

August 28, 2003

Mr. John L. Skolds, President  
Exelon Nuclear  
Exelon Generation Company, LLC  
4300 Winfield Road  
Warrenville, IL 60555

SUBJECT: QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2 - ISSUANCE OF  
AMENDMENTS RE: REACTOR VESSEL SPECIMEN REMOVAL SCHEDULE  
(TAC NOS. MB7008 AND MB7009)

Dear Mr. Skolds:

The U.S. Nuclear Regulatory Commission (Commission) has issued the enclosed Amendment No. 217 to Facility Operating License No. DPR-29 and Amendment No. 211 to Facility Operating License No. DPR-30 for the Quad Cities Nuclear Power Station (QCNPS), Units 1 and 2, respectively. The amendments consist of changes to the Updated Final Safety Analysis Report (UFSAR) in response to your application dated December 20, 2002, as supplemented May 30, 2003.

The amendments revise the licensing basis as described in the UFSAR to implement the Boiling Water Reactor Vessel and Internals Project reactor pressure vessel integrated surveillance program as the basis for demonstrating the compliance of QCNPS, Units 1 and 2, with the requirements of Appendix H to 10 CFR Part 50.

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/

Carl F. Lyon, 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. 217 to DPR-29  
2. Amendment No. 211 to DPR-30  
3. Safety Evaluation

cc w/encls: See next page

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ADAMS Accession Number: ML031960130

\*SE dated 6/30/03

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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.217

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 December 20, 2002, as supplemented May 30, 2003, 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, 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. 217, 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 60 days of the date of issuance. In addition, the licensee shall include the revised information in the Updated Final Safety Analysis Report submitted to the NRC, pursuant to 10 CFR 50.71(e), as described in the licensee's application dated December 20, 2002, as supplemented May 30, 2003, and evaluated in the staff's safety evaluation for this amendment.

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

Date of Issuance: August 28, 2003

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. 211  
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 December 20, 2002, as supplemented May 30, 2003, 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, 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. 211, 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 60 days of the date of issuance. In addition, the licensee shall include the revised information in the Updated Final Safety Analysis Report submitted to the NRC, pursuant to 10 CFR 50.71(e), as described in the licensee's application dated December 20, 2002, as supplemented May 30, 2003, and evaluated in the staff's safety evaluation for this amendment.

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

Date of Issuance: August 28, 2003



SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 217 TO FACILITY OPERATING LICENSE NO. DPR-29  
AND AMENDMENT NO. 211 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 application dated December 20, 2002 [Reference 1], as supplemented by letter dated May 30, 2003 [Reference 2], Exelon Generation Company, LLC (EGC, or the licensee) requested changes to the licensing basis as described in the Updated Final Safety Analysis Report (UFSAR) for the Quad Cities Nuclear Power Station (QCNPS), Units 1 and 2. The supplement dated May 30, 2003, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on February 4, 2003 (68 FR 5669).

Specifically, EGC requested Nuclear Regulatory Commission (NRC) review and approval of a license amendment to modify the basis for their compliance with the requirements of Appendix H to Title 10 of the *Code of Federal Regulations* Part 50 (Appendix H to 10 CFR Part 50), "Reactor Vessel Material Surveillance Program Requirements." In their license amendment submittal, EGC requested that they be approved to implement the Boiling Water Reactor Vessel and Internals Project (BWRVIP) reactor pressure vessel (RPV) integrated surveillance program (ISP) as the basis for demonstrating the compliance of QCNPS, Units 1 and 2 with the requirements of Appendix H to 10 CFR Part 50.

The BWRVIP RPV ISP was submitted for NRC staff review and approval in topical reports BWRVIP-78, "BWR Vessel and Internals Project, BWR Integrated Surveillance Program Plan," and BWRVIP-86, "BWR Vessel and Internals Project, BWR Integrated Surveillance Program Implementation Plan" [References 3,4]. Additional information necessary to establish the technical basis for, and proposed implementation of, the BWRVIP ISP was provided in letters from the BWRVIP to the NRC dated December 15, 2000, and May 30, 2001 [References 5,6]. The NRC staff approved the proposed BWRVIP ISP in a safety evaluation (SE) which was provided to the BWRVIP by letter dated February 1, 2002 [Reference 7]. However, the NRC staff's SE required that plant-specific information be provided by BWR licensees who wish to

implement the BWRVIP ISP for their facilities. EGC's December 20, 2002, and May 30, 2003, submittals addressed the plant-specific information required in the NRC staff's February 1, 2002, BWRVIP ISP SE.

## 2.0 REGULATORY EVALUATION

Nuclear power plant licensees are required by Appendix H to 10 CFR Part 50 to implement RPV surveillance programs to "monitor changes in the fracture toughness properties of ferritic materials in the reactor vessel beltline region...which result from exposure of these materials to neutron irradiation and the thermal environment." Two specific alternatives are provided with regard to the design of a facility's RPV surveillance program which may be used to address the requirements of Appendix H to 10 CFR Part 50.

The first alternative is the implementation of a plant-specific RPV surveillance program consistent with the requirements of American Society for Testing and Materials (ASTM) Standard Practice E 185, "Standard Practice for Conducting Surveillance Tests for Light-Water Cooled Nuclear Power Reactor Vessels." In the design of a plant-specific RPV surveillance program, a licensee may use the edition of ASTM Standard Practice E 185 which was current on the issue date of the American Society of Mechanical Engineers (ASME) Code to which the reactor vessel was purchased, or later editions through the 1982 edition.

The second alternative provided in Appendix H to 10 CFR Part 50 is the implementation of an ISP. An ISP is defined in Appendix H to 10 CFR Part 50 as occurring when "the representative materials chosen for surveillance for a reactor are irradiated in one or more other reactors that have similar design and operating features." Five specific criteria are stated in Section III.C.1 of Appendix H to 10 CFR Part 50 which must be met to support approval of an ISP:

- a. The reactor in which the materials will be irradiated and the reactor for which the materials are being irradiated must have sufficiently similar design and operating features to permit accurate comparisons of the predicted amount of radiation damage.
- b. Each reactor must have an adequate dosimetry program.
- c. There must be adequate arrangement for data sharing between plants.
- d. There must be a contingency plan to assure that the surveillance program for each reactor will not be jeopardized by operation at reduced power level or by an extended outage of another reactor from which data are expected.
- e. There must be substantial advantages to be gained, such as reduced power outages or reduced personnel exposure to radiation, as a direct result of not requiring surveillance capsules in all reactors in the set.

As noted in Section 1.0 above, the NRC staff approved the proposed BWRVIP ISP in Reference 7. All of the criteria cited above for approval of the ISP were addressed either completely or partially in Reference 7. For those criteria which could not be fully addressed in Reference 7, plant-specific information would be required from licensees who wished to implement the BWRVIP for their facilities. As stated in Reference 7:

[L]icensees who wish to participate in the BWR ISP must provide, for NRC staff review and approval, information which defines how they will determine RPV and/or surveillance capsule fluences based on the dosimetry data which will be available for their facilities. This information must be submitted concurrently with each licensee's submittal to replace their existing plant-specific surveillance program with the BWR ISP as part of their facility's licensing basis. The information submitted must be sufficient for the staff to determine that:

- (1) RPV and surveillance capsule fluences will be established as based on the use of an NRC-approved fluence methodology that will provide acceptable results based on the available dosimetry data, and
- (2) if one methodology is used to determine the neutron fluence values for a licensee's RPV and one or more different methodologies are used to establish the neutron fluence values for the ISP surveillance capsules which "represent" that RPV in the ISP, the results of these differing methodologies are compatible (i.e., within acceptable levels of uncertainty for each calculation).

This plant-specific information was required by the NRC staff to ensure that criterion III.C.1.b of Appendix H to 10 CFR Part 50 for an ISP could be met by each facility, and to confirm that data which would be shared as part of the BWRVIP ISP could be effectively utilized by each licensee for the monitoring of RPV embrittlement for their facility.

### 3.0 TECHNICAL EVALUATION

In References 1 and 2, EGC submitted information for QCNPS, Units 1 and 2, which addressed the information requested by the NRC staff in Reference 7. In Reference 2, EGC proposed a revision to UFSAR Section 5.3.1.4, which stated:

#### Regulatory Guide 1.190

Regulatory Guide (RG) 1.190 provides state of the art calculation and measurement procedures that are acceptable to the NRC for determining Reactor Pressure Vessel neutron fluence. RPV fluence has been evaluated using a method in accordance with the recommendations of RG 1.190. Future evaluations of RPV fluence will be completed using a method in accordance with the recommendations of RG 1.190 (as noted in Reference 3 [letter approving Quad Cities participation in ISP]).

In addition, EGC proposed a revision to UFSAR Section 5.3.2, which stated:

More recently, the NRC issued Regulatory Guide (RG) 1.190, which provides state of the art calculation and measurement procedures that are acceptable to the NRC for determining Reactor Pressure Vessel neutron fluence. Quad Cities RPV fluence has been evaluated using a method in accordance with the recommendations of RG 1.190. Future evaluations of RPV fluence will be completed using a method in accordance with the recommendations of RG 1.190 (as noted in Reference 3).

The NRC staff has concluded that the inclusion of these statements in the QCNPS, Units 1 and 2, UFSAR is sufficient to address both items (1) and (2) from Reference 7. Regarding item

(1), the licensee's use of a methodology for determining the QCNPS, Units 1 and 2, RPV neutron fluence values which is consistent with the attributes of RG 1.190, and has been approved by the NRC staff, will provide acceptable results based upon the available dosimetry data. Regarding item (2), RPV surveillance capsules tested under the BWRVIP ISP will have their fluences determined by the use of a methodology which is consistent with the attributes of RG 1.190 and has been approved by the NRC staff. The NRC staff has concluded that any two (or more) different fluence methodologies will provide "compatible" (as defined in Reference 7) results provided that the best estimate fluence values are within each other's uncertainty bounds.

EGC proposed a revision to UFSAR Section 5.3.1.6 to document the licensee's incorporation of the BWRVIP ISP into the QCNPS, Units 1 and 2, licensing basis:

Table 5.3-1 provides the location and status of the material specimens.

In 2003, the NRC approved Quad Cities participation in the BWR Vessel and Internals Project (BWRVIP) Integrated Surveillance Program (ISP) as described in BWRVIP-78 and BWRVIP-86 in Reference 2 [BWRVIP-86-A: "BWR Vessel and Internals Project, Updated BWR Integrated Surveillance Program (ISP)," Final Report, October 2002]. The NRC approved the ISP for the industry in Reference 2 and approved Quad Cities participation...The ISP meets the requirements of 10 CFR 50 Appendix H and provides several advantages over the original program....

The current withdrawal schedule for both units is based on the NRC-approved revision of BWRVIP-86 (Reference 2). Based on this schedule, Quad Cities is not scheduled to withdraw an additional material specimen.

The proposed revision is acceptable. In addition, EGC proposed a revised withdrawal schedule for QCNPS, Units 1 and 2, in UFSAR Table 5.3-1, in accordance with the NRC staff-approved BWRVIP-86. The proposed schedule is acceptable.

Based on the information provided by EGC, as discussed above, the NRC staff has concluded that the BWRVIP ISP, as approved in Reference 7, can be implemented for QCNPS, Units 1 and 2, as the basis for demonstrating the facility's continued compliance with the requirements of Appendix H to 10 CFR Part 50.

#### 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 a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 or change an inspection or 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 (68 FR 5669). 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 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.

## 7.0 REFERENCES

- [1] M. P. Gallagher (EGC and AmerGen) to U.S. NRC Document Control Desk, "Request for License Amendment Regarding Reactor Vessel Specimen Removal Schedule, December 20, 2002.
- [2] K. R. Jury (EGC and AmerGen) to U.S. NRC Document Control Desk, "Additional Information Supporting the Request for License Amendment Regarding Reactor Vessel Specimen Removal Schedule," May 30, 2003.
- [3] C. Terry (BWRVIP) to U.S. NRC Document Control Desk, "Project No. 704 - BWR Vessel and Internals Project, BWR Integrated Surveillance Program Plan (BWRVIP-78)," December 22, 1999.
- [4] C. Terry (BWRVIP) to U.S. NRC Document Control Desk, "Project No. 704 - BWRVIP-86: BWR Vessel and Internals Project, BWR Integrated Surveillance Program Implementation Plan," EPRI Technical Report 1000888, December 22, 2000.
- [5] C. Terry (BWRVIP) to U.S. NRC Document Control Desk, "PROJECT NO. 704 - BWRVIP Response to NRC Request for Additional Information Regarding BWRVIP-78," December 15, 2000.
- [6] C. Terry (BWRVIP) to U.S. NRC Document Control Desk, "PROJECT NO. 704 - BWRVIP Response to Second NRC Request for Additional Information on the BWR Integrated Surveillance Program," May 30, 2001.
- [7] W. H. Bateman (USNRC) to C. Terry, "Safety Evaluation Regarding EPRI Proprietary Reports BWR Vessel and Internals Project, BWR Integrated Surveillance Program Plan (BWRVIP-78)" and "BWRVIP-86: BWR Vessel and Internals Project, BWR Integrated Surveillance Program Implementation Plan," February 1, 2002.

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Date: August 28, 2003