



Risk-Informing ASME Code Requirements Relative to 10 CFR 50.69 Proposed Rule

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Meeting
U.S. Nuclear Regulatory Commission
American Society of Mechanical Engineers
Nuclear Energy Institute
Rockville, Maryland - February 21, 2002

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Risk-Informing ASME Code Requirements Relative to 10 CFR 50.69 Proposed Rule

AGENDA

- Introductions and Purpose of Meeting
- Background on ASME Consensus Standards
Development and Relationship to 10 CFR 50.55a
- ASME Initiatives on Risk-Informed Technology
- Summary

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Risk-Informing ASME Code Requirements Relative to 10 CFR 50.69 Proposed Rule

PURPOSE OF PRESENTATION

To Provide Appropriate Information on ASME
Codes & Standards to Assist in Development
of Proposed §50.69

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Background on ASME Consensus Standards
Development and Relationship to 10 CFR 50.55a

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ASME Codes & Standards

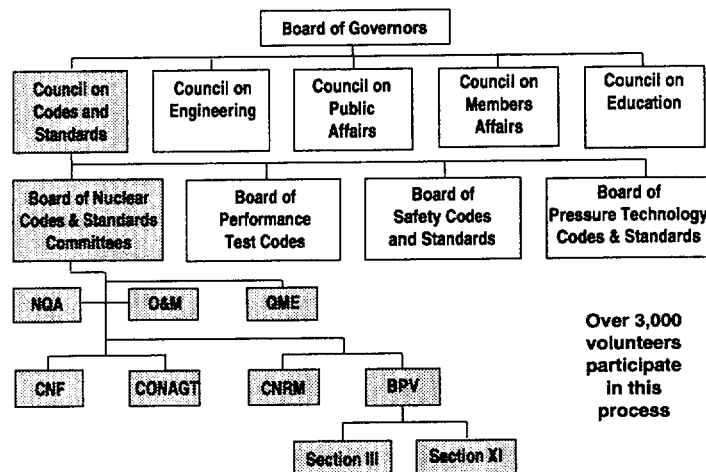
MISSION STATEMENT

To Develop, Maintain, and Promote the Use of ASME Codes, Standards, and Conformity Assessment Programs World-Around, Involving Diverse Participants Whose Expertise Will Result in the Best Codes, Standards, and Conformity Assessment Programs for the Well-Being of Humanity

Ref: ASME Council on Codes & Standards

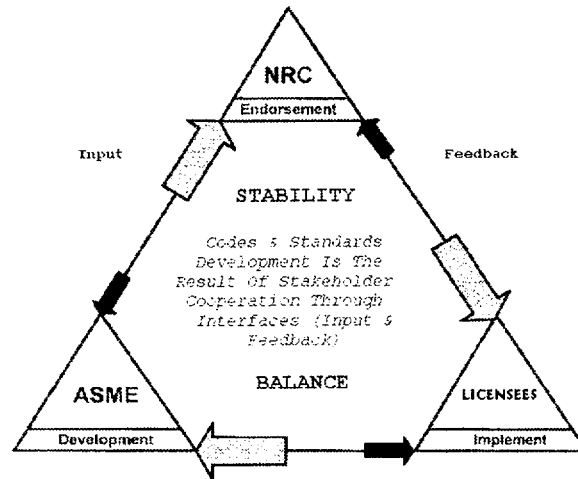
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ASME Organization Chart for Nuclear Codes and Standards Development



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Process to Develop ASME Nuclear Codes and Standards



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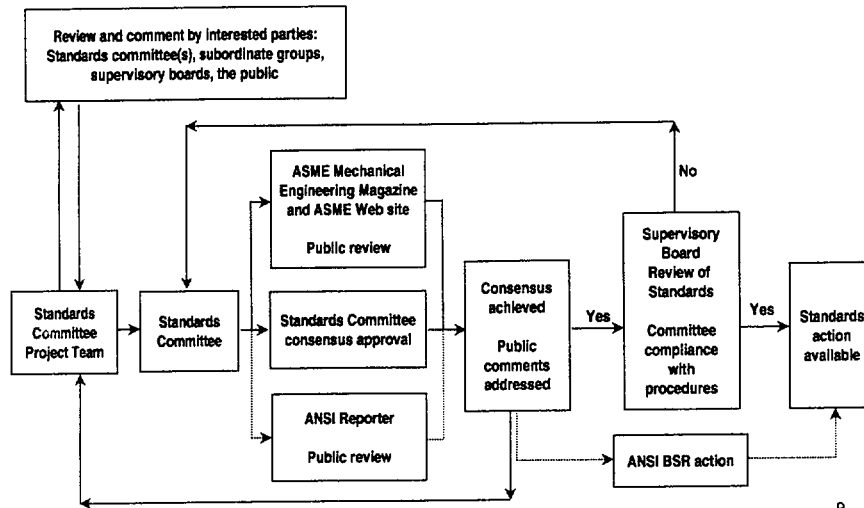
ASME Codes & Standards

- ASME Develops Codes & Standards under the American National Standards Institute Accredited Organization Method
- Categories of Interest For Nuclear Codes & Standards
 - Owner
 - Regulatory (State and Federal)
 - Designer
 - Manufacturer
 - Material Manufacturer
 - Constructor
 - Insurance/Inspection
 - Laboratories
 - General Interest
- Significant volunteer effort is devoted in the development of ASME Codes & Standards

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A Typical Path for Standards Approval



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ASME Codes & Standards Requirements

- **Code** - standardized requirements intended for adoption by governmental bodies as legally binding provisions
- **Standard** - requirements for specific items or activities to provide uniformity and interchangeability; they are used voluntarily
- **Guide** - a suggested or recommended practice, process or method to help practitioners in the performance of their responsibilities
- **Code Case** - provides for an alternative to existing Code Rules
 - allows for experience to be gained before consensus committee decides to incorporate in the Code
 - is used as a permissive, non-mandatory requirement
 - has a 3-year life to be reaffirmed, annulled, or gets incorporated into the Code

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Adoption of ASME Code Requirements in 10 CFR 50.55a

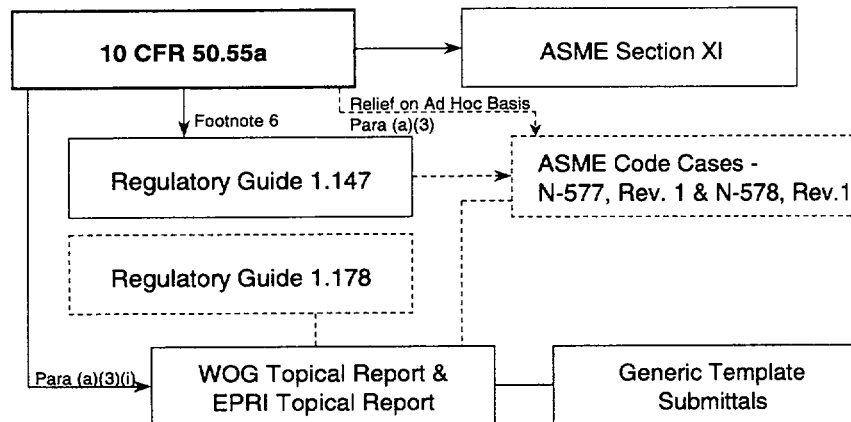
10 CFR 50.55a

- (b)(1) References ASME Section III Specific Editions / Addenda⁽¹⁾
- (b)(2) References ASME Section XI Specific Editions / Addenda ⁽¹⁾
- (b)(3) References to ASME OM Code Specific Additions / Addenda ⁽¹⁾
- (f) Inservice Testing Requirements
- (g) Inservice Inspection Requirements
- Footnote 6 - ASME Code Cases that may have been determined suitable for use by the NRC Staff are listed in the following Regulatory Guides:
 - RG 1.84 Design and Code Case Acceptability - ASME Section III Division 1
 - RG 1.85 Materials Code Case Acceptability - ASME Section III Division 1
 - RG 1.147 Inservice Inspection Code Case Acceptability - ASME XI Division 1
 - DG-1089 Operation and Maintenance Code Case Acceptability - ASME OM Code
 - DG-1112 ASME Code Cases Not Approved for Use

⁽¹⁾Identifies limitations and modifications including mandate to use ASME NQA-1, "Quality Assurance Requirements for Nuclear Facilities," or 10 CFR 50, Appendix B

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Adoption of ASME Code Requirements in 10 CFR 50.55a - Risk-Informed ISI Example



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ASME Initiatives on Risk-Informed Technology

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ASME Initiatives on Risk-Informed Technology

- ASME recognized in mid-1980s that plant PRAs had the ability to bring new, significant insights into Code & Standards process
- ASME led collaborative technology development efforts on risk-informed inservice inspection (ISI) and inservice testing (IST) with U.S. and international stakeholders over the past decade
- Results from pilot plant studies showed significant benefits in safety, radiation exposure, and regulatory burden
- These results supported development of several ASME Code Cases using the consensus standards process to allow for early use of the technology
- Many utilities underway in U.S., Europe, and Far East in development of risk-informed ISI and IST programs for their nuclear stations; Strong interest in extension to other applications

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ASME Risk-Informed Code Cases

ASME SECTION XI - INSERVICE INSPECTION (ISI) AND REPAIR/REPLACEMENT OF PRESSURE-RETAINING ITEMS			
CODE CASE	CONTENT	CLASSIFICATION	TREATMENT
N-577	Risk-Informed ISI for Class 1, 2, or 3 Piping - Method A	Yes	Yes
N-578	Risk-Informed ISI for Class 1, 2, or 3 Piping - Method B	Yes	Yes
N-658 ⁽¹⁾	Risk-Informed Safety Classification for Use in Risk-Informed Repair/Replacement	Yes	No
N-660 ⁽¹⁾	Alternative Repair/Replacement Requirements for Items Classified w/RI Processes	No	Yes

⁽¹⁾ Code Cases in final stages of approval within ASME Consensus Standards Approval Process

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ASME Risk-Informed Code Cases

ASME OPERATIONS & MAINTENANCE - INSERVICE TESTING OF PUMPS, VALVES, & MECHANICAL EQUIPMENT			
CODE CASE	CONTENT	CLASSIFICATION	TREATMENT
OMN-3 Revision 1	Requirements for Safety Significance Categorization of Components Using Risk Insights for IST of LWR Power Plants	Yes	No
OMN-4	Requirements for Applying Risk Insights for IST of Check Valves of LWR Power Plants	No	Yes
OMN-7	Requirements for Applying Risk Insights for IST of Pumps of LWR Power Plants	No	Yes
OMN-10	Requirements for Safety Significance Categorization of Snubbers Using Risk Insights and Testing Strategies for IST	Yes	Yes
OMN-11	Risk-Informed Inservice Testing of Motor-Operated Pumps (Used in Conjunction with Code Case OMN-1)	No	Yes
OMN-12	Alternate Requirements for IST Using Risk Insights for Pneumatically and Hydraulically Operated Valve Assemblies	No	Yes

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ASME International

STATUS OF ASME RISK-INFORMED REQUIREMENTS RELATED TO 10 CFR 50.55a						
SSC	DESIGN	INSERVICE INSPECTION			REPAIR/REPLACE	INSERVICE TESTING
		NDE	PRESS TEST	EVALUA-TION		
Reactor Vessel ¹						NA
Pressurizer ²						NA
Steam Generator ²						NA
Piping						NA
Tanks						NA
Vessels						NA
Heat Exchangers						NA
Supports			NA			NA
Snubbers		NA	NA			
Pumps						
Valves						
Containment						NA

Not Applicable	NA
Complete 100%	
In Process ≥ 50%	
Proposed ≤ 50%	
Potential	

Notes: ¹Reactor vessel nozzle inside radius and beltline weld examinations are expected to be based on risk insights
²Pressurizer and steam generator nozzle inside radius examinations are expected to be based on risk insights

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ASME International

IMPACT OF EXEMPTION OF LOW SAFETY SIGNIFICANT SSCs FROM §50.55a ASME REQUIREMENTS BY PROPOSED §50.69						
SSC	DESIGN	INSERVICE INSPECTION			REPAIR/REPLACE	INSERVICE TESTING
		NDE	PRESS TEST	EVALUA-TION		
Reactor Vessel						NA
Pressurizer						NA
Steam Generator						NA
Piping						NA
Tanks						NA
Vessels						NA
Heat Exchangers						NA
Supports			NA			NA
Snubbers		NA	NA			
Pumps						
Valves						
Containment						NA

Not Applicable	NA
Complete 100%	
In Process ≥ 50%	
Proposed ≤ 50%	
Potential	

LSS SSCs Exempted §50.55a (HSS SSCs Still Subject to §50.55a)

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Summary

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Summary

- ASME has led and continues to lead efforts in bringing risk technology into the development of consensus standards that are beneficial to its stakeholders
- ASME efforts to risk-inform nuclear Codes & Standards requirements, where appropriate, can be correlated with the NRC 10 CFR Part 50.69 Proposed Rule
- ASME willing to work with all stakeholders to assist in the development and implementation of Proposed Rule §50.69

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