NOAH – FoE Denmark report on SKB extended consultations meeting in Oesthammer Saturday 4 June

The following is NOAH – Friends of the Earth Denmark's report on a meeting held in Oesthammar Municipality Saturday 4 June. It is based on the notes of Niels Henrik Hooge, representative of FoE Denmark supported by information from SKB's website.

Background[1]

The Swedish Nuclear Fuel and Waste Management Co (Svensk Kärnbränslehantering AB - SKB), has started site investigations in two municipalities: Oskarshamn and Oesthammar (in Forsmark). This also implies the start of an Environmental Impact Assessment (EIA) process for a possible deep HLW repository in either Oskarshamn or Oesthammar. The process will eventually result in an Environmental Impact Statement (EIS), which will be submitted by SKB along with an application for an encapsulation plant and a deep repository in one municipality or the other or perhaps both.
The purpose of EIA, according to the Swedish Environmental Code, is to identify and describe the direct and indirect effects, which may result from a planned activity. It must be studied how humans, animals, plants, soil, water, air, the climate, the landscape and the cultural environment are affected. At the same time the management of land, water and other aspects of the physical environment is investigated. Management of materials, raw materials and energy is also an important aspect, which must be taken into consideration. Another purpose is to enable an overall assessment to be made of these effects on human health and the environment.
Via consultations of various kinds, SKB is obliged to invite everyone in Sweden who likes to take an interest in this work to offer viewpoints or pose questions. This includes public agencies, the municipality, organizations and the general public.
The consultation process started in 2003 and includes both the encapsulation facility and the final HLW repository. The consultation meetings are held 1-2 times a year until 2008.

A number of Swedish environmental organisations have taken an interest in the EIA process. First and foremost, these are Milkas and The Swedish NGO Office for Nuclear Waste Review (Miljöorganisationernas kärnavfallsgranskning - MKG) [2]. Milkas is a co-operation between The Swedish Anti Nuclear Movement (FMKK)[3] and Friends of the Earth Sweden (MJV)[4]. MKG is a co-operation between the Swedish Society for Nature Conservation and The Opinion Group for a safe Final HLW Repository in Oesthammar (Oss)[5]. Both Milkas and MKG are funded by the Swedish Nuclear Waste Fund.

The extended consultations meeting in Oesthammar Municipality

Saturday 4 June 11.00-14.00, SKB arranged an extended consultations meeting at Börstils Norra Bygdegård (Simundoe school) in Oesthammar Municipality for the purpose of giving the public an opportunity to discuss possible locations of the above-ground facilities and the disturbances that can be

[1] This section is based on information from SKB's website, mainly http://www.skb.se/templates/SKBPage____8736.aspx
[2] The website of MKG is http://www.mkg.se/index.php
[3] The website of FMKK is http://www.folkkampanjen.se/
[4] The website for MJV is http://www.mjv.se/
[5] The Website of Oss is http://oss.avfallskedjan.se/

expected from the construction and operation of the HLW repository installations and the excavation of the deep repository and the transports to and from the construction site. The hearing's target group was mainly the local residents in the Forsmark area. The presentations were similar to the ones that were given at the public hearing in Oeregrund 25 November 2004. Lunch was included in the programme. The meeting was attended by approximately fifty people.

Erik Setzman from SKB's Department of EIA and Community Contacts started off the meeting by outlining its objective and giving a short presentation on the Swedish nuclear fuel cycle and the background of SKB's deep repository project.
What remains to be built for the storage of radioactive waste in Sweden is a deep repository for spent nuclear fuel and a facility in which the fuel is encapsulated. A factory that builds these canisters is also required. The encapsulation plant could be located in the vicinity of CLAB – the Swedish central interim storage facility for spent nuclear fuel situated in Oskarshamn - which is SKB's preferred option, but it could also be built adjacent to the deep repository or at any other nuclear engineering plant. Three factors will determine the site selection: Firstly, the rock must meet the requirements imposed. Secondly, the industry must be built on a site with available land and good transport potential where the environmental impact will be minimal. Thirdly, society as a whole, as well as the municipality and its inhabitants, must view the establishment of the facility in a positive light.

A time-line for the application for building permits and the EIA process was outlined: In 2006 SKB will submit an application for a building permit pursuant to the Swedish Act on Nuclear Activities just for the encapsulation plant. In 2008 will follow an application both for the encapsulation plant and the final repository installations to undergo an EIA pursuant the Swedish Environmental Code.

Erik Setzman and SKB was criticised from people in the audience who focused on the question of transparency and SKB's willingness to involve the public in the site selection process. It was implied that SKB deliberately avoided sending out written invitations to the residents in a nearby densely populated summer residential area, because they would be the least inclined to accept a HLW repository in the vicinity. Discussions also emerged with respect to film documentation of the meeting. Oss is documenting the EIA process. However, now as before SKB accepted the filming of the meeting.

Erik Setzman was followed by *Kaj Ahlbom* who is in charge of SKB's site investigations in Forsmark. Kaj Ahlbom provided the audience with a situation report from the site investigation process.
The size of the Forsmark candidacy site is approximately 10 km^2. It is surrounded by among others a nature preservation reservation, the city of Forsmark and an area that has been marked a potential site for renewables. All the areas mentioned are categorised as "areas of national interest".
Kaj Ahlbom then described the technicalities with respect to the drilling practices: SKB are drilling three types of boreholes: Soil boreholes, percussion boreholes and cored boreholes. The soil boreholes are used for water and soil analyses. The percussion boreholes will provide information on the orientation and hydraulic conductivity of fracture zones and the core drilling involves the retrieval of drill cores from 1,000-metre deep boreholes. The cores are studied in detail and various measurements are made in the borehole.
Accoring to Kaj Ahlbom, SKB also performs ecological investigations in the woods and the fields.

These include extensive inventories of the flora and fauna, where the animal and plant life is surveyed both on land and in lakes and sea.
Especially the subject of the impact of the deep repository on the groundwater and the risk of water inflow into the repository seemed to generate interest in the audience. According to Kaj Ahlbom, the rock in Forsmark is relatively dry and fracture-poor at depth, but more hydraulically conductive near the surface. The boreholes confirm that it is potentially suitable for a deep repository, but a number of questions remain to be answered, among these that there are indications that the rock in Forsmark may have high rock stresses. The rock stresses will probably not prevent the construction of a deep repository, but they are important for the layout of the tunnels and the repository.
The question was raised in the audience, how much the groundwater level has to be sunk during the construction process. SKB is still calculating the repository's impact on the groundwater. A preliminary prognosis: No impact on ground level water flows.
How significant is the risk of water inflow into the deep repository? Due the repository's proximity to the Baltic Ocean, this inflow might consist of salt water rather than fresh water. The deeper the inflow, the saltier the water - which would also be less advantageous. SKB's assessments on the probability of water inflow are not yet completed.

Bengt Leijon, SKB's project manager for the deep repository in Forsmark, completed the morning programme by giving a description of the concept of the deep repository, its design and the planned construction process. The project was described as a 5,43 billion € (50 billion SEK) programme.
The basic principles of the deep repository are the following: Since spent nuclear fuel has an elevated level of activity for a very long period – on the order of 100,000 years – it should be built in such a way that it requires no monitoring by future generations. If today's 10 reactors in Sweden are operated for 40 years, there will be approximately 8,000 tons – the exact quantity will depend on how long the reactors are run.
The deep repository incorporates a series of safety features, relying on materials that occur naturally in the earth's crust. The idea is that the repository should imitate nature as closely as possible. In this way undesirable effects from man-made materials are avoided. Furthermore, the repository is built according to the multiple barrier principle. Nearest the fuel is the copper canister with a cast iron insert. Its function is to isolate the fuel from the environment. As long as the canister is intact, no radionuclides can escape. The canister is surrounded by a layer of bentonite clay called a buffer, since it protects the canister against small movements in the rock and keeps it in place. The buffer swells when it comes into contact with water, and the clay acts as a filter in the unlikely event that any radionuclides should escape from a canister. The rock also retards the transport of the radionuclides. But its primary purpose is to protect the canister and the buffer from mechanical damage and to offer a stable chemical environment. The copper canisters will be deposited in the bedrock, embedded in clay, at a depth of 500 meters.
The deep repository installation is a so-called "fish-bone construction", consisting of a complicated network of tunnels. It also contains an air ventilation system, involving numerous ventilation pipes.
The deep repository is designed in such a way that it is possible for future generations to retrieve the fuel if they want to do something else with it. Between 200 and 400 canisters (of a total of about 4,500) will be deposited in an initial phase. After the initial phase, an evaluation will be performed. If the evaluation has a positive outcome, the rest of the canisters will also be deposited. If the evaluation does not have a positive outcome, the canisters may have to be extracted and retrieved. Like deposition, retrieving the canisters requires a government permit. The method used for retrieval depends on when it

happens. The more time has passed since deposition, the more difficult it will be to remove the bentonite clay around the canisters. The most work and the highest costs will be required if the whole repository has been closed and sealed.

While the description of the repository concept sparked off only a few questions from the audience, there was considerable interest in the disturbances that might be caused by the construction of the repository. Especially the excavation of earth and rock and its impact on traffic intensity and the increased traffic's consequences for noise levels and infrastructure was discussed.
3 million m^2 rock is expected to be dug out in 30 years, some of it firm material, some of it loose. 1/3 of the excavated material will have to be removed immediately, 1/3 is reapplied during operation and 1/3 is used for refilling the repository.
Impact on traffic: 1 million m^2 of excavated material equals 100,000 truckloads. There are currently on Highway 76 200 trucks and 1800 cars per day. How much additional traffic in the area? During the building process per working day for 7 years and 120-150 trucks and 240-850 cars. During operation, i.e. 30 years, 35 trucks and 250 cars per day. There is no final decision yet on plans for an infrastructure extension.

After the lunch-break *Mikael Jensen* from The Swedish Radiation Protection Authority (SSI) gave a presentation on the role of the Swedish authorities in the consultation process.
According to Mikael Jensen, SSI determines how safe a deep repository for spent nuclear fuel must be. The repository must function in such a manner that the risk that an average person who lives in the vicinity of the repository will be harmed by radiation from radioactive particles does not exceed one in a million per year. This requirement is general and applies regardless of where the facility is located and how it is designed. SSI's requirement means that the dose from the repository may not exceed one-tenth of the dose from the natural background radiation each year.
Mikael Jensen also touched on the body of rules, laws and ordinances that governs nuclear activities in Sweden. The most important for SKB's activities and the EIA work are the Nuclear Activities Act, the Radiation Protection Act, the Environmental Code and the Planning and Building Act. Responsible for ensuring that SKB's work will result in the safe final disposal of spent nuclear fuel and other radioactive waste are in general SSI, The Swedish Nuclear Power Inspectorate (SKI) and The Swedish Environmental Protection Agency (EPA).
The European Union has a role to play as well, because Sweden is obligated to incorporate the common body of EU legislation in its national legislation. Furthermore, there are international agreements and conventions, which Sweden has undertaken to comply with, for example the Waste Convention, the Esbo Convention and the London Convention. All are relevant to the process of constructing a final repository for HLW in Sweden.

In the programme's final discussions the dominating subject was the alleged absence of alternative scenarios to the ones presented by SKB, especially scenarios that included other time perspectives for the storage of the HLW, natural disasters like earth quake or physical phenomena like ice age, the crux of this argument that unforeseen events or wrong preconditions could derail the project.
The SKB spokespersons assessed that this was in essence political questions and not questions to be answered by the authorities. Kaj Ahlbom also stated that SKB were literately drowning in reports touching on future event prognoses, according to him containing more than 1000 different scenarios. Requests were made from the audience for SKB to make public a summary of the alternative scenarios.

Finally, there was a question on possible radioactive pollution of the Baltic Sea from the deep repository. There are already several nuclear installations located near the Finnish Bay. The Baltic Sea has long been a recipient of radiological emissions and the radioactivity level is alarmingly high. Mikael Jensen from SSI conceded that the total amount of Caesium-137 in the Baltic Ocean was similar to the collective dose from Chernobyl, but estimated that the Forsmark HLW repository would not be a pollutant.

He also stated that in his opinion the so-called Ringhals verdict would have no impact on the HLW repository consultation process, not meaning to diminish the importance of this verdict though.

Before the meeting ended, Erik Setzman announced that the next extended consultations meeting would be in Oskarshamn 3 July 2006. The Oskarshamn meeting will focus on the plans for the encapsulation plant project. With respect to the meeting today it would be possible to submit questions, comments, documents for another fortnight and still have them registered by SKB as part of the documentation in the consultation process.

Sources:

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Svensk Kärnbränslehantering AB, *Slutförvaring och inkapsling i Forsmark, Utökat samråd den 25 november 2004*

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- *Niels Henrik Hooge 2005-6-10* -