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Plan for environmental assessment of regulations issued under the Nuclear Energy Act in accordance with the Act on the Assessment of the Effects of Certain Plans and Programmes on the Environment

The overall revision of the Radiation and Nuclear Safety Authority's (STUK) regulations will be carried out in connection with the overall revision of the Nuclear Energy Act (990/1987). The regulations will be issued under the new Nuclear Energy Act and will form part of the national nuclear safety regulations.

The regulations, together with a decree prepared by the Ministry of Economic Affairs and Employment, form a whole to which the Act on the Assessment of the Effects of Certain Plans and Programmes on the Environment (200/2005, hereinafter the SEA Act) applies.

These regulations are considered to constitute the framework for decisions on the authorisation or approval of projects in accordance with Article 4 of the SEA Act, and the sector concerned is the energy supply sector within the meaning of paragraph 1 of the Article.

Regulations considered likely to have significant transboundary environmental effects are subject to consultation of the Parties under the UNECE Protocol on Strategic Environmental Assessment (SEA Protocol) to the UNECE Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention).

STUK's task is to promote and supervise radiation safety and the safe use of nuclear energy in accordance with the Act on the Radiation and Nuclear Safety Authority (1164/2022). STUK's regulations are issued in accordance with the scope of STUK's tasks and their environmental impact is directed at the effects of radiation exposure.

In late 2020, STUK decided to start a structural and substantive reform of its safety regulations. During 2021, preparations for the reform were made, among other things, by examining the current status of the regulations and the need for changes, and by reviewing the regulation reforms already carried out by both domestic and foreign authorities. Based on the preparatory work, the overall reform of the STUK regulation was started in 2022 (SYTYKE project).

In the structural reform, STUK's regulations will be reformed in accordance with Article 80 of the Constitution, where law specifying requirements issued by STUK will be consolidated in regulations. A clearer distinction will be made between the mandatory requirements of the regulation and the prescriptive content, such as recommendations and justifications.

The starting point for the content reform is that the required level of safety and the top-level principles remain unchanged. After the reform, the safety requirements should be more technology-neutral and less detailed, so that they do not unnecessarily restrict the different ways of using nuclear energy.

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1 Objectives

STUK’s regulations are issued under the Nuclear Energy Act and, to a lesser extent, the Radiation Act (859/2018), and they provide technical requirements that specify the base requirements of the Acts. The reform of the regulations is part of a legislative package and is in line with the objectives of the Nuclear Energy Act reform.

STUK's objective through the reform is to:
- Maintain the current level of safety in the use of nuclear energy
- Developing licensing and regulation more risk-informed
- Enable the safe use of new technologies and business models

The only direct environmental impact of the STUK area of responsibility is related to the radiation exposure from regulated activities, and the regulation is explicitly aimed at limiting radiation exposure. Other environmental impacts of nuclear energy use fall within the scope of other legislation, such as environmental protection legislation or the Building Act, and are the responsibility of other authorities.

The dose limit for human radiation exposure is set in the Radiation Act and the dose limitations for the use of nuclear energy derived from this will be set in a Government Decree under preparation. The dose constraints will be set in accordance with international recommendations so as to limit the effects on humans. International and national environmental protection in the field of radiation is based on the premise that the limits set for the protection of human health will also protect the environment.

STUK's regulations provide technical requirements that go further in details compared to the Act and the Decree, specifying technical and organisational measures to limit the release of radioactive substances and radiation exposure. The regulations form part of the criteria for decisions on the authorisation and approval of projects.

2 Proposed set of regulations

In the overall reform, STUK's regulations issued under the current Nuclear Energy Act will be renewed and, as a result, STUK’s set of regulations will be expanded.

Under the plan, STUK would issue 23 orders under the Nuclear Energy Act. The subject areas of the orders would be as follows:
1. Content requirements for administrative documents
2. Regular reporting
3. Leadership and organisation of the nuclear facilities
4. Safeguards
5. Nuclear facility and transport security
6. Siting of the nuclear facility
7. Technical safety requirements for a nuclear power plant
8. Computational and experimental demonstration of the safety of nuclear facility design solutions
9. Nuclear fuel and reactivity control elements
10. Radiation safety design of a nuclear facility
11. Nuclear fuel handling and storage

12. Design, construction and operation of a disposal facility
13. Long-term safety of nuclear waste disposal
14. Safety requirements for a nuclear material recovery facility
15. Nuclear facility equipment and structures
16. Commissioning of the nuclear facility and its modifications
17. Operational safety of a nuclear facility
18. Radiation protection of workers in nuclear facility
19. Discharges of radioactive substances from the nuclear facility
20. Radiation monitoring of the nuclear facility environment
21. Handling, storage and exemption from control of nuclear waste
22. Nuclear facility emergency preparedness
23. Decommissioning of nuclear facility

The Espoo Convention and the SEA Protocol are considered to cover those regulations that have a significant impact on the prevention and management of transboundary environmental impacts. These regulations relate to site selection, design requirements for facility, demonstration of safety, management of radioactive discharges and accident preparedness. The main content of these facility is described below.

2.1 Siting of the nuclear facility

The regulation is intended to set requirements for the selection, assessment and monitoring of changes in the siting of a nuclear facility throughout its life cycle. The aim is to ensure that the site supports the safe operation and decommissioning of the nuclear facility. The regulation would require a comprehensive study of the site's natural conditions, population, infrastructure and external threats such as earthquakes, floods and human activities. It would also specify the assessment of the feasibility of emergency preparedness and security arrangements during the initial phase of a nuclear facility project.

2.2 Technical safety requirements for a nuclear power plant

The purpose of the regulation is to set requirements for technical safety solutions for nuclear power plants. The regulation complements the requirements of the Nuclear Energy Act and provides a basis for ensuring the technical safety of nuclear power plants throughout the life cycle of the plant. It would specify the requirements of the Act on the design of safety principles and systems implementing safety functions. It also deals with control rooms and the design of systems and control automation. The regulation sets out requirements for safety classification and earthquake classification.

2.3 Computational and experimental demonstration of the safety of nuclear facility design solutions

The purpose of the regulation is to set requirements for the demonstration of the safety of design solutions for nuclear facilities by means of computational and experimental methods. The aim is to ensure that the safety of nuclear facilities can be reliably demonstrated in all situations and that compliance with safety requirements can be verified throughout the life cycle of the facility. The regulation would specify the legal requirements on the use of deterministic and probabilistic analyses, the assessment of uncertainties and the quality and representativeness of experiments.

It would also cover, inter alia, the demonstration of safety functions, fault tolerance and collective failure analyses, and the analysis of fire safety and operating instructions.

2.4 Nuclear fuel handling and storage

The regulation would deal with technical requirements for the handling and storage of nuclear fuel in nuclear facilities. It would cover the storage of fresh and spent nuclear fuel in various forms (dry storage, pool storage), transfers, encapsulation prior to disposal, and related systems and structures. This regulation complements the requirements of the Nuclear Energy Act and provides the basis for the technical assurance of the safety of these nuclear facilities throughout their life cycle. It would specify the requirements of the Act for the design of the safety principles and the systems implementing the safety functions. It would also contain detailed technical requirements for instrumentation, automation, electrical networks and ventilation.

2.5 Long-term safety of nuclear waste disposal

The regulation would set requirements to ensure the safety of a nuclear waste disposal facility in the post-closure period. It would specify the requirements of the act on safety functions, performance targets and demonstration of safety for long-term safety.

2.6 Discharges of radioactive substances from the nuclear facility

The regulation is intended to set requirements for the control, measurement and reporting of discharges of radioactive substances from nuclear facilities. The regulation would set out requirements that would further specify the law to ensure that discharges of radioactive substances are kept to a minimum and that their effects on the population and the environment can be reliably assessed and controlled. It would require nuclear facilities to set limits and targets for discharges, monitor discharges by pathway and report the results annually and quarterly. It would require that emissions are limited by best available techniques (BAT).

2.7 Radiation monitoring of the nuclear facility environment

The regulation is intended to contain requirements for the establishment of a baseline environmental assessment and the implementation of radiation monitoring and associated modifications. It will also include requirements on the objects of environmental radiation monitoring, the equipment to be used for measurements and sampling, and the monitoring and reporting of the results of measurements.

2.8 Nuclear facility emergency preparedness

The regulation is intended to set requirements for the emergency preparedness arrangements of nuclear facilities, covering the anticipation, management and post-accident response to emergencies. It defines the classification of emergency situations, the design criteria for emergency arrangements, the definition of the emergency protection zones, and the structure and functioning of the emergency organisation. It emphasises the preparation of the emergency plan and operational instructions, the requirements for the emergency centre and other facilities, and the reliability of communication and measurement systems. It also addresses preparedness training, exercises and the continuous development of preparedness arrangements.

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3 Carrying out the environmental assessment and monitoring the impacts

The environmental assessment under the SEA Act is carried out as part of the impact assessment of the regulations, in accordance with the Government's Impact Assessment Guidelines for Legislative Drafting (Government Publications 2022:66), where applicable. The environmental assessment is documented in the explanatory memoranda of the regulations.

The purpose and objectives of the Radiation and Nuclear Safety Authority's regulations relate in particular to the prevention of harmful effects of radiation, and the environmental assessment would focus specifically on these aspects. From this point of view, the following aspects have been identified as relevant for the environmental assessment of the STUK regulations with regard to the environmental impacts referred to in Article 2(2) of the SEA Act:

- the impact on people's health, living conditions and well-being;
- impact on soil, water, air, climate, vegetation, organisms and biodiversity;
- the impact on the urban fabric, built environment, landscape, townscape and cultural heritage.

STUK assesses the above aspects from the point of view of radiation effects. As part of the preparation of each regulation, the impact of a change from the current situation is assessed. In particular, the assessment will consider the environment impact and other impacts on people and society. Transboundary impacts and their prevention are primarily related to regulations that impose requirements for the design of nuclear facilities, emission control and accident-related emergency preparedness. Transboundary impacts are assessed by STUK in the same context as national impacts, since potential radiological effects are first felt in Finland and, to a lesser extent, outside its borders.

The environmental assessment will be carried out by STUK experts. Stakeholders' views on the environment impacts of the regulations are collected in the consultation procedures under the SEA Act and the SEA Protocol. Stakeholders' views on the environment impacts are taken into account as part of the preparation and documented as part of the explanatory memorandum for each regulation.

The reform of STUK's regulations is part of the overall reform of the Nuclear Energy Act. The Act sets out the base requirements for the use of nuclear energy, which are further specified in the regulations. The Act also defines the matters on which STUK may issue regulations. From the point of view of environmental assessment, the options for STUK to issue regulations are:

- STUK does not issue regulations that specify the law (the "zero option")
- STUK issues so-called target-based regulations
- STUK issues detailed regulations to guide the activities in detail

The achievement of the objectives and environmental impacts of the regulatory reform will be assessed as part of the evaluation of the nuclear energy law reform. This type of evaluation is typically carried out approximately five years after the entry into force of the law and regulations.

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3.1 Timetable for the preparation of regulations

STUK's regulations are part of the overall nuclear energy legislation and are prepared in parallel with the preparation of the Act and the decree. The regulations may enter into force after the entry into force of the Act. STUK's objective is to finalise the content of the regulations by the end of 2026.

The consultation phase of STUK's regulation is expected to take place in autumn 2025. The consultation on the draft plan or programme under Section 9 of the SEA Act, on the environmental report and the consultation under the SEA Protocol of the Espoo Convention will be carried out simultaneously.