

MDEP Activities and Accomplishments on Design Specific Working Groups

EPR Working Group

2nd MDEP Conference on New Reactor Design Activities

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Petteri Tiippana

MDEP EPRWG Chair

General Objectives and Activities

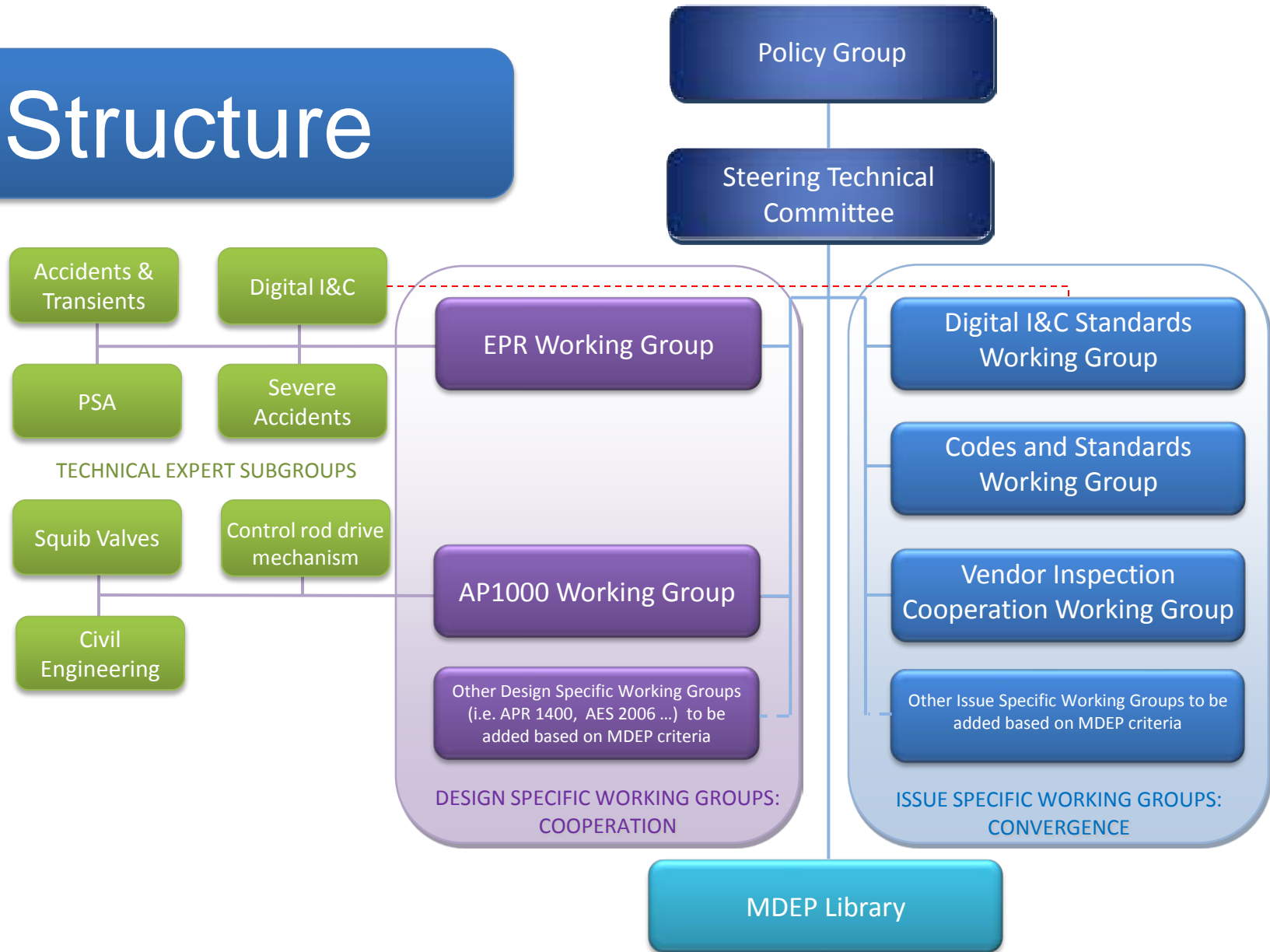
Objectives

The Multinational Design Evaluation Program (MDEP) is a multinational initiative to develop innovative approaches to leverage the resources and knowledge of mature, experienced national regulatory authorities who will be tasked with the regulatory design review of new reactor plant designs.

Activities:

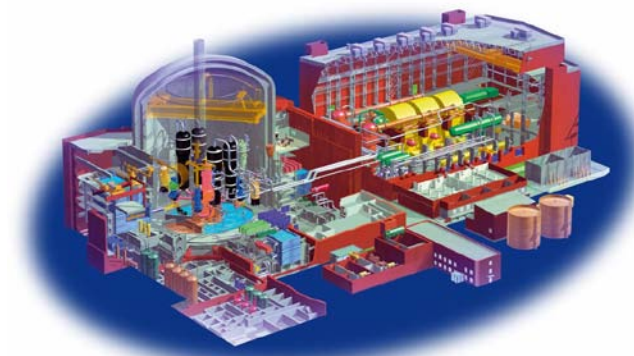
- Enhancing multilateral cooperation within existing regulatory framework.
- Increasing multinational convergence of codes, standards, and safety goals by establishing Reference Regulatory Practices
- Implementing MDEP products and regulatory practices to facilitate licensing reviews of new reactors, including those being developed by the Generation IV International Forum.

Structure



EPR Working Group - Goals

- Goal of the MDEP EPRWG is to share information including assessments and experience on design reviews and construction oversight in order to
 - leverage the technical evaluations completed by each of the participating regulators
 - leverage the resources and knowledge of the national regulatory authorities
 - develop consistency between regulators and/or to understand differences
 - develop joint assessments on specific subjects
- Make safety assessments more robust and increase the safety level of EPR



EPR Working Group - General

- Members of EPR WG are regulators from:
 - Canada,
 - China,
 - Finland (chair),
 - France (co-chair),
 - United Kingdom,
 - United States
- Countries where EPR is being licensed or constructed
- Group has been meeting regularly since early 2008

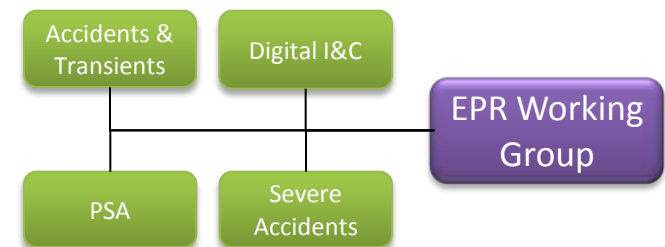


EPR Working Group - Activities

- General meetings on the status of each EPR project
 - discussions on the status of design review, construction
 - goal to identify new items for in depth discussions in the group
- Specific subgroups for
 - instrumentation and control
 - probabilistic risk assessment
 - accidents and transients
 - severe accidents
- Observed and Joint inspection efforts
 - Main coolant lines manufacturing, I&C design processes
- Issue specific ad hoc meetings, teleconferences
 - Internal hazards, radiation protection, human factors, grouted tendons, technical specifications, spent fuel cask loading device

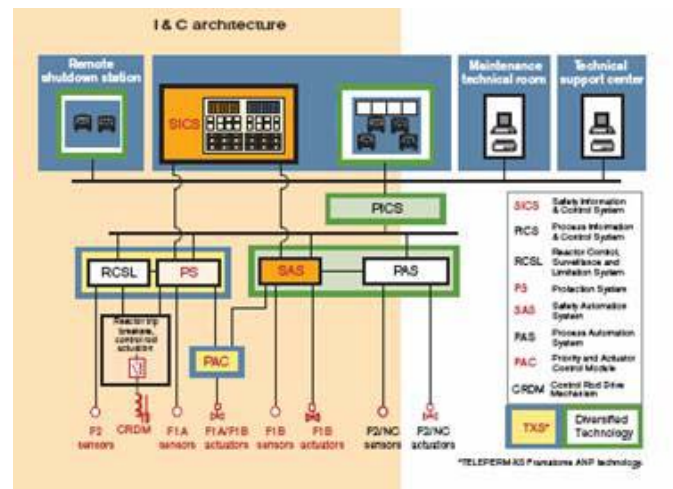


OL3 July 2011, Source: TVO, Hannu Huovila



EPR Working Group - Instrumentation and Control

- Common position published in 2010 highlighting areas where harmonization/standardization can be further achieved
 - Simplicity as a design principle
 - Data communications independence
 - TELEPERM XS digital platform and software
 - Embedded digital systems
 - Back-up systems for defense-in-depth and diversity
- Some of the common positions and experiences were input to the MDEP Digital I&C Issue-Specific Group discussions



EPR Working Group - PSA

- Comparison of EPR PSAs
 - main results and risk profiles
 - causes for differences & their risk significance
 - identification of potential issues
 - comparison report in 2012
- Internal and External events
 - adequacy of the provisions taken against internal and external hazards
 - layout and fire protection
- Co-operation with other subgroups
 - Modeling of I&C
 - Insights from Level 2 analyses, severe accidents



Source: Clipart

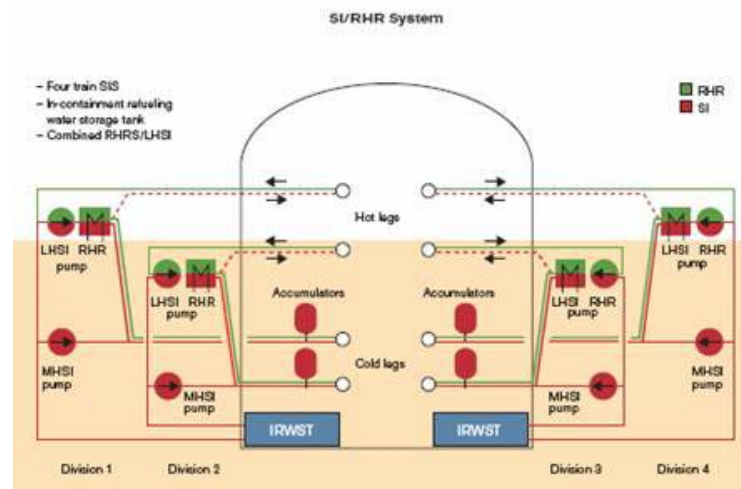


Source: Areva EPR Brochure March 2005

EPR Working Group - Accidents and Transients

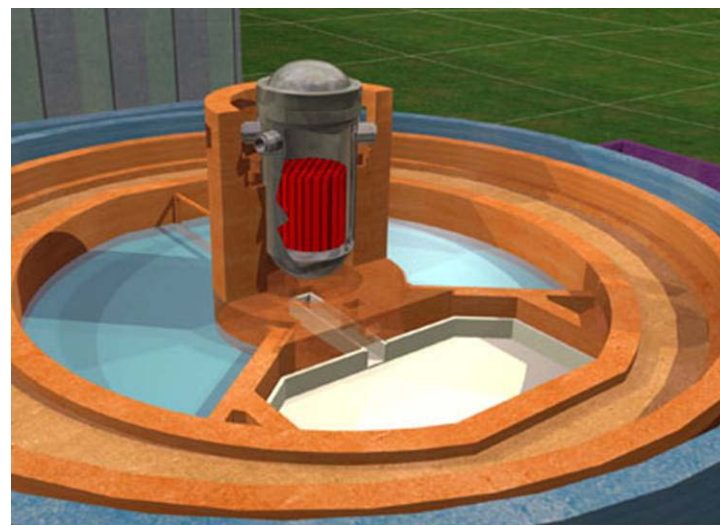
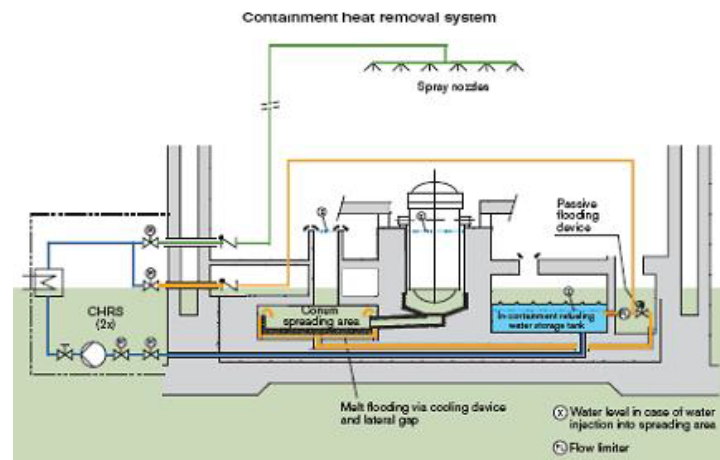
- Activities ongoing within the following areas
 - Regulatory approaches and methodologies for accident analysis
 - Containment performance
 - Fuel and core design
 - Criticality safety

- Products are in the process of being finalized
 - Identifying Differences in Regulatory Criteria and Approaches
 - Containment circulation/mixing response evaluation
 - Mass and Energy Release in Containment



EPR Working Group - Severe Accidents

- Group has been working on
 - Hydrogen management in two room concept
 - Cooling functions and structures for molten core
 - Scope of severe accident instrumentation
 - Operating strategies for severe accidents
- Future topics include
 - Reactor pit composition
 - CHRS active flooding
 - Debris ingress into valves compartments
 - pH control in IRWST
 - Dual use of PDS (Feed and Bleed and SA)
 - Containment venting/filtration system issue



Source: Areva EPR Brochure March 2005

EPR Working Group - Specific topics

- Meeting in May 2011 with Areva/EdF and involved utilities on EPR design differences
 - About 80 participants
 - Impacts of Fukushima accident were also discussed
- Other topics discussed
 - Internal hazards
 - Radiation Protection
 - Grouted tendons
 - Operational safety issues, Technical Specifications
 - Human factors engineering
 - Spent fuel cask loading device

EPR Working Group - Accomplishments

- ✓ Sharing results of the design reviews
 - have resulted in identification of common safety concerns
 - have made national safety assessments more robust
 - have made it possible to understand differences in EPR designs
 - have helped participants to anticipate future issues
- ✓ Discussions on the design differences have resulted in
 - understanding of the differences in safety requirements
 - identification of harmonisation areas and design changes
- ✓ Observed and joint inspection efforts have enabled us to understand inspections techniques and methods employed by another regulator
- ✓ Networking the experts on different technical disciplines - easy to contact, ask questions, share concerns and information