



Follow up of safety culture during from construction to operation / case Olkiluoto 3

IAEA webinar on Operating Experience from
Construction to Commissioning for nuclear safety

July 19th 2023

Background

TVO has operated two BWRs since 1980, with very good reliability and safety

In 2005 construction of OL3 was started

Supplier Areva (Nuclear) and Siemens (Turbine)

PWR, EPR-1600 MW (4300 MW th)

Several delays along the way, 1st criticality in Dec. 2021

Now steady operation from March 2023



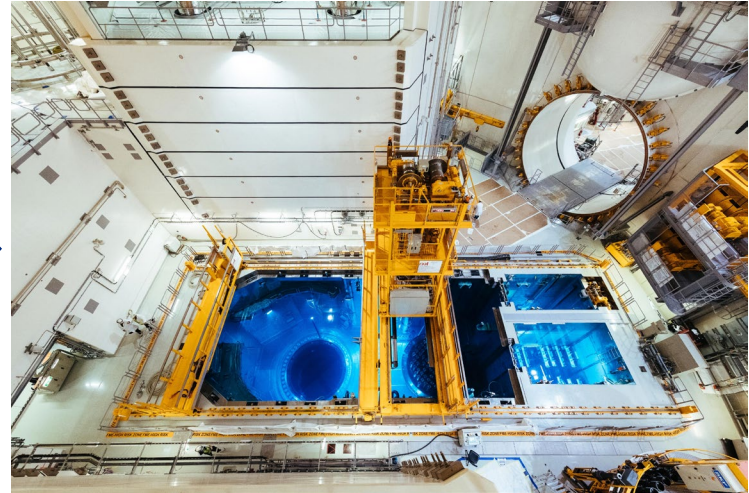
Safety Culture in Finland

All the key players (TVO, Fortum and STUK) use INSAG-4 definition:

That assembly of characteristics and attitudes in organizations and individuals which establishes that, as an overriding priority, nuclear plant safety issues receive the attention warranted by their significance.

Note: nuclear safety shall be the first priority, in some other industries safety culture refers to industrial safety. Also to some other industries our definition is close to quality (graded approach).

What is Safety Culture?



Why Nuclear Safety Culture matters in construction and commissioning?

Everyone on site **MUST** understand unique nature of nuclear installations (like 60 years+, huge energy, radiation)

Habits, routines and attitudes established (like Tech. Spec compliance) are very hard to change - miracles do **NOT** happen



Practices in OL3 site

- Recruiting SC coordinator in 2008. She spoke several languages, due to workforce heterogeneity. She was our eyes and ears on site – constantly present
- Site SC survey started in 2009, conducted 20+ times, twice a year.
- A lot of communication: posters on site, tool-box talk, on-site screens, developing induction training content, HU-training etc.
- Multi-channel reporting (phone-line, e-mail, mail-box for written cards)

OL3 SC site survey

- Based on the TVO's SC survey developed with the IAEA in 2004 (comprehensive SC self-assessment, survey part of it, 50+ items)
- Site survey had 20-30 items, some modifications along the way.
- Covered SC basic topics: compliance, production/schedule pressure, responsibility (clear?), psychological safety, and communication (language barrier)

OL3 reporting and actions

Bi-annual report

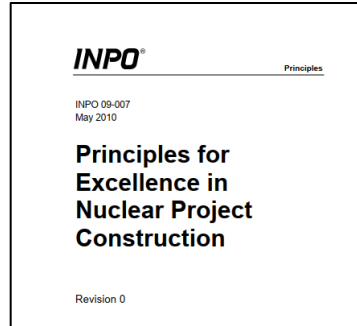
Survey results also in site-wide communication days

SMS and SC, large self-assessments, see next slide

Safety culture and SMS

- Comprehensive self-assessment for SMS and SC were conducted several times during the OL3 era
- SC self-assessment was done in company level, covering both operating units (OL1&2) and OL3 (TVO's own staff); 2004, 2007, 2010, 2013, 2016, 2020 – using IAEA method
- SMS was done separate self-assessment two times.

Using INPO framework, since it is sensitive to construction & commissioning phase topics.



Topics from survey

- What is good enough - 5%, 10%, 20%, 40% - note 25% is 1 out of 4 persons you meet on site...
- Good depends on the topic (item): in (non-)compliance 10% is disaster, whereas in communication issues 30% might be tolerable
- It is important to follow trends, analyse where problems come from (competence in survey analysis is needed) – we created indicators (KPI; ratio between 'wrong and right' responses).
- Note: the site survey can also be utilised elsewhere; we have used it in large modifications in OL1&2 and final repository for spent fuel construction & commissioning works (Posiva)

Conclusions

- It is essential to have valid situational awareness of the safety culture on site
- If and when any anomalies or issues in safety culture are detected, corrective actions must be started
- Safety Culture is a systematic framework to analyse performance on site. Competent people are needed for this.
- Any Euro, RMB, Pound, Lira etc. invested in SC during const&comm will certainly pay back in operations phase!



Thank you!
