Multinational Design Evaluation Program Status

Thomas Bergman
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Background

Why was MDEP needed?

- Small number of designs available worldwide
- Most vendors are international companies
- Safety and efficiency can be improved by cooperating
- Differences in regulation impact designs and cooperation

Goal

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.

Objective:

•Improve the effectiveness and efficiency of regulatory design reviews

•Raise the safety assessment quality and the safety level

•Facilitate convergence of regulatory requirements

History

- A one year pilot project conducted 2006 - 2007 to assess the feasibility of the programme and identify potential areas of convergence and cooperation.
- Pilot project focused on severe accidents, digital instrumentation and controls, and Emergency Core Cooling Systems
- Concluded that full convergence not feasible in short term
- Identified recommendations and a proposed structure that were approved by the PG in March 2008

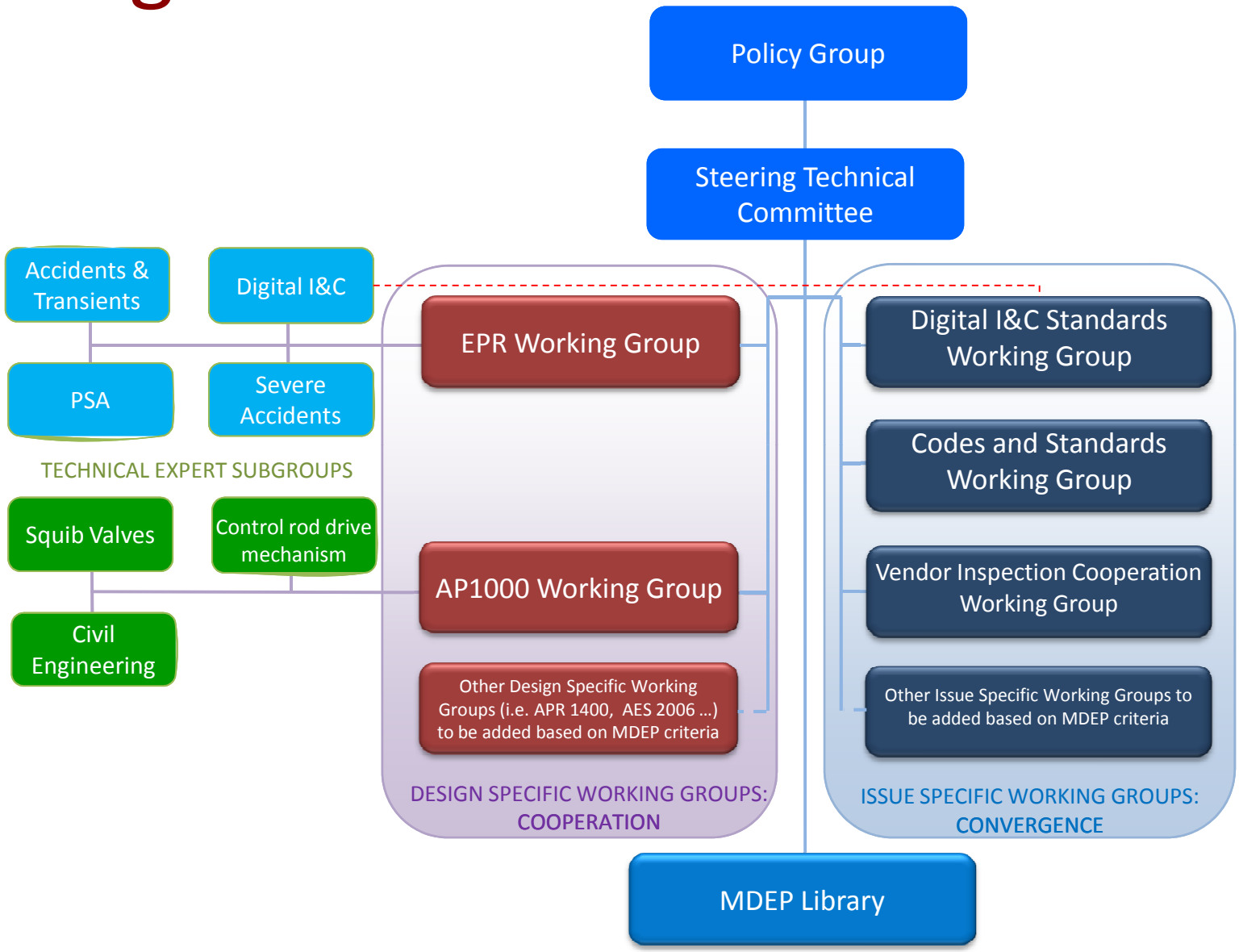
Membership

- Current members include the regulatory authorities of: Canada, China, Finland, France, Japan, Korea, Russian Federation, South Africa, the United Kingdom and the United States.
- Although NEA is the technical secretariat, members do not have to be members of NEA.
- The IAEA takes part in the work of MDEP
- Participation in the Policy Group and the Steering Technical Committee is open to mature regulators that already have commitments or firm plans for new build.
- New categories of membership recently approved:
  - Associate Member - participates in selected MDEP design-specific activities. Not necessarily experienced regulator
  - Candidate - experienced nuclear regulatory organizations with mid- to long-term plans to pursue new reactor licensing. Participates in issue specific working groups

Communications

- With other regulators through CNRA Working Group on the Regulation of New Reactors and WENRA
- With the public through NEA website and annual report
- MDEP Conference 2009 and 2011
- Vendors interact with MDEP Working groups
- Standards Organizations
- WNA/CORDEL
- Internal NRC Communications: quarterly report to the Commission, SECY papers for significant policy issues

Organization



Policy Group

- NRC Chairman is the US representative to the Policy Group. Andre Lacoste, ASN, is Chair of the Policy Group.
- Policy Group meets annually; last 2 meetings hosted by NRC, next meeting in Paris.
- OIP maintains an awareness of MDEP activities to support the Chairman
- Roles and Responsibilities:
  - Provides guidance to the Steering Technical Committee on the overall approach and topics to be addressed
  - Decides on membership of the program
  - Monitors the progress of the program
  - Provides guidance on the interactions with industry and other stakeholders

Steering Technical Committee

Roles and Responsibilities:

- Manages and approves the detailed programme of work including defining topics and working methods, establishment and oversight of technical working groups, nomination of experts.
- Establishes interfaces with other international efforts to benefit from available work and avoid duplication.
- Implements Policy Group guidance on interacting with industry and other stakeholders.
- Reports to the Policy Group and takes other management decisions as necessary
- Meets three times/year
- US chairs the STC

Working Groups

- **Issue Specific Working Groups**

  Goal : to benefit from other regulators' experiences and to encourage harmonization in regulatory practices and requirements and in industry codes and standards

- **Design Specific Working Groups**
  Goal: to share and cooperate on specific design evaluations and construction oversight

- **Criteria for potential new working groups:**
  - **(1) generic interest and safety significance**
  - **(2) the approach is not completely similar**
  - **(3) accomplishments within a reasonable timeframe and resource expenditures**
  - **(4) does not duplicate similar efforts by other organizations**
  - **(5) lead country willing to take an active leadership role and a defined product**

MDEP Products

- MDEP will publish Common Positions that may be used by regulators in making regulatory decisions, or by vendors in designing plants.
  - Design Specific Common Positions agreed upon by members of a design specific working group. Each regulator responds independently to its applicant, taking the same position.
  - Generic Common Positions developed by issue specific working groups. Constitute best practices, recommended by MDEP members to IAEA.
- There is no obligation on the part of any regulatory body to follow them. If a regulatory body chooses to adopt a Generic Common Position, it would be through that country's normal processes.
- The responsibility for regulatory decisions continues to be with the national regulator.

Design Specific Working Groups

EPR Working Group

- Members: Finland (lead), France (co-lead), US, UK, China, Canada
- Topics addressed: accidents and transients, digital I&C, PRA, and severe accidents

AP1000 Working Group

- Members: US (lead), China (co-lead), UK, Canada
- Topics addressed: squib valves, CRD mechanism, civil engineering

Accomplishments:

- Common positions issued (EPR digital I&C design, AP1000 squib valves, AP1000 shield building
- Shared issues identified and questions to applicant
- Identified additional questions for applicants based on MDEP interactions

Vendor Inspection Cooperation Working Group

Goals/Objectives:

- Maximize the use of the other regulators' inspections of vendors

Accomplishments:

- Identified the scope and content of inspections in each country
- Performed 24 witnessed inspections
- Coordinated one joint inspection (in which more than one regulator takes an active role in the inspection)
- Developed and maintain a Vendor Inspection Planning Table.
- Developed guidelines for conducting witnessed inspections
- Developed a procedure to share inspection results and an inspection results database in the MDEP library
- Compared quality assurance requirements used in the oversight of vendors with the goal of harmonizing

Next Steps:

- Conduct at least two joint inspections in 2011 (US/South Korea/ China/Japan and France/Finland/UK)
- Consider performing multinational inspections

Codes and Standards Working Group

Goals/Objectives:

- Achieve global harmonization of pressure-boundary design codes for nuclear power plants

Accomplishments:

- Compared pressure boundary codes (ASME, RCC-M, JSME, and KEPIC) for Class 1 pressure vessels, piping, pumps, and valves in coordination with standards development organizations (SDOs)
- Obtained a commitment from SDOs to work together to minimize further divergence of code requirements
- Met with WNA/CORDEL regarding harmonization of codes
- Drafted guidance documents on Attributes of Pressure-Boundary Mechanical Codes, Essential Safety References of Component Codes, and Regulatory Practices for Use of Codes and Standards

Next Steps:

- Identify significant differences and areas for potential convergence
- Consider expanding scope to include Class 2 and 3 components
- Develop a process to potentially accept a component that has been designed, manufactured and fabricated using a foreign code.

Digital Instrumentation and Controls Working Group

Goals/Objectives:

- Identify opportunities for convergence of applicable standards

Accomplishments:

- Identified member countries most significant technical issues
- Drafted 8 common positions. One approved.
- Obtained agreement from IEC and IEEE to increase cooperation and consider MDEP common positions for potential areas of convergence of standards

Next Steps:

- Complete development of common positions and present to the STC and Policy Group for approval
- Identify areas of potential convergence and make recommendations to standards organizations
- Develop additional common positions

MDEP Common Positions on Digital I&C

Common Position	Lead country	Status
0. Simplicity in Design	US	Approved by STC
1. Common Cause Failure	US	Under review by WG
2. Software Tools	UK	Under review by WG
3. Software Validation and Verification	Japan	Under review by WG
4. Complex Electronics	France	Under review by WG
5. Communication Independence	Korea	Under review by WG
6. Qualification of Industrial Digital Devices of Limited Functionality for Use in Safety Applications	IAEA	drafted
Adequate Diversity	Canada	Under development

Safety Goals Subcommittee

Goals/Objectives:

- Compare how top level safety goals are derived, expressed, and achievement is judged among the participating countries, and determine the extent to which they can be considered equivalent

Accomplishments:

- Identified work ongoing in this area by other organizations.
- Drafted framework paper to be used for development of safety goals and a position paper with recommendations for high level safety goals
- Presented MDEP results to the NUSSC at its meeting in November 2010.

Next Steps:

- A final draft of the report will be discussed at the January 2011 STC meeting and sent to IAEA as the MDEP input to the Workshop on Safety Goals in Vienna in April 2011.

MDEP Library

- Library established with two levels of access
- Each MDEP country has designated a contact responsible for identifying documents to be included
- User's manual issued to members

Contents:

- Vendor Inspection reports
- MDEP meeting summaries
- Inspection planning tables
- Design specific applications and evaluations
- Draft Common positions
- Information on regulatory processes in member countries
- Survey results
- Standards and guidance documents

Conclusion

- Significant progress is being made
- A broad level of multinational cooperation has already been achieved
- Outreach to other organizations is being expanded
- Progress towards harmonised regulatory practices and requirements for Generation IV reactor designs will be a natural outgrowth of this programme