

## **Guide YVL A.11, Security of a nuclear facility**

### **1 Scope of application**

Guide YVL A.11 comprises most of the regulations on the security of nuclear facilities and presents the requirements for their application. The Guide applies to nuclear facilities and the handling of nuclear material or waste in Categories 1–3 in Table 2. The requirements concerning other nuclear use items are presented in Guide YVL D.1 “Regulatory control of nuclear safeguards”. The requirements concerning the security arrangements of nuclear material and nuclear waste transports are provided in Guide YVL D.2 “Transport of nuclear materials and nuclear waste”. Design basis threat (DBT) is addressed in a separate document (1/Y42217/2020), “Design basis threat for the use of nuclear energy and use of radiation”, the facility-related parts of which are delivered to licensees operating nuclear facilities assigned in the facility classes in question (chapter 9.1 of the Guide) for use as the basis for the planning of nuclear security (security arrangements). General requirements for nuclear security and STUK’s oversight are also described in the other A series YVL Guides and, for example, in Guides YVL B.1, B.2, B.7, C.5, D.1, D.2, D.3, D.4, D.5, E.6 and E.7.

The description of the application rules presents the justification for the security requirements on a general level: legislation and other lower-level regulations.

### **2 Justifications of the requirements**

#### **2.1 Chapter 1 Introduction**

The chapter presents the starting points for Guide YVL A.11.

**101.** The description presents a general legislative hierarchy concerning nuclear security.

**102a.** The description presents what the nuclear security consist of.

**103.** The description presents the licensee’s duties related to security arrangements, which are stipulated in the Nuclear Energy Act (990/1987).

**104.** The description presents the justification for the confidentiality provisions: the confidentiality obligation stipulated in the Nuclear Energy Act and the confidentiality criteria stipulated in the Private Security Services Act (1085/2015) and the Act on the Openness of Government Activities (621/1999). The above-mentioned requirements shall be taken into account when submitting the documentation.

**105.** The requirements for confidentiality are presented in the requirement. Further requirements for confidentiality are presented, for example, in Guide YVL A.1 “Regulatory oversight of safety in the use of nuclear energy” (B.25) and in the Government Decree on Security Classification of Documents in Central Government (1101/2019).

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## 2.2 Scope of application

**201.** The description presents the structure of the Guide and other YVL Guides related to security arrangements.

**202.** The description presents the scope of application of the Guide.

## 2.3 Chapter 3 Design bases and principles for nuclear security

**301a.** The description presents the starting point for coordinating security, preparedness and nuclear safeguards arrangements. The requirements for coordination are presented in an applied manner in IAEA Recommendation INFCIRC/225/rev 5 [3.28, 3.36].

**302–303.** The requirements are presented in the Radiation and Nuclear Safety Authority Regulation on the Security in the Use of Nuclear Energy (STUK Y/3/2020).

**304.** Design basis threat (DBT) is presented in Section 146 of the Nuclear Energy Decree (161/1988) and IAEA Recommendation INFCIRC/225/rev 5 [3.10]. The requirement imposes an obligation on the operator to use the design basis threat as defined in the relevant document in the planning of nuclear security. It has been decided to present the design basis threat in a separate document, as the way it is prepared, processed and approved differs from the procedure for implementing the YVL Guides. Its content also requires the classification of several parts of the DBT, as they could compromise the objective of the security arrangements if they were public (Section 24.1(7k) of the Act on the Openness of Government Activities 621/1999). For the sake of clarity, these are presented in a separate document.

**304a.** The design and implementation of security arrangements shall ensure an interface with nuclear safety in the event of a loss of electricity, so that security arrangements do not impede the management of a potential accident situation. For example, it shall be possible to arrange the passage from one area to another also in the aforementioned situation.

**305.** The requirement is presented in the Radiation and Nuclear Safety Authority Regulation on the Safety of Disposal of Nuclear Waste (STUK Y/4/2018). After the regulation was published, the definition of nuclear security was changed in connection with the amendment of the Nuclear Energy Act in 2020 (Government Proposal 8/2020). However, the term used here is that of the regulation in force.

**307.** The requirement presents the use of risk analysis when designing nuclear security. The requirement is presented in Regulation STUK Y/3/2020.

**307a–b.** In connection with the risk analysis, Probabilistic-Risk Assessment (PRA) shall also be considered in order to take into account, as far as possible, the factors that may arise from different initial events already at the nuclear security design stage. The importance of risk analysis has also been highlighted by the need to describe it in the licensee's management system. When the Nuclear Energy Act was amended, a comprehensive risk management process was set as a requirement. Risk analyses are part of the process. The PRA shall be used whenever possible during the life cycle of the nuclear facility.

**307c.** This requirement takes into account Guide YVL A.3 “Leadership and management for safety”, requirement 301 of which requires the management system to be comprehensive as regards the various activities of the organisation.

**309 and 309a.** The requirements present the need to take into account different design criteria throughout the life cycle of a nuclear facility with regard to security arrangements. Upon modifications, it shall be ensured that they do not weaken security arrangements. This shall also be assessed. With regard to documentation needs, activities taking place after a threat, for example, shall be taken into account. Camera recordings, etc. may be required to solve the matter and enable investigations carried out by an authority. This shall be considered in the design and implementation of security surveillance systems in order to allow availability for this operational need.

**310.** The aim of security arrangements is to prevent unlawful action and other action endangering nuclear or radiation safety. Threat refers to situations where nuclear or radiation safety may be compromised as a result of unlawful action (Nuclear Energy Decree 161/1988, Section 146) or other intentional, negligent or otherwise unauthorised action. In this document, unauthorised action refers to situations where, for example, a person working at a nuclear facility does not comply with the given requirements concerning security arrangements, such as the two-person rule to enter a particular area. It is justified that, in such a situation, nuclear security officers (security organisation) may exercise the powers provided for in legislation and prevent any actions endangering nuclear or radiation safety. Requirement 310 presents the different aspects of nuclear security and the interfaces between them, which shall be taken into account in order to implement balanced security arrangements. Response includes, for example, limiting consequences, preventing more serious consequences and bringing the situation under control. The requirement is presented in an applied manner in the Nuclear Energy Act.

**311 and 311a.** The requirements are justified in terms of the effective organisation of security arrangements. In principle, it is justified that support functions that are not directly related to nuclear safety or its maintenance are not located in the plant area. For example, with regard to annual outage, it is necessary to locate supporting functions in the plant area. The requirement refers to functions that do not necessarily have to be located inside the plant area. The requirement therefore requires that these secondary activities be located outside the plant area in order to allow for the effective implementation of security arrangements. For example, it is necessary to try to place warehouses and workshops outside the plant area already at the planning stage. The requirement is presented in an applied manner in IAEA Recommendation INFCIRC/225/rev 5 [5.14].

**312.** The requirement is justified in order for the defence-in-depth principle to be carried out in the implementation of nuclear security. The requirement is presented in an applied manner in IAEA Recommendation INFCIRC/225/rev 5, fundamental principle I: Defence in Depth [3.45–3.47]. In order to implement this principle, the need for escape routes shall also be taken into account, for example, to carry out evacuation. However, these shall not undermine the implementation of the security arrangements.

**313.** This requirement is justified as equipment related to nuclear security may not be covered by the safety classification but appropriate standards shall nevertheless be used to ensure its usability and reliability in order to confirm its quality and fitness for purpose. Such a standard may be, for example, SFS-EN 62676, which concerns camera surveillance (CCTV). Chapter 3.4 of Guide YVL B.1 "Safety design of a nuclear power plant" presents requirements concerning quality management. Quality management is also discussed in standard ISO 9001:2015.

**314.** In this context, external threats mainly refer to intentional or negligent action against the nuclear facility from outside which, without preparation, could endanger the safety of the nuclear facility. Internal (insider) threat refers, for example, to a person working at the nuclear facility or a person who has access to information that could endanger nuclear or radiation safety, if misused. The insider may also have access to an area from which the nuclear or radiation safety of the nuclear facility could be compromised or access to nuclear materials. The insider threat is generally considered to be one of the most difficult threats to prevent and protect against, which is why the requirement is presented in the Guide. The threat is covered in more detail in IAEA Guide NSS No. 08-G. In practice, an insider is a person who has *access to, authority in and knowledge* of the facility and who could act unlawfully or assist a third party in unlawful action or other action that endangers nuclear or radiation safety. A person who does not work at the facility but meets the aforementioned definition, for example, an authority with access to confidential material, is therefore also considered an insider. The requirement presents the importance of the SAHARA principle (the principle of continuous improvement) as regards security arrangements in the context of a changing society and changing threats. Preparation for military action requires state-oriented measures, and its exclusion from the planning criteria is therefore justified. However, this approach does not mean that military action need not be/has not been prepared for, as security arrangements in themselves are also suitable for these situations but they alone are not sufficient to counteract the threat posed by military action.

Due to the complexity of the measures and arrangements against the insider threat, Appendix D to the Guide presents recommended measures that the licensee may use to minimise the insider threat. Annex D is by nature a recommendation. In accordance with the risk-based approach, the licensee shall present to STUK how it manages the risk of an insider threat. Procedures to prevent external threats shall also be presented.

**315 and 315a.** The requirements present the basic principles for the allocation of responsibilities between the licensee and the authorities. However, as the licensee alone does not have sufficient means and powers to deal with, for example, terrorist threats, the police and any other authorities that provide it with official assistance also have legal obligations in relation to various unlawful situations in order to ensure safety. The requirement for the licensee's cooperation with police authorities is presented in Regulation STUK Y/3/2020. The responsibility of the licensee for the use of nuclear energy is presented in the Nuclear Energy Act. The situation assessment mentioned in the requirement includes the maintenance of a general situation assessment concerning security arrangements and also determines the capability of the licensee to maintain a situation assessment related to the situation. This is justified in order to allow the licensee to maintain a timely and correct situation

assessment during threats. The requirement is presented in an applied manner in IAEA Recommendation INFCIRC/225/rev 5 [3.25, 3.27]. In its statement (2013), the Ministry of the Interior stated that, due to the importance of the situation assessment, it is necessary to plan the procedures in advance in order to convey the situation assessment.

**316.** The requirement requires the licensee to describe the security arrangements in writing. According to the Nuclear Energy Act, the licensee is responsible for the safety (including security) of the nuclear facility. Without documentation, the effectiveness of the security arrangements cannot be assessed, and they cannot be implemented correctly in qualitative terms. The documentation requirement is presented in Regulation STUK Y/3/2020.

**316a.** The requirement is presented in an applied manner in IAEA Recommendation INFCIRC/225/rev 5 [4.29].

**317.** The requirement is presented in the Nuclear Energy Act.

**318.** The requirement presents the safety classification of systems related to nuclear security. For practical reasons, systems related to several security arrangements cannot be treated as nuclear equipment. Systems related to nuclear security also include the IT systems/programmes necessary for their use. Guide YVL B.2 "Classification of systems, structures and components of a nuclear facility" specifies their safety classification in more detail. Equipment-level information concerning security arrangements need not be submitted to STUK, unless STUK specifically requires it.

**318a.** The requirement refers to Guide YVL B.2, which deals in more detail with the possible safety classification of structures or equipment included in the systems. The requirement emphasises that a structure or device belonging to a system related to nuclear security itself belongs to class EYT/STUK or even to a higher class according to requirement 311 of Guide YVL B.2. This shall be taken into account when designing and introducing systems related to security arrangements.

**320 and 320a.** The requirements are based on the description of security zones presented in IAEA Recommendation INFCIRC/225/rev 5 [e.g. 3.45, 4.22–4.25]. The requirements are also presented in Regulation STUK Y/3/2020 (Section 4). The security zones and their English terms are presented in Figure 1 below.

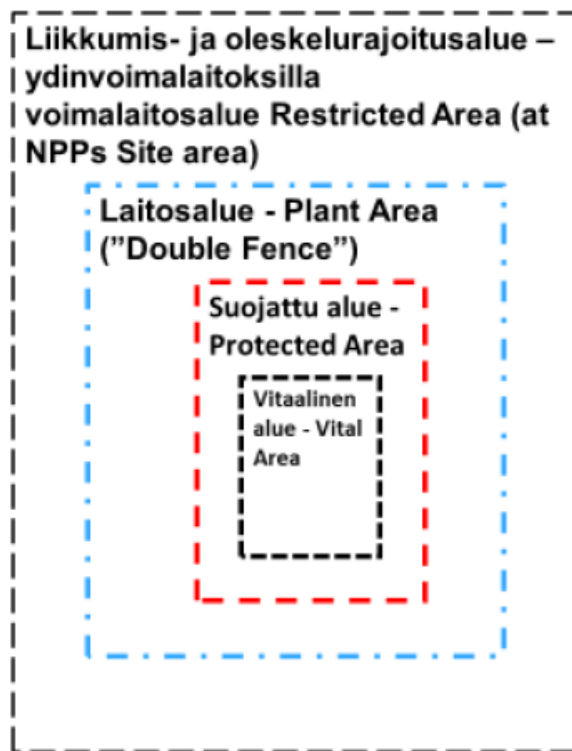


Figure 1. Security zone principle

**321.** The requirement is presented in Regulation STUK Y/3/2020.

**321a.** For the security zones to function appropriately and to meet their objectives, the separation between them shall be planned. The requirement for the utilisation of several security zones placed within each other is presented in Section 4 of Regulation STUK Y/3/2020. In this Guide, the term security zone is used to make it clearly distinguishable from the term safety zone used in other contexts.

**322.** The requirement is justified in order for the security arrangements to fulfil their purpose and the operator's responsibility for ensuring nuclear safety mentioned in the Nuclear Energy Act to be carried out. A corresponding requirement is presented in an applied manner in IAEA Recommendation INFCIRC/225/rev 5 [3.45, 3.46].

**323.** The requirement is justified in order to ensure the appropriateness of safety and balanced security arrangements. Fire safety requirements require these to be taken into account in the design and operation of the nuclear facility.

**324.** The requirement follows in an applied manner IAEA Recommendation INFCIRC/225/rev 5 [4.14, 4.18, 4.23]. It is justified to maintain the established term "site area" in nuclear power plants in order to facilitate situation management. The terms used at Finnish nuclear facilities are well established, which is why they have not been fully harmonised with IAEA Recommendation INFCIRC/225/rev 5. The correspondences are the following: restricted area (IAEA: limited access area), plant



area (IAEA: protected area), protected area (IAEA: no correspondence) and vital area (IAEA: vital/inner area).

**325.** The requirement is justified for Category 3 nuclear facilities due to their functionality and possible radiological consequences. The requirement also follows in an applied manner the graded approach in accordance with IAEA Recommendation INFCIRC/225/rev 5 [3.43].

**325a.** This requirement is justified as, in terms of detection, technical control is an essential part of the nuclear security. Technical supervision planning is part of the design of the nuclear facility and shall be carried out in a timely manner in connection with facility design.

**326.** This requirement describes the nature of the outermost security zone. National legislation provides regulations on movement and stay restrictions. The competent authority is the Ministry of the Interior. From the outermost zone, it is difficult to have a direct impact on nuclear safety, so it is justified that measures in this area are primarily aimed at preventing the threat by slowing it down. The requirements for the structures and purpose of different security zones are presented in IAEA Recommendation INFCIRC/225/rev 5 [4.14, 4.18, 4.23].

**327.** The requirement is related to requirement 326. Furthermore, from a nuclear safety point of view, it is justified that in an area from which it is very difficult to influence the operation of a nuclear facility, the use of force is not always necessary. However, the requirement does not remove the powers of the nuclear security officers as defined in the law. The use of force in all security zones, including the outermost, shall always be considered on a case-by-case basis, in accordance with the fundamental principles for the use of force: defensibility, appropriateness and the principle of least harm.

**328.** The requirement requires ensuring the safety of the outermost security zone and increasing the risk of capture not only by technical means. The requirement is derived from IAEA Recommendation INFCIRC/225/rev 5 [4.23, 4.34].

**329.** The requirement is derived from IAEA Recommendation INFCIRC/225/rev 5 [4.23].

**330.** The requirement is justified in the justifications of requirement 328. In addition, it is justified that due to their nature, more detailed provisions concerning the security zone are laid down in a separate appendix, which is confidential (Act on the Openness of Government Activities 621/1999).

**331.** The requirement is justified due to the nuclear safety significance of the protected area. Placing it inside the plant area increases the effectiveness of the security arrangements. It is also justified in accordance with IAEA Recommendation INFCIRC/225/rev 5 "Fundamental principle H: graded approach".

**332.** The requirement is justified in the justifications of requirement 328.

**333.** The requirement is based on IAEA Recommendation INFCIRC/225/rev 5 [5.20]. In addition, the International Physical Protection Advisory Service (IPPAS), in its 2012

follow-up mission, recommended that the licensee carry out the identification of vital areas, as it has the best knowledge of the facility and its important items which in particular need to be protected against illegal action. The licensee shall implement and justify the definition of vital areas. As regards the definition of vital areas, the IAEA has published document NSS No. 16 "Vital area identification". Vital areas may include, for example, the following:

- areas containing structures, systems or equipment necessary for the safety functions of the facility
- areas containing nuclear materials
- areas from which systems important for the safety of the facility can be controlled (e.g. control room and emergency control room)
- areas from which security arrangements are controlled and supervised (e.g. central alarm stations).

**334.** The requirement is justified in order to ensure that the effectiveness of the nuclear security is not impaired by unnecessary maintenance.

**335.** The requirement is presented in the Nuclear Energy Act. The organisation formed by the nuclear security officers at the nuclear facility is called the *security organisation*. The term is used in the Guide because it is established in use. The security organisation is formed by nuclear security officers as referred to in the Nuclear Energy Act.

**336.** The requirement is justified in order to ensure the effective implementation of security arrangements. It is also described in an applied manner in IAEA Recommendation INFCIRC/225/rev 5 [5.39, 5.41].

**337.** The requirement is justified in order to ensure the efficient and competent functioning of the security organisation. The Nuclear Energy Act presents a training requirement for nuclear security officers. Under the Private Security Services Act 1085/2015, the police supervise guarding services suppliers. If the security organisation of the licensee manages the security arrangements, the police will also supervise the security organisation of the licensee under the aforementioned Act.

**339.** The requirement is justified in order to ensure the effective implementation of security arrangements and the legal protection of persons belonging to the security organisation. Security personnel shall have, among other things, separate operating instructions for the area under guard or the person or object under guard.

**340.** The requirement is presented in an applied manner in the Nuclear Energy Act and the regulations issued thereunder.

**341 and 341a.** The requirements are justified in order to ensure the effective implementation of nuclear security, identify development measures and ensure the legal protection of persons belonging to the security organisation. The licensee shall define the matters relating to the notification and present them in the document concerning security arrangements. As a result of the Nuclear Energy Act amendment, the content of the security standing order has been specified in more detail, which is why the requirement has been modified.



**342.** The requirement is justified in order to ensure that nuclear security is not compromised, for example, due to maintenance. It is necessary to identify compensatory measures to replace, for example, a part of the security surveillance system that has been temporarily withdrawn from service.

**342a.** Requirement 342a is new and specifies the requirements set out in Appendix 1 to the Radiation and Nuclear Safety Authority Regulation STUK Y/3/2020 regarding the nuclear security officer's uniform and its marking.

**344.** The requirement is presented in the Nuclear Energy Act. The qualification requirements and approval procedure of the responsible manager and his or her deputy are set out in Section 7k of the Nuclear Energy Act and Guide YVL A.4 "Organisation and personnel of a nuclear facility".

**345.** The requirement is justified in order for the responsible manager to carry out the tasks provided for in the Nuclear Energy Act also in terms of security arrangements. The requirement is presented in IAEA Recommendation INFCIRC/225/rev 5 [3.27, 3.48], which emphasises the role of the individual in maintaining a safety culture.

**346.** The requirement is presented in the Nuclear Energy Act.

**348.** The requirement is presented in the Nuclear Energy Act. STUK approves these persons for their duties upon application based on an assessment. The qualification requirements and approval procedure of the the person responsible for nuclear security and his or her deputy are set out in Guide YVL A.4.

**348a.** The person responsible for nuclear security and his or her deputy shall be appointed within the licensee's organisation no later than when the licensee receives the construction licence. This is based on an amendment to Section 7m of the Nuclear Energy Act, which defines the commencement of the use of security personnel.

**350.** The requirement is presented in the Nuclear Energy Act.

**350a.** This requirement is justified as the responsible manager is responsible for the safety of the nuclear facility and shall be aware of matters relating to security arrangements which may have an impact on nuclear or radiation safety.

**351 and 351a.** The requirements are justified in order to implement the SAHARA principle (the principle of continuous improvement). Maintenance and development of the safety of the nuclear facility require the development of the necessary security arrangements in accordance with the changing threat assessment.

**352.** The requirement is justified in order for the person responsible for nuclear security to effectively assume the responsibility assigned to him or her and to develop in this task.

**353.** This requirement is justified as, under the Nuclear Energy Act, the licensee is responsible for nuclear safety (including security) and this responsibility cannot be transferred to another party. The duties of the persons responsible for nuclear security shall be carried out within the organisation of the licensee. The reference to

the responsible manager has been removed from the requirement because no new requirements for the responsible manager are set out in this Guide.

**354.** The requirement is presented in the Nuclear Energy Act. The requirement requires nuclear security officers to be used also for the transport of nuclear material related to the operation of a nuclear facility in a risk-based fashion. STUK deals with the adequacy of security personnel and other issues related to transport security arrangements in connection with the transport security plan.

**355.** The requirement is justified in order for the security organisation to be able to handle more than one threat arising from the same unlawful action or a simultaneous accident situation and, for example, unlawful action.

**356.** The requirement is justified in order for the security organisation to be effectively managed in operational situations. This requires special competence and leadership skills from the security shift manager.

**357.** The requirement is presented in the Nuclear Energy Act.

**358.** The requirement is presented in the Nuclear Energy Act.

**359.** The requirement is justified in order for the security organisation to only use persons experienced in the security sector.

**360.** The requirement is justified in order for the operational capability of the security personnel to be assessed by an external expert and for potential risk factors/the need for measures to be identified. The measures shall take into account, for example, the confidentiality provisions (privacy) concerning health.

**362.** The requirement is justified in order to ensure the physical capability of security personnel performing operational physical protection tasks. Operational security personnel refer to nuclear security officers who perform, for example, smoke diving tasks in addition to the tasks of security personnel. The requirement does not specify which levels of the directive shall be completed. The licensee shall specify in its instructions the security personnel to whom the requirement applies and also indicate the level requirement and any action to be taken if the test is not completed satisfactorily (passing the test). Qualification criteria is presented in the Ministry of the Interior publication [5/2016](#) (in Finnish).

**363.** The requirement is justified in order for the requirements set out in the Private Security Services Act to be complied with in this regard.

**364.** The requirement is justified in order for the division of responsibilities between the licensee and the external operator (e.g. facility supplier) to be clear. The requirement is derived from Section 73 of the Private Security Services Act.

**365.** The requirement is justified in order for the persons responsible to be known. The responsibility of the licensee for security arrangements is also highlighted in IAEA Recommendation INFCIRC/225/rev 5 [3.27].

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**366.** The requirement is justified in order to ensure that the same operating principles are applied within the same group and that the personnel of the external security service provider are sufficiently familiar with the special features of nuclear energy legislation. For practical reasons, this procedure is not possible if the distances between the operators are too long. For the sake of clarity, it is justified that the responsible persons of both parties are clearly designated and the documents related to the security arrangements are up-to-date. Each licensee shall have its own security plan approved by STUK. According to the requirement, the security standing order approved by STUK may be common if it is justified.

**367.** The requirement is justified because it may be necessary to use a procedure deviating from requirement 366 or an external operator during construction. In this case, too, the responsibility issues shall be clear and, for example, in order to ensure communication, it is justified that the same guarding services supplier is used in the area.

**368.** The requirement is presented in Regulation STUK Y/3/2020.

**369.** The requirement is presented in the Nuclear Energy Act. The requirement means that the powers provided for in the Nuclear Energy Act are used to ensure safety. Practices and inspection frequencies, for example, shall be specified in the nuclear facility's procedures.

**371–373.** The requirements are presented in the Nuclear Energy Act or Regulation STUK Y/3/2020. They are also justified to ensure the purpose of nuclear security and to meet the requirement of IAEA Recommendation INFCIRC/225/rev 5 [4.44, 5.23, 5.32] in order to prevent unauthorised exports of nuclear use items from a nuclear facility as effectively as possible. The right of access without escort presented in requirement 371 may only be granted to persons who need such permit for their work and who have been subject security clearance investigation in accordance with Section 7i of the Nuclear Energy Act (726/2014) or, in the case of a foreign employee, to another similar personal security clearance investigation, if possible.

**374 and 374a.** The requirements are justified in order to ensure the effectiveness of nuclear security in this regard, to provide administrative guidance on the determination of the access rights and to address the insider threat. In particular, persons entitled to issue visiting passes shall be taken into account in the instructions in order to ensure that the persons concerned cannot issue permits to their own guests and override the purpose of security arrangements. The information referred to in requirement 374a shall be stored for the period specified in the procedures.

**376–379.** The requirements are based on IAEA Recommendation INFCIRC/225/rev 5 and guide "Preventive and Protective Measures against Insider Threats" (NSS No. 8-G) highlighting various measures to minimise the insider threat. The requirements are also justified in order to ensure the safety of the nuclear facility.

Requirement 376 requires the conditions for granting access passes to the different security zones and areas to be defined. These conditions include, for example, the definition of duties (determination of the need for access rights), the duration of the access right and possible factors related to the person (mental state, etc.). The requirement is presented in an applied manner in IAEA Recommendation

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INFCIRC/225/rev 5 [4.25, 4.26, 4.27]. Persons may be admitted to security zones only in accordance with the instructions concerning access rights. It may not be necessary to issue a separate access pass for all areas (specific destinations). This may be the case, for example, with a visitor centre located in a restricted area. In such cases, however, access shall be supervised and controlled according to the instructions and restricted according to the instructions in threat level changes (threats).

Necessary work within the meaning of requirement 379 refers to situations in which a personal security clearance investigation cannot be carried out, for example, in order to carry out urgent work. Such situations may include maintenance of a system that is important to nuclear safety or updates to the information system. Short-term access rights refer to procedures to ensure that the work to be carried out is continuously supervised by a knowledgeable person holding a permanent access pass.

**381.** The requirement is presented in the Nuclear Energy Act. The requirement means that the powers provided for in the Nuclear Energy Act are used to ensure nuclear safety. Practices and inspection frequencies, for example, shall be specified in the nuclear facility's procedures.

**382–383.** The requirements are justified in order to ensure the effectiveness of security arrangements and the safety of the visitor. The requirements are presented, where applicable, in IAEA Recommendation INFCIRC/225/rev 5 [4.26, 4.27, 4.40, 4.42, 5.24]. The requirements are also justified in order to ensure the safety of the nuclear facility and the integrity of nuclear use items.

**384.** The requirement is justified in order to retrospectively ascertain the identity of persons who have been in the area of the nuclear facility. The requirement is also intended to ensure the safety of persons in the area of a nuclear facility in the event of a threat. Entry and departure data may also be key information to ensure that there are no additional persons (e.g. guests) in the area, for example, in the event of an accident.

**384a.** With regard to different registers, other legislation applicable to them, e.g. the Data Protection Act (1050/2018), shall be taken into account.

**385.** The requirement is justified in order to ensure the safety of the nuclear facility and the effectiveness of nuclear security. Identification shall take place using an official document (e.g. passport/identity card) on the basis of which the identity is established. With regard to safeguards inspections, Finland has undertaken to comply with the relevant regulations, according to which a United Nations laissez-passer demonstrates that the person is working in IAEA inspection duties and in such cases shall be allowed access (if other conditions are met) to the nuclear facility in connection with the duty. A Euratom inspector card granted in accordance with Article 81 of the Treaty establishing the European Atomic Energy Community shall also be accepted, subject to the above conditions, to demonstrate the right of a person to carry out inspections at a nuclear facility. However, these documents do not officially prove the identity of the person in accordance with the official authority document, which is why the above-mentioned procedure (verification of identity in the official document and confirmation of the access right for the inspection task in either a

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laissez-passer or a Euratom inspector card) shall be presented in the Basic Technical Characteristics (BTC) of the nuclear facility in order to avoid misunderstandings. Requirement 385 also relates to the competent identification of the correctness of documents.

**385a.** Requirement 385a is necessary because no system is always operational. In particular, there are always situations where biometrics cannot be used for all persons.

**386.** The requirement is justified in order for unlawful action and other action endangering nuclear or radiation safety to be detected early enough to initiate countermeasures.

**387.** The requirement is justified in order to determine in real time who are in the various areas during potential threats and to determine afterwards who have been in the security zones. This also supports a possible police investigation.

**388.** The requirement is justified in order to ensure the safety of the nuclear facility. In situations where it is essential for nuclear safety, it is justified to deviate from the requirement.

**390–392.** The requirements are presented in an applied manner in IAEA Recommendation INFCIRC/225/rev 5 [4.25, 4.26, 4.27]. They are justified for the effective implementation of the security arrangements of a nuclear facility.

**393–394.** Requirement 393 is presented in Regulation STUK Y/3/2020. Requirements 393–394 are also justified to ensure the purpose of nuclear security. Requirement 393 is presented, where applicable, in IAEA Recommendation INFCIRC/225/rev 5 [4.30, 4.31, 4.32, 4.33, 4.47]. The section concerning the testing of communication in requirement 394 is justified in accordance with IAEA Recommendation INFCIRC/225/rev 5 [4.33].

**395–396.** The requirements are presented in Regulation STUK Y/3/2020. In its statement (2013), the Ministry of the Interior stated that, depending on the situation, the command post may be other than that designated to the police. The communication arrangements in these places shall also be implemented appropriately.

**398.** The requirement is justified in order to ensure the purpose of nuclear security. Testing of security surveillance and communication systems is necessary to ensure their continued working condition. Guide YVL A.12 requires information/cyber security testing of security surveillance systems (requirement 423).

## 2.4

### Chapter 4 Maintenance and development of security arrangements

**401.** The requirement is justified as the planned procedures may not be available in all situations. In such situations, compensatory procedures shall be implemented to ensure the purpose of the security arrangements. In practice, these compensatory procedures need to be designed and thought through in advance, at least at a general level, and practiced as well as possible so that they can be implemented appropriately.

**402.** The requirement is presented in Regulation STUK Y/3/2020 and is justified in order to ensure that the security arrangements can be implemented appropriately despite the failure of an individual system, structure or device. It shall be possible to take care of security arrangements despite common cause failures, dangerous situations or natural disasters. Security arrangements are needed in all these situations to ensure the safety of the nuclear facility and the integrity of nuclear materials. The justifications of requirement 726 describe what constitutes a significant deterioration of a security system.

**403.** The requirement is presented in Regulation STUK Y/3/2020. In order to ensure the effectiveness of the security organisation, it is justified to organise exercises regularly. In addition, the requirement is presented in IAEA Recommendation INFCIRC/225/rev 5 [3.13].

**403a.** The requirement is justified because nuclear security is part of the safety culture<sup>1</sup>, which is everyone's responsibility. It is therefore justified that each employee informs the relevant party if he or she detects any threat to nuclear or radiation safety or to persons working at the facility.

**404.** The requirement is presented in the Section 7o of the Nuclear Energy Act.

**405 and 405a.** The requirements are justified in order to maintain the SAHARA principle (the principle of continuous improvement) and to ensure the purpose of the security arrangements. In its statement (2013), the Ministry of the Interior proposed that the police authority should also be involved in the supervision and monitoring of security arrangements. This is justified because the police usually command the situation in order to combat illegal activities when they arrive. The licensee can always ask the police to participate in the monitoring and evaluation, but this does not need to be specified as a requirement. For this reason, the requirement has been modified.

**406.** The requirement is justified in order for events related to nuclear security to be clarified afterwards and security arrangements to be developed.

**407.** The requirement is presented in an applied manner in IAEA Recommendation INFCIRC/225/rev 5 [3.42], and it describes the measures that can be used to manage, reduce and prevent risks. The list of measures described in the requirement is not exhaustive.

**408 and 408a** Requirements 408 and 408a refer to the requirement to observe a safety culture, which also includes nuclear security culture. Assessment of security arrangements as part of the self-assessment of safety culture is justified as they are part of the organisational culture and the responsibility of all employees [NSS No. 28-T].

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<sup>1</sup> In Finnish language, there are no separate words for safety and security as such. The Finnish word *turvallisuus* is officially translated into *safety*. For clarity, in this explanatory memorandum it is separately mentioned, when safety includes security and it is important for understanding the overall meaning of the requirement. This is the case e.g. in requirements 403a, 408 and 408a.



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## 2.5 Chapter 5 Action during a threat

**501–503.** The requirements are presented in Regulation STUK Y/3/2020. The notification referred to in requirement 502a shall be given to STUK's on-call duty officer.

**504.** The matter is presented in the Nuclear Energy Act.

**504a.** The requirement is presented in Regulation STUK Y/3/2020.

**506.** The requirement is justified in order to ensure the purpose of the security arrangements. In addition, the requirement is presented in an applied manner in IAEA Recommendation INFCIRC/225/rev 5 [3.25, 3.27].

**507.** The requirement is presented in an applied manner in IAEA Recommendation INFCIRC/225/rev 5 [3.42, 4.34, 5.40]. In its statement (2013), the Ministry of the Interior stated that, once the nuclear security event is over, the controlled normalisation of the situation shall also be ensured, and debriefing management shall be organised. The threat can be addressed either by the licensee alone or in cooperation with authorities. This depends on the nature and extent of the threat.

**507a.** Requirement 507a is justified so that threat situations can be assessed after the nuclear security event and learned from.

**508.** The requirement is justified in order to ensure the effectiveness of nuclear security and the legal protection of security personnel.

**508a.** Requirement 508a is justified in order for action during a threat to be planned in advance. Measures concerning threat levels (e.g. baseline, elevated and full preparedness) shall be defined and regularly exercised.

**509.** The requirement is justified on the basis of ensuring nuclear safety as provided in the Nuclear Energy Act.

**510.** The requirement is justified because emergency preparedness and nuclear security activities are not independent activities but require close cooperation between the security organisation and the emergency response organisation. Unlawful action and other action endangering nuclear or radiation safety may lead to an emergency situation and vice versa. The emergency preparedness plan is described in guide YVL C.5 "Emergency arrangements of a nuclear power plant".

**511.** The requirement is presented in an applied manner in Regulation STUK Y/3/2020. In addition to threats, it is necessary to inform STUK of other events that may be significant in terms of nuclear safety or be newsworthy nationally or internationally, as STUK's task is to monitor nuclear safety in Finland. Based on this, STUK is asked about newsworthy events. In addition, the requirement is presented in an applied manner in IAEA Recommendation INFCIRC/225/rev 5 [3.22].

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## 2.6 Chapter 6 Assessment and demonstration of the effectiveness of nuclear security

**601a.** The requirement is presented in Regulation STUK Y/3/2020. In addition to exercises, effectiveness can be demonstrated, for example, by analyses.

**602.** The requirement is presented in an applied manner in IAEA Recommendation INFCIRC/225/rev 5 [3.52, 3.27]. The licensee shall assess the effectiveness of the security arrangements on a regular basis and continuously develop them.

**602a.** It is the responsibility of the licensee to ensure security arrangements that are not the responsibility of the authority. In order to achieve this, the licensee needs to assess the security arrangements. Criteria, KATAKRI is required for the assessment.

**603–604.** The requirements are presented in an applied manner in IAEA Recommendation INFCIRC/225/rev 5 [3.27, 3.29, 5.15, 5.16]. The purpose of the assessment of nuclear security is to determine whether the security arrangements are adequate and to identify possible improvement targets. Due to the changing threat assessment, it is justified that the licensee periodically arranges both internal assessments and assessments carried out by an external team. In order to carry out its work, the assessment team needs certain classified documentation. These shall be made available to the group for the duration of the assessment in accordance with a separately agreed procedure. The information/cyber security and other requirements for the documents shall be defined and presented to the assessment team before the documentation is disclosed. After the assessment, care shall be taken to ensure that the above-mentioned documentation is collected and possibly destroyed in a documented manner.

**604a.** Requirement 604a requires the licensee to prepare a report on the assessments and their findings for STUK's information. This report shall present what action the licensee intends to take on the basis of the findings and state the justifications for them.

**604b.** Requirement 604b specifies when the assessments are to be carried out for the first time.

**605.** The requirement is justified in order to enable the assessment of the effectiveness of nuclear security. The requirement is presented in an applied manner in IAEA Recommendation INFCIRC/225/rev 5 [3.20, 3.21]. The licensee shall demonstrate, for example, by means of various exercises and tests (on a performance basis) that it is able to address the protection objectives of the nuclear facility set out in the requirements and in the design basis threat.

**606.** The requirement is presented in an applied manner in IAEA Recommendation INFCIRC/225/rev 5 [3.13, 4.19, 5.42]. The exercise program is also related to requirement 605 because the exercises can be used to demonstrate the effectiveness of security arrangements. This should also take into account the principle of continuous improvement and the regulatory activities relating to the response, and it is therefore necessary to plan the exercise programme in cooperation with the authorities concerned.

**607 and 607a-607b.** The requirements are presented in Regulation STUK Y/3/2020. In its statement (2013), the Ministry of the Interior stated that the participation of special police teams (VATI/ERTI) in the exercises should also be taken into account in the instructions. Similarly, the sufficient number of exercises shall be agreed upon with the police. The requirement relates to earlier requirements 605–606.

**608.** The requirement is presented in an applied manner in IAEA Recommendation INFCIRC/225/rev 5 [4.49, 5.41]. In its statement (2013), the Ministry of the Interior proposed that the ISPS requirements for ports be taken into account in the instructions. The requirement concerning blended attacks has been added because the threat of simultaneous physical and information/cyber security attacks cannot be excluded.

**609.** The requirement is justified in order for the content of the training to be ascertained and because it addresses necessary, current issues and has been drawn up from the point of view of the principle of continuous improvement.

**610 and 610a.** The requirements are justified in order to ensure the security organisation's capability of being responsible for the security arrangements and to correctly target the training. In order to allow STUK to participate in the training as an observer if necessary, the training programme shall be submitted to STUK for information. The activities of the security organisation are supervised by the police authority as part of the supervision of the private security sector, so information related to the training shall be presented to the relevant police authority upon request.

## 2.7

### Chapter 7 Documents to be submitted to STUK for oversight

**701.** The requirement is justified in order to always take into account the requirements for the safety classification at the different licensing stages and thus to ensure that the coverage of the documentation submitted to STUK and its content are ensured at the different licensing stages.

**702.** The requirement is presented in the Nuclear Energy Decree.

**703.** The requirement is presented in an applied manner in Regulation STUK Y/1/2018. Preparation for an aircraft crash is one of the design criteria for a nuclear power plant. The inclusion of plans of principle in the decision-making phase is justified because such planning takes time and in order to enable the authority to assess the content of the plan at a sufficiently early stage.

**704.** The requirement is presented in an applied manner in the Nuclear Energy Decree. In order to ensure sufficient time for processing the plans, it is justified that a preliminary security plan and a draft security standing order concerning the operation of the nuclear facility are submitted in connection with the construction licence application, in which case it is still possible to make the necessary changes to them.

**704a.** The requirement describes what shall be presented in the security plan. In order to ascertain the scope and content of the security arrangements during construction, it is necessary to provide information on them during the construction licence phase. An explanation of how the design basis threat has been taken into account in the preparation of the documents shall be provided because the document

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in question contains the national security objectives. In its statement (2013), the Ministry of the Interior stated that other authorities will also have access to the procedures and plans concerning security arrangements at the earliest possible stage. If nuclear facility units already exist on the plant site, special attention shall be paid to the implementation of security arrangements during construction. During construction, for example, the number of employees is significantly higher than during the operation of a nuclear facility.

**704b.** The requirement requires what shall be stated in the security standing order.

**704c.** The documents mentioned in requirements 704a and 704b shall be submitted to STUK for approval, in which case the related changes shall also be approved.

**707.** The requirement is justified in order to ensure in the construction licence phase that the security requirement needs during operation have already been taken into account during the design phase.

The requirement concerning system descriptions is justified in order for the EYT/STUK system descriptions related to nuclear security to be processed in connection with the application. The content of the system descriptions is usually not yet complete at the construction licence phase, but the necessary matters for the licence phase shall be described. Nuclear security also involves a large number of technical systems, the information/cyber security of which shall be taken into account with regard to the system descriptions.

The requirement for guarding procedures is justified as it describes the operational procedures concerning security arrangements.

**710.** The requirement is presented in an applied manner in the Nuclear Energy Decree and in part in requirement 704.

**710a–b.** The requirements describe the content of the plans.

**710c.** The requirement requires the approval of changes to the security plan and security standing order.

**711.** The requirement describes the content of the plans in general.

**712.** The requirement describes what shall be submitted for information during the licence phase. For example, guarding instructions are part of the overall security arrangements. In order to monitor, assess and verify the timetable for the implementation of the security arrangements in a timely manner, a description of the timetable is necessary.

**714.** The requirement is justified in order for the inspections to be carried out in sufficient time and for the security arrangements to be verified as sufficient in accordance with legislative requirements before the nuclear facility is put into operation.

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**714a.** The requirement is intended to ensure that the nuclear fuel security arrangements have been sufficiently discussed, prepared and implemented and that STUK has sufficient time to process the plan in question.

**715.** The requirement is justified in order to ensure that security arrangements have been inspected and found to be appropriate prior to the introduction of nuclear fuel.

**716.** The justification for this claim is presented under paragraph 715.

**717.** The requirement is justified in order for the inspections to be carried out in sufficient time.

**718.** The requirement is justified on the basis of IAEA Recommendation INFCIRC/225/rev 5 [3.20, 3.21, 3.27], the 2009 recommendation of the external IPPAS mission team and the Nuclear Energy Act. Essential/significant changes in nuclear security need to be submitted to STUK for approval in good time. These include changes concerning vital areas and major changes related to security surveillance systems, which as a whole have an impact on the effective implementation of security arrangements. In addition, it is necessary to submit changes containing large entities early enough to allow sufficient time for the changes to be processed.

**719.** The requirement is justified because the need for security arrangements may only be eliminated when the nuclear facility is permanently closed in a manner approved by STUK. This ensures that unlawful action and other action endangering nuclear or radiation safety against the use of nuclear energy is combated as effectively as possible.

**720.** The requirement is justified in order for STUK to ensure the adequacy of nuclear security during decommissioning.

**721.** The requirement presents the issues to be addressed in the plans, and its purpose is to facilitate the preparation of the plans by the licence applicant/licensee. The requirement takes into account, for example, matters presented in IAEA Guide NSS No. 13. These issues shall be dealt with either in the planning documents or in the actual plans (practical implementation), as appropriate for the licence phase. With regard to the content of the security standing order and the security plan, the licensee may determine, in accordance with its management system, in which documents the matters required by requirement 721 are presented. It is possible that, for example, for reasons of limited access to information, the licensee divides the presentation of information into different documents. STUK has therefore not specified in which documents the matters shall be presented. The content requirements of the security standing order are presented in the Nuclear Energy Act, and those of the security plan are presented in the Nuclear Energy Decree.

**722.** The requirement is justified in order for STUK to be able to assess the assessments carried out by the operator or an external expert group, their effects and the need for development measures and other measures.

**723.** The requirement is justified in order for STUK, at its discretion, to participate in the monitoring of the exercises and to ensure sufficient and correct training.

**724.** The requirement is justified in order for completed training to be assessed and the necessary changes to the procedures to be made based on it.

**725.** The requirement is justified under paragraph 723.

**726.** The requirement is justified in order for STUK to maintain a situation assessment of threats and assess the necessary measures based on them. The functionality of security arrangements has been significantly impaired in the event of a total or partial failure of a system related to nuclear security. The effectiveness of nuclear security is considered to have been significantly impaired, for example, when

- a malfunction or structural defect occurs that would allow unauthorised access to the protected or vital area without detection
- all communication channels with local authorities fail.

**728.** The requirement is justified in order for the necessary development measures to be assessed.

## **2.8 Chapter 8 Actions by the Radiation and Nuclear Safety Authority in the supervision of security arrangements**

**801–802.** The Requirements are presented in the Nuclear Energy Decree.

**803.** The matter relates to requirement 703 and is therefore justified.

**804.** The requirement is presented in Regulation STUK Y/1/2018.

**805.** The matter is presented in the Nuclear Energy Decree.

**806.** The matter relates to requirements 704–707 and describes the processing of matters by STUK.

**807.** This paragraph describes the oversight implemented by STUK during construction.

**808.** The matter is presented in the Nuclear Energy Decree.

**809.** The matter relates to the requirements presented for the commissioning phase.

**810.** The paragraph describes the time of processing the documentation in accordance with requirement 714a. The processing may be carried out earlier if it is justified from the point of view of the licence process of the nuclear facility.

**811.** This paragraph describes the implementation of STUK's monitoring programme during operation.

**812.** This paragraph describes STUK's actions regarding the handling of modifications.

**813.** This paragraph describes STUK's activities in connection with the renewal of the licence and the handling of the periodic safety assessment.

**814.** This paragraph describes STUK's actions during the decommissioning phase.



**815.** The requirement specifies the general security arrangements required of the licensee during the decommissioning phase. The security arrangements for decommissioning are addressed separately. The requirement has been modified by adding a reference to Guide YVL D.4 and updating the text of the requirement to comply with the guide in question.

## 2.9 Chapter 9 Classification

**902.** The requirements concerning security arrangements are based on a graded approach. The requirement is described in IAEA Recommendation INFCIRC/225/rev 5 [Fundamental principle H].

**904.** All substances referred to in Section 3 of the Nuclear Energy Act and Sections 3 and 5 of the Nuclear Energy Decree are considered nuclear material or nuclear waste. The protection classification is based on the Convention on the Physical Protection of Nuclear Material and Nuclear Facilities (Finnish Treaty Series 72/1989) and IAEA's Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities (NSS 13, INFCIRC/225/Rev.5). Protection Category 1 is the most severe, 3 is the lowest. Nuclear security requirements for nuclear material outside nuclear facilities, natural uranium extracted from uranium ore, depleted uranium and thorium are presented in Guide YVL D.1. Nuclear security requirements for the transport of nuclear materials and nuclear waste are presented in Guide YVL D.2. The requirement is presented in an applied manner in IAEA Recommendation INFCIRC/225/rev 5 [Table 1].

## 2.10 Appendices B and C to the Guide: General requirements for the resistance of a nuclear power plant and spent fuel storage against an aircraft crash

Appendix B to the Guide presents the public part of the resistance and layout design requirements and guidelines for protection against aircraft crashes as well as their justification. Annex C presents the design parameters against aircraft crashes in accordance with the durability requirements and instructions in Appendix B. Appendix C is classified SC III (Confidential).

There have been no changes to the technical content of Appendices B and C. Appendix B refers to the classification of accidents in Section 22 b of the Nuclear Energy Decree (161/1988) and corresponding radiation exposure limit values so that they can be applied when designing protection against small aircraft and large passenger aircraft crashes.

The methodology presented in Appendix B and the methods for defining design parameters presented in Appendix C are consistent with the principles presented in the relevant IAEA safety reports:

- IAEA Safety Reports Series No. 86. Safety Aspects of Nuclear Power Plants in Human Induced External Events: General Considerations. 2017
- IAEA Safety Reports Series No. 87. Safety Aspects of Nuclear Power Plants in Human Induced External Events: Assessment of Structures. 2018
- IAEA Safety Reports Series No. 88. Safety Aspects of Nuclear Power Plants in Human Induced External Events: Margin Assessment. 2017.

## **2.11 Appendix D to the Guide: Presentation of recommended measures against the insider threat**

Appendix D presents recommended measures that can be used to prevent and reduce the insider threat. The measures presented in the Appendix are presented in IAEA Implementing Guide NSS No 08-G (rev. 1) "Preventive and Protective Measures Against the Insider Threat". Some of the recommended measures are based on international good practices.

## **3 International provisions concerning the scope of the Guide**

IAEA Recommendation INFCIRC/225/revision 5 (NSS No. 13) is discussed, where applicable, in Guide YVL A.11 and its appendices. The numbering in square brackets [...] after the requirements refers to the relevant paragraph of the recommendation in question.

IAEA Guide NSS 08-G: "Preventive and Protective Measures against Insider Threats" is discussed, where applicable, in Guide YVL A.11 and its appendices.

## **4 Impacts of the Tepco Fukushima Dai-ichi accident**

The impact of the Fukushima accident on the Guide concerning security arrangements were added following the round of opinions (2013). Requirement 304 (in this version of the Guide, requirement 304a) was supplemented by the following:

*The planning of nuclear security shall ensure that the arrangements do not hamper emergency management measures at the facility in connection to a long-term loss of electricity.*

This addition is justified to ensure that the design of the security arrangements takes into account the loss of electricity and its effects, for example, on access control, in order to ensure that accident management measures can be effectively implemented despite the security arrangements.

Requirements concerning power supply to the control room and emergency centre have been transferred from the classified appendix to Guides YVL B.1 and YVL C.5, respectively. This is justified because it is necessary to present these requirements in a public guide. The content of the requirements has also changed from draft 2 in the light of the experience gained from the Fukushima accident.

## **5 Needs for changes taken into account in the revision**

The needs for changes due to changes made to international and national laws/regulations and the change proposals made in connection with the preparation of the YVL Guide implementation decisions (SYLVI) together with others recorded in STUK's change proposal database have been considered when updating the requirements. In addition, the possibilities to reduce the so-called administrative burden have been considered.

On the basis of the amendment to the Nuclear Energy Act, the requirements transferred to the level of the Act have been removed from the Guide (e.g. making

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safety investigations and the requirements for the training of nuclear security officers). In addition, the terminology has been specified to correspond to the changes to the Nuclear Energy Act. The term “unlawful action” is largely left in the Guide as it is still used in the Nuclear Energy Decree to regulate the design basis threat.

The Guide has been updated to comply with the requirements of the Radiation and Nuclear Safety Authority Regulation STUK Y/3/2020 and the changes to the Nuclear Energy Act (964/2020).

The shortcomings identified in a 2016 study by an international consultant have been corrected to comply with IAEA’s Recommendations-level documents. The explanatory memorandum includes a separate reference to the recommendation item in question in NSS No.13.

Requirements that do not contain a clear requirement for the licensee have been removed from the Guide. The Guide has been prepared in such a way that each requirement primarily contains only one requirement (to facilitate implementation and improve readability).

The requirements concerning a safety culture have been supplemented in order to make the inclusion of nuclear security as a concept in the safety culture as clear as possible.

Requirements concerning assessments, training and exercises have been specified, and overlapping requirements have been removed.

The description of the documents to be submitted to STUK has been clarified, and the related deadlines have been added in order to clarify the delivery dates.

The requirements of the Guide do not contain any possibilities for administrative burden reduction.