November 20, 2007

Mr. Charles G. Pardee
Senior Vice President and Chief Nuclear Officer
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2 – RELIEF REQUEST NO. RV-30E FROM 5-YEAR TEST INTERVAL FOR MAIN STEAM SAFETY VALVES (TAC NOS. MD6682 AND MD6683)

Dear Mr. Pardee:

By letter dated September 7, 2007, as supplemented by letter dated October 30, 2007, Exelon Generation Company, LLC (EGC, the licensee), submitted Relief Request (RR) No. RV-30E for Quad Cities Nuclear Power Station (QCNPS), Units 1 and 2. The licensee requested relief from the requirements of Title 10 of the *Code of Federal Regulations*, (10 CFR) Part 50, Section 55a, concerning a requirement in the American Society of Mechanical Engineers (ASME), Code for Operation and Maintenance of Nuclear Power Plants (OM Code). The RR involves an extension to the ASME OM Code 5-year test interval for QCNPS, Unit 1 main steam safety valves (MSSVs) 1-0203-4C, 1-0203-4D, and 1-0203-4G and Unit 2 MSSVs 2-0203-4A, 2-0203-4C, 2-0203-4D, 2-0203-4G, and 2-0203-4H.

The Nuclear Regulatory Commission (NRC) staff has reviewed EGC's analysis in support of its request for relief. The NRC staff has concluded that compliance with the ASME OM Code 5-year test interval for Unit 1 MSSV 1-0203-4D and Unit 2 MSSV 2-0203-4A is impractical. Granting relief pursuant to 10 CFR 50.55a(f)(6)(i) is authorized by law and will not endanger life or property or the common defense and security, and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were

imposed on the facility. Relief is granted for Unit 1 MSSV 1-0203-4D through May 2009 and Unit 2 MSSV 2-0203-4A through March 2008.

The NRC staff has not completed its review for Unit 1 MSSVs 1-0203-4C and 01-203-4G, for which the ASME OM Code 5-year test interval does not expire until March 2009. The NRC staff has also not completed its review for Unit 2 MSSVs 2-0203-4C, 2-0203-4D, 2-0203-4G, and 2-0203-4H, for which the ASME OM Code 5-year test interval expired prior to discovery. Technical Specification (TS) compliance for those four Unit 2 valves has been established by the licensee in accordance with TS Surveillance Requirement 3.0.3. Those valves will be replaced during the upcoming Unit 2 refueling outage scheduled for March 2008.

Sincerely,

/RA/

Russell Gibbs, Chief
Plant Licensing Branch III-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-254 and 50-265

Enclosure:
Safety Evaluation

cc w/encls: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELIEF REQUEST NO. RV-30E

RELIEF FROM 5-YEAR TEST INTERVAL FOR MAIN STEAM SAFETY VALVES

EXELON GENERATION COMPANY, LLC

QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2

DOCKET NOS. 50-254 AND 50-265

1.0 INTRODUCTION

By letter dated September 7, 2007 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML072530031), as supplemented by letter dated October 30, 2007 (ADAMS Accession No. ML073040244), Exelon Generation Company, LLC (EGC, the licensee), submitted Relief Request No. RV-30E for Quad Cities Nuclear Power Station (QCNPS), Units 1 and 2. The licensee requested relief from the requirements of Title 10 of the *Code of Federal Regulations*, (10 CFR), Part 50, Section 55a (10 CFR 50.55a), concerning a requirement in the American Society of Mechanical Engineers (ASME), Code for Operation and Maintenance of Nuclear Power Plants (OM Code). The licensee requested an extension to the ASME OM Code 5-year test interval for QCNPS, Unit 1 main steam safety valves (MSSVs) 1-0203-4C, 1-0203-4D, and 1-0203-4G and Unit 2 MSSVs 2-0203-4A, 2-0203-4C, 2-0203-4D, 2-0203-4G, and 2-0203-4H.

The following safety evaluation addresses only the impracticality of compliance with the ASME OM Code 5-year test interval for MSSVs 1-0203-4D and 2-0203-4A. The NRC staff has not completed its review for Unit 1 MSSVs 1-0203-4C and 01-203-4G. The 5-year test interval for those two valves does not expire until March 2009. The NRC staff has also not completed its review for Unit 2 MSSVs 2-0203-4C, 2-0203-4D, 2-0203-4G, and 2-0203-4H, for which the ASME OM Code 5-year test interval expired prior to discovery.

The 1998 Edition through the 2000 Addenda of the ASME OM Code is the current Code of Record for the QCNPS, Units 1 and 2 inservice test (IST) program.

2.0 REGULATORY EVALUATION

Section 50.55a(f) of 10 CFR, “Inservice Testing Requirements,” requires, in part, that ASME OM Code Class 1, 2, and 3 components must meet the requirements of the ASME OM Code and applicable addenda, except where alternatives have been authorized or relief has been requested by the licensee and authorized and granted by the Commission pursuant to paragraphs (a)(3)(i), (a)(3)(ii), or (f)(6)(i) of 10 CFR 50.55a.

The licensee requested relief from the 5-year test requirement in Mandatory Appendix I, Section I-1330(a) of the 1998 Edition through the 2000 Addenda of the ASME OM Code. 10 CFR 50.55a(f)(5)(iii) requires that the licensee determine that conformance with the ASME OM Code requirement is impractical for the facility. 10 CFR 50.55a(f)(6)(i) authorizes the Commission to grant relief from ASME OM Code requirements as it determines is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

As described and reviewed herein, relief from the 5-year test interval requirement for Unit 1 MSSV 1-0203-4D and Unit 2 MSSV 2-0203-4A is requested because compliance with the aforementioned ASME OM Code requirement is impractical.

3.0 TECHNICAL EVALUATION FOR RELIEF REQUEST NO. RV-30E

The licensee's proposed alternative involves an extension to the 5-year test interval specified by the ASME OM Code in Mandatory Appendix I, Section I-1330(a) for, among others (not reviewed herein), Unit 1 MSSV 1-0203-4D and Unit 2 MSSV 2-0203-4A. MSSVs provide overpressure protection for the reactor coolant pressure boundary.

3.0.1 ASME OM Code Requirements

ASME OM Code Mandatory Appendix I, Section I-1330(a), "Test Frequencies, Class 1 Pressure Relief Valves," of the 1998 Edition through the 2000 Addenda of the ASME OM Code requires that Class 1 pressure relief valves be tested at least once every 5 years.

ASME Code Interpretation 01-18, "ASME OM Code-1995 with OMa ASME Code-1996 Addenda, Appendix I," dated June 26, 2003, clarifies the start of the 5-year test interval. The ASME OM Code Committee position is that the 5-year test interval starts when the valve is tested.

3.0.2 Licensee's Basis for Relief

The test interval for Unit 1 MSSV 1-0203-4D and Unit 2 MSSV 2-0203-4A will expire before the upcoming Units 1 and 2 refueling outages because the licensee incorrectly applied the 5-year test requirement in ASME OM Code Mandatory Appendix I, Section I-1330(a). The licensee's practice was to start the 5-year interval when a MSSV was installed, not including storage time in the computation of the 5-year interval. The licensee is planning to remove and test Unit 1 MSSV 1-0203-4D during the upcoming May 2009 refueling outage. The licensee is planning to remove and test Unit 2 MSSV 2-0203-4A during the upcoming March 2008 refueling outage. Normal practice at QCNPS is to remove and test four of the eight MSSVs in each unit every refueling outage. Spare MSSVs that were previously refurbished and tested are installed in place of the MSSVs that are removed. The MSSVs removed from service are tested, refurbished, and then retested before being reinstalled during a future refueling outage. Testing Unit 1 MSSV 1-0203-4D and Unit 2 MSSV 2-0203-4A at power is impractical because the method utilized by the licensee to test MSSVs requires the plant to be shutdown. Without the ASME OM Code relief, both units would have to be shutdown solely to test these MSSVs. Testing the MSSVs prior to the Units 1 and 2 upcoming refueling outages would result in unnecessary plant shutdowns or an extension of a forced outage, unnecessary challenges to safety systems, and unnecessary cycling of equipment.

The 5-year test interval for Unit 1 MSSV 1-0203-4D will expire on November 27, 2007. The 5-year test interval for Unit 2 MSSV 2-0203-4A will expire on December 26, 2007. Test history provided by the licensee shows that the specific MSSVs in these locations generally passed the TS lift setpoint acceptance criteria of ±1 percent of nameplate setpressure. In one instance, an unsatisfactory test was only slightly above the TS acceptance criteria of ±1 percent of nameplate setpressure. In other instances, unsatisfactory tests exceeded the TS acceptance criteria of ±1 percent of nameplate setpressure in a negative, or conservative direction.

Test results for MSSVs stored in a controlled environment indicate that the impact of storage in a controlled environment on MSSV lift setpoint was minimal.

3.0.3 Licensee's Proposed Alternative Testing

The licensee is proposing to extend the test interval for Unit 1 MSSV 1-0203-4D and Unit 2 MSSV 2-0203-4A beyond 5 years on a one-time basis. The testing of Unit 1 MSSV 1-0203-4D would be delayed until the upcoming May 2009 refueling outage; the testing of the Unit 2 MSSV 2-0203-4A would be delayed until the upcoming March 2008 refueling outage.

3.0.4 NRC Staff's Evaluation of Relief Request

The NRC staff has reviewed the MSSV lift setpoint test summary results provided by the licensee to determine if it is acceptable to extend the test interval for Unit 1 MSSV 1-0203-4D and Unit 2 MSSV 2-0203-4A beyond the 5-year interval specified in the ASME OM Code. The MSSV lift setpoint test summary results for these valves show that the MSSVs generally passed the TS lift setpoint acceptance criteria of ±1 percent of nameplate setpressure. In one instance, an unsatisfactory test was only slightly above the TS acceptance criteria of ±1 percent of nameplate setpressure. In other instances, unsatisfactory lift setpoint tests exceeded the TS acceptance criteria of ±1 percent of nameplate set pressure in a negative, or conservative direction.

The licensee stated that Unit 1 MSSV 1-0203-4D and Unit 2 MSSV 2-0203-4A were stored in a controlled environment from 28 to 42 months prior to installation, and will have been in service for up to 4 years prior to removal during the upcoming refueling outages. The licensee also stated that the controlled environment was equipped to prevent condensation and corrosion. The licensee provided test results for four MSSVs that were stored in this same controlled environment for up to 4 years and 4 months in order to determine the impact of storage in a controlled environment on the lift setpoint. Results of this testing indicated that lift setpoint drift for three of the four MSSVs was negligible. The lift setpoint drift for the fourth MSSV was -1.3 percent.

Replacement of the affected MSSVs, prior to the planned refueling outage would result in an unnecessary plant shutdown; an unnecessary challenge to safety systems. Shutting the units down or extending a forced outage solely to test the MSSVs would also be contrary to the principles of keeping radiation exposure as low as reasonably achievable. Crews of workers would be required to remove each MSSV and install each spare MSSV. Insulation and appurtenances on the MSSV also require removal and reinstallation. Because of the location of the MSSVs in the containment, this would result in radiation exposure to the maintenance personnel performing the work.

The licensee stated that an ASME OM Code-certified off-site vendor is used to perform testing, inspection, and refurbishment of each MSSV that is removed from service in accordance with a licensee approved procedure. 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. Components are either reworked to within the specified tolerance or replaced if found to be worn or outside of specified tolerances.

Based on the foregoing, the NRC staff finds that the proposed alternative to extend the test interval for QCNPS, Unit 1 MSSV 1-0203-4D and Unit 2 MSSV 2-0203-4A beyond the ASME OM Code 5-year test requirement is acceptable. The additional time beyond that required by the ASME OM Code should not impair the valves' operational readiness based on the following:

> Although the ASME OM Code does not require the MSSVs to be routinely refurbished, refurbishment of the MSSVs every two operating cycles provides reasonable assurance that setpoint drift will be minimized.
>
> Lift setpoint drift percentages indicate that in general, MSSV lift setpoints tend to drift slightly downward not upward. A lift setpoint drift in the downwards direction is conservative because the valve would tend to open sooner than required, from an overpressure protection standpoint,
>
> Test results for MSSVs stored in a controlled environment for up to 4 years and 4 months demonstrate that storage in the controlled environment has a minimal effect on the lift setpoint.
>
> The MSSV lift setpoint test summary results for the MSSVs currently in the Unit 1 MSSV 1-0203-4D and Unit 2 MSSV 2-0203-4A locations show that these MSSVs generally passed the TS lift setpoint acceptance criteria of $\pm$1 percent of nameplate setpressure.

4.0 CONCLUSION

The NRC staff has concluded that compliance with ASME OM Code 5-year test interval for Unit 1 MSSV 1-0203-4D and Unit 2 MSSV 2-0203-4A is impractical because, pursuant to the licensee's testing methodology, compliant testing would require an unnecessary plant shutdown or an extension of a forced outage, along with unnecessary radiation exposure to plant personnel performing the testing and removal. At QCNPS, the unit must be shutdown to test the MSSVs. The additional time beyond that required by the ASME OM Code should not impair the valves' operational readiness. The NRC staff has determined that granting the relief requested for Unit 1 MSSV 1-0203-4D and Unit 2 MSSV 2-0203-4A pursuant to 10 CFR 50.55a(f)(6)(i) is authorized by law and will not endanger life or property or the common defense and security, and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. Relief is granted for Unit 1 MSSV 1-0203-4D through May 2009. Relief is granted for Unit 2 MSSV 2-0203-4A through March 2008.

Principal Contributor: S. G. Tingen, NRR

Date: November 20, 2007