The Radiation and Nuclear Safety Authority Regulation on the Emergency Arrangements of a Nuclear Power Plant, explanatory memorandum

MAIN CONTENT

By virtue of Section 7 q(23) of the Nuclear Energy Act (990/1987), the Radiation and Nuclear Safety Authority's Regulation on the Emergency Arrangements at Nuclear Power Plants is enacted. At the same time, the Radiation and Nuclear Safety Authority Regulation on the Emergency Arrangements of a Nuclear Power Plant (Y/2/2016), which entered into force on 1 January 2016, is repealed.

The regulation governs the planning of emergency arrangements at nuclear power plants, maintaining emergency preparedness and actions during emergency situations. In terms of content, the new regulation is for the most part consistent with the Radiation and Nuclear Safety Authority Regulation on the Emergency Arrangements of a Nuclear Power Plant which is repealed. The definitions of an emergency worker and a helper in an emergency corresponding to the definitions laid out in Section 4 of the Radiation Act (859/2018) are included in Section 2 concerning the definitions used in the regulation. In addition, some aspects of Sections 3, 4, 8 and 13 are proposed to be changed.

The regulation is scheduled to enter into force simultaneously with the amendment to the Nuclear Energy Act and the new Radiation Act on 15 December 2018.

General rationale

1 Introduction

The new Radiation Act (859/2018) was issued on 9 November 2018 and entered into force on 15 December 2018. The Radiation Act implemented Council Directive 2013/59/EURATOM of 5 December 2013, laying down the basic safety standards for the protection against the dangers arising from ionising radiation and repealing Directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/Euratom and 2003/122/Euratom (hereinafter, the BSS Directive).

The requirements regarding radiation emergencies laid down in the Radiation Act are also intended to be applied to activities falling within the sphere of the Nuclear Energy Act. For this reason, it is the intention to amend the Nuclear Energy Act (990/1987) as of 15 December 2018 to include the necessary references to the Radiation Act and provisions issued by virtue thereof regarding emergency workers and helpers.

By the amendment of Nuclear Energy Act (14.12.2017/905) nationally implemented the changes required by Council Directive 2014/87/EURATOM of 8 July 2014, establishing a community framework for the nuclear safety of nuclear facilities on the amendment of Directive 2009/71/Euratom (hereinafter, the amendment of the NSD Directive). The amendment of Nuclear Energy Act entered into force 1 January 2018. The amendment of the NSD Directive requires also specifications to the licensees' obligations to take care of appropriate emergency procedures and arrangements (Article 6).

2 Current status

Section 7 p of the Nuclear Energy Act lays down the requirements regarding the emergency arrangements of nuclear power plants. Until 31 December 2015, provisions specifying these requirements were included in the Government Decree on Emergency Response Arrangements at Nuclear Power Plants (716/2013).

The amendment (676/2015) of the Nuclear Energy Act transferred the authority for issuing general safety 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 Radiation and Nuclear Safety Authority's general safety provisions 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 Emergency Arrangements at Nuclear Power Plants was issued as part of this amendment by virtue of Section 7 q(23) (*Planning of emergency arrangements, operational readiness and acting in emergency situations of a nuclear facility*) of the Nuclear Energy Act. In terms of content, the new Radiation and Nuclear Safety Authority's regulation corresponded to the earlier Government Decree.

The current Radiation and Nuclear Safety Authority Regulation on the Emergency Arrangements of a Nuclear Power Plant includes no legal norms regarding emergency workers and helpers, as these fall within the scope of the new regulation which entered into force with the new Radiation Act. Nor does the current regulation oblige the licensee to prepare for receiving external assistance.

3 Main goals and proposals

The main goal is to bring the regulation regarding emergency arrangements of a nuclear power plant to correspond to the amendment of the Nuclear Energy Act, which entered into force on 1 January 2018 and another amendment of the Nuclear Energy Act intended to enter into force on 15 December 2018, and the new Radiation Act as well. The need to amend the Nuclear Energy Act is based on the national implementation of the amendments to the BSS Directive and to the NSD Directive.

It is the intention for the regulation to implement the licensee's obligation to provide arrangements to receive external assistance laid down in Article 6 e iii of the NSD Directive. Another goal of the regulation is to respond to the clarification and specification needs of the Nuclear Energy Act's amendment proposal.

The definitions of emergency worker and helper in an emergency corresponding to the definitions laid out in Section 4 of the Radiation Act (859/2018) are included in Section 2 of the regulation. Section 3(7) of the regulation has been specified so that the emergency arrangements must also be consistent with the special situation plans prepared by police authorities. Subsection 7a has been added to Section 3 of the regulation, detailing that arrangements to receive external assistance during an emergency situation shall be taken into account when planning emergency arrangements. Furthermore, Sections 4(4) and 8(7) of the regulation are amended to

specify that the licensee shall expressly consider external emergency workers and helpers in emergency arrangements and in operating instructions for emergency situations. Section 13(2) of the regulation has been clarified and the requirement of providing operating instructions for the general public in the emergency planning zone has been unified with the Ministry of the Interior's decree (774/2011). In other respects, the new regulation corresponds for the most part with the Radiation and Nuclear Safety Authority Regulation on the Emergency Arrangements of a Nuclear Power Plant which is repealed.

4 Impacts of the proposal

The regulation presents certain requirements that are new in terms of their content, the impact of which is estimated to be minor in view of the current situation.

A new addition to the regulation is that the licensee is obliged to consider not just its own personnel, but also other emergency workers and helpers when preparing for emergency situations and to take care of their instruction during the emergency situation and prepare induction material for this purpose in advance.

Thus, the regulation has minor impacts on, for example, the licensees' emergency plans and organisation, on the amounts of equipment and material reserved and the premises designated for the management of emergency situations. The required preparation to receive external assistance is estimated to have minor impacts on the licensee's independent emergency preparation.

5 Drafting of the regulation

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

Statements concerning the regulation proposal were requested with a letter dated 27 April 2017 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, Fortum Power and Heat Oy, Teollisuuden Voima Oyj, Fennovoima Ltd, Posiva Oy, VTT Technical Research Centre of Finland, the Rescue Services of Satakunta, the Rescue Services of Eastern Uusimaa, the Police Department of Southwest Finland and the Police Department of Eastern Uusimaa.

Teollisuuden Voima Oyj, Posiva Oy, the Rescue Services of Southwest Finland, the Police Department of Eastern Uusimaa and one private individual presented in their statements regarding the draft regulation's content.

The Ministry of Social Affairs and Health, the Ministry of the Environment, the Ministry of the Interior, the Ministry of Foreign Affairs, Fortum, Fennovoima Ltd and VTT presented no comments on the regulation in their replies.

The Advisory Committee on Nuclear Safety was requested to submit a statement regarding draft 4 of the regulation proposal. In its statement issued on 9 October 2017, the Advisory Committee on Nuclear Safety states that the draft prepared by STUK for safety regulation regarding emergency arrangements of a nuclear power plant is appropriate. In connection with its statement, the Advisory Committee on Nuclear Safety also presented some comments to further specify the requirements of the regulation.

Based on the statements, amendments were made to Sections 3, 11 and 13 as well as the explanatory memorandum. These amendments clarify and unify the text of the regulation in comparison with other provisions and are considered to have no impact on the requirement level of the regulation.

In spring 2018, the Steering Committee of the RYSÄ project decided that the final draft of the regulation would be published on the STUK website for public comments during the summer. No comments were offered by the public, but some further comments concerning clarification of some of the requirements were received from Teollisuuden Voima Oyj and Posiva Oy.

6 Regulation's entry into force

The regulation shall enter into force at the same time with the amendment to the Nuclear Energy Act (862/2018) that enters into force as an annexed act to the Radiation Act (859/2018) on 15 December 2018.

Detailed rationale

Section 1 Scope

The scope of the regulation covers nuclear power plants. Additionally, the scope covers other nuclear facilities under such phases of their life cycle during which an accident requiring protective measures for personnel or the general public could occur. For example, this refers to the storage and handling of spent nuclear fuel and other nuclear waste. The requirements presented in the regulation are taken into account in connection with preparing and processing emergency plans of other nuclear facilities and transportations.

Section 2 Definitions

The key terms and definitions used in the regulation are presented in Section 2. For the sake of readability and understandability, the definitions of a emergency worker and helper in an emergency based on the IAEA's general safety requirements [1] as they are in Section 4 of the Radiation Act were included in the definitions.

The definition of a severe accident also takes into account the possibility of damage to nuclear fuel in storage pools and facilities that are located outside of the reactor pressure vessel.

The definition of site area also covers the areas of other nuclear facilities located in the same area since, for the purposes of emergency situations, examining all such areas as a

single whole is appropriate. The classification of emergency situations is used to define the alert levels and scope of activities for the power plant and the authorities, for example.

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Section 3 Planning criteria

Section 3 of the regulation has been specified with subsection 7a, according to which the licensee's emergency arrangements shall include arrangements to receive external assistance. The assistance may be material or expert assistance. Issues to be considered when planning these arrangements include logistic arrangements as well as access rights and working areas for the assisting personnel. The requirement is based on Article 6 e iii of the Supplement [4] of the Nuclear Safety Directive.

The section takes into account the IAEA's general safety requirements [1] and the reference levels [2] that WENRA updated and published due to the Fukushima accident.

The basic goals for emergency planning are described in Section 3(1). Based on the lessons learned from the Fukushima accident, the possibility of a simultaneous accident at all of the nuclear facilities in the site area and the long duration (several days or weeks) of the emergency situation have been chosen as the basis for emergency planning.

The planning criteria shall be reviewed regularly and whenever necessary. The interval for the regular reviews shall be 2–4 years, and the review shall be described in the licensee's activity management system. In part, this requirement ensures that the planning of emergency activities at nuclear facilities observes operating experience and general developments in the field.

An emergency situation may result from different scenarios, such as fires or threats related to unlawful action. Therefore, the emergency arrangements shall be coordinated with the operational activities of a nuclear power plant, activities related to fire protection and security arrangements as well as plans concerning them and special situation, emergency and rescue plans that the authorities have drawn up in preparation for a nuclear power plant accident.

Section 4 Preparedness

The section takes into account the IAEA's general safety requirements [1] and the reference levels [2] that WENRA updated and published due to the Fukushima accident.

Section 4(1) of the regulation stipulates that, in addition to analysing and assessing the situation, the licensee shall prepare for the measures required for controlling and limiting the accident. In addition to providing information to the members of the public and the media, the licensee shall ensure continuous and effective information exchange with the authorities.

Section 4(4) of the regulation has been amended so that the licensee's preparation obligation covers, in addition to permanent and temporary personnel working at the site area, all emergency workers and helpers arriving in the site area during an emergency situation . The requirement is based on Section 5.52 of IAEA's general safety requirements [1].

The operability of the facilities reserved for managing the emergency situation (emergency response centre) shall be ensured during the emergency situation and, in particular, during an extended loss of power scenario.

There shall be a designated facility outside the site area from which to direct the emergency situation, if the emergency response centre is not available. Based on experience from the Fukushima accident, directing the emergency situation inside the site area may become difficult or impossible if the infrastructure has been destroyed or a substantial amount of radioactive substances have spread into the environment.

The last paragraph of Section 4 of the regulation presents the requirements concerning the management arrangements and organisation that are required for maintaining and developing the emergency arrangements.

Section 5 Emergency procedures

Activities during emergency situations require advance planning and procedures. Section 5 of the regulation describes the licensee's duty to draw up the emergency procedures required for the operation of the emergency organisation.

Section 6 Emergency response organisation

The section takes into account the IAEA's general safety requirements [1] and the reference levels [2] that WENRA updated and published due to the Fukushima accident.

The emergency arrangements and activities during the situation shall be planned in advance in order to ensure effective and timely operation that is commensurate with the situation. The licensee shall define the tasks and responsibilities of the personnel implementing the emergency arrangements, i.e. the emergency organisation, while taking into account the planning criteria in Section 3, in particular the quick availability of the emergency organisation and the possibility of an extended situation.

Section 7 Emergency preparedness during the commissioning of a nuclear power plant

The regulation sets forth the requirements for emergency arrangements at a nuclear power plant being commissioned. Loading the fuel into the reactor requires an operating license, and upon applying for an operating license, the licensee shall submit to STUK the plans for emergency arrangements (Nuclear Energy Decree, Section 36). The adequacy of the emergency arrangements is demonstrated by means of an exercise.

Section 8 Maintenance and development of preparedness to act

The section takes into account the IAEA's general safety requirements [1] and the reference levels [2] that WENRA updated and published due to the Fukushima accident.

The licensee has an obligation to arrange emergency preparedness training for everyone working inside the site area. This requirement concerns everyone working in the area, regardless of the duration of their employment or their employer.

The licensee shall arrange emergency exercises on an annual basis. At least once every three years the emergency exercise shall be arranged as a co-operation exercise with the authorities.

A training plan covering a minimum of three years shall be in place in order to ensure that training needs in all areas of preparedness to act are systematically taken into account and that activities are developed with a long-term focus. Systematic training shall be arranged in all areas of preparedness to act at least once every three years.

The requirement concerning the assessment of emergency exercises and emergency arrangements obliges the licensee to follow up on experience, research and technical development related to emergency arrangements in Finland as well as internationally. The interval for the regular reviews shall be 2–4 years, and the review shall be described in the licensee's activity management system.

Section 8 of the regulation was supplemented with subsection 7, concerning the licensee's obligation to, in addition to permanent and temporary personnel working at the site area, also take care of the instruction of emergency workers and helpers arriving in the site area during emergency situations and to prepare material for this purpose in advance. This instruction is aimed at informing the people involved of the risks entailed in the situation and tasks assigned to them. The requirement is based on Section 136 of the Radiation Act. When possible, the licensee and the emergency workers' employer (e.g. the regional rescue services) should agree on coordinating the content of the instruction given during the emergency with the advance training provided by the employer.

Section 9 Action in an emergency situation

According to the key requirements, the licensee shall maintain control of the plant status during an emergency situation, prevent and limit radiation exposure and relay an overall picture of the situation to the authorities. The actions and tools designed for this purpose are described in the licensee's emergency plan and instructions. These actions shall be taken immediately in order to gain control of the situation and to initiate rescue activities.

Section 10 Communication in an emergency situation

The licensee shall agree on the alert and communications procedures with the authorities and provide instructions that ensure immediate notifications when an emergency situation is created.

Section 11 Command of operations in an emergency situation

Section 11(1) of the regulation presents a reference to the Nuclear Energy Decree that contains provisions regarding the management responsibilities for rescue operations and threats requiring security arrangements.

Subsection 2 emphasises the role of the on-site emergency manager appointed in the emergency plan in directing the operation of the emergency organisation, and the licensee's duty to ensure nuclear safety and radiation safety.

The power plant's emergency plan shall describe the protection of the site area workers during emergency situations. It is very important that this protection of workers during emergency situations and, in particular, the related cooperation with the authorities are described in the external emergency plan.

Section 12 Termination of an emergency situation

The section takes into account the IAEA's general safety requirements [1].

The section requires that the licensee define the criteria for the termination of an emergency situation and prepare for cooperation with the rescue authorities if the rescue operations continue after the termination of the emergency situation.

Section 13 Measures pertaining to rescue operations

The section takes into account the IAEA's general safety requirements [1].

By virtue of Section 48 of the Rescue Act, the licensee is entitled to participate in the drawing up of the external rescue plan.

Section 13(2) of the regulation contains provisions regarding the licensee's obligation to participate in providing advance information to the public within the emergency planning zone and in warning the members of the public within the precautionary action zone during an emergency situation.

Section 14 Entry into force

The section issues the provisions for the regulation's entry into force. At the same time, the Radiation and Nuclear Safety Authority Regulation on the Emergency Arrangements of a Nuclear Power Plant issued on 22 December 2015 is repealed.

It is the intention that the regulation enters into force on 15 December 2018, at the same time with the amendment to the Nuclear Energy Act and the new Radiation Act.

Upon its entry into force, this regulation would be applied to any pending matters.

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.

List of references

1. Preparedness and Response for a Nuclear or Radiological Emergency, IAEA Safety Standard Series, General Safety Requirements GSR Part 7,, IAEA Vienna, 2015.

2. WENRA Safety Reference Levels for Existing Reactors, Update in Relation to Lessons learned from Tepco Fukushima Dai-Ichi Accidents, WENRA RHWG, 2014

3. Council Directive 2013/59/EURATOM of 5 December 2013, laying down basic safety standards for the protection against the dangers arising from ionising radiation and repealing Directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/Euratom and 2003/122/Euratom

4. Council Directive 2014/87/EURATOM of 8 July 2014, establishing a Community framework for the nuclear safety of nuclear installations on the changing of the Directive 2009/71/Euratom