

Overall safety of nuclear waste disposal – from the ISiD perspective

KYT seminar, October 25, 2019

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Overall safety projects

- Development of framework for justification of Overall safety (OSAFE)
 - **Objective:** To create a multidisciplinary view regarding the overall safety & framework for justification of overall safety => links technical and organizational factors

- Overall safety of nuclear waste disposal (OMT)

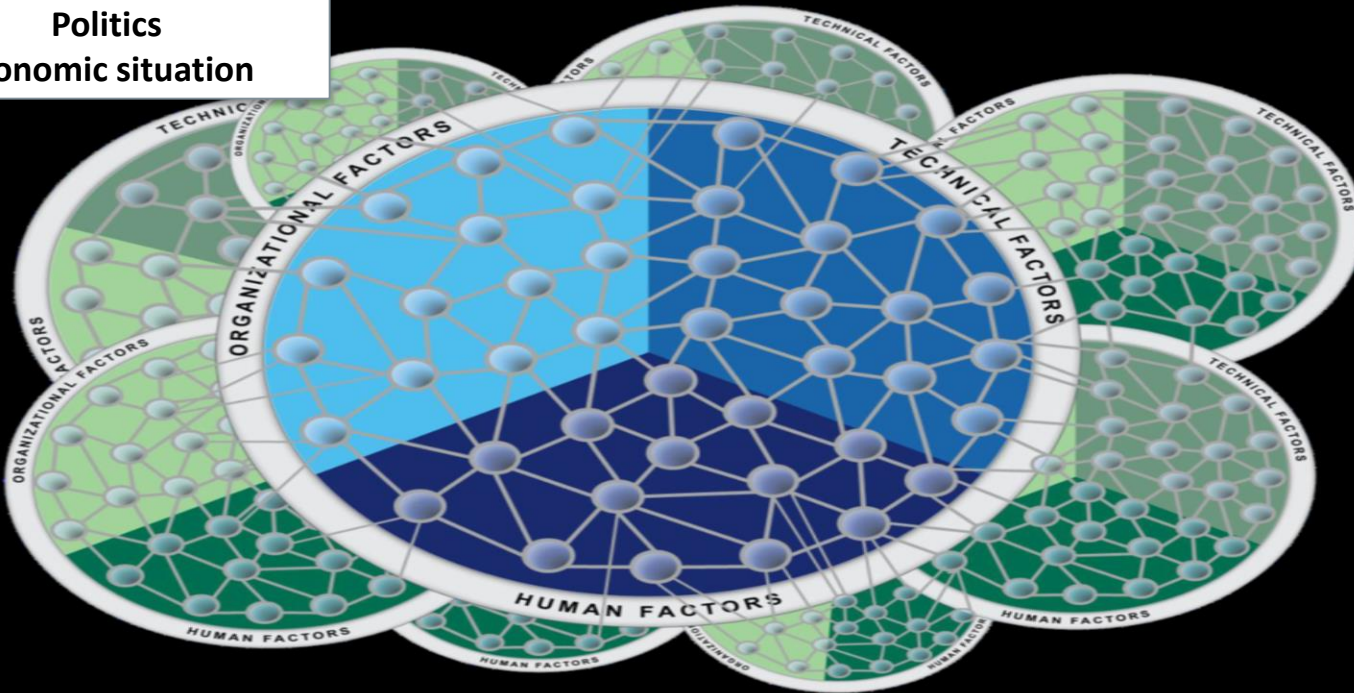
Concept of overall safety

- Dissensus about the content of the concept
- Need for holistic understanding of safety derives from theoretical (e.g. complexity theories) and empirical sources (accident investigations, analysis of safety)
- Near concepts: Sociotechnical systems and System of Systems

Systemic approach to nuclear safety

(Source: IAEA, Haage 2016)

Technical development
Politics
Economic situation



Macro

Meso

Micro

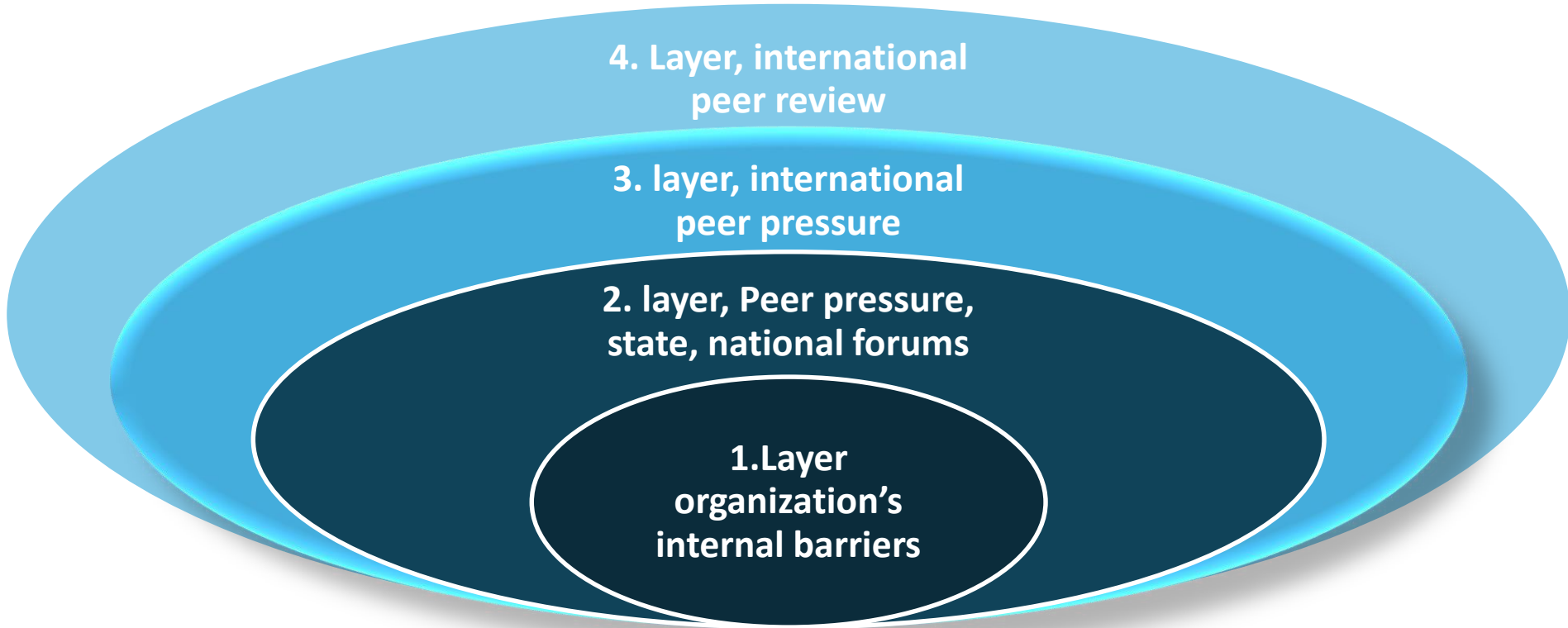
Overall safety of nuclear waste disposal from the Institutional strength-in-depth (ISiD) perspective

- ISiD introduced by the IAEA (INSAG-27, 2017; Ylönen et. al. 2017).
- Framework for evaluation of robustness of the national nuclear community from the organizational, inter-organizational and safety culture viewpoint
- A holistic understanding of safety

Overall safety of nuclear waste disposal from the Institutional strength-in-depth (ISiD) perspective

- The ISiD complements and enhances the philosophy of defence-in-depth (INSAG-27, 2017).
- Organizations, e.g. licensee, regulatory body, MEAE, TSOs, universities, other power companies and stakeholders, form an independent safety layer or barrier that is further strengthened by multiple internal barriers.

Layers of ISiD



How robust is the Finnish nuclear community in terms of nuclear waste disposal?

Relevant organizations in overall safety of nuclear waste disposal

MEAE



VTT

Universities

STUK

VYR



Consulting
companies

What is at stake?

- Adequate number of Finnish experts in the nuclear waste management in the future.
- Overall safety of nuclear waste disposal

What would be needed?	What has been done?
Identification of critical points based on interviews with core stakeholders (resources, expertise, future prospects of various actors)	Identified challenges related to maintaining and developing of competences
A longterm perspective (vision) on nuclear waste management	Aim: Functional, comprehensive, flexible and enabling nuclear waste management by 2030 (Kumpula ja Slant, 2019, p. 17).
Strategies regarding nuclear waste management	<ul style="list-style-type: none">▪ Integration of KYT and SAFIR research programs▪ Integration of nuclear waste management and nuclear safety courses (YJK)

Discussion

- What is needed in order to enhance the robustness of Finnish nuclear community in the nuclear waste disposal?
 - Identification of critical points based on interviews with core stakeholders (resources, expertise, future prospects of various actors)
 - Obtaining understanding of future prospects of various actors
 - Communicating the objectives and interests of different stakeholders (licensee, power companies, MEAE, regulator, TSO)
 - Coordinating and aligning the goals
 - Communicating the decisions
 - Introducing a longterm perspective (vision) on nuclear waste management
 - Creating strategies regarding the nuclear waste management

Conclusion

- Maintaining and developing of competence of experts has been identified as a challenge regarding the robustness of Finnish nuclear waste disposal
- Some measures have been taken, such as plans to integrate research programs, KYT and SAFIR.
- It is possible to ask whether the measures taken are sufficient enough to ensure the development of competence, and adequate number of experts in the future. What else should/could be made?
- Is it important to have own expertise? Identification of risks related to scarcity of experts would be needed.

References

- Kumpula, L. and Slant, O. Kansallisen ydinjätehuollon yhteistyöryhmän loppuraportti. Työ- ja elinkeinoministeriö. Energia 2019:39.
- Ylönen, M. 2019. Institutional strength-in-depth in the context of decommissioning and learning from incidents. ORSAPP. Research report. SAFIR VTT-R-00139-19.
- Ylönen, M., Kari, M. Gotcheva, N. and Talja, H. (2017). Overall Safety and Organisations: Institutional Strength-in-Depth and National Actors. Research Report. SAFIR 32/2017.

**KIITOS!
THANK YOU!**