ELECTRIC POWER RESEARCH INSTITUTE

Response to NRC Draft Conditions for Code case N-729-1 8/9/2006 Letter

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Inspection ITG Meetings

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Ft. Lauderdale, FL

Draft NRC Conditions

1. Item B4.40 of Code Case N-729-1, Table 1, shall be inspected at least every fourth refueling outage or at least every seven calender years, whichever occurs first, after the first ten-year inspection interval.

2. If flaws attributed to PWSCC have been detected, whether acceptable or not for continued service under Paragraphs -3130 or -3140, the reinspection interval shall be each outage instead of the reinspection intervals required by Table 1, Note (8).

3. Instead of the specified 'examination method' requirements for volumetric and surface examinations of Note 6 in Table 1, the licensee shall perform volumetric and/or surface examination of essentially 100% of the required volume or equivalent surfaces of the nozzle tube, as identified by Fig. 2 of ASME Code Case N-729-1. A surface examination shall be performed on all J-groove welds. If a surface examination is being substituted for a volumetric examination on a portion of a penetration nozzle that is below the toe of the J-groove weld [Point E on Fig. 2 of ASME Code Case N-729-1], the surface examination shall be of the inside and outside wetted surface of the penetration nozzle not examined volumetrically.

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Draft NRC Conditions

4. Appendix A of ASME Code Case N-729-1 shall not be implemented without prior NRC approval.

5. After December 31, 2007, ultrasonic examinations shall be performed using personnel, procedures and equipment that have been qualified by blind demonstration on representative mockups using a methodology that meets the conditions specified in 5.a through 5.d instead of the qualification requirements of Paragraph -2500 of ASME Code Case N-729-1.

   a. The specimen set shall have pipe diameters within ½ in. (13 mm) of the nominal diameter of the qualification pipe size and a thickness tolerance of ± 25% of the nominal through-wall depth of the qualification pipe thickness. The specimen set shall include geometric and material conditions that normally require discrimination from primary water stress corrosion cracking (PWSCC) flaws.

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Draft NRC Conditions

b. The specimen set shall have a minimum of ten (10) flaws which provide an acoustic response similar to PWSCC indications. All flaws shall be greater than 10% of the nominal pipe wall thickness. A minimum number of 30% of the total flaws shall be outside diameter initiated and 30% of the total flaws shall be inside diameter initiated. Further, at least 30% of the total flaws are at each of the depth ranges of 10%-30% and 31%-50% from the inside or outside diameter, as applicable. At least 30% and no more than 60% of the flaws shall be oriented axially.

c. Procedures shall identify the equipment and essential variable settings used for the qualification. An essential variable is any variable that has an effect on the results of the examination. The procedure shall be requalified when an essential variable is changed outside the demonstration range. Procedure qualification shall include the equivalent of at least three personnel performance demonstration test sets. Procedure qualification requires at least one successful personnel performance demonstration.

d. Personnel performance demonstration test acceptance criteria will meet the personnel performance demonstration detection test acceptance criteria of Table VIII-S10-1 of Section XI, Appendix VIII, Supplement 10. Examination procedures, equipment, and personnel are qualified for depth sizing and length sizing when the RMS error of the flaw depth measurements, as compared to the true flaw depths, do not exceed 1/32-inch (0.8 mm) and the RMS error of the flaw length measurements, as compared to the true flaw lengths, do not exceed 1/16-inch (1.6 mm), respectfully.

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Responses

- Conditions 1, 2 and 4 have been addressed by MRP, Section XI or no response necessary
- Condition 3 – essentially 100% Volumetric or Surface exam plus Surface exam of J-groove weld
  - This generally pertains to Assessment
  - More conservative than Code case but most plants have met this

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Response to Condition 5

- Blind qualification of UT and not Article 14 Low rigor after 12/31/2007
- Response: Qualification program will meet the requirements of an Article 14 medium rigor demonstration

a. The specimen set shall have pipe diameters within ½ in. (13 mm) of the nominal diameter of the qualification pipe size and a thickness tolerance of ± 25% of the nominal through-wall depth of the qualification pipe thickness. The specimen set shall include geometric and material conditions that normally require discrimination from primary water stress corrosion cracking (PWSCC) flaws.

- Response:

a. The specimen set shall have inside? diameters within 3/4 inch ? of the nominal diameter of the penetration to be examined and a thickness tolerance within 25%? of the nominal penetration thickness to be examined.

  - 2nd sentence is acceptable

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Response to Condition 5 b

b. The specimen set shall have a minimum of ten (10) flaws which provide an acoustic response similar to PWSCC indications. All flaws shall be greater than 10% of the nominal pipe wall thickness. A minimum number of 30% of the total flaws shall be outside diameter initiated and 30% of the total flaws shall be inside diameter initiated. Further, at least 30% of the total flaws are at each of the depth ranges of 10%-30% and 31%-50% from the inside or outside diameter, as applicable. At least 30% and no more than 60% of the flaws shall be oriented axially.

- Response: All flaws shall be greater than 10% through wall. A minimum of 20% of the total flaws shall initiate from the inside surface and 20% from the outside surface. At least 20% of the flaws shall be in the depth ranges of 10%-30% and 31% -50%. At least 20% and no more than 60% of the flaws shall be oriented axially.

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Response to Condition 5 c

c. Procedures shall identify the equipment and essential variable settings used for the qualification. An essential variable is any variable that has an effect on the results of the examination. The procedure shall be requalified when an essential variable is changed outside the demonstration range. Procedure qualification shall include the equivalent of at least three personnel performance demonstration test sets. Procedure qualification requires at least one successful personnel performance demonstration.

- Response: Insert - Ten flaws are required in the test set to requalify a procedure for essential variable changes.

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Response to Condition 5 d

d. Personnel performance demonstration test acceptance criteria will meet the personnel performance demonstration detection test acceptance criteria of Table VIII-S10-1 of Section XI, Appendix VIII, Supplement 10. Examination procedures, equipment, and personnel are qualified for depth sizing and length sizing when the RMS error of the flaw depth measurements, as compared to the true flaw depths, do not exceed 1/32-inch (0.8 mm) and the RMS error of the flaw length measurements, as compared to the true flaw lengths, do not exceed 1/16-inch (1.6 mm), respectfully.

- Response: The condition of flaw sizing tolerance is generally less than the accuracy of the flaw fabrication.
- Insert – The RMS error of the flaw depths shall not exceed .125 in and the length sizing error shall not exceed .375 in, respectively.

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Action Item
Providing Response to NRC

- Important to send recommendations to NRC before rulemaking is issued for public comment
- Obtain concurrence from Inspection ITG
- Confirm this approach with Christine King. IIG agreed this could be done without their concurrence
- Spanner will draft letter to Terence Chan at NRC
- Tom Alley and Greg Selby will review letter
- Issue letter to NRC

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