Role of OECD Nuclear Energy Agency (NEA) in the Safety Research

Olli Nevander (OECD NEA)

Overview

- NEA membership and Committee Structure
- NEA CSNI working groups
- Overview of NEA projects
- Examples of joint projects and database projects
- Some notes on the work in the projects of NEA

OECD/NEA Membership

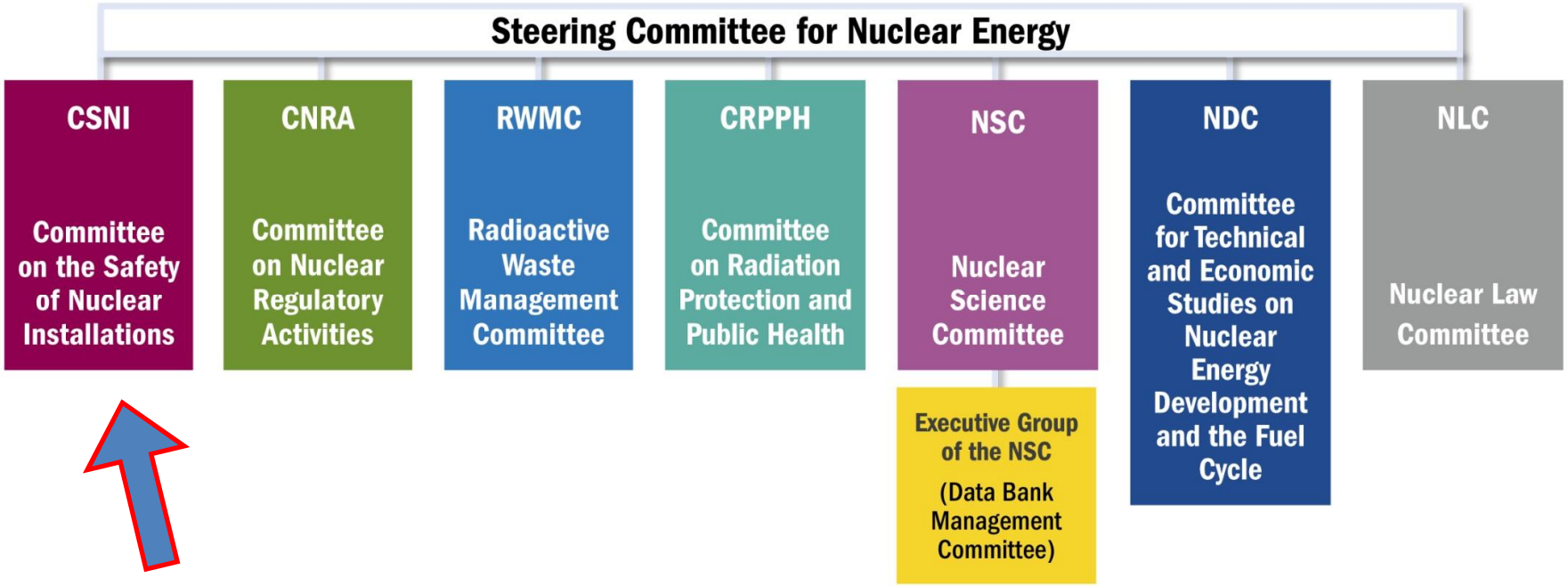
- Australia
- Austria
- Belgium
- Canada
- Chile
- Czech Republic
- Denmark
- Estonia
- Finland
- France
- Germany
- Greece
- Hungary
- Iceland
- Ireland
- Israel
- Italy
- Japan
- Korea
- Luxembourg
- Mexico
- Netherlands
- New Zealand
- Norway
- Poland
- Portugal
- Russia
- Slovak Republic

- Slovenia
- Spain
- Sweden
- Switzerland
- Turkey
- United Kingdom
- United States

Cooperation with China (NNSA), India (AERB), South Africa (NNR) and UAE (FANR)

OECD and NEA member
OECD member, not NEA
NEA member, not OECD

NEA Committee Structure



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

Committee on the Safety of Nuclear Installations (CSNI)

- CSNI Programme Review Group (PRG)
- Working Group on Risk Assessment (WGRISK)
- Working Group on Analysis and Management of Accidents (WGAMA)
- Working Group on Integrity and Ageing of Components and Structures (WGIAGE)
  - Subgroup on the Integrity of Metal Components and Structures
  - Subgroup on the Ageing of Concrete Structures
  - Subgroup on the Seismic Engineering
- Working Group on Human and Organizational Factors (WGHOF)
- Working Group on Fuel Safety (WGFS)
- Working Group on Fuel Cycle Safety (WGFCS)
- Working Group on External Events (WGEV)
- Working Group on Electrical Power Systems (WGELEC)
- Senior Expert Group on Safety Research Opportunities Post-Fukushima (SAREF)

OECD/NEA ongoing joint projects in 2016 in the nuclear safety area:

- SCIP-3 (new)
- HALDEN Reactor
- CABRI Water Loop
- LOFC
- PKL-3
- THAI-2
- HYMERES
- STEM
- PRISME-2
- HEAF
- BSAF
- ATLAS

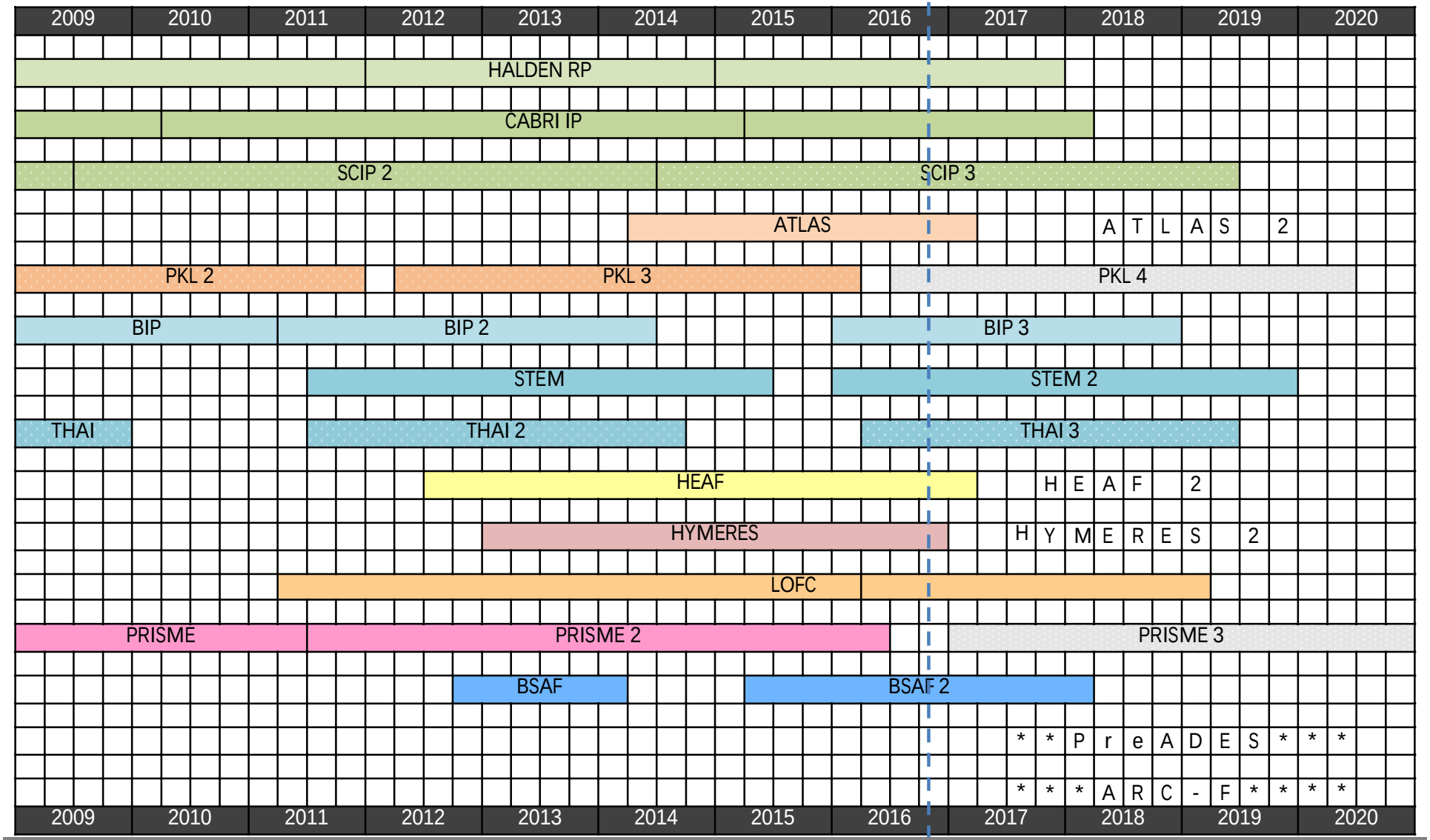
DATABASE PROJECTS

- CADAK Project
- CODAP Project
- FIRE Project
- ICDE Project

Joint Safety Research Projects

- Collaborative research between Governments of OECD / NEA Member countries or bodies designated by such Governments, or OECD non-member countries or economies in compliance with the rules and regulations applicable to the OECD
- Two types of projects – Experimental & Database
- Experimental projects with 3-5 year experimental programmes
  - Traditionally Host Country with Operating Agent propose experimental work with others then participating with funds and agreeing a mutually beneficial research work programme
  - Most recently we have begun to have multiple OA projects which have cost, scale and multiple aspect advantages
- Database
  - Four database projects: CODAP, CADAK, ICDE, FIRE
  - Ongoing projects with phases: No fixed end data
  - Membership share data for mutual analysis
  - Low cost annual fee

Overview of Status of Current Safety Projects



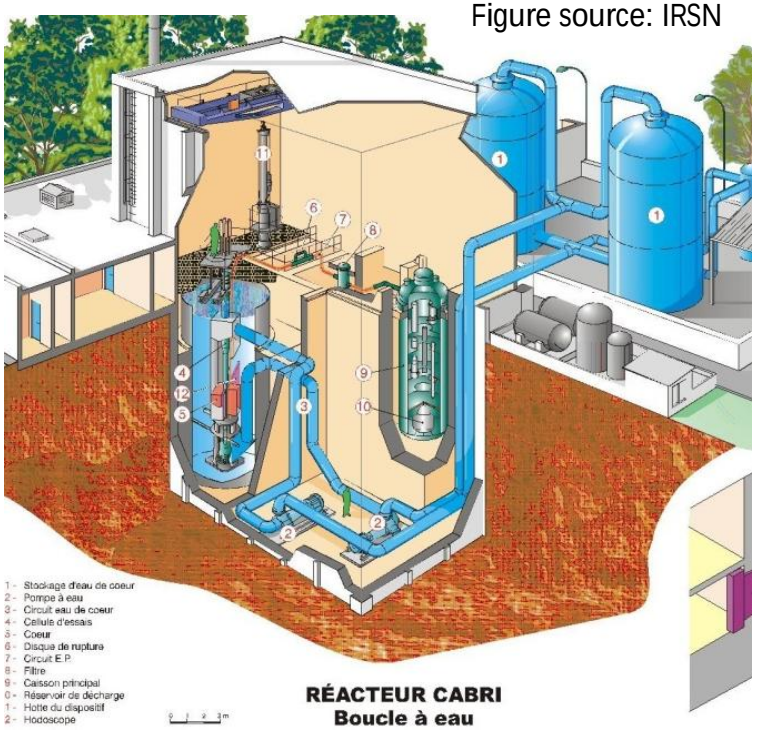
Halden Reactor Project (HRP)

- In-pile experiments on fuel and materials using a 25 MW BWR moderated by heavy water & a programme on human factors, led by the Institute for Energy Technology (IFE, Norway). This includes the people who work in the control rooms, human-machine interaction and the internal processes in irradiated materials.
- Status
  - 130+ partners, 20 countries (2 non-NEA)
  - started in 1958, current phase 2015-17; IFE promoting next phase
  - 39th meeting of the Enlarged Halden Programme Group in May 2016 attracted 250 delegates from 22 countries
- Documentation: https://www.oecd-nea.org/nsd/docs/2010/csni-r2010-5.pdf
  https://www.oecd-nea.org/nsd/docs/2007/csni-r2007-8.pdf

CABRI International Project (CIP)

- Ability of PWR fuels to withstand sharp power transients due to rapid reactivity injection, experiments led by IRSN (France; power transient duration 10-100 ms with a peak at ~20 GW.
- Status
  - 15 partners (12 countries), 2 others are considering joining
  - conversion to the water loop (from sodium) is complete
  - first criticality in refurbished reactor in 2015, commissioning & power tests in 2016
  - *aim*: authorization of first water-loop test (CIP-Q) in Oct. 2017
- Documentation: http://www.oecd-nea.org/jointproj/cabri.html

Figure source: IRSN



CODAP Database

The Component Operational Experience, Degradation and Ageing Programme (CODAP) builds on two recent NEA projects: the Piping Failure Data Exchange (OPDE) Project, an international database on piping service experience applicable to commercial nuclear plants and the Stress Corrosion Cracking and Cable Ageing Project (SCAP) which assessed, due to their implications for nuclear safety and their relevance for plant ageing management, stress corrosion cracking (SCC) and degradation of cable insulation.

- The structure and content of the CODAP database is now very useful and arrangements are being made in all countries to collect and validate data
- Phase 2 (2015-2017) on going.
- Improvements to the CODAP Database structure are going on
- Topical reports published:
  - Operating Experience Insights on Pipe Failures in Electro-hydraulic Control & Instrument Air Systems
  - Flow Accelerated Corrosion (FAC) of carbon steel & low alloy steel piping in commercial NPPs
- Third Topical Report: 'Operating Experience Insights Into Pressure Boundary component reliability & integrity management' will be published in early 2017
- Fourth topical report: Operating Experience Insights into Below Ground and Buried Piping will be published in late 2017

CADAK Database

The Cable Ageing Data and Knowledge (CADAK) Project provides a follow-up to the cable ageing part of the Stress Corrosion Cracking and Cable Ageing Project (SCAP), initially funded by Japan.

- Phase 1 was completed in December 2014; project report of phase 1 will be ready in April 2016. The report will describe the methods to collect information to the CADAK database. Database has been established for a number of member countries cable data and technical standards for qualification and inspection; SCAP project collects the main part of information
- In phase 1 (2012-2014) the following 8 countries took part: Belgium, Canada, France, Japan, Slovak Republic, Spain, Switzerland and the United States
- In phase 2 (2015-2017) only the following 5 countries are now taking part: Canada, Germany, Slovak Republic, Switzerland and the United States
- Additional memberships are necessary for continuing this database project into its third term in 2018-2020, therefore, CADAK needs more countries into the project

SOME NOTES ON THE WORK IN THE PROJECTS OF NEA

- The joint projects of NEA are very important part to develop the nuclear safety research in the world – Power companies are welcomed to take part
- Databases of NEA are collecting information in detailed analysed level and some of them are now mature enough for in-depth analyses of information
- In database projects there are room for power companies, if there is need of detailed event information and long term analyses of event mechanisms
- Joint research projects of NEA are important tool for cooperation and information exchange on specialists level
- Some results of NEA projects are available in NEA publication webpage http://www.oecd-nea.org/nsd/docs/indexcsni.html - more results are available only for participants in short term

OECD/NEA webpages

OECD NEA CSNI webpage:

https://www.oecd-nea.org/nsd/csni/

All NEA CSNI publications are in the webpage:

http://www.oecd-nea.org/nsd/docs/indexcsni.html

All coming NEA workshops and confrerences are informed in the NEA webpage:

http://www.oecd-nea.org/nsd/calendar.html.

Thank you for your attention

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