



UNITED STATES  
**NUCLEAR REGULATORY COMMISSION**

WASHINGTON, D.C. 20555-0001

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**Do not include proprietary materials.***

DATE OF MEETING

**04/24/2001**

The attached document(s), which was/were handed out in this meeting, is/are to be placed in the public domain as soon as possible. The minutes of the meeting will be issued in the near future. Following are administrative details regarding this meeting:

Docket Number(s)	<b>PROJECT NO. 669</b>
Plant/Facility Name	<b>EPRI</b>
TAC Number(s) (if available)	<b>MB1344</b>
Reference Meeting Notice	<b>4/6/01</b>
Purpose of Meeting (copy from meeting notice)	<b>TO DISCUSS EXTENSION OF RISK-INFORMED              INSERVICE INSPECTION METHODOLOGY</b>

NAME OF PERSON WHO ISSUED MEETING NOTICE

**LEONARD N. OLSHAN**

TITLE

**PROJECT MANAGER**

OFFICE

**NRR**

DIVISION

**DLPM**

BRANCH

**PD II-1**

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**DF03**



# **Risk & Performance- Inspired (RPI) Applications**

**April 24, 2001**

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## **Agenda**

- **Purpose of Meeting**
- **RI-ISI Submittals**
- **BER**
- **Additional RPi Activities**
- **Action Items**
- **Concluding Remarks**

**EPRI**



## **Purpose of Meeting**

- **Follow-up to August, 2000 meeting**
- **Continue NRC/Industry dialogue for Ongoing Risk and Performance Inspired Applications**
- **Discuss Status of RI-ISI Applications**
- **Discuss Schedule**

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## **RI-ISI Submittals**

- **Follow-on Plants**
  - **Approved Applications**
  - **In Process Applications**
  - **Lessons Learned**
  - **Needed Improvements to Future Applications**

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## Break Exclusion Requirements

- Historical Perspective
- Goals
- Impact on Existing Design Bases
- Adaptation of RI-ISI
- Results of Application to BER

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## Break Exclusion Requirements

- Historical Perspective
  - Giambusso Letter, December 1972
  - O'Leary Letter, 1973
  - Regulatory Guide 1.46 "Protection Against Pipe Whip inside Containment," May 1973
  - Standard Review Plan 3.6.1, "Plant Design for Protection Against Postulated Piping Failures in Fluid Systems Outside Containment," July 1981
  - Standard Review Plan 3.6.2, "Determination of Rupture Locations and Dynamic Effects Associated with the Postulated Rupture of Piping," July 1981
  - Many Specific Licensee/USNRC Agreements
  - ASME Boiler and Pressure Vessel Code, Section XI
  - USNRC Generic Letter 89-08 (FAC)

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## Break Exclusion Requirements

- **Historical Perspective (cont.)**

- Individual Plant Requirements vary greatly:
  - Group A plants have no requirements for augmented examinations
  - Group B plants have a small number of augmented examinations
  - Group C plants meet SRP requirements,
  - Group D plants exceed SRP requirements
- Terminology includes BER, NBZ, HELB, AE...
- Requirements predate augmented inspection programs for FAC and Thermal Fatigue

- **Goals**

- A logical, consistent, stable and predictable process,
- Cost-effective implementation (RI-ISI process)

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## Break Exclusion Requirements

- **Impact on Existing Design Bases**

- Current Process
  - Very plant specific
  - Special rules for "BER piping"
- Proposal
  - Change is to inspection size, only

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## Break Exclusion Requirements

- **Adaptation of RI-ISI (SCOPE)**
  - **BWRs:**
    - can be Class 1, 2, 3, NNS piping,
    - MS, FW, RWCU, HPCI
  - **PWRs:**
    - can be Class 2, 3 and NNS piping,
    - MS, FW, AFW, SGBD, CVCS, AS

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## Break Exclusion Requirements

- **Adaptation of RI-ISI (FAILURE POTENTIAL)**
  - **Operating Experience for applicable systems**
    - the only significant failures are due to FAC and high temperature creep and creep/fatigue,
    - others failures or anomalies due to thermal fatigue and cavitation
  - **Impact of Inspections**
    - Creep and creep/fatigue n/a for NPPs
    - FAC programs are in place,
    - RI-ISI assesses susceptibility to thermal fatigue and cavitation

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## Break Exclusion Requirements

- **Adaptation of RI-ISI (FAILURE POTENTIAL)**
  - Plant Specific Service History
  - $\geq 10$  years of BER inspection history
  - susceptibility to waterhammer
  - other augmented inspections (e.g. FAC)
  - leak detection capability

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## Break Exclusion Requirements

- **Adaptation of RI-ISI (CONSEQUENCE of FAILURE)**
  - Consequence of Failure (General)
  - no credit for equipment in the vicinity (e.g. inside containment vs outside containment),
  - if credited: successful and unsuccessful operation assessed,
  - some plants designed for breaks even in the "no break zone"

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## Break Exclusion Requirements

- **Adaptation of RI-ISI**
  - **RISK SIGNIFICANCE** - no change
  - **INSPECTION SIZE**
    - no change in "process" from TR-112657,
    - results will be plant specific
  - **Change in Risk**
    - meet R.G. 1.174 req'ts
    - provide for defense in depth

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## Break Exclusion Requirements

- **Adaptation of RI-ISI**
  - **Licensee Approval Process**
    - BER programs typically defined in UFSARs
    - NEI 99-04 and 2000-17 provide guidance on Managing Regulatory Commitments
    - Notification via periodic 50.59 summary report
    - Other licensee commitments

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## **Break Exclusion Requirements**

- **Results of Applications**

- **Provided via Letter dated February 28, 2001**
- **Three Units at Two Sites**
- **Two PWRs**
- **One BWR**

EP2



## **Break Exclusion Requirements**

- **Results of Applications (cont.)**

- **Each plant meets SRP (or predecessor) BER requirements**
- **As expected, results varying between sites**
- **Differences include additional hardware and/or analysis**

EP2



## **Break Exclusion Requirements**

- **Results of Applications**
  - **BWR application (one unit):**
    - SRP vintage plant,
    - resulted in an inspection size of 12 percent
  - **PWR application (two units):**
    - Pre SRP plants,
    - resulted in an inspection size of 1 to 2 percent of inspectable welds
    - 25 to 32 percent of welds protected via hardware/analysis

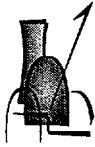
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## **Additional RPi Activities**

- **TASCS Additional Screen**
- **PSI Requirements**
- **Living RI-ISI Program Requirements**
- **Alternative Surface Exam req'ts**
- **Integration Tasks**
- **Snubber Testing**
- **Classification**

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## Additional RPi Activities - cont.

- **TASCS Addition Screen**
  - Incorporated NRC comments
  - Re-submitted March, 2001
  
- **PSI Requirements**
  - Attachment 3 to 2-28-01 Submittal
  - PSI method can be either RI-ISI or traditional SXI method
  - PSI inspection percentages as a function of risk category not ASME code class
  - Pursuing a code interpretation with ASME SXI

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## Additional RPi Activities - cont.

- **Living RI-ISI Program Requirements**
  - 30 RI-ISI applications completed or underway
  - Developing site specific and generic living program criteria
  - Participating in VC Summer/Oconee Industry Programs
  - Will include guidance on the need for NRC submittal
  - Schedule:
    - Draft - Summer, 2001
    - Final - December, 2001

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## **Additional RPi Activities - cont.**

- **Alternative surface exam req'ts**
  - Code case balloted at WGIRBE and WGISC
  - Approval by WGISC expected at May, 2001 meeting
  - To be presented to Subgroup Water Cooled System - May, 2001
  - Further supported by Task Group ISI Optimization Socket Welded Connection Whitepaper

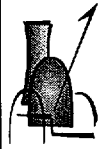
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## **Additional RPi Activities - cont.**

- **Integration Tasks**
  - EPRI-MRP thermal fatigue ITG
    - interim guidance
    - evaluation tools consistent with EPRI RI-ISI methodology
    - examination volumes
  - PDI

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## **Additional RPi Activities - cont.**

- **Snubber Testing**
  - **Existing draft code case**
    - developed based upon RI-IST results,
    - lessons learned from operating environment,
    - significant testing history
  - **Goal:**
    - update to reflect/coordinate impact of RIISI

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## **Additional RPi Activities - cont.**

- **RI-Classification**
  - **Draft SXI code case**
    - Uses EPRI RI-ISI consequence methodology
    - Subgroup WCS - May, 2001
    - ASME Whitepaper under development,
    - Case studies being developed
    - **At least two important needs:**
      - Tie between passive and active function,
      - understanding of "implementation" issues and impact

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## Action Items (12/99)

- **Industry/NEI/NRC Senior Level Mgt**
  - RI-ISI submittals
  - Integration/Coordination
- **Containment Inspections (NRC participation)**
- **LR - coordination with 3 year plan**
- **BER/HELB White Paper**
- **Living Program Criteria**
- **Use C&S whenever appropriate**

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## Action Items (8/00)

- **NEI to investigate regulatory basis for BER review and acceptance by NRC (GDC 4 exemption, revision to SRP, etc.)**
- **RI-ISI Submittals (NEI)**
  - Supply to NRC submittal dates by month and a need date per unit,
  - Send in proposal for a two year moratorium on piping inspections
  - include West in above

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## Action Items (8/00)

- **Submittals (General)**
  - should identify if relief from ASME percentages is required,
  - identify percent of inspections covered by old SXI program and percent of inspections covered by RI-ISI program
  
- **Living Program**
  - present progress at next mtg
  - include consideration of program re-submittal requirements

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## Action Items (4/01)

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## Concluding Remarks

- Industry
- NRC

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