

NRR-PMDAPem Resource

From: Sreenivas, V
Sent: Wednesday, September 14, 2016 1:57 PM
To: steven.Capps@duke-energy.com
Cc: Robertson, Jeffrey N; Richards, Brian H; Vu, Phong T; Murphy, George M; Miller, Ed; Tsao, John; Davis, Robert; Alley, David
Subject: McGuire Unit 1: RAI- Relief Request 16-MN-002 Alternative to Defect Removal Prior to Performing Temporary Repair Activities on Three-Inch-Diameter Nuclear Service Water System Piping. (CAC Nos. MF8052)

By letter dated June 23, 2016 (Agencywide Documents and Access Management System (ADAMS) Accession No. ML16180A177), Duke Energy (the licensee) requested relief from the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, IWA-4400, at McGuire Nuclear Station Unit 1. The licensee requested to use the alternative in contingency Relief Request 16-MN-002 for the repair of nuclear service water system piping. To complete its review, the Nuclear Regulatory Commission (NRC) staff requests the following additional information:

1. Paragraph 5.1.3, Item 2, of the relief request states that "...The defective area shall be encapsulated on the outside diameter of the pipe using pressure retaining parts that comply with the Construction Code and Owner's requirements..." Provide the title of the Construction Code (e.g., ASME Code, Section III, year of edition or ANSI B31.1, year of edition).
2. Paragraph 5.1.3, Item 3, of the relief request states that "...For corrosion initiated on the I.D. of the pipe (with or without through-wall leakage), and for corrosion initiated on the O.D. of the pipe that results in through-wall leakage, the repair/replacement activity shall be designed such that the I.D. of the encapsulation is greater than the maximum diameter of the defective area plus twice the nominal thickness of the component. In addition, the nominal thickness of the encapsulation and its connecting weld to the pipe O.D. surface shall be equal to, or greater than, the nominal wall thickness of the pipe..." The above first sentence does not discuss the encapsulation design requirement for the case that corrosion is initiated on the exterior surface of the pipe that results in no pin hole. Discuss the design requirement for the encapsulation if corrosion is initiated on the exterior surface of the pipe that results in no pin hole.
3. Paragraph 5.1.3, item 5.b, of the relief request requires that for internal general corrosion of the pipe wall that does not result in leakage, the design of the encapsulation should use 2 mils per year as the corrosion rate. Paragraph 5.1.3, Item 5.c requires that for internal pitting corrosion, 4 mils per year should be used as the corrosion rate for the design. By letter dated December 14, 2010, in a response to the NRC request for additional information Question Number 2.a.2, for the review of Relief Request 09-MN-002 (ADAMS Accession No, ML103560592), the licensee stated that the "...The lateral corrosion rate (in any single direction) of the defective area shall be not less than 8 mils/year, which is approximately 4 times the average general corrosion rate and 2 times the average pitting corrosion rate of surfaces on the interior of the RN pipe, based on data collected during the service life of the RN piping..." Also, in response to NRC Question Number 2.a.2 and 2.a.3, the licensee stated that it used a factor of 2 to the corrosion rate in the encapsulation design. The NRC staff notes that Relief Request 09-MN-002 is related to the encapsulation repair. Discuss why the lateral corrosion rate of 8 mils per year or a factor of 2 is not part of the encapsulation design in the current relief request, 16-MN-002.

4. Paragraph 5.1.3, Item 9, of the relief request discusses welding of encapsulation to the pipe. Cite the reference (e.g., the ASME Code) for the welding procedures and process that will be followed for the weld joint between the encapsulation and the pipe base metal.

5. Paragraph 5.1.3, Item 11, of the relief request states that “The encapsulation shall be pressure tested in accordance with IWA-4540 upon completion of the repair/replacement activity to confirm the leak-tight integrity of the encapsulation and its connecting welds to the pipe wall...” (a) The 2007 edition of the ASME Code, Section XI, IWA-4540 has two subsections. IWA-4540(a) requires pressure tests. IWA-4540(b) exempts pressure tests for certain components. Specify the exact subsection of IWA-4540 that the proposed alternative will follow. (b) Discuss the pressure that will be used for the pressure testing for the encapsulation, the medium that will be used, and the hold time. (c) It appears that the pressure test as specified in Item 11 is performed on the inside of the encapsulation, not the subject piping. If the repair is for a through-wall leak on the subject piping, discuss whether the subject piping will be pressure tested after encapsulation installation. If not, justify.

6. Confirm that a stress analysis will be performed considering all loads, including seismic, to address the presence of the encapsulation, including its weight.

7. Paragraph 5.1.3, Item 13, requires visual examinations of ground surfaces above buried piping and underground piping in the vicinity of each encapsulation as well as each encapsulation in the Auxiliary building. The frequency of these visual examinations is at least once during each inservice inspection period. By letter dated September 28, 2010 (ADAMS Accession No, ML102790167), the licensee required visual examination of the installed encapsulation after every operating cycle as part of Relief Request 09-MN-002. Discuss why the inservice visual examination of the installed encapsulation(s) is reduced from every refueling outage to every inservice inspection period for Relief Request 16-MN-002.

8. The relief request does not appear to provide a limitation on the minimum distance between two installed encapsulations. This limitation is to minimize residual stresses on the wall of the base metal. Provide a distance within which no two encapsulations can be installed nearby each other.

9. Given the potential that a large number of encapsulation could be installed in a small area of pipe, this could be indicative of a corrosion issue which is more significant than is typical (based on operating experience). Please describe an appropriate limit, e.g., number of repairs per unit length of pipe, which is considered acceptable for the proposed repair method.

Please submit your response by October 14, 2016. If you have any questions, please do not hesitate to contact me.

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Subject: McGuire Unit 1: RAI- Relief Request 16-MN-002 Alternative to Defect Removal Prior to Performing Temporary Repair Activities on Three-Inch-Diameter Nuclear Service Water System Piping. (CAC Nos. MF8052)

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