Modernisation and Human Factors Issues for Long Term Operations

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Context

- **1980** Nuclear Power phase out by 2010.
- **1995** Economically and environmentally impossible to phase out nuclear power by 2010.
- **1997** Barsebäck phase out agreement (1999, 2005).
- **2010-11** Opening for new built.
Effects on Maintenance

- **1997-98** The allocated resources for maintenance started to shrink. (Notified afterwards.)
- **2006** Forsmark event.
- **2010** Resources for maintenance doubled since 2006.
One of the IGSCC cracks which initiated FENIX
Modernisation

- Components and systems.
- Design.
SCC continuing phenomenon

Number of defects

Operating time, years
The new design
Some issues for RB

- Knowledge transfer (40 to 50 to 60?).
- Design authority – vendor role?
- Managing large projects.
- Dialog with utilities about requirements.
Some HF issues for LTO

- Changes of equipment, design basis, hybrid control rooms.
- Early involvement of HF aspects and availability of right people.
- Maintenance of unique systems.
Old Control room
New Control room (simulator)
Report to Government in 2012

- Radiation embrittlement of pressure vessel and welds.
- Frequently changes in I&C.
- …..