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MRP Materials Reliability Program MRP 2010-042

(via email)

July 15, 2010

Secretary
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
ATTN: Rulemakings and Adjudications Staff

Subject: Docket ID NRC–2008–0554
Comments to Proposed Rulemaking on Code Cases N-722-1 and N-770 Conditions

Reference:

1. NRC Proposed Rulemaking for 10 CFR 50.55a(g)(6)(ii)(E), "Reactor Coolant Pressure Boundary Visual Inspections", dated May 4, 2010
2. NRC Proposed Rulemaking for 10 CFR 50.55a(g)(6)(ii)(F), "Examination Requirements for Class 1 Piping and Nozzle Dissimilar-Metal Butt Welds", dated May 4, 2010

Dear Sir or Madam:

This attachment to this letter provides EPRI Materials Reliability Program comments on the subject proposed rulemaking specific to Code Cases N-722-1 and N-770.

Should you have any questions please contact me at 817-897-1433.

Sincerely,

Craig Harrington
EPRI MRP Project Manager

Attachment

cc: Al Ahluwalia, EPRI
Terry McAlister, SCANA
William Sims, Entergy
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Template = SECY-067

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Response to § 50.55a(g)(6)(ii)(E)(1) through (g)(6)(ii)(E)(3)

Proposed Condition:
The NRC proposes to update § 50.55a(g)(6)(ii)(E)(1) through (g)(6)(ii)(E)(3) to the requirements of Code Case N-722-1, and to revise footnote 1 to clarify requirements in that paragraph that pertain to reactor coolant pressure boundary visual inspections. In the most recent update to 10 CFR 50.55a, the NRC added new requirements in § 50.55a(g)(6)(ii)(E). The new requirements were for all licensees of PWRs to augment their ISI program by implementing ASME Code Case N-722, subject to the conditions specified in § 50.55a(g)(6)(ii)(E)(2) through § 50.55a(g)(6)(ii)(E)(4).

Response:
§ 50.55a(g)(6)(ii)(E) wording should be revised to remove the reference to § 50.55a(g)(6)(ii)(E)(4) since paragraph E(4) is not included on page 24342 of the proposed changes to § 50.55a(g)(6)(ii)(E).

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Response to § 50.55a(g)(6)(ii)(F)(2) through (g)(6)(ii)(F)(16)

Proposed Condition:
The NRC proposes to add a condition (§ 50.55a(g)(6)(ii)(F)(2)) to require that welds mitigated by inlays, cladding, or stress improvement by welding, be categorized as unmitigated welds pending plant-specific NRC review of the mitigation techniques and NRC authorization of an alternative ASME Code Case N–770 Inspection Item for the mitigated weld. ASME Code Case N–770 provides inspection methods and frequencies for welds mitigated by certain specified techniques. Inspections of mitigated welds are performed much less frequently than unmitigated welds. Requirements for most of the mitigation methods are contained in other ASME code cases under development. The NRC has typically approved the application of pressure boundary weld mitigation techniques on a case-by-case basis. This condition is necessary to ensure that appropriate mitigation techniques are applied to welds before they are categorized as mitigated under Code Case N–770.

Response:
All mitigation techniques, with the exception of Mechanical Stress Improvement Process (MSIP), discussed in Code Case N–770 are the subject of separate Code Cases which will be subject to approval by the NRC. MSIP meets the requirements of Appendix I of Code Case N–770 and has been separately approved by the NRC. If approved mitigation techniques are employed a separate review of the reclassification of the welds should not be required.

This proposed condition, requiring that welds that have been mitigated by weld inlay or onlay of corrosion resistant cladding be categorized for ISI frequency as Inspection Item A-1, A-2, or B, is not consistent with other proposed conditions of § 50.55a(g)(6)(ii)(F)(6) and § 50.55a(g)(6)(ii)(F)(7) dated May 4th, 2010, or the latest revision of Code Case N-770, which was approved on December 25, 2009. Section (g)(6)(ii)(F)(6) requires that a weld that has been mitigated by inlay or corrosion resistant cladding, and then is found to be cracked, be reclassified as and inspected using the frequencies of Inspection Item A-1, A-2, or B. This indicates that an uncracked weld that has been mitigated by inlay or corrosion resistant cladding would not be categorized as inspection Items A-1, A-2 or B following an acceptable pre-service examination. And Section (g)(6)(ii)(F)(7), which requires that a weld mitigated by inlay or corrosion resistant cladding be examined each interval if at hot leg temperatures, and as part of a 25 percent sample plan on a 20 year frequency if at cold leg temperatures, which is not consistent with Inspection Item A-1, A-2, or B.

Adoption of Revision 1 to Code Case N-770 is recommended.

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Proposed Condition:
The NRC proposes to add a condition (§ 50.55a(g)(6)(ii)(F)(*3*)) to require that the baseline examination of welds in Inspection Items A–1, A–2, and B (unmitigated welds) be completed at the next refueling outage after the effective date of the final rule. Paragraph –2200 of Code Case N–770 permits welds in Inspection Items A–1, A–2, and B (unmitigated welds) that have not received a baseline examination to be examined within the next two refueling outages from adoption of the Code Case. Welds in Inspection Items A–1, A–2, and B are the welds most likely to experience PWSCC and some of these welds may not have received a baseline examination, even under the industry initiative, MRP–139. This condition is necessary to ensure the integrity of these welds by requiring that all welds in Inspection Items A–1, A–2 and B be inspected at the first opportunity to perform the inspections.

Response:
As a practical matter of controlled outage planning, the final rule approval timing for some plants may be such that there is not adequate time to plan and prepare for the required baseline inspection and prepare repair contingencies, (e.g. approval of the rule in June and the next refueling outage for a plant is in September). By providing a window of the next two refueling outages, the required planning and preparation can be accommodated.

However, applicability of this condition has seemingly been addressed by Industry through utility compliance to MRP-139 inspection and coverage guidance issued under NEI Initiative 03-08. There appears to be little if any difference in the scope of locations subject to baseline volumetric inspection under both MRP-139 and the subject Code Case. Inclusion of this condition is duplicative and will add unnecessary confusion.

Additionally, for baseline examinations already completed to the requirements of the Industry guidance, any condition applied should recognize these examinations as acceptable for compliance to N-770 and the NRC Conditions.

It is recommended that condition 10CFR50.55a(g)(6)(F)(3) not be applied.

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Proposed Condition:
50.55a(g)(6)(ii)(F)(4)) to require essentially 100 percent coverage for axial flaws. Paragraph – 2500(c) of Code Case N–770 permits examination of axial flaws with inspection coverage limitations provided essentially 100 percent coverage for circumferential flaws is achieved and the maximum coverage practical is achieved for axial flaws. This requirement on inspection limitations is inconsistent with comparable inspection requirements of the ASME B&PV Code, Section XI. Axial flaws can lead to through wall cracks and leakage of reactor coolant, which is a safety concern. This condition is necessary for the NRC to ensure that, through NRC review of an authorization of alternative inspection coverage, appropriate actions are being taken to address potential inspection limitations for axial flaws.

Response:
The requirement was put in Code Case N–770 for those instances where essentially 100% coverage cannot be achieved due to interferences from other structures. In this case, if essentially 100% coverage for circumferential flaws (100% of the susceptible material volume) and the maximum coverage practical for axial flaws were achieved, and any limitations were noted in the examination report, the coverage requirements were considered to be satisfied. This would assure that examinations necessary to prevent a "break before leak" were completed.

As an example, it is not uncommon for the DM welds in PWR plants to have a taper transition from one side of the weld to the other side of the weld or to have an obstruction (non-removable) which would prohibit 100% coverage for axial flaw inspection. These conditions were recognized during the development of the inspection coverage guidance of MRP-139 Section 5.1.5. Since growth of an axially oriented PWSCC flaw is limited to the PWSCC susceptible material (weld width), the maximum axial flaw size would not result in a rupture concern. This has been documented in MRP reports (e.g. MRP-140) and PWROG evaluations. Furthermore, with no rupture concern associated with an axial flaw, leakage certainly remains an unacceptable condition but not an immediate threat to safety as long as a robust visual inspection regime is in place.

If this condition is applied, current mitigation plans may require revision and possibly delay. Furthermore, modification of existing mitigations could be required resulting in increased dose to personnel and increasing the potential for damage by the modification process without a commensurate safety improvement.

Additionally, this condition appears to challenge the validity of previously completed baseline exams where axial coverage of essentially 100% was not achieved and when considered in conjunction with Condition 50.55a(g)(6)(ii)(F)(*3*), could also create a significant implementation challenge with no commensurate safety improvement.

It is recommended that condition 10CFR50.55a(g)(6)(F)(4) not be applied.

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Proposed Condition:
The NRC proposes to add a condition (§ 50.55a(g)(6)(ii)(F)(5)) to reword Paragraph –3132.3(b) on determining flaw growth using wording consistent with that used in the ASME B&PV Code, Section XI. Paragraph –3132.3(b) contains the statement that a "flaw is not considered to have grown if the size difference (from a previous examination) is within the measurement accuracy of the nondestructive examination (NDE) technique employed." The "measurement accuracy of the NDE technique employed" is not defined in the code case or in the ASME B&PV Code. Use of this terminology may result in a departure from the past practice when applying ASME B&PV Code, Section XI. Under the requirements of Section XI, one concludes that flaw growth has not occurred when a "previously evaluated flaw has remained essentially unchanged." The proposed condition uses this wording. This condition is necessary to clarify the requirements for determining whether flaw growth has occurred and make the requirements consistent with ASME B&PV Code requirements endorsed by the NRC in 10 CFR 50.55a.

Response:
In Code Case N-770-1, approved by the ASME on Dec. 25, 2009, Paragraph –3132.3(b) has been modified to read as follows:

Previously evaluated flaws that were mitigated by the techniques identified in Table 1 need not be reevaluated nor have additional or successive examinations performed if new planar flaws have not been identified or the previously evaluated flaws have remained essentially unchanged.

Adoption of Code Case N-770-1 would remove this condition.

Proposed Condition:
The NRC proposes to add a condition (§ 50.55a(g)(6)(ii)(F)(*6*)) on welds that are determined through a volumetric examination to have cracking that penetrates beyond the thickness of the inlay or cladding. The condition would require such welds to be reclassified as Inspection Item A–1, A–2, or B, as appropriate, until corrected by repair/ replacement activity in accordance with IWA–4000 or by corrective measures beyond the scope of Code Case N–770. Code Case N–770 would permit welds mitigated by inlay or cladding (i.e., onlay) in Inspection Items G, H, J, and K, to remain in those Inspection Items if cracking that penetrates through the thickness of the inlay or cladding occurs. The purpose of an inlay or cladding is to provide a corrosion resistant barrier between reactor coolant and the underlying Alloy 82/182 weld material that is susceptible to PWSCC. If cracking penetrates through the thickness of an inlay or cladding, the inspection frequencies of Inspection Items G, H, J, and K would no longer be appropriate even after satisfying the successive examination requirements of paragraph –2420. This condition is necessary because welds with cracking that penetrates beyond the thickness of the protective barrier of the inlay or cladding would no longer be mitigated and would need to be inspected under one of the Inspection Items for unmitigated welds.

Response:
Code Case N-770-1, approved by the ASME on Dec. 25, 2009, added the following to the end of Note 16(c):

If cracking penetrates beyond the thickness of the inlay or onlay, the weld shall be reclassified as Inspection Item A-1, A-2, or B, as appropriate, until corrected by repair/replacement activity in accordance with IWA-4000 or by corrective measures beyond the scope of this Case (e.g., stress improvement).

Adoption of Code Case N-770-1 would remove this condition.

Proposed Condition:
The NRC proposes to add a condition (§ 50.55a(g)(6)(ii)(F)(7)) on welds in Inspection Items G, H, J, and K, (welds mitigated by inlay or cladding) that the ISI surface examination requirements of Table 1 should apply whether the inservice volumetric examinations are performed from the weld outside diameter or the weld inside diameter. Code Case N–770 only requires a surface examination for welds in Inspection Items G, H, J, and K if a volumetric examination is performed from the weld inside diameter surface. A volumetric examination performed from the weld outside diameter surface would not be capable of detecting flaws in an inlay or cladding. This condition is necessary to ensure that weld inlays or cladding are still performing their intended function of providing a protective barrier between the reactor coolant and the underlying Alloy 82/182 weld that is susceptible to PWSCC.

Response:
Code Case N-770-1, approved by the ASME on Dec. 25, 2009, modified the "Extent and Frequency of Examination" column for Inspection Items G, H, J, and K in Table 1 to state:

".....Twenty-five percent of this population shall receive surface examination (17) performed from the weld inside surface and a volumetric examination (16) performed from either the inside or outside surface..... ."

Adoption of Code Case N-770-1 would remove this condition.

Proposed Condition:
The NRC also proposes, as part of a new condition as § 50.55a(g)(6)(ii)(F)(7), to require that all hot-leg operating temperature welds in Inspection Items G, H, J, and K (welds mitigated by inlay or cladding) be inspected each interval and that a 25 percent sample of cold leg operating temperature welds in Inspection Items G, H, J, and K be inspected whenever the core barrel is removed (unless it has already been inspected within the past 10 years) or 20 years, whichever is less. Code Case N–770 permits welds in Inspection Items G, H, J, and K to be placed in a 25 percent sample inspection program under certain conditions after the required initial inspection. The NRC has performed analyses of crack growth in welds mitigated by Alloy 52/152 inlay or cladding using experimentally derived crack growth data for this weld material. The results of those analyses show that welds in Inspection Items G, H, J, and K at hot leg temperature have to be examined once per interval and welds at cold leg temperature have to be inspected under a sample inspection program to detect potentially significant crack growth. This condition is being proposed to ensure that ASME Code allowable limits would not be exceeded and PWSCC would not lead to leaks or ruptures.

Response:
Code Case N–770 requires that a pre-service inspection and at least one inservice inspection be performed before a weld mitigated by inlay or onlay can be put in the 25% population. This would provide early crack detection and the detection of any fabrication induced cracks. Thereafter, the leading indicator approach is taken in that the hottest, most susceptible, welds are inspected each interval. If these show indications of new cracking or growth of existing cracks, then the additional and successive examination paragraphs of the Case would apply to expand the examination. This is consistent with the philosophy applied to all the other mitigation techniques employed in the Case.

The analysis performed by Battelle assumed that a crack was present and then grown in the inlay/onlay Alloy 690 material. However, no experimental data has identified the initiation of a PWSCC crack in Alloy 690 material. The performance of steam generator tubes made from Alloy 690 would also support the absence of PWSCC initiated cracks in this material. Steam Generator Alloy 600 tubing failures served as an early precursor to the PWSCC cracking of Alloy 600 weld materials (Alloy 82/182). Hence, with the absence of failure indications from the Steam Generator tubing and the performance of two inspections prior to placing the hot leg inlays and onlays in the 25% population, and the inspection of the most susceptible welds each interval (hot leg welds), this provides defense in depth for detection of future cracking without undue radiation exposure to inspection personnel and risk to plant equipment. Cold leg inspections are not justified until such time as flaws are discovered in the hot leg welds at which time inspection of cold leg inspections would be warranted based upon the data available at that time.

Application of condition § 50.55a(g)(6)(ii)(F)(7) is not warranted based upon the Alloy 690 operational experience and additional personnel radiation exposure associated with the increase in inspection frequency.

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Proposed Condition:
The NRC proposes to add a condition (§ 50.55a(g)(6)(ii)(F)(*8*)) to prohibit the first examination following weld inlay, cladding, or stress improvement for Inspection Items D, G, and H from being deferred to the end of the interval. Code Case N–770 provides requirements on the timing of the first examination following weld inlay, cladding, or stress improvement. Inspection Items D, G, and H pertain to mitigation of cracked welds and the timing of the initial examinations in the code case has been specified in the code case so that the welds are not in service for an extended time period prior to the initial examination. However, the code case does not explicitly preclude deferral of these examinations to the end of the interval. Therefore, this NRC condition is needed to ensure that the initial examinations of welds in Inspection Items D, G, and H take place on an appropriate schedule to verify the effectiveness of the mitigation process.

Response:
Code Case N-770-1, approved by the ASME on Dec. 25, 2009, modified Notes 11(b)(1) and (2) as follows:

11(b) Examinations of welds originally classified Table IWB-2500-1, Category B-F welds, Item Numbers B5.10, and B5.20 prior to mitigation, may be deferred following weld inlay, onlay, overlay, or stress improvement, as follows:

(1) Examination for Inspection Item C may be deferred to the end of the interval and performed coincident with the vessel nozzle examinations required by Category B-D.

(2) The first examinations following weld inlay, onlay, weld overlay, or stress improvement for Inspection Items E through K shall be performed as specified. For Inspection Item D, the first examinations following stress improvement may be performed any time within 10 years following mitigation. Subsequent examinations for Inspection Items D through K may be performed coincident with the vessel nozzle examinations required by Category B-D.

Adoption of Code Case N-770-1 would remove this condition.

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Proposed Condition:
The NRC proposes to add a condition (§ 50.55a(g)(6)(ii)(F)(*9*)) on Measurement or Quantification Criterion I–1.1 of Appendix I to require the assumption in the weld residual stress (WRS) analysis of a construction weld repair from the inside diameter to a depth of 50 percent of the weld thickness extending 360°around the weld. Measurement or Quantification Criterion I–1.1 does not specify the circumferential extent of the repair that must be assumed. This condition is necessary to clarify the size of the repair to be assumed in the weld residual stress analysis which would ensure that appropriate criteria for the WRS analysis are used for mitigation by stress improvement.

Response:
Code Case N-770-1, approved by the ASME on Dec. 25, 2009, modified paragraph I-1.1 to read as follows:

".....A pre-stress improvement residual stress condition resulting from a construction weld repair from the inside surface to a depth of 50% of the weld thickness and extending for 360 deg. shall be assumed."

Adoption of Code Case N-770-1 would remove this condition.

Proposed Condition:
50.55a(g)(6)(ii)(F)(*10*)) on Measurement or Quantification Criterion I–2.1 of Appendix I to require that the last sentence be replaced. This criterion was inappropriately worded since this criterion pertains to the permanence of a mitigation process by stress improvement and plastic ''shakedown'' rather than ''ratcheting'' is the phenomenon that could lead to stress relaxation. This condition is necessary to clarify the type of analysis necessary to ensure that the mitigation process is permanent and that the inspection frequencies associated with the process continue to be correct.

Response:
Code Case N-770-1, approved by the ASME on Dec. 25, 2009, modified paragraph I-2.1 to read as follows:

"....The analysis or demonstration test shall account for (a) load combinations that could relieve stress due to shakedown and (b) any material properties related to stress relaxation over time."

Adoption of Code Case N-770-1 would remove this condition.

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Proposed Condition:
The NRC proposes to add a condition (§ 50.55a(g)(6)(ii)(F)(*11*)) to require that in applying Measurement or Quantification Criterion I–7.1 of Appendix I, an analysis be performed using IWB–3600 evaluation methods and acceptance criteria to verify that the mitigation process will not cause any existing flaws to grow. Measurement or Quantification Criterion I–7.1 permits the growth of existing flaws in welds mitigated by stress improvement. This is an inappropriate provision since the process of mitigating by stress improvement is intended to prevent growth of existing flaws which could lead to leakage or rupture of the weld. This condition is necessary to ensure that stress improvement of welds with existing flaws is an effective mitigation technique consistent with the inspection frequency in the code case.

Response:
Code Case N-770-1, approved by the ASME on Dec. 25, 2009, modified paragraph I-7.1 to read as follows:

An analysis shall be performed using IWB-3600 evaluation methods and acceptance criteria to verify that the mitigation process will not result in any existing flaws to become unacceptable over the life of the weld, or before the next scheduled examination.
This wording will assure that stress improvement of welds with existing flaws is an effective mitigation technique consistent with the inspection frequency in the code case. It is also consistent with the Code Case methodology. If one were to assume that mitigations are effective and the flaws do not grow, why would subsequent examinations need to be performed other than for defense in depth?

Adoption of Code Case N-770-1 would remove this condition.

Proposed Condition:
The NRC proposes to add a condition (§ 50.55a(g)(6)(ii)(F)(*12*)) to require that the NRC be provided with a report if the volumetric examination of any mitigated weld detects new flaws or growth of existing flaws that exceed the acceptance standards of IWB–3514 and are found to be acceptable for continued service through an analytical evaluation or a repair or the alternative requirements of an ASME code case. The report would summarize the evaluation, along with inputs, methodologies, assumptions, and cause of the new flaw or flaw growth and would be provided to the NRC prior to the weld being placed in service. Welds that are mitigated have been modified by a technique, such as weld inlays, cladding, or stress improvement. Mitigation techniques are designed to prevent new flaws from occurring and prevent the growth of any existing flaws. If volumetric examination detects new flaws or growth of existing flaws in the required examination volume, the mitigation will not be performing as designed and the NRC will need to evaluate the licensee's actions to address the problem. Therefore, this condition is needed to verify the acceptability of the weld prior to being placed back in service.

Response:
Submittal of this report to the NRC is appropriate.

Proposed Condition:
The NRC proposes to add a condition (§ 50.55a(g)(6)(ii)(F)(*13*)) to require that the last sentence of the Extent and Frequency of Examination for Inspection Items C and F be revised. Inspection Items C and F apply to butt welds mitigated by full structural weld overlays of Alloy 52/152 material. Note 10 of the Code Case requires that welds in Inspection Items C and F that are not included in the 25 percent sample be examined prior to the end of the mitigation evaluation period if the plant is to be operated beyond that time. This condition would ensure that welds in the 25 percent sample are also examined prior to the end of the mitigation evaluation period; that is, prior to the end of life of the overlay predicted by the mitigation evaluation. Inspection prior to the end of the mitigation evaluation period is necessary to ensure that appropriate information has been obtained to verify the condition of the weld overlay and update the analysis for the predicted life of the weld overlay.

Response:
Code Case N-770-1, approved by the ASME on Dec. 25, 2009, added the following sentence to the Extent and Frequency of Examination for Inspection Items C and F:

For each overlay in the 25% sample that has a design life of less than 10 yr., at least one inservice inspection shall be performed prior to exceeding the life of the overlay.

Adoption of Code Case N-770-1 would remove this condition.

Proposed Condition:
50.55a(g)(6)(ii)(F)(*14*)) on the 1/2-inch (13 mm) dimension shown in Figures 2(b) and 5(b) of Code Case N–770. The condition would require that a dimension ''b'' be used instead of c inch, where ''b'' is equivalent to the nominal thickness of the nozzle or pipe being overlaid, as appropriate. The code case contains information on component thicknesses to be used in application of the acceptance standards of ASME B&PV Code, Section XI, IWB–3514, to evaluate flaws detected during preservice inspection of weld overlays. The 1/2-inch (13 mm) dimension shown in Figures 2(b) and 5(b) is nonconservative. The appropriate dimension is a function of the nominal thickness of the nozzle or pipe being overlaid and not a single specified value for all pipes and nozzles. This condition is necessary to ensure that acceptance standards used for evaluation of any flaws detected during preservice inspection of weld overlays assure an appropriate level of safety.

Response:
The suggested change to the ½ inch (13 mm) dimension shown in Figures 2(b) and 5(b) were recognized by the ASME Code committee as well as errors in these figures as well. A change to both the ½ inch dimension and the figures is required for continuity. Code Case N-770-1, approved by the ASME on Dec. 25, 2009, removed the 1/2-inch (13 mm) dimension and revised the Figures 2(b) and 5(b) of Code Case N–770 and replaced them with dimensions "X" and "Y". The notes beneath each figure define dimensions "X" and "Y" as follows:

Dimension "x" or "y" is equivalent to the nominal thickness of the nozzle end preparation or the pipe, respectively, being overlaid.

While the revised Code Case would address the proposed condition and errors in the figures, application of this condition could create a hardship on utilities that have already applied an overlay mitigation. Both the revised Code Case and the proposed 10CFR50.55a(g)(6)(ii)(F)(14) condition would extend the examination volume of an overlay in the axial direction beyond that required for existing weld overlay applications. The existing weld overlay applications may not be long enough to allow examiners to meet this inspection coverage requirement. To meet this inspection coverage requirement for an existing weld overlay, the application of additional weld metal during an upcoming outage may be required. This activity would not provide any increase in the safety or integrity of the mitigated weld joint commensurate with the risk to plant equipment and personnel exposure.

It is recommended that this condition be revised to specify that pre-existing weld overlays shall be examined to the specified volume, or the extent possible/practicable with all limitations to coverage noted by examiner.

Proposed Condition:
The NRC proposes to add a condition (§ 50.55a(g)(6)(ii)(F)(*15*)) on the use of the acceptance standards of ASME B&PV Code, Section XI, IWB–3514, for evaluating indications in inlays or onlays. The proposed condition specifies that the thickness "t" in IWB–3514 is the thickness of the inlay or onlay. The code case requires that the preservice examination for inlays or onlays consist of a surface examination, which does not allow planar flaws, and a volumetric examination. The volumetric examination allows the use of the acceptance standards of IWB–3514 provided the surface examination acceptance standards are satisfied. That is, it would allow the acceptance of some subsurface indications, but IWB–3514 acceptance standards would only allow very small flaws. However, the code case does not specify the value "t" to be used in the application of IWB–3514. The appropriate value "t" when applying IWB–3514 to inlays or onlays is the thickness of the inlay or onlay, since the acceptance standards in this case only apply to accepting flaws within the inlay or onlay. This condition is necessary to preclude the misapplication of the acceptance standards of IWB–3514 and potential acceptance of flaws that could compromise the integrity and function of the inlay or onlay as a protective barrier.

Response:
In a typical inlay/onlay mitigation application, no structural credit is taken for the inlay/onlay material or thickness which is the intent of the acceptance standards contained in IWB-3514 and therefore should not be applied to the inlay or onlay.

The requirement for a surface examination addresses the ID surface integrity of the Alloy 690 material which is used to isolate the Alloy 82/182 material from the Primary Water thus mitigating the PWSSC situation. If a sub-surface flaw were to exist in an inlay or onlay it does not compromise the integrity of the protective barrier.

Proposed Condition:
The NRC proposes to add a condition (§ 50.55a(g)(6)(ii)(F)(*16*)) on welds mitigated by stress improvement by welding in Inspection Items D and E to not permit them to be placed into a population to be examined on a sample basis after the initial examination. Stress improvement by welding is also called an optimized weld overlay. Code Case N–770 permits welds mitigated by this technique to be placed in a 25 percent inspection sample after the initial examination. Sample inspections could result in three-quarters of the welds never being examined after the initial examination. Although full structural weld overlays have been used extensively in the nuclear industry for many years, the industry does not have experience with optimized weld overlays. Optimized weld overlays are designed to rely on the outer 25 percent of the original Alloy 82/182 material to satisfy the design margins and would not satisfy design margins if significant cracking were to occur. If significant cracking were to occur in the Alloy 82/182 material, the optimized weld overlay material would prevent the weld from leaking and could potentially rupture without prior evidence of leakage under design basis conditions. The proposed condition is necessary to ensure that all optimized weld overlays are periodically inspected for potential degradation.

Response:
Code Case N–770 requires that a pre-service inspection and at least one inservice inspection be performed before a weld mitigated by an optimized overlay can be put in the 25% population. This would provide early crack detection and the detection of any fabrication induced cracks. Thereafter, the leading indicator approach is taken in that the hottest, most susceptible, welds are inspected each interval. These inspections would demonstrate the effectiveness of the stress improvement on the weld joint similar to philosophy applied to the mechanical stress improvement process. If these show indications of new cracking or growth of existing cracks, then the additional and successive examination paragraphs of the Case would apply to expand the examination. This is consistent with the philosophy applied to all the other mitigation techniques employed in the Case.

It seems inappropriate to penalize stress improvement by welding (OWOL) when all stress improvement techniques rely on the appropriate application of the process to impart a compressive stress to the region of interest thus stopping growth or initiation of a PWSCC flaw. Once the compressive stress has been imparted there is no reason to believe that a stress improvement by welding would be any more susceptible to flaw initiation or growth following application than any other means of stress improvement.

This condition is unnecessary and the Code Case should be followed.

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Rulemaking Comments

From: Ma, Jennifer [jma@epri.com]
Sent: Thursday, July 15, 2010 6:49 PM
To: Rulemaking Comments
Cc: Ahluwalia, Kawaljit; Terry McAlister; William Sims; Jim Riley; Harrington, Craig
Subject: MRP 2010-042: Docket ID NRC-2008-0554: Comments to Proposed Rulemaking on Code Cases N-722-1 and N-770 Conditions
Attachments: MRP 2010-042.pdf

MRP Materials Reliability Program MRP 2010-042

(via email)

Secretary
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
ATTN: Rulemakings and Adjudications Staff

Subject: Docket ID NRC–2008–0554
Comments to Proposed Rulemaking on Code Cases N-722-1 and N-770 Conditions

Reference:

1. NRC Proposed Rulemaking for 10 CFR 50.55a(g)(6)(ii)(E), "Reactor Coolant Pressure Boundary Visual Inspections", dated May 4, 2010
2. NRC Proposed Rulemaking for 10 CFR 50.55a(g)(6)(ii)(F), "Examination Requirements for Class 1 Piping and Nozzle Dissimilar-Metal Butt Welds", dated May 4, 2010

Dear Sir or Madam:

This attachment to this letter provides EPRI Materials Reliability Program comments on the subject proposed rulemaking specific to Code Cases N-722-1 and N-770.

Should you have any questions please contact me at 817-897-1433.

Sincerely,

Craig Harrington
EPRI MRP Project Manager

cc: Al Ahluwalia, EPRI
Terry McAlister, SCANA
William Sims, Entergy
Jim Riley, NEI

Received: from mail1.nrc.gov (148.184.176.41) by OWMS01.nrc.gov
(148.184.100.43) with Microsoft SMTP Server id 8.1.393.1; Thu, 15 Jul 2010
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on Code Cases N-722-1 and N-770 Conditions
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From: "Ma, Jennifer" <jma@epri.com>
To: <Rulemaking.Comments@nrc.gov>
CC: "Ahluwalia, Kawaljit" <kahluwal@epri.com>,
"Terry McAlister" <tmcalister@scana.com>,
"William Sims" <wsims@entergy.com>,
"Jim Riley" <jhr@nei.org>,
"Harrington, Craig" <charrington@epri.com>
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