Decommissioning in Norway

“Foreseen challenges and related innovation needs”

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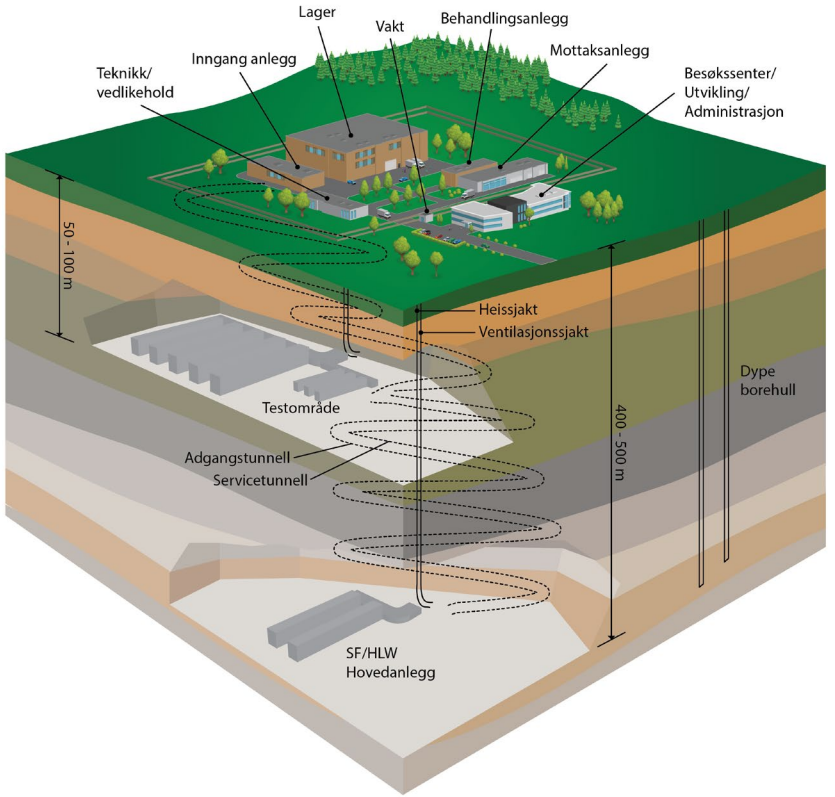
NND one organization two assignments

- Decomissioning

- RWM



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Decommissioning an innate complex mission

The actual work

- Planning
- Building
- Licensing and relicensing and relicensing…
- Dismantling and segmentation
- Decontamination
- Control

The context

- Financing
- Competence building
- Regulatory issues
- Social licensing
- Stakeholder involvement
- Transparency

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Site localization for radioactive waste disposal facilities: Probably the hardest task in the world

- Not technically but sociologically

- Both tasks have been performed without modern advanced technology that is available today.
- Still NND sees a great need for innovation to adress our challenges ahead

In the siting process we plan to use BAT for communication purposes

- 3D modell of the Halden Site delivered by IFE
- 3D modells of Kjeller under way
- We are working on a tactile AR-enhanced model of the Halden Reactor
- We actively use SoMe for both internal and external communication
- We have just started the planning of a joint decom-cluster

Colaboration IFE NND

- Therefor NND and IFE have developed a joint research program
  - Developing a visitors' center as described above
  - Support in procuring an integrated information management “platform”
  - Developing scanning and engineering 3D capabilities.

- We are exploring the possibilities to expand our collaboration and develop an umbrella and hub for testing out new technologies. IFE contributes with deep experience and network NND with real world challenges and infrastructure.

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Challenges in decommissioning

- Site characterisation
- Dismantling
- Waste management
- Release of materials, buildings & sites
- Data management
- Other challenges

Site characterization

Challenge: Obtain reliable information that give a solid background to develop decommissioning plans and waste management strategies.

Need:

- Measurement devices coupled to a suitable data management systems that can handle measurement data, waste management information, etc.
- Ongoing characterization work performed using handheld devices but currently not connected to waste management system.
- Anlytical tools and systems to manage radioactive waste data and radioactivity in materials and facilities.

Dismantling

Challenge: To dismantle and remove systems and components in a safe and cost-effective way. Ensure that the available methods are reliable and able to be approved by the authorities.

Need:

- Available technology is not always possible to apply. Introduction of new technology need to reduce, not increase, the burden on authorities and technical experts.
- There is a need for proven technical designs. A pre-approved/accepted technology would reduce the obstacle to introduce and apply.
- Use standard systems and components (not specifically for the nuclear industry) could be made as examples.

Waste management

Challenge: Ensure that waste routes are defined before start of decommissioning. Reduce the risk of bottle-necks in waste management.

Need:

- Determine waste acceptance criteria, WAC. If possible, ensure that waste that is conditioned today does not need to be re-conditioned prior to disposal.
- Records of data and historical inventory need to be trusted regarding nuclide and material inventory. Need to be sufficient to plan for safe dismantling and waste packaging.
- Quality data management system to support our radioactive waste management processes.

Release of materials, buildings & sites

Challenge: Perform reliable measurements to ensure that the materials, buildings and sites can be released from regulatory control. Reporting and approval of activities from the authorities in pre-agreed control programs.

Need:

- Site specific release criteria to take into account the specific circumstances of facility. In the Halden case the reactor facility is located in a cavern.
- Statistical tools to analyse and approve the release processes of materials, buildings and sites.
- Good techniques for larger scale measurements of concrete.

Data management

Challenge: Several systems that store data needed for a successful decommissioning, one system for all data management should be beneficial.

Need:

- Many suppliers have many interesting solutions to use. Need to adapt, modify and develop.
- Ensure that sufficient data gets stored so that present and future needs are covered.
- Nuclide data management are crucial for planning of decommissioning and development of a radioactive waste management strategy.

Other challenges

Two sites and several on-site facilities will be decommissioned at the same time in Norway at Kjeller and Halden. During this time localization and design of the final repository for radioactive waste and spent nuclear fuel is also planned.

Bottlenecks for approval and authorization processes. How can we ensure that authorities and technical experts have sufficient resources, competence and information?

Can approval processes be unified in a standardized and stream-lined manner with correct support of tools and data?

Thankyou for your attention!

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