



Risk & Performance Initiatives

NRC / EPRI Meeting

July 7, 2003



Agenda

- Code Case N663
- Safety-based / Risk-informed Classification & Treatment
- Partial Examination Coverage
- Discussion on Existing RI-ISI Applications
- Action Items



Code Case N663

- Alternative Surface Examination Requirements
- Approved By ASME Board of Nuclear Codes & Standards (9-17-02)
- Applicable to:
 - Class 1 piping: ≥ 4 inch NPS
 - Class 2 piping: all pipe sizes
- Relief to be requested via 10CFR50.55a(a)(3)(i)

3



Code Case N663

- November 26, 2002 meeting between NRC Staff and Industry
 - NRC suggested a pilot plant (Entergy) take lead for submitting a request for alternative to use Code Case N-663
 - The Staff expected the request to be submitted for emergent use to support spring outages.
 - Entergy submitted request for alternative December 2002.

4



Code Case N663

- RAIs
 - March 8, 2003 Entergy supplied requested ASME white paper on Code Case N-660⁵¹⁰
 - A phone call between the Staff and Entergy was held May 08, 2003.

5



Code Case N663

- RAI Topics
 - Surface examination for preservice purposes, as currently required by Section XI
 - Surface examination of Cast Stainless Steel piping welds
 - Surface examination of Corrosion Resistant Cladding (CRC) welds

6



Code Case N663

- **STATUS**
 - Discussion
 - Actions
 - Schedule



RI - Classification and Treatment

- EPRI TR-112657 and WCAP-14572 approved by USNRC
- EPRI RI-ISI methodology embodied in N560 and N578
- Westinghouse RI-ISI methodology embodied in N577
- Code cases and methodologies integrate classification and treatment requirements



RI - Classification and Treatment

- Number of high safety significant (HSS) locations added by plant review
 - VY = zero
 - ANO-1 = zero
 - ANO-2 = zero
 - Fitzpatrick = zero
 - South Texas 1 & 2 = zero
 - BWR-N560
 - B&W-N560
 - CE - N578 (fullscope)
 - BWR - N578 (fullscope)
 - West - N560
- Number of HSS locations added by NRC review
 - VY = zero
 - ANO-1 = zero
 - ANO-2 = zero
 - Fitzpatrick = zero
 - South Texas 1 & 2 = zero



RI - Classification and Treatment

Status of RI-ISI Applications (USA)

- Submittals *
 - Total 69
 - N560/N578 49
 - N577 20
- Approved
 - Total 52
 - N560/N578 39
 - N577 13

(*) ~ one half are Class 1 only scope



RI - Classification and Treatment

RI- Break Exclusion Requirements (BER/HELB)

- Methodology integrates classification and treatment requirements (EPRI TR-1006937)
- Submitted, Feb 2001
- Approved, June 2002
- NRC Review
 - No Changes RI-BER methodology
 - No Changes to Plant-specific results
 - Implementation via 50.59 procedure

11



RI - Classification and Treatment

Recent Experiences

- Results of USNRC Review
 - Plant A – 70 locations added,
 - Plant B – 40 locations added,
 - Plant C – 40 locations added,
 - Plant D – 17 locations added
 - Plant E – 13 locations added

12



RI - Classification and Treatment

Recent Experiences (cont.)

– RI-ISI Program Updates

- Plant A

- PRA model updates
- Physical plant changes (e.g. power uprate, S/G replacement)
- No change in HSS
- No change in inspection program

- Plant B

- PRA model updates
- Minor physical plant changes
- ~ 80 segments moved from Low to High/Medium
- ~ 30 segments moved from High to Low



13

RI - Classification and Treatment

ASME Code Cases N660 & N662

- Developed to support USNRC/Industry Option 2 efforts
- Decoupled classification (N660) from treatment (N662)
- N660 founded upon N560/N578 classification criteria, minus failure potential
- Conservative classification scheme due to time constraints and lack of information (e.g. failure probability)
- Costs associated with implementation (e.g.
 - determining classification
 - living program updates
- Burden reduction limited due to:
 - excess conservatisms (e.g. Class 3 systems, "other considerations")
 - lack of integration between classification and treatment



14

RI - Classification and Treatment

Summary

- Some applications approved with no changes required
- Some applications are pushing the envelope (i.e. risk-based versus risk-informed)
- Some applications are experiencing difficulty in gaining USNRC approval (e.g. numerous RAIs, re-analysis, changes to program, etc.)
- Costs associated with program updates
- Updates may challenge initial program selections
- Integrating classification and treatment increases success likelihood

15



RI - Classification and Treatment

- **GOAL: Develop a consistent, coherent, generic and integrated set of classification and treatment requirements.**
 - Nature of the action will reduce licensee/NRC resource burden
 - Nature of the action will increase consistency of plant specific applications
 - Nature of the action will increase robustness of plant specific applications

16



RI - Classification and Treatment

- ASME Whitepaper 2002-02-01
 - Reviewed over fifty plant-specific RI-ISI applications,
 - Thirty, of which, were Class 1 & 2 or fullscope applications
 - Reviewed a number of industry and USNRC risk assessments
- Action integrates risk assessment, treatment, change control and operating experience requirements into a stable and effective pressure boundary integrity management program

17



RI - Classification and Treatment

Classification Criteria (safety-based / risk-informed)

- Category A (SS)
 - Reactor Coolant Pressure Boundary (e.g. Class 1)
 - Shutdown Decay Heat Removal (out to containment isolation)
 - Break Exclusion Region (BER)
 - Main Feedwater from S/Gs to BER
- Category B (LSS)
 - Remaining items (i.e.
 - other Class 2,
 - all Class 3,
 - all NNS

18



RI - Classification and Treatment

Treatment Criteria (PS/ISI)

- Category A (SS)
 - NDE population equal to 10%, plus augmented programs
 - NDE locations generally selected based upon postulated susceptibility to degradation mechanisms
 - may use existing RI-ISI program, if available

- Category B (LSS)
 - NDE per augmented programs (e.g. FAC, LC, IGSCC)
 - pressure/leakage testing continues

19



RI - Classification and Treatment

Treatment Criteria (RRM)

- Category A (SS)
 - No change to existing RRM requirements

- Category B (LSS)
 - Reduced requirements, essentially N662

20



RI - Classification and Treatment

Additional Requirements

- Risk assessment per Generic Letter 88-20,
- Augmented inspection programs per Generic Letters 88-01, 89-08 & 89-13,
- Operating experience review program per NUREG-0737,
- Change control program per 10CFR50.59

21



RI - Classification and Treatment

Expectations

- Existing RI-ISI plants will transition to this action
 - cost of implementation less than RI-ISI update requirements
 - half of RI-ISI plants applied RI-ISI to Class 1 only
 - Stability of process
 - additional benefit from RRM application
- Traditional ISI plants will implement this action
 - cost-effective implementation
 - significant dose reduction,
 - Stability of process
 - additional benefit from RRM application

22



RI - Classification and Treatment

Schedule

- WGIRBE: letter ballot prior to 8/03 Mtg
- SGWCS: letter ballot after 8/03 Mtg
- In parallel with SGWCS Letter ballot:
 - Review and Comment ballot by:
 - SCXI
 - Main Committee
 - BNCS
- Discussion
- NRC letter ballot

23



Partial Examination Coverage

- RI and traditional Section XI examinations obtaining <90% coverage require a relief request
- Alternative process:
 - Select other locations (i.e. > 90%) where allowed, physically possible and desirable,
 - Review basis for inspection location selection (e.g. type of degradation, severity of degradation),
 - Can be used both pre- and post- inspection,
 - Expect to eliminate many low value-added relief requests
 - Some locations may still require relief request

24



Partial Examination Coverage

- Partial Exam Whitepaper
 - Provides a process for accepting partial coverage,
 - Provides guidance for use of the process
 - Provides basis for when partial coverage is acceptable (i.e. no relief request required),
 - Identifies situations that still require a relief request,
 - Provides guidance in developing risk-informed basis for required relief requests

25



Partial Examination Coverage

- Section XI Status
 - Letter balloted March, 2003 (WGIRBE),
 - Five ballots "approve with comments"
 - Editorial, or
 - Whitepaper clarifications
 - Two negatives
 - Presentations to
 - TG ISI Optimization
 - WG ISC
 - Goal: re-letter ballot prior to August mtg (WGIRBE & WG-ISC)

26



Existing Applications

- Status, Process, Feedback
 - RI-ISI Template Submittals
 - Additional Lessons Learned
 - Update to Incoming Submittals?

27



Other Initiatives

- Pressure Testing
- Cast Stainless Steel
- Snubber Testing
- On-line ISI
- Period Percentage Requirements

28



Agenda

- Action Items

29



Agenda

- Action Items

30

