

## **Public Involvement and Participation in Site Selection for Spent Nuclear Waste in Sweden – 14460**

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### **ABSTRACT**

In 2009 the Nuclear waste management company, SKB, chose Forsmark in the municipality of Östhammar as the best place for a repository for spent nuclear fuel. As a natural follower to that, SKB brought license applications forward 2011 to the authorities in Sweden, the Land- and environmental court (MMD) and the Swedish radiation safety authority (SSM). The municipality of Östhammar has together with the municipality of Oskarshamn been an active part in the process since 1994 with different setups of local organisations financed by the Swedish nuclear fund.

There are three leading themes that form the basis for our participation – voluntarism, complete openness of plans and results and participation with the possibility to influence.

The main goal for the organisations is to build up knowledge skills and prepare both the existing as well as the future municipality councils for the decisions of whether or not the municipalities of Östhammar and Oskarshamn will accept the facilities that SKB has applied for, a final repository for spent nuclear fuel in Östhammar and an encapsulation plant in Oskarshamn.

The absolutely most important issue for the municipalities has all along been long term safety and as the process progress, the municipalities work with dialogue with the inhabitants, stretching the implementer and leave several statements to the authorities. The municipalities are through their self governance an asset and active parts in the process of finding a solution for long term safe waste management of radioactive waste in Sweden.

Site investigations for a repository started 2002 and were finished when SKB selected Östhammar municipality in March 2009. To follow and scrutinize both site investigations as well as the license applications the organisations within the municipalities has changed over time.

The paper from the municipalities will enlighten their work with this complex issue towards inhabitants, local politicians, the implementer and authorities. It will also present the initiatives to a network for municipalities and regions who are site selected or already have a repository for nuclear waste in any form within Europe.

### **GENERAL BACKGROUND**

To put Swedens work into perspective of other nations work, a small description of the context is presented below.

#### **Oskarshamns municipality**

The municipality of Oskarshamn is located on the east coast of Sweden. The municipality covers an area of about 1000 km<sup>2</sup> and has about 26 000 inhabitants. Oskarshamn has a stable economy and high employment. Located in the municipality are three nuclear reactors, as well as Clab - an interim storage for all spent nuclear fuel in Sweden. There is also the Äspö

underground laboratory operated by SKB, which is a kind of dress rehearsal for a final repository. Another SKB operated facility in the municipality is a laboratory for development of methods for closure and testing of spent fuel disposal canisters.

### **Östhammar municipality**

The municipality of Östhammar is located on the east coast of Sweden as well, approximately 200 km north of Stockholm. The municipality covers an area of 2 790 km<sup>2</sup> and has about 21 400 inhabitants. Östhammar municipality has three major companies within; Sandvik Coromant, the municipality's organisation itself and Vattenfall who runs the power plant. Each one of the companies has between 1200 and 1700 employees, but the municipality is otherwise covered with small enterprises and entrepreneurs. More than 95 % of the enterprise structure has less than 5 employees. Located in the municipality are three nuclear reactors and the central final repository in Sweden for all low- and intermediate level radioactive waste, the SFR.

### **Siting process**

In the beginning of the 90's both municipalities was pointed out as possible locations for a final repository and an encapsulation plant. In the end of the 90's and the beginning of year 2000 feasibility studies for a final repository was conducted in both municipalities. In late 2000 the municipalities received an invitation from SKB to participate in a site investigation programme. In 2001 the council of Östhammar agreed to participation and in 2002 the council voted for participation in Oskarshamn as well.

The Municipality of Oskarshamn and the municipality of Östhammar are the two Swedish municipalities where SKB has conducted site investigations for a possible final repository for spent nuclear fuel. The site investigations followed feasibility studies in eight Swedish municipalities. The implementer, SKB, made their site selection in 2009 and in 2011 they filed an application to the authorities concerning an encapsulation plant in Oskarshamn and a final repository for spent nuclear fuel in Östhammar as a complete system for handling spent nuclear fuel in Sweden. The application contained, among other documentation, a comprehensive safety analysis report, a detailed site-specific systems description and an Environmental Impact Assessment – EIA.

Already in November 2006, SKB applied for building an encapsulation plant in Oskarshamn. The application were more or less “put on hold” from the authorities because of the foreseen applications concerning the whole system for spent nuclear fuel.

Licensing of a repository in Sweden is subject to two major acts – the Act on Nuclear Activities and the Environmental Code. The Swedish Radiation Safety Authority (SSM) prepares the government decision according to the Act on Nuclear Activities and the Land & environmental Court (MMD) prepares the government decision according to the Environmental Code. The municipalities has the veto-right concerning a nuclear facilities according to the Environmental Code.

### **INTRODUCTION**

Are a final repository and an encapsulation plant safe? That is the key question for the public and the decision makers in the municipalities of Östhammar and Oskarshamn. Before other aspects of a possible final disposal can be discussed there must be a convincing answer about the safety.

### **Perspectives of future generations**

The main difference between a “conventional” project and a final repository is the extreme time span during which the spent fuel will have a high potential to threat human health and environment. The public is well aware of the threat and concerned by this fact.

The public is also well aware that the problem must be solved and that it should not be postponed and be a burden for future generations. From several polls there is a clear advice to the experts to continue to develop and test new technology in parallel to the continuous study of proposed method. In summary the message from the public concerning our spent fuel is – OK, go ahead and carry out site investigations for a geological repository but continue to invest in alternative technology where the time span can be shortened and the content of energy is better used before disposal.

### **Experts and society**

The consent of the public to a repository will require unbroken trust in the safety case. This does not necessary mean a detailed understanding of performance assessment and all the long-term processes and events that are evaluated. In a complex safety case like this we would argue that there are probably not a single expert who has a detailed and complete understanding of the entire safety case. In the scientific world various facts, theories and calculation cases are built up to an entire safety assessment. Where lack of knowledge exist and other uncertainties cannot be removed, the use of conservative assumptions are needed. Conservative scenarios and calculation cases may also be needed to test the robustness of the system. One can say that if a conclusion is supported by a broad majority of experts it has a tendency to become accepted as a fact and remain to be perceived as a fact until replaced by another conclusion or theory.

Siting of a repository is not solely a decision by experts. It is not either an issue of taking the risk-based decision making from the experts and give it to the public. It is rather the challenge to facilitate risk-based decisions by a sound and balanced participation by all stakeholders in their respective role. From many experts we hear that this is not possible, participation requires a certain level of knowledge etc - maybe like a green card in order to play golf– but we think such an expert position is a threat to progress in waste management.

In a democratic society, final decisions are political and taken by laymen in government and in the case of Sweden also by the laymen in the municipality elected council. The other reality is that the elected decision makers cannot take such a decision without public support and the public does not have resources or time to study the detailed safety case. The decision if a repository is safe or not is, in its final stage, in the hands of laymen.

### **How to establish an acceptable safety case with the laymen decision makers?**

What is safety for the public? This is not an easy question. It contains a lot of aspects; science to a point you can understand it, trust for the implementer, regulators and also the politicians in the municipality.

This is a question that has concerned those of us working with the issue of siting a final repository for many years. We are quite optimistic that there are ways to reach rationale decisions also in a complicated safety case as the one for repository long-term safety. There are many aspects of this work and it would take to long to cover them all. We will describe four key aspects:

- A clear description of what the project is all about and what the alternatives are
- A well defined decision making process and clearly defined roles of the key actors

- An open process allowing for participation and influence
- Facts, values and stretching

### **KEY ASPECTS**

The most important condition of all for the municipalities participation in the process has been, and still are, **the voluntarism**. The municipalities can, at any time, step out of the process. Below we present other key aspects that are of importance for the work that has been done.

#### **A clear description of what the project is all about and what the alternatives are**

Spent nuclear fuel and high-level waste is extremely hazardous for hundred thousand years or maybe more. If not handled correctly in the short term and effectively removed from the biosphere in the longer term it poses significant threat to many generations. Temporary solutions in an interim storage may be acceptable for shorter periods of time of say hundred years but for longer term, a final solution must be found. The solution that most scientists and experts are suggesting is to finally solve the waste problem by disposing it in a geological formation. This is also what many national programmes initially have aimed for and it has been pointed out as the only solution. But strong public opposition has in many cases brought especially the siting projects to a halt.

From our discussions in the municipalities we have a clear message what waste management is all about. There need to be an open discussion about the options – wait and see, long term monitored surface storage, transmutation, geological disposal etc, so that the public and decision makers can among themselves with expert support work out the arguments and reach conclusions. A geological disposal seems to be the preferred option right now.

#### **A well defined decision making process and clearly defined roles of the key actors**

In complex decision making the format is as important as the content. Changing rules, parallel discussions about process and content, vague roles of the participants and a feeling of that the public is being excluded are ingredients that are likely to stop any nuclear waste project.

A system starting with a clear legislation, a stringent safety standard defined in advance, a clearly defined implementer with authority to propose solutions and sites, a strong independent regulatory body with a mandate to follow and review the implementers programme – and stop it if necessary. A local veto or at least a strong local role together with well defined decision making steps are what we would define as necessary ingredients of a sound national nuclear waste programme.

Three national organisations (NGO's) have received funding from the nuclear waste fund to participate in the EIA consultations. One of the organisations, MKG, is very active and has own experts and an expert board. They have had different focus over the years, although site selection and alternative methods have been the most important. From the municipalities point of view the NGO's are defined as a resource in the discussions.

#### **An open process allowing for participation and influence**

Reality is that the public does not have much interest in a national R&D programme for how the nuclear waste is to be handled and disposed. The interest will arise when the finger is put on the map and potentially interesting sites are identified. From an expert point of view the programme has probably been running for decades and solutions are seen as mature. For the public a completely new issue is now on the agenda and they see this as the starting point and

also see it as their right to question all and any aspect of the proposal. This is frustrating to the experts as they already see many questions as finally solved. Maybe this is the most critical point for any nuclear waste project and probably one explanation to be found to why some projects fail.

At this juncture the experts and laymen must meet, allow time for discussions and be prepared to give and take. If the experts takes on the role that they know all the answers and only takes it as an information problem, there is again a large likelihood of failure.

The key words are... take the time required for participation and influence. How can the project be set up to allow true participation by the local public and the local decision makers and how can the local expertise be utilised to form a better project? The answers to these questions are keys to progress in any siting programme. For those experts and managers that do not think there is anything to learn from the public and local decision makers and that participation is only a burden, we can foresee large problems and distrust.

### **Facts, values and stretching**

With this fourth point we will try to address how to formulate the answer to the question from the public - is it safe?

Important is to set up various forums where experts and laymen can meet. From our experience it is of crucial importance that the experts from the regulator participate in these forums. It is also important that experts with other opinions get the possibility to meet the public.

Safety analysis does not only include facts but also contain value judgements on several levels.

Our experience from the municipalities tells us that the answer to the question "is it safe?" contains two main components. Firstly how the soundness of the system itself is perceived and secondly if the experts can be trusted. The experts can roughly be put in to three groups - those who are developing the technical details (for the implementer), those who are critical and sometimes also linked to the environmental groups and those working for the regulator who review and approve. The role of the regulator is often underestimated. A strong, competent and independent regulator with the legal tools and resources to participate is crucial based on our experience in the municipalities if we are to reach solid and respected decisions.

For the critical experts from e.g. the environmental groups we must find forums where they can address their questions to both the implementor and the regulator. Several projects within the European union (ex RISCUM) has developed and improved models for stretching expertise. To establish a demanding environment for the experts where the issues can be thoroughly stretched is one important ingredient if decision makers and the public will trust the safety case or not.

### **METHODS**

A key factor for our involvement is that we receive independent funding for our work related to the waste program. The government changed the rules so the municipality work could be financed by the national nuclear waste fund. There has been some discussions between the municipalities and the authorities in how to use the money from the fund, but mostly we

agree. Key areas for the municipalities use of money is information and knowledge building within the public and the political arena.

Another key factor is the strong and independent position of a Swedish municipality. For siting a nuclear facility the municipality has a veto possibility. Some other factors are:

- Local experiences with nuclear operations
- Traditionally regulators and authorities have a high degree of credibility in Sweden
- There are clear party roles in the process with the government, the regulators and the industry, SKB
- A step by step process

For the municipalities there are three leading themes that formed the basis for the participation – voluntarism, complete openness of plans and results and participation with the possibility to influence.

The information to the public has been through open meetings, articles in newspapers, brochures, exhibitions, theme at school, local papers, radio and TV, and most recently for the municipality of Östhammar..a “Dialoguetour” in 2013.

In 2012 the municipality of Östhammar took the initiative to create an European network for municipalities with, or in an advanced siting process for, repositories of radioactive waste. In april 2014 we will start up, under the umbrella of Group of municipalities with nuclear facilities (GMF), with at least 7 countries and the aims are:

- exchange knowledge and experiences among politicians and civil servants
- sharing and spreading "best practise" or good examples for ex citizen dialogues
- empowering the municipalities by improving the processes at home
- be a speaking partner and a platform to the EU Comission

### **The organisations**

The organisations of the municipalities has been changing over time due to different causes but the most obvious one was by the time SKB made their site selection, in 2009. The municipality of Östhammar reorganised and broaden their organisation, while Oskarshamn also reorganised but made their organisation smaller. The organisations has to a major extent consisted of local politicians, from the council with a little help from some desk officers, and with participation from neighbouring municipalities, local NGO´s and regional councils.

Independent of the organisations the key aspects has been crucial all along.

### **CONCLUSIONS**

The siting process for a final repository in Sweden has been going on for two decades. You need a long period to build trust and to communicate with the citizens. It is a vulnerable process, you can loose the trust in a second and it takes years to build it up again.

On the other hand, a long drawn out process can lose interest among both decision makers and the public. A realistic timetable is as important as the process and must be predictable.

We believe that complicated issues like safety assessments can be communicated among laymen if you have a process for it and an idea for how to carry it out. We also believe that full openness and transparency between all involved stakeholders facilitates the engagements from the inhabitants.

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