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Nuclear Energy Agency

NEA
NUCLEAR ENERGY AGENCY

NEA activities on nuclear safety research for SMR

Vesselina.Ranguelova@oecd-nea.org

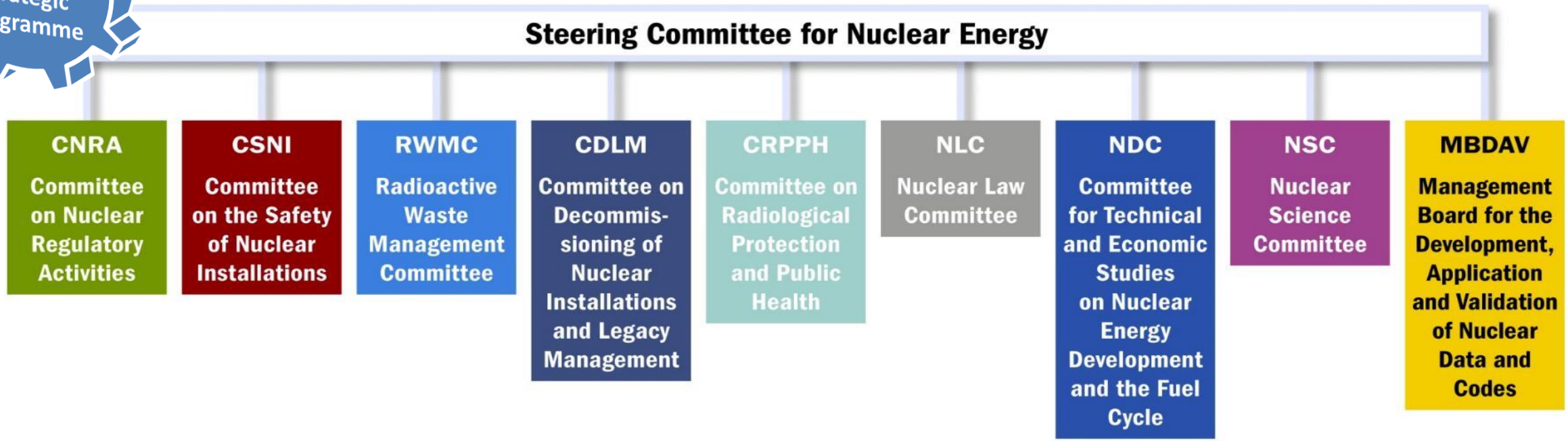
Deputy Head of the Division of Nuclear Safety Technology and Regulation (SAF), Nuclear Energy Agency

The NEA: 34 Countries Seeking Excellence in Nuclear Safety, Technology, and Policy

- 33 member countries + strategic partners (e.g., China and India).
- 8 standing committees and more than 80 working parties and expert groups.
- The NEA Data Bank - providing nuclear data, code, and verification services.
- Growing global relationships with industry and universities.

NEA Standing Technical Committees

Safety in the Strategic programme



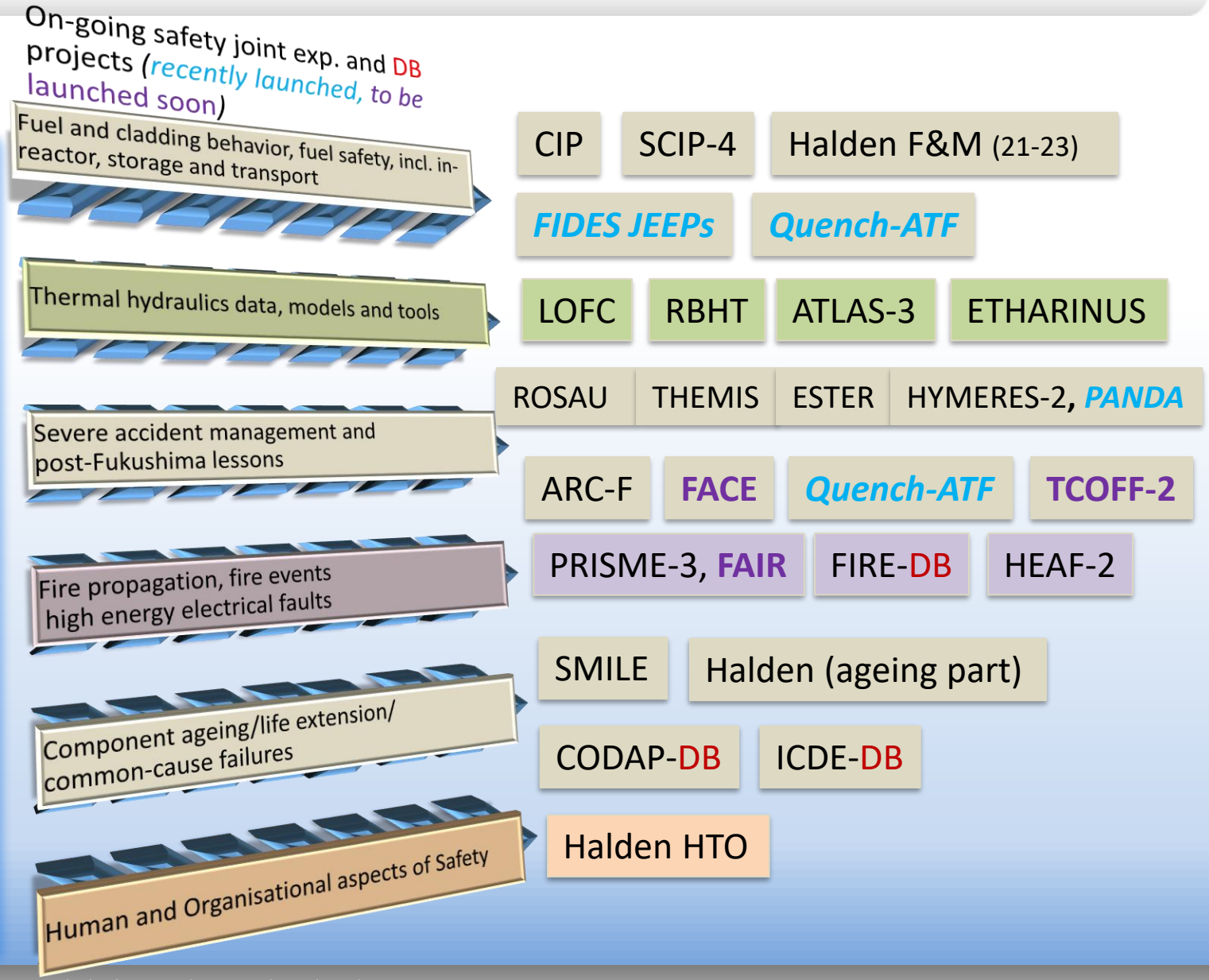
The NEA's committees bring together top governmental officials and technical specialists from NEA member countries and strategic partners to solve difficult problems, establish best practices and to promote international collaboration.

Cooperating with partner-countries through joint safety research projects

- **Maintain key experimental facilities and key competencies and support the operating agents**
- **Address a wide range of high priority safety issues**
- **Facilitate cooperation between countries**
- **Anticipate needs for future technologies**
- **Preserve and disseminate high quality data**

Updates of guidance and principles for initiation and conduct of JPs discussed at last CSNI, approval of the document to be addressed at this meeting

Working on enhancing JPs data sets preservation



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On-going safety joint exp. and DB projects

- Fuel and cladding behavior, fuel safety incl. in-reactor, storage and transport
- Thermalhydraulics data, models and tools
- Severe accident management and post-Fukushima lessons
- Fire propagation, fire events high energy electrical faults
- Component ageing/life extension/ common-cause failures
- Human and Organisational aspects of Safety

LOFC (2011-2024, 8 countries)

Loss Of Forced Cooling transients without SCRAM, reactor kinetics, coupled core physics and TH

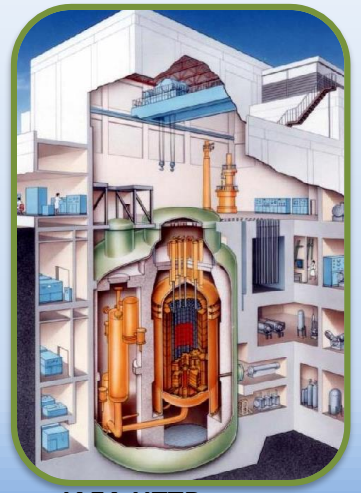
Run 1 done in 2010

Project on hold after Fukushima Daiichi accident

Restart of reactor in July 21

LOFC run 3 done in Jan. 22

LOFC run 2 postponed (change of components)



JAEA HTTR reactor
Figure source JAEA

ATLAS-3 (2021-2024, 10 countries)

RCS & containment TH, cooling performance of passive safety systems (PSS), asymmetric NC conditions, DEC (multiple failures)

Scaling, benchmark

First two tests performed in 2021: IB-LOCA with PSS, DEC

Three tests planned in 2022

ATLAS facility
Figure source KAERI

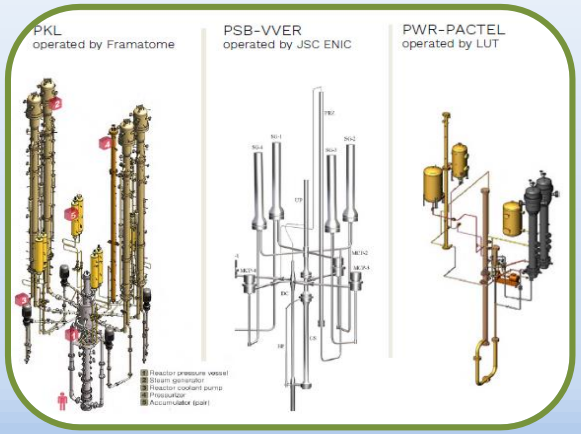
ETHARINUS (2020-2024, 14 countries)

DEC UH SB-LOCA and IB-LOCA, performance of passive safety systems, partial core blockage, DEC MSGTR, asymmetric NC conditions

Scaling, benchmark

DEC UH SB-LOCA and IB-LOCA, PSS and asymmetric NC tests done in 2021

MSGTR and further PSS tests planned in 2022



PKL facility, Figure source Framatome
PSB-VVER facility, Figure source JSC ENIC
PWR-PACTEL Facility, Figure source LUT University)

RBHT (2019-2022, 12 countries)

High quality data for reflooding models

All tests completed in 2021 (open and blind)

Two benchmark phases completed, uncertainty analysis under completion

Final Meeting was held May 2022

RBHT Test Section
Figure source Penn. State University

CSNI Expert Group on Small Modular Reactors

Aim:

to support safety demonstration for advanced nuclear technology

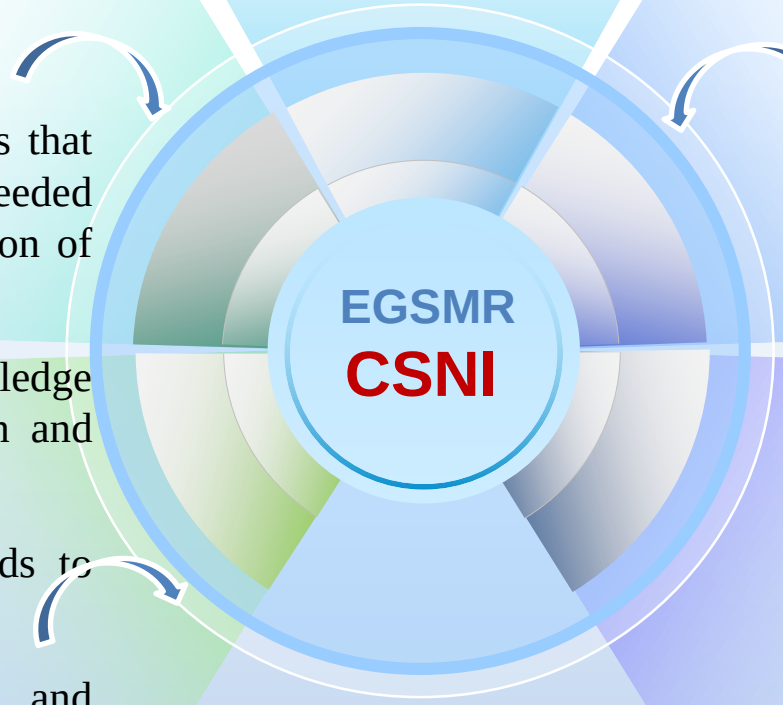
Tasks:

assess CSNI past activities on water cooled NPPs that are of relevance to SMRs and define the work needed to leverage this knowledge for safety demonstration of SMRs;

identify and provide a ranking of the safety knowledge gaps and recommendations for common research and assessment to address the identified gaps,

identify any new technical areas the CSNI needs to develop;

identify necessary experimental programmes and specify key research facilities needed to support safety demonstration.



Members:

Belgium, Czech Republic, Canada, France, Germany, Italy, Japan, Netherlands, Norway, Spain, Sweden, Switzerland, USA, IAEA and EC

Outcomes:

- define which technologies of interest to NEA member countries shall be addressed and identify areas of common interest for research on SMR safety.
- seek synergy with IAEA, GIF, EC
- Establish close links with regulators, as the focus on near term deployment of SMR needs strong scientific support for licensing

Thank you for your attention

More information @ www.oecd-nea.org

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