe accidents to the extent this is practicable. Probabilistic Risk Assessment (PRA) shall be used in planning the training. The PRA is discussed in Guide YVL A.7.

343. The licensee of a nuclear power plant shall demonstrate the adequacy of the training simulator for its intended purpose by means of a description of its technical implementation, a testing programme, and its result report. Industry standards shall be taken into account when preparing the documents.

344. A training simulator modelling a new nuclear power plant shall be made available for training no later than one year prior to the loading of fuel into the reactor so as to allow a sufficient simulator training period for the prospective operators.

345. The replica accuracy of the training simulator of the nuclear power plant and any deviations from the actual plant shall be monitored by means of systematic procedures and regular assessments. In the event of more extensive changes to the training simulator, the adequacy of the simulator for its intended purpose shall be demonstrated by means of a testing programme.

346. Once the description, testing programme and result report of the full-scale replica training simulator are completed, they shall be submitted to STUK for information. This shall be carried out before the simulator is put into use for actual training.

3.6 Leadership and management skills

347. The licensee's management shall possess adequate expertise in the technical and admin-

istrative safety requirements pertaining to the nuclear facility. The licensee's management shall demonstrate their commitment to safety as an overriding priority.

348. Nuclear facility managers involved in functions important to safety shall have at least three years' experience in the nuclear sector and be familiar with the relevant regulations.

349. Nuclear facility managers involved in functions important to safety shall possess relevant competences in management and leadership, the technology used in nuclear facilities, the control of nuclear and radiation safety risks, and the functioning of individuals and the organisation.

350. Managers and supervisors shall possess administrative and people management competence, management and leadership skills as well as communication and interpersonal skills. They shall have the skills to manage and support their subordinates, develop their skills, and solve problems and conflicts. Supervisors shall be familiar with the requirements and special characteristics of their subordinates' work.

351. Managers and supervisors shall, through their own actions, promote the safe way of working and reinforce good practices. Managers shall develop the values and behavioural expectations of the organisation while setting an example themselves in order to promote these values and encourage the expected behaviour. The general requirements regarding the safety culture are set out in Guide YVL A.3.

352. Managers and supervisors shall be able to recognise any deterioration in safety performance or related attitudes and take immediate steps to respond to the situation.

353. Managers and supervisors shall ensure that the working conditions and arrangements promote the safety culture, the employees' motivation, and competence. Managers and supervisors shall see to it that the performance management and related incentives encourage safe ways of working.

354. Managers and supervisors shall define the maximum permissible working hours for functions critical to safety and see to it that they are complied with. Managers and supervisors shall monitor the working ability of the personnel and note any changes in such ability.

355. Managers and supervisors shall promote and exercise effective communications at all levels. Any piece of information with a bearing on attainment of safety, health, environment, corporate security, quality, or financial objectives shall be communicated to the personnel of the licensee's organisation and other relevant stakeholders. The management shall be responsive to the feedback received from the personnel. Any such feedback shall be duly processed and answered.

356. The performance of managers and supervisors and their professional development in their positions shall be assessed on a regular basis. Development programmes addressing the managers' individual development needs shall be planned and implemented.

3.7 Special requirements related to the different stages of a nuclear facility's lifecycle

Decision-in-principle

357. According to Guide YVL A.1, the applicant for a decision-in-principle shall draw up a preliminary personnel plan for the design, construction, commissioning and operation stages of a nuclear facility. The preliminary personnel plan shall describe the competences and personnel resources by competence area, as well as how the licence applicant intends to acquire these resources. These plans shall contain general plans for the organisations and expertise needed for implementing the facility options.

Construction licence

358. According to the Nuclear Energy Decree, the licence applicant shall – in the application for a construction licence filed with the Ministry of Employment and the Economy – provide an outline of the operating organisation foreseen for the nuclear facility, a description of the expertise available to the applicant, and the organisation

implementing the construction project. In connection with the application for the construction licence, the licence applicant shall submit to STUK an updated personnel plan formed as stated in requirement 357.

359. According to Sections 7 i and 7 k of the Nuclear Energy Act, when applying for a construction licence, the licence applicant shall apply for STUK's approval for a responsible manager and his or her deputy as well as persons responsible for security arrangements, emergency arrangements and nuclear safeguards of the nuclear facility for the construction stage.

360. According to Guide YVL A.1, the licence applicant shall submit a preliminary description of the ageing management principles to be applied at the nuclear facility. These principles shall include an outline of how the availability of knowledge related to ageing management at the nuclear facility and the expertise of in-house personnel are ensured at all life cycle stages. Ageing management at a nuclear facility is addressed in Guide YVL A.8.

Design, construction and commissioning stages

361. The licensee shall identify the positions and functions important to safety for which the various parties are responsible and define the competence and qualification requirements applicable to the positions and functions. The licensee shall have a procedure in place for monitoring the competences, qualifications, and training records of the individuals involved in functions important to safety during the project.

362. The operating organisation personnel shall be recruited and trained in their duties on a timely basis prior to the commissioning of the nuclear facility. A nuclear power plant shall have a sufficient number of approved operators available before any nuclear fuel is loaded into the reactor.

363. During the design, construction and commissioning stages, the licensee's organisation shall have, in particular, expertise in project management, quality management, oversight and procurement as well as the capability of operating

in a multicultural operating environment. The construction stage is addressed in Guide YVL A.5.

364. The responsibilities and sufficient personnel resources shall be defined for the commissioning stage, and the number and competences of the individuals involved in the commissioning stage shall be verified.

365. The licensee shall demonstrate by means of analyses that the shift team is sufficient for simultaneously performing the duties required by the instructions for anticipated operational occurrences and accidents. The most demanding situations shall be practised at the facility. Commissioning is addressed in Guide YVL A.5.

Operation

366. According to the Nuclear Energy Act, the licensee shall designate a responsible manager and his or her deputy for the operation of the nuclear facility. According to the Nuclear Energy Decree, the licence applicant shall, when applying for the operating licence, submit the nuclear facility's administrative rules to STUK for approval.

367. When applying for a renewal of its operating licence or carrying out a periodic safety review, the licensee shall verify, as required under YVL A.1, that the organisational and people management safety factors presented in the relevant IAEA Guide SSG-25 Periodic Safety Review of Nuclear Power Plants [17] have been taken into account to a sufficient degree in the safety review and other licence application documents.

368. When applying for the operating licence, the licensee shall present a plan containing an itemised list of the required expertise and number of personnel.

Decommissioning

369. Steps shall be taken to ensure that sufficient expertise in project management, radiation protection, nuclear safety, nuclear safeguards, nuclear waste management, corporate security, and quality management is available for the duties to be performed at the decommissioning stage of a nuclear facility. Decommissioning is addressed in Guide YVL D.4.

4 Regulatory oversight by the Radiation and Nuclear Safety Authority

401. The prerequisites for the use of nuclear energy are presented in the Nuclear Energy Act and Nuclear Energy Decree. STUK will state its opinion on the licence applicant's organisation, the adequacy of the applicant's expertise, and the qualifications of the applicant's personnel in its statements concerning the decision-in-principle and construction and operating licence.

402. STUK oversees the fulfilment of the requirements pertaining to the licensee's organisation, management and leadership, and competence management by reviewing documents and performing inspections. STUK sets qualification requirements for the individuals involved in the use of nuclear facilities and controls that the requirements are met.

403. STUK evaluates and approves, in response to an application filed by the licensee, the persons for whom a specific approval is required.

404. STUK oversees the training activities by means of separate inspections and by follow-up visits to training events.

Decision-in-principle stage

405. STUK reviews the outline of the organisation and competencies submitted by the licence applicant. Additionally, STUK reviews the general plans for the organisations responsible for facility option implementation and their expertise provided by the licence applicant. STUK will state its opinion on the conformity of the organisation and personnel when issuing a statement on the application for a decision-in-principle to the Ministry of Employment and the Economy.

Construction licence stage and its oversight

406. STUK reviews the outline of the operating organisation foreseen for the nuclear facility, the description of the expertise available to the applicant, and the construction organisation submitted by the licence applicant to the Ministry of

Employment and the Economy. STUK will state its opinion on the conformity of the organisation and personnel when issuing a statement on the application for the construction licence to the Ministry of Employment and the Economy.

407. STUK evaluates and approves, in response to an application filed by the licensee, the responsible manager for the construction stage of the nuclear facility and his or her deputy as well as other individuals serving in positions that require specific approval.

Construction stage, commissioning, and oversight

408. During construction and commissioning, STUK oversees that the requirements pertaining to the operation, management, leadership and competences of the licensee's organisation and the construction project organisation are met. Additionally, STUK performs inspections in accordance with in the Construction Inspection Programme.

409. STUK evaluates and approves the nuclear power plant control room operators proposed by the licensee before any nuclear fuel is loaded into the reactor.

410. STUK reviews the description, testing programme, and result report of the full-scale replica training simulator submitted by the licence applicant to STUK for information.

Oversight during the operating licence stage

411. STUK reviews the description of the expertise available to the applicant and the operating organisation of the nuclear facility provided by the licence applicant as part of the application for an operating licence. Additionally, STUK reviews the safety assessment report, which includes a description of the operating organisation, competence requirements for the personnel, and the procedures related to competence management. STUK will state its opinion on the conformity of the organisation, personnel, and the associated documentation and issue a statement to the Ministry of Employment and the Economy on the application for an operating licence.

412. Before any nuclear fuel is loaded into the reactor at a nuclear power plant and before any other nuclear facility is commissioned, STUK verifies that the organisation and personnel satisfy the preconditions set out in Section 20 of the Nuclear Energy Act.

Operation and its oversight

413. During the operation of a nuclear facility, STUK oversees that the requirements pertaining to the adequacy and operation of the licensee's organisation, its management and leadership, and the competences of the personnel are met in accordance with its periodic inspection programme.

Renewal of the operating licence and periodic safety review

414. As part of the renewal of the operating licence and/or periodic safety review, STUK reviews the description of the expertise available to the applicant and the operating organisation of the nuclear facility provided by the licence applicant, along with the safety assessment report that provides an outline of the operating organisation, competence requirements for the personnel and the procedures related to competence management.

415. With regard to the renewal of the operating licence, STUK will state its opinion on the conformity of the organisation, personnel, and the associated documentation when issuing a statement to the Ministry of Employment and the Economy.

Decommissioning and its oversight

416. During the decommissioning of a nuclear facility, STUK oversees that the requirements pertaining to the adequacy and operation of the licensee's organisation, its management and leadership, and the competences of the personnel are met in accordance with its periodic inspection programme for decommissioning.

Definitions

Operating organisation

Operating organisation shall refer to an organisation and personnel required for the safe operation of a nuclear facility.

Licensee's personnel

Licensee's personnel shall refer to the personnel necessary for the use of nuclear energy who are employed by the licensee.

Organisational competence

Organisational competence shall refer to the performance level of an organisation and related factors (such as structures, resources, processes, networks).

Competence management

Competence management shall refer to set of actions designed to ensure the acquisition, development, and maintenance of knowledge and skills, including systematic assessment, development, and utilisation of these actions in the management of an organisation.

Competence development

Competence development shall refer to a set of planned, target-oriented and structured actions designed to maintain and develop individual and organisational competences, and to assess the effectiveness of competence development measures.

Qualification (personnel)

Qualification shall refer to a demonstrated ability to apply knowledge and skills.

Construction project organisation

Construction project organisation shall refer to the organisation required to construct a nuclear facility meeting the requirements set.

Supplier

Supplier shall refer to an organisation or person manufacturing or providing a product.

Function critical to safety

Function critical to safety shall refer to a work stage or task with a bearing on nuclear safety or radiation safety and, owing to its nature, calls for special competence and personal characteristics, such as an ability to concentrate, accuracy and stress tolerance.

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.

References

1. Nuclear Energy Act (990/1987).
2. Nuclear Energy Decree (161/1988).
3. Government Decree on the Safety of Nuclear Power Plants (717/2013).
4. Government Decree on the Security in the Use of Nuclear Energy (734/2008).
5. Government Decree on Emergency Arrangements at Nuclear Power Plants (716/2013).
6. Government Decree on the Safety of Disposal of Nuclear Waste (736/2008).
7. Radiation Act (592/1991).
8. Guide ST 1.4 Radiation user organisation.
9. Guide ST 1.8 Qualifications and radiation protection training of personnel within a radiation user organisation.
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Annex A Responsible manager and his or her deputy

Position

A01. According to Section 7 k of the Nuclear Energy Act, *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 the nuclear safeguards are complied with.*

The licensee shall ensure that the responsible manager occupies the position required for task, while possessing adequate authority and the genuine prerequisites for bearing the responsibility vested in him or her.

A02. To successfully perform his or her duties, the responsible manager shall have access to the information necessary for ensuring nuclear and radiation safety and for managing risks, and hold such a position within the organisation as to ensure that he or she will be provided with sufficient information and be capable of effectively deciding on the steps to be taken to ensure nuclear and radiation safety. The responsible manager and his or her deputy shall be employed by the licensee.

Responsible manager for the construction of a nuclear facility

A03. The responsible manager for the construction of a nuclear facility is responsible for ensuring that

- the facility being constructed is so designed that the nuclear and radiation safety requirements applicable to the operation of the facility can be met;
- the facility is constructed in compliance with the conditions stated in the construction licence and the plans approved at the construction licence stage and during construction;

- the actions related to the construction of the facility do not present risks to the nuclear and radiation safety of the on-site plant units currently in operation;
- the security arrangements and emergency arrangements of the facility and the requirements pertaining to nuclear safeguards are duly taken into account in the design and construction of the facility;
- the personnel participating in the licensee's project possess the competence and qualifications required for their duties.

Furthermore, the responsible manager shall ensure that STUK will be informed of any

- nonconformities related to plans and designs with a bearing on the nuclear and radiation safety of the facility and to their implementation;
- significant nonconformities related to the quality and safety management of design and construction.

Responsible manager for the operation of a nuclear facility

A04. The responsible manager for the operation of a nuclear facility shall

- ensure that the operation of the nuclear facility is safe;
- ensure that the necessary security arrangements and emergency arrangements and nuclear safeguards are implemented;
- direct the operation and maintenance of the nuclear facility and the technical support functions at the facility;
- ensure that the personnel of the nuclear facility have the necessary competence and qualifications;
- ensure that decommissioning is planned and implemented in compliance with the approved plans in such a way that the requirements

pertaining to nuclear and radiation safety, security arrangements and emergency arrangements, and nuclear safeguards are duly met;

- ensure that the actions related to the decommissioning of the facility do not pose risks to the nuclear and radiation safety of the on-site plant units currently in operation.

Furthermore, the responsible manager shall ensure that STUK receives all the reports required under Guide YVL A.9.

Serving directly under the responsible manager are, for example, the managers in charge of the operation, maintenance, technical support, and decommissioning of the facility. The persons responsible for security and emergency arrangements and nuclear safeguards shall also be able to report directly to the responsible manager.

Competence requirements

A05. The approval criteria for a responsible manager of a nuclear facility are defined in Section 125 of the Nuclear Energy Decree. These approval criteria mean, among other things, that the individual concerned

- is known to be honest and dependable and his or her personal characteristics make him or her suitable for the position;
- has good management and communication skills;
- is familiar with the principles of emergency arrangements and security arrangements, nuclear safeguards, and the fundamental legislation related to supervisory and managerial duties and is capable of applying the legislation to the practical duties and various problem situations arising at the nuclear facility;
- has the expertise in the field of nuclear energy required for the position and, in particular, expertise in the safe use of nuclear energy;
- is sufficiently familiar with nuclear legislation and the regulations issued thereunder;
- has sufficient managerial experience;
- sets an example of good safety culture through his or her own conduct.

Responsible manager for the construction of a nuclear facility

A06. The responsible manager for the construction of a nuclear facility is required to have expertise and at least three years' work experience in the nuclear field.

Responsible manager for the operation of a nuclear facility

A07. The responsible manager for the operation of a nuclear facility shall have

- sufficient practical experience of at least five years covering a range of duties at the nuclear facility, such as nuclear safety, operation, maintenance and technical support;
- sufficient expertise in nuclear safeguards and emergency arrangements and security arrangements.

Competence verification and regulatory control exercised by STUK

A08. The licence applicant shall, in its application, provide an assessment of the person's aptitude for the position and of his or her background in terms of training and work experience.

A09. STUK will arrange a meeting for the purpose of competence verification, assessing the candidate's performance. The topics to be addressed at such a meeting for responsible managers of nuclear facilities include safety management and safety culture, nuclear safety, radiation safety, emergency response, nuclear safeguards (including transports of nuclear materials), security arrangements, and nuclear safety regulations.

Validity of the qualification

A10. The responsible manager or his or her deputy may be approved for a fixed or an indefinite period of time. However, in any event, the approval is only valid for as long as the person actually holds the position. If the person no longer holds the position, the licensee shall file a change notification with STUK to that effect. Where possible, the notification shall be filed before the change and, in any event, no later than on the seventh day thereafter.

A11. On special grounds, additional temporal, regional, and position-specific conditions and restrictions pertaining to training, personal characteristics, or other similar factors may be imposed as a condition for the approval of the responsible manager or his or her deputy.

A12. The additional conditions imposed for the approval of the responsible manager and his or her deputy may be revised should there be changes in their competence or other similar factors.

A13. The approval of the responsible manager or his or her deputy may be revoked in whole or in part if

- so requested by the licensee or the individual concerned;
- owing to material changes in the circumstances, the individual concerned no longer satisfies the qualification requirements specified as the precondition for his or her approval;
- a final judgement is handed down in respect of the individual for an offence that shows the individual to be unfit for the position, or he or she is in breach of the nuclear energy legislation or has wilfully or repeatedly contravened STUK's regulations or instructions;
- the individual concerned is in material breach of the principal conditions or restrictions specified for his or her approval.

Annex B Person in charge of security arrangements and his or her deputy

Position

B01. The person in charge of security arrangements is, on his or her part, responsible for ensuring that the provisions on the security arrangements pertaining to the use of nuclear energy, licence conditions and the regulations issued by STUK are complied with. The person in charge of security arrangements maintains and develops the licensee's security arrangements. The person in charge of security arrangements shall attend to the management and supervision of the security organisation responsible for the planning and implementation of security arrangements ensuring that

- the legal protection of the individual subjected to security measures is ensured and the laws are complied with;
- the security organisation is prepared to use force and intermediate weapons in a professional and responsible manner in threat scenarios;
- the entire personnel is properly acquainted with the security arrangements and security control, and the measures facilitating their implementation.

The person in charge of security arrangements and his or her deputy shall be employed by the licensee.

Competence requirements

B02. The person in charge of security arrangements shall

- have a suitable university degree;
- have a total of three years' work experience with at least one year in the nuclear sector if the individual has completed a higher university degree;
- have a total of five years' work experience with at least three years in the nuclear sector

if the individual has completed a lower university degree;

- be familiar with the legislation governing security arrangements and the private security sector and other closely related legislation (e.g. the essential aspects of firearms legislation, the legislation related to the use of force and intermediate weapons and, as far as security duties are concerned, the criminal code and coercive measures legislation);
- be familiar with the nuclear facility and have sufficient understanding of legislation and regulations concerning nuclear energy, radiation protection, and rescue operations as well as relevant legislation applicable to security authorities (including basic knowledge of the Finnish judicial system and the Constitution, and legislation on fundamental rights, STUK, the police, rescue, customs, and border control authorities, the Defence Forces, and their duties and authorities).
- be familiar with the principles and practices of different areas of security arrangements and corporate security and understand the principles of security plans of varying levels drawn up for different purposes;
- be familiar with the requirements and contents of statutory plans and design bases (for example, design basis threat (DBT), steps to be taken in response to threat scenarios, and security standing order);
- be familiar with the legislation related to work supervision and managerial duties, such as the basics of the legislation pertaining to occupational safety, employment relationships, and personnel security;
- be capable of applying the legislation to the practical duties and various problem situations arising at the nuclear facility and have the necessary competence to justify the solutions taken.

He or she is also required to be generally suitable for the position.

Competence verification and regulatory control exercised by STUK

B03. The licence applicant shall, in its application, provide an assessment of the person's aptitude for the position and of his or her background in terms of training and work experience.

Familiarity with security arrangements and the related legislation shall be demonstrated by presenting a suitable diploma, such as the Specialist Qualification for Security Officers awarded by the Qualification Committee for the Security Sector.

B04. STUK will arrange a meeting for the purpose of competence verification, assessing the candidate's performance.

Validity of the qualification

B05. The person in charge of security arrangements or his or her deputy may be approved for a fixed or an indefinite period of time. However, in any event, the approval is only valid for as long as the person actually holds the position. If the person no longer holds the position, the licensee shall file a change notification with STUK to that effect. Where possible, the notification shall be filed before the change and, in any event, no later than on the seventh day thereafter.

B06. On special grounds, additional temporal, regional and position-specific conditions and restrictions pertaining to training, personal characteristics, or other similar factors may be imposed as a condition for the approval of the person in charge of security arrangements.

B07. The additional conditions imposed for the approval of the person in charge of security arrangements may be revised should there be changes in his or her competence or other similar factors.

B08. The approval of the person in charge of security arrangements may be revoked in whole or in part if

- so requested by the licensee or the individual concerned;
- owing to material changes in the circumstances, the individual concerned no longer satisfies the qualification requirements specified as the precondition for his or her approval;
- a final judgement is handed down in respect of the individual for an offence that shows the individual to be unfit for the position, or he or she is in breach of the nuclear energy legislation, or has wilfully or repeatedly contravened STUK's regulations or instructions;
- the individual concerned is in material breach of the principal conditions or restrictions specified for his or her approval.

Annex C Person in charge of emergency arrangements and his or her deputy

Position

C01. The person in charge of emergency arrangements maintains and develops the licensee's emergency arrangements in collaboration with the rest of the organisation. The duties of the person in charge of emergency arrangements are as follows:

- preparing and maintaining the emergency plan;
- planning and implementing the emergency training and exercises;
- looking after the emergency premises and equipment.

The person in charge of emergency arrangements and his or her deputy shall be employed by the licensee.

Competence requirements

C02. The person in charge of emergency arrangements shall

- have a suitable university degree;
- have a total of three years' work experience with at least one year in the nuclear sector if the individual has completed a higher university degree;
- have a total of five years' work experience with at least three years in the nuclear sector if the individual has completed a lower university degree;
- be familiar with the emergency arrangements and rescue operations at nuclear facilities, as well as nuclear safety and radiation protection;
- have technical knowledge of the nuclear energy sector;
- be familiar with the nuclear facility;
- have sufficient understanding of the legislation and guidelines relating to nuclear energy, radiation protection and rescue operations.

He or she is also required to be generally suitable for the position.

Competence verification and regulatory control exercised by STUK

C03. The licence applicant shall, in its application, provide an assessment of the person's aptitude for the position and of his or her background in terms of training and work experience.

C04. STUK will arrange a meeting for the purpose of competence verification, assessing the candidate's performance.

Validity of the qualification

C05. The person in charge of emergency arrangements or his or her deputy may be approved for a fixed or an indefinite period of time. However, in any event, the approval is only valid for as long as the person actually holds the position. If the person no longer holds the position, the licensee shall file a change notification with STUK to that effect. Where possible, the notification shall be filed before the change and, in any event, no later than on the seventh day thereafter.

C06. On special grounds, additional temporal, regional and position-specific conditions and restrictions pertaining to training, personal characteristics, or other similar factors may be imposed as a condition for the approval of the person in charge of emergency arrangements.

C07. The additional conditions imposed for the approval of the person in charge of emergency arrangements may be revised should there be changes in his or her competence or other similar factors.

C08. The approval of the person in charge of emergency arrangements may be revoked in whole or in part if

- so requested by the licensee or the individual concerned;

- owing to material changes in the circumstances, the individual concerned no longer satisfies the qualification requirements specified as the precondition for his or her approval;
- a final judgement is handed down in respect of the individual for an offence that shows the individual to be unfit for the position, or he or she is in breach of the nuclear energy legislation, or has wilfully or repeatedly contravened STUK's regulations or instructions;
- the individual concerned is in material breach of the principal conditions or restrictions specified for his or her approval.

Annex D Person in charge of nuclear safeguards and his or her deputy

Position

D01. The person in charge of nuclear safeguards shall

- attend to the nuclear safeguards obligations (submission of reports and notifications to the Commission and STUK within the specified deadlines)
- attend to the licensee's nuclear accountancy and safeguards system, its maintenance, and development;
- assume responsibility for the preparation and currency of the safeguards manual;
- assume responsibility for the preparation, updating, and submission to STUK of the description of the plant area pursuant to the Additional Protocol to the Safeguards Agreement
- assume responsibility for ensuring that the competence requirements specified in the transport regulations for dangerous goods are duly taken into account in the transport of nuclear materials.

The person in charge of nuclear safeguards and his or her deputy shall be employed by the licensee.

Competence requirements

D02. The person in charge of nuclear safeguards shall

- have a higher university degree suitable for the position at the nuclear facility;
- have at least three years of work experience with at least one year in the nuclear sector;
- have technical knowledge of the nuclear energy sector;
- be sufficiently familiar with nuclear energy legislation and international contractual arrangements, in particular with regard to nuclear safeguards.

He or she is also required to be generally suitable for the position.

Competence verification and regulatory control exercised by STUK

D03. The licence applicant shall, in its application, provide an assessment of the person's aptitude for the position and of his or her background in terms of training and work experience.

D04. STUK will arrange a meeting for the purpose of competence verification, assessing the candidate's performance.

Validity of the qualification

D05. The person in charge of nuclear safeguards or his or her deputy may be approved for a fixed or an indefinite period of time. However, in any event, the approval is only valid for as long as the person actually holds the position. If the person no longer holds the position, the licensee shall file a change notification with STUK to that effect. Where possible, the notification shall be filed before the change and, in any event, no later than on the seventh day thereafter.

D06. On special grounds, additional temporal, regional and position-specific conditions and restrictions pertaining to training, personal characteristics, or other similar factors may be imposed as a condition for the approval of the person in charge of nuclear safeguards.

D07. The additional conditions and restrictions imposed for the approval of the person in charge of nuclear safeguards may be revised should there be changes in his or her training, personal characteristics, or other similar factors.

D08. The approval of the person in charge of nuclear safeguards may be revoked in whole or in part if

- so requested by the licensee or the individual concerned;
- owing to material changes in the circumstances, the individual concerned no longer satisfies the qualification requirements specified as the precondition for his or her approval;
- a final judgement is handed down in respect of the individual for an offence that shows the individual to be unfit for the position, or he or she is in breach of the nuclear energy legislation, or has wilfully or repeatedly contravened STUK's regulations or instructions;
- the individual concerned is in material breach of the principal conditions or restrictions specified for his or her approval.

Annex E Control room operators

Position

E01. Only a person specifically approved by STUK may serve as an operator in the control room of a nuclear power plant. The operator shall be employed by the licensee. Operators include shift supervisors (SS) for shift teams, reactor operators (RO), and turbine operators (TO) of a nuclear power plant. The approval of an operator is specific to each plant unit and position.

E02. Operations engineers serving as the shift supervisors' immediate superiors are required to have shift supervisor competence and a valid approval by STUK as a shift supervisor. Shift supervisor competence are also required of the chief simulator instructor and the on-call safety engineers working in the main control room. Simulator instructors are required to have operator competence. The licensee's instructions shall provide a description of the competence, training, and competence verification requirements associated with these special positions.

E03. The minimum staffing of operators in the plant unit's control room and at the plant area shall be separately specified in the Operational Limits and Conditions for each operational state of the plant. The shift supervisor may also serve as a reactor or turbine operator in his or her plant unit. A reactor operator may substitute for the shift supervisor for a short period of time during the shift.

Competence requirements

E04. Control room operators shall

- have a polytechnic degree in a relevant field of technology or other technical degree suitable for the position;
- have at least three years' relevant work experience with at least one year in the nuclear sector;
- be in a physical condition suitable for the position and undergo dependability and aptitude assessment.

E05. In addition to meeting the requirements specified for operators, shift supervisors are also required to:

- have at least five years' relevant work experience with at least three years in the nuclear sector;
- possess leadership and managerial skills;
- have at least three months' work experience in the reactor operator's duties and at least three months' work experience in the turbine operator's duties.

E06. The initial training of control room operators shall

- provide training in the safety principles and requirements of the nuclear power plant, pre-conditions and presuppositions for the safe conduct of operations, and safety culture;
- provide thorough training in the functioning and operation of the plant and its systems, structures and components; knowledge and skills pertaining to plant behaviour during normal operation, operational occurrences and accidents, including severe accidents and emergency situations;
- provide solid teamwork skills required for the duties and for the administrative control and supervision of work carried out at the plant;
- include a pre-planned on-the-job training period in the main control room with a minimum duration of six months; the sets of tasks performed during this training period shall be recorded;
- include at least eight weeks' simulator-based training covering the normal operation of the plant and its systems as well as operational occurrences and accidents, including severe accidents;
- include written examination, demonstration of professional skills with a full-scale replica training simulator, and an oral examination.

Competence verification and regulatory control exercised by STUK

E07. A precondition for working as a control room operator of a nuclear power plant is that the licensee determines the candidate to be qualified for the intended position and that STUK has, in response to a written application filed by the licensee, approved the proposal based on its own oversight. Several licences can be granted in response to a single application (e.g. TO and RO).

Written examination

E08. The licensee shall, through a written examination, verify that the operator candidate has learnt and understood the factual content of the initial training. The written examination can be taken at such a point during the initial training when the licensee has determined that the candidate is capable of passing the examination.

E09. The written examination shall include questions related to the following areas:

- the safety principles of the nuclear power plant and the essential nuclear safety and radiation safety regulations;
- the structure and principle of operation of the reactor, primary and secondary circuits, safety systems, and key auxiliary systems;
- the main behavioural characteristics of the plant during anticipated operational occurrences and accidents;
- the requirements imposed by the technical and administrative plant procedures.

E10. As a minimum, the written examination shall include ten questions to be answered in writing. To ensure the sufficient scope of the exam, these questions may be supplemented by a sufficient number of multiple-choice questions. A minimum of 70% of the maximum score is required for passing the examination.

E11. STUK oversees the degree of difficulty of the questions presented in the written examination, the examination arrangements, and the objectivity of the grading of the answers given in the examination. For oversight purposes, the licensee shall inform STUK of the arrangement of a written examination no later than two weeks prior to the date of the examination. The notification

shall include a proposal for the questions to be asked. STUK may add questions of its own where necessary. STUK performs random checks to control the conduct of written examinations.

Approval as an operator trainee

E12. The licensee shall ensure that the candidate is qualified to commence on-the-job training in the main control room before applying for his or her approval as an operator trainee.

E13. For the approval procedure, the licensee shall file an application with STUK for the candidate's appointment as an operator trainee. The application shall be accompanied by the answers given in the written examination and the grading of the examination. STUK's decision on the approval as an operator trainee is valid for a maximum of two years, during which time the licensee shall obtain STUK's decision for the trainee's approval as a control room operator.

Demonstration of professional skills in a training simulator

E14. The licensee shall ensure that the control room operator trainee of a nuclear power plant has the necessary competence and that he or she masters ways of working that take due account of nuclear and radiation safety. The demonstration of professional skills shall be given in a training simulator in which two types of operating conditions are simulated:

- operating conditions, during which the operator trainee assesses the state of the plant and potential deviations from normal operation by means of plant alarm system signals and other data, and determines and takes the necessary actions;
- anticipated operational occurrences and accidents, during which the operator trainee identifies the disturbance, performs the first actions required by the procedures, detects the abnormally functioning component, corrects the situation, and determines any further action required.

E15. The demonstration of professional skills shall be arranged for the operator trainee prior to the oral examination and at least every second calendar year after that.

Table 1. Scores and approval decisions.

Total score	Points scored in individual areas	Period of validity of approval decision	
		First	Second or more
$80\% \leq P_{tot}$	$P_{part} \geq 50\%$	2 years	4 years
$70\% \leq P_{tot} < 80\%$	$P_{part} \geq 50\%$	2 years	3 years
$60\% \leq P_{tot} < 70\%$	$P_{part} \geq 40\%$	1 year	2 years
$50\% \leq P_{tot} < 60\%$	$P_{part} \geq 40\%$	6 months	6 months

E16. STUK oversees the procedures and practical arrangements for the demonstration of professional skills by means of random checks. For oversight purposes, the licensee shall, if so requested, inform STUK of the dates when the demonstrations of professional skills are arranged.

Oral examination

E17. The licensee is required to arrange an oral examination for control room operators and the operator trainee when the candidate has successfully passed the written examination, undergone thorough on-the-job training, and acceptably demonstrated his or her professional skills in a training simulator.

E18. The oral examination shall include at least nine questions related to the following areas:

- the plant unit's technical and administrative procedures and rules and the Operational Limits and Conditions (3 questions);
- the operation of the plant unit and its systems under normal operating conditions (3 questions);
- the behaviour of the plant unit and its systems during anticipated operational occurrences and accidents (3 questions).

E19. A plant tour is also required of an individual applying for his or her first operator approval. It may consist of several separate assignments and questions (e.g. the location of components at the plant, the operation of control equipment in and outside the control room, system presentation). The assignment is graded as either "Pass" or "Fail". Plant tours may also be required in connection with refresher examinations.

E20. The questions in the oral examination, the main points of the model answers to the questions, and their share of the total score shall be

defined in advance. The questions shall measure whether the candidate has sufficient competence for the position being applied for.

E21. The licensee shall appoint at least two examiners for the oral examination. One of the licensee's examiners shall be an operations engineer or an individual with equivalent competence, qualification and experience.

E22. Each answer given in the oral examination shall be separately evaluated on a scale from 0 to 5 as follows:

5 = Extensive and profound understanding of the area being examined. Presentation of knowledge fluently and understandably in a logical sequence.

4 = Extensive understanding of the area being examined and presentation as above. The presentation of some details may require a little assistance.

3 = Sufficient understanding of the area being examined for work-related purposes. The discussion of the question may involve assistance. A detail with minor significance to safety may be omitted.

2 = Passable understanding of the area being examined. Knowledge of most fundamentals. Inadequate mastery of details.

1 = Gaps in the mastery of fundamentals.

0 = Very poor understanding of the area being examined. Major gaps in the mastery of fundamentals.

E23. If the candidate receives a grade 2 or lower for any of the questions, he or she shall be given refresher training by the licensee.

E24. The period of validity of the approval decision issued by STUK depends on the total score obtained in the examination. The scores required

for approval and the respective periods of validity of the approval decision are presented in Table 1.

E25. STUK oversees the degree of difficulty of the questions presented in the oral examination, the examination arrangements, and the objectivity of the evaluation. STUK will appoint at least one supervisor for the oral examination.

E26. For oversight purposes, the licensee shall inform STUK of the arrangement of an oral examination and the questions to be asked no later than two weeks prior to the foreseen date. During the examination, STUK's supervisors may ask supplementary questions when deemed necessary.

Approval as a control room operator

E27. The licensee shall ensure that the imposed qualification requirements are met and that the candidate is otherwise fit for the intended duties. After this, an application for the candidate's approval may be filed with STUK.

E28. The following information shall be included in the application for approval filed with STUK:

- the candidate's personal information, job title, and the period of validity of the approval decision being applied for as well as a reference to the previous approval decision;
- the licensee's assurance that the candidate has the required basic training and work experience, has completed the required initial, refresher and continuing training, has passed the dependability and aptitude evaluations, has a valid medical certificate, has completed the required on-the-job training, and has worked in the duties concerned as required;
- the record of an approved demonstration of professional skills;
- the record of the approved oral examination.

Maintaining the validity of the qualification

E29. The refresher training for control room operators shall cover the plant's operation in normal operational states, selected transients and accidents, cooperation within the shift team, operating experiences, as well as any plant modifications and changes to the operating procedures.

E30. A precondition for maintaining the validity of the approval decision is that shift supervisors and other operators regularly attend the annual refresher training that includes at least five days of simulator training. The shift supervisor shall maintain his or her preparedness to operate both the reactor and the turbine by means of annual simulator training.

E31. The licensee shall have systematic procedures in place for providing shift supervisors and other operators with training regarding plant modifications and their significance. If a plant modification is of material significance in terms of control room work, it shall be first modelled and practised in a simulator. A test for the demonstration of professional skills shall be taken whenever extensive modifications with implications for control room work are made.

E32. A precondition for maintaining the validity of the approval decision is that the individual performs the duties concerned on a regular basis. Service as an operations engineer or his or her deputy shall be deemed comparable to control room work if the individual concerned has previously worked as a shift supervisor.

E33. The preconditions for the continuation of the validity of the approval decision shall be reassessed if

- the operator's physical condition deteriorates considerably;
- the operator grossly or repeatedly violates safety regulations when performing his or her duties;
- the operator has not been actively performing operator duties for more than six months;
- it is determined that the amount of simulator training or control room work falls clearly short of the requirements;
- the candidate fails the oral examination or the demonstration of professional skills.

Based on the assessment, the licensee shall, where required, propose the revocation of the approval decision, or STUK may revoke the approval decision. The preconditions for renewing an expired approval decision are defined on a case-by-case basis in response to the licensee's proposal.