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**Paula Savioja, Section Head  
Radiation and Nuclear Safety Authority of  
Finland, STUK**

RIC 2024 Human in the Loop Panel

# Nuclear Energy Landscape in Finland



## ~~Fennovoima Ltd~~

- ~~• New utility, no operating reactors~~
- ~~• Construction license application phase going on for FH1 (AES-2006), Hanhikivi Site~~



## Olkiluoto NPP (TVO) 3 Reactors

- 2 older operating units - ABB BWRs
- New unit OL3 (EPR) started commercial operation
  - First outage on-going as of now
- Interim Spent Fuel Storage at site
- L/ILLW repository

## Posiva Onkalo Final Waste Repository

- Under construction and commissioning

Nuclear Energy Legislation  
Renewal – to be in effect in 2028

One goal of the renewal is to  
enable licensing of new reactor  
designs (SMRs)

## Loviisa NPP (Fortum) 2 Reactors

- 2 operating units – VVERs
- Interim Spent Fuel Storage at site
- L/ILLW repository



Photo: Fortum



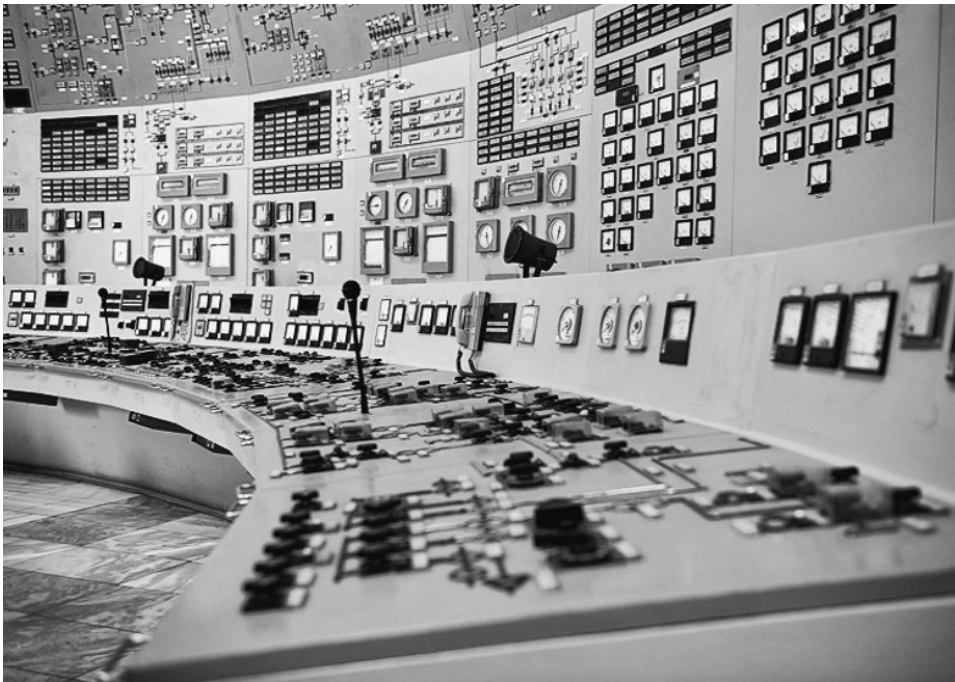
FiR research reactor –  
preparing decommissioning

Paula Savioja, Human in the Loop



Photo: TVO

# Human Factors Challenges



**Are our human factors (engineering) methods appropriate for capturing the essential aspects of modern technologies posing threat to human performance?**

**Do we even understand the role of human performance in the context of advanced reactors?**

**What are the blind spots?**

# Experiences of human factors challenges in newbuilds

- Relating to operating crews
  - Insufficient competence regarding operating limits and conditions (OLC)
  - Difficulties in switching between UI systems within the MCR
- Relating to interface between operating, commissioning and maintenance
  - Insufficient joint situation awareness concerning plant status
- Relating to building and assembly
  - Scope of QC
  - Scope and detail of proceduralisation
  - Licensee oversight competence and capability
- Relating to emergency management
  - Spaces not always appropriate for intended use

