Radiation and Nuclear Safety Authority 3/0007/2017
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The Radiation and Nuclear Safety Authority's Regulation on the Security in the Use of Nuclear Energy, STUK Y/3/2020

MAIN CONTENT

Under Section 7 q(22) of the Nuclear Energy Act (990/1987), the Radiation and Nuclear Safety Authority's Regulation on the Security in the Use of Nuclear Energy is enacted. It repeals the Radiation and Nuclear Safety Authority's Regulation on the Security in the Use of Nuclear Energy (STUK Y/3/2016) that entered into force on 1 January 2016.

The regulation applies to the planning and implementation of the security arrangements in the use of nuclear energy and actions to be taken when under threat. In terms of content, the new regulation corresponds to the Radiation and Nuclear Safety Authority's Regulation on the Security in the Use of Nuclear Energy it repeals. The key amendments the new regulation proposes concern the application of the regulation to other use of nuclear energy besides nuclear facilities. The new regulation highlights continuous improvement, secure communications in threatening situations, measures related to the loss or theft of nuclear material, quality control and plans related to transports of nuclear material. Furthermore, items have been removed from the regulation and moved to the Nuclear Energy Act (security clearances, training requirements), and items have been added due to the amendment of the Nuclear Energy Act (marking of the movement and stay restriction areas, and the nuclear security officer's uniform).

General rationale

1 Introduction

The need to update the regulation is based on the proposed amendment of the Nuclear Energy Act. The Ministry of Economic Affairs and Employment submitted a related request for statements to various parties (TEM/635/03.01.01/2018). Government proposal (HE 8/2020) to Parliament on the Acts to amend the Nuclear Energy Act, the Act on Security Clearances and the Mining Act was submitted to the Council of State on 13 February 2020. Amendment for the Nuclear Energy Act entered into force 21 December 2020. Furthermore, needs for change have been set forth in the third-party assessment commissioned by STUK (Assessment of the Finnish Legal and Regulatory Framework for Security of Nuclear Material and Nuclear Facilities) in comparison to the international convention on security arrangements (Convention on the Physical Protection of Nuclear Material, as Amended 2005) and the IAEA's recommendation on security arrangements NSS 13 (Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities) and the Fundamentals document NSS 20 (Objective and Essential Elements of a State's Nuclear Security Regime).

2 Current status

Requirements concerning the security arrangements in the use of nuclear energy are provided for under Sections 7, 7 i and 7 l-w of the Nuclear Energy Act. Until 31 December 2015, most of the provisions supplementing these requirements were included in the Government Decree on the Security in the Use of Nuclear Energy (734/2008).

The amendment (676/2015) of the Nuclear Energy Act transferred the authority for issuing general safety (including security arrangements) provisions to the Radiation and Nuclear Safety Authority. In connection with the amendment of the Nuclear Energy Act, previous general safety provisions issued as Government Decrees were repealed. The general safety provisions of the Radiation and Nuclear Safety Authority were issued on 22 December 2015, and they entered into force on 1 January 2016.

The Radiation and Nuclear Safety Authority's Regulation on the Security in the Use of Nuclear Energy (STUK Y/3/2016) was provided for as part of this reform under Section 7 q(22) of the Nuclear Energy Act (design and implementation of security arrangements in the use of nuclear energy as well as personal security, data security, access control, security personnel, preparing for and acting in threat situations of a nuclear facility). In terms of content, the Radiation and Nuclear Safety Authority's regulation largely corresponded to the previous Government Decree.

In the current Radiation and Nuclear Safety Authority's regulation on the Security in the Use of Nuclear Energy that entered into force on 1 January 2016, some items require clarification and updating. Today, the same principles are highlighted in security arrangements as in nuclear and radiation safety in general; therefore, additions concerning these principles are provided in the regulation. Furthermore, due to legislative reasons, some of the current requirements in the regulation have been introduced into the Act. The scope of application has also been specified for other use of nuclear energy besides nuclear facilities. With the exception of all stylistic changes, the changes have been justified in the section-specific rationale.

3 The purpose and objectives of the regulation, and key change proposals

3.1 Purpose and objectives

The proposed regulation lays down the provisions that supplement the Nuclear Energy Act regarding the planning and implementation of security arrangements in the use of nuclear energy as well as regarding the action to be taken when under threat. The regulation supplements the sections of the Nuclear Energy Act that concern security arrangements (Nuclear Energy Act, Sections 7, 7 i, 7 l–w). The regulation provides for requirements concerning the security arrangements in the use of nuclear energy, applicable to the licensee.

In connection with issuing regulation Y/3/2016, the regulations concerning the authorities were moved from the Government Decree (734/2008) valid from 2008 into the Nuclear Energy Decree (161/1988) because STUK's regulations cannot be used to issue provisions governing the activities of other authorities. The Government will continue to have the power to issue such decrees. The authorisation to issue decrees

concerning these factors was added to Section 82 of the Act that also contains the other authorisations to issue decrees. Following the legislative amendments, the Nuclear Energy Act and the Nuclear Energy Decree contain provisions regarding the definition of the design basis threat and the threat from unlawful activity towards the use of nuclear energy as well as leadership under threats related to security arrangements (action that could endanger nuclear or radiation safety).

The intention is for the Nuclear Energy Act, the Nuclear Energy Decree and the regulation on security arrangements to form a legislative collection that regulates security arrangements in the use of nuclear energy. They are supplemented by the YVL Guides published by the Radiation and Nuclear Safety Authority (YVL A.11 and YVL A.12 in particular) and the design basis threat (DBT, 1/Y42217/2020).

The provision is related to the requirement laid down in Section 7 of the Nuclear Energy Act: *Sufficient physical protection and emergency planning as well as other arrangements for limiting nuclear damage and for protecting nuclear energy against activity that could endanger nuclear or radiation safety shall be a prerequisite for the use of nuclear energy.*

3.2 Key change proposals

The key change proposals of the regulation concern applying the regulation to other use of nuclear energy besides nuclear facilities; highlighting continuous improvement; secure communication in threatening situations; measures related to loss or theft of nuclear material; taking quality control into consideration; and preparing plans related to transports of nuclear material. In addition, changes have been made due to the amendment of the Nuclear Energy Act.

The purpose of the change proposals is to supplement the security arrangement requirements laid down in the Nuclear Energy Act. The regulation has considered the Convention on the Physical Protection of Nuclear Material and Nuclear Facilities (CPPNM, SopS 72/1989) and the amendments made to it in summer 2005 that entered into force in Finland under Act 513/2008. The new article 2A of the aforementioned convention lists the basic principles concerning security arrangements that the parties shall apply wherever practical and possible. Additional change needs have been set forth in the third-party assessment of security arrangement requirements, commissioned by STUK and carried out by an international specialist.

4 Impacts of the regulation and change proposals

The regulation presents certain requirements that are new in terms of their content, the impacts of which are estimated to be minor in view of the current situation, so the stipulated changes will not have substantial financial or practical impacts on the operations of the licensee or the authorities. The regulation laid down in Appendix 1 of the Regulation on marking the stay and movement restriction area and the markings used in nuclear security officer's uniforms will generate some extra costs to licensees.

The regulation is estimated to have only minor impacts on the existing security arrangement practices, and the changes are intended to improve the standard of

security arrangements. Pursuant to the principle of continuous improvement, these can be processed as part of the implementation of current construction-time and operation-time monitoring programmes. The regulation also has the impacts mentioned above on modifications in which the requirements set forth in the previous regulation have been taken into account.

5 Drafting of the regulation

The regulation was drafted at the Radiation and Nuclear Safety Authority (STUK) as standard clerical work within the framework of the project (RYSÄ) that STUK established to guide the drafting of regulations, to ensure coherence between different regulations, and to manage the conformity to the law and the layout of STUK's regulations.

Statements concerning the regulation proposal were requested from the Ministry of Employment and the Economy, the Ministry of Social Affairs and Health, the Ministry of the Environment, the Ministry of the Interior, the Ministry for Foreign Affairs, the Ministry of Defence, the Ministry of Justice, the Finnish Border Guard, the National Police Board, the Advisory Commission on Nuclear Security, the Advisory Committee on Nuclear Safety, Fortum Power and Heat Oy, Teollisuuden Voima Oyj, Posiva Oy, Fennovoima Oy, VTT Technical Research Centre of Finland Ltd, the Finnish Safety and Chemicals Agency, the Customs, Terrafame Oy, the Regional State Administrative Agency of Northern Finland and the Centre for Economic Development, Transport and the Environment for Kainuu. The request for a statement was published on the lausuntopalvelu.fi site maintained by the Ministry of Justice and in STUK's online service at https://ohjeisto.stuk.fi, where all interested parties had the opportunity to submit a statement. It was also possible to submit a statement and comments directly to STUK's registry office by e-mail: diaari@stuk.fi. The request for a statement was also sent for information to contact persons named by the licensees. The due date of the submission of the statement was 17 April 2020. Statements were provided by the Finnish Border Guard, the Ministry of Justice, the Ministry for Foreign Affairs, the Ministry of Defence, the Ministry of the Interior, the Customs, the Finnish Safety and Chemicals Agency, the National Police Board, Fortum, the Advisory Commission on Nuclear Security, the Advisory Committee on Nuclear Safety and Fennovoima. Teollisuuden Voima and Posiva provided a joint statement commenting on issues such as some markings in Appendix 1 and proposing the postponement of the entry into force of the new markings. Further comments were also received from within STUK, requesting clarifications on some ambiguous items in the regulation and proposing a dedicated section for preparing for threats related to information security.

The Finnish Border Guard, the Ministry for Foreign Affairs, the Ministry of Defence, the Customs and the Finnish Safety and Chemicals Agency announced that they do not have any comments on the draft. The Ministry of Justice announced that it will not give a statement on the matter. The National Police Board, Fortum, Fennovoima and TVO/Posiva had comments which led to change proposals being applied to the draft regulation. These proposals were then presented to the Steering Committee of the RYSÄ project for assessment.

Based on the statements, changes were made to Sections 4–7 and 15 of the regulation, Appendix 1 and the explanatory memorandum. The term "efficient" used in the regulation has, as a rule, been replaced with the term "appropriate", because it is challenging to measure the efficiency of security arrangements unless specific approval criteria have been set. "Appropriate" refers to the fact that the measures must meet the requirements and goals/objectives set. In this regard, the change and its impact are primarily stylistic.

With regard to Section 5, the measures required have been specified so that their implementation and necessity must be regularly assessed.

A general requirement concerning information/cyber security has been added to Section 6.

Based on the statements, the appendix of the regulation has been altered so that, in terms of markings, it covers protective equipment in addition to the workwear used. Markings related to the stay and movement restriction area have also been specified and the linguistic form has been corrected.

Due to the amendment of the Nuclear Energy Act, the term "security organisation" has been replaced with "nuclear security officer" or some other term suitable for the requirement.

The explanatory memorandum has been supplemented based on the statements provided by licensees.

6 Regulation's entry into force

The regulation shall enter into force on 29 December 2020.

Detailed rationale

Section 1 Scope

Section 1 of the regulation lays down the scope of the regulation. The regulation applies to security arrangements in the use of nuclear energy. The use of nuclear energy is defined in Section 2 of the Nuclear Energy Act. The YVL Guides published by STUK set forth more detailed requirements concerning the scope. The life cycle approach has been set forth in the regulation, since security arrangements are required at all stages of the nuclear facility's life cycle, but their level varies according to risk. Repetition related to the life cycle approach has been removed from the regulation. Requirement-specific definition of the nuclear power plant's various licence phases proposed in a statement (Fennovoima) has not been implemented because many requirements are generic in nature and applicable to various licence phases in different ways (for example, Section 5 concerning internal threats shall be taken into account in the design phase, but the practical measures will become tangible in the operation phase).

The regulation applies to nuclear facilities as such. Section 11(3) of the regulation applies to nuclear power plants only. The regulation applies to other use of nuclear

energy for the subsections laid down in Section 1. The regulation is not applied to the use of nuclear energy referred to in Section 2(1)(6) of the Nuclear Energy Act.

Security arrangements consist of physical protection and information/cyber security. These areas support each other, and they cannot or should not be processed independently of each other. The regulation emphasises the importance of information security in a digital plant environment. Personal security presented in a statement (the National Police Board) has not been added to the scope of application of the security arrangements because it is included in both the physical security arrangements and information/cyber security. When a site is protected physically, the persons working there are protected as well. According to Section 7 of the Nuclear Energy Act, the security arrangements shall be sufficient against activity endangering nuclear or radiation safety.

To clarify the regulation, the subsections presented under the scope of application have been numbered.

Section 2 Definitions

Section 2 of the regulation sets forth the definitions used in the regulation. Definition 2) *security zone* was not included in the Government Decree preceding this regulation. It is used in Guide YVL A.11 Security of a nuclear facility. This definition clarifies the difference between a safety zone used in nuclear safety and a security zone used in the context of security arrangements in order to avoid confusion. Guide YVL A.12 “Information security management of a nuclear facility” also takes advantage of the zone approach from the perspective of information/cyber security. The term “security zone” used in the regulation is related to physical security arrangements, but information/cyber security processes are also used to protect such a zone. However, the term “security arrangement” used in the regulation is not identical to the definition of zones used in information/cyber security.

The definitions of security arrangements, use of nuclear energy and nuclear facility are included in the Nuclear Energy Act and, therefore, they are not repeated in this regulation.

In this update, the definition of *unlawful action* has been removed because the definition of security arrangements has been changed with the amendment of the Nuclear Energy Act. The change proposal has been justified in government proposal HE 8/2020 concerning the Act. At the same time, the numbering of the definitions has changed in relation to the former regulation. Furthermore, the design basis threat has been removed from the definitions because it has been defined in Section 1 of the Nuclear Energy Decree.

Definition 1) *risk analysis* has been specified in terms of content to align with the general description of the risk analysis. The plan for development measures presented in a statement (the National Police Board) has not been added to the definition because it is part of the application of a risk analysis, not its definition, and belongs to the comprehensive risk management process discussed in more detail in Guide YVL A.11 Security of a nuclear facility.

Definition 3) *threat* has been specified on account of the amendment of the Nuclear Energy Act. The definition of security arrangements has been amended in the Nuclear Energy Act. It takes into account that a threat may also apply to a person, thereby endangering nuclear or radiation safety. Therefore, protecting people is another goal and purpose of the security arrangements. The *threat* means situations where nuclear or radiation safety may be endangered due the unlawful (Nuclear Energy Decree, Section 146) or other deliberate, negligent or otherwise unauthorised actions. Unauthorised action means e.g. situations where an employee of a nuclear facility does not follow the given procedures, e.g. two-person-rule when entering a specific area. It is therefore important that the nuclear security officers can use powers stipulated in the Nuclear Energy Act in order to prevent such actions.

Definition 4) *dangerous object* has now been clarified in connection with the update and modified in order to also cover other use of nuclear energy besides nuclear facilities.

Section 3 General planning criteria for security arrangements

Section 3 of the regulation contains provisions on the general planning criteria for security arrangements. The headings have been specified and wordings updated, while references and terminology have been corrected to align with modern regulatory technique. Security arrangements shall be taken into account in the planning of operations as well as in the design and placement of a nuclear facility's systems, structures and components. Risk analyses, the design basis threat and the YVL Guides shall be used as the planning criteria for security arrangements. Section 3 does not define in greater detail the abilities of the party potentially engaging in activity that endangers nuclear or radiation safety, because this information and other threats have been presented in detail in the design basis threat, which is confidential and safety-classified under Section 24.1(7) of the Act on the Openness of Government Activities (621/1999).

In order to ensure the security of a nuclear facility, it is important that the security arrangements are harmonised with operational activities, fire safety and emergency arrangements as well as the plans drawn up by the appropriate authorities. Radiation protection proposed in a statement (the National Police Board) has not been added to this subsection because it is part of the emergency arrangements and use of nuclear energy and is observed therein. The nuclear safeguards interface presented in the IAEA's recommendation on security arrangements (NSS No. 13, 3.28, 3.36) has been added to the regulation.

The responsibility for drawing up the design basis threat is provided for in Section 146(1) of the Nuclear Energy Decree (161/1988), and the responsible party is the Radiation and Nuclear Safety Authority. The design basis threat has been drawn up and it is based on a threat assessment provided by the Finnish Security and Intelligence Service. Section 146(2) of the Nuclear Energy Decree provides for defining the threat of unlawful action or preparing the threat description; previously, this fell under the National Police Board's responsibility. Section 146(2) of the Nuclear Energy Decree has been amended (1001/2017) so that the responsibility for defining the threat now lies with the Finnish Security and Intelligence Service.

Section 4 General planning of the use of nuclear energy

The title of Section 4 of the regulation has been amended because some of the requirements set therein are also applicable to other use of nuclear energy besides nuclear facilities (a more detailed definition of the scope of application). This section sets forth the regulations concerning general planning in more detail. Because Section 4 as a whole applies to the general design of a nuclear facility, the term "nuclear facility" has been removed from various subsections. This is justified also because some of the subsections in the regulation also apply to other use of nuclear energy.

Subsection 1 provides for the appropriate protection of locations important in terms of security. The assessment of appropriateness shall take into account both the design basis threat and the risk analyses. Based on the statements, the term efficient has been replaced with the term appropriate, because efficiency cannot be assessed unless specific criteria have been provided for it. The licensee shall assess the security arrangements in a manner that meets the goals/objectives of the regulation. In practice, this requires assessing the design basis threat and the fulfilment of the requirements laid down in Guides YVL A.11 and YVL A.12. This requirement also emphasises the licensee's responsibility to assess the suitability and efficiency analyses performed during modifications, for example, while taking into account the purpose of the security arrangements. The word "storage" has been added to subsection 1 because the locations of nuclear material and nuclear waste in nuclear material transports, for example, vary and may be temporary locations.

Subsection 2 contains provisions on the application of the defence-in-depth principle by means of setting different security zones. This makes it possible to detect, delay and respond to any activity endangering nuclear or radiation safety as efficiently as possible, and the defence-in-depth principle used in security arrangements can be complied with. The wording has been modified to align with the risk-based approach (highlighting the safety (including security) significance).

Subsection 3, which is a requirement for the basis of setting security zones, has been added to Section 4 of the regulation: when planning the security zones of a nuclear facility, it shall be based on nuclear and radiation safety and the appropriate implementation of security arrangements. No area shall be approved as a stay and movement restriction area (at nuclear power plants: site area) if it is not significant in terms of nuclear and radiation safety or the appropriate implementation of security arrangements at the nuclear facility. For example, an accommodation village is not included in the stay and movement restriction area with regard to security arrangements because regulations concerning the home privacy are also to be applied there.

Subsection 4 contains provisions on using security zones to provide appropriate security arrangements against activity endangering nuclear or radiation safety. This is justified in order to ensure the purpose of the security arrangements. The proposed wording is based on the fact that, instead of assessing the integrity of the interfaces, the entire security zone and the security arrangements implemented inside it are assessed as a whole. The assessment of appropriateness shall be based on the design basis threat, and the assessment shall present how the threat is repelled.

Subsection 4 also contains provisions regarding the use of surveillance systems in order to enable detection, for example. Surveillance/detection systems are a key part of the systems important for the safety of a nuclear facility, since unlawful action and other compromising activity targeted towards them might jeopardise the purpose of the security arrangements and, indirectly, also affect nuclear safety. In terms of detection, the requirement has been moderated because not all threats can be continuously detected and, therefore, the fulfilment of the requirement is not always possible.

Subsection 5 requires the use of appropriate information/cyber security principles in the design and maintenance of the nuclear facility's different systems and other important locations. The principles applied shall be appropriate, and maintenance is an essential part of information/cyber security throughout the nuclear facility's life cycle. Observation and prevention alone are not sufficient measures, and the limitation of negative consequences is an essential component of the requirement. The assessment of appropriateness shall be based on the design basis threat, and the assessment shall present how the threat is repelled. It shall be presented how the specific solutions have been arrived at and how they are used to prevent activity endangering nuclear or radiation safety. This requires assessing the solutions against the design basis threat, for example. A requirement concerning plans related to information/cyber security has been added to the subsection, because information/cyber security processes shall be implemented in a systematic manner.

Information/cyber security is one subarea of security arrangements. Information/cyber systems may be utilised as an attack vector for activity endangering nuclear or radiation safety, which in turn requires that they be appropriately protected. Subsection 5 has been modified so that the requirement applies to information, communications and I&C systems as well as systems and equipment as a whole. The word "advanced" has been removed because it specifies the manner of implementation, the assessment of which falls under the licensee's responsibility. Unauthorised action also covers unauthorised access. Detecting and preventing information/cyber security deviations is important, since it may also reveal information/cyber security threats to systems important for nuclear safety that are not attributable to unauthorised action.

Subsection 6 presents a requirement concerning preparing for extraordinary situations resulting from information/cyber security threats. This applies to all use of nuclear energy to which the regulation is applied. This is justified from the point of view of continuity planning and recovery. Information/cyber security threats shall be prepared for and processed. For example, many of the systems in modern nuclear facilities rely on information/cyber systems, which is why preparation for information/cyber security threats is emphasised today. The preparation obligation applies to activity even prior to the occurrence of a threat.

Subsections 7 and 8 are entirely new with respect to the previous regulation (2016):

Subsection 7 presents a requirement on taking quality assurance into consideration. The requirement is based on the CPPNM(A) Fundamental principle J: Quality Assurance. The justification for maintaining security arrangements is presented in subsection 3.57 of NSS 13 (sustainability programme). The principle of continuous

improvement is presented in safety-related requirements, and this principle also applies to security arrangements. The wording has been altered based on the statement (TVO and Posiva). In terms of quality assurance, an ISO-standard compliant approach, for example, may be used.

Subsection 8 sets forth a requirement concerning the implementation of secure communication arrangements to deal with threats. The requirement is based on subsections 4.32, 5.38 and 6.29 of NSS No. 13. The requirement concerns organisation of secure communication internally and between the security personnel and authorities. The buildings of nuclear facilities in particular are sturdily built and affect the functionality of various communication systems, particularly inside the buildings. The licensee shall carry out arrangements which ensure the functionality of the communication systems of both the security personnel and the authorities, particularly when under a threat. Transports of nuclear material and nuclear waste are special situations (a mobile situation), which heightens the necessity of ensuring good communication between the licensee and the authority. In this case, communication refers to real-time communication between different operators when under a threat – not to the preparation of notifications, for example.

Section 5 Internal threats

The section title “Personal security” was changed to “Internal threats”, which more aptly describes the content of the section since the requirements therein address the prevention of internal threats.

The previous subsection 1 of Section 5 of the regulation, referring to security clearances, was removed because it has been moved to the Nuclear Energy Act. Therefore, the numbering of the requirements has also been updated.

Since security clearances are only one part of the actions taken in order to repel internal (insider) threats, it is justified to require that the licensee describe the actions taken in order to combat the threats mentioned above. In particular, it is emphasised that the actions taken to repel threats caused by persons shall be *systematically* applied to the subcontractors employed by the licensee and their employees in a risk based fashion. The wording has been altered based on a statement (Fennovoima). STUK shall assess the sufficiency of the actions based on the licensee’s proposal. The tasks and rights to receive and use information of persons participating in the use of nuclear energy must be defined in order to ensure that sensitive information or access thereto or to the item protected is limited only to persons who have a justified need for it based on their work tasks. A requirement concerning regular evaluation of these rights has been added to the requirement based on a statement (Fennovoima). This helps to ensure that the rights remain valid only as long as they are needed.

The obligation laid down in subsection 2 to wear an access pass in an area referred to in Section 2(1)(2) of the Nuclear Energy Act shall not offer an opportunity to deviate from the corresponding requirement set forth in Guide YVL A.11.

Section 6 Implementation of security arrangements, and maintenance of security

Subsection 1 of Section 6 of the regulation has been modified. The list of documents related to security arrangements has been removed, according to which security

arrangements shall be carried out, because they are to be implemented according to the legislative requirements to which there is no need to refer separately. The Nuclear Energy Act presents a requirement that security arrangements and any changes made to them shall be approved by STUK. Because of this, the requirement concerning the matter proposed at the draft stage has been removed as unnecessary. All documents concerning security arrangements shall be kept up to date. This requirement also applies to documents other than those approved by STUK (such as the security services procedures), in which the implementation of the security arrangements has been described and presented. This ensures that the personnel have up-to-date instructions on the correct actions at their disposal, regardless of whether the document has undergone STUK's approval procedure.

A requirement in subsection 2 lays down that the efficiency of the security arrangements may not be significantly reduced by any failure or hazard scenario of a single security system, structure or component. This is justified, as the significance of security arrangements in ensuring safety is emphasised under these circumstances in order to ensure nuclear or radiation safety. Disturbances have also been added to the subsection, in addition to failure. Subsection 2 has been modified such that it does not attempt to provide an exhaustive list of events, disturbances or threats corresponding in scope with the common cause failure and during which the security arrangements shall be ascertained; instead, one example has been used, and threats comparable to it in terms of severity have been referred to. Such threats include natural disasters (such as floods, storms), severe fires, loss of electricity and related consequences such as a severe pandemic, which may affect the availability of critical personnel. Nuclear and radiation safety shall also be ensured under these circumstances, taking security arrangements into account. In terms of common cause failures, the requirement has been moderated in accordance with the risk-based approach. Subsection 2 consists of two types of threats in a risk based fashion: a single cause failure and a common cause failure or events of a similar scope. Similarly, there is a two-tier requirement level concerning the objectives of security arrangements: for a single cause failure, it is required that efficiency is not significantly reduced; and for a common cause failure (or an event of a similar scope), it is required that security arrangements can be taken care of.

Subsection 3 contains provisions regarding exercises. Regular exercises are required from security personnel in order to ensure the level of security arrangements, and they shall take place according to the licensee's documents governing the matter. Because the design basis threat shall be used as a basis for planning and assessing security arrangements, it is justified that the exercises involve threats described in the design basis threat.

Subsection 4 contains provisions on the licensee's responsibility to demonstrate the efficiency of the security arrangements when under a threat against activity endangering nuclear or radiation safety. Exercises are one way of demonstrating efficiency. Using other appropriate methods of demonstration has also been added to the subsection, based on a statement (Fennovoima).

Subsection 5 provides for joint exercises with the authorities. Since cooperation with the security authorities is especially emphasised during threats, the requirement for regular exercises with the authorities is justified. In practice, this shall take place as

agreed with the authorities in question. The authorities shall, therefore, be provided with the opportunity to participate in the exercises.

Subsection 6 obliges the licensee to keep the entire personnel up to date on the actions and practices related to security arrangements. This also affects the maintenance of safety culture. Safety culture as a concept also covers security arrangements. Justifying the actions and presenting them as openly as possible to the entire personnel may affect the efficiency of the security arrangements, since the entire personnel can be committed to following the specified practices. The starting point is that induction (which also covers training) contains the necessary matters concerning security arrangements. Induction is also important in other use of nuclear energy. The subsection has been modified based on a statement (Fennovoima) such that it covers the entire personnel instead of only applying to the operating personnel. It shall also be taken into account that the requirement also applies to personnel participating in the design of a nuclear facility, for example, even if they would not visit the plant site. Such personnel shall be sufficiently familiarised with the security arrangements related to the use of nuclear energy, such as information security. This is particularly vital with regard to persons processing sensitive information.

Subsection 7 is new. It requires the supervision of information/cyber security with appropriate methods in order to observe, prevent and clarify abnormal events and manage their consequences. This highlights security arrangements as a whole and the significance of information/cyber security in overall safety. The appropriate methods described in the requirement consist of the licensee's information/cyber security plans and instructions. Guide YVL A.12 Information security management of a nuclear facility sets requirements for information/cyber security, based on which the licensee shall implement the management systems and the procedures related to information security. These are the *appropriate procedures* referred to in the requirement.

Section 7 Control of personnel and goods traffic

Section 7 of the regulation contains provisions regarding the justifications for visiting a nuclear facility and control of personnel and goods traffic. Security arrangements (including access control) cannot be implemented appropriately unless measures against activity endangering nuclear or radiation safety have been planned in advance. This requires implementing specific actions (such as guest visits), determining identities and defining access rights to the different security zones. The passage of the licensee's personnel is also a transaction within the meaning of the section.

Furthermore, subsection 2 now includes transports of nuclear material and nuclear waste and mining operations, the purpose of which is the production of uranium or thorium, because confirming the relevant person's identity in these tasks is necessary in order to carry out the security arrangements. Based on a statement (the National Police Board), a requirement concerning training has been added to subsection 2. In addition to security personnel, other persons responsible for implementing security arrangements have been added to the subsection, because nuclear security officers do not work in an area referred to in Section 2(1)(2) of the Nuclear Energy Act.

Subsection 3 presents a requirement that movement in the area of a nuclear facility and in the area of a mine intended for the production of uranium or thorium shall be restricted in compliance with the purpose of the visit, and it shall be controlled. The addition concerning mining operations (specification of the scope of application) is new. This requirement obliges the licensee to define the access areas, access control and surveillance of movement suited for the purpose. The area of a nuclear facility includes various security zones, of which the outermost zone, the stay and movement restriction area (at nuclear power plants: the site area), extends several kilometres beyond the actual plant site in some cases. If visiting is limited to this area only, to a visitor centre or similar place for example, the licensee shall determine what kind of supervision it employs for the visiting in question. Primarily, security clearances are intended for persons who work at the site of the actual nuclear facility (plant area, protected area, vital area). However, this does not entirely exclude the possibility to use security clearances if the authority conducting security clearances (the Finnish Security and Intelligence Service) clears a person who only visits the outermost security zone. In the area of a mine intended for the production of uranium or thorium, the licensee shall, based on the purpose of the activity, determine the aforementioned access areas where visiting is limited and supervised in order to carry out the security arrangements.

Subsection 4 provides for inspections. Ensuring the efficiency of security arrangements requires inspections that target persons, vehicles and goods in order to ensure that they do not without authorisation introduce into a nuclear facility items or substances that may jeopardise nuclear or radiation safety. Items or substances that may jeopardise safety are introduced into a nuclear facility on a daily basis, yet with permission and under supervision. Security surveillance shall be planned and systematic and it shall extend to everyone visiting a nuclear facility. Subsection 4 clarifies Section 7(3) of the regulation in terms of surveillance of movement. The licensee shall describe the performance of said surveillance in its procedures. Because the area of a nuclear facility consists of several security zones, it is important that the licensee defines the inspection procedures in its instruction procedures. For example, the inspection of vehicles in a basic emergency situation may not be necessary until reaching the boundary of the plant area, but a full emergency situation may render inspections necessary already at the boundary of the actual site area. In consideration of this, a requirement concerning the point where inspections shall be conducted *at the latest* has been added to the regulation.

Vehicles, goods traffic and other traffic shall also be supervised and monitored in addition to persons. In particular, it should be emphasised that the confidential nuclear information mentioned in Section 7(6) of the regulation refers to a confidential document that concerns security arrangements or nuclear safety, the information available in such a document and documents and material produced on the basis of such information. Nuclear information containing data relevant in terms of the proliferation of nuclear weapons is classified as nuclear use item. In this case, even a single file may be considered confidential nuclear information unless it is apparent that the information it contains will not endanger nuclear or radiation safety or the implementation of the purpose of security arrangements. Confidential nuclear information may only be used and handed over for the purpose it has been provided for, unless the one defining the protection class of the information has given its consent for some other purpose. The licensee shall ensure that access to confidential

nuclear information is limited to those individuals that require this information for their work. Correspondingly, Section 78 of the Nuclear Energy Act requires that persons who hold or have previously held such positions shall keep confidential any parts of the nuclear information protected that they have become aware of during their work. The subsection has been modified in accordance with a statement (TVO and Posiva) so that the risk-aware approach has been taken into account in the requirement, in addition to which the wording of the requirement has been updated based on the statement by the National Police Board.

Detection and prevention methods are required in order to prevent the unauthorised removal, with persons or goods, of nuclear material, nuclear waste, other radioactive substances or confidential information from a nuclear facility or some other site where nuclear energy is used. STUK will evaluate their adequacy at the proposal of the licensee. Subsection 6 of the regulation has been modified in order to correspond to current requirements. The word *appropriately/appropriate* has been removed from subsections 5 and 6 because the term is vague and cannot be defined in practice. Assessment shall also be performed against the threats presented in the design basis threat, which allows for a practical assessment of the objective of the existing requirement.

Subsection 6 has been clarified. The words “of others” have been added because nuclear material is a radioactive substance but not all radioactive substances are nuclear material. Because the scope of application has been expanded to cover other use of nuclear energy besides nuclear facilities, the words “in a nuclear facility” have been replaced with the words *in the use of nuclear energy* to cover these situations in a manner specified in more detail in the scope of application.

Section 8 Qualification requirements for nuclear security officer

The previous (2016) subsection 1 was removed from Section 8 of the regulation because, in the amendment of the Nuclear Energy Act (964/2020), the training requirements of security personnel are provided by the law following the amendment of the Nuclear Energy Act. Subsection 2 preceding the current subsection 1 has been modified more generally to constitute an obligation applicable to the licensee so that it will not oblige individual employees, something that should be provided by the law. The term “security organisation” has been removed because it is no longer used in the Nuclear Energy Act. It has been replaced by the term “nuclear security officer”.

Section 9 Special requirements related to the use of force and use of force equipment

Section 9 of the regulation presents the special requirements concerning the use of force and use of force equipment. In the use of force, competence in the use of force equipment is required. The competence requirements have been separately defined in the nuclear facility security standing order.

The use of force usually interferes with fundamental rights. This requirement ensures that only equipment that has been deemed necessary by the Ministry of the Interior, the Advisory Commission on Nuclear Security and STUK during the approval of the security standing order is used as use of force equipment.

A reference to Section 7 t of the Nuclear Energy Act has been corrected in the regulation, which following the legislative amendment provides for the right of security personnel to use force.

Section 10 Central Alarm Station

Section 10 of the regulation contains provisions regarding the central alarm station and stand-by station of a nuclear facility. A central alarm station and a stand-by station are required at a nuclear facility in order to ensure and control the security arrangements and the operation of the nuclear security officers, assess the alarms received, monitor the progress of the situation, and maintain an overall picture of the situation. The connections to manage the situation and to maintain and communicate an overall picture of the situation shall be secure. Contact with the *command centre* has been added to the regulation because this is needed under a threat. The word "always" has been removed from the requirement concerning staffing in the central alarm station because it is not always possible when transitioning from the central alarm station to the stand-by alarm station. In terms of separation, the requirement has been moderated so that both distance and structural solutions may not necessarily be required.

Preparing for threats also includes the advance planning of appropriate external prerequisites and communication systems. The regulation stipulates that these functions be implemented in a redundant manner that makes them available and operable even during unexpected threats or under abnormal operational conditions.

The practices required for the transport of nuclear material and nuclear waste are assessed on a case by case basis, but they also require security arrangements with alarm connections in order to prevent activity endangering nuclear or radiation safety.

The terminological change concerning the central alarm station presented in the statement by the National Police Board has not been implemented because the term is a well-established one in the private security sector.

Section 11 Command centre and leadership

Section 11 of the regulation contains provisions regarding the command centre and leadership required to repel threats endangering nuclear and radiation safety. With regard to the leadership of security arrangements, the amendment of the regulation necessitates that a nuclear facility and nuclear material transports related to its operations always have someone appointed to lead the security arrangements. The wording has been amended based on a statement (TVO and Posiva) so that the person may not necessarily need to be physically present at the nuclear facility or accompany the transport, because it is possible that the person concerned works in a leadership position at the police, for example, which may not be located at the site of the nuclear facility in question. If the nuclear facilities of two different licensees are located inside the same site area, it is possible that the same organisation formed by the security personnel is used for security arrangements. In this case, the person in charge of leading the security arrangements as presented in the requirement shall be in charge of leading the security arrangements of both nuclear facilities. More specific requirements on joint activities are provided in Guide YVL A.11.

After a discussion with the licensees, a requirement concerning the person in charge of the operational management of the security personnel has been added to the regulation. In practice, this refers to a defence or guard supervisor who leads the operations of the security personnel under a possible threat. Such a person shall be continuously present at the nuclear facility or in a related transport of nuclear material; remote operational management is not possible.

Since it is important for the purpose of repelling threats that the organisation can be led from a protected location, a command centre and a stand-by centre are required for this function. A command centre or a stand-by centre will be manned if necessary and as laid down in the licensee's plans. In order to ensure suitable leadership, the communications with the control room and the police shall be redundant and secure. Even the regulation (2016) had altered the wording of the previous decree in order to make it easier to understand. The previous version had used the terms "command centre" and "command centre function". An amendment aligning with the one in Section 10 has been added to the regulation (contact with the central alarm station). The wording has been clarified and the person in charge of leading the security arrangements has been inserted into a separate requirement. In terms of separation, the same terminology has been used as for the central alarm station; furthermore, both distance and structural solutions are not required. The licensee shall plan and implement the central alarm station and command centre functions. The requirement does not provide that these centres must be located in separate facilities; it is possible to operate them in the same facility. In such a case, however, it shall be ensured that their use is practically possible (such as sufficient facility needs, fixtures, etc.). Furthermore, requirements concerning matters such as access control and access management shall be taken into account, since they may restrict the extent to which the centres may be combined into one facility.

In order to enable the leadership of police operations, a suitable room shall be appointed for use by the police. The equipment of the room shall be agreed on with the police. The police will decide on the best location for commanding its activities on the basis of the situation in question.

At a nuclear power plant, the same person cannot be simultaneously responsible for the emergency functions and the commanding of the security organisation. This is justified, since most nuclear power plants are too versatile and large for a single person to manage several tasks simultaneously.

Section 12 Actions to be taken when under threat

Section 12 of the regulation contains provisions regarding the actions to be taken when under threat. The actions to be taken when under threat are those described by the licensee in the security standing order, the security plan or other instructions of the licensee.

In order to ensure the correct dimensioning of police resources, the police shall be alerted as soon as the threat has been detected. The wording has been altered to be more easily understandable. The status of the situation shall be relayed to the police before their arrival in order to allow them to organise their activities and counter the threat.

A dedicated, trained person shall lead the operations of the nuclear security officers. The Nuclear Energy Act contains provisions regarding the transfer of leadership responsibility to the police, since STUK may not issue regulations that apply to the police.

The licensee shall appoint a sufficient number of persons with knowledge of the facility, radiation protection and security arrangements to assist the police. Security arrangements have been added to the requirement based on a statement (the National Police Board). This is justified in order to ensure the security of the facility's operation and personal security. Subsection 4 uses the expression "is responsible for" regarding the licensee's responsibility, since the police has the overall leadership responsibility during a threat. However, nuclear security officers shall make use of their powers stipulated by the Nuclear Energy Act in such situations primarily under the leadership of the police.

Section 13 Notifying the Radiation and Nuclear Safety Authority (STUK)

Section 13 of the regulation contains provisions regarding the duty to notify STUK. Under a potential threat, it is important that STUK receives information regarding the threat without delay. In this case, if so required by the situation, the necessary actions required to take care of the situation can be started at an early stage. Preparing for any media enquiries also requires that information is provided as early as possible.

If the situation so requires, STUK will inform other authorities of the situation; however, this requirement is not included in the regulation, since STUK may not set requirements for itself in a regulation.

Section 14 Drafting of plans

Section 14(1) of the regulation contains provisions regarding the drafting of plans on security arrangements in cooperation with the police in order to ensure that actions are taken while considering the starting points and resources for police activities. The joint preparation also promotes cooperation between the licensee and the police authorities, ensuring that different viewpoints are taken into account and that the required information concerning the facility and its operating environment is relayed to the police. The subsection has been modified based on a statement (the National Police Board) so that the police is not obliged to prepare any plans. STUK may not issue requirements concerning any other authorities.

Subsection 2 of Section 14 of the regulation is new and contains provisions regarding procedures concerning the retrieval of lost or stolen nuclear material or nuclear waste and the obligation to reduce radiation impacts as a consequence of activity endangering nuclear or radiation safety.

The international convention (CPPNM/A, 2A b) requires that a party of the convention implements systematic procedures that help retrieve stolen or lost nuclear material. In accordance with the requirement, the licensee of the nuclear material shall prepare systematic practices in order to retrieve the nuclear material. This consideration was also highlighted in a third-party assessment concerning requirements for security arrangements.

Subsection 2 of Section 14 of the regulation contains provisions regarding the obligation to reduce radiological consequences when these have been caused by unlawful action directed towards a nuclear facility or transport of nuclear material (sabotage). The justification for the requirement has been set forth in Article 2A, item (d) of the CPPNM(A). This consideration was also highlighted in a third-party assessment concerning requirements for security arrangements.

Section 15 The nuclear security officer's uniform, and marking the movement and stay restriction area

Subsection 1 of Section 15 of the regulation contains provisions regarding marking of the movement and stay restriction area of a nuclear facility. The marking can be done by means of signs or strips, but they shall indicate the factors specified in Appendix 1 to the regulation. The markings help to ensure that a person in or entering the area of a nuclear facility can, based on the signs, observe that they are in an area where movement is restricted and a permission from the licensee is required. Red colour has been added to the edges of the restriction sign based on the National Police Board's statement, and it is also possible to use marking strips in addition to signs (Fortum).

The size of the sign or its font size, type or colour codes have not been specified. Therefore, they may have minor differences in tone, but the main colours have been determined. In terms of size, it is possible that some sites may have to use signs of varying sizes, which is why a size requirement has not been set. However, the sign or strip shall be easily noticeable and the text in it shall be legible. The writing style in Finnish and Swedish shall be the same.

Subsection 2 of Section 15 of the regulation contains provisions regarding the uniforms of the nuclear security officer and the identifiers used in them. The requirements concerning the nuclear security officer's uniforms and the markings and identifiers used therein are entirely new, and their purpose is to harmonise the markings used. In connection with the amendment of the Nuclear Energy Act, STUK has been issued with the authority to make provision for the matter. A person working in or visiting a nuclear facility shall be able to reliably identify nuclear security officer based on their uniforms and the markings therein. There shall be no likelihood of confusion with the uniforms worn by the security authorities. The issue is significant in terms of the legal protection of both the nuclear security officer and the person subjected to their measures. Nuclear security officers exercise significant powers in their role stipulated by the Nuclear Energy Act; consequently, it is necessary that they can be identified. Both Finnish and Swedish have been used in the markings concerning the nuclear security officers. Since a considerable number of people who speak other languages work in the nuclear facilities (particularly during annual outages), English is also used in the markings. Due to the lack of space, markings on the back shall only be provided in English since it is understood by all.

Based on statements (Fortum, TVO and Posiva), the requirements have been modified to be more clear in terms of presentation, and the order of the requirements has been changed (Fennovoima). Similar terminology has been used as in the decree issued by the Ministry of the Interior concerning the uniforms of guards and security persons (stewards) (875/2016).

Appendix 1 to the regulation has been modified based on statements (the National Police Board, TVO, Posiva and Fortum), so that practical implementation has been observed to the extent possible. Based on the statements given by the licensees, the requirement concerning the colour of the nuclear security officer's uniform has been removed as unnecessary. This is justified because nuclear security officers serving in different positions have to wear uniforms of varying colours and types due to reasons such as occupational safety (such as in a radiation-shielded area). In terms of workwear, it is essential that the nuclear security officers can be effortlessly identified as such based on their uniform and the markings therein and that there is no risk of confusing them with the authorities, for example. Because of this, a specific colour code has not been determined for the markings referred to in Appendix 1; based on the uniform, the background colour or font colour of the markings may vary slightly without compromising their identifiability. Table 1 specifies the main categories of uniforms and the related clothing items. For example, a clothing item similar to a high-visibility vest may be used in some tasks instead of a coat (main category: coat). These items shall be equipped with markings that are in line with the main category.

Section 16 Obligation to observe confidentiality and secrecy

Section 16 of the regulation contains provisions regarding the obligation to observe confidentiality and secrecy. The section addressing the obligation to observe confidentiality and secrecy has been modified so that it indicates to whom or to which functions it applies. References to current legislation have been updated.

Section 17 Entry into force

Section 17 of the regulation contains provisions regarding the entry into force of the regulation. It repeals the Radiation and Nuclear Safety Authority's Regulation on the Security in the Use of Nuclear Energy issued on 22 December 2015.

The intention is for the regulation to enter into force on 29 December 2020 and shall remain in force until further notice.

This regulation shall be applied to any matters which are pending upon the entry into force of this regulation.

Section 18 Transitional provision

Section 18 of the regulation contains provisions regarding the compulsory nature of the markings used in workwear of the security personnel and in indicating the movement and stay restriction area of the licensee's nuclear facility, valid as of 1 January 2022; this means that the markings currently used by the licensee may be used until 31 December 2021.

Availability of the regulation, guidance and advice:

This regulation has been published as part of the regulations issued by the Radiation and Nuclear Safety Authority that can be found on Finlex at: http://www.finlex.fi/en/viranomaiset/normi/555001/. The regulation is also available from the Radiation and Nuclear Safety Authority.