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

Quad Cities Nuclear Power Station, Unit 1
Renewed Facility Operating License No. DPR-29
NRC Docket No. 50-254

Reference: Letter from R. Gibbs (U.S. NRC) to C. G. Pardee (Exelon Generation Company, LLC), "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)," dated November 20, 2007

Subject: Request for One-Time Relief from ASME OM Code 5-year Test Interval for Main Steam Electromatic Relief Valve (Relief Request RV-30G, Revision 0)

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-30G to extend the 5-year inservice test (IST) interval for the 0203-3C Main Steam Electromatic Relief Valve (ERV) at Quad Cities Nuclear Power Station (QCNPS) Unit 1 on a one-time basis to 5-years plus approximately six weeks (i.e., to the start of the first refueling outage after expiration of the 5-year interval).

Specifically, EGC requests relief from the 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." This proposed relief request is similar to a one-time relief request to extend the 5-year IST interval for Main Steam Safety Valves at QCNPS, which was approved by the NRC in the referenced letter. The proposed relief request is provided in the attachment to this letter.

In that the QCNPS Unit 1 0203-3C ERV (i.e., Valve Serial No. BY-94637) will exceed the 5-year IST interval on March 17, 2009, EGC requests approval of this request by March 15, 2009 to enable continued operation of QCNPS Unit 1 until the start of the twentieth QCNPS Unit 1 refueling outage in late-April 2009. Without the proposed relief, EGC would be required to implement an unnecessary and unplanned mid-cycle shutdown. This mid-cycle shutdown, and the resulting additional personnel radiation exposure associated with the replacement of the ERV, represents a hardship, without a compensating increase in the level of quality or safety.

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,

Jeffrey L. Hansen
Manager - Licensing

Attachment: Relief Request RV-30G, Revision 0

Attachment
Relief Request RV-30G, Revision 0
Proposed Alternative in Accordance with 10 CFR 50.55a(a)(3)(ii)
Hardship or Unusual Difficulty without Compensating
Increase in Level of Quality or Safety

1) ASME Code Component(s) Affected

Quad Cities Nuclear Power Station (QCNPS) Unit 1, Main Steam Electromatic Relief Valve (ERV) 0203-3C; Model: 1525VX; Manufacturer: Dresser

Component Number	System	Code Class	Category
1-0203-003C	Main Steam	1	B/C

2) Applicable Code Edition and Addenda

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

3) Applicable Code Requirement

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

4) Reason for Request

10 CFR 50.55a(f)(4) directs a licensee to meet inservice test (IST) requirements for ASME Code Class 1 valves set forth in the ASME OM Code and Addenda. QCNPS is committed to the 1998 Edition through 2000 Addenda of the ASME OM Code. The 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. Appendix I, Section I-1330(a) of the ASME OM Code states that Class 1 pressure relief valves shall be tested at least once every five years, starting with initial electric power generation.

EGC conducts IST testing of ERVs at QCNPS in accordance with an NRC-approved relief request and license amendment (Reference 1). This relief request and license amendment established a series of overlapping tests for ERVs at QCNPS, as opposed to in-situ pressure testing, which was required at the time by the QCNPS Technical Specifications (TSs).

Specifically, the approved relief request and license amendment established a requirement to 1) remove, disassemble, inspect, refurbish, and as-left test one half of the installed ERVs each refueling outage; and 2) demonstrate that the valve actuator would stroke when manually actuated each refueling outage. These overlapping tests ensure that the ERVs, 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 assumed in the safety analysis.

Attachment
Relief Request RV-30G, Revision 0
Proposed Alternative in Accordance with 10 CFR 50.55a(a)(3)(ii)
Hardship or Unusual Difficulty without Compensating
Increase in Level of Quality or Safety

EGC installed ERV Serial Number BY-94637 in QCNPS Unit 1, position 0203-3C during the eighteenth refueling outage in April 2005. This was a new valve that was pre-installation tested in March 2004 and placed into controlled storage until installation in April 2005 (i.e., approximately 13 months).

An EGC-qualified procedure is used at QCNPS for packaging, handling and storage of all safety related equipment, which includes ERVs. 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 equivalent, 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 ERV is enclosed in a sturdy metal box. These controls provide assurance that valve performance is unaffected during the storage period. As described in Section 5.0 below, a series of tests are performed following installation of an ERV to ensure the valve actuator is fully functional, prior to power operation.

During a review of the QCNPS IST program in late-2007 with respect to a recent ASME OM Code interpretation, EGC identified a discrepancy relative to the 5-year IST test interval for Main Steam pressure relief valves. 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 compliance with ASME OM Code, Subsection I-1330 was an "installation-to-test" duration. As such, EGC had initially established April 2005 as the beginning of the 5-year IST interval for the QCNPS Unit 1 0203-3C ERV (i.e., the installation date), as opposed to the as-left test date of March 2004, with the difference being the 13 months that the ERV was in storage, as described above.

In accordance with 10 CFR 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 through 2000 Addenda, Appendix I, Section I-1330, paragraph (a) for the 0203-3C ERV at QCNPS Unit 1 (i.e., Serial Number BY-94637) until the start of the twentieth QCNPS Unit 1 refueling outage (i.e., Q1R20). Q1R20 is scheduled to begin in late-April 2009. The requested duration of the relief is approximately seven weeks. Compliance with the ASME OM Code during power operation is impractical, and compliance during a mid-cycle outage would result in hardship (i.e., unnecessary challenges to safety systems and unnecessary personnel radiation exposure), without a compensating increase in the level of quality and safety.

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.

5) Proposed Alternative and Basis for Use

a) Proposed Alternative

For the 4th ten-year inservice testing interval at QCNPS Unit 1, EGC proposes to remove the 0203-3C ERV and replace it with a refurbished and tested ERV during Q1R20, which is scheduled to start in late-April 2009, approximately six weeks after expiration of the 5-year IST interval. EGC will inspect, refurbish, and test the removed valve, as described below, during a non-outage period.

Compliance with the ASME OM Code is not practicable during operation at power (i.e., in-situ ERV actuation). Industry experience has demonstrated that manual actuation of main steam relief valves during plant operation can lead to increased seat leakage. Seat leakage can lead to plant challenges, including increased suppression pool temperature and the potential for pilot valve leakage. Pilot valve leakage can cause an inadvertent opening of the valves and impair the ability to re-close.

Given this impracticality, replacement of the 0203-3C ERV would require an unplanned mid-cycle outage, prior to the planned refueling outage, resulting in an unnecessary plant shutdown, 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.

Based upon: 1) historical IST inspection and refurbishment of QCNPS ERVs; 2) recent maintenance and verification tests of the QCNPS Unit 1 0203-3C ERV; 3) EGC's current ERV maintenance and storage procedures; 4) recent ASME OM Code tests of stored pressure relief valves; and 4) vendor recommendations, compliance with the ASME OM Code would not result in a compensating increase in the level of quality or safety.

b) Unnecessary Personnel Exposure

All ERVs (as well as the Main Steam Safety Valves (MSSVs) and the Target Rock Safety Relief Valve (SRV)) are on the second elevation of the QCNPS Unit 1 Drywell. The major contributor to radiation exposure on the first and second elevations of the Drywell is the Reactor Recirculation System, for which permanent shielding has been installed. However, other major piping systems on the second elevation of the Drywell also contribute to radiation exposure, including Feedwater system and Main Steam system piping. Temporary lead shielding is used during refueling outages to reduce exposure rates from these other radiation sources.

In addition to installing and removing temporary lead shielding in the Drywell, the replacement of an ERV includes removing and re-installing insulation on the ERV standpipe and appurtenances, unbolting of the ERV, maneuvering the ERV from its existing location to the first elevation, and repeating this process in reverse with a newly tested valve. Due to the highly congested configuration of the General Electric Mark I containment at QCNPS, and the size of an ERV, this evolution requires additional rigging and a crew of five to seven personnel to safely move an ERV.

EGC has evaluated the historical cumulative radiation exposure at QCNPS for removal and replacement of MSSVs, ERVs, and the SRV from the last eight QCNPS refueling outages. The work evolutions necessary to remove and replace these valves each refueling outage, which includes the removal and replacement of two ERVs, are conducted under equivalent radiological conditions and with the same manpower requirements.

Historical cumulative radiation exposure at QCNPS for removal and replacement of safety and relief valves from eight recent QCNPS refueling outages is described in the following table.

TABLE
Cumulative Radiation Exposure

Outage	Q1R16	Q2R16	Q1R17	Q2R17	Q1R18	Q2R18	Q1R19	Q2R19
Number of Valves Replaced	11	7	7	9	9	13	7	8
Cumulative Radiation Exposure	69.7	24.1	52.8	33.7	37.7	78.6	12.2	14.7

This data indicates that the cumulative radiation exposure to replace an ERV during a refueling outage could range from approximately 1.8 person-rem to over seven person-rem. The outage-specific variability of cumulative radiation exposure is attributed to the location of a particular valve relative to radiation hot spots, the physical configuration of surrounding equipment for a particular valve, the impact of outage-specific plant configurations, and the effectiveness of temporary shielding in the reduction of exposure rates. In that the combinations of these factors for a particular refueling outage are highly variable, EGC has concluded that the expected average cumulative radiation exposure to remove and replace a single ERV during a refueling outage would be approximately 3.0 person-rem.

However, the estimated exposure to remove and replace an ERV during a mid-cycle outage would be even higher, since installation and removal of temporary shielding for a single valve could not be justified (i.e., the exposure to install and remove the shielding would be greater than the savings for replacement of a single valve). Therefore, EGC has estimated that the personnel exposure to replace the Unit 1 0203-3C ERV during a

mid-cycle outage would be as much as 4.5 person-rem (i.e., up to 150% of the estimated refueling outage exposure).

Absent the requested relief, this additional person-rem would be incremental exposure, in that EGC would again be required to replace this valve, prior to the normal replacement schedule, during subsequent refueling outages in order to maintain compliance with ASME OM Code requirements and other preventive maintenance schedule requirements.

c) ERV Testing

As discussed in Section 4 above, EGC conducts a series of overlapping tests of ERVs at QCNPS, in accordance with an NRC-approved relief request and license amendment (Reference 1). Specifically, these overlapping tests are: 1) removal and complete disassembly, inspection, refurbishment, and as-left testing of one half of the installed ERVs each refueling outage; and 2) replacement of the ERV pilot valve assemblies, visual inspections of valve components, and ERV actuator tests each refueling outage for those ERVs that are not removed from service.

The disassembly, inspection, refurbishment, and as-left testing of removed ERVs is performed at a steam test facility. The ERV (i.e., main valve and pilot valve) and an actuator representative of the actuator used at the plant is installed on a steam header in the same orientation as the plant installation. The test conditions are similar to normal operating conditions, including ambient temperature, valve insulation, and steam conditions. The valve is then leak-tested, functionally tested to ensure that the ERV is capable of opening and closing (including stroke time), and leak-tested again. Valve seat tightness is verified by a cold bar test. If the cold bar is not free of water droplets, valve seat maintenance is re-performed to improve valve seating.

The replacement of the pilot valve assemblies (i.e., for those ERVs that are not removed during a particular refueling outage) does not affect the main valve disc. Following replacement of a pilot valve assembly, the ERV actuator is tested, without stroking the main valve.

The combination of steam testing of an ERV (i.e., following inspection and refurbishment) and valve actuator replacement and testing provides a complete check of the capability of the ERVs to open and close.

EGC has completed the disassembly, inspection, refurbishment, and as-left testing (i.e., as described above) of 16 ERVs that were refurbished within the last 10 years, following installation in either QCNPS Unit 1 or Unit 2. The as-found inspection of these valves indicated that the material condition of all subcomponents was satisfactory, and that these subcomponents would be able to function properly.

EGC also completed the following tests and inspections of the Unit 1 0203-3C ERV, subsequent to the March 2004 as-left testing and April 2005 installation:

- Functional check of actuator and pilot valve motion and visual inspections of valve components in February 2006 following actuator maintenance during a forced outage.

- Functional check of actuator and pilot valve motion and visual inspections of valve components in May 2006, following installation of the Acoustic Side Branch modification and replacement of the actuator during a maintenance outage.

- Functional check of actuator and pilot valve motion and visual inspections of valve components in May 2007 following replacement of the pilot valve and actuator during the nineteenth QCNPS Unit 1 refueling outage.

Since 2005, EGC has utilized an ASME OM Code-certified off-site vendor to perform inspection, refurbishment, and as-left testing of the ERVs from QCNPS. This vendor utilizes an EGC-approved and qualified procedure for disassembly and inspection of each ERV that is removed from service. The procedure identifies the critical components that are required to be inspected to identify potential 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. All parts that are defective, outside-of-tolerance, and all reworked/replaced components are identified, and EGC is notified of these components by the off-site vendor. The ERV is then re-assembled, the as-left test is performed, and the ERV is returned to QCNPS.

The inspection, refurbishment, and as-left testing of the ERVs from QCNPS, as described above, is consistent with the special maintenance requirement in ASME OM Code Case OMN-17, "Alternative Rules for Testing ASME Class 1 Pressure Relief/Safety Valves." This code case allows owners to extend the test interval for safety and relief valves from 60 months to 72 months, plus a 6-month grace period. The code case imposes a special maintenance requirement to disassemble and inspect each safety and relief valve to verify that parts are free from defects resulting from the time related degradation or maintenance induced wear prior to the start of the extended test interval.

In Reference 2, EGC described results from ASME OM Code tests of four similar Main Steam system pressure relief valves (i.e., MSSVs) from the same manufacturer (i.e., Dresser Model 3777Q valves) that were maintained in a controlled environment for an extended period of time (i.e., as described in Section 4.0 above), but not yet installed. These valves had been previously installed at QCNPS, refurbished, and were awaiting to be installed as replacement valves. The purpose of the additional testing was to determine the impact of controlled environment storage upon the ability of the valves to satisfy ASME OM Code acceptance criteria, and thus their design safety function. These pressure relief valves had been maintained in this controlled environment for periods of time ranging from 15 months to 52 months (i.e., as compared to a storage

duration of 13 months for the QCNPS Unit 1 0203-3C ERV). The test results for the four stored pressure relief valves indicated that storage in a controlled environment for various durations had no impact upon the ability of the valves to comply with ASME OM Code acceptance criteria, prior to installation. Given the design and functional similarities between Dresser Model 3777Q MSSVs and Dresser Model 1525VX ERVs, EGC has concluded that the results of the additional ASME OM Code tests of MSSVs are also applicable to the ERVs.

EGC has also reviewed, and complies with manufacturer recommendations for valve storage. This review indicated that the Dresser Model 1525VX ERVs are required to be stored in a controlled environment, inside specially designed metal storage containers prior to installation as replacement ERVs. The manufacturer recommendations also require that the controlled environment in which these ERVs would be stored is not subject to thermal cycling or vibration (i.e., the normal operating conditions to which ERVs are subjected).

Finally, EGC has contacted the ERV manufacturer (i.e., Dresser), to identify any operating and/or maintenance experience with Model 1525VX ERVs that could provide additional insights regarding the impact of controlled environment storage upon ERVs. The manufacturer indicated that other licensees have stored Model 1525VX ERVs in a controlled environment with excellent results.

6) Duration of Proposed Alternative

This relief is requested for the period from March 17, 2009 until the start of the QCNPS twentieth refueling outage, which is currently scheduled to commence on April 27, 2009. At that point, the ERV will be removed and replaced with a refurbished and as-left tested ERV.

7) Precedent

In Reference 3, the NRC reviewed and approved a similar one-time relief request for QCNPS Units 1 and 2 (i.e., Reference 2) to extend the IST test interval duration for two MSSVs beyond the ASME OM Code interval of five years by five months for one valve and 17 months for the second valve.

8. References

1) Letter from G. Y. Suh (USNRC) to C. M. Crane (Exelon Generation Company, LLC), "Dresden Nuclear Power Station, Units 2 and 3 and Quad Cities Nuclear Power Station, Units 1 and 2 - Issuance of Amendments for Main Steam Line Relief Valves and Associated Relief Requests (TAC Nos. MC1792, MC1793, MC1794 and MC1795)" dated October 19, 2004

2) Letter from P. R. Simpson (Exelon Generation Company, LLC) to U. S. Nuclear Regulatory Commission, "Request for Relief from ASME OM Code 5-year Test Interval for Main Steam Safety Valves (Relief Request RV-30E)," dated September 7, 2007

3) Letter from R. Gibbs (U.S. NRC) to C. G. Pardee (Exelon Generation Company, LLC), "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)," dated November 20, 2007