November 1, 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 - ISSUANCE OF AMENDMENTS TO INCREASE THE MAIN STEAM SAFETY VALVE LIFT SETPOINT TOLERANCE AND STANDBY LIQUID CONTROL SYSTEM ENRICHMENT (TAC NOS. MD3689 AND MD3690)

Dear Mr. Pardee:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment No. 235 to Renewed Facility Operating License No. DPR-29 and Amendment No. 230 to Renewed Facility Operating License No. DPR-30 for the Quad Cities Nuclear Power Station, Units 1 and 2, respectively. The amendments are in response to your application dated November 7, 2006 (Agencywide Documents Access and Management System (ADAMS) No. ML063110636) as supplemented by letter dated January 24, 2007 (ADAMS No. ML070250166).

The amendments revise Technical Specification (TS) Surveillance Requirement (SR) 3.4.3.1 to increase the allowable as-found main steam safety valve lift setpoint tolerance from ±1 percent to ±3 percent. In addition, the amendments revise TS SR 3.1.7.10 to increase the enrichment of sodium pentaborate used in the Standby Liquid Control System from $\geq$ 30.0 atom percent boron-10 to $\geq$45.0 atom percent boron-10.

A copy of the related Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

/RA/

Joel S. Wiebe, Senior Project Manager
Plant Licensing Branch III-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-254 and 50-265

Enclosures:
1. Amendment No. 235 to DPR-29
2. Amendment No. 230 to DPR-30
3. Safety Evaluation

cc w/encls: See next page

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via e-mail

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EXELON GENERATION COMPANY, LLC

AND

MIDAMERICAN ENERGY COMPANY

DOCKET NO. 50-254

QUAD CITIES NUCLEAR POWER STATION, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 235
Renewed License No. DPR-29

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Exelon Generation Company, LLC, et al. (the licensee) dated November 7, 2006, as supplemented by letter dated January 24, 2007, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 3.B. of Renewed Facility Operating License No. DPR-29 is hereby amended to read as follows:

B. Technical Specifications

The Technical Specifications contained in Appendix A as revised through Amendment No. 235, are hereby incorporated into the renewed operating license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance and shall be implemented prior to main steam safety valve testing during the next refueling outage (currently scheduled for May 2009).

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

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

Attachment: Changes to the Technical
Specifications and Facility Operating License

Date of Issuance: November 1, 2007

EXELON GENERATION COMPANY, LLC

AND

MIDAMERICAN ENERGY COMPANY

DOCKET NO. 50-265

QUAD CITIES NUCLEAR POWER STATION, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 230
Renewed License No. DPR-30

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Exelon Generation Company, LLC, et al. (the licensee) dated November 7, 2006, as supplemented by letter dated January 24, 2007, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 3.B. of Renewed Facility Operating License No. DPR-30 is hereby amended to read as follows:

B. Technical Specifications

The Technical Specifications contained in Appendix A as revised through Amendment No. 230, are hereby incorporated into the renewed operating license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance and shall be implemented prior to main steam safety valve testing during the next refueling outage (currently scheduled for May 2008).

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

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

Attachment: Changes to the Technical
Specifications and Facility Operating License

Date of Issuance: November 1, 2007

ATTACHMENT TO LICENSE AMENDMENT NOS. 235 AND 230

RENEWED FACILITY OPERATING LICENSES NOS. DPR-29 AND DPR-30

DOCKET NOS. 50-254 AND 50-265

Replace the following pages of the Facility Operating Licenses and Appendix "A" Technical Specifications with the attached pages. The revised pages are identified by number and contain marginal lines indicating the areas of change.

Remove	Insert
Renewed License DRP-29 Page 4	Renewed License DRP-29 Page 4
Renewed License DRP-30 Page 4	Renewed License DRP-30 Page 4
TSs 3.1.7-3 3.4.3-2	TSs 3.1.7-3 3.4.3-2

B. Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 235, are hereby incorporated into this renewed operating license. The licensee shall operate the facility in accordance with the Technical Specifications.

C. The licensee shall maintain the commitments made in response to the March 14, 1983, NUREG-0737 Order, subject to the following provision:

The licensee may make changes to commitments made in response to the March 14, 1983, NUREG-0737 Oder without prior approval of the Commission as long as the change would be permitted without NRC approval, pursuant to the requirements of 10 CFR 50.59. Consistent with this regulation, if the change results in an Unreviewed Safety Question, a license amendment shall be submitted to the NRC staff for review and approval prior to implementation of the change.

D. Equalizer Valve Restriction

Three of the four valves in the equalizer piping between the recirculation loops shall be closed at all times during reactor operation with one bypass valve open to allow for thermal expansion of water.

E. The licensee shall fully implement and maintain in effect all provisions of the Commission-approved physical security, training and qualification, and safeguards contingency plans including amendments made pursuant to provisions of the Miscellaneous Amendments and Search Requirements revisions to 10 CFR 73.55 (51 FR 27817 and 27822), and the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The combined sets of plans[1], which contain Safeguards Information protected under 10 CFR 73.21, is entitled: "Quad Cities Nuclear Power Station Security Plan, Training and Qualification Plan, and Safeguards Contingency Plan, Revision 0," submitted by letter dated October 21, 2004.

F. The licensee shall implement and maintain in effect all provisions of the approved fire protection program as described in the Updated Final Safety Analysis Report for the facility and as approved in the Safety Evaluation Reports dated July 27, 1979 with supplements dated November 5, 1980, and

[1] The Training and Qualification Plan and Safeguards Contingency Plan are Appendices to the Security Plan.

B. Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No.230, are hereby incorporated into this renewed operating license. The licensee shall operate the facility in accordance with the Technical Specifications.

C. The license shall maintain the commitments made in response to the March 14, 1983, NUREG-0737 Order, subject to the following provision:

> The licensee may make changes to commitments made in response to the March 14, 1983, NUREG-0737 Order without prior approval of the Commission as long as the change would be permitted without NRC approval, pursuant to the requirements of 10 CFR 50.59. Consistent with this regulation, if the change results in an Unreviewed Safety Question, a license amendment shall be submitted to the NRC staff for review and approval prior to implementation of the change.

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[1] The Training and Qualification Plan and Safeguards Contingency Plan are Appendices to the Security Plan.

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION RELATED

TO AMENDMENT NO. 235 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-29

AND AMENDMENT NO. 230 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-30

EXELON GENERATION COMPANY, LLC

AND

MIDAMERICAN ENERGY COMPANY

QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2

DOCKET NOS. 50-254 AND 50-265

1.0 INTRODUCTION

By letter to the Nuclear Regulatory Commission (NRC, the Commission) dated November 7, 2006 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML063110636), as supplemented by letter dated January 24, 2007 (ADAMS Accession No. ML070250166), Exelon Generation Company, LLC (the licensee), requested to amend Renewed Facility Operating License Nos. DPR-29 and DPR-30 to revise the technical specifications (TS) for Quad Cities Nuclear Power Station, Units 1 and 2 (QCNPS). The proposed change revises TS Surveillance Requirement (SR) 3.4.3.1 to increase the allowable as-found main steam safety valve (MSSV) lift setpoint tolerance from ±1 percent to ±3 percent. The proposed change will also revise TS SR 3.1.7.10 to increase the enrichment of sodium pentaborate used in the standby liquid control system (SLCS) from $\geq$ 30.0 atom- percent boron-10 to $\geq$ 45.0 atom-percent boron-10.

The January 24, 2007, supplement contained clarifying information and did not change the NRC staff's initial proposed finding of no significant hazards consideration.

The licensee justified the proposed revision to TS SR 3.4.3.1 using guidance specified in Boiling Water Reactor Owners Group (BWROG) document NEDC-31753P-A, "BWROG In-Service Pressure Relief Technical Specification Revision Licensing Topical Report." The NRC staff determined that this topical report was acceptable for referencing by letter to the BWROG dated March 8, 1993.

Changes to TS SR 3.1.7.10 are also requested because, with the MSSV lift setpoint tolerance change, the SLCS at QCNPS would not function properly under pressure-limiting anticipated transients without scram (ATWS) scenarios. Therefore, the minimum isotopic enrichment of

boron-10 is being increased to support continued functional operation of the SLCS with the proposed MSSV lift setpoint tolerance change.

2.0 REGULATORY EVALUATION

Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.36, "Technical specifications," paragraph (d)(1)(ii)(A) specifies, among other things, "Where a limiting safety system setting is specified for a variable on which a safety limit has been placed, the setting must be so chosen that automatic protective action will correct the abnormal situation before a safety limit is exceeded."

The standard technical specifications (STS) were developed based on the criteria in 10 CFR 50.36(d)(2)(ii). Existing limiting conditions for operation (LCO) and related SR included as TS requirements that satisfy any of the criteria specified in 10 CFR 50.36(d)(2)(ii) must be retained in the TS. The Commission encourages licensees to upgrade TS to be consistent with those criteria and to conform, to the extent practical and consistent with the licensing basis for the plant, to the current STS.

The subject license amendment request references approved licensing topical report NEDC-31753P-A. This review was performed in accordance with the guidance provided in the NRC staff's safety evaluation (SE) recommending approval of topical report NEDC-37153P-A. Modifications to the SLCS, however, are not encompassed in the NRC staff's approval of NEDC-37153P-A; therefore, the requirements applicable to the SLCS are identified individually.

For boiling water reactors (BWR), the provisions of 10 CFR 50.62, "Requirements for reduction of risk from anticipated transients without scram (ATWS) events for light-water-cooled nuclear power plants," require the SLCS. Its function is, per the requirements, to inject into the reactor pressure vessel (RPV) a borated water solution at a prescribed flow rate, concentration and boron-10 isotopic enrichment. The boron in the solution absorbs neutrons, thus providing reactivity control to shut down the reactor in the event the control rods fail to insert into the core. Section 50.62 of 10 CFR is known as the "Anticipated Transients Without Scram (ATWS) Rule."

In proprietary report NEDE 31096P-A, "Anticipated Transients Without Scram: Response to NRC ATWS Rule," General Electric (GE) provided guidance on modifications to SLCS to ensure licensee compliance with the ATWS rule. By letter to the BWROG dated September 30, 1987, the NRC approved the methods presented in NEDE 31096P-A for use by BWR licensees to demonstrate compliance with the ATWS Rule.

In response to variations in SLCS system pressure due to changes made to SLCS operation, the NRC issued Information Notice (IN) 2001-13, "Inadequate Standby Liquid Control System Relief Valve Margin." IN 2001-13 requested licensees to evaluate their SLCS to ensure that modifications made to the systems would not cause SLCS relief valves to lift at required injection pressures, thus causing the borated water to discharge to SLCS pump recirculation, rather than to the RPV.

The basis for review of the SLCS amendment is continued compliance with the requirements of 10 CFR 50.62. The information contained in IN 2001-13 was also considered during the review of this license amendment request.

3.0 TECHNICAL EVALUATION

The QCNPS MSSV is the plant specific name for the valves generally referred to in generic industry documents as the safety relief valve (SRV). The use of ±1 percent allowable as-found SRV code safety function lift setpoint tolerance in plant TS has been a generic industry issue. Nuclear power plant licensees have experienced difficulty in meeting the typical ±1 percent setpoint for SRVs. As a result, the BWROG developed NEDC-31753P to support the use of a ±3 percent setpoint tolerance, which is consistent with American Society of Mechanical Engineers (ASME) OM Code requirements (formerly Section XI requirements). NEDC-31753P was reviewed and approved by the NRC as documented in its safety evaluation (SE) dated March 8, 1993. In its SE, the NRC determined that it is acceptable for licensees to submit TS amendment requests to revise the SRV code safety function lift setpoint tolerance to ±3 percent, provided that the setpoints for those SRVs tested are restored to ±1 percent prior to reinstallation. The NRC also indicated in its SE that licensees planning to implement TS changes to increase the SRV setpoint tolerances should provide the following plant specific analyses:

1. Transient analysis, using NRC approved methods, of anticipated operational occurrences (AOOs) as described in NEDC-31753P utilizing ±3 percent setpoint tolerance for the safety mode of the SRVs.

2. Analysis of the design basis overpressure event using the ±3 percent setpoint tolerance limit for the SRV setpoints to confirm that the vessel pressure does not exceed ASME pressure vessel code upset limits.

3. Plant specific analyses described in Items 1 and 2 should assure that the number of SRVs included in the analyses corresponds to the number of valves required to be operable in the TS.

4. Re-evaluation of the performance of high pressure systems (pump capacity, discharge pressure, etc.), motor-operated valves, and vessel instrumentation and associated piping considering the ±3 percent tolerance limit.

5. Evaluation of the ±3 percent tolerance on any plant specific alternate operating modes (e.g., increased core flow, extended operating domain, etc.).

6. Evaluation of the effects of the ±3 percent tolerance limit on the containment response during loss-of-coolant accidents (LOCAs) on the hydrodynamic loads on the SRV discharge lines and containment.

3.1 Description of Proposed Change

The proposed change revises the lift setpoint tolerances for the MSSVs that are listed in SR 3.4.3.1 of QCNPS TS 3.4.3, “Safety and Relief Valves.” The proposed revision implements a wider MSSV setpoint tolerance to better match the TS performance requirements with the installed valve capabilities. The intended change increases the allowable MSSV lift setpoint tolerance from ±1 percent of the nominal lift setpoint to ±3 percent of the nominal lift setpoint.

The proposed change also revises QCNPS TS 3.1.7, "Standby Liquid Control System," SR 3.1.7.10 to increase the required enrichment of sodium pentaborate used in the SLCS.

3.2 Description of System

The QCNPS units are each designed with nine safety valves. Eight of these valves are spring safety valves. The remaining valve is a dual function safety and relief valve manufactured by Target Rock Corporation. Consistent with the licensee's submittal, this SE employs the term MSSV to refer to both types of valves that are used at QCNPS to perform the safety function of the SRV as discussed in NEDC-31753P-A.

Two safety valves are located on each of four main steam lines; the dual function safety and relief valve is located downstream of the two safety valves on a single main steam line. Each of the safety valves is capable of passing 644,543 pounds-mass per hour each at 1240 psig; the setpoints for the safety valves range from 1240 pounds per square inch guage (psig) to 1260 psig. The dual function safety and relief valve is designed to pass 598,000 pounds-mass per hour at 1080 psig; its pressure setting is 1135 psig.

The SLCS consists of an unpressurized tank for sodium pentaborate solution storage, a pair of positive displacement pumps, two explosive-actuated shear plug valves, the injection sparger inside the RPV, and the necessary piping, valves and instrumentation. The sodium pentaborate solution is injected into the RV to effect shutdown conditions in the event that control rods cannot be inserted into the reactor core. Because increasing the MSSV lift setpoint tolerance may cause an increase in the predicted peak reactor pressure, changes to SLCS operation are required to ensure that the relief valves at the discharge of the SLCS pumps do not lift when injecting sodium pentaborate solution against possibly increased reactor pressure.

3.3 Review of Anticipated Operational Occurences

GE reviewed the Updated Final Safety Analysis Report (UFSAR), Chapter 15 events and reanalyzed them assuming the MSSV lift setpoints had increased 3 percent. GE concluded generically, for the class of plants to which QCNPS belongs, that AOOs were not affected by the increase. Consistent with NRC staff's SE of NEDC-31753P-A, however, GE performed an analysis of the UFSAR Chapter 15 anticipated operational occurrence (AOOs) and discussed the results in a January 24, 2007, supplement to the licensee's November 7, 2006, submittal. The NRC staff reviewed the AOO analyses, and found that they were largely consistent with the generic disposition in NEDC-31753P-A. For the feedwater controller failure, turbine trip without bypass, and load reject without bypass, the licensee-specific analyses were performed with different assumptions that are more limiting than those identified in NEDC-31753P-A, which is acceptable because of the conservatism.

Based on the results of the analysis, and on GE's generic disposition of AOOs included in NEDC-31753P, the NRC staff concludes that the analysis of AOOs in support of the proposed MSSV lift setpoint tolerance increase is acceptable.

3.4 RPV Overpressure Protection

The ASME Code requires that the peak vessel pressure remain less than 110 percent of the vessel design pressure. The design pressure of each QCNPS RPV is 1250 psig; therefore, the maximum vessel pressure is 1375 psig. TS Safety Limit (SL) 2.1.2, "Reactor Coolant System Pressure SL," requires that the reactor steam dome pressure not exceed 1345 psig, which, because of sensing location, corresponds to the1375 psig maximum vessel pressure. The licensee identified the limiting overpressure event is the mainstream isolation valve (MSIV) closure on flux scram (MSIVF).

GE performed overpressure analyses of the most recent MSIVF transients for both QCNPS units in accordance with methods described in NEDE-24011P-A, "General Electric Standard Application for Reactor Fuel."

The analyses considered the 3 percent MSSV tolerance and credited all nine MSSVs, although the licensee's January 24, 2007, supplement indicated that future reload analyses will credit eight of nine MSSVs. Currently, the plant TSs require the operability of all nine MSSVs; therefore, the submitted analysis is consistent with TS operability requirements, and the future analyses will be conservative, assuming TS LCO 3.4.3, "Safety and Relief Valves," does not change.

The analyses were performed at 102 percent power and at 95.3 percent and 108 percent of rated flow. The results demonstrated that, for QCNPS, Unit 1, the peak dome pressure is 1342 psig and the peak vessel pressure is 1366 psig. For QCNPS, Unit 2, these values are 1339 and 1362, respectively. For both units, the peak pressures are within the limits for peak dome and vessel pressures of 1345 and 1375 psig, respectively.

The NRC staff finds that there is adequate RPV overpressure protection for QCNPS in light of the proposed, increased MSSV setpoint tolerance because the analysis was performed using an NRC-approved methodology, the analysis was performed as specified in NEDE-24011P-A, the results of the analysis are within the specified safety limits, and the MSSV valve operability assumptions are consistent with TS requirements.

3.5 Number of MSSVs

Both units at QNCPS have eight safety valves and one dual function SRV. Per the TS LCO 3.4.3, all of these valves are required to be operable. For the purposes of the submitted analyses, no valves are assumed to be out of service. In the SE for NEDC-31753P, the NRC staff indicated that the plant specific analyses should assure that the number of valves included in the analyses correspond to the number of valves required to be operable in the technical specification. The NRC staff finds that this condition is satisfied because the analysis and the TS operability requirements are consistent.

3.6 High Pressure System Performance

3.6.1 Standby Liquid Control System

The proposed MSSV lift setpoint tolerance change has resulted in changes to the predicted transient responses at QCNPS. As a result, the maximum postulated pressure in the RPV has increased. To ensure that the SLCS remains capable of injecting the required equivalent amount of boron-10 into the RPV during an anticipated transient without scram, and therefore, that the licensee remains in compliance with the ATWS rule, changes to the standby liquid control system are required.

GE performed analyses of transients to support the proposed increase in MSSV lift setpoint tolerance. As a result of the analyses, the maximum postulated RPV pressure at the SLCS discharge sparger is now 1301 psig. This pressure is the peak predicted during SLCS discharge in the pressure-limiting ATWS event.

In order to provide the required SLCS flow, the licensee proposes to use single-pump operation with increased boron-10 isotope enrichment to meet the requirements of the ATWS rule. The licensee proposes to increase boron-10 enrichment to 45 atom-percent, from 30 atom-percent. The licensee indicates that this change is proposed to allow reducing the SLCS system flowrate to prevent the SLCS pump discharge relief valve from opening during SLCS discharge in the bounding scenario.

The SLCS modifications are being requested to prevent the SLCS pump discharge relief valve from lifting at times when the system must inject borated water into the reactor at its peak predicted pressure. This request is consistent with IN 2001-13 and with GE's recommendations as presented in the licensee's submittal.

In light of the increase in predicted peak RPV pressure, the NRC staff identified that the design basis requirement for the SLCS pumps would change as a result of the proposed amendment request. As indicated in the January 17, 2007, supplement, the licensee performed upgrades to the SLCS at both QCNPS units in 2002. As a part of these upgrades, the licensee tested the SLCS pumps to demonstrate the capability to achieve a minimum flow rate of 42 gallons per minute at a pressure range of 1470 - 1500 psig as measured at the pump discharge. Therefore, the NRC staff concludes that Exelon has demonstrated the capability of the SLCS to meet the new design basis requirement.

Section 50.62(c)(4) of 10 CFR provides prescriptive reactivity control requirements for BWR licensees. The NRC staff reviewed the prescriptive requirements and determined that the proposed changes will enable the SLCS to conservatively meet the requirements by a factor of 1.1.

The NRC staff concludes that the proposed changes to the SLCS are acceptable for the following two reasons: (1) the SLCS can meet the new design basis requirement as demonstrated by the 2002 test discussed above; and (2) the proposed SLCS changes include design margin such that the reactivity control requirements in 10 CFR 50.62 are met conservatively. Because the proposed SLCS modifications are acceptable, the NRC staff concludes that TS SR 3.1.7.10 may be revised as proposed.

3.6.2 High Pressure Coolant Injection and Reactor Core Isolation Cooling

The NRC staff reviewed the licensee's evaluation of the effects of the increased MSSV setpoint tolerance on the performance of the motor-operated valves (MOVs) in certain high pressure systems. The licensee determined that there are high pressure coolant injection (HPCI) and reactor core isolation cooling (RCIC) steam line containment isolation MOVs, which could potentially be affected by the increased MSSV setpoint tolerance of ±3 percent. These MOVs are normally open with the system in standby and must close against the differential pressure represented by the SRV nominal setpoint plus the increased setpoint tolerance.

The licensee stated that the performance of MOVs in the main steam line drain, reactor water cleanup, RCIC and HPCI systems were reviewed for impact of the increased differential pressure due to a larger MSSV setpoint tolerance of ±3 percent. The licensee's review of MOV performance in these high pressure systems indicated some reduction in margins, but that a margin of at least 10 percent capability would be retained for all MOVs. Therefore, the ability of the MOVs to meet their safety functions is not affected by this change.

The NRC staff finds that the effects of the increased MSSV setpoint tolerance have been adequately evaluated and are acceptable.

3.7 Alternate Operating Modes Evaluation

GE stated that this review is based on any additional requirement imposed by the MSSV setpoint tolerance increase that would affect a specific option. The licensee-specific GE evaluation includes evaluations of the average power range monitor Rod-Block TS changes that could affect the analysis of AOOs. The overpressure evaluation bounds the maximum extended load line limit analysis region, and the increased core flow region. GE noted that an MSSV out of service has been previously evaluated, and this option does not meet the over pressure criteria under EPU. Therefore, the MSSV out of service option remains unacceptable for QCNPS.

The NRC staff reviewed GE's evaluation of the effects of the increased MSSV setpoint tolerance on the alternative modes of operation at QCNPS. Based on the evaluation, the increase in MSSV code safety function lift setpoint from ±1 percent to ±3 percent is acceptable.

3.8 Containment Response During LOCA and Hydrodynamic Loads on MSSV

The NRC staff reviewed the licensee's evaluation of the effects of the increased MSSV setpoint tolerance on the structural integrity of the MSSV discharge lines. A relaxed setpoint tolerance can increase the MSSV opening pressure, thus increasing dynamic loads. The licensee has credited two items, not credited in previous analyses, to offset the increased dynamic loads that could result from the wider MSSV setpoint tolerance.

First, hydrodynamic loads are dependent, in part, on flow capacity and opening pressure, water wave length, valve opening time, and discharge line geometric parameters. Slower valve main disc opening times reduce the transient wave thrust load on the discharge piping, while shorter stroke times result in higher loading. The licensee states that the original computer code (General Electric RVFOR) analysis used to define the blowdown-force time histories used a value of 0.02 seconds to model an actual opening time of 0.05 seconds in the benchmarking

and validation process for the code. When the same adjustment factor (2.5) is applied to the actual time of 0.25 seconds used in the QCNPS analysis, the computer code modeling time is 0.1 seconds. This increase in MSSV opening time resulted in a load reduction of approximately 2 percent in the model output.

Second, the licensee states that there was an error in the original General Electric RVFOR that causes over-prediction of blowdown force loads by as much as 50 percent. The existing QCNPS analysis was completed with the version of RVFOR predating the discovery of the error, and therefore includes the additional conservatism afforded by the error. Removal of the error further offsets the increased MSSV dynamic loads resulting from the larger setpoint tolerance.

The NRC staff concludes that crediting the above two items offset the increase in dynamic loads resulting from the increased MSSV setpoint tolerance, and therefore, the change to the MSSV setpoint tolerance is acceptable with respect to dynamic loading of discharge piping.

In addition to loads on MSSV discharge piping, the licensee has also evaluated potential changes to containment dynamic loading as a result of the wider MSSV setpoint tolerance. The licensee states that the containment pressure and temperature responses for the design basis loss of coolant accident are not affected because the vessel depressurizes without any MSSV actuations. The containment pressure and temperature responses drive hydrodynamic loads such as pool swell, vent thrust condensation oscillation and chugging. Because the containment pressure and temperature responses are not affected by the potential increase in MSSV setpoint, the associated containment hydrodynamic loading is also not affected.

Based on the above evaluation, the NRC staff finds that the licensee has adequately addressed the effects of increased MSSV setpoint tolerance on MSSV discharge lines and containment structures and has met the condition regarding hydrodynamic loads on the MSSV discharge lines and containment established in NRC's SE that approves use of NEDC-31753P.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Illinois State official was notified of the proposed issuance of the amendment. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change the requirements with respect to installation or use of a facility's component located within the restricted area as defined in 10 CFR Part 20 or changes a surveillance requirement. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (72 FR 4307; January 30, 2007). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

6.0 CONCLUSION

The NRC staff has reviewed the licensee's response to the six conditions identified in the staff's SER of NEDC-31753P-A as discussed in Section 3.0 above. The NRC staff finds that the licensee has adequately addressed these six conditions; therefore, the proposed TS change to increase the allowable as-found MSSV code safety function lift setpoint tolerance from ±1 percent to ±3 percent is acceptable. Additionally, the licensee modified the TS Bases to reflect the change. Since the Bases are not a part of the TS, the NRC staff reviewed the Bases only to assure consistency with the proposed change however, the NRC staff did not perform an evaluation of the TS Bases page.

The NRC staff has reviewed the licensee's proposed changes to the SLCS. The NRC staff finds that the changes are acceptable; therefore, the proposed TS change to increase boron-10 isotope enrichment to 45 atom-percent, from 30 atom-percent is acceptable. Additionally, the licensee modified the TS Bases to reflect the change. Since the Bases are not a part of the TS, the NRC staff reviewed the Bases only to assure consistency with the proposed change however, the NRC staff did not perform an evaluation of the TS Bases page.

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

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