

Sweden

Nuclear regulatory authority

The Swedish Radiation Safety Authority (SSM) is the regulatory authority for nuclear safety, radiation protection, nuclear security and nuclear non-proliferation. SSM works pro-actively and preventively to maintain a high level of nuclear safety and radiation protection in Sweden and internationally. The Authority has just over 300 employees with expertise in fields such as engineering, natural and behavioural sciences, law, economics and communications. Its budget is approximately 400 million Swedish kronor per year. SSM's work is financed through fees and tax funds.

SSM issues legally binding regulations under the Act on Nuclear Activities (1984:3) and Radiation Protection Act (1988:220). SSM is involved in licensing of nuclear activities and carries out inspections and enforcement. In an accident situation involving radioactive material or radiation, SSM arranges for expert assistance to responsible entities. This is done from the emergency response centre located at SSM's premises. SSM also has the responsibility to coordinate the national organisation for measurement and analysis.

The mission and tasks of SSM are defined in Ordinance 2008:452, which contains instructions for the Authority, and in annual appropriation directions from the Swedish Government.

Nuclear activities

Sweden has ten nuclear power reactors in operation and three reactors that are permanently shut down (undergoing decommissioning). The ten operating reactors comprise seven BWRs of ASEA-ATOM design and three PWRs of Westinghouse design. In an average year, nuclear power constitutes around 45 per cent of all electricity produced in Sweden.

The Swedish reactors in operation have undergone, and are undergoing, a process of modernization, safety upgrades and power uprates. Safety upgrades relating to reactor design and construction have recently been implemented.

In June 2010 the Swedish Parliament lifted a ban on nuclear reactor new builds. This legislation, which entered into force in 2011, allows for construction of new reactors on the condition that they replace existing ones being permanently shut down, also provided that

they are built on a site with pre-existing reactors in operation.

In July 2012 an application in principle for construction of new reactors was submitted by Vattenfall AB to the regulatory authority. However, the owners have indicated for the time being that they see no justification to continue with the next step of the licensing process.

The owners of the Oskarshamn and Ringhals nuclear power plants have recently decided that four reactors, Oskarshamn 1 and 2, and Ringhals 1 and 2, will be closed down. All four reactors will be closed down by 2020.

In order to raise the level of safety, the Authority issued in December 2014 a decision on conditions for Independent Core Cooling. Independent Core Cooling is activated if the other cooling systems fail to function in connection with an accident. Swedish nuclear power plants are by 2020 required to implement an independent system for cooling of the reactor core.

Other facilities in Sweden include a nuclear fuel plant, an interim spent fuel storage facility and a waste disposal facility for low and intermediate level waste.

Radioactive waste and spent fuel management

The Swedish Nuclear Fuel and Waste Management Company (SKB) was established jointly in the 1970s by Swedish nuclear reactor operators. SKB is the licensee of a repository for operational waste, SFR, located at Forsmark. The SFR facility is situated on the coast of the Baltic Sea at a depth of 50 metres in bedrock, 5 metres below the seabed. Construction of SFR began in 1983 and the facility was commissioned in 1988. SFR is currently licensed for disposal of 63,000 m³ of operational waste. In 2014, SKB submitted a licence application to increase SFR's disposal capacity to 200,000 m³ in order to also accommodate decommissioning waste. In addition, SKB operates Clab, an interim storage facility for spent nuclear fuel, which is located at Oskarshamn. Clab is currently licensed for storage of 8,000 tonnes of spent nuclear fuel. An application to extend its storage capacity to 11,000 tonnes was submitted in 2015.

The process to select a site for a spent nuclear fuel repository was launched more than two decades ago. In 2009, SKB opted to locate the geological repository at Forsmark, in the municipality of Östhammar. SKB applied for a licence in March 2011 to site and construct the repository at Forsmark. Operation of the repository is foreseen as of circa 2025. Safety reviews, additional research and follow-up programmes must be completed before the repository is commissioned.

SSM is in the process of reviewing the application for permission to construct the repository for spent nuclear fuel. In spring 2017, the land and environmental court will announce its decision regarding the application. The Authority expects to complete its examination of the application in 2017 and submit its statement to the Government. The Government will take the decision on whether SKB will be permitted to construct the repository.

Main legal instruments

Five enactments constitute fundamental nuclear safety and radiation protection legislation:

- Act on Nuclear Activities (1984:3)
- Radiation Protection Act (1988:220)

- Environmental Code (1998:808)
- Act on Financing of Management of Residual Products from Nuclear Activities (2006:647)
- Nuclear Liability Act (1968:45)

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