



## Vendor Perspective on International Certification of Small Modular Reactors

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## Purpose and Agenda

- Purpose - provide a vendor perspective on international certification of small modular reactors (SMRs)
- Agenda
  - Background
  - Challenges with current approach
  - Potential of module design certification
  - NuScale Power Module (NPM) as case-study
  - Potential step forward
  - Conclusions

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## Background

- Efforts by both regulators and industry to address harmonization of requirements for nuclear power
  - Regulators: MDEP
  - Industry: CORDEL
- Within CORDEL, the SMR task force is evaluating approaches to international certification of SMRs
  - issued report, “Facilitating International Licensing of Small Modular Reactors”
  - “Module Design Certification” is key step of optimized SMR licensing process
  - goal is single regulatory authority approval
  - site approval and site-specific features require local approval

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## Challenges With Current Approach

- Assumption: regulators achieve the same end-state of a safe design
  - fundamentally evaluate same issues
  - approach to reaching safety conclusion differs
- Current approach – country-specific designs
  - regulatory requirements
  - codes and standards
  - materials available
- Consequences
  - inefficient
  - increases costs
  - increases time to deployment
  - offers no safety benefit

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## Potential of Module Design Certification

- Why is it important?
  - 1.3 billion people without electricity
  - nuclear is best option for carbon free electricity
  - time to deploy nuclear means other power sources used, with greater negative environmental impact
- Module design certification
  - goal: allow single regulatory approval of NSSS (and containment depending on design)
  - “embarking” countries have confidence in safety of design
  - takes advantage of unique aspects of SMRs
  - allows faster deployment
  - reduces costs of nuclear without impacting safety

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## NuScale Power Module as Case Study

- NuScale ideal fit for concepts in report
  - NPM is a complete NSSS and containment
  - each module has its own dedicated safety systems, which are passive
  - modules are assembled in factory
  - transportable by truck, rail, or barge
- From safety standpoint, no reason NPM design should differ on basis of country of deployment



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## Potential Step Forward

*"It doesn't work to leap a twenty-foot chasm in two ten-foot jumps"*  
American Proverb

- Current harmonization efforts continue to move forward
  - address issues on broad front
  - unlikely to achieve necessary success in timeframe desired by current or near-term vendors
- Need a breakthrough development
  - one driver to country-specific designs are the different codes and standards in use
  - lead regulators could adopt (determine acceptable) other countries' codes and standards; example
    - US NRC allows alternatives to standards endorsed in 10 CFR 50.55a
    - NRC could endorse other standards within that regulation
    - would remove one driver to country-specific designs

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## Conclusions

- Regulators achieve consistent level of safety, yet create country-specific designs
- Country-specific design approach
  - inefficient
  - increases costs
  - delays deployment
  - puts nuclear at disadvantage to other power sources
  - without safety benefit
- SMRs, especially highly integrated designs, are suited to generic module design certification
- Need a first-mover regulator to take the lead, and eliminate one driver to country-specific designs

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


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## Acronyms

- CORDEL – Cooperation in Reactor Design Evaluation and Licensing
- MDEP – Multinational Design Evaluation Program
- NPM – NuScale Power Module
- NPP – nuclear power plant
- NSSS – nuclear steam supply system
- SDO – Standards Development Organization
- SMR – small modular reactor
- SMRTF – SMR task force (part of CORDEL)

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