

ASME Risk-Informed Code & Standards  
Related to Risk-Informing 10 CFR Part 50 - Option 2  
*“Risk-Informing Special Treatment Requirements”*

Kenneth R. Balkey

Member, ASME Board on Nuclear Codes & Standards  
Fellow Engineer, Westinghouse Electric Company

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**STATUS - NOVEMBER 7, 2001**  
**ASME RISK-INFORMED CODES AND STANDARDS**  
**RELATED TO RISK-INFORMING 10 CFR PART 50**  
**OPTION 2 - RISK-INFORMING SPECIAL TREATMENT REQUIREMENTS**

**ASME SECTION XI - INSERVICE INSPECTION (ISI) AND REPAIR/REPLACEMENT OF PRESSURE-RETAINING ITEMS**

Document No.	Title	Explanation	ASME Status	NRC Endorsement Status	Reference in 10 CFR 50.69 / NEI 00-04
<b>Code Cases</b>					
N-577-1 (Revision 1)	Risk-Informed Requirements for Class 1, 2, or 3 piping, Method A	Process to place piping segments into HSS and LSS categories; Defines appropriate ISI requirements (sample sizes, frequency & exam methods)	Approved	Could be endorsed in RG 1.147 in near future (NRC endorsed WOG Topical Report in interim)	If not already endorsed in RG 1.147, 10 CFR 50.69 and NEI 00-04 could reference EPRI and WOG Topical Reports in interim
N-578-1 (Revision 1)	Risk-Informed Requirements for Class 1, 2, or 3 piping, Method B	Process to place piping segments into High, Medium, Low categories; Defines appropriate ISI requirements (sample sizes, frequency & exam methods)	Approved	Could be endorsed in RG 1.147 in near future (NRC endorsed EPRI Topical Report in interim)	If not already endorsed in RG 1.147, 10 CFR 50.69 and NEI 00-04 could reference EPRI and WOG Topical Reports in interim
N-658	Risk-Informed Safety Classification for Use in Risk-Informed Repair/ Replacement Activities	Process to determine classification of pressure-retaining items into HSS and LSS categories for repair/ replacement activities	Issued for Letter Ballot to Boiler & Pressure Vessel Stds Committee; Expect Approval in Early 2002	Could be endorsed in RG 1.147	Could be endorsed in 10 CFR 50.69 and NEI Option 2 Implementation Guideline, NEI 00-04
N-XXX	Alternative Repair/ Replacement Requirements for Items Classified in Accordance With Risk-Informed Processes	Defines appropriate treatment requirements for repair/ replacement of pressure-retaining items categorized per Code Case N-658	Issued for Letter Ballot to ASME XI Subgroup – Repair, Replacement, Modifications for reconsideration; Expect Approval in 2002	Could be endorsed in RG 1.147	Could be endorsed in 10 CFR 50.69 and NEI Option 2 Implementation Guideline, NEI 00-04
<b>Proposed ASME Code Section XI Addition</b>					
Appendix X – ASME Section XI	Risk-Informed Requirements For Piping	Non-mandatory appendix to Section XI to incorporate lessons learned from use of Code Cases N-577 and N-578	Being Developed Within ASME XI Working Group on Implementation of Risk-Based Examination	Would be endorsed in 10 CFR 50.55a(g) after 2002	Not available at this time

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<b>ASME OPERATIONS &amp; MAINTENANCE COMMITTEE - INSERVICE TESTING OF PUMPS, VALVES, AND MECHANICAL EQUIPMENT</b>					
Document No.	Title	Explanation	ASME Status	NRC Endorsement Status	Reference in 10 CFR 50.69 / NEI 00-04
<b>Code Cases</b>					
OMN-3 Revision 1	Requirements for Safety Significance Categorization of Components Using Risk Insights for Inservice Testing of LWR Power Plants	Process to place pumps and valves into HSS and LSS categories; To be used in conjunction with Code Cases OMN-4, 7, 11, and 12	Approved	In DG-1089; To be issued for comment; Finalize late 2002	10 CFR 50.69 and NEI 00-04 could reference, as needed
OMN-4	Requirements for Applying Risk Insights for Inservice Testing of Check Valves of LWR Power Plants	Defines appropriate IST requirements (frequency & test methods) for check valves categorized per Code Case OMN-3	Approved	In DG-1089; To be issued for comment; Finalize late 2002	10 CFR 50.69 and NEI 00-04 could reference, as needed
OMN-7	Requirements for Applying Risk Insights for Inservice Testing of Pumps of LWR Power Plants	Defines appropriate IST requirements (frequency & test methods) for pumps categorized per Code Case OMN-3	Approved	In DG-1089; To be issued for comment; Finalize late 2002	10 CFR 50.69 and NEI 00-04 could reference, as needed
OMN-10	Requirements for Safety Significance Categorization of Snubbers Using Risk Insights and Testing Strategies for Inservice Testing of LWR Power Plants	Process to place snubbers into HSS and LSS categories; Defines appropriate IST requirements (frequency & test methods) for snubbers	Approved	Not in DG-1089; Would only be endorsed after 2002	Not applicable at this time
OMN-11	Risk-Informed Inservice Testing of Motor-Operated Valves	Defines appropriate IST requirements (frequency & test methods) for motor-operated valves categorized per Code Case OMN-3 and in conjunction with Code Case OMN-1	Approved	In DG-1089; To be issued for comment; Finalize late 2002	10 CFR 50.69 and NEI 00-04 could reference, as needed
OMN-12	Alternate Requirements for Inservice Testing Using Risk Insights for Pneumatically and Hydraulically Operated Valve Assemblies in LWR Power Plants	Defines appropriate IST requirements (frequency & test methods) for pneumatically- and hydraulically-operated valve assemblies categorized per Code Case OMN-3	Approved	In DG-1089; To be issued for comment; Finalize late 2002	10 CFR 50.69 and NEI 00-04 could reference, as needed
<b>Proposed ASME OM Code Addition</b>					
Section ISTE	Risk-Informed Inservice Testing of Components of LWR Power Plants	New section to ASME OM Code to incorporate lessons learned from use of Code Cases OMN-3, 4, 7, 10, 11, and 12	Being developed by O&M Committee	Would be endorsed in 10 CFR 50.55a(f) after 2002	Not available at this time

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**ASME COMMITTEE ON NUCLEAR RISK MANAGEMENT - PRA STANDARD**

Document No.	Title	Explanation	ASME Status	NRC Endorsement Status	Reference in 10 CFR 50.69 / NEI 00-04
<b>Proposed Standard</b>					
Rev 14A	Standard For Probabilistic Risk Assessment For Nuclear Power Plant Applications	Sets forth requirements for probabilistic risk assessments (PRAs) used to support risk-informed decisions for commercial nuclear power plants, and prescribes a method for applying these requirements for specific applications. Standard applies to PRAs used to support applications of risk-informed decision-making related to design, licensing, procurement, construction, operation, and maintenance. Standard establishes requirements for a Level 1 analysis of internal events while at power. In addition, this Standard establishes requirements for a limited large, early release frequency (LERF) analysis sufficient to evaluate the LERF for internal events while at power.	Approved by Committee on Nuclear Risk Management; Currently addressing additional comments from NRC received during public review period; Expect to be issued in early 2002	To be defined	To be defined

# NRC Option 2 Meeting

Tony Pietrangelo  
Adrian Heymer  
November 7, 2001



## Overview

- Definition of industrial treatment
- Adequacy of industrial treatment for low safety significant SSCs (RISC-3 SSCs)
- Licensing framework for implementation of 50.69
- Other issues
- Conclusion



## **Nuclear Industrial Treatment**

- Practices that provide adequate confidence that the required functions will be satisfied under conditions as intended. Such practices are defined in applicable national, local and industry codes and standards, vendor recommendations, and plant guidelines and procedures. The scope includes: design, procurement, installation, inspection, testing, maintenance, assessment and corrective action.



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## **Adequacy of Industrial Treatment for RISC-3 SSCs**

Three principal bases:

- No change to functional requirements
- Historical performance data
- Functional monitoring and corrective action



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## Functional Requirements

- 50.69 does not change the design bases of any safety-related SSCs
- Engineering and procurement specifications and processes will preserve design bases requirements
- Alternative equipment designs can meet the specifications and thus preserve design bases functionality



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## Historical Performance Data

- Generic equipment performance data indicates robustness of industrial designs & equipment
  - Reliability comparison of safety-related and nonsafety-related SSCs (STP report)
    - ◆ 33 component types investigated
    - ◆ No significant difference in reliability
- 90% industry average capacity factor
- Conclusion: Industrial treatment leads to comparable performance



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## Monitoring/Corrective Action

- No expected change in RISC-3 SSC performance
- Functional monitoring and corrective action assure SSC capability
- Aggregate impact sensitivity studies demonstrate adequate margin of safety



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## Licensing Basis Regarding Treatment

- Rule should specify industrial treatment for RISC-3 SSCs including a list of the attributes
- QA topical referenced in UFSAR should provide summary description of attributes (Use 50.54(a) to control)
- Licensee commitment to regulatory guide endorsing NEI 00-04 (Use NEI 99-04, CM guidance, to control)



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## Rationale for licensing basis

- Draft Alternative 2 RISC-3 approach is equivalent to current Appendix B
- Low safety significance of RISC-3 SSCs does not warrant equivalent level of detail in rule as RISC-1 SSCs
- Other elements of licensing basis are consistent with current regulatory framework



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## RISC-3 Treatment Conclusions

- Industrial controls provide adequate confidence that design bases will be maintained
- RISC-3 functional monitoring assures equipment capability
  - Maintenance rule reliability & availability monitoring not necessary
- Special treatment requirements do not apply to RISC-3 & RISC-4



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## Other §50.69 Input



## Generic Changes

- Replace design input with design bases
- Delete the term “...throughout service life”
  - Redundant to design bases



## Categorization

- §50.69(c)(1) CDF & LERF are accepted PRA metrics
- §50.69(c)(3) – Aggregate sensitivity studies demonstrate ample safety margin
- §50.69(c)(5) Assess impact of new information on categorization results



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## Maintenance Rule Link §50.69(d)(1)

- Duplicates §50.65 requirement for RISC-1 & RISC-2 §50.69d(1)



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## **Need for License Amendment §50.69(f)(1)**

- What is the basis?
  - No license amendment for similar regulatory changes (e.g. for RI-ISI)
  - Licensees will implement §50.69 i.a.w. NRC endorsed guidance
  - Existing requirements provide regulatory flexibility for changing SSC classification without prior NRC review and approval



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## **Change Control §50.69(g)**

- §50.59 applies to design bases & safety analyses
- Categorization described in a NRC approved guideline & controlled through commitment management process
- Treatment description in SAR & controlled via §50.54(a)



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## Reporting requirements under §50.69(h)

- Only applicable to safety-significant SSCs
- Linked to a failure to satisfy a safety-significant function
  - Component failures need not be reported if redundant equipment is available to meet safety-significant function

