

At some point in the future, Sweden's nuclear power plants will be decommissioned and dismantled. The plan is that decommissioning waste containing radioactivity will be disposed of at Forsmark. SKB therefore wants to extend its Final Repo-sitory for Short-Lived Radioactive Waste (SFR).

SFR at Forsmark is owned and operated by SKB (the Swedish Nuclear Fuel and Waste Management Company). Opened in 1988, the repository contains short-lived low- and intermediate-level operational waste, such as used protective clothing and replaced parts from nuclear power stations. But waste from Swedish research, health care and industry is also finally disposed of here.

SKB now plans to extend the repository. The idea is to create an entirely new section directly adjoining the existing SFR. The extension will primarily be used for decommissioning waste from Sweden's nuclear facilities, consisting of reactor components, scrap metal, concrete and other building materials.

The rock vaults of the present repository are located some 60 metres below the seabed in Öregrundsgrepen off Forsmark. They are accessed via an operational and

a construction tunnel that descend from close to Forsmark harbour. The new section for decommissioning waste would end up deeper, roughly 120 metres below the seabed, where studies have shown there to be suitable bedrock for the purpose.

Six new vaults

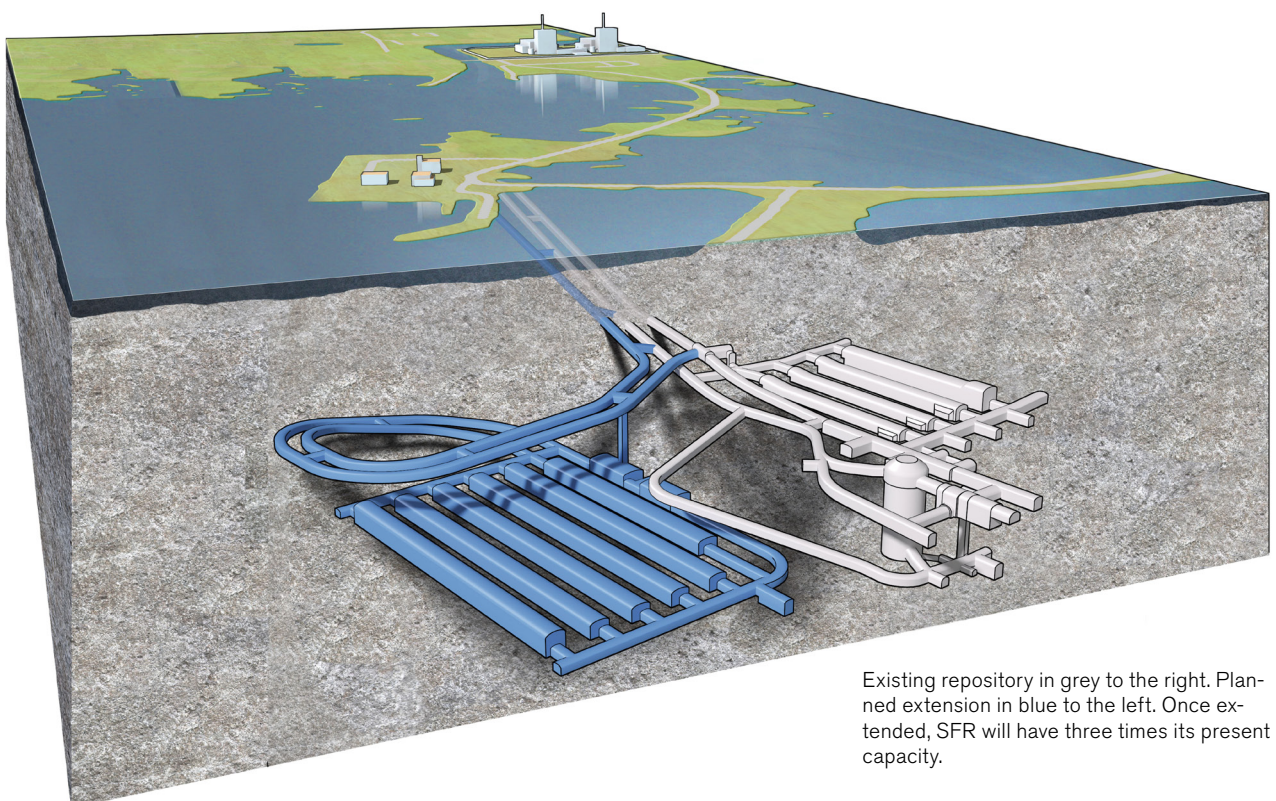
The extension to SFR will comprise six rock vaults, varying in length from 240 to 270 metres. The plan is to build a new tunnel down to the new part of the repository, some 1,700 metres long and large enough to transport entire reactor vessels in.

When the extension is fully developed, SFR will have three times its current capacity. All final disposal of Swedish short-lived radioactive waste, both operational and decommissioning, will then be concentrated at a single site and facility.

Twice as much

The volume of decommissioning waste is expected to be roughly twice that of operational waste, but its radioactivity will generally be lower. The existing SFR has a capacity for around 60,000 cubic metres of short-lived low- and intermediate-level operational waste.

The quantity of decommissioning waste, together with



Existing repository in grey to the right. Planned extension in blue to the left. Once extended, SFR will have three times its present capacity.

some operational waste for which there will not be room in the present facility, is expected to total about 110,000 cubic metres. In addition, nine reactor vessels will be disposed of in the extension.

Exactly how much waste there will be is difficult to estimate, however, as experience of dismantling nuclear facilities is limited. Also, in some cases it may be possible to decontaminate the waste in various ways, allowing what is called 'free release'. That means that the material can be reused and no longer needs to be permanently disposed of.

Waste from Barsebäck

To begin with, decommissioning waste from the Barsebäck nuclear power plant (closed down for good in 2005 and now awaiting dismantling) will be placed in the extended SFR, along with waste arising from decommissioning the old reactors at Ågesta and Studsvik. Following the extension, there will also be room at SFR to receive decommissioning waste from Sweden's other reactors, which are still in operation today, but which will be shut down and decommissioned at some point in the future. In all, 1,270,000 cubic metres of blasted rock will be removed and 200 people will be employed on site in the construction of the facility.

Early in 2014, SKB expects to be able to submit an application for a licence to extend SFR. Only when this licence has been granted can construction begin, probably around 2017. At the earliest, the extension is expected to be ready for use in 2023.

Background

Under the Nuclear Activities Act, it is the responsibility of the holder of a licence for nuclear activities to ensure that facilities that are no longer operated are decommissioned and dismantled. SKB, which is jointly owned by Sweden's power companies, has been entrusted with the safe management and final disposal of radioactive waste and spent nuclear fuel from the country's nuclear power plants.

Low- and intermediate-level operational waste is already finally disposed of at the present SFR. The planned extension will provide space for low- and intermediate-level decommissioning waste. To handle spent nuclear fuel, finally, SKB wishes to build a new final repository, the Spent Fuel Repository, also at Forsmark. SKB intends to coordinate its resources at Forsmark, to ensure efficient construction of both the extension to SFR and the Spent Fuel Repository.



Photo: Lasse Modin

For the most part, decommissioning waste will be transported to SFR in Forsmark on SKB's own ship. M/S *Sigyn* (pictured) will be replaced in 2013 by a new transport vessel, M/S *Sigrid*.



Photo: Curt-Robert Lindqvist

The reactors at Barsebäck, which have been shut down, already await dismantling.



Photo: Lasse Modin

Investigations in preparation for extending SFR were carried out between 2008 and 2010. The results formed the basis for the choice of site for the extension.