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Consensus Standards at the Nuclear Regulatory Commission

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US NRC Standards Executive

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NRC Goals for Standards Development

- Communication
- Coordination
- Cooperation

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Goals for Today's Meeting

- Contact counterparts in government, SDOs, industry
- Summarize standards activities and needs
- Discuss:
  - New standards needed
  - Standards needing revision/updating
  - Government and Industry priorities

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NRC's Personnel in Standards Activities

- Standards Executive: Dr. Jennifer Uhle
- Staff contact for each Standards Developing Organization (SDO)
  - Liaison on standards developments, agency positions
- Staff members on SDO committees
  - Understand SDO activities and NRC positions, use engineering judgment
  - Active at every level of SDO committee structures, from task groups to standards board chairmen
  - Provide NRC liaison reports

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NRC Endorsement Methods

- Code of Federal Regulations (CFR)
  - 10 CFR § 20 – Standards for Protection Against Radiation
  - 10 CFR § 50.55a – Codes & Standards
  - Incorporation By Reference
- Regulatory Guides
  - Ex.: RG 1.147, 1.84, 1.193 – ASME Code Cases
  - Endorsed for use by licensees in meeting requirements
- Processes for both involve public comment and resolution prior to issuance

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Future Directions for Standards

- Performance-based
- Risk-informed
- Proactive
  - Aging management: For reactor and piping integrity, detecting (or even preventing) degradation is preferred over detecting failures
  - Anticipate structures, fabrication methods, and materials needed for new and advanced reactor designs

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NRC Priorities for Electrical and I&C Safety Standards (IEEE)

- Revisions of IEEE Standards which were published prior to 2000 to reflect current state of technology and lessons learned from operating experience
- General update of standards for new reactor designs
- Guidance to industry for digital instrumentation and control (I&C) systems
- New standards or revisions to existing standards to reflect the use of probabilistic risk assessment, and new technologies such as fiber optics, VRLA batteries, etc.

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High-Priority Standards Revisions

- Revision of IEEE Std. 7-4.3.2-2003: Digital Computers
- Revision of IEEE Std 603-1998: Safety Systems
- Revision of IEEE Std 352-1987: Reliability Analysis

The NRC staff will review IEEE standards upon publication, in order to incorporate them into our regulations or to endorse them in regulatory guides, as appropriate.

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IEEE Std 7-4.3.2 – Digital Computers

- IEEE Std. 7-4.3.2-2003, "IEEE Standard Criteria for Digital Computers in Safety Systems of Nuclear Power Generating Stations"
- Endorsed in RG 1.152, Rev. 2
- IEEE working on a revision to incorporate guidance in NRC's Interim Staff Guidance (ISG) documents related to new digital instrumentation and controls
- High priority for:
  - New reactor licensing
  - Digital modernization of currently licensed plants

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IEEE Std 603 – Safety Systems

- IEEE Std. 603-1998: “Standard Criteria for Safety Systems for Nuclear Power Generating Stations”
- Incorporated by reference in 10 CFR 50.55(a)(h)
- Revisions in progress to align it with upcoming revisions to IEEE Std. 7-4.3.2

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IEEE Std 352 – Reliability Analysis

- IEEE Std. 352-1987: "General Principles of Reliability Analysis of Nuclear Power Generating Station Safety Systems"
- Revise to address Failure Modes and Effects Analysis (FMEA) for control systems, including digital systems

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ANSI/AISC N690 – Steel Structures

- ANSI/AISC Std. N690-06: "Specification for Safety-Related Steel Structures for Nuclear Facilities"
- Submitted by letter to NRC for review

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ANSI Radiation Instrument Standards

- Large number of security-related instrument standards completed on accelerated schedule
- Cooperation among NIST, DHS, NRC, ANSI
- Keys to rapid progress:
  - Strong committee chairmen
  - Monthly teleconferences

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NRC's Priorities for ASME

- Continue our long history of cooperation, technical progress
- Task Group on New Reactors
  - Includes Sections III (Nuclear Design), XI (Inspection)
  - First meeting in April 2008
- Comparison of Codes for MDEP
- Pressure boundary leakage integrity
  - Need standards for leakage found outside of scheduled inservice inspections

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NRC Priorities for Health Physics

- Clearance Standards – detection limit or level
- NRC evaluating revisions in radiation protection standards (Part 20, Part 50 Appx. I)
  - Dose limits are not consensus standards
  - Underlying computer codes could have standards
- IAEA Standards and Guides
  - Not voluntary consensus SDO
  - Need awareness of changing standards on radiation protection

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NRC Priorities for American Nuclear Society

- Methods for submitting standards for NRC review, possible approval
- Interaction with ISO, especially TC85
- ANS/ASME joint standard on probabilistic risk assessment (PRA)
  - Recent success
  - Prototype for other collaborations?
    - ANS and IEEE have standards for single failure criterion

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Questions?