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10 CFR 50.55a

RS-07-126

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

Quad Cities Nuclear Power Station, Units 1 and 2
Renewed Facility Operating License Nos. DPR-29 and DPR-30
NRC Docket Nos. 50-254 and 50-265

Subject: Request for Relief from ASME OM Code 5-year Test Interval for Main Steam Safety Valves (Relief Request RV-30E)

In accordance with 10 CFR 50.55a, "Codes and standards," paragraph (a)(3)(ii), Exelon Generation Company, LLC (EGC) requests NRC approval of proposed Relief Request RV-30E to extend the 5-year test interval, on a one-time basis, for three Main Steam Safety Valves (MSSVs) at Quad Cities Nuclear Power Station (QCNPS), Unit 1 and five MSSVs at QCNPS, Unit 2.

Specifically, EGC requests relief from American Society of Mechanical Engineers (ASME) "Code for Operation and Maintenance of Nuclear Power Plants," 1998 Edition through 2000 Addenda (ASME OM Code), Appendix I, "Inservice Testing of Nuclear Power Plant Pressure Relief Devices," Section I-1330, "Test Frequencies, Class 1 Pressure Relief Valves," paragraph (a), "5-Year Test Interval."

EGC requests approval of proposed Relief Request RV-30E by November 27, 2007 to enable continued operation of QCNPS Unit 2 until the nineteenth refueling outage (Q2R19), which is currently scheduled to begin in March 2008. This approval schedule will also enable continued operation of QCNPS Unit 1 until the twentieth refueling outage (Q1R20), which is currently scheduled to begin in May 2009.

There are no regulatory commitments contained within this letter.

If you have any questions concerning this letter, please contact Mr. John L. Schrage at (630) 657-2821.

Respectfully,

Patrick R. Simpson
Manager - Licensing

Attachment: Relief Request RV-30E

Attachment

Relief Request RV-30E

Proposed Alternative in Accordance with 10 CFR 50.55a(a)(3)(ii)
Impracticality without Compensating Increase in Level of Quality or Safety

Attachment
Relief Request RV-30E
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1. ASME Code Component(s) Affected

Quad Cities Nuclear Power Station (QCNPS) Unit 1 and Unit 2, Main Steam Safety Valves (MSSVs): Model: 3777Q; Manufacturer: Dresser

Table 1 provides valve-specific identification data, test dates, installation dates, and requested extension duration for the eight valves.

2. Applicable Code Edition and Addenda

American Society of Mechanical Engineers (ASME) "Code for Operation and Maintenance of Nuclear Power Plants," 1998 Edition through 2000 Addenda (ASME OM Code)

3. Applicable Code Requirement

ASME OM Code, Appendix I, "Inservice Testing of Nuclear Power Plant Pressure Relief Devices," Section I-1330, "Test Frequencies, Class 1 Pressure Relief Valves," paragraph (a), "5-Year Test Interval."

This section states: "Class 1 pressure relief valves shall be tested at least once every 5 years, starting with initial electric power generation. No maximum limit is specified for the number of valves to be tested within each interval; however, a minimum of 20% of the valves from each valve group shall be tested within any 24-month interval. This 20% shall consist of valves that have not been tested during the current 5-year interval, if they exist. The test interval for any individual valve shall not exceed 5 years."

4. Reason for Request

10 CFR 50.55a(f)(4) directs a licensee to meet inservice testing requirements for ASME Code Class 1 valves set forth in the ASME OM Code and addenda. The fourth ten-year inservice testing (IST) interval for QCNPS is based on the 1998 Edition through 2000 addenda of the ASME OM Code; and specifically, Appendix I, "Inservice Testing of Pressure Relief Devices in Light-Water Reactor Nuclear Power Plants."

The ASME OM Code, Subsection ISTC, Section ISTC-3200, "Inservice Testing," states that inservice testing in accordance with this subsection shall commence when the valves are required to be operable to fulfill their required function(s). ASME OM Code Section ISTC-5240, "Safety and Relief Valves," directs that safety and relief valves meet the inservice testing requirements set forth in Appendix I of the ASME OM Code. Section I-1330, paragraph (a) of the ASME OM Code states:

> Class 1 pressure relief valves shall be tested at least once every 5 years, starting with initial electric power generation. No maximum limit is specified for the number of valves to be tested within each interval; however, a minimum of 20% of the valves from each valve group shall be tested within any 24-month interval. This 20% shall consist of valves that have not been tested during the current 5-year interval, if they exist. The test interval for any individual valve shall not exceed 5 years.

The required test ensures that the MSSVs, which are located on each of the main steam lines between the reactor vessel and the first isolation valve within the drywell, will open at the pressures bounded by the safety analysis.

In accordance with 10CFR 50.55a, "Codes and Standards," paragraph (a)(3)(ii), Exelon Generation Company, LLC (EGC) requests relief from the requirements of ASME OM Code, 1998 Edition with 2000 Addenda, Appendix I, Section I-1330, paragraph (a) for three MSSVs at QCNPS Unit 1 until the twentieth QCNPS Unit 1 refueling outage (i.e., Q1R20) and five MSSVs at QCNPS Unit 2 until the nineteenth QCNPS Unit 2 refueling outage (i.e., Q2R19). Q1R20 is scheduled to begin in May 2009 and Q2R19 is scheduled to begin in March 2008. The requested duration of the relief ranges from two months to 17 months for the affected QCNPS Unit 1 MSSVs and five months to 18 months for the affected QCNPS Unit 2 MSSVs.

NUREG-1482, Revision 1, "Guidelines for Inservice Testing at Nuclear Power Plants," Section 3.1, "Inservice Test Frequencies and Extensions for Valve Testing," states that the NRC may approve relief to extend a test interval for extenuating circumstances in which (1) compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety, or (2) the system design makes compliance impractical. Impractical conditions that would justify a test deferral are those that result in an unnecessary plant shutdown, cause unnecessary challenges to safety systems, place undue stress on components, cause unnecessary cycling of equipment, or unnecessarily reduce the life expectancy of the plant systems and components. In addition, the ASME OM Code, Section ISTC-3521, "Exercising Requirements, Category A and B valves," paragraph (d) states that if exercising is not practicable during operation at power or cold shutdowns, it (testing) may be limited to full-stroke during refueling outages.

Compliance with the applicable requirements of the ASME OM Code for the three MSSVs at QCNPS Unit 1, and five MSSVs at QCNPS Unit 2 prior to Q1R20 and Q2R19 respectively, is not practical. The evolution required to replace the affected MSSVs is not practicable during operation at power due to plant conditions. Replacement of the affected MSSVs, prior to the planned refueling outage would result in an unnecessary plant shutdown or an extension of a forced outage, unnecessary challenges to safety systems, unnecessary radiation exposure to plant workers, and unnecessary cycling of equipment, all without a compensating increase in the level of quality or safety.

EGC currently replaces four of eight MSSVs on each unit at QCNPS every refueling outage, so that all valves on each unit are removed and tested every two refueling outages. This methodology supports the ASME OM Code requirements for testing previously untested Class 1 pressure relief valves. After each valve is removed and as-found tested, the MSSVs are refurbished to a like-new condition, and reset to an as-left value of plus or minus 1%.

EGC utilizes an ASME OM Code-certified off-site vendor to perform as-found and as-left testing, inspection, and refurbishment of the QCNPS MSSVs. An EGC-approved and qualified procedure is used for disassembly and inspection of MSSVs. This procedure requires that each MSSV be disassembled and inspected upon removal from service, independent of the as-found test results. The procedure identifies the critical components that are required to be inspected for wear and defects, and the critical dimensions that are

required to be measured during the inspection. If components are found worn or outside of the specified tolerance(s), the components are either reworked to within the specified tolerances, or replaced. Parts that are defective, outside-of-tolerance, and any reworked/replaced components are identified, and EGC is notified of these components by the off-site vendor. The MSSV is then re-assembled, an as-left test is performed, and the MSSV is returned to QCNPS.

An EGC-qualified procedure is used at QCNPS for packaging, handling and storage of safety related equipment. Since the MSSVs are safety related, the procedure requires storage within fire resistant, tear-resistant, weather-tight packaging, as well as inside a building or enclosure. The procedure also states that the storage area or enclosure shall not be subject to flooding; the floor shall be paved or equal, and well drained. The storage area must be provided with uniform heating and temperature control to prevent condensation and corrosion. Minimum and maximum temperatures are controlled, and each MSSV is enclosed in a separate sturdy metal box.

As part of a review of the QCNPS IST program with respect to a recent ASME OM Code interpretation, EGC identified a discrepancy relative to the 5-year test interval. The ASME OM Code interpretation (i.e., ASME Code Interpretation 01-18 from the ASME OM Code, 2004 Edition) indicated that implementation of the 5-year test interval should be based upon a "test-to-test" duration. The historical method used at QCNPS with respect to MSSV test intervals has been to use an "installation-to-test" duration, and to ensure that all installed MSSVs would not exceed a 5-year testing frequency.

During the upcoming Q2R19 refueling outage, which is scheduled to begin in March 2008, EGC will replace and test five MSSVs (i.e., approximately 50% of the total number of valves). The five affected QCNPS Unit 2 MSSVs are listed in Table 1. This replacement and test schedule is consistent with the historical EGC method for implementing the ASME OM Code, Appendix I, Section I-1330(a) (i.e., the valves will have been installed for less than or equal to two operating cycles). However, utilizing a test-to-test interpretation, the 5-year interval for the five affected MSSVs have expired, or will expire prior to Q2R19, as indicated in Table 1.

Similarly, during the upcoming Q1R20 refueling outage, which is scheduled to begin in May 2009, EGC will replace and test four MSSVs (i.e., 50% of the total number of valves). These four MSSVs include the three affected QCNPS Unit 1 MSSVs that are listed in Table 1. This replacement and test schedule is consistent with the historical EGC method for implementing the ASME OM Code, Appendix I, Section I-1330(a). However, utilizing a test-to-test interpretation, the 5-year interval for the three affected MSSVs will expire prior to Q1R20, as indicated in Table 1.

5. Proposed Alternative and Basis for Use

For the fourth ten-year IST interval at QCNPS, EGC proposes to remove and test the three affected Unit 1 MSSVs during Q1R20, and the five affected Unit 2 MSSVs during Q2R19.

Inservice testing history of Dresser Model 3777Q MSSVs at QCNPS from 1994 to the present indicates that all tested MSSVs (i.e., 83 MSSV tests) that have been installed for

two operating cycles (i.e., 48 months) have successfully passed the ASME OM Code as-found acceptance criteria of plus or minus 3%. Historical test data indicates that 53 of the 83 tests remained within the as-left tolerance of plus or minus 1%. The data analysis also indicates that, in general, the MSSVs tend to drift slightly downward, which is in a conservative direction.

This historical QCNPS test data is also consistent with the reliable and consistent performance of the Dresser Model 3777Q MSSVs at Dresden Nuclear Power Station[1] (DNPS) Units 2 and 3. Since 1997, EGC has collected and documented 96 as-found Model 3777Q test results from both DNPS and QCNPS. This test data indicates that all MSSV test results (i.e., Dresser Model 3777Q valves) are within the ASME acceptance criteria of plus or minus 3%.

In addition to historical valve test results, EGC recently tested four MSSVs, (i.e., all Dresser Model 3777Q valves) that were maintained in a controlled environment for an extended period of time, but never installed. These MSSVs had been previously installed at QCNPS, refurbished, and were awaiting to be installed as replacement MSSVs. The controlled environment in which these MSSVs were stored was not subject to thermal cycling or vibration (i.e., the conditions to which installed MSSVs are subjected). The purpose of the additional testing was to determine the impact of controlled environment storage upon the opening set pressure of MSSVs. These MSSVs, which are listed in Table 2, had been maintained in this controlled environment for the duration indicated in the table. The test results for the four MSSVs are also shown in Table 2. All four MSSVs opened at a pressure within the ASME OM Code acceptance criteria of plus or minus 3% tolerance.

EGC has also reviewed and complies with vendor recommendations for valve storage. This review indicated that the Dresser 3777Q MSSVs are required to be stored in a controlled environment, inside specially designed metal storage containers prior to be installation as replacement MSSVs. The vendor recommendations also require that controlled environment in which these MSSVs would be stored is not subject to thermal cycling or vibration (i.e., the normal operating conditions to which MSSVs are subjected). Table 1 provides both the storage time (i.e., the time period from the as-left test to the installation date) and the installed time for the eight affected QCNPS MSSVs at the start of the outages in which they are scheduled to be replaced.

Finally, EGC contacted the MSSV vendor (i.e., Dresser), to identify any operating and/or maintenance experience with Model 3777Q valves that could provide additional insights regarding the impact of controlled environment storage upon MSSVs. The vendor indicated that, in general, there is no degradation in the valve when stored in a controlled environment for approximately five years.

In addition to historical test results, the current QCNPS Unit 1 and Unit 2 ASME overpressure analysis assumes that one MSSV is out of service, and all of the operable MSSVs open to relieve pressure at the upper ASME Code limit of 1375 psig (i.e., 110% of design pressure). This design approach provides additional assurance that the requested

[1] Dresser Model 3777Q MSSVs from DNPS were tested and refurbished at the same facility that tested and refurbished the QCNPS MSSVs, utilizing the same work processes.

relief from the ASME OM Code requirement for the subject MSSVs would not result in a decrease in the level of quality or safety.

6. Duration of Proposed Alternative

This proposed alternative is requested for the three QCNPS Unit 1 MSSVs until the start of Q1R20, which is scheduled to commence in May 2009, and for the five QCNPS Unit 2 MSSVs until the start of Q2R19, which is scheduled to commence in March 2008. Table 1 provides the requested test interval extension for each of the eight MSSVs.

7. Precedents

In Reference 1, the NRC reviewed and approved a relief request for Susquehanna Steam Electric Station, Units 1 and 2 to extend the MSSV test interval duration for individual valves to six years for the entire third 10-year Inservice Testing interval. In Reference 2, the NRC reviewed and approved a relief request for Nine Mile Point, Unit 2 to extend the MSSV test interval duration for individual valves to three refueling outages or approximately six years for the entire third 10-year Inservice Testing interval. In both approvals, the NRC allowed for a total installed interval of at least six years in contrast to this one time request to extend the test interval for six MSSVs by a maximum of nine months.

8. References

1) Letter from R. J. Laufer (USNRC) to B. L. Shriver (SSES), "Susquehanna Steam Electric Station Units 1 and 2 - Third 10-Year Interval Inservice Testing (IST) Program Plans," dated March 10, 2005

2) Letter from M. Banerjee (USNRC) to J.H. Mueller (NMPC), " Nine Mile Point Nuclear Power Station, Unit No. 2 – Alternative to American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Regarding Inservice Testing of Safety Relief/Relief Valves (TAC No. MB0290)," dated April 17, 2001

Attachment
Relief Request RV-30E
Proposed Alternative in Accordance with 10 CFR 50.55a(a)(3)(ii)
Impracticality without Compensating Increase in Level of Quality or Safety

Table 1
QCNPS Unit 1 and Unit 2 MSSV Data

Unit #	Valve Location	Valve Serial Number	Last Test Date	Installation Date	Storage Duration	Scheduled Replacement Outage	Scheduled Replacement Date	Installed Time	Requested Interval Extension
1	1-0203-4C	BK7156	3/24/2004	04/17/2005	13 months	Q1R20	05/2009	4 years	2 months
1	1-0203-4D	BK7159	12/26/2002	04/17/2005	28 months	Q1R20	05/2009	4 years	17 months
1	1-0203-4G	BK6306	3/24/2004	04/17/2005	13 months	Q1R20	05/2009	4 years	2 months
2	2-0203-4A	BK7164	11/27/2002	04/17/2006	42 months	Q2R19	03/2008	2 years	5 months
2	2-0203-4C	BK7163	9/21/2001	03/26/2004	31 months	Q2R19	03/2008	4 years	18 months
2	2-0203-4D	BK6266	10/09/2001	03/26/2004	31 months	Q2R19	03/2008	4 years	17 months
2	2-0203-4G	BK6529	02/28/2002	03/26/2004	25 months	Q2R19	03/2008	4 years	14 months
2	2-0203-4H	BK6278	9/21/2001	03/26/2004	31 months	Q2R19	03/2008	4 years	18 months

Table 2
Stored MSSV Test information

Serial Number	Test Date Prior to Storage	Most Recent Test Date	Storage Time	Nameplate Setting (psig)	Tested Pressure (psig)
BK-6252	11/26/2002	4/10/2007	52 months	1240	1224
BL-2467	10/8/2003	4/10/2007	42 months	1250	1251
BK-6318	4/14/2005	4/11/2007	24 months	1260	1261
BK-6294	1/6/2006	4/11/2007	15 months	1260	1257