



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

July 20, 2010

Mr. Michael J. Pacilio
President and Chief Nuclear Officer
Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: BRAIDWOOD STATION, UNITS 1 AND 2 - RELIEF REQUEST I3R-05 FOR
POST ACCIDENT HYDROGEN MONITORING SYSTEM PIPING
(TAC NOS. ME2200 AND ME2201)

Dear Mr. Pacilio:

By letter to the Nuclear Regulatory Commission (NRC), dated September 4, 2009 (Agencywide Documents Access and Management System Accession No. ML092510267), Exelon Generation Company, LLC (the licensee) submitted Relief Request (RR) I3R-05 for relief from certain requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, Subsection IWC, for the third 10-year inservice inspection (ISI) interval for Braidwood Station (Braidwood), Units 1 and 2. The third 10-year ISI interval for Braidwood is currently scheduled to end on July 28, 2018, for Unit 1, and on October 16, 2018, for Unit 2. In accordance with Title 10 of the Code of Federal Regulations (10 CFR), 50.55a(a)(3)(ii), the licensee requested relief from the ASME Code, Section XI, requirements in Table IWC-2500-1 and IWC-5210 to perform certain examinations of portions of the post accident hydrogen monitoring system piping in the process sampling system.

The NRC staff has reviewed the licensee's submittal and has determined that compliance with the specified code requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety, and that the alternative proposed in RR I3R-05 will provide reasonable assurance of structural integrity of the affected piping. Therefore, the alternative proposed in RR I3-05 is authorized pursuant to 10 CFR 50.55a(a)(3)(ii), for the third 10-year ISI interval for Braidwood, Units 1 and 2. All other ASME Code, Section XI, requirements for which relief was not specifically requested and approved remain applicable, including third party review by the Authorized Nuclear Inservice Inspector. The NRC staff's safety evaluation is enclosed.

M. Pacilio

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Please contact Mr. Marshall David at (301) 415-1547 if you have any questions on this action.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert D. Carlson", with a long horizontal flourish extending to the right.

Robert D. Carlson, Chief
Plant Licensing Branch III-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. STN 50-456 and 50-457

Enclosure:
Safety Evaluation

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELIEF REQUEST NO. I3R-05

EXELON GENERATION COMPANY, LLC.

BRAIDWOOD STATION, UNITS 1 AND 2

DOCKET NOS. STN 50-456 AND 50-457

1.0 INTRODUCTION

By letter to the Nuclear Regulatory Commission (NRC), dated September 4, 2009 (Agencywide Documents Access and Management System Accession No. ML092510267), Exelon Generation Company, LLC (EGC, the licensee), submitted Relief Request (RR) I3R-05 related to the Inservice Inspection (ISI) Program pertaining to pressure testing portions of the process sampling (PS) system piping associated with the post accident hydrogen monitoring system for Braidwood Station (Braidwood), Units 1 and 2 for the third 10-year ISI interval. In RR I3R-05, the licensee requested relief from performing the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," pressure test of the subject piping by proposing an alternative test consistent with the testing requirements of Title 10 to the Code of Federal Regulations (10 CFR), Part 50, Appendix J, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors." As requested by RR I3R-05, the NRC staff reviewed the licensee's proposed alternative pursuant to 10 CFR 50.55a(a)(3)(ii) because compliance with the ASME Code requirement would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

2.0 REGULATORY EVALUATION

The regulation at 10 CFR 50.55a(g) requires that ISI of ASME Code Class 1, 2, and 3 components be performed in accordance with Section XI of the ASME Code and applicable addenda, except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). According to 10 CFR 50.55a(a)(3), alternatives to the requirements of paragraph 50.55a(g) may be used, when authorized by the Commission, if an applicant demonstrates that the proposed alternatives would provide an acceptable level of quality and safety or if the specified requirement would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the pre-service examination requirements, set forth in the ASME Code, Section XI, to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that ISI of components and system pressure tests conducted during the first

ENCLOSURE

10-year ISI interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month ISI interval, subject to the limitations and modifications listed therein.

The ISI Code of Record for the third 10-year ISI interval for Braidwood, Units 1 and 2, is the 2001 Edition through the 2003 Addenda of the ASME Code, Section XI.

3.0 TECHNICAL EVALUATION

3.1 System/Component(s) for which Relief is Requested

RR I3R-05 requested relief for post accident hydrogen monitoring system piping in the PS system.

3.2 ASME Code Requirements

ASME Code, Section XI, 2001 Edition including Addenda through 2003, Table IWC-2500-1, Item C7.10 requires that the specified piping be tested using the VT-2 examination method at a frequency of each inspection period and the end of each inspection interval. The portion of the PS system containing the affected piping is not required to operate under normal plant operating conditions; therefore, as required by IWA-5210 and IWC-5221, a system leakage test is required in accordance with IWA-5211(a).

IWC-5210(b)(1) states that the contained fluid in the system shall serve as the pressurizing medium and, where air is used, the test procedure shall permit the detection and location of through-wall leakages in components of the system tested.

3.3 Licensee's Request for Relief

The licensee requested relief from performing the Code-required system pressure test for the post accident hydrogen monitoring system piping in the PS system outside the containment during each inspection period and at the end of the inspection interval.

3.4 Licensee's Basis for Requesting Relief

The piping in the RR serves as the supply flow path from the containment to the hydrogen monitors and the return flow path from the hydrogen monitors to the containment using 1/4 inch and 1/2 inch tubing. The system medium is air. The system is comprised of two separate trains for each unit with a total length of approximately 930 feet (i.e., 500 feet for Unit 1, and 430 feet for Unit 2). The piping/tubing material is austenitic stainless steel and the system design pressure is 60 pounds per square inch gauge (psig). The nominal operating pressure is 10 psig maximum. A typical Code-required system pressure test would consist of pressurizing the volume to 10 psig and performing a soap bubble or "snoop" test on all welds and piping. The licensee discovered during a test that approximately 50 feet of this piping is inaccessible to perform the test due to its proximity to a tunnel wall. In addition to the limitation on accessibility,

a significant portion of the piping outside the tunnel run is at a high elevation, which creates a personnel safety hazard during testing.

3.5 Licensee's Proposed Alternative

In lieu of performing the Code-required system pressure test for the post accident hydrogen monitoring system piping in the PS system outside the containment during each inspection period, and at the end of the inspection interval in accordance with the requirements of IWC-5210(b)(1) for Braidwood, Units 1 and 2, the licensee proposed an alternative to use the provisions of the test in accordance with the requirements of 10 CFR Part 50, Appendix J. The proposed alternative is to apply the Appendix J testing method, which is already required for the containment isolation valves at applicable penetrations identified as P-36 and P-45, to the remaining portion of the ASME Class 2 piping outside of penetrations P-36 and P-45.

The remaining portion of Class 2 piping outside of the primary containment examination boundary will be examined by pressurizing the remainder of the system to at least the applicable peak accident pressure, which is higher than the system nominal operating pressure, and applying the Appendix J acceptance criteria for the solenoid valves associated with Penetrations P-36 and P-45 to the remainder of the system located outside of containment. The applicable acceptance criteria used for the Appendix J test surveillances (currently less than or equal to 10 standard cubic feet per hour) will be applied independently to the supply and return piping for each hydrogen monitor train, and subsequent corrective actions will be applied to the remainder of the system. For any leakage in excess of the acceptance criteria, the licensee will investigate the source of leakage and generate an Issue Report and resolve it in accordance with the Exelon Corrective Action Program.

3.6 NRC Staff Evaluation

The Code of Record for Braidwood, Units 1 and 2, requires a system functional test for the post accident hydrogen monitoring system piping outside the containment using air as the pressurizing medium and a soap bubble test of all welds and piping. The frequency of the test is once during each inspection period and at the end of an inspection interval. The licensee has stated that a portion of this piping is inaccessible due to its proximity to a tunnel wall and, further, a large portion of the piping runs at an elevation which creates personnel safety hazards during the test. Braidwood has approximately 930 feet of stainless steel piping 1/4 inch and 1/2 inch diameter with socket weld joints that are subject to the pressure test. During normal plant operation, the system is not required to operate. When the system is operational, the pressure in the piping is approximately 10 psig on the discharge side of the pump. Hence, the piping system is normally subject to very low stress, and there is no known degradation mechanism to which the system is exposed. The containment penetration piping for the post accident hydrogen monitoring system is routinely leak-rate tested in accordance with Appendix J of 10 CFR Part 50, following every outage. But the balance of this piping system outside the containment is required to be pressure tested once every 40 months in accordance with the 2001 Edition including Addenda up to 2003, of the ASME Code, Section XI. The licensee has proposed an alternative to the system pressure test by extending the test boundary of the leak-rate test of Appendix J to cover the remainder of the system outside the containment.

The acceptance criteria for the leak-rate test per Appendix J will be less than or equal to

10 standard cubic feet per hour applied independently to the supply and return piping for each hydrogen monitor train. If the leak-rate exceeds the acceptance criteria, the licensee will investigate the source of leakage and generate an Issue Report and resolve it in accordance with the Exelon Corrective Action Program.

The NRC staff finds that the leak-rate test of Appendix J, conducted at the peak accident pressure of approximately 45 psig, will provide a leak detection method equivalent to the Code pressure test at 10 psig with application of soap bubble solution along with the VT-2 visual examination. Therefore, the proposed testing provides reasonable assurance of structural integrity. The NRC staff further finds that the Code-required system pressure test would result in hardship or unusual difficulty to the licensee without a compensating increase in the level of quality and safety.

4.0 CONCLUSION

The NRC staff concludes that the Code-required system pressure test for the post accident hydrogen monitoring system piping in the PS system outside the containment during each inspection period and at the end of the inspection interval in accordance with the requirements of IWC-5210(b)(1) of the ASME Code, Section XI, 2001 Edition including Addenda up to 2003, would result in hardship to the licensee without a compensating increase in the level of quality and safety. The licensee's proposed alternative to use the provisions of the test in accordance with the requirements of 10 CFR Part 50, Appendix J, provides reasonable assurance of structural integrity. Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), the alternative proposed in RR I3R-05 is authorized for the third 10-year ISI interval of the Braidwood, Units 1 and 2. All other requirements of the ASME Code, Section XI, for which relief has not been specifically requested remain applicable, including a third party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: Pat Patnaik, NRR

Date: July 20, 2010

M. Pacilio

- 2 -

Please contact Mr. Marshall David at (301) 415-1547 if you have any questions on this action.

Sincerely,

/RA/

Robert D. Carlson, Chief
Plant Licensing Branch III-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. STN 50-456 and 50-457

Enclosure:
Safety Evaluation

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NRR-028

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