

RS-08-033

March 6, 2008

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 No. 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-30F, Revision 0) and Partial Withdrawal of Relief Request RV-30E, Revision 0

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

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-30F to extend the 5-year Inservice Test (IST) interval to a 6.5-year IST interval for all Dresser Model 3777Q Main Steam Safety Valves (MSSVs) at Quad Cities Nuclear Power Station (QCNPS), Units 1 and 2.

Specifically, EGC requests relief from the American Society of Mechanical Engineers/American National Standards Institute, Operation and Maintenance of Nuclear Power Plants, "Code for Operation and Maintenance of Nuclear Power Plants," 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." This relief is requested for the remainder of the fourth 10-year Inservice Testing (IST) interval, which began February 19, 2004 and is scheduled to end on February 18, 2014.

EGC requests approval of Relief Request RV-30F by March 23, 2009 to enable continued operation of QCNPS Unit 1 until the start of the twentieth QCNPS Unit 1 refueling outage, since two MSSVs that are currently installed in Unit 1 will exceed their 5-year IST interval on March 24, 2009 (i.e., Valve Serial Nos. BK7156 and BK6306). This refueling outage is currently scheduled to begin in May 2009.

In Reference 1, EGC previously submitted a one-time relief request (i.e., Relief Request RV-30E) for these two specific QCNPS Unit 1 MSSVs, along with six other installed MSSVs (i.e., a total population of three Unit 1 MSSVs and five Unit 2 MSSVs). In Reference 2, the NRC approved the relief for one Unit 1 MSSV and one Unit 2 MSSV, and indicated that the NRC staff had not yet completed its review of the two remaining Unit 1 MSSVs, as well as four QCNPS Unit 2 MSSVs. When approved, this relief request will supercede Relief Request RV-30E (i.e., as approved in Reference 2) for the two specific Unit 1 MSSVs (i.e., Valve Serial Nos. BK7156 and BK6306).

With respect to the Reference 1 request, relief is no longer required for the remaining four MSSVs that were installed in QCNPS Unit 2 and specifically delineated in the Reference 1 relief request (i.e., Valve Serial Nos. BK7163, BK6266, BK6529, and BK6278), since EGC will replace these valves during the March 2008 Unit 2 refueling outage. Therefore, EGC is withdrawing relief request RV-30E for these four specific valves.

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,



Darin M. Benyak  
Director - Licensing and Regulatory Affairs

Attachment: Relief Request RV-30F, 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

**Attachment**  
**Relief Request RV-30F, 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) Units 1 and 2, Main Steam Safety Valves (MSSVs): Model: 3777Q; Manufacturer: Dresser

<b>Component Number</b>	<b>System</b>	<b>Code Class</b>	<b>Category</b>
1-0203-004A	Main Steam	1	C
1-0203-004B	Main Steam	1	C
1-0203-004C	Main Steam	1	C
1-0203-004D	Main Steam	1	C
1-0203-004E	Main Steam	1	C
1-0203-004F	Main Steam	1	C
1-0203-004G	Main Steam	1	C
1-0203-004H	Main Steam	1	C
2-0203-004A	Main Steam	1	C
2-0203-004B	Main Steam	1	C
2-0203-004C	Main Steam	1	C
2-0203-004D	Main Steam	1	C
2-0203-004E	Main Steam	1	C
2-0203-004F	Main Steam	1	C
2-0203-004G	Main Steam	1	C
2-0203-004H	Main Steam	1	C

**2. Applicable Code Edition and Addenda**

American Society of Mechanical Engineers (ASME)/American National Standards Institute (ANSI), "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 testing 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.

Section ISTC-3200, "Inservice Testing," states that inservice testing shall commence when the valves are required to be operable to fulfill their required function(s). Section ISTC-5240, "Safety and Relief Valves," directs that safety and relief valves meet the inservice

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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. This section also requires that a minimum of 20 percent of the pressure relief valves are tested within any 24 month interval and that the test interval for any individual valve shall not exceed five 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 assumed in the safety analysis.

The Dresser Model 3777Q MSSVs have shown exemplary test history at both QCNPS and Dresden Nuclear Power Station (DNPS), as described in Section 5 below. However, given the current 24-month operating cycle for each QCNPS unit, Exelon Generation Company, LLC (EGC) is required to remove and test fifty percent (four of eight) MSSVs every refueling outage, so that all valves are removed and tested every two refueling outages. This ensures compliance with the ASME OM Code requirements for testing Class 1 pressure relief valves within a five-year interval. Approval of extending the test interval to 6.5 years would reduce the minimum number of MSSVs tested at QCNPS over three refueling outages by four MSSVs per unit.

Without Code relief, the incremental outage work due to the inclusion of the four additional MSSVs would be contrary to the principles of maintaining exposure to radiation as low as reasonably achievable (ALARA), in that the removal and replacement of the four MSSVs over three refueling outages per unit will result in approximately 14 person-rem of additional cumulative radiation exposure. This additional cumulative radiation exposure represents a hardship for QCNPS without a compensating increase in the level of quality or safety.

In accordance with 10 CFR 50.55a, "Codes and standards," paragraph (a)(3)(ii), EGC requests relief from the five year test interval requirements of ASME OM Code, Appendix I, Section I-1330(a) for the Dresser Model 3777Q MSSVs at QCNPS Units 1 and 2. EGC requests that the test interval be increased from five years to 6.5 years. All other requirements of the ASME OM Code would be met. Compliance with the applicable requirements of the ASME OM Code for these MSSVs results in hardship due to unnecessary personnel radiation exposure without a compensating increase in the level of quality or safety.

**5. Proposed Alternative and Basis for Use**

EGC proposes that ASME Class 1 pressure relief valves (i.e., Dresser Model 3777Q MSSVs) at QCNPS shall be tested at least once every 6.5 years. A minimum of 20% of the pressure relief valves will be tested within any 24-month interval and that this 20% shall consist of valves that have not been tested during the current 6.5 year interval, if they exist. The test interval for any individual valve shall not exceed 6.5 years.

All MSSVs (as well as the Electromatic relief valves (ERVs) and the Target Rock safety relief valve (SRV)) are on the second elevation of the 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

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major piping systems on the second elevation of the Drywell also contribute to radiation exposure, including Feedwater system and Main Steam system piping.

Removal of an installed MSSV and installation of a replacement MSSV require removal of insulation and appurtenances on the MSSV and unbolting the MSSV. Once unbolted, the MSSV is maneuvered from its location and lowered to the first elevation. Due to the highly congested configuration of the General Electric Mark I containment at QCNPS, this evolution requires construction and demobilization of additional rigging. Based upon the size of the valves, a crew of five to seven personnel is necessary to safely move each valve.

Historical cumulative radiation exposure at QCNPS for removal and replacement of safety and relief valves from seven recent QCNPS refueling outages (i.e., a combination of MSSVs, ERVs, and one SRV each refueling outage) is described in Table 1.

**TABLE 1: Cumulative Radiation Exposure**

<b>Outage</b>	<b>Q1R16</b>	<b>Q2R16</b>	<b>Q1R17</b>	<b>Q2R17</b>	<b>Q1R18</b>	<b>Q2R18</b>	<b>Q1R19</b>
Number of Valves Replaced	11	7	7	9	9	13	7
Cumulative Radiation Exposure	69.7	24.1	52.8	33.7	37.7	78.6	12.2

This data indicates that the cumulative radiation exposure to replace an MSSV could range from approximately two rem to over seven rem. The outage-specific variability of cumulative radiation exposure is attributed to the location of a particular valve relative to higher radiation fields, the physical configuration of surrounding equipment for a particular valve, and the impact of outage-specific plant configurations. 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 MSSV would be approximately 3.5 person-rem. Therefore, absent the requested relief, replacement of four incremental MSSVs would result in approximately 14 additional person-rem over three refueling outages per unit, without a compensating increase in the level of quality or safety.

IST history for the Dresser Model 3777Q MSSVs at QCNPS from May 1997 to the present indicates that all tested MSSVs (i.e., 60 MSSV tests) that have been installed in either QCNPS Unit 1 or Unit 2 have successfully passed the ASME OM Code and the currently approved Technical Specification (TS) as-found lift setpoint acceptance criteria within plus or minus 3%. Historical test data indicates that 37 of the 60 tests remained within an as-left tolerance of plus or minus 1%, and of the 23 tests that were greater than plus or minus 1%, only eight tests were greater than plus 1% (i.e., the majority of MSSV test results that exceeded plus or minus 1% were in the negative, or conservative, direction).

This historical QCNPS test data is consistent with the reliable performance of the Dresser Model 3777Q MSSVs at DNPS, Units 2 and 3. Since 1997, EGC has collected and documented 108 as-found Model 3777Q test results from both QCNPS and DNPS. Dresser

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Model 3777Q MSSVs from QCNPS are tested and refurbished at the same facility that tests and refurbishes the DNPS MSSVs, utilizing the same work processes. 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 the historical test results, the current QCNPS reload ASME overpressure analyses for both units assume that only eight of nine MSSVs are operable, and all of the operable MSSVs open to relieve pressure at the upper ASME limit of plus 3% of the MSSV setpoint. These conservative assumptions provide additional assurance that the requested relief from the ASME OM Code requirement would not result in a decrease in the level of quality or safety.

QCNPS utilizes an ASME OM Code-certified off-site vendor to perform as-found and as-left testing, inspection, and refurbishment of the MSSVs. An EGC-approved and qualified procedure is used for disassembly and inspection of the 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. 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 MSSV is then re-assembled, the as-left test is performed, and the MSSV is returned to QCNPS.

Based upon the estimated cumulative radiation exposure to comply with the ASME OM Code, coupled with historical MSSV test results for Dresser Model 3777Q MSSVs at QCNPS and DNPS, EGC has concluded that compliance with the ASME OM Code would result in a hardship, without a compensating increase in the level of quality or safety.

**6. Duration of Proposed Alternative**

This relief is requested for the remainder of the fourth 10-year IST interval, which began February 19, 2004 and is scheduled to end on February 18, 2014.

**7. Precedents**

In Reference 1, the NRC reviewed and approved a relief request for Susquehanna Steam Electric Station (SSES), 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 Nuclear Power Station, Unit 2 (NMP2) 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.

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This proposed relief request is consistent with the SSES and NMP2 precedents, in that it will establish a test interval that would enable EGC to maintain a Dresser Model 3777Q MSSV in-service for three operating cycles, while also allowing adequate time to transport, test, and refurbish an MSSV, at an external facility, prior to reinstallation.

**8. References**

- 1) Letter from R. J. Laufer (U. S. NRC) to B. L. Shriver (PPL Susquehanna, LLC), "Susquehanna Steam Electric Station Units 1 and 2 - Third 10-Year Interval Inservice Testing (IST) Program Plans (TAC Nos. MC3382, MC3383, MC3384, MC3385, MC3386, MC3387, MC3388, MC3389, MC4421, MC4422)," dated March 10, 2005.
- 2) Letter from M. Banerjee (U. S. NRC) to J.H. Mueller (Niagara Mohawk Power Corporation), "Nine Mile Point Nuclear Power Station, Unit No. 2 - Alternative to American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) Regarding Inservice Testing of Main Steam Safety/Relief Valves (TAC No. MB0290)," dated April 17, 2001.