

# KYT2022 OMT

## Overall Safety of Nuclear Waste Disposal

Seminar 25.10.2019  
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# KYT2022 OMT project

- Small steering group project, focus on overall safety
- Current status:
  - overall safety of NPP studied in SAFIR programme (ORSAC, OSAFE)
  - not yet for nuclear waste management
- Aim: General framework incorporating long-term safety, the quality and safety of operations and the activities of involved organisations, that would allow the assessment of the overall safety of nuclear waste disposal

# KYT2022 OMT project

## Methodology

- Interview strategy developed and corresponding survey prepared
  - overall safety
  - safety culture
  - collaboration and information flow
  - integrity
  - safety case
  - assumption and uncertainty management
- Experts on various aspects relevant for radioactive waste management and disposal (in total, 17 interviewees)

# KYT2022 OMT project

## Methodology

- No right or wrong answers, no strict structure
- Very heterogeneous answers, not all topics covered equally by interviewees
- Disclaimer: representative of VTT only (if at all)!

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# Interview findings

# Safety culture

- Implementer needs to assure healthy safety culture of supply-chain
  - organizational culture affects also their contractors' cultures (self-reflection)
- At implementer side, a change in mind-set noticed during transition from research focused organisation to operating company.
  - QC & QA very important now when moving from design work to actual construction plans.

# Safety culture

- People familiarize themselves with safety culture through regulations (YVL guide), organization's guides and practices and training courses.
- Continuous learning and improvement through iterative discussions with implementer and regulator.
- Imperfection: possibility of mistakes and to admit lacking knowledge.
  - honesty and speaking up when noticing a mistake is appreciated.
  - proper pre-conditions for addressing mistakes? (schedules, budget)
  - redundancy of expertise necessary to discuss concerns (critical knowledge, compartmentalization of knowledge)

# Collaboration and information flow

## Compartmentalization of knowledge

Causes for compartmentalization of knowledge:

- Division and distribution of information to different contractors
- Experts working isolated and exclusively on certain topic. Often no (equivalent) redundancy of expertise.
  - exchange of expert opinions with similar in-depth understanding limited
  - danger of loss of knowledge with retirement of experts (→ critical knowledge?)
- Confidentiality may constrain information flow between experts
- Commercial reasons may constrain Finnish-Swedish collaboration



# Collaboration and information flow

## Competence and knowledge mgmt. (1)

- Definition of “critical” knowledge/competence desirable
  - guidance on knowledge transfer, funding
  
- Challenges in funding
  - decrease from industry side expected to continue after granting of operational license
  - public programs like KYT important (but sufficient?)
  
- Danger of future dependence on expertise abroad
  - critical expertise in-house at implementer?
  - critical expertise in RWM community in Finland?

# Collaboration and information flow

## Competence and knowledge mgmt. (2)

- Relevant role of VTT in RWM in Finland
  - education of qualified people for other organizations
  
- Attractivity to work in nuclear field in Finland
  - close to solve final disposal problem
  - approx. stagnant NPP fleet
  - reputation/perception of nuclear in future
  
- Attractivity to work in remote area (Olkiluoto, Hanhikivi)

# Safety case

- VTT's role is to feed the assessment basis by carrying out experimental research and conduct modelling
  
- Data management
  - types, quantities and quality has increased over years/decades
  - clear and traceable documentation important
  - expert's individual responsibility in judging and selecting data and further to ensure its high quality (→ link to safety culture)

# Safety case

- (Cultural) gap between safety case people and researchers: worries that their concerns are not fully understood
- Difficult to be aware of all assumptions made. Need for trust in the community to be able to rely on other's work (→ safety culture)
- Worries that the outcomes are not always seen in the light of the assumptions and are taken as valid in other boundaries.

# Safety case

- Knowledge about safety case limited to a few aspects (depending on own background), no overall understanding.
  
- Wish for training expressed
  - informative presentations for general overview
  - role of own research and relation to other works within the safety case
  - how information is integrated into safety case
  - however, specialists want to focus mainly on research
  - leading to better project proposals

# Future activities?

- No continuation planned in 2020 but eventually in 2021-2022
- International collaboration (SITEX)?
- Potential topics:
  - Interviews at other stakeholders to be more representative
  - Interaction between safety case people and researchers
  - Differences in safety perception between researchers and decision-makers (e.g. politicians)
  - Comparisons to other safety-critical fields (e.g. disposal of hazardous wastes, aviation industry, oil & gas)

# bey<sup>0</sup>nd

## the obvious

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