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Exelon Nuclear

10 CFR 50.55a

RS-06-057

April 20, 2006

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Braidwood Station, Units 1 and 2
Facility Operating License Nos. NPF-72 and NPF-77
NRC Docket Nos. 50-456 and 50-457

Byron Station, Units 1 and 2
Facility Operating License Nos. NPF-37 and NPF-66
NRC Docket Nos. 50-454 and 50-455

Subject: Inservice Inspection Program Relief Requests

In accordance with 10 CFR 50.55a, "Codes and standards," paragraph (a)(3)(ii), Exelon Generation Company, LLC (EGC), is requesting relief from the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," on the basis that compliance with the specified requirements for pressure testing buried piping would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Specifically, two relief requests are being proposed to perform alternative flow impairment tests of certain portions of Braidwood Station and Byron Station essential service water buried piping in lieu of either pressure decay tests or flow change tests. The details of the requests for relief are contained in the attachments to this letter.

EGC requests approval of this request by April 20, 2007. If there are any questions or comments, please contact David J. Chrzanowski at (630) 657-2816.

Respectfully,

Joseph A. Bauer

Joseph A. Bauer
Manager – Licensing

Attachments:

1. Braidwood Station, Units 1 and 2 Relief Request I2R-46
2. Byron Station, Units 1 and 2 Relief Request I3R-07

Attachment 1

Braidwood Station, Units 1 and 2

Relief Request I2R-46

RELIEF REQUEST I2R-46
Revision 0

Request for Relief for Hardship Or Unusual Difficulty Without Compensating Increase In Level Of Quality Or Safety
Proposed Alternative Examination Requirements
ASME Section XI, IWA-5244, "Buried Components"
In Accordance with 10 CFR 50.55a(a)(3)(ii)

1.0 ASME CODE COMPONENTS AFFECTED:

Code Class:	3
Reference:	IWA-5244
Examination Category:	D-B
Item Number:	D1.10
Description:	Alternative Examination Requirements of ASME Section XI, IWA-5244, "Buried Components"
Component Number(s):	Supply Lines: 0SX01CA-30", 0SX01CB-30", 0SX01CC-30", 0SX01CD-30", 0SX01CE-30", 0SX01CF-30", 0SX01AA-48", and 0SX01AB-48" Return Lines: 0SX03CA-48", 0SX03CB-48", 0SX03DA-48", and 0SX03DB-48"
Drawing Number(s):	M-42 Sheet 1A, M-42 Sheet 1B, M-42 Sheet 2A, M-42 Sheet 2B, and M-42 Sheet 6

2.0 APPLICABLE CODE EDITION AND ADDENDA:

The Inservice Inspection program is based on the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, 1989 Edition.

3.0 APPLICABLE CODE REQUIREMENT:

The following Code requirements are paraphrased from the 1989 Edition of ASME Section XI.

IWA-5244*(a)* requires nonredundant/isolable buried components that are isolable by means of valves be tested to determine the rate of pressure loss. Alternatively, the test may determine the change in flow between the ends of the buried components.

IWA-5244*(b)* requires redundant/nonisolable buried components be tested to determine the change in flow between the ends of the buried components. If an annulus exists, the area around the annulus at each end shall be visually examined in lieu of a flow test.

IWA-5244*(c)* requires nonredundant/nonisolable buried components be tested through verification that the flow during operation is not impaired.

IWA-5244 does not address the case of redundant/isolable buried components. The Essential Service Water (SX) System suction and return lines at Braidwood Station fall into this category. The most appropriate choice for the testing requirements of these components would be IWA-5244*(a)*.

4.0 REASON FOR REQUEST:

Pursuant to 10 CFR 50.55a(a)(3)(ii), relief is requested on the basis that compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

The SX suction line buried piping consists of six 30" common (i.e., Unit 0) supply headers that feed into two 48" Unit 0 supply headers and the SX return line buried piping consists of two 48" Unit 0 return headers. Portions of the suction piping are encased in concrete at the Lake Screen House (LSH). The remainder of the SX suction line buried piping runs from the LSH to the Turbine Building. The SX System water is distributed to required system loads and eventually leaves the plant, returning to the SX cooling pond through two Unit 0 48" return headers. All of the return piping between the Turbine Building and the SX cooling pond through the SX discharge structure is buried. The buried piping (both supply and return) is not accessible for examination without excavation, as an annulus allowing for examination of the buried sections of piping was not provided during original construction.

IWA-5244*(a)* requires a test that isolates the buried sections of piping to conduct a pressure decay test or to perform a test that determines the change in flow between the buried ends. In order to perform a pressure decay test, it would be necessary to close two large butterfly valves (i.e., 36") and three large gate valves (i.e., 30") to isolate the buried portion of each supply header. Such a test methodology would render one train of SX to each unit inoperable. This would result in entering Technical Specification (TS) Limiting Condition for Operation (LCO) 3.7.8, "Essential Service Water (SX) System," for one unit-specific SX train inoperable on both units.

For the return header piping, it would be necessary to close several large butterfly valves to isolate the buried portions of piping. This would also result in the isolation of a return train of SX from both units, thus requiring entry into TS LCO 3.7.8 for one unit-specific train inoperable on both units. In addition to placing the units in an undesirable condition, the butterfly valves required for isolation of the supply and return headers are not designed or expected to provide an adequate test boundary necessary to conduct a pressure decay test. Extensive maintenance or system modification would be required to perform an adequate pressure decay test, as it would be necessary to either replace the existing butterfly valves with those of better leakage characteristics or to install blind flanges to conduct this test. In addition, as established by the NRC Safety Evaluation Report contained in a letter from R. R. Assa (U. S. NRC) to D. L. Farrar (Commonwealth Edison Company), "Issuance of Amendments," dated March 20, 1995, Braidwood Station is required to maintain the SX return to the cooling pond isolation valves (0SX165A and 0SX165B) open with the

power removed. Based on this commitment, these SX return butterfly valves cannot be used to isolate the SX System return piping at Braidwood Station.

In later approved Editions of ASME Section XI, redundancy of piping is no longer a consideration for determining the type of test required. Under the later Editions of ASME Section XI, specific test methods for buried piping are based on whether or not the system can be isolated. A test for determining that flow is not impaired would be the required test for buried portions of the SX System piping under the later Editions of ASME Section XI.

The other potential test would be a change in flow test as described in IWA-5244*(b)*. However, the buried SX supply and return headers were not designed with plant instrumentation and flow orifices on the exposed ends of pipe, which are required to determine the flow rates. In addition, sufficient lengths of accessible straight pipe for reliable use of ultrasonic flow meters do not exist. For these reasons, the configuration of the SX System will not allow for determining the change in flow between the ends of the buried piping.

Compliance with the specified requirements is a hardship without a compensating increase in the level of quality and safety. Performing the specified examinations would require either excavating the buried piping between the LSH Forebay and the Turbine Building (i.e., supply headers), and the Turbine Building and SX cooling pond (i.e., return headers) or rendering an SX System train inoperable on both units. Pressure tests that isolate buried sections of SX piping have a significant impact on core damage frequency since significant portions of Emergency Core Cooling System equipment would need to be isolated. Depending on the line being isolated, the configuration specific risk increase factor ranges from 8 to 40 for Braidwood Station.

5.0 PROPOSED ALTERNATIVE AND BASIS FOR USE:

For the buried piping sections required to provide flow from the LSH Forebay to the SX pumps (i.e., supply headers) and the buried piping sections required to return flow from the SX System to the SX cooling pond (i.e., return header), Braidwood Station proposes to utilize the requirements of IWA-5244*(c)* along with the trending data obtained during quarterly Inservice Testing (IST) to provide an adequate level of quality and safety. The IWA-5244*(c)* requirements call for a test that confirms flow is unimpaired in nonisolable buried components. To confirm that flow is unimpaired in these buried pipes, the Braidwood Station IST Program will be utilized to ensure adequate flow. Braidwood Station will use the Owner established minimum flow rate specified in the site IST surveillances, currently specified at 23,520 gallons per minute (gpm) for all SX pumps, as the acceptance criteria for IWA-5244 pressure testing of SX System buried piping.

If during an IST surveillance the minimum flow could not be achieved and the cause of the deviation not attributed to the test instruments being used, the pump would be declared inoperable and an Issue Report (IR) generated in accordance with the Exelon

Generation Company, LLC Corrective Action Program as required by the existing IST surveillance. Further corrective actions (i.e., maintenance on the pump, system walk downs, etc.) would be initiated as required to restore the pump and/or the system to an Operable status.

Along with the quarterly IST surveillance trending, additional protection of the pressure boundary integrity for the SX System is assured through the Braidwood Station Service Water Chemistry Program. This program assures that the SX System water is chemically controlled to mitigate various degradation mechanisms. The chemicals used include a biocide to prevent Microbiological Induced Corrosion (MIC), sulfuric acid to reduce corrosion rates and scaling, and additional additives to provide a protective layer (i.e., zinc chloride) and inhibit calcium carbonate scaling. The piping is protected from microbiological attack through the injection of biocides at the LSH.

In addition, it can be reasonably assumed that catastrophic piping failure is not likely based on the design and construction of the SX System and the system service conditions. The SX piping is coated, wrapped, and protected by a cathodic protection system. The SX piping is buried and protected from external forces. The backfill materials used at Braidwood Station were lean concrete, granular material, and bash. Bash is a mixture of cement, flyash, sand, and water. The backfill that encases the SX piping is a lean concrete that covers the piping by a minimum of one foot. This section of piping operates at low pressure and temperature. The maximum pressure of the SX buried piping is 30 psig.

6.0 DURATION OF PROPOSED ALTERNATIVE:

Relief is requested for the second inspection interval for Braidwood Station Units 1 and 2.

7.0 PRECEDENTS:

A similar relief request was previously approved for Nebraska Public Power District (NPPD) for Cooper Nuclear Station (i.e., D. L. Wigginton/J. W. Clifford (NRR) letter to G. R. Horn (NPPD), "Evaluation of the Third Ten-Year Interval Inspection Program Plan and Associated Requests for Relief for Cooper Nuclear Station (TAC NO. M94000)", dated October 23, 1997).

Attachment 2

Byron Station, Units 1 and 2

Relief Request I3R-07

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Request for Relief for Hardship Or Unusual Difficulty Without Compensating Increase In Level Of Quality Or Safety
Proposed Alternative Examination Requirements
ASME Section XI, IWA-5244, "Buried Components"
In Accordance with 10 CFR 50.55a(a)(3)(ii)

1.0 ASME CODE COMPONENTS AFFECTED:

Code Class:	3
Reference:	IWA-5244
Examination Category:	D-B
Item Number:	D2.10
Description:	Alternative Examination Requirements of ASME Section XI, IWA-5244, "Buried Components"
Component Number(s):	Supply Lines: 0SX01AA-48", 0SX01AB-48", 0SXA8AA-3/4", 0SXA8AB-3/4", 1SX01BA-36", 1SX01BB-36", 2SX01BA-36", 2SX01BB-36", Return Lines: 0SX03CA-48", 0SX03CB-48", 0SX79AA-6", 0SX79AB-6", 0SX97AA-24", 0SX97AB-24", 0SX97AC-24", 0SX97AD-24", 0SX97AE-24", 0SX97AF-24", 0SX97AG-24", 0SX97AH-24", 0SX98AA-24", 0SX98AB-24", 0SX98AC-24", and 0SX98AD-24"
Drawing Number(s):	M-42-1A, M-42-1B, M-42-2A, M-42-2B, M-42-6, and M-42-7

2.0 APPLICABLE CODE EDITION AND ADDENDA:

The Inservice Inspection program is based on the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, 2001 Edition through the 2003 Addenda.

3.0 APPLICABLE CODE REQUIREMENT:

The following Code requirements are paraphrased from the 2001 Edition through the 2003 Addenda of ASME Section XI.

IWA-5244(b)(1) requires buried components that are isolable by means of valves be tested to determine the rate of pressure loss. Alternatively, the test may determine the change in flow between the ends of the buried components and the Owner shall establish the acceptable rate of pressure loss or flow.

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4.0 REASON FOR REQUEST:

Pursuant to 10 CFR 50.55a(a)(3)(ii), relief is requested on the basis that compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

The buried piping in question consists of two 48" common (i.e., Unit 0) supply headers and two 48" Unit 0 return headers between the Essential Service Water Cooling Towers (SXCT) and the Auxiliary Building. Each 48" supply header with 3/4" sampling lines, branches into two 36" pump supply lines (i.e., each unit). Each 48" return header branches into four 24" risers and two 24" hot water bypass lines, and has a 6" blowdown line connection. Both 48" return headers and each of the 24" risers have a line-stop fitting that was previously installed for maintenance of the system. These components are all buried between the SXCT and the Turbine Building (TB) or encased in the TB foundation. There is no access to the buried sections without excavation. In addition, no annulus was provided during original construction that would allow for examination of these buried sections of piping.

IWA-5244(b)(1) requires a test that isolates the buried sections of piping to conduct a pressure decay test or to perform a test that determines the change in flow between the buried ends. In order to perform a pressure decay test, it would be necessary to close three large butterfly valves[1] to isolate the buried portion of each supply header.

For the return header piping, it would be necessary to close several large butterfly valves[2] to isolate the buried portions. This would also result in the isolation of an entire return train of SX, which is a configuration not allowed by the Byron Station Technical Specifications. These butterfly valves on both the supply and return headers are not designed or expected to provide an adequate test boundary, which is necessary to conduct a pressure decay test. Extensive maintenance or system modification would be required to perform an adequate pressure decay test, as it would be necessary to either replace these butterfly valves with those of better leakage characteristics or to install blind flanges to conduct this test.

The other potential test would be a change in flow test. However, the buried SX supply and return headers were not designed with plant instrumentation and flow orifices on both sides that would be required to determine the flow rates. Additionally, sufficient lengths of accessible straight pipe for reliable use of ultrasonic flow meters do not exist. For these reasons, the configuration of the SX System will not allow for determining the change in flow between the ends of the buried piping.

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[1] A-Train: 0SX138A, 1SX001A, and 2SX001A.
B-Train: 0SX138B, 1SX001B, and 2SX001B.

[2] A-Train: 1SX010, 2SX010, 1SX015A, 2SX015A, 1SX057A, 2SX057A, 1SX114A, 2SX114A, 1SX147A, 2SX147A, 0SX162A, 0SX162C, 0SX163A, 0SX163B, 0SX163C, and 0SX163D.
B-Train: 1SX015B, 2SX015B, 1SX057B, 2SX057B, 1SX114B, 2SX114B, 1SX136, 2SX136, 2SX147B, 1SX147B, 0SX162B, 0SX162D, 0SX163E, 0SX163F, 0SX163G, and 0SX163H.

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Compliance with the specified requirements is a hardship without a compensating increase in the level of quality and safety. Performing the specified examinations would require excavation of buried piping between the SXCT and the Turbine Building (i.e., Supply Headers), and the Turbine Building and SXCT (i.e., Return Headers) or rendering an SX System train inoperable on both units. Pressure tests that isolate buried sections of SX piping have a significant impact on core damage frequency since significant portions of Emergency Core Cooling System equipment would need to be isolated. Depending on the line being isolated, the configuration specific risk increase factor ranges from 4 to 400 for Byron Station.

5.0 PROPOSED ALTERNATIVE AND BASIS FOR USE:

For the buried piping sections required to provide flow from the SXCT through the 48" headers and each of the 36" supply lines to the SX Pumps (i.e., Supply Headers) and the buried piping sections required to return flow from the SX System through the 48" headers to the 24" branch lines into the SXCT (i.e., Return Header), a test will be conducted to confirm unimpaired flow. Byron Station proposes to utilize the requirements of IWA-5244(b)(2) along with the trending data obtained during quarterly Inservice Testing (IST) to provide an adequate level of quality and safety. These requirements call for a test that confirms flow is unimpaired in nonisolable buried components. To confirm that flow is unimpaired in these buried pipes, Byron Station Inservice Testing (IST) program will be used to ensure adequate flow. Byron Station will use the Owner established minimum flow rate specified in the site IST surveillances, currently specified at 24,000 gallons per minute (gpm) for all SX pumps, as the acceptance criteria for IWA-5244 pressure testing of SX System buried piping.

If during an IST surveillance, the minimum flow could not be achieved and the cause of the deviation not attributed to the test instruments being used, the pump would be declared inoperable and an Issue Report (IR) generated in accordance with the Exelon Corrective Action Program as required by the existing IST surveillance. Further corrective actions (e.g., maintenance on the pump, system walk downs, etc.) would be initiated as required to restore the pump and/or the system to an Operable status.

Along with the quarterly IST surveillance trending, additional protection of the pressure boundary integrity for the SX System is assured through the Byron Station Service Water Chemistry Program. This program assures that the SX System water is chemically controlled to mitigate various degradation mechanisms. The chemicals include a biocide to prevent Microbiological Induced Corrosion (MIC), sulfuric acid to reduce corrosion rates and scaling, and additional additives to provide a protective layer (i.e., zinc chloride) and inhibit calcium carbonate scaling.

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In addition, it can be reasonably assumed that catastrophic piping failure is not likely based on the design and construction of the SX System and the system service conditions. The SX piping is coated, wrapped, and protected by a cathodic protection system. The SX piping is buried and protected from external forces. The backfill materials used at Byron Station were lean concrete, granular material, and bash. Bash is a mixture of cement, flyash, sand, and water. This section of piping operates at low pressure and temperature. The maximum pressure of the SX buried piping is 30 psig.

6.0 DURATION OF PROPOSED ALTERNATIVE:

Relief is requested for the third inspection interval for Byron Station Units 1 and 2.

7.0 PRECEDENTS:

A similar relief request was previously approved for Nebraska Public Power District (NPPD) for Cooper Nuclear Station (reference D. L. Wigginton/J. W. Clifford (NRR) letter to G. R. Horn (NPPD), "Evaluation of the Third Ten-Year Interval Inspection Program Plan and Associated Requests for Relief for Cooper Nuclear Station (TAC NO. M94000)", dated October 23, 1997).

8.0 REFERENCES:

None