ESFR-SMART: new Horizon-2020 project on SFR safety

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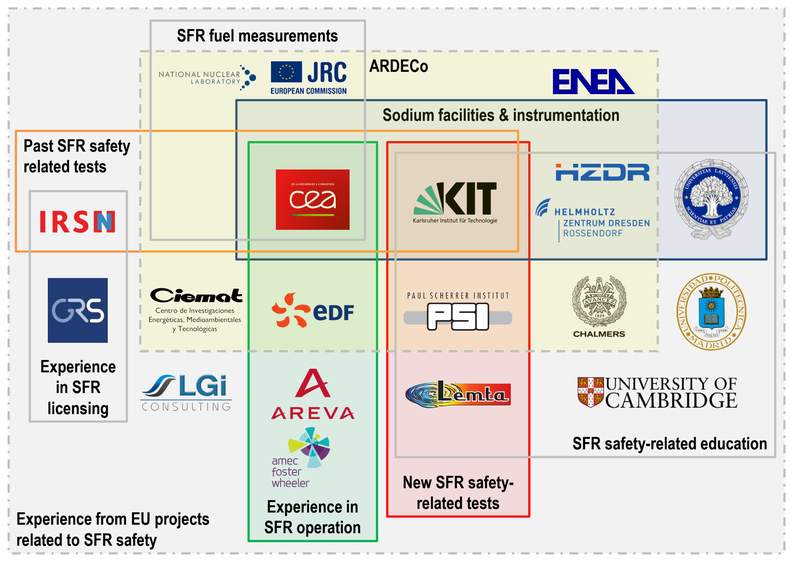
Summary

To improve the public acceptance of the future nuclear power in Europe we have to demonstrate that the new reactors have significantly higher safety level compared to traditional reactors. The Horizon-2020 ESFR-SMART project (**European Sodium Fast Reactor Safety Measures Assessment and Research Tools**) aims at enhancing further the safety of Generation-IV SFRs and in particular of the commercial-size European Sodium Fast Reactor (ESFR) in accordance with the European Sustainable Nuclear Industrial Initiative (ESNII) roadmap and in close cooperation with the Advanced Sodium Technological Reactor for Industrial Demonstration (ASTRID) program.

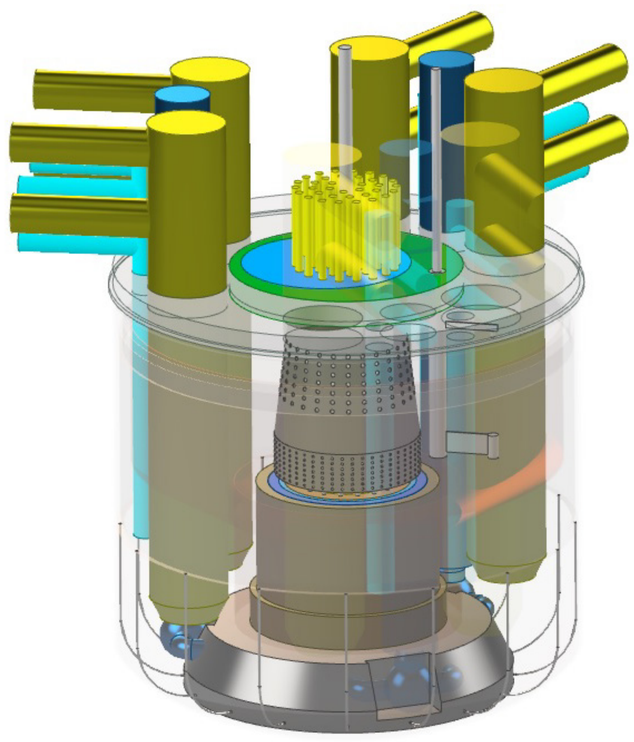
Objectives

1. Produce new experimental data in order to support calibration and validation of the computational tools for each defence-in-depth level.
2. Test and qualify new instrumentations in order to support their utilization in the reactor protection system.
3. Perform further calibration and validation of the computational tools for each defence-in-depth level in order to support safety assessments of Generation-IV SFRs, using the data produced in the project as well as selected legacy data.
4. Select, implement and assess new safety measures for the commercial-size ESFR, using the GIF methodologies, the FP7 CP-ESFR project legacy, the calibrated and validated codes and being in accordance with the update of the European and international safety frameworks taking into account the Fukushima accident.
5. Strengthen and link together new networks, in particular, the network of the European sodium facilities and the network of the European students working on the SFR technology.

Partners and relevant expertise

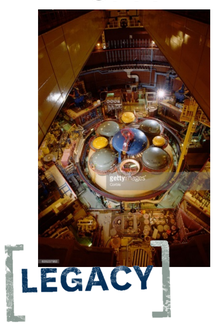


Starting ESFR design

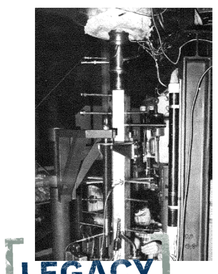


Experiments for each defence-in-depth level: legacy, in progress, and new

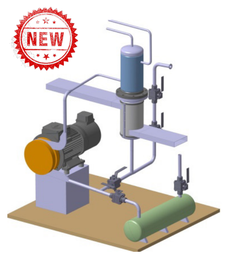
SPX



KNS-37



SOLTEC



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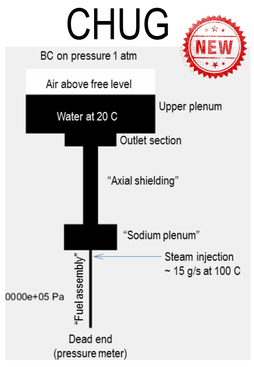
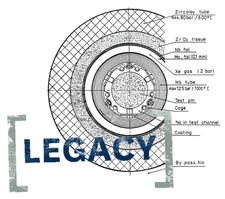
CHUG



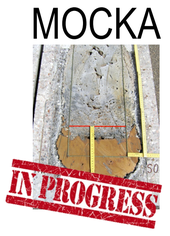
CABRI



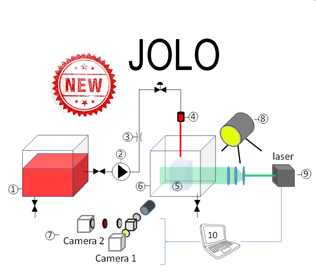
SCARABEE

LIVE

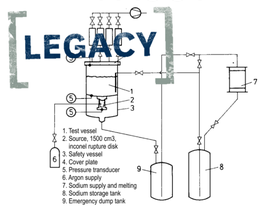
MOCKA



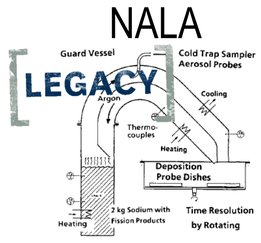
JOLO



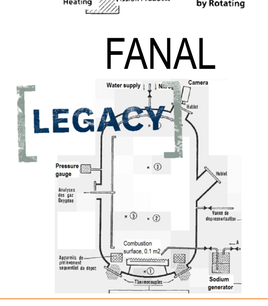
FAUST



NALA

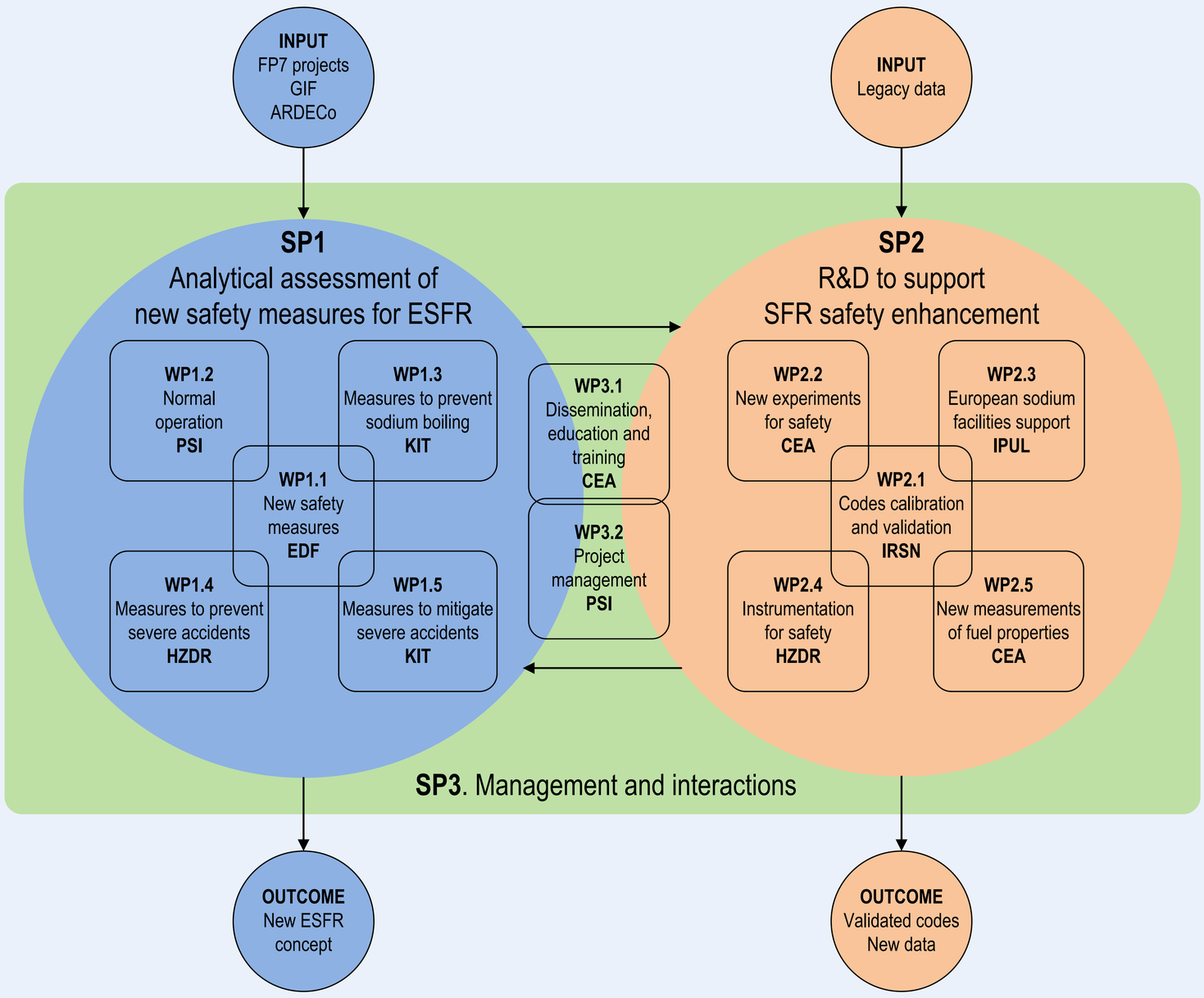


FANAL

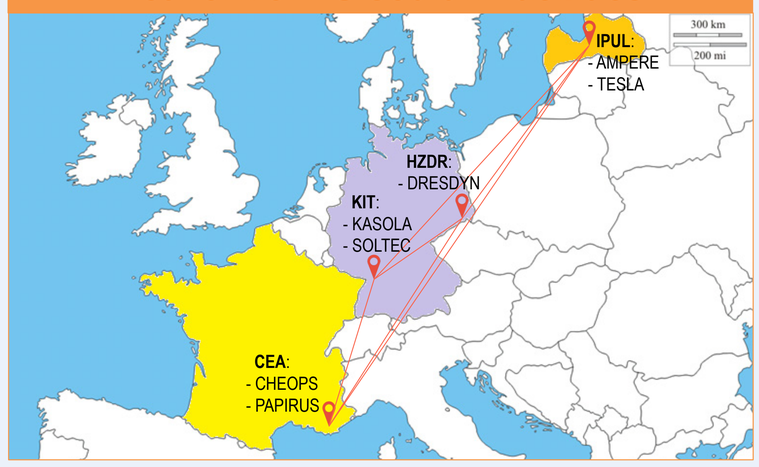


NEW MOX fuel properties measurements

Eddy-Current Flow Meter development NEW



Network of EU sodium facilities



Conclusions

The new project on Generation-IV Sodium Fast Reactor safety starts September 1, 2017 and ends on August 31, 2021.

The project has received funding from the Euratom research and training programme 2014-2018 under grant agreement No 754501