



TVONS - Decommissioning waste management

Nuclear Energy Ecosystems - Open Business Day 2022

May 4th 2022 Paasitorni

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Teollisuuden Voima Oyj (TVO)

- TVO is a non-listed public company that delivers climate-friendly electricity for its shareholders, Finnish industrial and power companies, at a cost price.
- TVO has been generating electricity for Finnish society for over 40 years.
- The nuclear power plant units Olkiluoto 1 and Olkiluoto 2 (OL1 and OL2) are boiling water reactors. The current net electrical output of the plant units is 890 megawatts (MW).
- Olkiluoto 3 (OL3) is an EPR (European Pressurized Water Reactor) plant unit. The net electrical output of the unit will be approximately 1,600 MW and it is now in test production phase.

TVO Nuclear Services (TVONS)

- A subsidiary of TVO
- We use TVO's experts and partners
- TVO has excellent operation experience with BWRs since 1978 and LILW repository since 1992
- TVO has a unique experience of tendering, sourcing and constructing a first of a kind modern nuclear power plant
- Experience covers almost the entire life cycle of NPP
- Our customers can benefit from TVO's expertise and network. It consists of around 1 000 experts in TVO and several hundred consultants.
- TVO is an independent private-owned operator, license owner, and owner of three NPPs.

TVONS - Consulting Services

NEW BUILT	RADIOACTIVE WASTE	NUCLEAR SAFETY	PERFORMANCE IMPROVEMENT
<ul style="list-style-type: none">• Evaluation and bidding phase• Project implementation• Commissioning and training	<ul style="list-style-type: none">• Site selection and survey• Environmental impact assessment procedure• Operating and decommissioning waste management	<ul style="list-style-type: none">• Nuclear safety in general• Safety culture• Probabilistic Risk Assessment (PRA)	<ul style="list-style-type: none">• Operating rate improvement• Outage planning and execution

DECOMMISSIONING WASTE MANAGEMENT

PUBLIC

Decommissioning experience

- Low and Intermediate Level Waste (LILW) repository implementation from preparatory phase to commissioning in Olkiluoto during the years 1988 - 92
- Effective experience operation of LILW repository since 1992. This consists of handling, interim storage and final disposal of:
 - Operating waste
 - Systems, Structures and Components dismantled in modification projects (=decommissioning waste)
- Practical competence on streamlining and improving the cost effectiveness of the processes. For example TVO is now implementing of an on ground facility for Very Low Level Waste (VLLW).

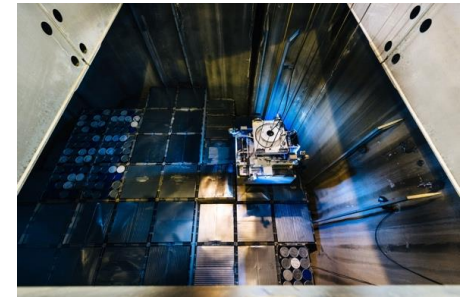
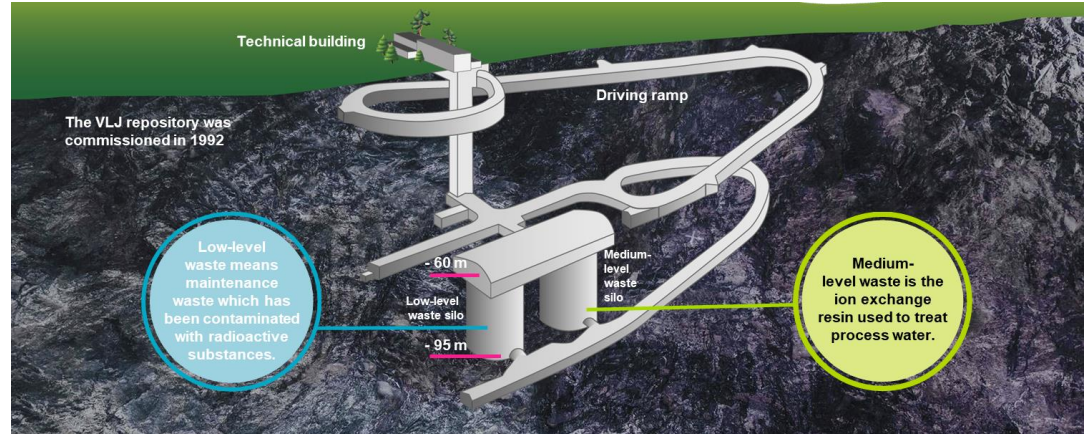
Decommissioning experience and expertise

- Know-how gained during modification projects regarding the dismantling of old contaminated Systems, Structures and Components
 - Planning and licensing
 - Dismantling
 - Sorting of the waste based on activity and material
 - Minimizing the amount of waste
 - Free release, reuse and recycling
 - Minimizing volume and packaging of the waste to be final disposed
 - Transport and final disposal of the waste
 - Final documentation

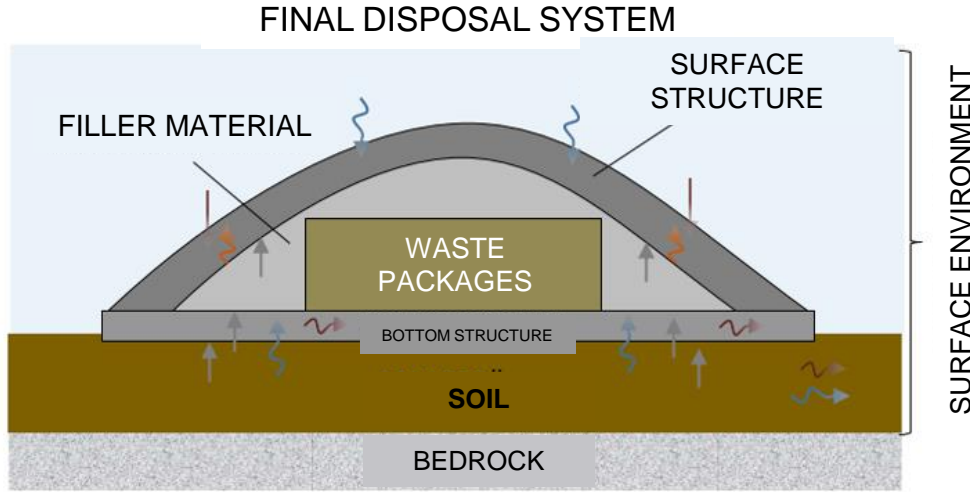
Key driver - minimization





- The basic principle is to minimize amount of waste
 - Preparation work and planning before dismantling
 - Sorting of dismantled material
 - Recycle and reuse of suitable materials
- Different ways to reduce volume of final disposal waste
 - Decontamination
 - Compaction
 - Metal treatment technology - can achieve up to 90 % volume reduction

Decommissioning waste final disposal



On-Ground Final Disposal Repository - System



-  Limits and slows down the passage of radionuclides
-  Limits the penetration of rainwater, groundwater or seawater into the waste fill
-  Limits inadvertent penetration and reduces direct radiation
-  Supports the waste backfill or surface structure

Contact Information

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Thank you!
