Post-closure related responsibilities and plans of license holders and authorities in Finland on knowledge and awareness preservation

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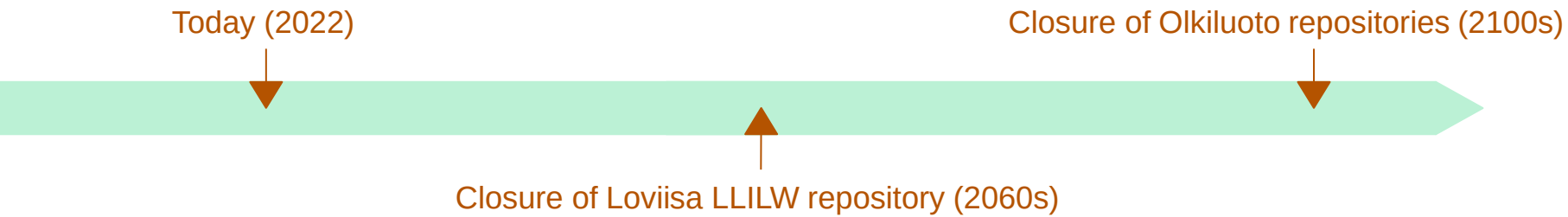
Agenda

1. Background of the KYT CloMap project
2. Requirements for The National Nuclear Waste Management Programme
3. Requirements related to restriction zones
4. Retrievability related requirements
5. Data and knowledge preservation related requirements
6. Conclusions and path forward

Background

- Radioactive waste repositories in Finland:
  - Two operational LILW repositories
  - One HLW repository under construction
  - One planned VLLW repository
- Closure of Finnish nuclear waste repositories is upcoming in Loviisa LILW in 2060s and for HLW after 2100s
  - Still relatively far in the future, but knowing what is upcoming is vital to start planning with sufficient time



background

- TEM, STUK etc who are they

KYT CloMap

- Phase 1:
  - Closure- and post-closure related legislation and regulation were reviewed
    - 25 closure-related requirements identified
    - Handling of the identified obligations by responsible organisations was explored
    - Four issue categories were identified:

Post-closure knowledge preservation

- Phase 2:
  - Licence holders, STUK and MEAE were asked for more details on their handling of the issue categories

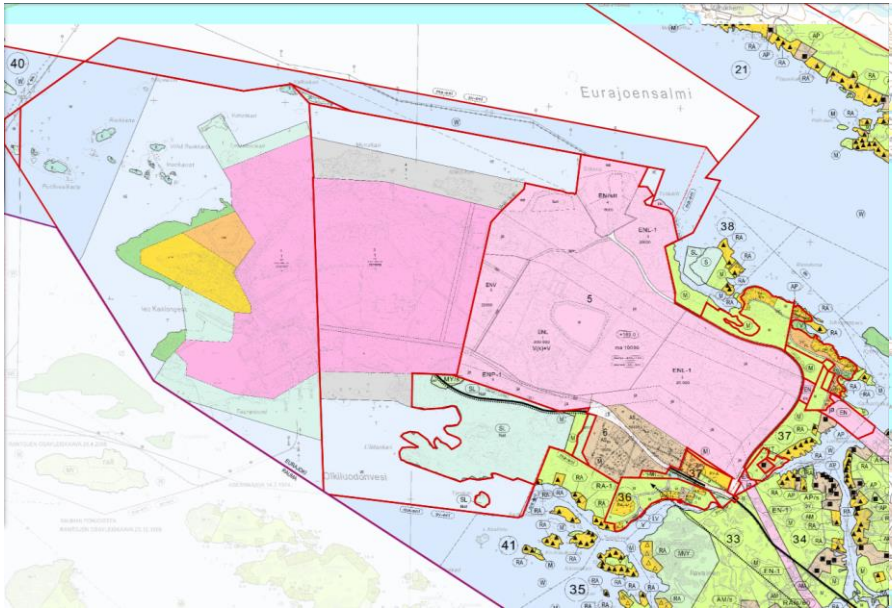
Requirements for The National Nuclear Waste Management Programme

- Requirement
  - Nuclear Energy Decree 79 c § (Valtioneuvosto, 1988): The National Nuclear Waste Management Programme (KYT) shall include at least the following information:
    5) plans relating to the post-closure period of the disposal facility, the period during which the monitoring of the disposal shall be continued as well as the long-term measures through which the continuity of knowledge of the facility shall be assured
- Handling:
  - KYT (and upcoming SAFER) provides Finnish decision makers with knowledge to make nuclear waste management related decisions
  - No post-closure knowledge preservation plans have been created in KYT
    - This work and proposed work for upcoming years seem to be the first steps
- Discussions with responsible organisations
  - MAEM: Responsibility on creating knowledge preservation plans is on the government
    - National programmes such as KYT or SAFER can be used in preparation of such plans

Requirements related to restriction zones

- Requirements:
  - STUK (2018b) D.5 815 § : A precondition for the permanent closure of a disposal facility is that STUK has approved the plan concerning the closure, which shall include: c.) a plan for the potential post-closure monitoring measures and a proposal for the restriction zone with prohibition on measures…

  - STUK (2018a) y/4 34§: An adequate protection zone shall be reserved around the disposal facility as a provision for the prohibitions on measures



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Requirement related to restriction zones

- Handling:
  - Protective zones have been established around the LILW and HLW repositories
  - Final site area information can only be added during repository closure

- Open issue:
  - The duration over which the protective zones should be maintained after repository closure has not been defined
  - Long-term plans for preservation and administration of the information is not available
  - The national archives preserve the data currently on paper

- Discussions with responsible organisations:
  - STUK:
    - No information on duration is yet available
    - Detailed plans will eb included in the closure plan closer to repository closure
    - STUK provides the location of the repository to the registries in addition to basic information of the closed repository
    - Registry can include detailed instructions on land usage restrictions

Retrievability related requirements

- Requirements:
  - Decision in Principle (Finnish Government, 2002): The disposal of nuclear waste involves various stages, that are completed after the selection of the disposal area […] These stages, some of which may overlap, should be scheduled so that they are beneficial for the long-term safety. In that case, the following aspects should be considered:
    - the need for maintaining retrievability of SNF canisters from the repository
- Handling:
  - It is envisioned that the retrieval of the canisters would be done using same devices that were used in their emplacements
- Issues
  - No plans on how the devices, repository layout or canister location information will be preserved after closure
- Discussions with responsible organisations (STUK):
  - Retrievability has been demonstrated by the licensees to be technically feasible
  - Retrievability not required in legislation, only in DIP
  - More relevant in operational period
  - No need for a separate knowledge preservation plan for retrievability. It will be included with other information.

Data and knowledge preservation requirements

- Requirements:

  - STUK (2018a) Y/4 29 §: *The licensee shall maintain a record of the disposed waste that includes waste package specific data on the waste type, radioactive substances, location within the emplacement rooms and other information deemed necessary by the authority. The waste records shall be submitted to the Radiation and Nuclear Safety Authority (STUK) in a format approved by it. The Radiation and Nuclear Safety Authority arranges the permanent keeping of records of information concerning the disposal facility and disposed waste.*

  - STUK (2018b) D.5 603 §: *The holder of an operating license of a disposal facility shall maintain records of the disposed waste, providing at least the following information to an accuracy of an individual waste package:*
    a. the waste type, its processing and packaging method and structural and material characteristics significant to safety;
    b. a waste package identifier and location in the emplacement room; and
    c. the upper limits for the activities of the significant nuclides, to an accuracy of an individual disposal canister in case of spent fuel and to an accuracy of an individual emplacement room in case of other waste

Data and knowledge preservation requirements

- Handling
  - Waste disposal ongoing in the LILW repositories
    - Chrasteristics of waste reported to the State
  - HLW in interim storage has been reported to STUK
- Open issue
  - It has not been publicly defined why the data presented in the previous requirements has been selected for permanent preservation
  - It is unclear when the data should be provided to STUK and the State
  - Limited information on nature, format and submission of this data
  - No plans on how the date would be permanently preserved

Data and knowledge preservation requirements

- Discussions with responsible organisations:
  - TVO and Fortum (licence holders)
    - Licence holders collect relevant data and provide it regularly to STUK and the State
    - Information is currently stored in databases and archives
  - STUK:
    - All repository types must maintain records on waste type, radioactive substances, location within the disposal facility and other information they deem necessary
    - No detailed plans exist yet on knowledge management have been done yet as they deem it is not yet topical. STUK follows international discussion in development regarding knowledge preservation
  - MEAE:
    - No post-closure knowledge preservation related plans have been created yet. The plan is to create them a decade before the first repositories are closed (2050s)

Conclusion and path forward

- Knowledge preservation related plans in Finland are lacking
  - Responsibilities regarding knowledge preservation are defined in regulations
  - Methodology and extent of knowledge to be preserved has not been planned
    - Currently operational data is being stored in databases and archives
    - Larger questions of knowledge and memory preservation have not been addressed in regulatory context

- SAFER2028 application on knowledge preservation
  - Applicability of the NEA RK&M plan in Finland is assessed
    - Key knowledge preservation methods and actors are identified
    - First iteration of Key Information File
    - Story telling and art as knowledge preservation methods

The End

Sources

- SWECO. 2022. Sweco karttapalvelu. Online, available at: Sweco - UI