# WORKSHOP

## RISK-INFORMING
## 10 CFR PART 50 SPECIAL TREATMENT REQUIREMENTS
## RIP50 OPTION 2

## FEBRUARY 21-22, 2001
## ROCKVILLE, MARYLAND

Attachment 2

# Risk-Informed Part 50 -- Option 2 Workshop
# February 21-22, 2001
# Agenda

## Wednesday, February 21, 2001

| | |
|---|---|
| 1:00 pm -- 1:30 pm | Introduction and Opening Remarks |
| 1:30 pm -- 2:00 pm | Keynote Remarks by Frank Miraglia, Deputy Executive Director for Reactor Programs |
| 2:00 pm -- 2:30 pm | Status of Option 2 |
| 2:30 pm -- 2:45 pm | Break |
| 2:45 pm -- 3:15 pm | Pilot Activities |
| 3:15 pm -- 4:15 pm | ASME Risk-Informed Code Cases |
| 4:15 pm -- 5:00 pm | Industry Guidelines for Option 2 |

## Thursday, February 22, 2001

8:30 am -- 9:30 am Prior Review and Approval

Concern: Staff wants to construct a 50.69 rulemaking framework that has the least impact on staff and industry resources to implement

Staff view: A framework constructed to have no prior review was judged (SECY-99-256) to be most efficient. Staff continued this view in SECY-00-194 but opened the door to consider other approaches.

Industry view: It was a noble objective. But the proposal would require imposition of a prescriptive and rigid regulatory process rendering such an approach impractical in the long term. Industry now wants a staff review of a 50.69 submittal based on the template guidance in NEI 00-04.

9:30 am -- 10:30 am Box Chart

Concern: The original "box chart" (diagram of the 4 "RISC" categories that was used to define the categories and conceptually show how 50.69 would work) was based on the

terminology "safety-related" vs "nonsafety-related". Since many STRs have scopes that are not solely based on safety-related, the staff is concerned that some SSCs that are subject to special treatment requirements (STRs) could be categorized as RISC-4 if they are low safety significant. The concern is that these SSCs might have some design basis function that would not be preserved (which is not consistent with Option 2).

Staff: SECY-00-194 discussed/defined a revised "box chart" that uses the terminology "special treatment requirements". Any SSC subject to STRs that is low safety significant would go to RISC-3 and get 50.69 treatment to maintain its design basis function (if the SSCs have a design basis function).

Industry: The industry commented that the revised approach completely changes the categorization scheme discussed in the ANPR which was the basis for industry interactions with the staff. It has implications for pilots and appears more complex.

10:30 am -- 10:45 am Break

10:45 am -- 12 noon Selective Implementation (SSCs)

Concern: That 50.69 could be implemented in an unbalanced manner with priority given to systems that contain predominantly RISC-3 SSCs (where cost benefits exist), and either low priority or no attention given to systems that contain "RISC-2" systems (where additional requirements could result).

Staff: SECY-00-194 stated that all RISC-1 and RISC-2 SSCs should be identified. Selectivity for rules is not a problem as long as no exemptions are required.

Industry: Should not have to categorize all RISC-1 and RISC-2 SSCs. Would require a complete categorization of the plant. Staff's concerns are unfounded. RISC-2 SSCs are already subject to 50.65 treatment which has increased availability and reliability of these SSCs.

12 noon -- 1:00 pm Lunch

1:00 pm -- 2:30 pm Treatment Requirements

Concern: Option 2 is maintaining the design function. Treatment of RISC-3 SSCs must provide an appropriate (albeit reduced) level of assurance that the design functions of RISC-3 SSCs are maintained.

Staff: SECY-00-194 indicated that licensees would be required to maintain the functional capability of SSCs using existing or new programs, and take corrective actions when functionality is lost. For RISC-3 SSCs, licensees would maintain the design functions of the SSCs. Licensees would be required to describe in the updated FSAR how they will meet these requirements through measures and activities such as procurement control, monitoring, and corrective action.

Industry: In view of the minimal safety-significance of RISC-3 SSCs, can apply commercial controls (the same controls applied to the safety-significant RISC-2 SSCs).

2:30 pm -- 3:15 pm Framework/Option 2 Future Direction

The Option 2 approach is risk-informing special treatment requirements while maintaining the deterministic design basis. Having to maintain the functionality of RISC-3 SSCs without the assurance provided by the special treatment requirements has proven to be a challenge.

Is there a better way, to risk-inform the special treatment requirements than what has been conceived to date?

3:15 pm -- 3:30 pm Break

3:30 pm Remaining Discussion
Closing Remarks
Adjourn

# INTRODUCTION

Objectives for the workshop:

- Inform stakeholders of RIP50 Option 2 status and key issues
- Provide a forum for stakeholder input on the RIP50 Option 2 issues
- Get stakeholder input on how to improve Option 2 to better risk-inform the special treatment requirements

# OVERVIEW OF WORKSHOP AGENDA

- Feb 21 afternoon is to "baseline" attendees on the status of some of the key efforts supporting Option 2

- Feb 22 is a more focused discussion of some the key Option 2 issues

- Although the agenda specifies "rigid" time frames–we are flexible and expect issue discussion to vary from the set agenda

- Agenda did not attempt to incorporate all the issues -- can discuss others as time allows

# MOVING FORWARD WITH RISK-INFORMED REQUIREMENTS IN 10 CFR PART 50

Frank J. Miraglia, Jr.

February 21, 2001

# Background

- PRA Policy Statement (1995)
- Commission "white paper" on risk-informed" (and performance-based regulation
- RG 1.174 and related documents for licensing actions
- Strategic Plan performance goals and strategies
  example: We will continue to develop and incrementally use risk-informed, and where appropriate, less prescriptive performance-based regulatory approaches to maintain safety.

# INCREASING USE OF RISK INFORMATION IN REGULATORY PROCESS

- Supplement (e.g., IPEs, severe accident management)
- Refocus (e.g., revised reactor oversight process)
- Revise (e.g., Options 1/2/3)

# RISK-INFORMED REGULATION IMPLEMENTATION PLAN

- Replaced PRA Implementation Plan
  - includes all risk-informed activities in three arenas, including Option 2

- Recent Commission direction (SRM dated January 4, 2001)
  - identify priorities, resources, cross-cutting issues
  - look for missing items that should be part of comprehensive strategy
  - "moving forward with risk-informed regulation to extent practical"
  - more emphasis on communication
  - issue of PRA quality remains a key consideration (work with stakeholders to finalize quality standards)

- Public comment (FR notice and planned workshop 3/15) on RIRIP

# OPTION 3

- Commission direction on SECY-00-0198 (framework and 50.44)
  - caution against prescriptiveness in the rule

  - selective implementation of individual elements of a risk-informed alternative should not be permitted

  - backfit analysis for voluntary alternative not required.

  - proceed expeditiously with rulemaking for 50.44

## RIP50 OPTION 2 STATUS

- Issued ANPR in March 2000
- SECY-00-194 (September 2000) provided staff preliminary views and briefed the Commission
- NEI sent NRC comments on SECY-00-194 in November 2000
- Staff's review of NEI guidance has continued –sent comments to NEI in September 2000
- The draft STP SE was issued November 2000 (issues regarding categorization and treatment are same as for Option 2)
- NEI responded to the staff comments in January 2001 with a revised guideline and responses to the peer review RAI
- STP responded to the draft SE open items in January 2001

## RIP 50 OPTION 2 STATUS CONT'

- The staff is reviewing the NEI revised guideline (NEI 00-04) and the peer review response information
- The staff is working to finalize the STP SE –met with STP on Feb 15-16, 2001
- Resolution of treatment and categorization issues on STP provides the first cut for the Option 2 position (recognizing the approaches are not identical)
- Next RIP50 Option 2 task is development of acceptance criteria -- requirements to be incorporated into 50.69 and Appendix T (if it exists)
- Workshop feedback will be an input in the development of acceptance criteria

# PRIOR REVIEW AND APPROVAL

- What type of submittal is contemplated? 50.90 type? Information?
- What happens to Appendix T requirements ? Move some to the rule? In NEI 00-04 ? Into a RG ?
- What is the regulatory hook? What does NRC review/approve/inspect/enforce ?
- Given the "review and approval" approach, what is the change control vehicle? 50.59? NEI 99-04? License amendments?

# BOX CHART

- What is industry's concern with revised approach? Is it that treatment would be applied indiscriminately to important to safety equipment that ends up in RISC-3?

- Goal is for a simple approach with 50.69 treatment focused to preserving design function. What is the best way to do that?

- Examples -- Seismic II/I or 50.49 equipment important to safety

## SELECTIVE IMPLEMENTATION

- How would "partial" implementation work?
- Categorization of SSCs is "relative" –wouldn't the licensee know which SSCs were important (assumed credit in PRA) in order to identify which are not significant?
- With limited implementation–wouldn't this still require control of PRA assumptions/SSC credit on which the categorization was based ?
- Is 50.65 (a)(4) scope of SSCs (for controlling risk for maintenance and testing) converging to the set of SSCs that are safety significant for Option 2 ?

## TREATMENT

- Staff has been using a "minimum attributes" approach for its review of the STP exemption (staff believes good commercial programs are adequate but recognizes there can be large variation)

- NEI 00-04 outlines a commerical program but does not establish a set of minimum attributes for programs applied to RISC-3 SSCs

- What is the basis for NEI approach that "as is" commercial programs are sufficient for maintaining functionality of RISC-3 SSCs ?

## FRAMEWORK/OPTION 2 FUTURE 2

- Is there a better way to risk-inform special treatment requirements?
- What does adequate confidence of design basis functionality mean?
- Why is it necessary to maintain functionality of RISC-3 SSCs for Option 2 ?

NRC Option 2 Workshop
February 21-22, 2001

# Option 2:
# Fish or Cut Bait?

Tony Pietrangelo, Director
Risk and Performance-Based Regulation

NEI

## Overview

- Intent of Option 2
- Safety Case for Option 2
- Principal Issues
- Industry Plan on Treatment
- "Late" Containment Failure
- Conclusions

NEI

## Original Premise of Option 2 (from SECY-98-300)

- "The SSC functional capabilities (for low risk important SSCs) would remain in the plant and be expected to perform their design function but without additional margin, assurance or documentation associated with high safety significant SSCs."



NEI

## Safety Case for Option 2

- Applying special treatment requirements to SSCs regardless of safety significance dilutes the focus on safety and squanders resources
- Provide reasonable assurance of functionality commensurate with the safety significance of the SSCs



NEI

## Principal Issues

- Treatment of low risk-significant, safety-related SSCs
  - Environmental qualification
  - Seismic qualification
  - Codes and standards
- Addressing "late" containment failure in categorization process



NEI

## Industry Plan on Treatment

- Provide documentation to support commercial treatment of low risk significant SSCs
  - Commercial seismic standards
  - EQ experience and practice
  - Code case



NEI

## "Late" Containment Failure

- Not an issue in RG 1.174 development
  - Why now?
- Industry has already addressed substantive risk issues
  - LERF criteria
  - Severe accident management insights
  - Emergency planning



NEI

## "Late" Containment Failure

- Concern appears to go beyond safety goals
  - Late failures have insignificant impact on Quantitative Health Objectives
- NRC staff must make safety case for inclusion as a consideration in categorization process



NEI

# Conclusions

- Option 2 is not viable if a new treatment category is created
- Industry will document case for commercial treatment
- Need timely decision by Commission so that agency and industry resources are allocated judiciously



NEI

# BWROG
# RIP50 OPTION 2

NRC Public Workshop
Washington, DC
February 21, 2001

Eric Jebsen (Exelon)

# PURPOSE OF THE PRESENTATION

- Provide a status of the BWROG Option 2 pilot effort

# OPTION 2 PILOT
# Purpose of the Committee

- The objective of this committee is to complete a pilot on three common BWR systems.
- The pilot program will:
  - Test the draft NEI classification methodology and
  - Provide indication of risk/cost benefit for the BWR utilities.

# OPTION 2 PILOT
# Phases

- Phase 1: Cost benefit evaluation
- Phase 2a: Lead plant evaluation
  Lead plant submittal
- Phase 2b: All other plant evaluations (exemptions) (template)
- Phase 3: "Generic" BWR submittal
- Phase 4: RAI resolution for generic submittal

# OPTION 2 PILOT Status

- Phase 1 is complete (cost info. hard to find)
- Phase 2a first cut evaluations are complete. (LPCS, SBGTS, FW)
- Committee met in January 2001
  - Review draft evaluations and report
  - Discuss the IDP requirements
  - Evaluate needs for exemption request

# OPTION 2 PILOT Issues/Actions

- Technical issues are being resolved through the NEI Risk Applications Task Force.
  - BWROG is participating in the Task Force and providing input.
- Complete the pilot plant evaluation
  - Support the pilot plant in their Exemption submittal

# Westinghouse Owners Group
# Status of Option 2 Pilot Plant Efforts

Kenneth R. Balkey
Technical Lead, WOG Risk-Informed Regulation Project
Fellow Engineer, Westinghouse Electric Company

U.S. Nuclear Regulatory Commission Option 2 Workshop
Rockville, MD
February 21-22, 2001

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# Westinghouse Owners Group
# Status of Option 2 Pilot Plant Efforts

## Background

- Dominion Generation & Wolf Creek volunteered and have management support & teams to support lead plant evaluation for two systems at each plant
- Initial work has selected charging/feedwater at Surry (early 3-loop) and containment spray/normal service water systems at Wolf Creek (later 4-loop)
- Safety classification and Maintenance Rule data used from both plants to determine risk-informed safety classification of some modeled components; created "Areas of Potential Savings" for regulations impacted by Option 2
- WOG recently approved resources to demonstrate application of NEI Option 2 Implementation Guideline for the above systems at Surry and Wolf Creek

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# Westinghouse Owners Group
# Status of Option 2 Pilot Plant Efforts

## Objectives for WOG Option 2 Program in 2001

- Continue to interface with NRC, NEI, other Owners Groups, professional societies (e.g., ASME) to support Option 2 developments
- Complete lead plant evaluation of two systems at both Surry and Wolf Creek to demonstrate the NEI Option 2 Guidelines and to support NRC regulatory developments
  - demonstrate overall categorization process for use in risk-informed applications
  - evaluate changes in special treatment, particularly for low safety significant SSCs relative to key 10 CFR 50 requirements
  - ensure process results in increased licensee focus on safety significant SSCs
  - demonstrate that significant benefits exist

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# Westinghouse Owners Group
# Status of Option 2 Pilot Plant Efforts

## Estimate of Cost-Benefit

- Estimate of cost-benefits difficult to quantify because risk-informed regulation requirements still evolving; need to complete pilot plant work
- WOG closely following the resolution of open items from Draft SER for South Texas Exemption Requests from Special Treatment of Part 50; can impact scope of WOG program and resulting benefits of Option 2
- Would expect significant benefits for a fully implemented Option 2 program; if Option 2 becomes unfeasible, acceptable benefits are still achievable from completion of some initiatives under current framework
- Overall cost includes development and implementation costs (e.g., changes to plant procedures, spec, drawings, data bases, etc)
- Having an approved NEI guideline along with template for Option 2 submittals (~ to risk-informed ISI submittals currently being successfully provided by industry to facilitate NRC approval), will provide an efficient path for implementation

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# Risk-Informed Safety Classification For Repair / Replacement Activities ASME Section XI

Kenneth R. Balkey
Lead, ASME Task Group -- Risk-Informed Classifications and Requirements
Member, ASME Board on Nuclear Codes & Standards
Fellow Engineer, Westinghouse Electric Company

U.S. Nuclear Regulatory Commission Option 2 Workshop
Rockville, MD
February 21-22, 2001



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## Risk-Informed Safety Classification For Repair / Replacement Activities

- Background
- Charter and Membership
- Process Applied and Information Used to Develop Proposed Code Case
- Conceptual Layout of Risk-Informed Requirements
- Some Key Issues Identified
- Proposed Layout of ASME Risk-Informed Code Cases in Relation to NRC RIP-50 Option 2
- Presentation and Discussion of Proposed Code Case
- Future Actions

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# Risk-Informed Safety Classification For Repair / Replacement Activities

Background

- 10 CFR 50.55a(f) and 10 CFR 50.55a(g) reference the requirements of ASME Section XI for IST and ISI, respectively, including repair and replacement of SSCs
- ASME has had significant efforts underway for over 10 years on risk-informed initiatives, and efforts continue to expand the use of the technology throughout all ASME Codes & Standards
- Risk-informing repair / replacement activities logically extends risk-informed ISI efforts for piping currently under development and implementation in 85 U.S. reactors and 5 other countries
- Application integrates well with NRC Option 2 for risk-informing 10 CFR Part 50; however, could be done under Option 1
- Presentation represents work in progress



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# ASME Task Group -- Risk-Informed Classifications and Requirements

Charter

"The Task Force is to revise ASME Section XI to incorporate pressure boundary safety significance determinations using risk-informed technology. These classifications will apply to passive pressure boundary components including vessels, piping, valves, pumps, etc. These classifications will be used in the determination of the treatment elements consisting of testing, inspection, and repair/ replacement."

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# ASME Task Group -- Risk-Informed Classifications and Requirements

Members

- Ken Balkey - Westinghouse (Lead)
- Jim Connor - Carolina Power & Light
- Robin Graybeal - Enertech
- Pat O'Regan - Electric Power Research Institute

Contributors

- James Agold - Southern Nuclear
- Bruce Bishop, Nancy Closky, Phil Kotwicki, Barry Lubin - Westinghouse
- Bill Holston - Baltimore Gas & Electric
- Stephen Dinsmore, Gene Imbro - NRC
- Bob Herman (formerly NRC) - Structural Integrity Associates
- Alex McNeill - Dominion Generation
- Wes Rowley - Consultant (ASME BNCS RIP-50 Lead)

ASME Staff Support

- Oliver Martinez



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# ASME Task Group -- Risk-Informed Classifications and Requirements

Process Applied / Information Used

- Used Draft Code Cases:
  - "Risk-Informed Exemptions for Class 1 and 2 Pressure Retaining Components other than Piping, Section XI, Division 1," Rough Draft
  - "Risk-Informed Requirements for Class 1,2, and 3 Pressure Boundary Components, Method A, Section XI, Division 1," Rough Draft
  - "Alternative Repair/Replacement Rules for Structures, Systems, Components Classified in Accordance with Risk-Informed Processes"
- Drafted Code Case N-XXX, "Safety Significance Determination for Pressure Boundary Components", Section XI, Division 1
- Tested five examples - Regenerative heat exchanger, reactor pressure vessel, reactor coolant hot leg pipe, emergency boration valve, feedwater piping - some key issues identified
- Proposed Code Case N-XXX, "Risk-Informed Safety Classification For Use in Risk-Informed Repair and Replacement Activities", Section XI, Division 1

# Fig 1. Conceptual Layout of Risk-Informed Requirements

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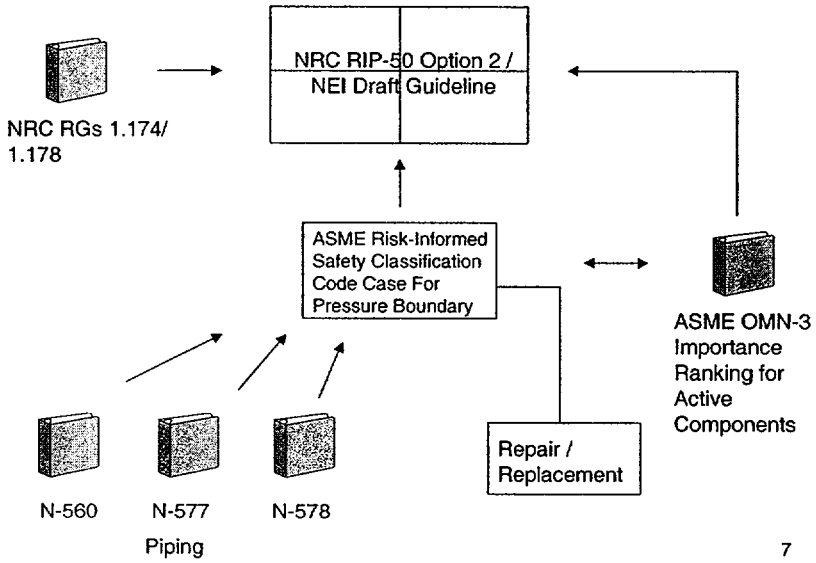




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# Fig. 2 NRC Proposed Risk-Informed Safety Classifications (RISC)

**(From NRC Advance Notice of Proposed Rulemaking, "*Risk-Informing Special Treatment Requirements*," March 3, 2000)**

| ← Risk-Informed → | ← Deterministic → |
|---|---|
| 1 **"RISC-1" SSCs**<br>**Safety-Related Safety Significant**<br>*Special Treatment+50.69 Requirements* | 2 **"RISC-2" SSCs**<br>**Nonsafety-Related Safety Significant**<br>*50.69 Requirements* |
| 3 **"RISC-3" SSCs**<br>**Safety-Related Low Safety Significant**<br>*50.69 Requirements to Maintain Functions* | 4 **Out of Scope SSCs**<br>**Nonsafety-Related Low Safety Significant** |

## Fig. 3 ASME Pressure Boundary Risk-Informed Safety Classification Matrix

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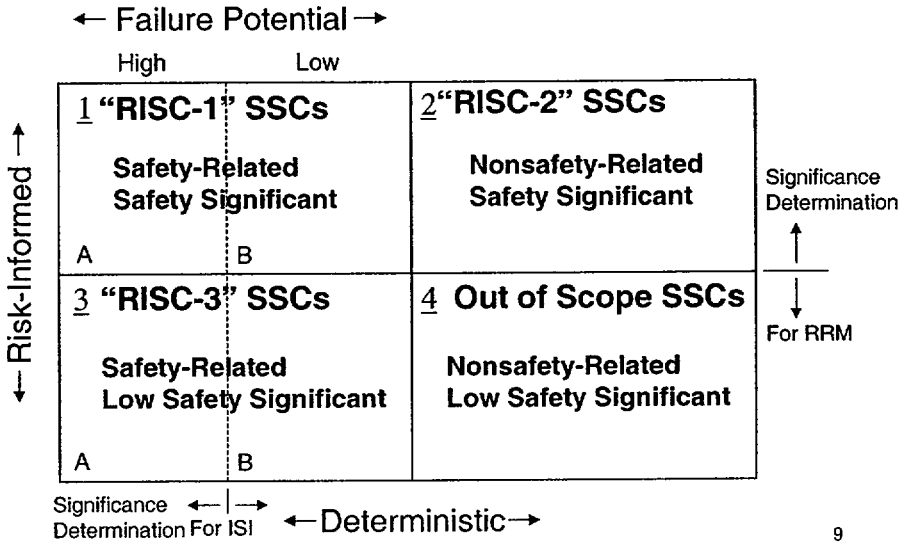




## Fig. 4 ASME Pressure Boundary Risk-Informed Safety Classification Matrix Related to Methods A and B

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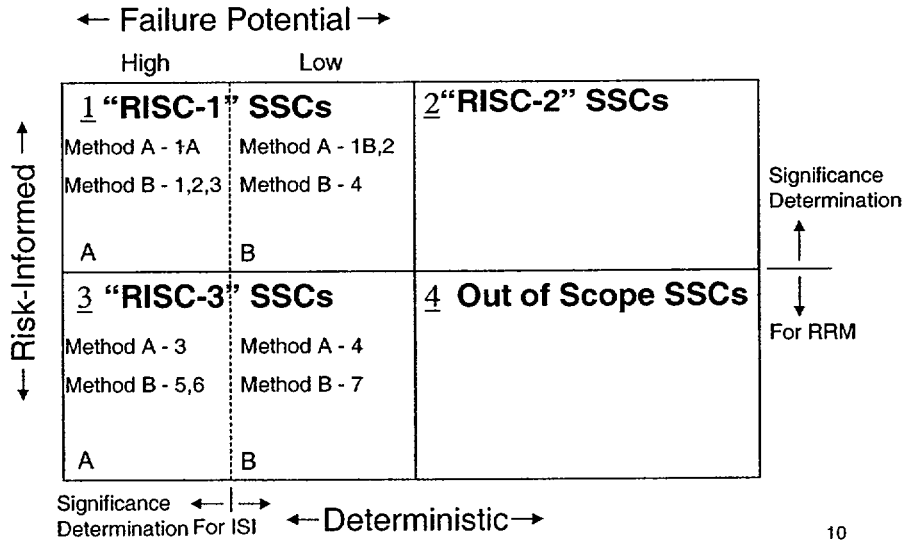

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## Some Key Issues Identified

- Failure data and predictive analytical models not available to support technical bases for estimating failure potential in most components beyond piping
- To ensure there is no degradation of physical characteristics (with corresponding effects on failure rate) due to potential change in Repair/Replacement activities, classification is based on potential consequence of failure only
- Risk-informed safety classification for RRM can be determined through conditional importance of pressure boundary component failure (i.e., consequence) - insights can be gained from probabilistic risk assessment models



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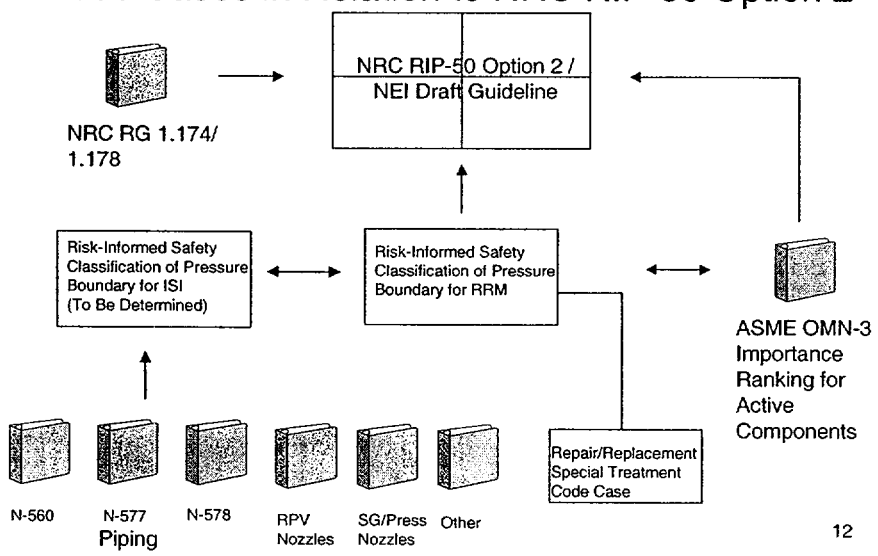
## Fig. 5 Proposed Layout of ASME Risk-Informed Code Cases in Relation to NRC RIP-50 Option 2



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# Proposed RISC Code Case Contents

Case N-XXX, *"Risk-Informed Safety Classification for Use in Risk-Informed Repair and Replacement Activities", Section XI, Division 1,"* Dated 2/14/01

- Scope
- Application
  - Components Subject to Classification
  - Classifications
- Owner's Responsibility
  - Determination of Classification
  - Required Disciplines
- Glossary
- Appendix I - Risk-Informed Safety Classification Process



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# Proposed RISC Code Case Proposed Classification

| Classification Term | Optional Term |
|---|---|
| HSS Code Class component | RISC-1 |
| HSS non-class component | RISC-2 |
| LSS Code Class component | RISC-3 |
| LSS non-class component | RISC-4 |

## Proposed RISC Code Case
## App. I - Risk-Informed Safety Classification Process

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- Introduction
- Scope Identification
- Consequence Evaluation
  - Failure Modes and Effects Analysis (FMEA)
  - Impact Group Assessment
    - Table I-1 Consequence Categories For Initiating Event Impact Group
    - Table I-2 Consequence Categories For System Impact Group
    - Table I-3 Consequence Categories For Combination Impact Group
    - Table I-4 Consequence Categories For Failures Resulting in Increased Potential For an Unisolated LOCA Outside of Containment
    - Table I-5 Quantitative Indices For Consequence Categories
  - Components and Design/Operational/Risk Considerations Not Modeled in PRA
  - Maintain Defense-in Depth
  - Maintain Adequate Safety Margins
  - Classification
- Reevaluation of Risk-Informed Safety Classifications



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## Risk-Informed Safety Classification For Repair / Replacement Activities

Future Actions

- Proposed Code Case has been approved by the cognizant ASME Task Group and Working Group, has been presented to Subgroup for letter ballot prior to the next meeting, and has been presented to Subcommittee XI for information only; With approval at Subgroup, the case will move to Subcommittee XI for action in May 2001
- Technical basis document in course of preparation
- Expect that Code Case will be tested by some of the Option 2 pilot plants over the next few months
- Expect more detailed discussions with NRC Staff and appropriate industry groups as results become available
- Expect Code Case to be approved within ASME in 2001

# Risk Informed Treatment

# Repair/Replacement Activities

# ASME Section XI IWA-4000

William C Holston
Chairman Subgroup Repairs Replacements and Modifications
General Supervisor Design Engineering Section
Calvert Cliffs Nuclear Power Plant

# Code Case N-XXX Alternative Repair/Replacement Rules for Structures Systems Components Classified in Accordance With Risk Informed Processes

Items classified in accordance with current deterministic criteria (i.e., Class 1, 2, 3, MC, CC and their supports).

⇓

Owner performs risk-informed process to categorize pressure retaining, core support and component support items.

⇓

A simplistic classification matrix would be as follows:

| Code Case Term | 50.69 & Appendix T Term |
|---|---|
| HSS Class 1, 2, 3, MC or CC | RISC –1 (HSS SR) |
| HSS Non-Class | RISC –2 (HSS NSR) |
| LSS Class 1, 2, 3, MC or CC | RISC –3 (LSS SR) |
| LSS Non-Class | RISC –4 (LSS NSR) |

In reality, due to the many ways nuclear plants have classified their systems. the classification matrix is more complex:

| | Section XI Code Classification | Code Treatment | Population Size | Examples |
|---|---|---|---|---|
| RISC – 1<br>HSS - SR | Code Class | Full Requirements | Large | ♦ ECCS |
| | Non-Class | Structural Integrity Requirements | Maybe None | ♦ ? |
| RISC – 2<br>HSS – NSR | Code Class | Structural Integrity Requirements | Maybe None | ♦ ? |
| | Non–Class | Structural Integrity Requirements | Small | ♦ SBO Diesel<br>♦ Feedwater Piping in TB<br>♦ FP Piping |
| RISC – 3<br>LSS - SR | Code Class | Structural Integrity Requirements | Large | ♦ PWR Containment Spray |
| | Non-Class | Exempt Items | Large | ♦ IA |
| RISC – 4<br>LSS - NSR | Code Class | Structural Integrity Requirements | Small | ♦ Primary Sampling After Two Isolation Valves |
| | Non-Class | Exempt Items | Large | ♦ Extraction Steam |

## Code Treatment General Base Assumptions

- RISC-1: No changes – full Code requirements
- RISC-2: Items are predominantly outside the scope of Code, they will be added to the scope and treated to ensure structural integrity (functionality from a passive item Code perspective).
- RISC-3:
  - Must meet structural integrity requirements
  - Accept a reduced level of assurance than for that of normal Section XI repair/replacement activities.
  - Accept typical commercial treatment with some additional controls.
- RISC-4 No Code requirements imposed.

## Provisions of the Case Related to Structural Integrity Requirements

1. NPS 1 and smaller items , except heat exchanger tubing/plugs. do not need to meet AIA and administrative requirements of the Construction Code.

2. Owner develops a plan for each repair/replacement activity, but not under the Appendix B or NQA-1 Program. Plan can be documented in normal Owner maintenance documents.

3. Items that fail structural integrity requirements such that stress allowables are exceeded by 110% or fails assumptions in risk analysis, require a root cause and corrective provisions.

4. ANII oversight only required for vessels, and items $\geq$ 200F or $\geq$250 psig, but documentation reduced to using the Owner's maintenance process.

## Structural Integrity Requirements, cont.

5. Items used for replacements, repair processes, examinations, and tests are performed in accordance with one of the following:

- The requirements of the Construction Code and Owner's Requirements, or
- Other nationally-recognized Codes, Standards, or Specifications suitable for that item (e.g., Section VIII for vessels, B31 series for piping, B16.34 for valves, API 620 for 0 -15 psi storage tanks, API 650 for atmospheric storage tanks), or
- Manufacture the item to the same material, pressure temperature-rating and configuration (changes are allowed with documented analyses or evaluation). Use the remaining fabrication, examination and testing requirements of a nationally recognized Code, Standard or Specification. This option has the following limitations.
  - For castings with quality factors and joints with efficiency factors linked to specific NDE, if the alternative Code does not require this NDE, the Owner must perform the NDE or reconcile its elimination to the existing design.
  - If the item being replaced was constructed to Section III Class 1, Section III NC-3200, Section VIII Division 2, Section III Class A or B31.7 Class I, must meet:

    Construction Code NDE

    Material NDE (e.g., NB-2500)

    Impact testing and test coupon heat treatment requirements.

## Structural Integrity Requirements, cont.

6. Alternative material and design may be used for repairs. Subject to the following.
   - ♦ Engineered using fundamental engineering and material principles.
   - ♦ Acceptability of as left configuration demonstrated by analysis, evaluation or test.
   - ♦ Restricted to the following conditions – not practical to perform repair to Code requirements due to the activity resulting in:
     - Unit shutdown, or
     - Significant increase in daily or cumulative risk – 10CFR50.65(a)(4), or
     - Consumes significant allowed out of service time assumed in the risk analysis – 10CFR50.65(a)(2).
7. Pre-service examinations required if item has ISI requirements based on IWX-2000 or risk informed ISI Code Cases.
8. No pressure testing requirements.

# MOVING FORWARD WITH RISK-INFORMED REQUIREMENTS IN 10 CFR PART 50

Frank J. Miraglia, Jr.

February 21, 2001

# Background

- PRA Policy Statement (1995)
- Commission "white paper" on risk-informed" (and performance-based regulation
- RG 1.174 and related documents for licensing actions
- Strategic Plan performance goals and strategies
  example: We will continue to develop and incrementally use risk-informed, and where appropriate, less prescriptive performance-based regulatory approaches to maintain safety.

# INCREASING USE OF RISK INFORMATION IN REGULATORY PROCESS

- Supplement (e.g., IPEs, severe accident management)
- Refocus (e.g., revised reactor oversight process)
- Revise (e.g., Options 1/2/3)

# RISK-INFORMED REGULATION IMPLEMENTATION PLAN

- Replaced PRA Implementation Plan
  - includes all risk-informed activities in three arenas, including Option 2

- Recent Commission direction (SRM dated January 4, 2001)
  - identify priorities, resources, cross-cutting issues
  - look for missing items that should be part of comprehensive strategy
  - "moving forward with risk-informed regulation to extent practical"
  - more emphasis on communication
  - issue of PRA quality remains a key consideration (work with stakeholders to finalize quality standards)

- Public comment (FR notice and planned workshop 3/15) on RIRIP

# OPTION 3

- Commission direction on SECY-00-0198 (framework and 50.44)
  - caution against prescriptiveness in the rule

  - selective implementation of individual elements of a risk-informed alternative should not be permitted

  - backfit analysis for voluntary alternative not required.

  - proceed expeditiously with rulemaking for 50.44