

Radiation and Nuclear Safety Authority Regulation on the Emergency Arrangements of a Nuclear Facility

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In accordance with the Radiation and Nuclear Safety Authority's decision, the following provisions are issued under section x, subsection x of the Nuclear Energy Act (xx/yyyy):

Chapter 1 Scope and definitions

1 Scope

SYT-6135 - This regulation shall apply to the emergency arrangements of nuclear facilities.

2 Definitions

For the purposes of this regulation:

- 1) *helper in an emergency* shall refer to the type of emergency helper referred to in section 4, subsection 30 of the Radiation Act;
- 2) *emergency worker* shall refer to the type of emergency worker referred to in section 4, subsection 33 of the Radiation Act.

3 Classification of emergency situations

SYT-5777 - Emergency situations are classified according to their severity and manageability:

- 1) an alert, where the aim is to ensure the safety of the nuclear facility in exceptional situations by preparing for the deterioration of the situation with possible proactive measures;
- 2) a site area emergency, where the safety of the nuclear facility deteriorates or threatens to deteriorate significantly;
- 3) a general emergency, where there is a risk of the release of radioactive substances that may require protective measures in the vicinity of the nuclear facility.

Chapter 2 Planning of emergency arrangements

4 Design basis for emergency arrangements

SYT-5775 - The nuclear facility's emergency arrangements shall be based on analyses used to ascertain the timelines of accidents resulting in releases. These analyses are subject to the provisions of the Radiation and Nuclear Safety Authority's regulation on computational and experimental demonstration of the safety of the design solutions of a nuclear facility (STUK Y/x/202x). The analyses shall take into account variations in the state of the plant, the

development of events as a function of time, the radiation situation at the plant, releases, release routes, and weather conditions.

The analyses of the consequences of an accident shall consider the radiation exposure-related impact that the protective measures would have on the population.

SYT-5776 - The planning of emergency arrangements shall take into account

- 1) the effective management of emergency situations, ensuring the safety of people in areas subject to restrictions on access, movement and stay, and promptly launching measures to prevent or limit the radiation exposure of the population in the emergency planning zone;
- 2) the occurrence of simultaneous emergency situations in all nuclear facilities in the area subject to restrictions on access, movement and stay, and the possible consequences thereof, in particular the radiation exposure caused by the situation at the site and in its vicinity, and arranging access to the area in this type of situation;
- 3) events that reduce safety, their combinations, their manageability, and the severity of the consequences, as well as threats related to illegal activities and their potential consequences;
- 4) the duration of the emergency situation bearing in mind that emergency situation may be prolonged;
- 5) preparedness for receiving external assistance during an emergency situation.

SYT-5758 - The design basis for emergency arrangements shall be assessed regularly, in connection with significant plant-related modifications, and whenever necessary.

5 Coordination of emergency arrangements

SYT-5756 - Emergency arrangements shall be coordinated with the operation, fire protection, and security arrangements of the nuclear facility.

SYT-5757 - The plant's official radio network coverage shall be sufficient, taking the needs of the rescue department and the police into account.

6 Determination of the precautionary action zone and emergency planning zone

SYT-5755 - When determining the precautionary action zone referred to in section 65 of the Nuclear Energy Act and the emergency planning zone referred to in section 66 of the Nuclear Energy Act, the process shall address an accident scenario that is more severe than what the nuclear facility's planning has accounted for. In addition, when determining the precautionary action zone, it shall be assumed that the plant's ability to limit emissions to the environment has

significantly deteriorated. General-purpose analyses may be used to define the precautionary action zone and the emergency planning zone if they can be demonstrated to cover any plant and site-specific differences. When defining the precautionary action zone, more conservative assumptions should be used for the accident scenario than when defining the emergency planning zone. The emission calculations can utilise realistic dispersion conditions.

SYT-5752 - When determining the size of the precautionary action zone, it shall be demonstrated that, in the event of an accident referred to in subsection 1, the radiation dose received by an unprotected person outside the precautionary action zone does not exceed 1 Sv within 10 hours of the beginning of the exposure.

SYT-5753 - When determining the size of the emergency planning zone, it shall be demonstrated that, in the event of an accident referred to in subsection 1, the radiation dose received by an unprotected person outside the emergency planning zone does not exceed 10 mSv within 48 hours of the beginning of the exposure. The emergency planning zone may extend to a maximum distance of approximately 20 km, taking local conditions into account. The precautionary action zone is included in the emergency planning zone.

7 Basis for implementing emergency planning measures

SYT-5721 - In addition to the provisions laid down in section 173 of the Nuclear Energy Act, the licensee shall ensure that the emergency response organisation is prepared to:

- 1) analyse emergency situations and their consequences;
- 2) assess the expected evolution of emergency situations;
- 3) take corrective actions necessary for managing and limiting accidents;
- 4) continuously and effectively exchange information with public authorities;
- 5) provide information to the media and members of the public;
- 6) take other measures required by the emergency situation.

8 Preparedness for assessing a situation and measurements

SYT-5728 - The emergency response organisation shall be prepared to analyse the situation at the facility. In order to analyse the situation, preparations shall be made for assessing the technical status of the facility, the release of radioactive substances or the threat of releases,

and the radiation situation inside the facility, in areas subject to restrictions on access, movement and stay, and in nearby areas.

SYT-5729 - The radiation measurements of the nuclear facility shall be organised in a way that they provide sufficient information on the radiation situation at the facility for the purposes of implementing emergency response measures.

SYT-5726 - The emergency response organisation shall be prepared to investigate the radiation situation in areas subject to restrictions on access, movement and stay and in the precautionary action zone. The radiation measurements used to continuously monitor the state of the environment shall be suitable for accident conditions.

SYT-5727 - The emergency response organisation shall have access to meteorological data in the immediate vicinity of any areas subject to restrictions on access, movement and stay, and be able to assess the spread of radioactive substances and the radiation exposure caused to the population by the releases in emergency situations. The meteorological data shall be reliably available to the emergency response organisation. The meteorological data shall be transmitted to the Radiation and Nuclear Safety Authority and the Finnish Meteorological Institute using fixed systems.

9 Personnel protection preparedness

SYT-5725 - To prepare for an emergency situation, appropriate personnel alert arrangements, meeting points in areas subject to restrictions on access, movement and stay, evacuation arrangements, necessary personnel protective equipment and radiation measuring equipment, and iodine tablets (according to the threat posed by the facility) shall be in place. These arrangements shall take into account not only the permanent and temporary personnel working in areas subject to restrictions on access, movement and stay, but also any emergency workers and helpers who may enter these areas during an emergency situation.

SYT-5722 - The licensee shall be prepared for contamination measurements for personnel and their decontamination.

10 The nuclear power plant's emergency response centre and the facilities required by the emergency response organisation

SYT-5731 - The management of a nuclear power plant's emergency response activities requires an emergency response centre. The emergency response centre shall be available at all times

and be operational and inhabitable during an emergency situation. The facilities shall comply with the requirements laid down in section 43, subsection 3, and section 47, subsections 1 and 2 in the Radiation and Nuclear Safety Authority's regulation on the technical safety requirements for a nuclear power plant (STUK Y/x/202x).

SYT-5740 - Facilities required for managing emergency situations at nuclear power plants shall be identified, and their functionality and habitability shall be sufficient for the safe management of the situation.

SYT-5741 - The management of the emergency response organisation requires a backup command post that is available for managing the plant's emergency response activities in the event that the emergency response centre becomes unavailable. The operating condition and habitability of the backup command post shall be implemented on a risk-oriented basis. The emergency response centre or backup command post shall be located in the area that is subject to restrictions on access, movement and stay.

11 Facilities required for emergency response activities at other nuclear facilities

SYT-5739 - The arrangements for facilities used in other nuclear facilities to manage emergency situations shall be implemented on a risk-oriented basis.

SYT-5736 - The operating condition and habitability of facilities used in other nuclear facilities to handle emergency situations shall be implemented on a risk-oriented basis.

12 Supplementary requirements for facilities

SYT-5734 - The routes used to access the facilities required in emergency situations shall be sufficiently quick and safe to limit any radiation exposure.

SYT-5735 - The facilities required in emergency situations shall be suitable for the emergency response organisation's training- and education-related needs.

SYT-5732 - Space shall be reserved in the emergency response facilities for the Radiation and Nuclear Safety Authority during emergency situations. Space shall also be reserved for representatives sent by other authorities in accordance with the emergency plan.

SYT-5733 - The facilities reserved for emergency situations shall be kept continuously available

and in full operating condition.

13 Emergency response equipment

SYT-5809 - Based on its characteristics, the nuclear facility shall have appropriate equipment for emergency situations. A sufficient quantity of equipment shall be reserved, and their placement shall facilitate the effective management of emergency situations.

SYT-5810 - For the management of emergency response activities, the nuclear facility shall have reliable communication and alarm systems in place to facilitate its internal and external communications. A recording shall be retained of all communication between control room and emergency response centre during emergency situations.

SYT-5807 - The information transmitted by means of automatic data transmission, as referred to in section 180, subsection 2 of the Nuclear Energy Act, shall be presented in such a format that allows the assessment of the emergency situation. The information transmitted via the data transmission system shall correspond to the facility.

SYT-5808 - In accordance with the properties of the facility, the licensee shall be prepared to use mobile devices for ensuring safety.

SYT-5805 - The equipment reserved for emergency situations shall be kept continuously available and in full operating condition.

SYT-5806 - Suitable tools and facilities shall be reserved for carrying out repairs at the nuclear facility during emergency situations.

14 Emergency plan

SYT-5804 - The emergency plan, which is referred to in section 176 of the Nuclear Energy Act, shall include the following details:

- 1) emergency response organisation;
 - a. the emergency response organisation's personnel;
 - b. the continuous capacity of the licensee to respond to emergency situations;
 - c. the target time for reaching the operating condition of the emergency response organisation;

- 2) measures included in the emergency arrangements;
 - a. the classification of emergency situations and the descriptions of the events and accidents on which they are based;
 - b. the alarms systems of the emergency response organisation;
 - c. management of the emergency situation and conducting situational assessments;
 - d. radiation protection and safety of workers in emergency situations;
 - e. measures taken by the licensee related to the rescue operations;
 - f. procedures and criteria for the resolution of emergency situations and for the management of post-event actions;
- 3) the facilities, tools, equipment, communication systems, and data transmission systems required for emergency arrangements;
 - a. information on data transmission systems and data transmission arrangements;
 - b. the format used to exchange data in the event of an emergency situation;
 - c. the maintenance of facilities, tools, equipment, communication systems, and data transmission systems;
- 4) the alarm systems and arrangements for alerting the population in the areas nearby the nuclear facility
 - a. procedures for informing the public;
 - b. alerting the public in an emergency situation;
- 5) training and emergency exercises related to emergency arrangements;
- 6) other matters necessary for emergency arrangements;
 - a. a report on the maintenance of emergency preparedness;

15 Instructions for emergency arrangements

SYT-5820 - The instructions for emergency arrangements, referred to in section 177 of the Nuclear Energy Act, shall comprehensively describe the measures to be taken in the event of an emergency situation. The key instructions and materials needed to assess the radiation situation and releases shall be included in the instructions. The tasks specified in the instructions shall be assigned to the emergency response organisation in advance.

SYT-5821 - The measures described in the instructions shall be planned in such a way that the principles of individual protection and optimization are taken into account in radiation protection.

16 Emergency response organisation

SYT-5819 - The leadership structure and tasks of personnel assigned to emergency response roles shall be defined in advance.

SYT-5816 - The licensee shall ensure that the personnel required in emergency situations can be reached quickly. There shall also be sufficient personnel to manage any long-term emergency situations.

SYT-5817 - The facility's operating organization shall always have a person with sufficient operational authority who can be responsible for emergency response activities until the designated manager of the emergency response organisation assumes control.

Chapter 3 Preparedness to act

17 Emergency arrangements during the commissioning of a nuclear facility

SYT-5812 - The licensee shall ensure that the nuclear power plant unit being commissioned has sufficient arrangements in place before any nuclear fuel is brought to said power plant unit.

SYT-5813 - Before the reactor reaches criticality or a similar state in another nuclear facility, the emergency arrangements shall comply with the necessary requirements. The emergency plan shall indicate the time and date after which the emergency arrangements will be required in full. The functionality of the emergency arrangements shall be demonstrated by means of an emergency exercise.

SYT-5791 - The co-ordination of the new plant unit's emergency situations with rescue operations shall be initiated during the planning phase of the plant project.

18 Emergency training

SYT-5790 - The licensee shall provide emergency training for nuclear facility personnel and other persons working in areas subject to restrictions on access, movement and stay.

SYT-5787 - The licensee shall plan the training of the emergency response organisation for at least three years at a time and ensure that training is provided at regular intervals in all areas of preparedness to act.

SYT-5788 - The licensee shall ensure that permanent and temporary personnel working at the area subject to restrictions on access, movement and stay as well as all emergency workers and helpers arriving in the site area during an emergency situation receive appropriate instruction as required by the emergency situation. The licensee shall prepare in advance material for the instruction given during an emergency situation.

19 Emergency exercises

SYT-5786 - The licensee shall annually organise emergency exercises referred to in section 175, subsection 2 of the Nuclear Energy Act. These exercises shall cover a significant share of the measures taken during emergency situations and correspond to possible sequences of events at the facility. A emergency exercise may be arranged in connection with the exercise related to the external emergency plan specified in section 48 of the Rescue Act.

SYT-5783 - The availability of the members of the emergency response organisation shall be tested regularly, and the ability of the emergency response organisation to initiate the necessary measures shall be assessed and developed on the basis of these tests.

SYT-5784 - The nuclear power plant's emergency response organisation shall have a simulator suitable for emergency exercises, and the information gained during this simulation shall be transmitted to the Radiation and Nuclear Safety Authority via the plant's data transmission system. At nuclear facilities, the use of the data transmission system shall be included in the emergency exercises.

SYT-5782 - The Radiation and Nuclear Safety Authority shall be provided with the opportunity to participate in the planning of the exercise, the exercise itself, and the evaluation of the exercise.

20 Development and evaluation of emergency arrangements

SYT-5801 - Emergency arrangements shall be evaluated regularly. The development of emergency arrangements shall take into account the experiences and conclusions on management of emergency situations, the experiences gained from exercises, as well as research data and technological developments.

SYT-5798 - The emergency arrangements shall be subject to independent assessments covering all aspects of the emergency arrangements. These assessments shall be carried out regularly during operation and to the extent necessary before the commissioning of a new plant unit. The emergency exercises shall be assessed on the basis of the objectives set for emergency response activities. Provisions on the submission of reports prepared on the exercise are laid down in section 394 of the Nuclear Energy Act.

21 Emergency arrangements for a nuclear facility/plant unit being decommissioned

SYT-5796 - The design basis for emergency arrangements shall be assessed before the initiation of the decommissioning process.

SYT-5797 - The emergency arrangements shall be kept up to date as required by the accident and risk analyses, depending on the danger posed by the plant at each stage of the process.

Chapter 4 Action in an emergency situation

22 Action in an emergency situation

SYT-5792 - In an emergency situation, the emergency response organisation shall assess the situation, determine the classification of the emergency situation, and initiate emergency operations in accordance with the emergency plan. The emergency response organisation shall keep a record of the progress of the emergency situation.

SYT-5793 - Recommendations for protective measures are issued on the basis of the classification of the emergency situation, plant status, release, or threat thereof, or other conditions threatening the plant's safety.

SYT-5751 - Where possible, the emergency response organisation shall initiate damage control and repair measures.

SYT-5749 - The licensee shall decide on the continued operation of other nuclear facilities in areas subject to restrictions on access, movement and stay, and on the co-operation between the plant's units. The use or operating status of all facilities shall support the management of the emergency situation.

SYT-5750 - During field operations in an emergency situation, the radiation exposure of emergency workers is primarily monitored using a real-time meter that alerts them to the committed dose received. Any radiation doses exceeding 20 mSv shall be immediately reported to the Radiation and Nuclear Safety Authority. Internal radiation doses shall also be assessed.

SYT-5747 - The emergency response organisation shall initiate the warning of local residents and the evacuation of areas subject to restrictions on access, movement and stay together with emergency services.

SYT-5748 - The emergency response organisation shall have procedures in place for initiating the treatment of injured persons and organising transports for further treatment.

SYT-6611 – Licensee shall have up-to-date information concerning estimated releases and information on the radiation situation.

23 Communication in emergency situations

SYT-5746 - During an emergency situation, the licensee's emergency response organisation shall submit up-to-date situation assessments as well as any significant decisions concerning the nuclear facility and their justifications to the commander of rescue operations, as referred to in section 34 of the Rescue Act, the regional rescue service, and the Radiation and Nuclear Safety Authority.

SYT-5743 - The licensee's emergency response organisation shall continuously assess the INES rating of the incident and submit this rating to STUK.

24 Command of operations in emergency situations

SYT-5742 – The manager of the nuclear facility's emergency response organisation shall ensure that personnel with the necessary expertise for assessing the safety of the nuclear facility are designated to assist the director of rescue operations.

25 Measures after an emergency situation

SYT-5767 -Any damage caused to systems, structures or components of a nuclear facility during operational occurrences and accident situations as well as any modifications made to them during emergency situation shall be investigated. Measures to further limit releases shall be continued.

SYT-5764 - The assessment of radiation doses to the population caused by the accident shall be carried out in co-operation with the authorities.

SYT-5765 - The licensee shall immediately initiate the necessary decontamination measures and an effective waste management planning process.

SYT-5762 - The reasons that led to the incident shall be ascertained and reported.

Chapter 5 Miscellaneous provisions

26 Measures pertaining to rescue operations

SYT-5761 - The licensee shall see to the publishing and distribution of the instructions referred to in section 178 of the Nuclear Energy Act.

SYT-5771 - The licensee shall maintain continuous preparedness to assist in rescue operations in emergency situations. Such measures shall be practised in co-operation with the relevant authorities.

SYT-5770 - The licensee shall, in co-operation with the rescue authorities of the wellbeing services county, plan in advance how they will warn people in areas subject to restrictions on access, movement and stay and in the vicinity of the nuclear power plant who may be directly threatened by an accident.

Chapter 6 Entry into force and transitional provisions

27 Entry into force

SYT-6613 - This regulation shall enter into force on X Y 202z and shall remain valid until further notice.

SYT-6614 - This regulation repeals the Radiation and Nuclear Safety Authority's regulation on the emergency arrangements of a nuclear power plant (STUK Y/2/2024).