ENISS
European Nuclear Installations Safety Standard

A decade of ENISS achievements and 20 years to go forward for NPP Long Term Operation in Europe

2015 European Nuclear Safety Conference

Brussels, 29 June 2015

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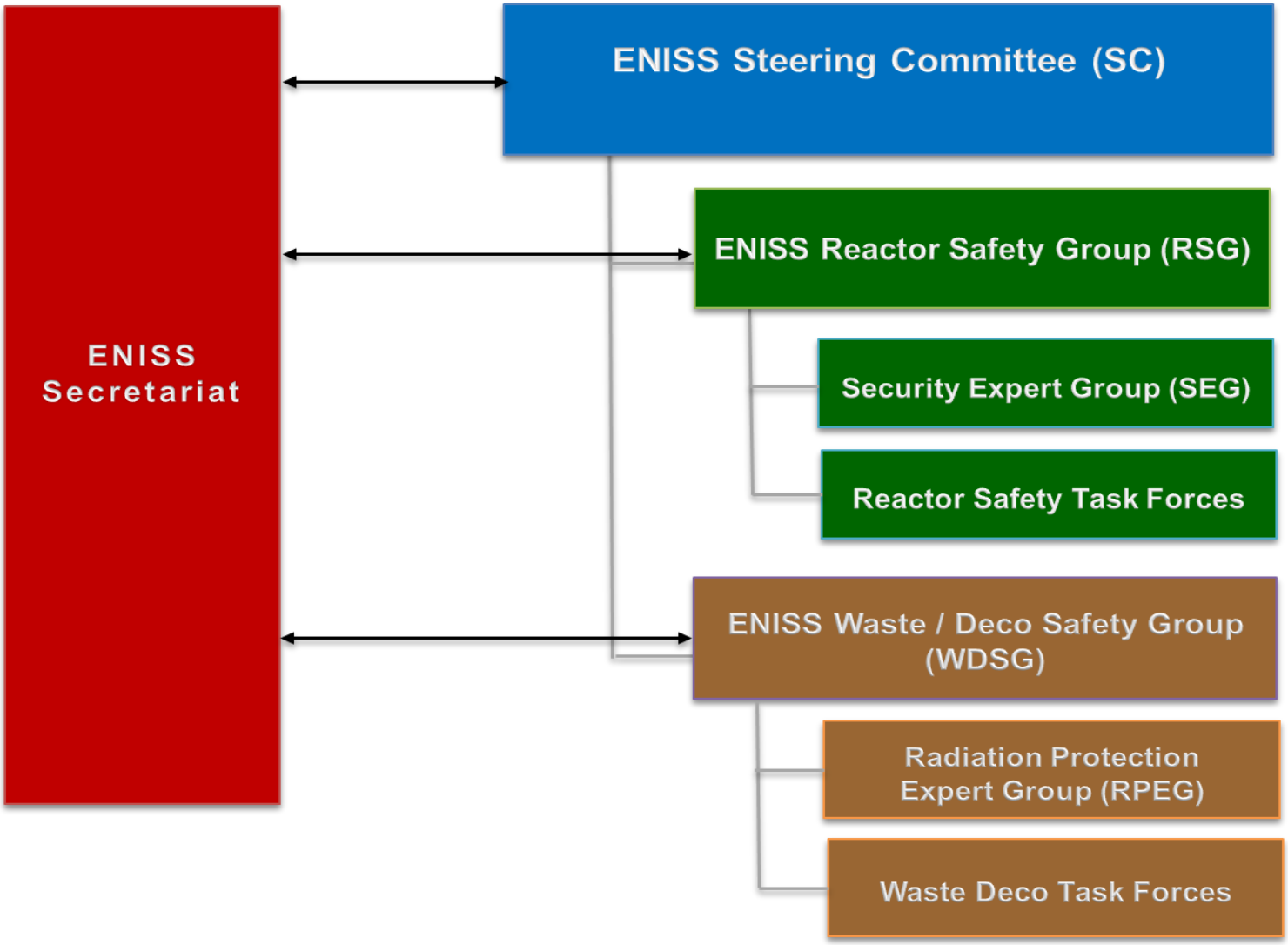
A bit of History: Establishment of ENISS

Ten years ago, on May 2005, when WENRA was about to publish its first draft of Reference levels (RLs), European nuclear operators gathered together:

- To establish a common licensee view on these RLs and to present it to WENRA
- To support an exchange of information on the interaction of license holders with their national regulators, in order to achieve a harmonised set of regulations
- To cooperate with the European Institutions on regulatory issues

And they set up ENISS *European Nuclear Installations Safety Standards* under the umbrella of FORATOM

ENISS Organisation



ENISS – Membership 2015

- Belgium (Electrabel)
- Bulgaria (Kozloduy NPP)
- Finland (Fortum, TVO)
- Germany (EON, RWE, EnBW)
- Italy (SOGIN)
- Spain (UNESA)
- The Netherlands (EPZ)
- France (EdF, AREVA NC)
- Switzerland (swissnuclear)
- Czech Republic (CEZ)
- Hungary (Paks NPP)
- Slovakia (Slovenske Elektrarne)
- Romania (Nuclearelectrica)
- United Kingdom (EDF Energy)
- Slovenia (Krško NPP)
- Sweden (EON-Se, Vattenfall AB)

All ENISS Members are representing licensees

ENISS mains achievements: interaction with WENRA

- Comments on various versions of Safety Reference Levels both for operating reactors and waste storage/decommissioning activities
- Comments on WENRA waste disposal report
- Comments on WENRA safety objectives for new build
- Comments on the terms of reference for post-Fukushima stress tests
- Comments on the guidance documents on DEC and natural hazards

ENISS main achievements: interaction with IAEA

- ENISS has observer status representing the European nuclear industry in IAEA Safety/Security Standards Committees: NUSSC, WASSC, RASSC, NSGC
- Provides comments on a selection of Safety/Security Requirements, Guides and TECDOCs
- Participates in some drafting/consulting groups on safety standards

ENISS main achievements: support to ENEF

When the EU established ENEF and its working groups, ENISS provided support to the Nuclear Installation Safety sub-working group of ENEF:

- Comments on the 2009 and 2014 European Nuclear Safety Directives
- Inputs to NPP Long-Term Operation (letter from ENEF to EU in May 2014)
- Nuclear severe accident cost assessment

LTO Definition

LTO is the operation of the plant beyond the technical design basis lifetime that is justified by safety assessment, considering life limiting processes and features for system, structures and components

The need for European NPPs Long Term Operation

- Many operating NPPs are approaching the limits of their original design basis lifetime
- EU average fleet age is about 30 years
- 1/3 of the installed EU nuclear capacity will be lost in the next few years based on original plant lifetime
- Some plants may be shutdown for economical reasons
- LTOs contribute to reach EU CO_2 reduction target of 40% by 2030
- LTOs contribute to ensure energy security of supply in Europe

Feasibility of NPPs LTO

- R&D and operating experience have provided extended knowledge of technical limits and safety margins
- Operators have made significant safety upgrades from the original designs
- Operators have put in place ageing programmes
- Several countries in the world including Europe are already engaged in LTO (mainly 60 years, 80 considered)

Proposal of a EU common framework for LTO

- Long-term operation should be managed in an integrated manner
- Should take benefit of the existing good practices applied by the utilities
- Should be based on the IAEA recommendations (cf Salto mission)
- Should take benefit of the existing EU Safety Directive
- Should integrate the LTO within the existing process of the Periodic Safety Review
- Should focus on the best applicable technology rather than the best available technology

Content of a EU common framework for LTO (ENEF document)

- Ageing management Program (AMP)

Operators are implementing AMP describing technical and organisational elements of physical ageing covering SSCs

- Non replaceable components,

AMP ensures that Reactor Pressure Vessel and Reactor Containment Building are assessed taking into account the ageing effects

Content of a EU common framework for LTO (ENEF document)

- SSCs obsolescence programme

Equipment should be replaced whenever the AMP reveals potential ageing degradation or loss of spare part suppliers

- Knowledge management programme

It covers integrity of the design and the human resources issue

- Regular Periodic Safety Review in compliance with EU Nuclear Safety Directive

Ensuring compliance with the design basis and practicable safety improvements

Content of a EU common framework for LTO (ENEF document)

- Continuous safety improvement

Potential safety improvements should be decided on a risk informed basis taking the form of “cost/benefit” assessment, “ALARP” analysis or comparison with quantitative safety objectives.

Once decided, detailed design of modifications should use deterministic rules.

Conclusion (1/2)

- NPPs LTO is needed in Europe
  - CO_2 reduction
  - Security of supply
  - Energy costs for the industry

- NPPs LTO is feasible and is already a reality in Europe

- Operators are engaged in Ageing Management Programmes to ensure LTO of their plants

Conclusion (2/2)

- Existing EU Safety Directive and Periodic Safety reviews provide an appropriate regulatory framework without the need of additional specific national framework

- LTOs must remain affordable (use the best applicable technology rather than the best available technology)

- Risk-informed decision making approach is a valuable tool and the industry preferred tool to decide for design upgrades. Once decided, detailed design of modifications should use deterministic rules