The CORDEL perspective on standardisation, and a brief view of SMR challenges and opportunities

Andrew Wasylyk
Project Manager

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World Nuclear Association

TRANSPORT, LEGAL, FINANCIAL, INSURANCE & BROKERAGE COMPANIES

VIRTUALLY ALL URANIUM MINING, CONVERSION, ENRICHMENT & FUEL FABRICATION

OPERATORS GENERATING SOME 90% OF WORLD NUCLEAR POWER

MAJOR NUCLEAR ENGINEERING, CONSTRUCTION & WASTE MANAGEMENT COMPANIES

MAJOR REACTOR VENDORS

190 Members
International “Standardisation” of each Vendor Design

Each vendor’s design:

- Can be ordered by a utility in any country
- Will meet national regulations without significant adaptation

*Design changes will be driven by site characteristics*

Large benefits to be expected in performance

- Operating experience and Design improvements easily shared
- Safety and Economic best practices more easily shared
Cooperation in Reactor Design Evaluation and Licensing (CORDEL) Working Group

WNA Board of Management (Chairman: T. Gitzel)
(WNA Board Mentor for CORDEL: A. Candris)

CORDEL Working Group (Chairman: J. Head)

Task Forces
- Codes & Standards (N. Prinja)
- Design Change Management (R. Swinburn)
- Licensing & Permitting (P. Bowden)
- IAEA Safety Standards / Probabilistic Safety Goals (T. Froehmel / N. Buttery)

Ad-hoc Groups
- Digital I&C (J. Pickelmann)
- SMRs (D. Goodman)
- Results from Fukushima

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Societal Benefits

- Reduces licensing, construction and commissioning risks,

- Enhance credibility with Investors

- Leverage of resources across fleets in special tooling, share of spare parts, obsolescence issues

- Public confidence in regulatory decisions increases in new countries – and old

- Peer review and International cooperation can address issues and problematic areas with wider knowledge and resources (training, design changes, upgrades)

- Plant quality: standardisation of components with wider markets
## Key Factors Challenging Standardization

### Finnish EPR/US EPR

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<th>Regulatory</th>
<th>Site Characteristics</th>
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<td>Standards and Regulatory Requirements</td>
<td>Seismic</td>
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<td>Heat Sink Design (EPA NPDES)</td>
<td>Heat Sink Temperature</td>
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<td>Codes and Methods</td>
<td>Safeguards Building</td>
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<td>Severe Accident Mitigation</td>
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<td>Source Term</td>
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<td>Fuel Building</td>
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<td>Safeguards Building</td>
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### Customer / Market

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<th>Instrumentation &amp; Controls</th>
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<td>Fuel Building</td>
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Advantage of Modularisation and small reactors to component cost

At least 15% for the second-of-a-kind plant

At least 5% for the 2nd, 3rd and 4th units (learning, improvement of technologies etc.)

Range of stable values after the 5th unit
Phase 1: Share design assessments/reviews

Regulator A

Design review

Design approval by regulator A

Regulator B

Design review

Share elements of design review, i.e., calculations, modelling of event sequences, etc.

This is being done more and more by NEA/ MDEP
Phase 2: Validate & accept design approvals of other countries

- Regulator A: design review
- Regulator B: validation

Faster and easier! Focus on adaptation of the project and site-specific conditions.

- Is done de facto by newcomer Countries
- Needs more specific guidance – application to SMR Licensing
Phase 3: International Design Certification

Team of Regulators: A, B, C
(or, later, International Organisation)

► In practice, some elements of phase 3 could be done immediately: joint design review, commitments to issue identical licences
► In the long term, a treaty system could be installed

multinational design Approval / Certification

Country A  Country B  Country C
The international industry should lead the drive for convergence of requirements

CORDEL SMR meeting – 10th September 2013

Specific Measurable Attainable Relevant Time-bound aims of the group will be defined