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OFFICE OF SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

Attn: Rulemaking, Directives, and Editing Branch
Office of Administration
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
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Subject: ASME Comments on Draft Regulatory Guides DG-1191, DG -1192, DG-1193, and the Proposed Rule Incorporating the Final Revisions of these Regulatory Guides into 10 CFR 50.55a

References:

1. Draft Regulatory Guide DG-1191, (Proposed Revision 35 of Regulatory Guide 1.84, dated October 2007), Design, Fabrication, and Materials Code Case Acceptability, ASME Section III, April 2009, Division 1, (ADAMS Accession No. ML080910389)

2. Draft Regulatory Guide DG-1192, (Proposed Revision 16 of Regulatory Guide 1.147, dated October 2007), Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1, June 2009, Division 1, (ADAMS Accession No. ML090900445)

3. Draft Regulatory Guide DG-1193, (Proposed Revision 3 of Regulatory Guide 1.193), ASME Code Cases Not Approved For Use, April 2009, Division 1, (ADAMS Accession No. ML080920854)

4. Proposed Rule, *Federal Register, Vol. 74, No. 104, pp.* 26303-26310, Tuesday, June 2, 2009, 10 CFR Part 50, RIN 3150-A137, {NRC 2009-0014}, Incorporation by Reference of Regulatory Guide 1.84, Revision 35, and Regulatory Guide 1.147, Revision 16, Into 10 CFR 50.55a

Dear Sir or Madam:

ASME is pleased to have the opportunity to provide comments and suggestions on its Nuclear Code Cases listed in Draft Regulatory Guides DG-1191, DG-1192, and DG-1193, contained in References 1 through 3, and the Proposed Rule to implement these Regulatory Guides into 10 CFR 50.55a, Reference 4.

Specifically, ASME supports NRC's endorsement of its Nuclear Code Cases and the NRC's continued effort in this area to complete these updates and rulemakings on a regular basis. However, it is believed that not all the conditions placed on the use of some of these Code Cases, along with the unacceptability status of others, is completely warranted and should be reconsidered based on the information provided in this letter.

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As a general comment for correction to the Proposed Rule, Reference 4, there is an error in Table 1, on page 26305. The titles of Code Cases N-712 and N-730 have been inadvertently switched and this should be corrected. **Code Case N-712**, is actually titled: *"Class 1 Socket Weld Examinations, Section XI, Division 1,"* and **Code Case N-730** is titled: *"Roll Expansion of Class 1 Control Rod Drive Bottom Head Penetrations in Boiling Water Reactors BWRs, Section XI, Division 1."*

Section III Code Cases in DG-1191, Reference 1, - ASME has several comments on the Staff's conditional acceptability of **Code Case N-71-18** that is currently listed in Revision 34 of Regulatory Guide 1.184 and is proposed to be incorporated in Revision 35 of Regulatory Guide 1.84 with this DG.

- **Code Case N-71-18**, *"Additional Materials for Subsection NF, Class 1, 2, 3, and MC Component Supports Fabricated by Welding, Section III, Division 1,"* December 8, 2000

  NRC Conditions

  (1) The maximum measured ultimate tensile strength (UTS) of the component support material must not exceed 170 Ksi in view of the susceptibility of high-strength materials to brittleness and stress corrosion cracking.

  (2) Certain applications may exist where a UTS value of up to 190 Ksi could be considered acceptable for a material and, under this condition, the Design Specification must specify impact testing for the material. For these cases, it must be demonstrated by the applicant that: the impact test results for the material meet Code requirements,

  (a) the impact test results for the material meet Code requirements,
  (b) the material is not subject to stress corrosion cracking by virtue of the fact that:
  (i) a corrosive environment is not present, and
  (ii) the component that contains the material has essentially no residual stresses or assembly stresses, and
  (iii) it does not experience frequent sustained loads in service.

  (3) In the last sentence of paragraph 5.3, reference must be made to paragraph 4.5.2.2, "Alternative Atmosphere Exposure Time Periods Established by Test," of the AWS D1.1 Code for the evidence presented to and accepted by the Authorized Inspector concerning exposure of electrodes for longer periods of time.

  (4) Paragraph 16.2.2 is not acceptable as written and must be replaced with the following: When not exempted by 16.2.1 above, the postweld heat treatment must be performed in accordance with NF-4622 except that ASTM A-710 Grade A Material must be at least 1000°F (540°C) and must not exceed 1150°F (620°C) for Class 1 and Class 2 material and 1175°F (640°C) for Class 3 material.

(5) The new holding time at temperature for weld thickness (nominal) must be 30 minutes for 2 inch or less, 1 hour per inch for thickness over 2 inch to 5 inches, and for thicknesses over 5 inches, 5 hours plus 15 minutes for each additional inch over 5 inches.

(6) The fracture toughness requirements as listed in this Code Case apply only to piping supports and not to Class 1, Class 2, and Class 3 component supports.

ASME Comments - The reference in paragraph 5.3 in condition (3) is incorrect since this paragraph is not part of Code Case N-71-18. The requirements for weld filler material hydrogen content are now in paragraph 4.2.

In condition (4) the reference to paragraph 16.2.2 is also incorrect since this paragraph is not part of N-71-18. The correct reference should be 15.2.2.

Finally, in condition (6) the statement that the fracture toughness requirements as listed in this Code Case apply only to piping supports and not to Class 1, Class 2, and Class 3 component supports appears to be in error. The Case addresses component supports and provides appropriate fracture toughness criteria.

ASME Conclusion – Although the current conditions that are shown in DG-1191, Reference 1, may have been appropriate to an earlier revision of Code Case N-71-18, they are not appropriate to Revision 18 as it is written today. The Staff should review the current Code Case N-71-18 and correct or remove the NRC conditions on this Case, as appropriate.

Section XI Code Cases in DG-1192, Reference 2, including the regulatory discussion contained in the Proposed Rule, Reference 4, - ASME has several comments on the acceptance and conditions placed on **Code Cases N-416-4, N-504-4, N-661-1, N-751,** and is requesting expedited approval of **Code Case N-513-3,** which is not currently included in DG-1192.

- **Code Case N-416-4**, "*Alternative Pressure Test Requirement for Welded or Brazed Repairs, Fabrication Welds or Brazed Joints for Replacement Parts and Piping Subassemblies, or Installation of Replacement Items by Welding or Brazing, Classes 1, 2, and 3, Section XI, Division 1,*" January 12, 2005

  NRC Proposed Condition - Nondestructive examination shall be performed on welded or brazed repairs and fabrication and installation joints in accordance with the methods and acceptance criteria of the applicable subsection of the 1992 Edition of Section III. (Note: Code Case N-416-3 was unconditionally approved in Revision 15 to Regulatory Guide 1.147)

  ASME Comments - The NRC proposes the condition above to require that when using Code Case N-416-4 that nondestructive examination is performed for welded or brazed repairs and fabrication and installation joints in accordance with the methods and acceptance criteria of the applicable subsection of the 1992 Edition of Section III.

There are two corrections to be made to the discussion in the Proposed Rule, Reference 4, Paragraph 4.6, Code Case N-416-4 [S1], on page 26306, the third paragraph, and last sentence.

"In as much as the NRC believes that a ~~hydrostatic pressure~~ **system leakage** test would not be effective in this situation, the more rigorous NDE ~~requirements~~ **methods and acceptance criteria** of Section III must be performed (as is currently required by N-416-3)."

The NRC basis for the condition is that some Construction Codes are less rigorous than others, depending on when the provisions were developed. The NRC believes that to compensate for the substitution of a system leakage test for the hydrostatic test, additional NDE should be required in instances where components subject to the provisions of older codes are not required to receive the same amount of NDE as Section III. It is the NRC's position that a system leakage pressure test does not provide an equivalent level of safety as a hydrostatic pressure test. The higher pressure of the hydrostatic pressure test would make any potential leakage more evident than if a system leakage test was performed, particularly in the case of smaller defects.

ASME Conclusion - ASME disagrees with this position. This Code Case should be accepted in DG-1192, Reference 2 with no conditions and then placed in Revision 16 of Regulatory Guide 1.147 for unrestricted use by the industry.

When Code Case N-416-1 was developed and approved by ASME on February 15, 1994, some 15 years ago, it eliminated the requirement for the hydrostatic test. The justification presented at the time of the change was that the difference in the ability to identify leakage during a hydrostatic test as compared with a system leakage test was negligible. An analytical comparison of the two tests was presented which showed that the increased stress from the hydrostatic test was extremely unlikely to cause a subsurface defect to grow to a through-wall defect and then to show leakage during the test. For those defects that were already through-wall, the stresses involved in a hydrostatic test were similarly unlikely to show leakage in a flaw that would otherwise not show leakage at system pressure.

The ASME Committee on Nuclear Inservice Inspection, Section XI, also conducted an industry survey of historical test results that identified only one case in which a small amount of leakage occurred at the hydrostatic test pressure and not at the lower system leakage test pressure. The survey results, though not totally definitive, largely confirmed the results of the analysis presented. It was therefore concluded that the hydrostatic pressure test, which creates a significant hardship in an operating nuclear power plant, could be suitably replaced by a system pressure test. The hardship is not compensated for by the slight increase in assurance of leak-tightness of the weld or brazed joint due to the higher hydrostatic test pressure.

The NRC makes the argument in the Proposed Rule, Reference 4, that it's the NDE requirements not being performed by various other acceptable Construction Codes which is the concern.

Requiring the use of the Section III NDE methods and acceptance criteria in lieu of normally used Construction Code requirements, which have been approved for use at older plants to offset the proposed reduction in test pressure by not performing a hydrostatic test, is not warranted. Although there was not a sound basis for adding the additional Section III examination requirements in the 1999 Addenda when the Case was first incorporated into Section XI, it was done as a compromise only to satisfy the aforementioned NRC concerns. In retrospect, those additional requirements were considered to be over-conservative, and have since been removed. However, the NRC continues to mandate the use of Section III NDE methods and acceptance criteria as conditional requirements in this Case and in 10 CFR 50.55a on later Editions and Addenda of Section XI. These conditional requirements are not necessary and should not be applied to Code Case N-416-4 or to the regulation.

- **Code Case N-504-4**, "*Alternative Rules for Repair of Class 1, 2, and 3 Austenitic Stainless Steel Piping, Section XI, Division 1,*" July 14, 2006

  NRC Proposed Conditions - The provisions of Section XI, Nonmandatory Appendix Q, "Weld Overlay Repair of Class 1, 2, and 3 Austenitic Stainless Steel Piping Weldments," must also be met. In addition, the following conditions shall be met: (a) the sum of laminar flaw length in any direction shall be less than 10% of the overlay with a total reduction in area equal to or less than Table IWB-3514-3; (b) the finished overlay surface shall be 250 micro-in (6.3 micrometers) root mean square or smoother; (c) the surface flatness shall be adequate for ultrasonic examination; and (d) radiography shall not be used to detect planar flaws under or masked by laminar flaws. (Note: Code Case N-504-3 was conditionally approved in Revision 15 to Regulatory Guide 1.147)

  ASME Comments - Code Case N-504-3 was conditionally accepted in Revision 15 of Regulatory Guide 1.147. The NRC has determined that Code Case N-504-4 is acceptable with the same condition. Revision 15 of Regulatory Guide 1.147 states:

  "The provisions of Section XI, Nonmandatory Appendix Q, "Weld Overlay Repair of Class 1, 2, and 3 Austenitic Stainless Steel Piping Weldments, must also be met."

  However, the proposed conditions that are now in DG-1192, Reference 2, for the use of Code Case N-504-4 are much more extensive than what was in Revision 15 of Regulatory Guide 1.147 in that they now include the following:

  In addition, to requiring the use of Nonmandatory Appendix Q the following conditions shall be met: "*(a) the sum of laminar flaw length in any direction shall be less than 10% of the overlay with a total reduction in area equal to or less than Table IWB-3514-3; (b) the finished overlay surface shall be 250 micro-in (6.3 micrometers) root mean square or smoother; (c) the surface flatness shall be adequate for ultrasonic examination; and (d) radiography shall not be used to detect planar flaws under or masked by laminar flaws.*"

  As stated in the Proposed Rule paragraph 4.6, Code Case N-504-4 [S10], on page 26306 of Reference 4, the NRC makes the statement that, "The NRC has determined that N-504-4 is acceptable with the same condition," approved in

Revision 15 of Regulatory Guide 1.147. This condition requires the use of Nonmandatory Appendix Q, but it does not specify the Edition or Addenda of Section XI where Nonmandatory Appendix Q is acceptable for use. Currently the latest Edition and Addenda of Section XI included in 10 CFR 50.55a is the 2004 Edition and does not contain Nonmandatory Appendix Q. It was not included in Section XI until the 2005 Addenda and later Editions and Addenda now up to the published 2008 Addenda. Licensees that used Code Case N-504-3 had to resolve this issue with the NRC on a case by case basis. To continue to condition Code Case N-504-4 without a specified reference to which Section XI Edition or Addenda Nonmandatory Appendix Q is to be used needs to be resolved, but ASME believes that the entire condition is unnecessary.

Additionally, Code Case N-504-4 as listed in DG-1192, Reference 2, includes conditions being proposed that are not mentioned in the Proposed Rule, Reference 4. There should be some explanation to both ASME and the public for the additional conditions included in the Proposed Rule.

In regards to the new added condition *"(a) the sum of laminar flaw length in any direction shall be less than 10% of the overlay with a total reduction in area equal to or less than Table IWB-3514-3."* – This condition appears to be related to a change made to Code Case N-740 during committee discussions. There is no technical need to for this condition on N-504-4. The limitations on laminar flaw size, and the acceptance criteria of the assumed planar flaw below the laminar flaw, are more conservative than the proposed limitation. Code Case N-504-4 requires that the assumed planar flaw meet the inservice acceptance criteria of Table IWB-3514-2. This requirement effectively restricts the maximum size of the laminar flaw to a relatively small size. In comparison, in N-740, where the wording of this proposed limitation first appears, the assumed flaw may be evaluated for acceptability in accordance with IWX-3600. Using the flaw evaluation procedures of IWX-3600 would permit a larger assumed planar flaw to be acceptable, and therefore permit larger laminar flaws in the weld overlay. The N-504-4 requirement for the assumed planar flaw to meet the inservice acceptance criteria of Table IWB-3514-2 makes the proposed limitation unnecessary.

For the new added conditions *"(b) the finished overlay surface shall be 250 micro-in (6.3 micrometers) root mean square or smoother."* and *"(c) the surface flatness shall be adequate for ultrasonic examination."*– These proposed conditions are redundant to existing requirements. Code Case N-504-4 identifies "Grinding and machining of the as-welded overlay surface may be used to improve the surface finish for such examinations..." and these words would apply to ultrasonic test (UT) examinations. Additionally, since the September 22, 1999 revisions of 10 CFR50.55a, licensees are required to follow the Performance Demonstration requirements of Appendix VIII. This included implementing Supplement 11, 'Qualification Requirements for Full Structural Weld Overlaid Wrought Austenitic Piping Welds,' by 11/22/2001. The weld overlay examination procedures qualified through the Electric Power Research Institute Performance Demonstration Initiative program contain the appropriate surface finish and flatness requirements. Therefore, the proposed limitations are already addressed by the Appendix VIII qualified UT procedure which would be used following application of a Code Case N-504-4 weld overlay.

For the last added new condition *"(d) radiography shall not be used to detect planar flaws under or masked by laminar flaws."* – There is no technical basis for restricting the use of radiographic examination (i.e., the Construction Code approved volumetric examination for deposited weld metal) used to verify the absence of construction type flaws in the deposited weld metal of the overlay. The radiographic method is extremely effective in detecting the radial planar flaws in welds. This examination is not being used to find or accept inservice type flaws and is only an alternative to assuming radial planar flaws that might be masked by a laminar flaw in the weld overlay. This provision was added to N-504-4 because assuming a planar flaw in the uninspectable volume below a laminar flaw was very conservative and represented a very large penalty for a structurally insignificant flaw. The conditional restriction against using the radiographic examination method, accepted by the Construction Code for examination of weld metal, should not be imposed on Code Case N-504-4.

ASME Conclusion - Therefore, ASME concludes that the original condition that was placed on the use of Code Case N-504-3 to use Nonmandatory Appendix Q and the newly added conditions to Code Case N-504-4 should not be required and should be removed from DG-1192, Reference 2 and then the Case should be included in Revision 16 of Regulatory Guide 1.147 for unrestricted use by the industry.

- **Code Case N-661-1**, "*Alternative Requirements for Wall Thickness Restoration of Class 2 and 3 Carbon Steel Piping for Raw Water Service, Section XI, Division 1,*" October 11, 2005

NRC Proposed Conditions – As with Code Case N-504-4 there is an inconsistency between DG-1192, Reference 2, where this Code Case is listed as acceptable without conditions and where the Proposed Rule, Reference 4, paragraph 4.6, Code Case N-661-1 [S7], on page 26306, where the NRC makes the statement that they are proposing to retain conditions (a) and (c) of the following three conditions for Code Case N-661 that were included in Revision 15 of Regulatory Guide 1.147.

(a) If the root cause of the degradation has not been determined, the repair is only acceptable for one cycle.
(b) Weld overlay repair of an area can only be performed once in the same location.
(c) When through-wall repairs are made by welding on surfaces that are wet or exposed to water, the weld overlay repair is only acceptable until the next refueling outage.

The discussion goes on to say that for condition (a) the term "one cycle" will be replaced with "next refueling outage" to remove potential ambiguity and that condition (b) will be deleted due to changes made in the Code Case, and that condition (c) will remain.

ASME Comment – DG-1192, Reference 2, needs to be corrected with the proposed conditions that are described in the Proposed Rule, Reference 4, but only if the NRC decides to maintain these conditions. Code Case N-661-1, does have requirements in paragraph 7(b) that addresses condition (a) and also in paragraph 4(c) that addresses condition (c). The only issue with this Code Case that is

discussed in the Proposed Rule is the potential for the misuse of the terms "one fuel cycle, two fuel cycles, or once per fuel cycle" as used in the Case.

ASME Conclusion - Adding a condition to clarify the terms associated with a cycle used in this Case mean a "refueling outage" is the only issue that needs to be considered for the approval of this Case.

- **Code Case N-751**, "*Pressure Testing of Containment Penetration Piping, Section XI, Division 1,*" August 3, 2006

  NRC Proposed Condition - When a 10 CFR 50, Appendix J, Type C test is performed as an alternative to the requirements of IWA-4540 (IWA-4700 in the 1989 edition through the 1995 edition) during repair and replacement activities, nondestructive examination must be performed in accordance with IWA-4540(a)(2) of the 2002 Addenda of Section XI.

  ASME Comment – The specific content of the 2002 Addenda in IWA-4540(a)(2) which is the subject of this proposed NRC condition reads as follows:

  "IWA-4540(a)(2)(a) - The nondestructive examination method and acceptance criteria of the 1992 Edition or later of Section III shall be met prior to return to service."

  This condition cites the same requirements that have caused a problem with the acceptance of Code Case N-416-4. Essentially, when these words were removed in the 2003 Addenda other requirements in IWA-4000 were added that specifically address meeting the Construction Code for repair/replacement activities. The Construction Code may or may not require NDE which may include volumetric examination and neither does Section III require volumetric examination in all cases. This Code Case provides an option to determine by an Appendix J, Type C test whether or not there is weld or brazed joint leakage and thus NDE is not necessary to make this determination.

  ASME Conclusion - The NRC's acceptance of many licensee's design requirements, which may or may not include requirements for NDE of piping welds in penetrations that were designed to B31.1, or any other Construction Code that does not specifically require NDE for certain pipe sizes, should continue to apply and the presence or absence of specific NDE requirements should not be a reason to condition this Code Case.

- **Code Case N-513-3**, - Special request for expedited inclusion into Revision 16 of Regulatory Guide 1.147.

  ASME Request - Table 1 of the current Revision 15 of Regulatory Guide 1.147 and DG-1192, Reference 2, lists Code Case N-513-2, *"Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping, Section XI, Division 1,"* February 20, 2004 as acceptable for use with no conditions. Thus, this Code Case is fully acceptable to the Staff with no conditions required for its use.

Recently, in October 2008, 10 CFR 50.55a was changed to require the use of the 2004 Edition of Section XI as the latest approved and mandated version of Section XI in 10 CFR 50.55a. Within the 2004 Edition of Section XI, the following requirement exists:

"IWA-2441(b) Code Cases shall be applicable to the Edition and Addenda specified in the Inspection Plan."

For Licensees that have updated their ISI plans to meet the 2004 Edition of Section XI, they are no longer allowed to use Code Case N-513-2. The Code applicability for Code Case N-513-2 is limited to the 2003 Addenda of Section XI.

To resolve this issue ASME has just recently published Code Case N-513-3 in Supplement 8 of the ASME Nuclear Code Cases Book and this revision now includes applicability up to the 2008 Addenda of Section XI alleviating the applicability issue from the ASME perspective.

However, because Code Case N-513-3 was just recently published by ASME it was not included in the proposed DG-1192, Reference 2. This letter is a request to expedite the approval of Code Case N-513-3 into DG-1192 and ultimately into Revision 16 of Regulatory Guide 1.147 Rev. 16.

The first reason to allow this expedited approval of Code Case N-513-3 is to resolve the administrative applicability issue described above. The Code Case regardless of its revision has been proven to be a very valuable tool for the nuclear industry and the NRC in allowing flaws to be evaluated without plant specific and item specific relief requests being required. Use of this Code Case is an example of providing an acceptable alternative, while reducing burden on both the industry and the NRC, and at the same time maintaining an acceptable level of quality and safety as required under 10 CFR 50.55a(a)(3)(i). Additionally, in support of how valuable this Code Case is, it is currently included in the Regulatory Issue Summary (RIS) 2005-20, Rev. 1, "Revision to NRC Inspection Manual Part 9900 Technical Guidance, "Operability Determinations & Functionality Assessments for Resolution of Degraded or Nonconforming Conditions Adverse to Quality and Safety." The reference in this RIS allows the use of the original version of Code Case N-513 and future revisions of this Case as they are approved for use in Regulatory Guide 1.147.

Secondly, not only was there an effort to increase the applicability of Code Case N-513-2 with its revision to N-513-3, but it was also revised to clear up some ambiguity in Code Case N-513-2. The documented statement for the revision of Code Case N-513-2 within ASME said, in part, it included:

"The proposed revision to Code Case N-513-2 provides significant clarifications for the user regarding the evaluation of through-wall, nonplanar flaws which is the flaw type most commonly dispositioned by the Code Case. Currently, no guidance is provided for nonplanar flaw combination and the two approaches for the evaluation of through-wall, nonplanar flaws (branch reinforcement and planar characterization) are not entirely clear. More specifically, the current branch reinforcement evaluation approach (based on ASME Section III Class 2 and 3 rules) provides an ambiguous

acceptability criterion. The proposed revision to Code Case N-513-2 resolves this issue by specifying the required area of reinforcement be calculated in accordance with Class 1 rules (acceptance criteria provided in new equation in revision). Also, the depth at which a through-wall, nonplanar flaw is characterized for planar evaluation in both the axial and circumferential directions is made less restrictive in the proposed revision to account for NDE inspection capabilities."

ASME Conclusion – For the reasons explained above it is requested with this letter that Code Case N-513-3 be included in DG-1192, Reference 2, and ultimately accepted in Revision 16 of Regulatory Guide 1.147.

Code Cases Not Approved for Use in DG-1193, Reference 3 – Although, on page 26307 of the Proposed Rule, Reference 4, the NRC did not seek public comments on Code Cases listed in DG-1193, Reference 3, ASME would like to address with comments the unacceptable status of **Code Cases N-702 and N-747** that are contained in the DG.

- **Code Case N-702**, *"Alternative Requirements for Boiling Water Reactor (BWR) Nozzle Inner Radius and Nozzle-to-Shell Welds, Section XI, Division 1,"* February 20, 2004

  NRC Summary Statement – The Electric Power Research Institute (EPRI) proprietary report, "BWR Vessel and Internals Project, Technical Basis for the Reduction of Inspection Requirements for the Boiling Water Reactor Nozzle-to-Vessel Shell Welds and Nozzle Inner Radius (BWRVIP-108)," is the technical-basis document for Code Case N-702. EPRI is revising the report based on NRC staff review of the report and supplementary information provided by the BWRVIP (See letter dated December 19, 2007, ML073600374; Ref. 12). The NRC will reconsider the status of Code Case N-702 after receipt of the revised report.

  ASME Comment – EPRI informed the NRC via letter dated November 21, 2007 that the report is non-proprietary and is available to the public. The report is cited as BWRVIP-108NP. The referenced NRC letter provides the Staff's Safety Evaluation (SE) for the report. Although it is true that EPRI is working with the NRC to revise the report to address limitations that are included in the SE, the SE does provide for use of Code Case N-702 via a relief request provided the licensee can show that certain criteria are met. Use of N-702 will provide significant benefit to the industry in that it results in substantial dose reduction. As such, use of the Case should be facilitated by incorporation of the Case within RG 1.147 as a conditionally accepted Code Case, with the criteria given in the SE being the conditions included for BWR recirculation inlet and outlet nozzles only. All other nozzles are exempt unless otherwise stated in Code Case N-702.

  Conditions to be added from the SE of the BWRVIP-108NP report to this Case:

  (1) the maximum RPV heatup/cooldown rate is limited to less than 115 °F/hour;

  For recirculation inlet nozzles

  (6) $(pr/t)/C_{RPV} < 1.15$

p = RPV normal operating pressure,
r = RPV inner radius,
t = RPV wall thickness, and
C_{RPV} = 19332 (i.e., 1000 psi x 110 inch/5.69 inch, based on the BWRVIP-108 recirculation inlet nozzle/RPV FEM model);

(7) $[p(r_o^2 + r_i^2) / (r_o^2 - r_i^2)] / C_{NOZZLE} < 1.15$

p = RPV normal operating pressure,
r_o = nozzle outer radius,
r_i = nozzle inner radius, and
C_{NOZZLE} = 1637 [i.e., 1000 psi x $(13.988^2 + 6.875^2) / (13.988^2 - 6.875^2)$], based on the BWRVIP-108 recirculation inlet nozzle/RPV FEM model];

For recirculation outlet nozzles

(8) $(pr/t)/C_{RPV} < 1.15$

p = RPV normal operating pressure,
r = RPV inner radius,
t = RPV wall thickness, and
C_{RPV} = 16171 (i.e., 1000 psi x 113.2 inch/7.0 inch, based on the BWRVIP-108 recirculation outlet nozzle/RPV FEM model); and

(9) $[p(r_o^2 + r_i^2) / (r_o^2 - r_i^2)] / C_{NOZZLE} < 1.15$

p = RPV normal operating pressure,
r_o = nozzle outer radius,
r_i = nozzle inner radius, and
C_{NOZZLE} = 1977 [i.e., 1000 psi x $(22.31^2 + 12.78^2) / (22.31^2 - 12.78^2)$], based on the BWRVIP-108 recirculation outlet nozzle/RPV FEM model].

ASME Conclusion – The use of this Case has benefit to the industry and consideration should be given to allowing this Case to be accepted for use with the conditions described above. These conditions should be included in DG-1192, Reference 2, and ultimately accepted for use in Revision 16 of Regulatory Guide 1.147 and then the Case should be removed from Revision 3 of Regulatory Guide 1.193.

- **Code Case N-747**, *"Reactor Vessel Head-to Flange Weld Examinations, Section XI, Division 1,"* January 13, 2006

NRC Summary Statement - Alternatives to current ISI requirements that use a probabilistic risk assessment (PRA) as a basis must initially be submitted as a risk-informed ISI program relief request in accordance with 10 CFR 50.55a(a)(3)(i), i.e., on a plant-specific basis and not on a generic basis.

As a general comment, the NRC staff finds that the technical basis is too qualitative. Three specific issues are provided to highlight additional concerns. First, no supporting fluence assessment or documentation to establish a conservative

neutron fluence estimate for these welds and a conservative RT_{NDT} value for the welds is provided. Thus, there is no data to support a conclusion that the fracture toughness is low. Second, the methods in Appendix G to Section XI apply only to pressure-temperature limit methods and not to ISI inspection requirements. Third, the technical basis appears to credit $K\text{-}1_C$ twice - once to support the fracture toughness analysis and again in the Section XI Appendix A flaw growth analysis.

ASME Comments – Although the NRC has placed this Code Case in DG-1193, Reference 3, as a Case that is not acceptable for generic use because it uses a PRA as part of the basis for its acceptability, ASME does not agree. The ["White Paper", Technical Basis] for the Code Case discusses how improvements have been made with Risk-Informed ISI, but it never actually uses a PRA as such to support this Code Case nor does the Code Case itself require the use of a PRA.

The NRC evaluation seems to apply insufficient insight to the fundamental basis for this Code Case, which is the stress distribution in the upper head to flange weld region. The highest stresses are on the outside surface of the head, which makes the most likely location for a flaw to grow on the outside surface, and thus an OD surface exam makes good technical sense.

The upper head region of either a BWR or a PWR is far removed from the core region, and therefore the fluence level there is negligible. Because this fact has been previously well established additional extensive documentation does not appear warranted. The fluences have been calculated for all the irradiated regions of a PWR, from the core region up to the inlet and outlet nozzle regions. After 60 years of service, the maximum fluence in this region was calculated as 10^{17} n/cm^2. Since the upper head region is farther away from the core than the nozzles, the fluence will be less than 10^{17} n/cm^2.

Because the fluence is very low, there is no irradiation induced change in RT_{NDT}. There is, of course, a variation in RT_{NDT} in these regions from plant to plant, but a reasonable and conservative upper bound for RT_{NDT} would be 60°F. Although a complete list is not available for all plants, Westinghouse reviewed the Certified Material Test Reports for all their early plant designs, and determined RT_{NDT} using the NRC Standard Review Plan, NUREG 0800 for the upper head region. Of the 19 units evaluated, the RT_{NDT} values ranged from -13°F to 60°F. Units ordered in later years had an Equipment Specification requirement limiting RT_{NDT} to no greater than 60°F. This information supports the conclusion that the fracture toughness is "**high**" and "**not low**" in the region. (Note "**low**" appears to be a typo in the NRC summary statement).

The next statement in the NRC comment is simply incorrect. Appendix G provides the requirements for demonstration of margins against non-ductile failure for "**all**" Class 1 ferritic components. Since the limiting transient is generally the heat-up and cool-down transient for the reactor vessel, Appendix G is used for P-T limit curves. The third comment, concerning crediting K_{IC} twice, is unclear. There is no limit on how many times a material property may be used.

ASME Conclusion – The conditions that have been included on this Code Case are not needed. This Case should be included as acceptable without conditions in DG-

1192, Reference 2, and then accepted for use in Revision 16 of Regulatory Guide 1.147 and removed from Revision 3 of Regulatory Guide 1.193.

If you have any questions, please contact me or direct them to Mr. Kevin Ennis, ASME Director, Nuclear Codes and Standards by telephone at (212) 591-7075 or by e-mail (*ennisk@asme.org*) and thank you for consideration of our comments.

Very Truly Yours,

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cc: W.E Norris, USNRC Research *Wallace.Norris@nrc.gov*
ASME Board on Nuclear Codes and Standards Members
ASME Standards Committee on Nuclear Inservice Inspection
ASME Standards Committee on Construction of Nuclear Facility Components

Rulemaking Comments

From: NRCREP Resource
Sent: Wednesday, August 05, 2009 3:37 PM
To: Rulemaking Comments
Subject: FW: Draft Regulatory Guides DG-1191, DG -1192, DG-1193,
Attachments: ASME DG Comments on Code CasesJully 31, 2009.pdf

Attached for docketing is a comment we received on the proposed rule "Incorporation by Reference of Regulatory Guide 1.84, Revision 35, and Regulatory Guide 1.147, Revision 16, into 10 CFR 50.55a" (74 FR 26303).

Carol

-----Original Message-----
From: Kevin Ennis [mailto:EnnisK@asme.org]
Sent: Friday, July 31, 2009 2:26 PM
To: NRCREP Resource
Cc: Bryan Erler
Subject: Draft Regulatory Guides DG-1191, DG -1192, DG-1193,

Dear Sir,

Attached are the ASME Comments on Draft Regulatory Guides DG-1191, DG -1192, DG-1193, and the Proposed Rule Incorporating the Final Revisions of these Regulatory Guides into 10 CFR 50.55a. If you have any questions, please feel free to contact me.

Kevin Ennis
Director, Nuclear Codes and Standards
212.591.7075

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