

Renewal of Finnish Nuclear Energy Legislation and Regulations

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General

The current Nuclear Energy Act was drafted in 1987 and has undergone several amendments, resulting in complexity and difficulty in implementation.

The renewal of nuclear energy legislation and regulations commenced in 2022, with the aim of comprehensive renewal. The Ministry of Economic Affairs and Employment of Finland (TEM) leads the preparation of the new legislation, with STUK closely involved in the process.

STUK is responsible for drafting the nuclear safety regulations and providing necessary guidelines under the project name SYTYKE. Stakeholders, e.g. Fortum and TVO, are kept informed of project progress.

The aim of the renewal project

The aim is a comprehensive renewal of nuclear energy legislation, harmonizing the Nuclear Energy Act and Government Decrees while considering constitutional principles (Article 80).

In the nuclear power plant sector, at least five new regulations related to radiation protection, will be issued. The objective is for the new legislation and regulations to come into force by 2028.

The renewal process also considers:

- Potential new energy or operating companies
- Emerging nuclear power plant concepts, such as Small Modular Reactors (SMRs)
- Target-oriented requirements rather than detailed ones
- Consideration of technology neutrality
- International regulations (IAEA, WENRA)

SMRs – New aspects

SMRs will be considered in the renewal, however, no SMR specific regulations nor guidelines will be drafted. STUK has identified several questions that must be addressed, including:

- Size of Emergency Planning Zones
- Application of Defence-in-Depth
- New business models and organisational arrangements in constructing, operating and decommissioning
- Serial production of reactor modules and other components
- New applications such as process heat for industry, district heating and hydrogen production
- Marine-based reactors
- Remote operation
- Spent fuel management arrangements

New features and new ways of doing things should be enabled, as long as safety can be demonstrated.

The zoning in the surrounding of a SMR

According to the previous requirements:

- In the Precautionary Action Zone (PAZ) 5 km, land restrictions are in force
- For the Urgent Protective Action Planning Zone (UPZ) 20 km, an external rescue plan shall be drafted

However, the 5 km PAZ and the 20 km UPZ are problematic and present challenges for facilities like district heating plants (SMR plants).

The updated definitions without exact kilometers:

- PAZ shall refer to an area where, in the event of an accident, it may be necessary to take protective measures to prevent or limit the severe deterministic effects of ionising radiation.
- UPZ shall refer to an area where, in the event of an accident, it may be necessary to take urgent protective measures for the population in order to limit the stochastic effects of ionising radiation.

Conclusion

The ongoing renewal of nuclear energy legislation in Finland represents a proactive approach to address evolving technological and regulatory challenges.

By harmonizing laws, considering new technologies like SMRs, and prioritizing safety, Finland aims to maintain a robust and adaptable regulatory framework for the future.



Timetable



Fig 1. The estimated timetable of the renewal project.