

2nd EGATFL and Task Forces Meeting:

Introduction and background

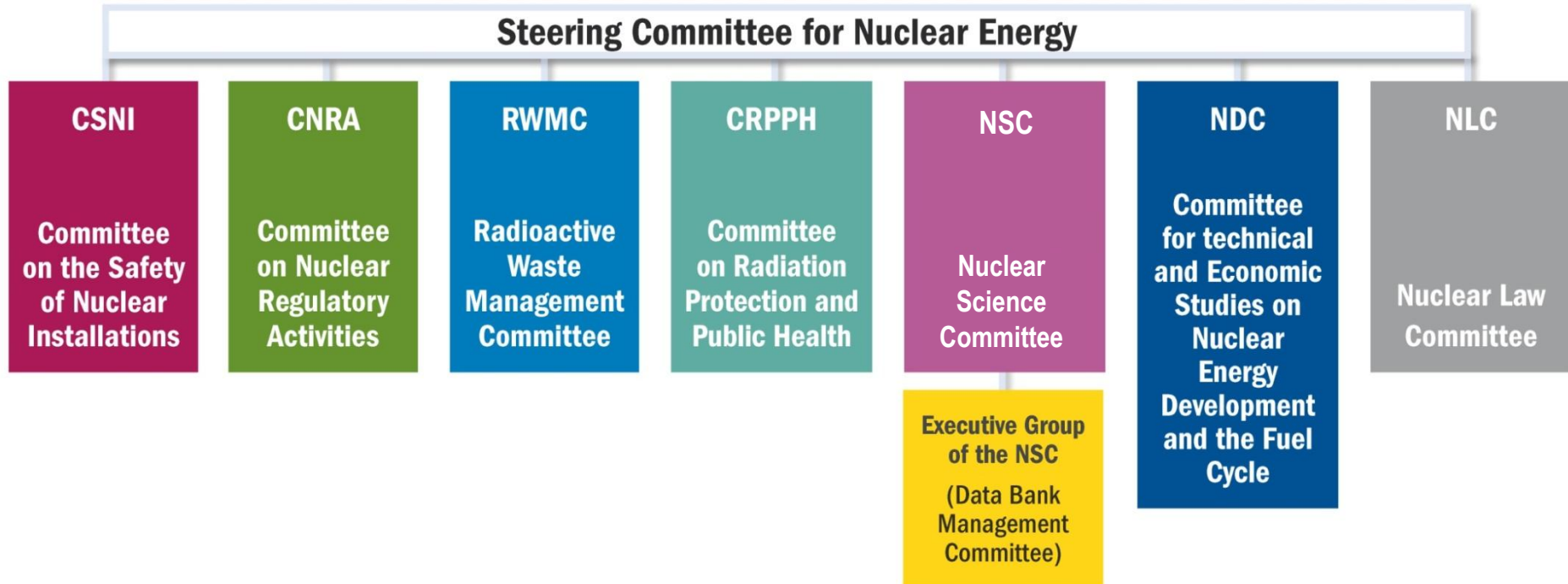
S. Massara (OECD-NEA), Technical Secretary

23-25 September 2014, NEA HQ

Outline

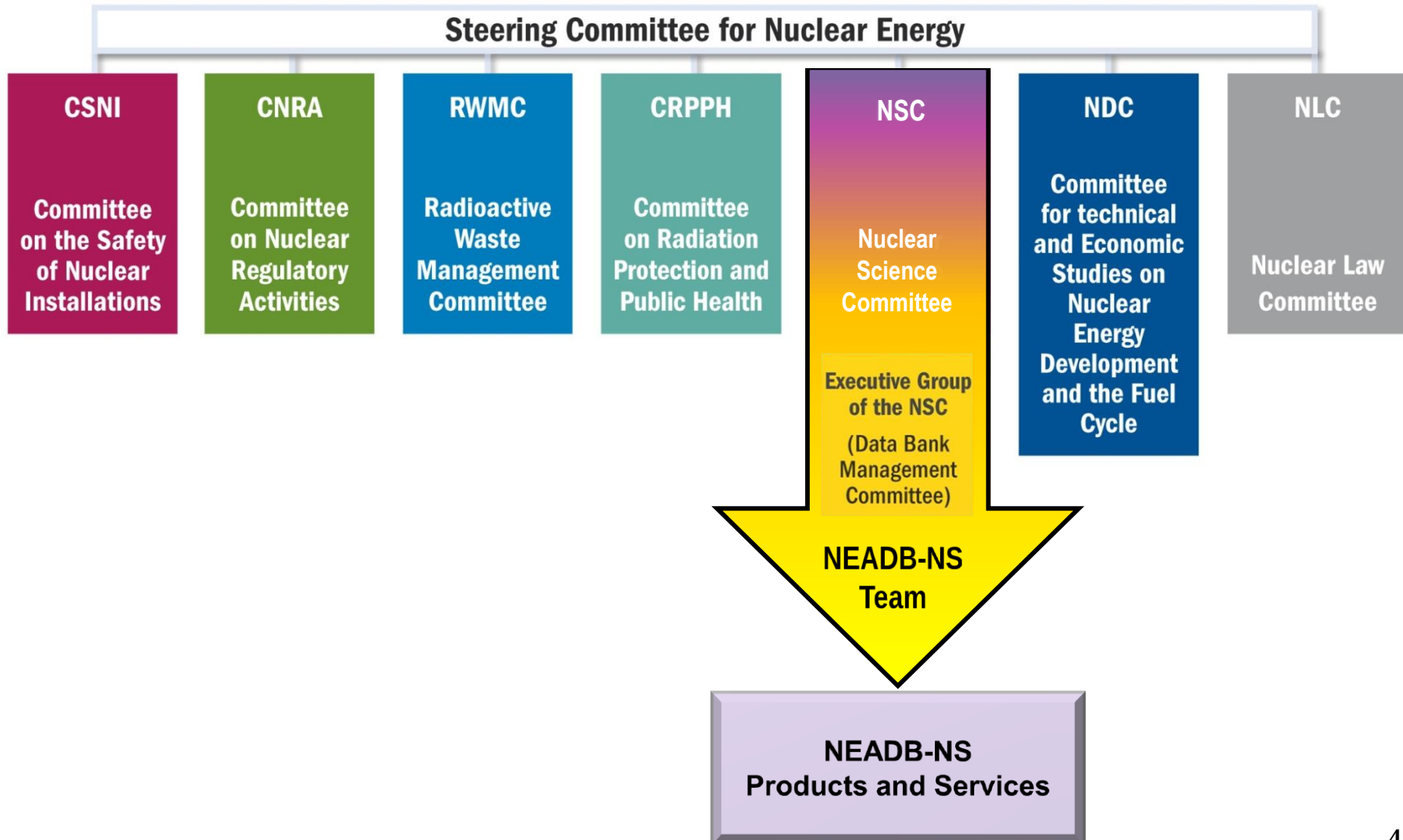
- **OECD-NEA, Nuclear Science, NEA Data Bank**
- **Background & previous ATF workshops at the OECD-NEA**
- **Creation of new Nuclear Science Expert Group EGATFL**
- **Outcomes of the previous meeting (28-29 April 2014)**
- **Practical arrangements for the meeting**

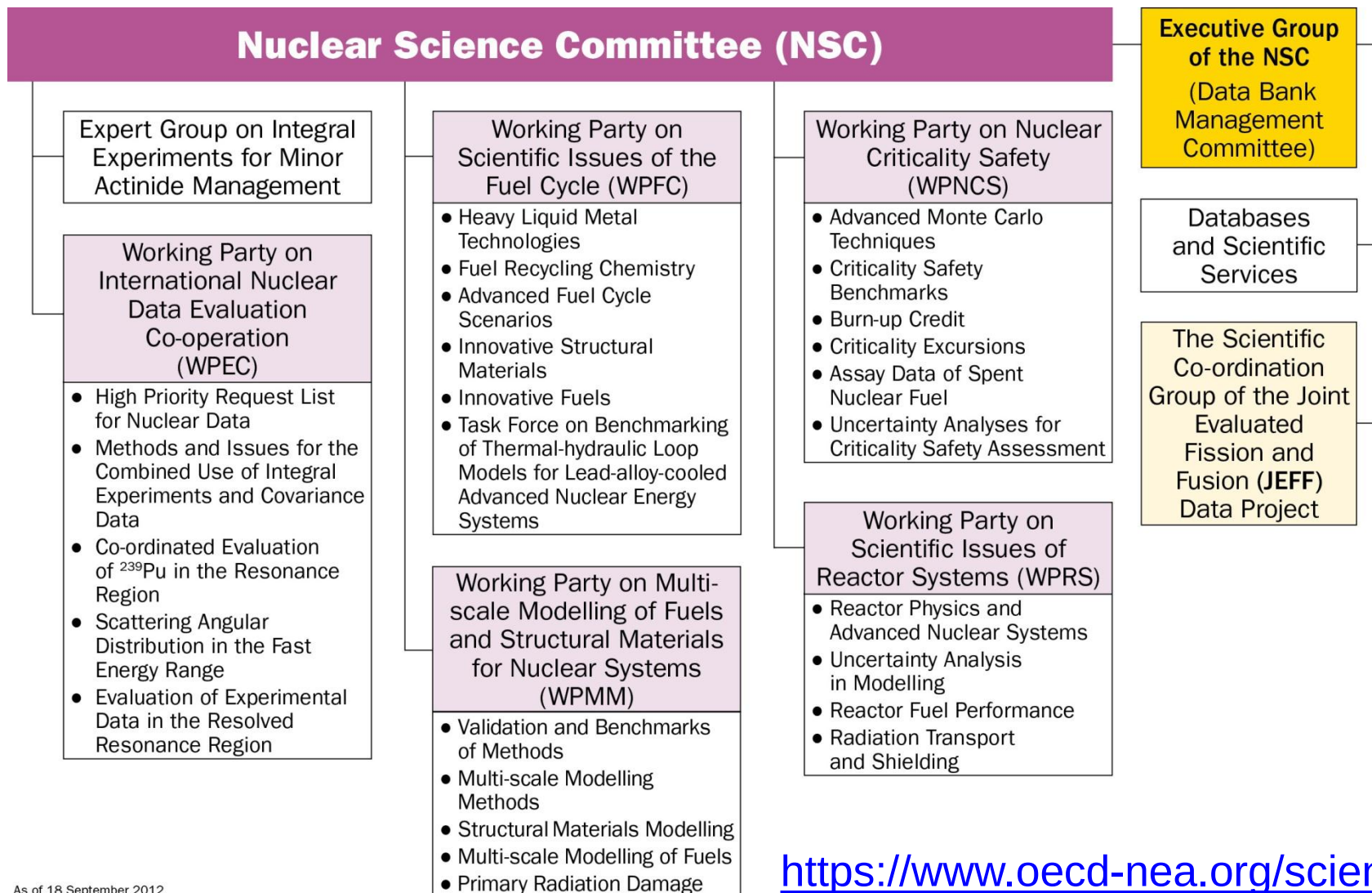
NEA Committees



As of 18 September 2012

Nuclear Science-Data Bank Products & Services





As of 18 September 2012

<https://www.oecd-nea.org/science/>

Nuclear Science Committee (NSC)

Expert Group on Integral Experiments for Minor Actinide Management

Working Party on International Nuclear Data Evaluation Co-operation (WPEC)

- High Priority Request List for Nuclear Data
- Methods and Issues for the Combined Use of Integral Experiments and Covariance Data
- Co-ordinated Evaluation of 239Pu in the Resonance

Working Party on Scientific Issues of the Fuel Cycle (WPFC)

- Heavy Liquid Metal Technologies
- Fuel Recycling Chemistry
- Advanced Fuel Cycle Scenarios
- Innovative Structural Materials
- Innovative Fuels
- Task Force on Benchmarking of Thermal-hydraulic Loop Models for Lead-alloy-cooled Advanced Nuclear Energy Systems

Working Party on Nuclear Criticality Safety (WPNCS)

- Advanced Monte Carlo Techniques
- Criticality Safety Benchmarks
- Burn-up Credit
- Criticality Excursions
- Assay Data of Spent Nuclear Fuel
- Uncertainty Analyses for Criticality Safety Assessment

Working Party on Scientific Issues of Reactor Systems (WPRS)

- Reactor Physics and Advanced Nuclear Systems
- Uncertainty Analysis in Modelling
- Reactor Fuel Performance
- Radiation Transport and Shielding

Working Party on Multi-scale Modelling of Fuels and Structural Materials for Nuclear Systems (WPMM)

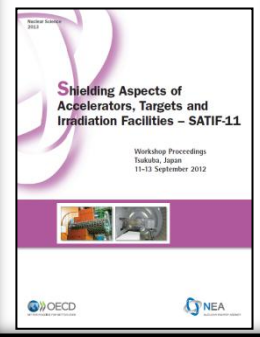
- Validation and Benchmarks of Methods
- Multi-scale Modelling Methods
- Structural Materials Modelling
- Multi-scale Modelling of Fuels
- Primary Radiation Damage

Executive Group of the NSC
(Data Bank Management Committee)

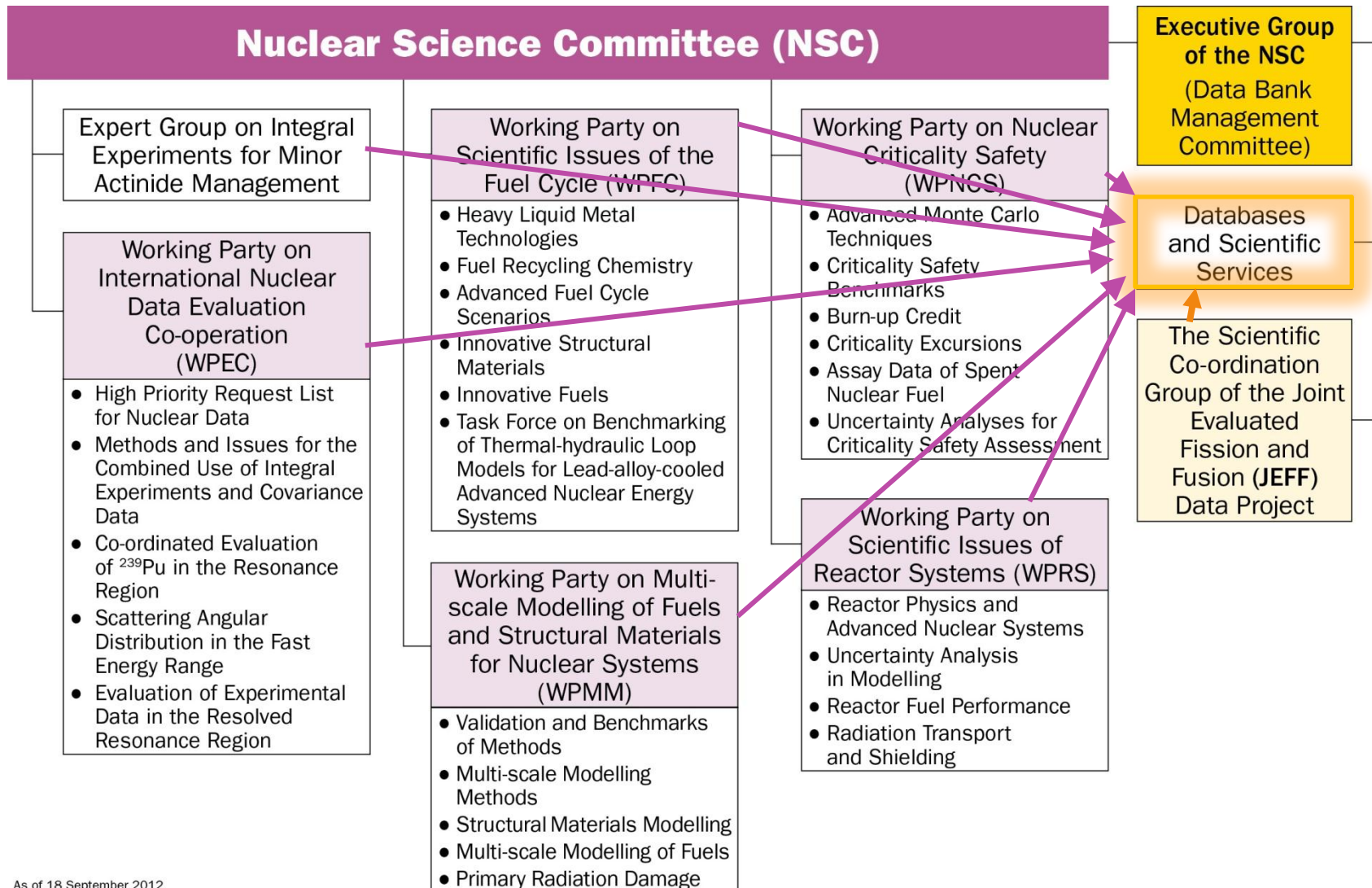
Databases and Scientific Services

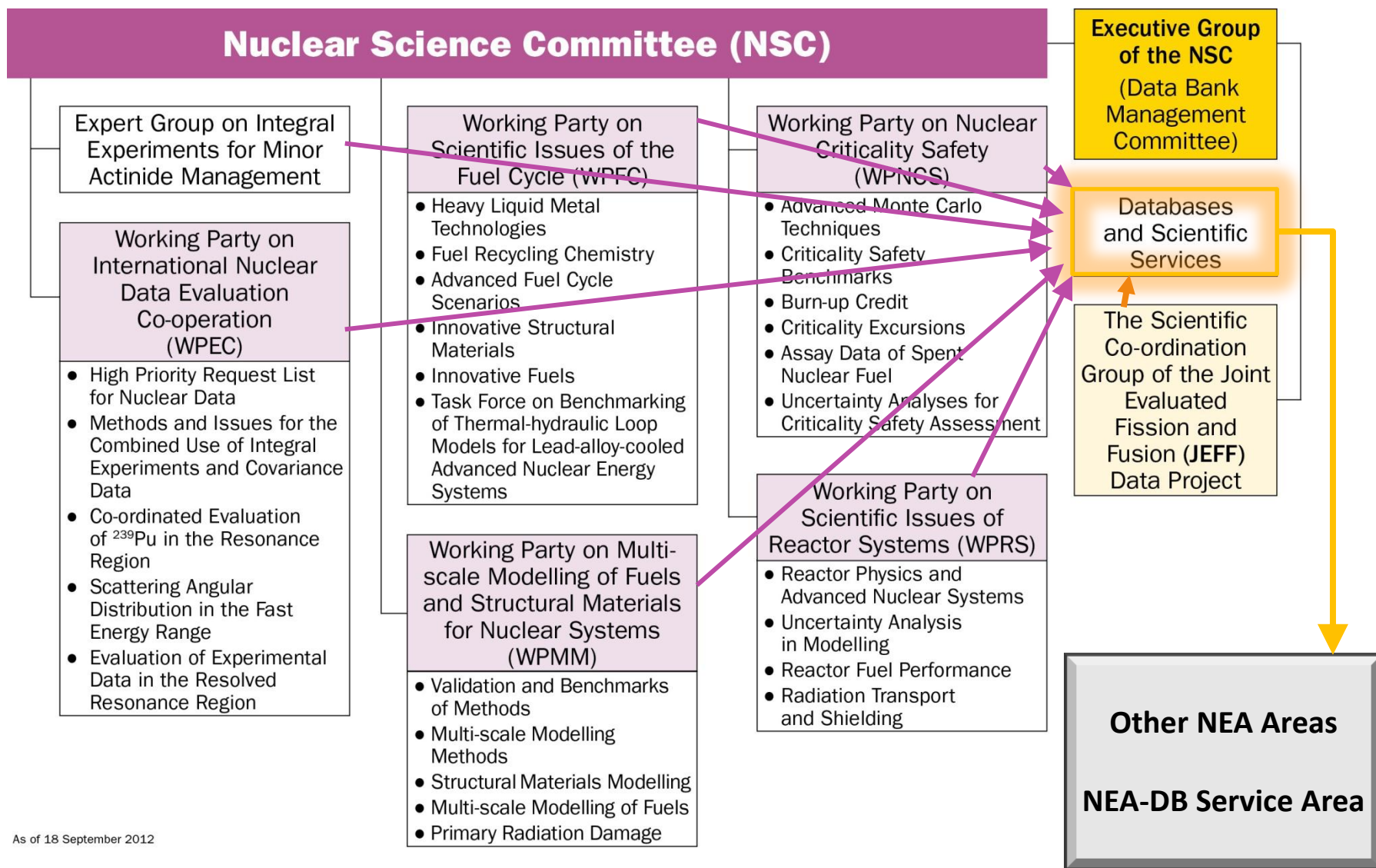
The Scientific Co-ordination Group of the Joint Evaluated Fission and Fusion (JEFF) Data Project

Nuclear Science Publications

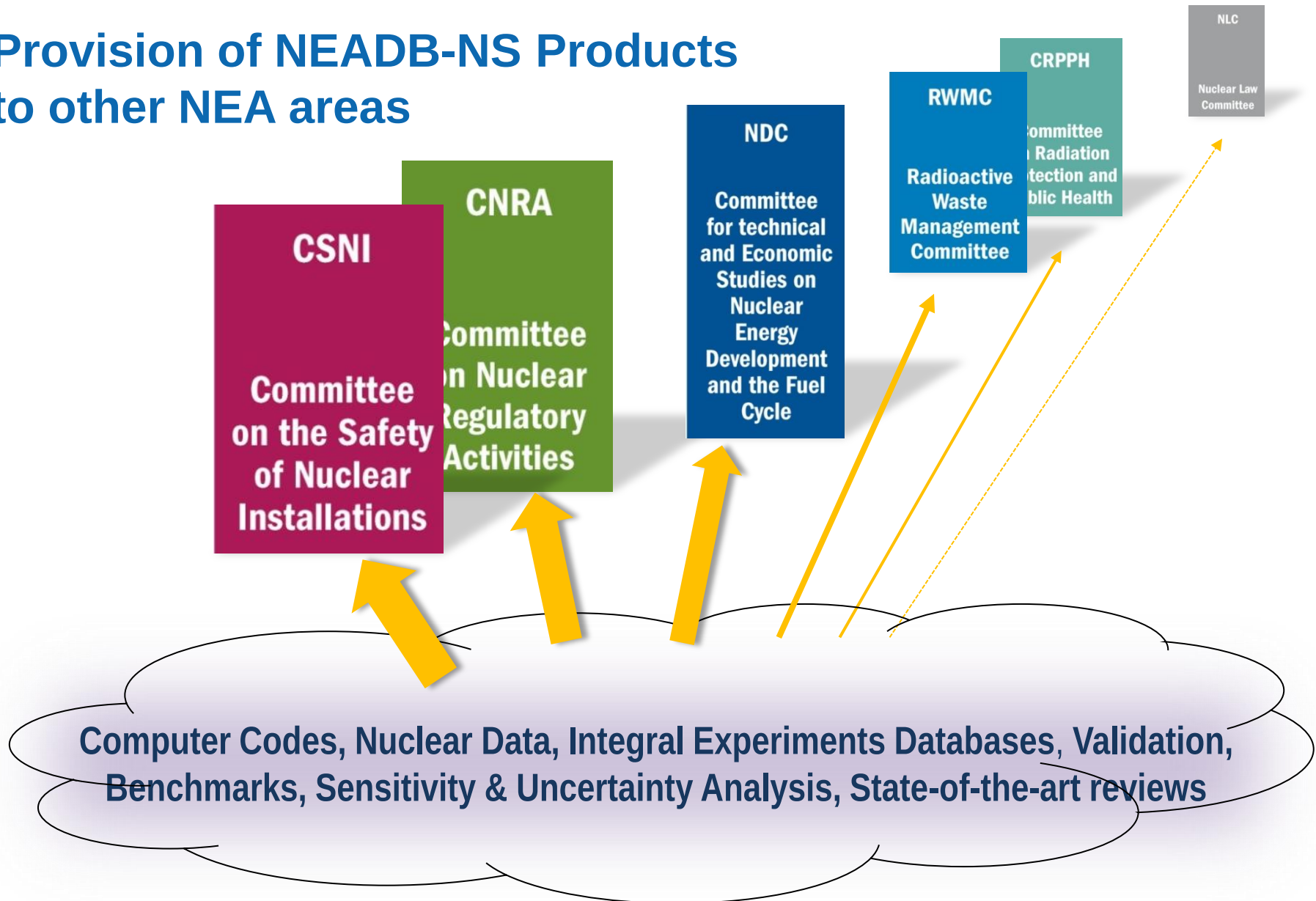


Angular
in the Fast
Range
of Experimental
Resolved
Region





Provision of NEADB-NS Products to other NEA areas



Data Bank Goals (from Strategic Plan 2011-2016)

The Data Bank operates as an **international centre of reference for** its member countries with respect to **basic nuclear tools, such as computer codes and nuclear data**, used for the analysis and prediction of phenomena in the nuclear field. It provides a direct service to its users **by acquiring, developing, improving and validating these tools and making them available as requested.**

Nuclear Science Goals (from Strategic Plan 2011-2016)

The aim of the nuclear science programme is to help member countries **identify, pool, develop and disseminate basic scientific and technical knowledge** required to ensure safe, reliable and economic operation of current nuclear systems and to develop next-generation technologies. The main areas covered are reactor physics, fuel cycle physics and chemistry, criticality safety and material science.

NEA Data Bank – Nuclear Science Products and Services:

- **Management of Scientific and Technical Knowledge**
- **Provision of modelling tools along with the means to test, validate and improve them**

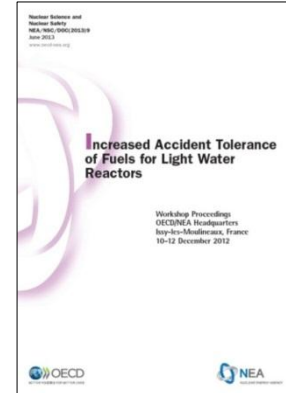
Background to Formation of New NEA EGATFL

- **June 2011 Ministerial Meetings, International Fukushima Forum**
- **June 2011 Nuclear Science Meeting – NSFF e-forum**
- **November 2011 Nuclear Science Bureau**
 - Discussion threads from NSFF reviewed
 - Fukushima identified as topic of in-depth discussion at 2012 NSC meeting
- **June 2012 Nuclear Science Meeting**
 - Proposals for additional PoW items in NSC bodies discussed
 - Fukushima status report from JAEA
 - MELCOR modelling analyses of Fukushima accident
 - Proposal for ATF Workshop received from the Working Party on Scientific Issues of the Fuel Cycle (K. Pasamehmetoglu, K. McCarthy)
- **10-12 December 2012: 1st OECD-NEA Workshop on Increased Accident Tolerance of Fuels for LWRs**
- **28-29 October 2013: 2nd OECD-NEA Workshop on Increased Accident Tolerance of Fuels for LWRs**

Previous workshops/meetings at the OECD-NEA

• **1st Workshop, 10-12 December 2012**

- Technical information exchange on on-going studies in 15 NEA member countries, plus P.R. of China (55 participants)
- Particular focus on safety issues and on which metrics should be applied for a down-selection between different candidates
- Workshop Proc. and available on <https://www.oecd-nea.org/science/egatfl/>



• **2nd Workshop, 28-29 October 2013**

- 32 attendees from 11 NEA member countries, P.R. of China and IAEA
- The delegates agreed on proposing to the OECD-NEA Nuclear Science Committee the creation of a new EG directly reporting to the NSC
 - Preliminary draft mandate presented at the Nuclear Science Committee Bureau meeting December 2013
 - Start-up meeting April 2014
 - **NSC approved detailed mandate June 2014**

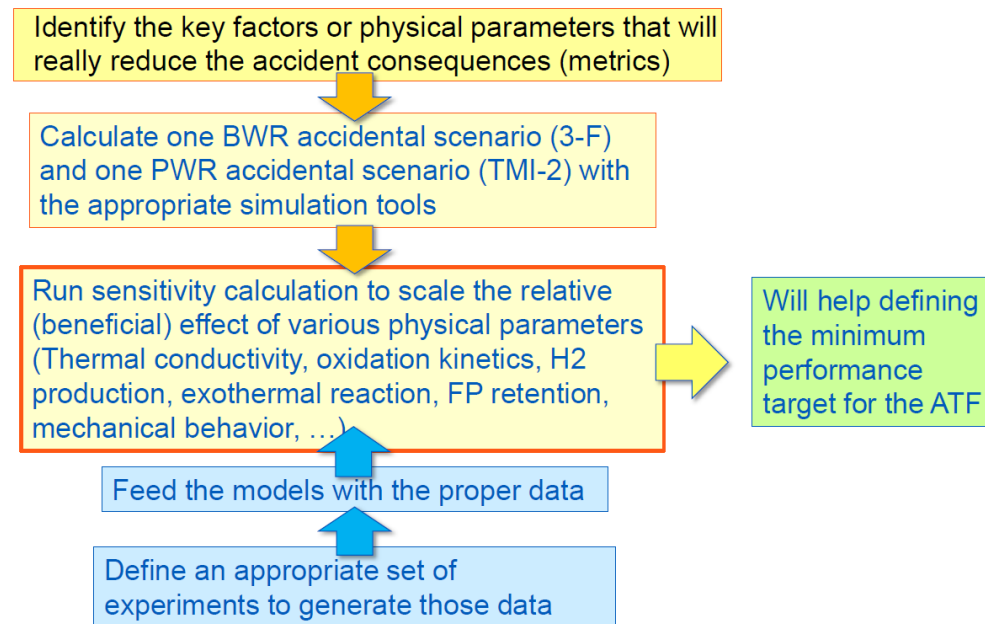
Start-up meeting of EGATFL (28-29 April 2014): Main Outcomes

- Nominated Chair: K. Pasamehmetoglu (INL, USA)
- Draft mandate finalized and submitted to the NSC for approval

- Key activities & roadmap:

- **Safety:** metrics development, severe accident calculation and model improvement for new materials,...
- **Material science:** advanced core materials development (cladding, fuel, control rods)
- **Reactor physics**
- **Reactor operation**
- **Fuel cycle issues**
- **Experimental qualification**

Roadmap for ATF activity within NEA EG



NEA Workshop on ATF for LWR, December 2012, Paris Nicolas WAECKEL

- **Licensing?**

Proposed structure for EGATFL

Expert Group on Accident Tolerant Fuels of LWRs (EGATFL)

Information Exchange and Technical Discussions on general issues of ATF

Task Force 1 Systems Assessment

- Metrics
 - Economics
 - Fuel cycle (SNF, ...)
 - Operations
 - DBAs
 - BDBAs
 - ...
- TRL definition
- Illustrative Scenario (to feed TF1 and TF2)
- Parametric studies
- System codes

Deliverables

- Definition of illustrative scenarios and first parametric studies
- State-of-the-art report (metrics, system codes)+ Recommendations and priorities

Task Force 2 Cladding/Core Materials

- Properties
- Evaluation under normal operations (incl. fretting)
- Evaluation under illustrative scenario
- PCI
- Testing needs – data gaps (to be linked to RTFDB)
- Modeling needs – modeling gaps
- Experimental infrastructure

Deliverables

- State-of-the-art report + Recommendations and priorities

Task Force 3 Fuel Concepts

- Properties
- Evaluation under normal operations (incl. fretting)
- Evaluation under illustrative scenario
- PCI
- Testing needs – data gaps (to be linked to RTFDB)
- Modeling needs – modeling gaps
- Recommendations on priorities

Deliverables

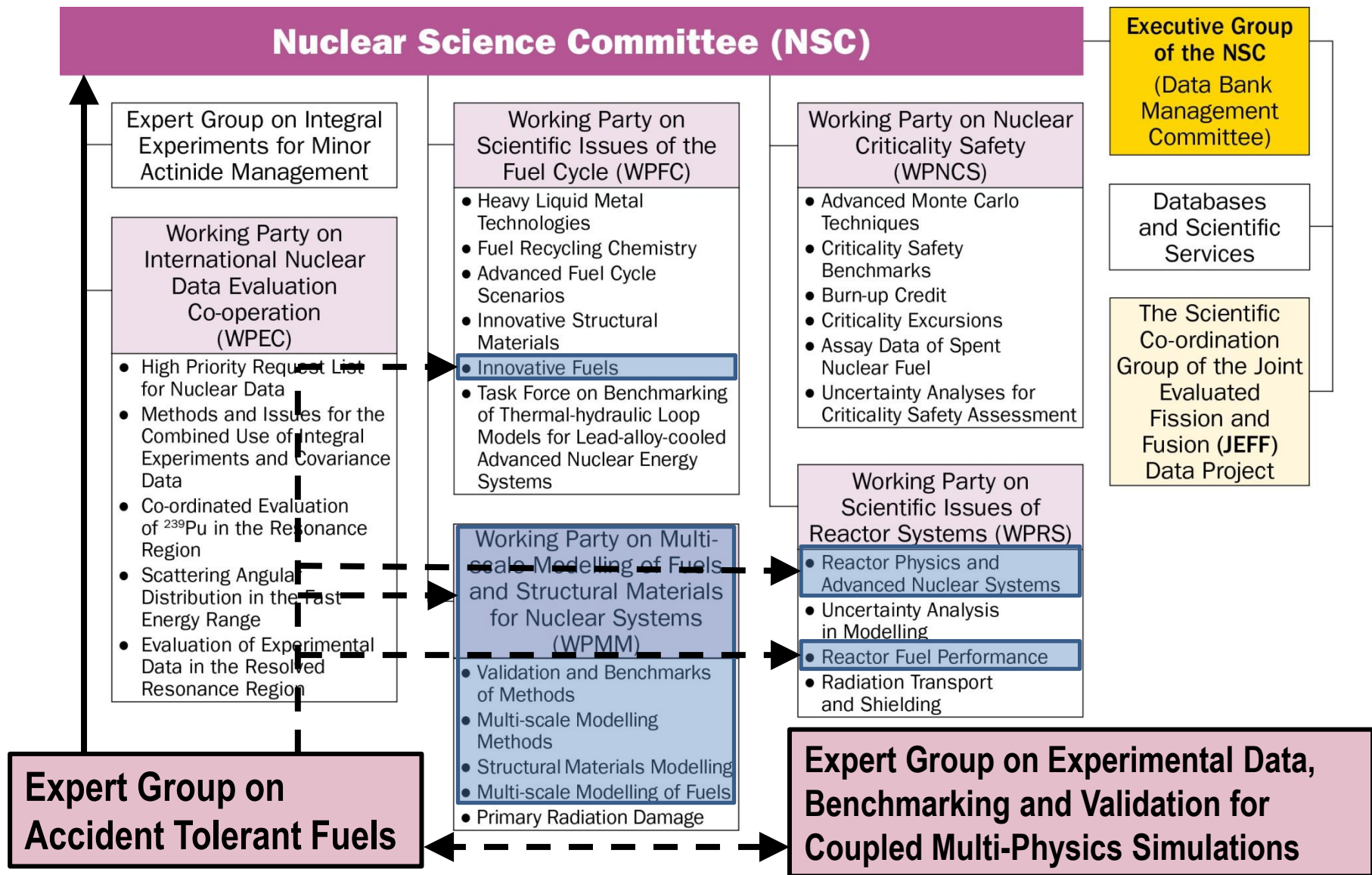
- State-of-the-art report + Recommendations and priorities

Link with other activities

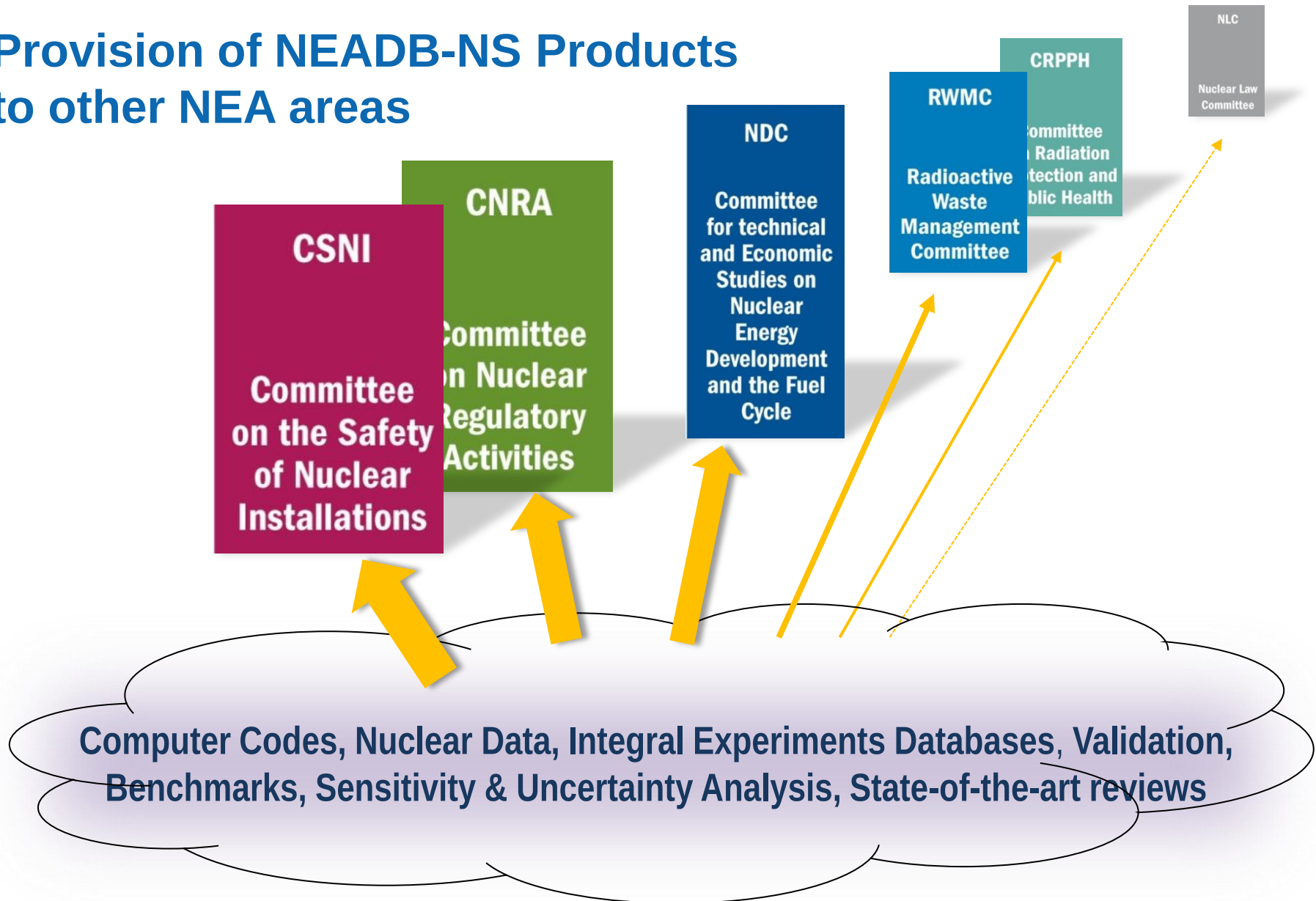
Synergistic links may be established (participation to common meetings, expert advice and/or reports reviewing, joint membership in multiple groups, etc.) with other bodies and stakeholders¹ within and outside the OECD-NEA:

- OECD-NEA Nuclear Science Committee:
 - Working Party on Multiscale Modelling of Fuels and Structural Materials for Nuclear Systems (WPMM), on the issue of advanced modelling techniques;
 - Working Party on Reactor Systems (WPRS), for nominal and accidental behaviour, fuel modelling;
 - Working Party on Scientific Issues of the Fuel Cycle (WPFC), Expert Group on Innovative Fuels (EGIF), for innovative fuels and cladding;
 - New Expert Group on Multi-Physics, Experiments, Benchmark & Validation.
- OECD-NEA Committee on the Safety of Nuclear Installations:
 - Working Group on Fuel Safety (WGFS);
 - Working Group on Analysis and Management of Accidents (WGAMA), for accidental scenarios modelling;
 - Benchmark Study of the Accident at the Fukushima Daiichi Nuclear Power Station (BSAF) Project, for the accidental sequences on Fukushima Units 1-3;
- IAEA, which foresees establishing a Coordinated Research Project on ATF from 2015.

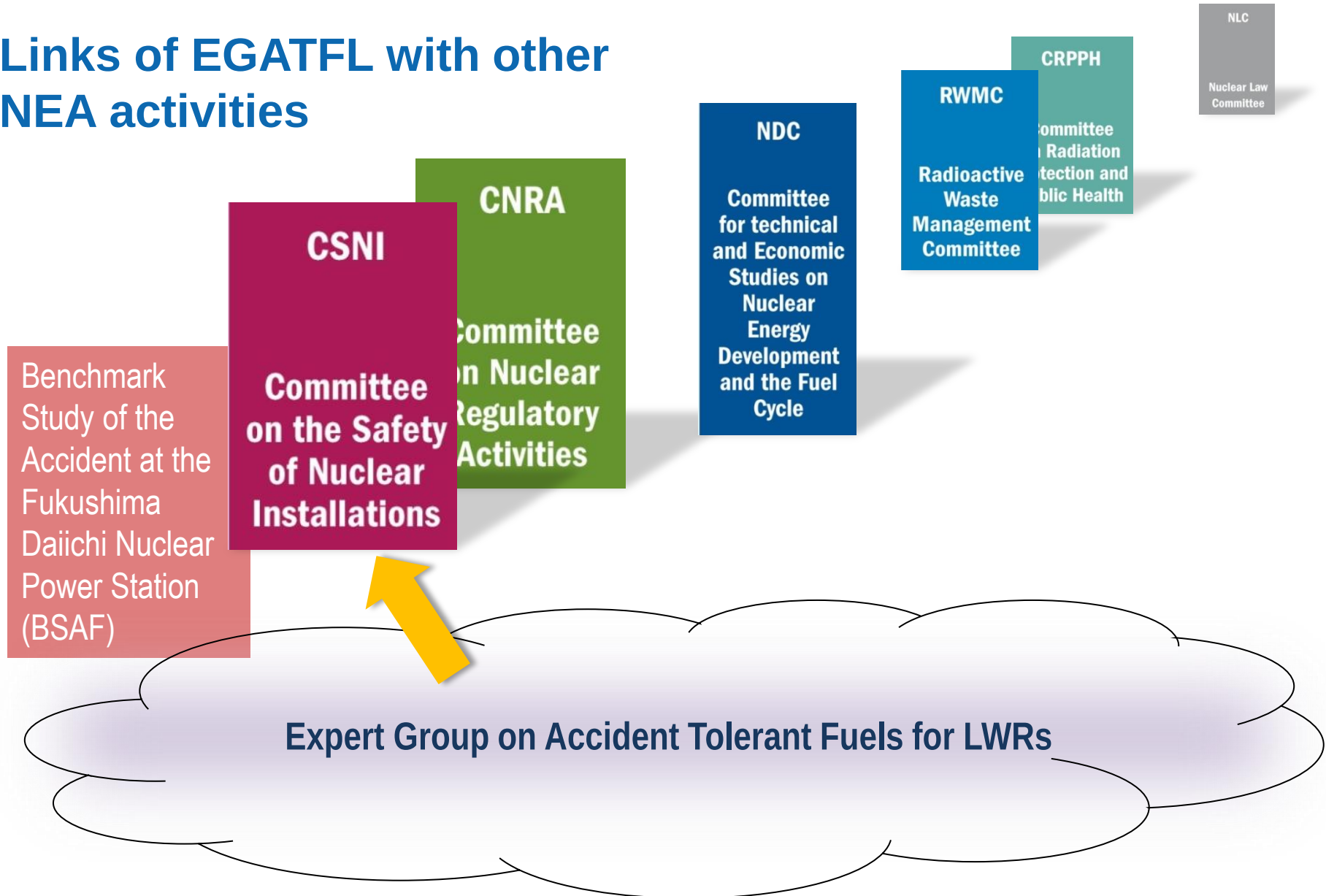
Links with other NEA Nuclear Science activities



Provision of NEADB-NS Products to other NEA areas



Links of EGATFL with other NEA activities



Follow-up actions after the 28-29 April meeting

- Received nominations for EG, TF1 (Systems), TF2 (Cladding/core materials) and TF3 (Fuel designs), (Cf. item on the agenda of this meeting)
- EGATFL website created (link from Nuclear Science Committee webpage <https://www.oecd-nea.org/science/>), with links to documents & technical presentations of previous meetings:

<https://www.oecd-nea.org/science/egatfl/>

Practical arrangements

- Please keep your multiple days badges until 25th Sept.
- Coffee served in the back of the room
- Lunch on your own (canteen in the court or restaurants beyond the bridge)
- Presentations: please contact Secretariat (S. Massara) for uploading them during coffee and lunch breaks
- Attendance to Task Forces meetings on 24th (TF1 & TF2) and 25th morning (TF3) not exclusively reserved to nominated members, but observers are invited to clarify their status
- Election of the Chairs for TF1, TF2 and TF3: if interested please contact the Secretariat (S. Massara) & EGATFL Chair (Kemal P.)