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NUCLEAR ENERGY AGENCY  
RADIOACTIVE WASTE MANAGEMENT COMMITTEE

### Forum on Stakeholder Confidence (FSC)

**Tools and Processes for Handling of Transfer of Burdens, Knowledge and Responsibility:  
Preparing Future Generations and Empowering Local Communities**

**Proceedings of a Topical Session**

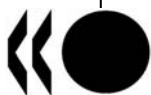
**Issy-les-Moulineaux, France 6-8 June 2007**

*As part of its programme of work the OECD/NEA Forum on Stakeholder Confidence continues to investigate the theme of "Tools and Processes to Help Society Prepare and Manage Decisions through Stakeholder Involvement". A topical session was held on June 7, 2007 on the issues of transfer of burden and responsibilities to both the present and future generations. Case studies were presented from Sweden and the United States.*

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## **FOREWORD**

As part of its programme of work the OECD/NEA Forum on Stakeholder Confidence continues to investigate the theme of “Tools and Processes to Help Society Prepare and Manage Decisions through Stakeholder Involvement”. A topical session was held on June 7, 2007 on the issues of transfer of burden and responsibilities to both the present and future generations.

The Topical Session was composed of two parts: Part A: Preparing future generations; Part B: Empowering local communities and improving decision making. Regulatory case studies were heard from Sweden and the US in the first part. In the second part, the Transparency Programme of KASAM (Sweden) was presented.

Mariano Molina chaired the topical session. Elizabeth Atherton acted as rapporteur.

The present report documents the topical session. Its summary and lessons learnt capture both the oral presentations and the discussions that took place in the audience.

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## SUMMARY AND LESSONS LEARNT

Mariano Molina opened the session by considering: “Why do we need to discuss how to help society to make decisions about radioactive waste management (RWM)?” He outlined two reasons:

-Whatever the decision, it will be complex; it involves not only safety or technical aspects but ethical questions arising from the long term nature of risk.

-Members of the public perceive that RW managers are talking about taking decisions for eternity. Society does not refuse such discussion but want to know how we can decide.

Our decisions today could affect lots of future generations; there are many issues that we need to consider in this context, for example:

- What is the ethical model that we should choose? It would be arrogant to imagine that our model will last for 10 centuries or more...
- We have obligations to future generations - how many is difficult to define.

Molina suggested that for the next two or three generations, which we can see, it is a reasonable starting point to take our best ethical position along with our best knowledge and social behaviour, and pass these on to our close descendents.

The presentations and discussions summarised below touched on these and other issues that are important in the long-term management of radioactive waste management facilities.

### **Lessons learnt from the topical session**

The experiences reported suggest that the following are important:

- Careful consideration of impacts on future generations including the opportunities and burdens we pass on to them;
- Forward planning to enable long-term issues to be adequately addressed, on technical, regulatory, financial and societal aspects;
- Listening to and involving communities who live close to facilities;
- Recognising that communities feel more confident if they are part of the discussions about the long-term implications of RWM and that they want to be involved in the discussions and the plans;
- Exploring the long-term role of local communities and how this should be supported;
- Recognising our own limitations and putting in place mechanisms to deal with these;
- Ensuring transparency throughout the process;
- Developing clear roles and responsibilities in the short and long term.

## **PART A: PREPARING FUTURE GENERATIONS**

### **SKI AND SSI'S RECOMMENDATIONS TO THE GOVERNMENT CONCERNING LONG-TERM RESPONSIBILITY AFTER CLOSURE OF A REPOSITORY FOR SPENT NUCLEAR FUEL**

**Josefin Päiviö Jonsson, SKI**

Many activities will cease at the closure of a repository, but not responsibilities. The candidate municipalities in Sweden expressed concern about who will take over after the implementer is released from responsibility for the facility? They feel this is a question that should be investigated and want a clear answer before they are willing to host a repository. Addressing the issue is one of the conditions set by the Oskarshamn community. The government thus commissioned SKI and SSI to review the legal obligations of institutional players as laid out today in legislation in Sweden. SKI and SSI formed a joint committee to look at the issue. They looked at obligations set out in the regulations, namely the:

- Act on Nuclear Activities
- Radiation Protection Act
- Environmental Legislation
- Resources for future costs
- Nuclear Liability Act
- Euratom Treaty

It is the role of the government now to learn if the municipalities are happy with the suggestions made by SKI and SSI for the management of responsibilities.

In their review of environmental and nuclear legislation, SKI and SSI identified many recognised responsibilities toward future generations. However, there is no plan for how they will be met. In general SKI and SSI considered that there is sufficient time before us (100 years before closure) to develop understanding and make such decisions. However it is important to start to address the issue now.

The reactor owners have several responsibilities for the management of nuclear waste that have been delegated to their jointly owned company SKB. Under the act on nuclear activities SKB is responsible for the spent nuclear fuel and nuclear waste that will be placed in a final repository and

ensuring that the facility meets the requirements of the legislation. SKB is also responsible as the licensee for the licensed facilities.

SKB's responsibility remains until all their obligations under the law are fulfilled or the government grants a release to them. They are also responsible for the future costs of the management system. It could be said that SKB will have fulfilled their obligation when the repository has been sealed. SKI will be responsible for reviewing the post closure safety.

The present environmental code outlines the polluter pays principle. SKB is responsible for paying for the costs related to any follow-up measures needed due to any pollution that comes from the repository. The costs can be related to an action that is needed to clean up the pollution or to provide financial compensation.

Under the radiation protection act SKB must follow SSI's regulations on radiation protection of human health and the environment in connection with the final management of spent nuclear fuel and nuclear waste. This includes a responsibility for monitoring the facility. Under the nuclear liability act SKB is responsible for damages occurring from running the facility and the act requires money to be set aside to cover this.

Under safeguards legislation SKB will be responsible for operating the repository according to international agreements with the IAEA and Euratom. The operation will be controlled by IAEA, the European Commission and SKI. The general demands regarding safeguards for a closed repository are not yet established since no facility of this kind exists.

SKB is obliged to take responsibility for costs for after-treatment irrespective of the owner of the property. When SKB no longer exists the property owner could be obliged to take this responsibility and cover possible costs for after-treatment after closure of the facility. The new party that hosts the final facility for spent nuclear fuel will have no responsibilities for possible damages that might occur during its operation or after closure.

As for the Swedish state, according to article 21 in the Convention on the safety of spent fuel management and on the safety of radioactive waste management the Swedish state is ultimately responsible for the spent nuclear fuel and nuclear waste. One way to meet this obligation would be to set up a Swedish authority when the repository is closed and the licensee is released from its responsibility. The authority would be responsible for the management of the money in the national waste fund and also for providing information about the final repository to future generations according to the Act on archiving documents.

According to the *recommendations* submitted by the joint committee to the government, the responsibility for reviewing and monitoring the post-closure safety shall be taken over by the state in cases where the permit holder no longer exists. However, it is not specified which state authority should take over these responsibilities. Furthermore, it is the committee's recommendation that this responsibility should not be stipulated in law at this stage since it would not have any tangible meaning so long before (approx. 100 years) the proposed repository would be sealed. Furthermore, stipulation in the Act on nuclear activity could reduce the actual actors' incentive to fulfil their current requirement for long-term responsibility. The committee estimates that the proposed repository for spent nuclear fuel will be sealed earliest ca. year 2100. When SKB potentially can be dissolved is not clear in the legislation, but it would not be before the sealing of the repository. However, the nuclear reactors could be terminated before this time.

One issue that was considered was the fact that encapsulated spent nuclear fuel might in the future be regarded as a valuable resource. The resource would be owned by the owner of the repository property. When SKB ceases to exist the state will own the resource as the new property owner. Because of this the state would also be responsible for monitoring the site and taking the necessary action to prevent intrusion and to prevent man and nature from being exposed to danger.

The study outlines some outstanding questions relating to property rights and who would own the site including the ownership of the spent fuel, who would own it after final disposal and the fact that legislation on safeguards has not yet been established for a closed facility. However, the need for safeguards will not stop after closure of the facility, which needs to be thought about internationally.

The committee has sent their work to the government who has passed it on to stakeholders for comment. Responses to the proposals are expected in the summer of 2007, when the government will make a decision about what to do next. It is the government's responsibility to talk to the municipalities and get their feedback on the committee's proposals to identify the way forward.

A major theme of the ensuing FSC discussion was 'when will the implementer be freed of responsibilities?' Should this take place before or after sealing? During the post-closure monitoring period? Some FSC members thought that future government liability may prove to be a controversial issue in countries other than Sweden.

It was noted that although responsibility for the site ends at closure, financial obligations post-closure will still remain. The criteria to be used to set up the fund for this, has still not been decided but it is recognised as an issue that needs to be addressed.

Some participants noted the obligations on the state but pointed out that there is a risk that the state itself will not exist. People in Sweden do not consider that Sweden will not exist in the future. There may be issues of stability in the future and possible changes in society but it is only possible to work with the current situation and assume that it will continue.

After closure of the repository there will be post-closure monitoring, possibly for a few hundred years. This will be a part of the conditions on SKB which will be set out at the time. Some activities will end at the closure of the facility but monitoring and safeguards obligations may continue. The exact nature of this monitoring and safeguard work needs to be discussed and agreed upon. With the proposed approach most of the liabilities rest with the state in the long term, the waste producers only have liabilities in the short term but their decisions could have big impacts on long term liabilities.

## **TRANSFER OF SAFETY RESPONSIBILITIES TO FUTURE GENERATIONS: REGULATORY TOOLS**

**Janet P. Kotra, USNRC**

The case study reported views presented by the Nye County last December (Janet Kotra was not speaking for the County). At the Nye County, we see a shift from plans for passive safety, to a community taking the lead to organise active safety and stewardship. In a forward-looking local

development plan, Nye County defends a series of principles like safety, equity, and societal acceptability of responsibility (safety being foremost).

Janet Kotra distributed a brochure “Judging the Safety of a Repository at Yucca Mountain, Nevada: U.S. Nuclear Regulatory Commission Requirements”. In her presentation, she spoke of how the regulator can respond to the conditions set by the community.

The Nye County community clearly advocates permanent oversight of facilities. Locals now are advocating in a forceful way – saying “we are the ones responsible for our long-term safety. The relationship with this site is part of our identity.” The Nye County is also preparing to meet the energy needs of an expanding desert community. The link with the future is the community itself. They need to create a culture of foresight. With today’s projects they are creating human capital that will continue to put the pressure on existing government structures.

Continued oversight has its own important issues like financing the system in a credible way. The Nye County invests much of the funding provided now in e.g., infrastructure programs that should increase the sustainability of the community.

To respond to community requirements the regulators can establish requirements and guidance to ensure that safety obligations that can reasonably be discharged are in fact carried out and that remaining obligations are transferred as responsibly as possible, so that subsequent generations have the maximum flexibility to discharge their responsibility. There are transferred burdens of cost, risk and effort and these need to be at least partially compensated for by ensuring a subsequent transfer of information, resources and continuity of education, skills and research.

The US regulatory requirements for disposal in a geological repository set out obligations in terms of landownership and control, records maintenance, performance confirmation, post-closure monitoring, monuments and markers, archives and records preservation and post-closure oversight.

There are many active regulatory controls before closure of a repository which aim to ensure the maintenance of proper records from the outset of the project and that land ownership and control including water rights are properly managed. There are controls that restrict the access to the facility and avoid disturbances that could affect safety, and also there are performance confirmation and pre-closure monitoring to ensure that the site is fully understood.

There are also active regulatory controls after closure of the facility. These will include post-closure monitoring and maintenance of institutional and physical access controls. Participation in and updating of local, state, federal and international archives and land record systems is required along with an active programme for continuing oversight of the facility.

There are also regulatory controls which are set out as requirements, for example monuments and markers are to be designed, fabricated and emplaced to be as permanent as practicable and comprehensive records must be maintained at multiple archives around the world.

However, apart from the post closure oversight requirement, the requirements have remained essentially unchanged for 25 years. They were first established as part of the generic repository regulations in 1983 and they have been adopted virtually unchanged for Yucca Mountain specific regulations in 2001. The parts that have changed are related to the requirement for active repository oversight in perpetuity. There is now recognition that technology continues to advance and that advances should be taken into account in the design and the evolving vision for protecting future generations including an emerging stewardship role for the local community.



The Energy Policy Act of 1992 section 801 part C states that following repository closure the implementer shall continue to oversee the Yucca Mountain site to prevent any activity at the site that poses an unreasonable risk of:

1. breaching the repository's engineered or geological barriers, or
2. increasing the exposure of individual members of the public to radiation beyond allowable limits.

Various advances in technology related to the durability of monuments and markers, information technology and global access, archival media and techniques and remote sensing have to be integrated into the project design to make sure that best practice is being followed at all stages.

The Nye County seems to be developing a stewardship role despite vigorous opposition to the principle of hosting a repository from the state of Nevada. The Nye County continues to pursue cooperative agreements and relationships with the federal implementer. The county is planning for a separate, active role in the regulator's decision making process and is looking for long term responsibilities for and a relationship with the Yucca Mountain site and the repository.

The Nye County government is aiming to ensure the protection of present and future populations in the community and they want to ensure that the repository project is a success in every way possible. They want to make sure that the Nye County benefits economically from the project.

The county has set up various oversight initiatives over the years to follow the project. They set up an independent scientific investigation programme in 1995 and an early warning drilling programme at the same time. Their quality assurance programme was accepted by the US NRC in 1999 and the community protection plan was approved by the county commission in 2006.

For the future the Nye County is proposing that there would be a co-ordinated involvement of the county in planning, development, operation and long term monitoring of the repository. They want to encourage the development of a live-work community for the repository workers so that they will be engaged in the local community as well as working at the facility. They want to encourage the full integration of the federal repository facility with the local infrastructure development for example by setting up a visitors centre, and by working to get the emergency responses in place and medical training facilities.

The county is looking to develop the Amargosa Valley Science and Technology Park and Museum so that it links with the facility. The county wants to hold the repository sample management and archive facility and they are looking at an advanced energy and water management facility related to the site including a solar power farm. The county wants to see itself as a test bed for energy technology applications for the US; however the role of the local community in the long term future of the site remains unclear. The congress will need to approve land withdrawals to enable the facility to be completed. In order to have a role in the process the community will need to get the co-operation and funding of the implementer. There is also the issue of continued state opposition to the facility which impacts on the ability of the Nye County to engage in the process. Certain aspects of their proposals may require regulatory acceptance to enable them to be put in place.

Although there are some regulatory tools in place these may need to adapt and change to the changing requirements of the community. There was also a change in technology and expectations that will need to be integrated into the programme. The emerging role of the community in partnership

with the implementer and regulatory authorities has the potential to profoundly influence the effectiveness of the regulatory tools and technology that are in place.

Experts used to think that the safety panacea was passive safety but communities are now saying that they want active safety and prolonged stewardship including monitoring. However this raises the issue about long term financing of programmes. There is a strong articulation of the polluter pays principle in US law which means that the fund for the repository design, construction, operation, local governance, oversight and protection measures are negotiated by the county with the implementer.

The government is to provide monitoring and oversight in perpetuity but this relies on the nuclear power levy and long term plans. However if the community is saying that Nye County needs a long term role and that the link between the facility and future generations is the community itself then there is a need to promote the long term role of the community as they will provide the human capital to pass on knowledge about the facility to future generations. To enable this to really develop will need cultural links to the facility possibly through energy development.

The regulations rely on “no active control” of the facility over the long term. It will be the congress who will decide whether to have active controls in place and there will need to be an alignment of these two approaches. It may be possible to take credit for controls over a period of a few hundred years but ultimately this will not be possible.

To date in the US, this long-term active oversight orientation has been superimposed on existing regulation and some specific rules have not yet been worked out. Long-term oversight may mean an obligation to refurbish markers and monuments, and proper ways to maintain records in order to transfer knowledge to future generations. In some regulatory frameworks credit is given for safety provided by existing institutional controls. One starts to worry about passive safety AFTER the institutional control period (representing a bonus of a few hundred years).

The ensuing FSC discussion highlighted new trends in regulatory culture. Reflecting public demand, there is a shift in the regulatory field towards a requirement for “permanent” oversight of a repository. For instance, WIPP was designed with the intention to maintain active surveillance for 100 or 300 years. The 2000 report “Disposition of SNF and HLW - Societal and technical challenges”<sup>1</sup> analysed OECD ethical statements and saw a similar shift, from a view that assuring passive safety immediately is ethically correct, to an emphasis on leaving pathways open for later decisions. That group interpreted the shift as a greater recognition of the fact that we do not have all the answers, we are not the final generation. There may be other ways of viewing and behaving later and we must respect those differences and provide resources for that. There is more emphasis now on passing responsibility down the chain of generations, rather than on a far-future scenario in which a new civilisation stumbles onto the repository site.

There appears to be a trade-off between the focus on passive safety, no reliance on active institutional controls and no undue burden on future generations versus a focus on active oversight in perpetuity, the preservation of options and the responsible transfer of unavoidable burdens. This in turn brings out an emerging role of local stewardship for local communities.

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<sup>1</sup> US National Academy of Sciences, Board on Radioactive Waste Management, National Academy Press, Washington, D.C., 2001.

## **PART B: EMPOWERING LOCAL COMMUNITIES AND IMPROVING DECISION MAKING**

### **KASAM PROJECT FOR DETAILED STUDY OF THE DECISION MAKING PROCESS AND BASIS FOR DECISIONS IN THE NUCLEAR WASTE AREA**

#### **Björn Hedberg, KASAM**

The Swedish National Council for Nuclear Waste, KASAM, which is an independent committee attached to the Swedish Ministry of Environment, studies issues related to nuclear waste management and the decommissioning of nuclear installations in order to advise the government on these issues.

In autumn 2006, the Swedish Nuclear Fuel and Waste Management Company (SKB) planned to apply for a permission to construct an encapsulation plant, and during 2009 to apply for a permission to construct a final repository for spent nuclear fuel. This was an important starting point for planning KASAM's activities, as from 2006 onwards KASAM needed to prepare and intensify work in order to be an active and effective support for the government prior to dealing with these applications.

An important part of this work is to identify the key issues from different perspectives, prior to the decision on the final repository, and also to make arguments and assessments transparent to decision makers and the general public. Further, it is of great importance to create a dialogue around these issues between stakeholders who are central to the licensing process and stakeholders who are affected by the decision in different ways. The dialogue is important both from the perspective of knowledge (to identify important issues and have them highlighted and discussed) and from a democratic perspective (affected stakeholders shall be given the opportunity to make their voices heard, and issues shall be highlighted in a way which is accessible to different categories of stakeholders). Therefore, KASAM saw a need to broaden and develop its activities regarding the identification of central issues, to have them studied in detail and to contribute to the dialogue on these issues.

#### **Background**

During 2005 and 2006 discussions were held between KASAM and the ministry as well as between KASAM and a number of actors having an interest in the nuclear waste management area including SKB, responsible authorities, municipalities involved in site investigations by SKB, their respective county administrative boards and regional councils, as well as environmental groups about their views about the future work of KASAM. These discussions showed that there is a need for activities by KASAM leading to more transparency in the Swedish nuclear waste management programme. Therefore KASAM decided to start a pre-study for a transparency programme and Kjell Andersson (Karita Research) was contracted to carry out the pre-study. The idea of the transparency programme is that it should increase the transparency, and thereby the quality, of the decision process and the document basis for the up coming decisions related to the SKB license applications for a final repository for high level nuclear waste and an encapsulation plant for spent nuclear fuel, expected to be submitted to the government at the end of 2009 (SKB, 2006, in Swedish).

### **Earlier efforts towards transparency**

The KASAM transparency programme builds on research and development that has taken place in Sweden since the beginning of the 1990s starting with the Dialogue Project of SKI and SSI (Andersson J, Andersson K & Wene, 1993), followed by the RISCOP Pilot study (Andersson, Espejo & Wene, 1998) and the RISCOP II project (Andersson et.al., 2003) co-ordinated by SKI. Also the Swedish municipalities Oskarshamn and Östhammar have used the ideas of the RISCOP-model in organising seminars and hearings, and the “Oskarshamn model” builds partially on RISCOP ideas. The RISCOP-model has also been used in other areas than nuclear waste management, such as the risk assessment of mobile telephone systems (Hedberg, 2006), siting of energy installations (Andersson, Johansson & Wene, 2006), and cleaning and remediation of chemically contaminated sites (Andersson, Grundfelt & Wene, 2005). A description of the model is placed at the end of this paper.

### **Basic elements**

The pre-study proposes that KASAM uses the RISCOP-model to support the transparency programme. Recurrent elements in the programme would then be:

- A clear description of the background for the issue being addressed
- Knowledge building activities
- A hearing where the KASAM committee members and staff stretch the stakeholders

The transparency programme can combine the RISCOP-model with other approaches to citizen participation at occasions when this is deemed suitable. For example, focus groups, other forms of working groups and consensus conferences could be organised and linked to a “RISCOP hearing”. Therefore, the pre-study report contains an overview section about methods for public participation.

At this stage of the Swedish programme for nuclear waste management it is believed that KASAM can provide an arena for transparency which other stakeholders can trust not having hidden agendas or vested interested in the results.

### **Contents**

During the pre-study a number of stakeholders were approached to give their views about the format and contents of the transparency programme. The consultations showed great expectations on the programme and a large number of issues were raised that could be included in transparency creating activities.

A typical activity will be relatively resource demanding, especially with respect to the time available for key stakeholders. Therefore, issues to be addressed must be critically prioritised. The pre-study report contains nine issues proposed for special efforts by KASAM:

- Deep bore holes as a possible alternative method for final disposal
- Citizen participation and democracy
- The roles of responsible authorities

- Decommissioning of nuclear reactors
- Site selection – on what basis?
- Socio-economic issues
- Local environmental issues and regional environmental goals
- Long-term storage of spent nuclear fuel
- Critical assumptions in the safety assessment

A first event in this suggested series of activities within the transparency programme took place in March 2007, when KASAM arranged a hearing about deep bore holes as a possible alternative method for final disposal. Technical feasibility, long term safety and safety philosophy were among the topics addressed. The hearing will be reported in a KASAM report, to be published in 2007.

Realistically, at most two issues can be covered per year, therefore maximum five issues can be dealt with until SKB has submitted its licence application, however, in principle the transparency programme can continue also during the licensing process. The timing of the KASAM activities will be crucial considering the SKB programme, the review work of the authorities as well as the municipality involvement.

## Conclusions

The transparency programme should prepare KASAM for its advisory role to the Swedish government but it should also be a resource for all stakeholders, the political decision makers and concerned citizens who wish to deepen their insight into the issues addressed. Besides contributing in a constructive way to the Swedish nuclear waste management programme, the KASAM transparency programme can contribute to the development of nuclear waste management in a wider context including research and development work that takes place in Europe about public participation and transparency, as well as to other sectors in the society.

## ENCLOSURE

### The RISCOM-model for transparency

RISCOM gives a model for transparency with three cornerstones: facts, legitimacy and authenticity. **Facts** are produced using scientific methods and state “what is true”. **Legitimacy** mirrors what is regarded as right and acceptable in the society. **Authenticity** builds confidence – which has to do with the harmony between a person’s (or an organisation’s) actions and who the person/organisation is, and the role in the decision making process. The **values** which are expressed in proposals and bases for decisions must be both legitimate (rooted in society’s norms) and authentic (agree with the values of the proposers).

Transparency is achieved when the points at issue, the legitimacy of the arguments and the actors’ authenticity is made clear to the decision makers and the general public. In the RISCOM-model it is achieved by “**stretching**”. The term means that conditions for different actors (e.g. a person making a proposal, a producer, a developer) are sufficiently demanding, that the questions are put forward from different perspectives, and that the questions are answered.

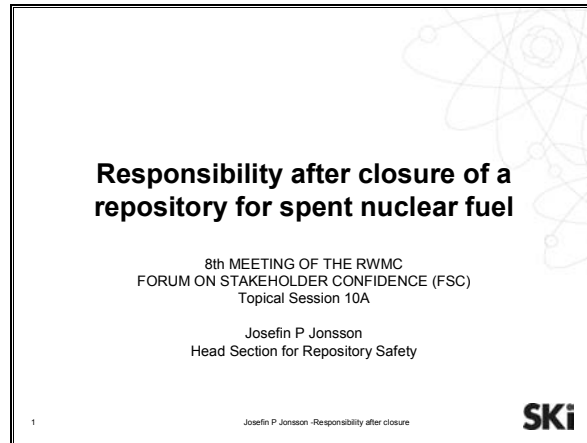
To be able to handle the flow of information in a complex question it must be structured. With the RISCUM-model the structure has **independent levels** where different aspects can be discussed. On each and every one of these levels pre-conditions must be created for a meaningful dialogue between the parties concerned. There shall be a process to **increase awareness** of the questions at the different levels and to create a **forum for dialogue**. Work to find the independent levels and to develop the process of increased awareness and dialogue demand an independent guarantor acknowledged by all parties. Without such a guarantor there is a serious risk that the control of the work is taken over by the party which is stronger information-wise, which often is the party proposing.

A high-quality decision demands that factual reasons and values are explained and that the decision makers have confidence in the experts. However, transparency is not only a question for political decision makers. In a democratic system there must also be general insight into the decisions. It must be possible for the general public to see how decisions are made and to see the facts behind the decisions and the value arguments. Openness is not sufficient – transparency demands more than that. There can be openness in the form of access to information, without this giving transparency.

Transparency demands that there are procedures for citizens' insight and involvement.

## ANNEX

Slides provided by Josefin Päiviö Jonsson, SKI

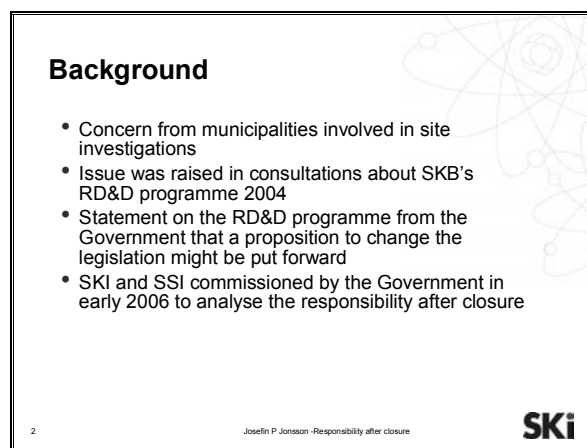


**Responsibility after closure of a repository for spent nuclear fuel**

8th MEETING OF THE RWMC  
FORUM ON STAKEHOLDER CONFIDENCE (FSC)  
Topical Session 10A

Josefin P Jonsson  
Head Section for Repository Safety

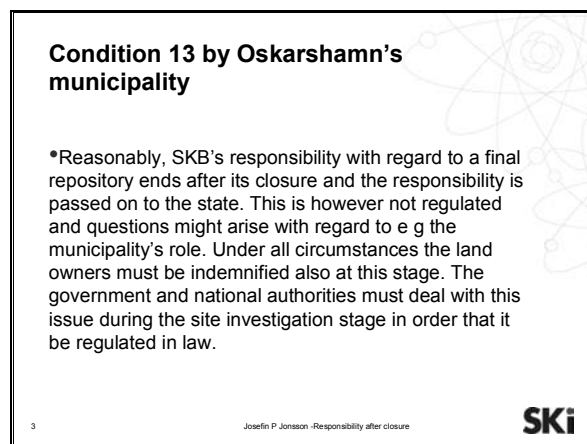
1 Josefin P. Jonsson - Responsibility after closure **SKI**



**Background**

- Concern from municipalities involved in site investigations
- Issue was raised in consultations about SKB's RD&D programme 2004
- Statement on the RD&D programme from the Government that a proposition to change the legislation might be put forward
- SKI and SSI commissioned by the Government in early 2006 to analyse the responsibility after closure

2 Josefin P. Jonsson - Responsibility after closure **SKI**



**Condition 13 by Oskarshamn's municipality**

•Reasonably, SKB's responsibility with regard to a final repository ends after its closure and the responsibility is passed on to the state. This is however not regulated and questions might arise with regard to e.g the municipality's role. Under all circumstances the land owners must be indemnified also at this stage. The government and national authorities must deal with this issue during the site investigation stage in order that it be regulated in law.

3 Josefin P. Jonsson - Responsibility after closure **SKI**

## **FUTURE RESPONSIBILITY FOR A FINAL REPOSITORY**

- In accordance with the Act on Nuclear Activities it is the responsibility of the operator of a nuclear facility to secure safe disposal of the nuclear waste.
- When a final repository has been sealed and the seal has been approved by SKI it must be considered that SKB has fulfilled its obligations.
- The subsequent responsibility for the repository is not regulated in law even if the 22§ of the Government Ordinance (1984:14) on Nuclear Activities indicates that SKI "...surveys and controls final repositories". Reasonably it must, in the long run, be the state which takes the overall responsibility for the repository.
- The municipality is of the opinion that the issue must be regulated before SKB is granted the permission to start a detailed investigation.

4

Josefin P. Jonsson - Responsibility after closure

**SKI**

## **Work of committee**

- Obligations by licensees according to Act on Nuclear Activities
  - Reactor owners and SKB
- Obligations according to Radiation Protection Act
- Licensees responsibility according to environmental legislation
- Resources for future costs
- Licensees damage reparations cost according to Nuclear Liability Act

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**SKI**

## **Cont.**

- Safeguards according to Euroatom treaty and contract between IAEA, Euroatom and Sweden
- Property related question regarding registration of real-estate
- Archiving of document about the final repository

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**SKI**



## Sharing of responsibility between state and nuclear power producers

- I. Future costs for a final repository must be covered by the incomes from the energy production from where the waste originate
- II. The waste producer has the full responsibility siting, constructing and operating a repository
- III. The state has the overall responsibility for the spent nuclear fuel and nuclear waste
  - Convention on the safety of spent fuel management and on the safety of radioactive waste management
- IV. Only waste from Sweden

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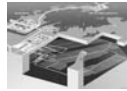
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SKI

## Division of responsibility

VATTENFALL 

 okg



 SKB  
Svensk Kärnbränslehantering AB

 SKI  
Svensk strålningsmyndighet  
Swedish Radiation Protection Authority

 REGERINGSKANSLIET

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Josefin P. Jonsson - Responsibility after closure

SKI

## Reactor owners

- Management of nuclear waste has been delegated to the reactor owners' jointly owned company SKB
- Remaining responsible for the management of nuclear waste and all necessary safety precautions
- Responsible until all obligations are fulfilled or the Government grants a release
- Responsible for future costs for the management system

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SKI

### SKB and Act on Nuclear Activities

- Responsible for that the spent nuclear fuel and nuclear waste will be placed in a final repository that meet demands according to the legislation
- Responsible as licensee for licensed facilities
- Long term commitment that remains until all obligations are fulfilled or a release have been granted

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### SKB and Environmental Code

- Polluters Pays Principle (PPP)
- Pay for costs related to the follow-up measures needed to be taken caused by pollution from the repository
  - The cost can be related to action needed to be taken or financial compensation

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**SKI**

### SKB

- **Radiation Protection Act**
  - SKB must follow SSI's regulations on Radiation Protection of Human Health and the Environment in connection with the final management of spent nuclear fuel and nuclear waste
- **Nuclear Liability Act**
  - Responsible for damages occurring running the operations of the facility.

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### SKB and Safeguard

- Responsible for operating the repository according to international agreements with IAEA and Euroatom
- The operation will be controlled by IAEA, the European Commission and SKI
- The general demands regarding safeguards for a closed repository are not yet established since no facility of this kind exists

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**SKI**

### Property owners

- SKB:s are obliged to take responsibility for costs for after treatment irrespective of property owner
- When SKB no longer exists the property owner could be obliged to take this responsibility and cover possible costs for after treatment

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**SKI**

### Municipalities

- The municipality hosting a final repository for spent nuclear fuel have no responsibility for possible damages that might occur during operation or after closure

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## The Swedish State

- According to article 21 in the “Convention on the safety of spent fuel management and on the safety of radioactive waste management” is the Swedish State ultimately responsible for the spent nuclear fuel and nuclear waste
- A Swedish authority should possibly be formed when the repository is closed and the licensee are released from its responsibility
- Responsible for management of the money in the national waste fund
- Responsible for information about a final repository to future generations according to Act on filing

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## **Cont.**

- The encapsulated spent nuclear fuel might in the future be regarded as a valuable resource
  - The resource is “owned” by the owner of the property
  - When SKB ceases to exist the State will own the resource as new property owner
  - The state is by that also responsible to monitor the site and take necessary action to
    - prevent intrusion
    - prevent man and nature to be exposed to danger

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## **Result from the committee**

- The committee suggests an addition to the Act on Nuclear Activities
  - When the nuclear industry by its jointly owned company SKB is released from its responsibilities according to the Act on Nuclear Activities the State will take over both the obligations and the rights earlier belonging to the licensee

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## Hesitations

- Not appropriate to legislate the long-term responsibility 100 years before the repository will be finally closed
- Reduce the motivation or incentive for the industry today responsible to fulfil their obligations

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## Remaining questions


- property rights
- ownership of spent fuel
- ownership of spent fuel after final disposal
- legislation on safeguards not yet established
  - The need of safeguard will not stop after closure

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**SKI**

Slides provided by Janet P. Kotra, NRC




**U.S. NRC**  
UNITED STATES NUCLEAR REGULATORY COMMISSION  
*Protecting People and the Environment*

**Transfer of Safety Responsibilities to  
Future Generations: Regulatory Tools**

8<sup>th</sup> Meeting of the RWMC  
Forum on Stakeholder Confidence  
Topical Session 10.b.

Janet P. Kotra  
Division of HLW Repository Safety  
U.S. Nuclear Regulatory Commission  
June 6, 2007

1




**U.S. NRC**  
UNITED STATES NUCLEAR REGULATORY COMMISSION  
*Protecting People and the Environment*

**What duties to future generations can or  
should regulators address?**

- Safety?
- Equity?
- Social acceptability?

“Focus on Safety”  
After a certain time, “...attend to safety only”

2



**U.S. NRC**  
UNITED STATES NUCLEAR REGULATORY COMMISSION  
*Protecting People and the Environment*

**Regulators can establish requirements and  
guidance to provide that**

- Safety obligations that can reasonably be discharged are, in fact, carried out
- Remaining obligations are transferred as responsibly as possible to afford subsequent generations maximum flexibility to discharge *their* responsibilities
- Transferred burdens of cost, risk and effort, are at least partially compensated by ensuring transfer of
  - Information
  - Resources
  - Continuity of education/skills/research

3



### **U.S. Regulatory Requirements for Disposal in a Geologic Repository**

- Land Ownership and Control
- Records maintenance
- Performance confirmation
- Post-closure monitoring
- Monuments and markers
- Archives and records preservation
- Post-closure oversight

4



### **Active Regulatory Controls Before Closure**

- Maintenance of proper records from the outset of the project
- Land ownership and control, including water rights
- Controls that restrict access and avoid disturbances that could affect safety
- Performance confirmation and pre-closure monitoring

5



### **Active Regulatory Controls After Closure**

- Post-closure monitoring
- Maintenance of institutional and physical access controls
- Participation in, and updating of local, State, Federal and International archives, land record systems
- Active program of continuing oversight

6



**“Less Active” Regulatory Controls**

- Monuments and markers that are “designed, fabricated, and emplaced to be a permanent as practicable”
- Comprehensive records in multiple archives around the world

7



**Except for post-closure oversight, requirements essentially unchanged for 25 years**

- First established as part of generic repository regulations in 1983
- Adopted, virtually unchanged, for Yucca Mountain-specific regulations, in 2001

8



**What has changed ?**

- Requirement for active repository oversight in perpetuity
- Technology continues to advance
- Evolving vision for protecting future generations
- Emerging stewardship role of local community

9





### Energy Policy Act of 1992

- Section 801 (c)
  - “Following repository closure the [implementer] **shall continue to oversee the Yucca Mountain site** to prevent **any** activity at the site that poses an unreasonable risk of–
    - (1) breaching the repository’s engineered or geologic barriers; or
    - (2) increasing the exposure of individual members of the public to radiation beyond allowable limits.

10



### Advances in Technology that affect

- Durability of monuments and markers
- Information technology and global access
- Archival media and techniques
- Remote sensing

11



### Evolving vision for protecting future generations

- Focus on “passive safety,” “no reliance on active institutional controls”, and “no undue burden”
- vs.**
- Focus on active oversight in perpetuity, preservation of options, responsible transfer of unavoidable burdens, and emerging role of local stewardship

12



**Emerging Role of Local Community:  
Nye County, Nevada**

- Despite vigorous opposition from State of Nevada, Nye County continues to
  - Pursue cooperative agreements and relationship with federal implementer
  - Plan for separate, active role in regulator’s decision-making process
  - Prepare for long-term responsibilities for, and relationship with the Yucca Mountain site and the repository

13



**Stated Objectives of the  
Nye County, Nevada Government:**

- Assure protection of present and future populations in the community
- Assure that the repository project is a success in every way possible
- Assure that Nye County benefits economically from the project

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**Active County Oversight Initiatives**

- Independent Scientific Investigation Program (since 1995)
- Early Warning Drilling Program (since 1995)
- QA program accepted by U.S. NRC (since 1999)
- Community Protection Plan (approved by County Commission August, 2006)

15



### **Nye County Proposals**

- Coordinated Involvement of County in planning, development, operation and long-term monitoring of repository
- Encourage development of “Live-Work Community” for repository workers
- Encourage full integration of federal repository facilities with local infrastructure development (e.g. visitor center, emergency response, medical, training facilities)

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### **Nye County Proposals (cont.)**

- Amargosa Valley Science and Technology Park and Museum
- County custody of repository sample management and archive facility
- Advanced energy and water management facility, including “solar power farm”
- “Test Bed for Energy Technology Applications”

17



### **Role of Local Community in Long-term Stewardship of Site Remains Unclear**

- Congressional approval for land withdrawals
- Cooperation and funding of implementer
- Impact of continued State opposition
- Certain aspects may require regulatory acceptance

18



### **Closing Thoughts**

- Regulatory tools in place
- Changing technology and expectations
- Emerging role of local community, in partnership with implementer and regulatory authorities, has potential to profoundly influence the effectiveness of these tools

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### **NOTE:**

*The views expressed in this presentation are the observations of the author and do not reflect any judgment or determination by NRC on matters addressed or the acceptability of a license application for a geologic repository at Yucca Mountain.*

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Slides provided by Björn Hedberg, KASAM

**KASAM**  
STATENS RÅD FÖR  
 KÄRNANFÄLLSFRÅGOR

## KASAM Transparency Programme

8<sup>th</sup> Meeting on the NEA/RWMC Forum on Stakeholder Confidence (FSC)

Topical Session 10c

Björn Hedberg, Director  
 Swedish National Council on Nuclear Waste (KASAM)

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## Why Transparency?

**Decisions of high quality in controversial issues needs**

- Neutral arenas where all stakeholders can meet
- High level of knowledge in basis for decisions
- Clear structure for an effective decision-making process
- Authenticity – no hidden agendas
- Unfolding of values and value judgments
- Long-term systematic process to avoid fragmentation

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## Background (1)

- SKB's (Swedish Nuclear Fuel and Waste Management Company) applications:
  - 2006 encapsulation plant
  - 2009 final repository for spent nuclear fuel.
- KASAM needs to prepare and intensify work to give active and effective support to the Government

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## Background (2)

- Discussions with stakeholders, 2005 and 2006 (Ministry of environment, SKB, SSI, SKI, municipalities, county administrative boards, regional councils, NGO's) **on their views about the future work of KASAM**
- Discussions showed a need for activities by KASAM leading to more transparency in the Swedish NWM programme
- Decision (2006) on a Transparency Programme

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## Programme Purpose

**The KASAM Transparency Programme should**

- prepare KASAM as advisor to the Swedish government
- be a resource for all stakeholders
- contribute to the development of nuclear waste management in a wider context, as well as to other sectors in society.

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## Programme activities

- **Identify important issues**  
prior to decision about a final repository
  - Decision making process (regulations, roles, ...)
  - Technical-scientific issues of importance for evaluation of long-term safety
- **Specify format for dialogue and hearings**  
of these issues, taking into account the actual stage of the decision-making process
- **Carry out dialogues and hearings**  
of these issues

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## Earlier efforts towards transparency

- Dialogue Project SKI/SSI 1991-93
- RISCOP Pilot Project SKI/SSI 1996-98
- RISCOP II Project EU 2000-03
- The Oskarshamn model 1994-
- Oskarshamn & Östhammar 2004-
- Use of RISCOP in other areas
  - risk assessment of mobile telephone systems
  - siting of energy installations
  - cleaning and remediation of chemically contaminated sites

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## Efforts towards transparency

**”Process hosts”**

First: SKI and SSI

Later: Municipalities

Now : KASAM

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## Basic elements

- Use of RISCOP Model to support the transparency programme
- Recurrent elements in the programme would be:
  - A clear description of background for the issue being addressed
  - Knowledge building activities
  - A hearing where the KASAM committee members and staff stretch the stakeholders
  - Documentation and analysis of the hearing
- When needed, combine RISCOP with other approaches to citizen participation (focus groups, other forms of working groups and consensus conferences)

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## Pre-study (2006)

**Purpose**

- Communicate idea with stakeholders
  - Suggestions on relevant issues for dialogue
  - Suggestions on format for dialogue
- Feedback on preliminary report

Consultant: Karita Research AB

- Pre-study Report, April 2007

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## Pre-study results

**9 issues proposed for dialogue/hearing by KASAM**

- Deep bore holes as a possible alternative method for final disposal (March 14-15, 2007)
- Citizen participation and democracy
- The roles of responsible authorities
- Decommissioning of nuclear reactors
- Site selection – on what basis?
- Socioeconomic issues
- Local environmental issues and regional environmental goals
- Long term storage of spent nuclear fuel
- Critical assumptions in the safety assessment

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## Preliminary programme

**Outline on *what, when & how* issues should be studied (2007-2010)**

- Analysis of the system for final disposal (December 2007)
- Decommissioning of nuclear installations (December 2007)
- Participation & Democracy (spring 2008)
- Actions and Authenticity in NWM (autumn 2008)
- Authorities regulations and guidance (spring 2009)
- Site selection – on what grounds? (autumn 2009)
- Values, judgments and critical assumptions in the safety case (spring 2010)

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