PSR approaches in Finland

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SÄTEILYTURVAKESKUS • STRÅLSÄKERHETSCENTRALEN RADIATION AND NUCLEAR SAFETY AUTHORITY

Finnish PSR requirements

- Nuclear Energy Act:
 - operating license shall be granted for a fixed term (previously 10 years was a typical license period but can be longer)
 - overall safety of the facility shall be assessed at regular intervals
- STUK's Regulatory Guide YVL A.1 sets more detailed requirements for PSR:
 - PSR shall be carried out at least every ten years
 - From STUK's perspective there is no difference whether PSR is carried out in operating licence renewal or as separate assessment during licence period
 - Includes list of documents submitted to STUK (modified list of IAEA safety factors taking into account Finnish regulatory framework)
 - Refers to IAEA Guide SSG-25 for more guidance
- LTO: from safety regulator's point of view NPPs can operate as long as they are safe
 - Comprehensive ageing management programmes required
 - Ageing management important topic in PSRs

PSR Documentation (YVL A.1)

- Summary of the most significant changes to the licensing documents (FSAR etc., adequacy and up-to-date checking)
- Fulfilment of the requirements laid down in Government Decrees and in YVL Guides (status of the implementation plans)
- Reassessment of the site-specific design bases concerning external hazards (emphasised as a separate point after Fukushima accident)
- Summary of the renewed safety analyses and conclusions drawn from their results
- Experience of the facility ageing and ageing management
- Environmental qualification of equipment
- Summary of plant's safety indicators
- Licensee's safety culture and safety management
- Summary of plant procedures
- Summary of radiation protection arrangements and waste management
- Description on operating experience feedback, research activities, implemented plant improvements
- Action plan for improving plant safety



Licensing status of Finnish NPPs

• Renewal of Operating Licence has always involved a safety review, latest renewals were done taking into account the IAEA PSR guidelines (SSG-25, NS-G-2.10, 50-SG-012)

• PSR carried out at the same time to all NPP units at site

PVM/NN

Loviisa NPP		Olkiluoto NPP		
LO1	LO 2	OL1	OL2	OL3
1977 - 1983	1980 - 1983	1978 - 1983	1982 - 1983	5/2002 Decision in Principle
1984 - 1988	1984 - 1988	1984 - 1988	1984 - 1988	2/2005 Construction License
1989 - 1998	1989 - 1998	1989 - 1998	1989 - 1998	
1999 - 2007	1999 - 2007	1999 - 2018	1999 - 2018	
2007 - 2027	2007 - 2030	PSR in 2008	PSR in 2008	
PSR in 2015 and 2023	PSR in 2015 and 2023			

Continuous Safety Improvement at NPPs in Finland

 Nuclear Energy Act Section 7 a: "for further safety enhancement, measures shall be taken which can be regarded as justified considering operating experience, results of safety research and advacement of science and technology"

-> regulatory decisions and revised regulatory guides

- STUK regularly updates regulatory guides and makes a decision on how they apply to operating NPPs (reg. guides apply as such to new NPPs)
- Implementation decisions are referenced in PSR -> there is no need in PSR to go through all the modified regulatory requirements in detail -> focus in most significant safety issues



Olkiluoto NPP units 1 and 2 PSR (2007-2009)

- Current operating license of Olkiluoto 1/2 is valid until end of 2018
 - -> license condition that the licensee had to perform PSR by the end of 2008
- Examples of most significant topics:
 - Changes in classification of accidents (including DEC cases) and public dose limits -> updated deterministic safety analyses
 - Diversification of RHRS and systems important in LOOP situations -> STUK's requirement to assess the plant diversity as a whole by end of 2010
 - Emergency control room -> building plans in connection of I&C renewal, faster schedule agreed
 - Physical protection requirements updated -> some additional requirements to the licensee in the PSR decision
 - More systematic approach to equipment qualification (especially concerning validity follow-up during plant operation)
- STUK's decision and safety assessment are found in English from the STUK's website (<u>www.stuk.fi</u>)

http://www.stuk.fi/ydinturvallisuus/ydinvoimalaitostentoiminta/ydinvoimalaitosluvat/en_GB/kayttolupa/



Loviisa NPP's PSR2015: status of the project

- Current operating licence until the end of 2027 (LO1) and 2030 (LO2)
 -> Two PSRs were set as license condition (end of 2015 and 2023)
- During the previous licence renewal project ~70 open issues were identified which were related to e.g. PRA, ageing management and I&C renewal project
- <u>1.1.2015</u>: 14 of these issues are still open because relevant modernisation projects at Loviisa are delayed
- The PSR2015 documents sent by the licensee reviewed against
 - relevant government decrees
 - new YVL Guides (parallel project to make implementation decisions for revised YVL Guides for LO NPP)
- Target date for STUK's decision and safety assessment: March 2016



Summary of PSR experiences in Finland

- STUK regularly updates YVL Guides
 - set safety level for new NPPs
 - separate implementation decisions for existing NPPs
- -> continuous improvement and compliance with modern safety standards is already considered there
- PSR is a good additional tool for assessing overall safety of NPP and to discuss the major safety issues
 - looking back the history; assessing cumulative effects of plant ageing, operating experience, technical developments and siting aspects
 - making assessment of current safety status and summarising needed actions to improve and maintain safety

