

SAFIR2022 – Supplement to the Framework Plan for 2021 Call

Summary based on the minutes of the SAFIR2022 Management Board meeting on 12.6.2020 and the related material.

General

SAFIR2022 research programme started at the beginning of 2019. In accordance with Chapter 7a of the Finnish Nuclear Energy Act, which was enacted in 2004, the objective of the SAFIR2022 research programme is to ensure that *“should such new factors concerning safe operation of nuclear facilities emerge that could not be foreseen, the authorities have such sufficient and comprehensive nuclear engineering expertise and other facilities at their disposal that can be used, when necessary, to analyse without delay the significance of such factors”*.

The ongoing projects reflect the SAFIR2022 Framework Plan and the long-term goals for 2022 and 2026 set in the planning phase. The research goals defined in the SAFIR2022 Framework Plan for the programme period are:

1. Nuclear safety experimental and laboratory capability building
2. Overall safety and systemic approach to safety
3. Validated tools for reactor and nuclear power plant analysis
4. Nuclear fuel and its lifecycle from reactor to final disposal
5. Ageing phenomena and the integrity of barriers
6. Severe accidents
7. External and internal hazards
8. Nuclear safety in a changing environment.

The topics 1, 2 and 4 are common with the ongoing national nuclear waste management research programme KYT2022. Research issues common to the SAFIR2022 and KYT2022 safety goals can also be found under topics 5 and 7. More information about the goals and content of the research can be found in the SAFIR2022 Framework Plan.

The development and creation of the national nuclear safety assessment capability is assessed using the SAFIR2022 Nuclear Safety Assessment Capability Model as defined in the SAFIR2022 Framework Plan. This includes the use of general research programme indicators. The review of the SAFIR2022 indicators for year 2019 showed a drop in the number of scientific journal articles per person year when compared with the first year of the previous research programme (SAFIR2018). Also, the level of international networking has shown some signs of decline. Because of this, SAFIR2022 Management Board wants to emphasise the importance of high-level scientific publications and national and international cooperation as also stated in the vision of the SAFIR2022 research programme:

“The SAFIR2022 research community is a vigilant, internationally recognised and strongly networked competence pool that carries out research on topics relevant to the safety of Finnish nuclear power plants on a high scientific level and with modern methods and experimental facilities.”

Also, in the call 2021, SAFIR2022 Management Board wants to highlight the following two timely research topics, which could provide additional support to the fulfilment of the SAFIR2022 safety goals:

1. A renewal of Finnish nuclear energy regulation (including Nuclear Energy Act) is being planned. The renewal could be supported by research projects that investigate e.g. the impact of the foreseen changes in the regulation on the licensees' and regulator's operations and way of acting. Insights from e.g. other regulated industries in Finland and experience from the point of view of Finnish

culture could help recognising benefits and pitfalls when introducing changes in the regulatory system in nuclear safety.

2. The global spread of Covid-19 has affected the activities of people, businesses, organisations and states in a number of different ways. Also, nuclear licensees and regulators have been forced to find new ways to carry on their daily activities, including protection of personnel, management of plant operations and outages as well as carrying out reviews and inspections. Research projects focusing on the impacts of Covid-19, or similar global phenomena, and on the related operating experience could provide valuable information on the ways to ensure and develop nuclear safety under normal and exceptional circumstances.