

February 11, 2002

Mr. Oliver D. Kingsley, President
Exelon Nuclear
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: ISSUANCE OF AMENDMENTS - TECHNICAL SPECIFICATIONS CHANGE -
REACTOR PROTECTION SYSTEM INSTRUMENTATION SCRAM
DISCHARGE VOLUME WATER LEVEL HIGH FOR QUAD CITIES NUCLEAR
POWER STATION, UNITS 1 AND 2 (TAC NOS. MB2352 AND MB2353)

Dear Mr. Kingsley:

The U.S. Nuclear Regulatory Commission (Commission) has issued the enclosed Amendment No. 203 to Facility Operating License No. DPR-29 and Amendment No. 199 to Facility Operating License No. DPR-30 for the Quad Cities Nuclear Power Station, Units 1 and 2. The amendments are in response to your application dated July 6, 2001, as supplemented by your letters dated October 25, 2001, and December 17, 2001.

The amendments revise technical specifications (TS) Section 3.3.1.1, "Reactor Protection System Instrumentation," to modify the description for Reactor Protection System (RPS) Function 7.a, "Scram Discharge Volume Water Level - High." This change supports a planned upgrade to the scram discharge volume level instrumentation from Fluid Components International thermal switches to Magnetrol float switches. These float switches are more reliable than the existing thermal switches, which are highly sensitive to a steam environment, since they respond to actual water level increases within the scram discharge volume. These types of Magnetrol float switches are used successfully in various applications at Quad Cities.

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/

Mahesh Chawla, Project Manager, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos.: 50-254 and 50-265

Enclosures: 1. Amendment No. 203 to DPR-29
2. Amendment No. 199 to DPR-30
3. Safety Evaluation

cc w/encls: See next page

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Units 1 and 2

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- 2 -

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Units 1 and 2

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The amendments revise technical specifications (TS) Section 3.3.1.1, "Reactor Protection System Instrumentation," to modify the description for Reactor Protection System (RPS) Function 7.a, "Scram Discharge Volume Water Level - High." This change supports a planned upgrade to the scram discharge volume level instrumentation from Fluid Components International thermal switches to Magnetrol float switches. These float switches are more reliable than the existing thermal switches, which are highly sensitive to a steam environment, since they respond to actual water level increases within the scram discharge volume. These types of Magnetrol float switches are used successfully in various applications at Quad Cities.

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Mahesh Chawla, Project Manager, Section 2
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cc w/encls: See next page

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ADAMS Accession No.: **ML020100131**

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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 FACILITY OPERATING LICENSE

Amendment No. 203
License No. DPR-29

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Exelon Generation Company, LLC (the licensee) dated July 6, 2001, as supplemented by your letters dated October 25, 2001, and December 17, 2001, 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 Facility Operating License No. DPR-29 is hereby amended to read as follows:

B. Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 203, are hereby incorporated in the 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 within 30 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Anthony J. Mendiola, Chief, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: February 11, 2002

EXELON GENERATION COMPANY, LLC

AND

MIDAMERICAN ENERGY COMPANY

DOCKET NO. 50-265

QUAD CITIES NUCLEAR POWER STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 199
License No. DPR-30

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Exelon Generation Company, LLC (the licensee) dated July 6, 2001, as supplemented by your letters dated October 25, 2001, and December 17, 2001, 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 Facility Operating License No. DPR-30 is hereby amended to read as follows:

B. Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 199, are hereby incorporated in the 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 within 30 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Anthony J. Mendiola, Chief, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: February 11, 2002

ATTACHMENT TO LICENSE AMENDMENT NOS. 203 AND 199

FACILITY OPERATING LICENSE NOS. DPR-29 AND DPR-30

DOCKET NOS. 50-254 AND 50-265

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

Remove Pages

3.3.1.1-9

Insert Pages

3.3.1.1-9

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 203 TO FACILITY OPERATING LICENSE NO. DPR-29
AND AMENDMENT NO. 199 TO 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 dated July 6, 2001, the Exelon Generation Company, LLC, (Exelon, the licensee) submitted a request to the Nuclear Regulatory Commission (NRC) to amend the Technical Specifications (TS) for the Quad Cities Nuclear Power Station, Units 1 and 2. The proposed TS change will permit replacement of thermal switches made by Fluid Components International (FCI), to float switches made by Magnetrol, in the scram discharge volume (SDV) instrumentation of the reactor protection system (RPS) to interface with the existing RPS logic. Further, in response to NRC's request, the licensee provided additional information by letters dated October 25, 2001, and December 17, 2001.

The proposed amendment will modify the description of Function 7.a of TS Table 3.3.1.1-1, Reactor Protection System Instrumentation from "Thermal Switch" to "Thermal Switch (for Unit 1 only through cycle 17) Float Switch."

The proposed plant design changes are scheduled for implementation during the next refueling outage on Unit 2 in February 2002. A similar design change will be implemented on Unit 1 during the 17th refueling outage scheduled to begin in October 2002.

The October 25, 2001, and December 17, 2001, supplements provided clarifying information that was within the scope of the original *Federal Register* notice and did not change the staff's initial proposed no significant hazards considerations determination.

2.0 BACKGROUND INFORMATION

The RPS has protection and monitoring functions which have been designed to ensure safe operation of the reactor. The RPS initiates a reactor scram when one or more monitored

parameters exceed their specified limits, to preserve the integrity of the fuel cladding and the reactor coolant system (RCS), and minimize the energy that must be absorbed following a loss-of-coolant accident (LOCA).

The current instrumentation for the SDV - high level trip, Function 7.a of TS Table 3.3.1.1-1, Reactor Protection System Instrumentation, utilizes FCI thermal type level switches mounted directly in the scram discharge instrument volume (SDIV) to initiate a reactor scram when the monitored parameter exceeds its specified limit. If the SDV were to fill to a point where there is insufficient volume to accept the water from the control drives that are displaced during scram, control rod insertion would be hindered. This scram is required to be functional in Modes 1, "Power Operation," 2, "Startup," and 5, "Refueling" with any control rod withdrawn from a reactor core cell containing one or more fuel assemblies.

3.0 EVALUATION

3.1 Evaluation of Proposed Instrument Change

The current SDV instrumentation consists of four internally mounted, non-indicating thermal switches, which monitor the SDV level. The switches are arranged in pairs on each of two SDVs, so each switch pair provides an input to RPS trip systems A and B. The sensor of each FCI thermal type level switch is mounted directly in the SDIV and comprises a pair of resistance temperature detectors (RTDs), one heated and the other one unheated. When covered with water, the temperatures and RTD outputs will approach the same value. The signals from the RTDs are compared via a bridge circuit and when the setpoint is reached, a trip signal is generated, which corresponds to a four-second time delay from the time of immersion. This delay desensitizes the instrument loop to transient type conditions in the SDIV, such as splashing, moisture/steam intrusion, etc.

The current setpoint incorporates the maximum delay, which ensures that the SDV is not full at the end of the time delay, and there is sufficient free volume in the SDV to provide rod insertion capability. The licensee stated that it has experienced spurious half and full scrams because the delay is inadequate to fully desensitize the instrument to low quality steam flow (steam/moisture environment).

The proposed replacement Magnetrol float switch consists of a float attached to a vertical shaft which magnetically actuates a switch on high water level. Since the replacement float switches will be installed external to the SDV, it eliminates sensitivity to transient conditions in the SDIV and thus eliminates spurious half or full scrams. The new assemblies will be mounted to actuate at the same level as the existing FCI sensors, and since there is no time delay involved in the new assemblies, the scram signal will be received 4 seconds earlier. Therefore, application of these float switches will eliminate the current four second time delays in the SDV instrumentation. There are no setpoint changes required due to the SDV instrumentation change.

The licensee has used these switches for multiple applications at Quad Cities, namely Table 3.3.5.1-1, "ECCS Instrumentation," Sub-Function 3.d, "CCST Level - Low," and Sub-Function 3.e, "Suppression Pool Water Level - High." Also, the licensee states that the modification has been successfully evaluated under Exelon's design change process and does

not introduce any new failure modes. Moreover, there is no credit taken for a scram initiated by this function for any of the design basis accidents or transients analyzed in the updated final safety analysis report.

During a telephone conference held on October 3, 2001, between NRC staff and Exelon representatives, the licensee was asked to provide additional information regarding the improved reliability of the upgrade instrumentation. In its letter dated October 25, 2001, the licensee stated that these switches have historically, throughout the nuclear industry, proven to be highly reliable since they require low maintenance and experienced little to no functional failure. These float switches provide increased accuracy of detecting actual water level within the SDV.

During the follow-up telephone conference held on November 29, 2001, between NRC staff and Exelon representatives, the licensee was asked to describe the process to determine the allowable value for the scram discharge volume instrumentation loop. In its letter dated December 17, 2001, the licensee stated that Exelon methodology as defined in procedure NES-EIC-20.04, "Analysis of Instrument Channel Setpoint Error and Instrument Loop Accuracy," was used to determine the allowable value (AV). This methodology has been reviewed and accepted by the NRC as part of the Quad Cities implementation of improved technical specifications (NRC letter from Anthony J. Mendiola to Exelon, dated March 30, 2001).

No changes were made to the analytical limit (AL) during the change to the new Magnetrol level switches. A Quad Cities evaluation and the placement of the new switches allowed the AV to remain unchanged. The evaluation demonstrated a significant margin between the AV and AL, due to the differences in the time response characteristics of the Magnetrol switches as compared to the FCI switches.

3.2 Conclusion

The licensee proposes to replace the current FCI thermal type switches used in SDV instrumentation with Magnetrol float switches. These switches are free from sensitivity to steam/moisture changes in the SDIV, have increased accuracy in detecting actual water level, and have demonstrated more reliable operation in multiple applications at Quad Cities and in the nuclear industry. The overall effect of this modification is to provide an identical function as the previous SDV Water Level - High trip signal and to provide increased reliability and better overall performance of the SDV level trip function.

Based on the proven industry performance record of the float switches, including those installed at Quad Cities in similar applications, and the licensee's use of NRC-approved calculation methodology to determine AVs for the SDV instrumentation loop, the NRC staff concludes that the proposed TS change is acceptable.

4.0 STATE CONSULTATION

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

