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ANS Initiatives for Risk-informed Performance-based Standards

Presentation to

NRC Standards Forum

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Risk-informed Performance-based Principles and Policy Committee (RP3C)

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ANS and Standards Modernization

- ANS advocates risk-informed and/or performance-based (RIPB) approaches for economic deployment of nuclear technology (PS-46).
- We are cognizant of operating reactor priorities and the opportunities to meet advanced reactor needs.
- Each ANS consensus committee (CC) is engaged in supporting existing facilities while also upgrading the methods used.
- JCNRM (ANS+ASME) produces probabilistic risk assessment (PRA) standards that are available for all (i.e., industry, other SDOs).
- Timely development and deployment of advanced reactors would greatly benefit from better standards from all SDOs.

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RP3C Operating Plan

- ANS Standards Board chartered Risk-informed Performance-based Principles and Policy Committee (RP3C) to facilitate development of RIPB standards for current and new technology reactors.
- RP3C has a set of by-laws that make it responsible for implementing principles and policies but not developing standards.
- We have a plan that targets developing guidance for CCs and working groups (WGs), offering training, interfacing internally and externally, and self-assessing for effectiveness.
- Three important parts of the plan are
  - Review ANS standards, current and historic, to find useful information for needs of advanced reactors
  - Develop guidance for making standards more RIPB
  - Apply and refine guidance by working on pilot projects

ANS Standards Evaluation Status

- Preliminary Screening:
  - RIPB – xx
  - RI – xy
  - PB – xz
  - Leave as is – aa
- Used for Advanced Reactor development:
  - Near term –
  - Mid term –
  - Long term –

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Outlines of RIPB Guidance

- Clarify RIPB principles to enable desired outcomes
  - Graded approach to safety
  - Avoid criteria that do not benefit safety (lower risk)
- Screening procedure for WGs to identify whether, when, where, and how risk-informed and/or performance-based principles are best applied
  - Explore alternatives to conserve resources
- Define major steps toward achieving outcomes, including identifying lower level supporting outcomes
- Produce and archive documentation to enable knowledge management and transfer

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Pilot Projects Supporting Guidance Development

- Two pilots have been identified.
  - ANS-30.2 is a proposed standard for establishing performance requirements for structures, systems, and components on a technology-independent basis.
  - ANS-3.14 is a proposed standard for nonreactor facilities on ageing management and life extension.
- Standards need to capture and effectively use best practices.
  - ANS-30.2 will use most recent non-light water reactor work.
  - ANS-3.14 will use risk concepts not based on PRA.
- Interaction with the WGs is just beginning.
- RP3C faces challenge developing guidance at the right level for experts in widely varying fields.

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Closing Comments

- The wide variety of technical expertise needed for nuclear safety modernization requires participation by all SDOs.
- RP3C is very much interested in knowing how other SDOs are employing outcome-oriented and probabilistic concepts in their standards development.
- NRC can offer a vital convening role to facilitate safety outcomes from all SDO products that meet principles of good regulation and avoidance of unnecessary burden.
- We would like to help in achieving industry's needs by more effectively using our extensive liaisons including with other SDOs.