

SFR – Final Repository for Short-lived Radioactive Waste



This is where Sweden keeps its radioactive operational waste

The SFR, Final Repository for Short-lived Radioactive Waste, was the first facility of its type when it was commissioned in 1988. This is where radioactive waste from nuclear power plants and other applications is kept.

The radioactive waste deposited in the SFR is low and intermediate-level operational waste. This means that unlike spent nuclear fuel it does not have to be cooled and is relatively short-lived.

Most of this waste comes from the operations of Swedish nuclear power plants. It can include filters that have collected radioactive substances from the water in the reactors, tools and protective clothing. Radioactive waste from hospitals, veterinary medicine, research and industry is also deposited in the SFR.

The SFR facility is situated at about 50 metres depth below the bottom of the Baltic close to Forsmark nuclear power plant. It has room for 63,000 cubic metres of waste. Up to now just over half of that capacity has been used. The SFR is owned and operated by SKB and over 30 people work at the facility.

SFR is classified as a nuclear technology facility and is therefore subject to stringent control and monitoring by the authorities. The facility consists of four 160-metre long rock vaults and a 50-metre high concrete silo which is surrounded by a layer of bentonite. The silo is intended for the intermediate level waste with the highest radioactivity that may be deposited in the SFR. Two parallel kilometre-long access tunnels link the facility to the surface.

A number of barriers

The radioactive waste is kept in various types of waste containers that are protected in their turn by one or more barriers. When the SFR is sealed in the future, the repository will slowly fill with groundwater that seeps in from the surrounding rock. The task of the barriers is to slow down and prevent as far as possible any movement of dangerous substances to the surrounding

environment. This movement will take place so slowly that the radioactivity has disappeared before the substances reach daylight.

In the silo the waste is kept in containers of steel or concrete which after disposal are surrounded by another layer of concrete. The next barrier is the concrete wall of the silo, which is almost one metre thick.

Between the outer wall of the silo and the bedrock there is a thick layer of bentonite clay. After sealing, the clay will swell and prevent groundwater from flowing freely through the silo. It also acts as a filter to slow down and prevent radioactive substances from moving out from the silo. The bentonite also protects the silo from mechanical movements in the rock.

The final barrier is the rock in which the repository has been built. This is also capable of slowing down movement of radioactive substances through adsorption. Should any escape their movement will be considerably slower than the movement of the groundwater.

After about 500 years most of the radioactivity will have disappeared. SKB has to show that what is left can be stored safely for 10,000 years. This is done with the help of continuous safety analyses.

Decommissioning waste

In the future the radioactive waste coming from the decommissioning of the Swedish nuclear power stations (for instance metal waste and building materials) will be deposited in the facility. For this reason an extension of the SFR facility is being planned. When completed, the repository will have room for about 200,000 cubic metres of waste.

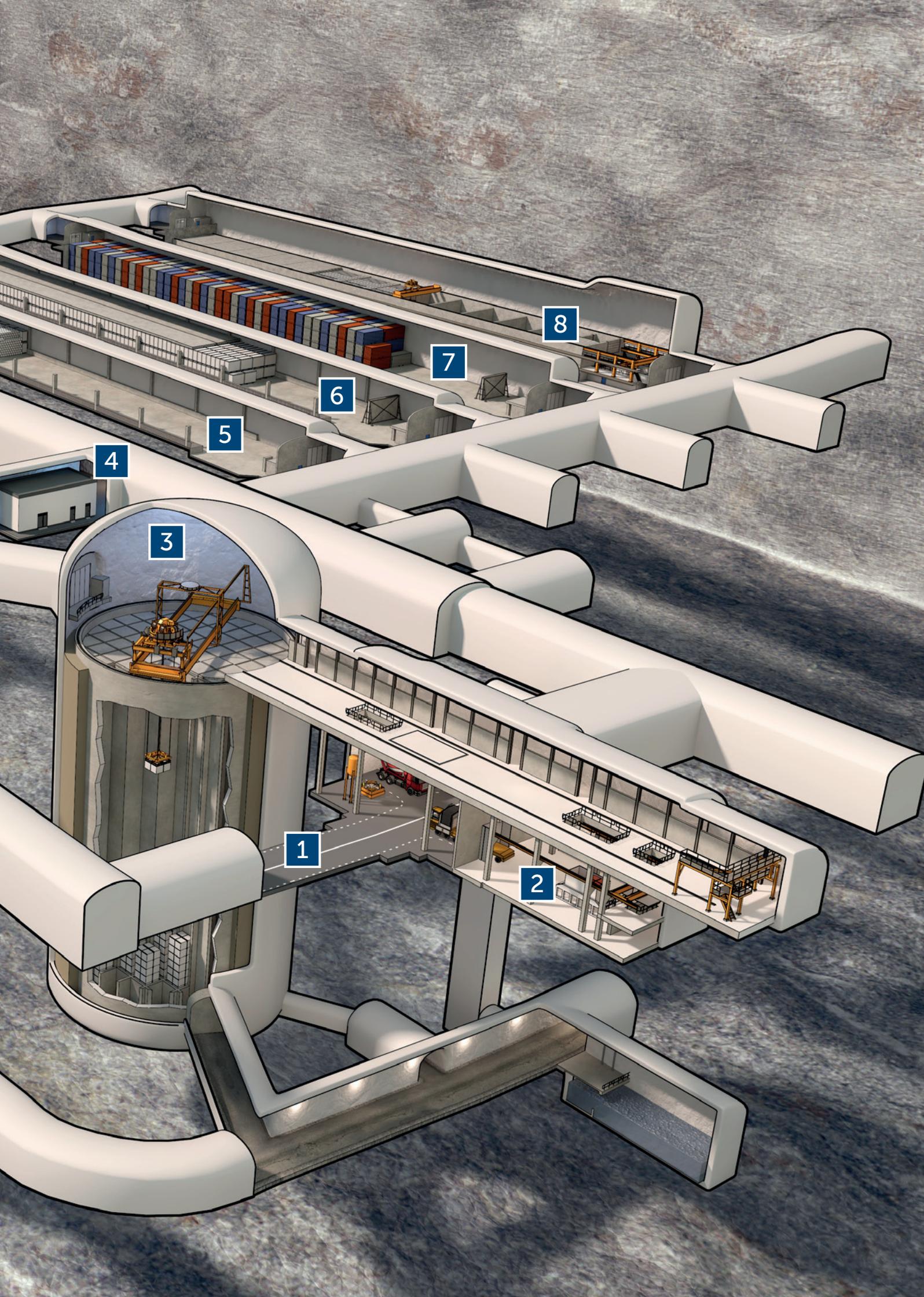




SFR

Final Repository for Short-lived Radioactive Waste

SFR is situated 50 metres below the bottom of the sea at Forsmark. This is where low and intermediate-level operational waste from Swedish nuclear power plants is deposited. The facility consists of three rock vaults for the low level waste and a silo and one rock vault for the intermediate level waste. Two parallel kilometre-long access tunnels link the facility to the surface.





1 The waste arrives at the SFR on board SKB's transport vessel M/S Sigrid to be taken down to the facility in specially designed transport containers.



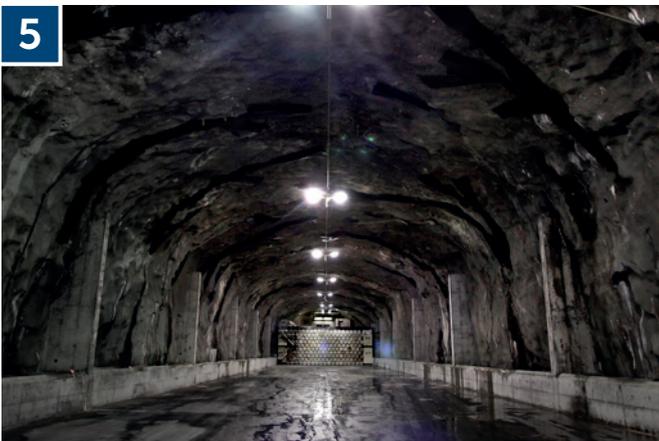
2 Here the transport container is unloaded and scanned on the outside to discover any radioactive substances on its surface.



3 An overhead crane is used to move the waste containers to the top of the silo. The silo is divided into shafts into which the waste is lowered.



4 The overhead crane and the unloading of the transport containers are monitored and directed from the control room.



5 Low-level waste is deposited in this rock vault. A fork-lift truck is used to move it.



6 Rock vault for low-level waste in concrete tanks. The tanks are moved using a fork-lift truck.



7 In this rock vault low level waste is deposited in regular containers that are moved using a fork-lift truck.



8 Here intermediate level waste is deposited in barrels or moulds. An overhead crane monitored from the control room is used to move them.

*Sweden has been using electricity generated by nuclear power since the 1970s.
SKB's task is to take care of the waste products that have resulted from this process.
It is we who have benefited from the nuclear power that have to take responsibility
for the waste – it cannot be left to future generations.*

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