Public

Manuscript Public report

Document ID	Version	Status	Reg no	Page
1496933	1.0	Approved		1 (3)
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Approved by: Helene Åhsberg			Approved date: 2015-11-18	

SKB´s licence applications and the Swedish review process

1 Introduction

The Swedish Nuclear Fuel and Waste Management Co (SKB) has been working with research, development and demonstration of geological disposal of spent nuclear fuel for more than 30 years. Site investigations in two municipalities (Östhammar and Oskarshamn) started in 2002 and resulted in 2009 in the selection of the Forsmark site in Östhammar for the final repository and Simpevarp in Oskarshamn for the encapsulation plant for spent nuclear fuel. The encapsulation plant will be integrated with the central interim storage (Clab) to form a new facility, Clink.

The licence applications were submitted in March 2011. These applications cover the entire system that will enable the final disposal of spent nuclear fuel in accordance with the KBS-3 method.

The applications were submitted to the Land and Environment Court in Nacka (Stockholm) and to the Swedish Radiation Safety Authority (SSM). Part of the submitted material is common to both applications, e.g. the Environmental Impact Statement (EIS). The Land and Environment Court prepares and reviews the case subject to the provisions of the Environmental Code. Following a number of preparatory procedures a main hearing will be held. The Court will then submit its comments to the Swedish Government. SSM will prepare the case in accordance with the Act on Nuclear Activities and then also submit its comments to the Government. According to the current plan, both SSM and the Land and Environment Court are expected to report to the Government by early 2017.

At this stage, the Government will request statements from the municipalities of Östhammar (for the spent fuel repository) and Oskarshamn (for the encapsulation plant), as to whether they accept or reject the establishment of the respective facilities, given the fact that the municipalities have a right of veto.

If the municipalities accept the respective facilities, the Government will make a decision on whether the KBS-3 system is permissible or not, according to the Environmental Code. If it is deemed permissible, the Land and Environment Court will hold a new hearing. Following this, the Court will grant licences and stipulate conditions pursuant to the Environmental Code. The Government, in the same manner, will (if the KBS-3 system is deemed permissible) issue a licence under the Act on Nuclear Activities, followed by SSM stipulating conditions pursuant to the Act on Nuclear Activities and the Radiation Protection Act.

The review processes included in the Environmental Code and the Act on Nuclear Activities are shown in Figure 1. One of the authorities that the Land and Environment Court sends the application to under the Environmental Code for consideration and comments is the Swedish Radiation Safety Authority (SSM).

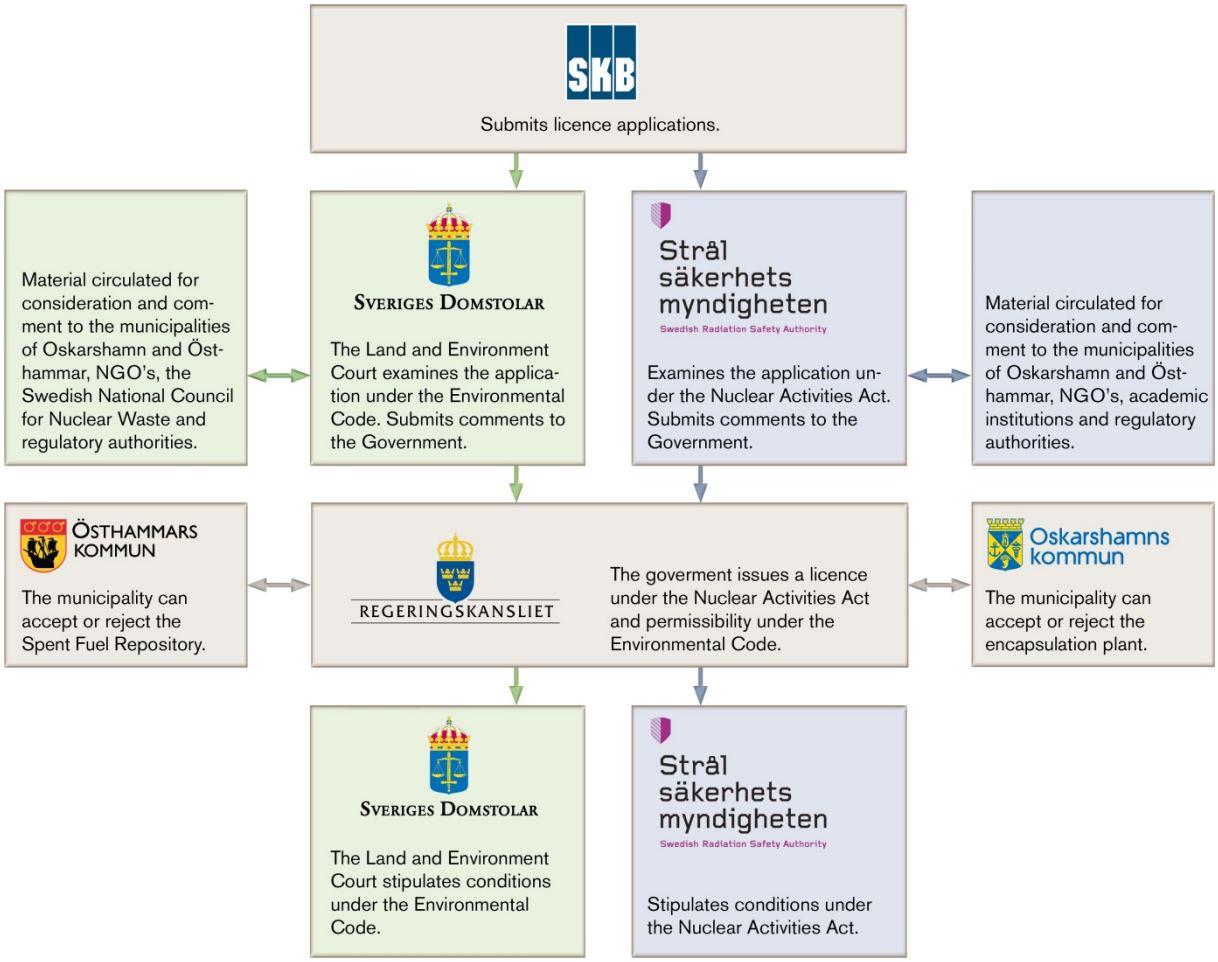

Figure 1. *The Swedish review processes for SKB's licence applications.*

2 Requests for clarifications and complementary information

A large number of requests for clarifications and complementary information have been received from a number of the reviewing stakeholders.

2.1 Licencing according to the Environmental Code

The application in accordance with the Environmental Code has been subject to a stakeholder review for consideration and comments. This has resulted in the application being complemented on four occasions. The completions have been in the form of short answers to questions as well as the addition of reports. The additional reports are supplements to the *Environmental Impact Statement* (EIS) and *Choice of Method – Evaluation of Strategies and Systems for Disposal of Spent Nuclear Fuel.*

The supplements to the EIS focus on local environmental issues such as water activities, preservation of valuable nature and transport of rock spoil and bentonite. The supplements to the Choice of Method focus on comparing the KBS-3 method with other methods for the final disposal of spent nuclear fuel, such as disposal in deep boreholes.

A specific issue that has raised a lot of discussion concerns how wide the EIS should be made. In particular two issues have been brought up: to what extent and level of detail other methods

and alternative sites should be evaluated in the EIS, and to what level of detail radiation safety issues should be included in the Land and Environment Court process in general and in the EIS in particular. A special complication here is that an EIS is required according to both the Environmental Code and the Act on Nuclear Activities. This is a specific issue connected to the structure of the Swedish legislation.

2.2 Licencing according to the Act on Nuclear Activities

The application in accordance with the Act on Nuclear Activities has, in addition to supplementary material to the EIS, mainly been complemented with detailed information regarding nuclear safety during operation and long term safety after closure of the repository.

SSM's requests for supplementary information and the results of the stress tests carried out after the Fukushima accident in 2011 have led to a comprehensive update of the underlying safety analysis as well as increased security and safety requirements for interim storage and the encapsulation plant. This resulted in a new design for the encapsulation plant that includes, for instance, extended earthquake assurance for buildings and systems and better protection of the buildings against an aircraft crash.

2.3 Extended capacity for the interim storage facility for spent nuclear fuel, Clab

The licensing process has been prolonged due to, among other things, longer review time. At the same time the interim storage facility for spent nuclear fuel, Clab, is expected to be full in around 2023, given the conditions stipulated in the current permit, which has a limit of 8,000 tonnes of spent fuel. The current amount of spent fuel stored in Clab is approximately 6,000 tonnes. According to the present plans, disposal of the fuel will start several years after the interim storage has reached maximum capacity according to the current permit.

To prevent this situation, SKB submitted in early 2015 complementary information to the applications in order to increase the storage capacity from 8,000 to 11,000 tonnes of spent nuclear fuel and therefore use the entire physical storage capacity of the facility. Complementary information on the increased storage capacity in Clab and the encapsulation plant (Clink) has been submitted to both the Land and Environmental Court and SSM.

3 Time schedule

The application in accordance with the Environmental Code is expected to be announced in late 2015. The main hearing is expected to take place in late 2016. The Court’s findings and recommendations should then be submitted to the Government in the beginning of 2017. SSM will do the same for the applications according to Nuclear Activities Act.

At present, it seems achievable to obtain a decision from the Government on permissibility according to the Environmental Code and on licence in accordance with the Nuclear Activities Act within two years after the Land and Environment Court and SSM have submitted their findings.

The estimated start of construction for the spent fuel repository and the encapsulation plant which will be integrated with the interim storage (Clab) to a new facility Clink is about 2020. These facilities will then be ready for operation in about 2030.