



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

April 24, 2018

Mr. Barry Quigley
3512 Louisiana Rd.
Rockford, IL 61108

Dear Mr. Quigley:

This letter responds to the petition you filed with Mr. Victor M. McCree, Executive Director for Operations, dated February 8, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17061A127). You filed a petition under Title 10 of the *Code of Federal Regulations* (10 CFR) 2.206, "Requests for Action Under this Subpart." Attachments to the petition are located at ADAMS Accession Nos. ML17061A126, ML17061A125, and ML17061A124. In your petition, you requested that the U.S. Nuclear Regulatory Commission (NRC or the Commission) take the following actions against Exelon Generation Company, LLC (Exelon), the licensee for Byron Station, Unit Nos. 1 and 2 (Byron), and Braidwood Station, Units 1 and 2 (Braidwood):

1. Issue a violation under 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," Criterion III, "Design Control," for deficiencies in the analysis of record for the main steam isolation valve room pressurization following a high-energy line break.
2. Issue a violation under 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for failure to update the analysis of record in a timely manner.
3. Require Exelon to show that the consequences of the secondary missiles resulting from main steam isolation valve room pressurization do not have adverse consequences.
4. Issue a demand for information under 10 CFR 2.204, "Demand for Information," to compare and contrast the behavior of Exelon management as described in the petition with the NRC's policy statement on the attributes of a safety-conscious work environment (SCWE).
5. Use Exelon's response to item 4 above as a basis on which to determine whether to issue a "chilling effects" letter.

On July 17, 2017 (ADAMS Accession No. ML17125A245), the NRC staff acknowledged receiving your petition and stated pursuant to 10 CFR 2.206 that your petition was being referred to me for action and that it would be acted upon within a reasonable time.

You met with the petition review board on April 13, 2017, to clarify the bases for your petition. The NRC treated the transcript of this meeting (ADAMS at Accession No. ML17111A774) as a supplement to the petition. The supplement is available for inspection at the Commission's Public Document Room, located at One White Flint North, Public File Area O1 F21, 11555

Rockville Pike (first floor), Rockville, Maryland, and is available online from the NRC Library at <https://www.nrc.gov/reading-rm.html>.

By letter dated July 26, 2017 (ADAMS Accession No. ML17166A362), the NRC staff informed Exelon of its right to provide information related to the petition via a voluntary response. Exelon responded on September 1, 2017 (ADAMS Accession No. ML17255A824), and the NRC staff considered the response in its evaluation of the petition.

The NRC staff sent a copy of the proposed director's decision to you and to Exelon for comment on February 23, 2018 (ADAMS Accession No. ML17291A183). The staff did not receive any comments on the proposed director's decision.

The NRC staff conducted inspections at the Byron Station and Braidwood Station that assessed the licensee's compliance with the regulations under 10 CFR Part 50, Appendix B, Criterion III, "Design Control," and Criterion XVI, "Corrective Action," related to the adequacy of the analysis of record for the structural design of the main steam isolation valve house and the main steam tunnel, and took enforcement action as outlined in inspection reports 05000454/455-2017-010 for Byron and 05000456/457-2017-008 for Braidwood, dated December 15, 2017 (ADAMS Accession Nos. ML17349A917 and ML17349A894, respectively). Each inspection report identifies a noncited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," and a noncited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action."

The NRC staff requested that the licensee evaluate the SCWE concerns expressed in the petition, and conducted an inspection that assessed the licensee's SCWE at Byron. Based on the licensee's voluntary responses and the results of the inspection, the NRC staff did not identify challenges to the licensee's SCWE or evidence of a chilled environment at Byron and, therefore, determined that issuance of a chilling effect letter was not warranted. Because these actions address the underlying concerns raised in requests 1, 2, 4, and 5 of the petition, the petition is granted in part. (The NRC's letter dated July 17, 2017, indicated that item 3 did not meet the criteria for acceptance. However, the licensee and NRC have taken action that addresses the issue raised by the petitioner, as described in the enclosure to this letter.)

A copy of the Director's Decision DD-18-01 will be filed with the Secretary of the Commission for the Commission to review in accordance with 10 CFR 2.206(c). As provided for by this regulation, the decision will constitute the final action of the Commission 25 days after the date of the decision unless the Commission, on its own motion, institutes a review of the decision within that time. The documents cited in the enclosed decision are available in ADAMS for inspection at the Commission's Public Document Room, located at One White Flint North, 11555 Rockville Pike (first floor), Rockville, Maryland, and online in the NRC Library at <http://www.nrc.gov/reading-rm.html>.

A notice of "Issuance of Director's Decision under 10 CFR 2.206" will be filed with the Office of the Federal Register for publication.

B. Quigley

- 3 -

I appreciate your bringing these issues to the attention of the NRC staff. Please feel free to contact Joel Wiebe at Joel.Wiebe@nrc.gov or 301-415-6606 to discuss any questions related to this petition.

Sincerely,

A handwritten signature in black ink, appearing to read "B. E. Holian". The signature is fluid and cursive, with the first letters of each name being capitalized and prominent.

Brian E. Holian, Acting Director
Office of Nuclear Reactor Regulation

Docket Nos. STN 50-454, STN 50-455
STN 50-456, STN 50-457

Enclosure:
Director's Decision DD-18-01

cc: Mr. Bryan C. Hanson
Senior Vice President
Exelon Generation Company, LLC
President and Chief Nuclear Officer (CNO)
Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

Listserv

Enclosure

Director's Decision ML18087A187

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION

Brian E. Holian, Acting Director

In the Matter of)	
)	
Exelon Generation Company, LLC)	
)	
Braidwood Station, Units 1 and 2)	Docket Nos. STN 50-456, 50-457
)	License Nos. NPF-72, NPF-77
Byron Station, Unit Nos. 1 and 2)	Docket Nos. STN 50-454, 50-455
)	License Nos. NPF-37, NPF-66

DIRECTOR'S DECISION UNDER 10 CFR 2.206

I. Introduction

By e-mail to Mr. Victor M. McCree, Executive Director for Operations, dated February 8, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17061A127), Mr. Barry Quigley filed a petition under Title 10, "Energy," of the *Code of Federal Regulations* (10 CFR) 2.206, "Requests for Action under this Subpart." Attachments to the petition are located at ADAMS Accession Nos. ML17061A126, ML17061A125, and ML17061A124. The petitioner requested that the U.S. Nuclear Regulatory Commission (NRC or the Commission) take the following actions against Exelon Generation Company, LLC (Exelon), the licensee for Byron Station, Unit Nos. 1 and 2, and Braidwood Station, Units 1 and 2:

1. Issue a violation under 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," Criterion III, "Design Control," for deficiencies in the

analysis of record (AOR) for the main steam isolation valve (MSIV) room pressurization following a high-energy line break (HELB).

2. Issue a violation under 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for failure to update the AOR in a timely manner.
3. Require Exelon to show that the consequences of the secondary missiles resulting from MSIV room pressurization do not have adverse consequences.
4. Issue a Demand for Information under 10 CFR 2.204, "Demand for Information," to compare and contrast the behavior of Exelon management as described in the petition with the NRC's policy statement on the attributes of a safety-conscious work environment (SCWE).
5. Use Exelon's response to Item 4 above as a basis on which to determine whether to issue a "chilling effects" letter.

As the basis for the request, the petitioner stated the following:

1. (a) - Break enthalpies used in the MSIV room pressurization AOR are actually the thermodynamic internal energy of the steam, not the enthalpy. Because, in the range of interest, the internal energy is about 13 percent less than the enthalpy, the energy flow to the areas of concern is nonconservative.
(b) - Steam flow from secondary piping is neglected.
2. Corrective actions to resolve an issue in the AOR are long overdue (8 years) and improperly tracked.
3. A proposed revision to the AOR shows that the MSIV room roof slabs will be ejected by the high pressures in the MSIV rooms becoming potential missiles.
4. Management dismissed information in the updated final safety evaluation report (UFSAR) that supported the concerns about the AOR as "excessive detail" and directed personnel to remove the information. Management dismissed UFSAR internal inconsistency related to the "Break Exclusion Zone" without discussion or review and

stated that the information supporting the concern could be deleted as an UFSAR cleanup item. Recently, there was an operability concern for which engineering management maintained a position of operability in the face of conflicting information. The information that engineering management relied on to support operability was demonstrably irrelevant.

The petitioner met with the Office of Nuclear Reactor Regulation (NRR) Petition Review Board (PRB) on April 13, 2017, to clarify the basis for the petition. The NRC is treating the transcript of this meeting (ADAMS Accession No. ML17111A774) as a supplement to the petition. In its acknowledgement letter dated July 17, 2017 (ADAMS Accession No. ML17125A245), the NRC informed the petitioner that Items 1, 2, 4, and 5 were accepted for review under 10 CFR 2.206 and that the agency had referred the issues in the petition to NRR for appropriate action. This letter states that Item 3 does not request enforcement action and, therefore, does not meet the criteria for acceptance for review under 10 CFR 2.206. However, the NRC informed the petitioner that the item is likely to be resolved when reviewing activities to address the AOR under Item 1.

By letter dated July 26, 2017 (ADAMS Accession No. ML17166A362), the NRC requested that Exelon provide a voluntary response to the petition. By letter dated September 1, 2017 (ADAMS Accession No. ML17255A824), Exelon provided its voluntary response.

II. Discussion

1. Issue a violation under 10 CFR Part 50, Appendix B, Criterion III, for deficiencies in the AOR for the MSIV room pressurization following an HELB.

The petitioner's basis and the licensee's September 1, 2017, voluntary response letter both identify errors in calculation 3C8-0282-001, Revision 3. The licensee stated in its voluntary

response letter that calculation 3C8-0282-001 is the design-basis analysis for the structural design of the MSIV house and the main steam tunnel. The regulation under 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that the licensee provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program. The NRC Region III staff conducted inspections at the Byron and Braidwood Stations between October 30 and November 16, 2017. The inspectors identified that as of October 22, 1996, and continuing through the date of the NRC inspections, the licensee failed to verify that Design Analysis 3C8-0282-001, Revision 3, which was the AOR addressing a postulated HELB in the safety-related main steam safety valve (MSSV) rooms [the petitioner and the licensee used the label MSIV house or room], would not cause a structural failure since it failed to apply worst-case environmental loading. The NRC Inspection Reports 05000454/455-2017-010 for Byron Station and 05000456/457-2017-008 for Braidwood Station, dated December 15, 2017 (ADAMS Accession Nos. ML17349A917 and ML17349A894, respectively), each identify a non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion III, "Design Control."

2. Issue a violation under 10 CFR Part 50, Appendix B, Criterion XVI, for failure to update the AOR in a timely manner.

The petitioner's basis states that although the errors regarding the wrong break enthalpies in calculation 3C8-0282-001, Revision 3, were documented on June 30, 2008, in Issue Report 792213, "MSLB Calc[ulation] Energy Release Error," the analysis still contains the nonconservative break enthalpies 8 years later. Exelon's voluntary response letter agrees that Issue Report 792213 for Byron Station and the related Issue Report 792215 for Braidwood Station were documented on June 30, 2008. Exelon's voluntary response letter shows that it issued a contract with a vendor to revise calculation 3C8-0282-001, Revision 3, in February 2013; 5 years after identification of the error. In November 2013, the vendor provided a draft

copy of a revision to calculation 3C8-0282-001 to Exelon for review. Currently, Exelon still has the analysis and proposed plant modifications under review to correct the analysis.

The regulation under 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures shall be established to assure that conditions adverse to quality, such as non-conformances, are promptly identified and corrected. The NRC Region III staff conducted inspections at the Byron and Braidwood Stations between October 30 and November 16, 2017. The inspectors identified that as of the dates of NRC inspections at Byron and Braidwood Stations, the licensee failed to promptly correct errors in Design Analysis 3C8-0282-001, Revision 3, for a main steam line break in the safety-related MSSV rooms [the petitioner and the licensee used the label MSIV house or room] and steam tunnels that were identified on June 30, 2008. The NRC Inspection Reports 05000454/455-2017-010 for Byron Station and 05000456/457-2017-008 for Braidwood Station, dated December 15, 2017, each identify a NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action."

3. Require Exelon to show that the consequences of the secondary missiles resulting from MSIV room pressurization do not have adverse consequences.

The July 17, 2017, acknowledgement letter informed the petitioner that this item did not meet the criteria for review under 10 CFR 2.206 because it does not request enforcement action, as specified in Management Directive 8.11, "Review Process for 10 CFR 2.206 Petitions" (MD 8.11). However, the licensee and NRC have taken action that addresses the issue raised by the petitioner. In September 2017, the licensee initiated operability evaluations (Operability Evaluation 17-002, Revision 0, for Braidwood Station and Operability Evaluation 17-001, Revision 0, for Byron Station) to address the consequences of secondary missiles from the MSIV room pressurization and has determined that no equipment safety functions are affected by potential missiles. During inspections conducted at Byron Station (Inspection Reports 05000454/455-2017-003 (ADAMS Accession No. ML17306A639) and 05000454/455-2017-010) and Braidwood Station (Inspection Reports 05000456/457-2017-003 (ADAMS Accession

No. ML17306A664) and 05000456/457-2017-008), the NRC reviewed the licensee's revisions to the applicable operability evaluations and did not identify any concerns, but did identify NCVs of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the failure to identify design deficiencies involving secondary missiles from the MSSV room pressurization and NCVs of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for the failure to correct the design deficiencies.

4. Issue a "Demand for Information" under 10 CFR 2.204, to compare and contrast the behavior of Exelon management as described in the petition with the NRC's policy statement on the attributes of an SCWE.

As described in the NRC Enforcement Manual (ADAMS Accession No. ML102630150), a demand for information (DFI) is a formal request made to a licensee or applicant to obtain information for the NRC staff to determine whether an Order should be issued to modify, suspend, or revoke the license, or whether to take other enforcement action. The PRB determined that issuance of a DFI in this circumstance was not necessary to evaluate the SCWE concerns expressed in the petition. Consistent with MD 8.11, the NRC's letter dated July 26, 2017, requested that Exelon provide a voluntary response to the concerns raised in the petition. Exelon's September 1, 2017, response, in part, provided the results of its evaluation of the SCWE at Byron Station. Exelon's evaluation included interviews with Braidwood Station personnel that were involved with the activities that the petitioner described in the petition. The evaluation concluded that the actions taken and behaviors demonstrated by Exelon management in response to the issues and activities cited in the petition dated February 8, 2017, demonstrate a healthy SCWE.

The NRC conducted an inspection at Byron Station that ended on August 25, 2017 (Inspection Report 05000454/455-2017-007 (ADAMS Accession No. ML17276B174) that, in part, assessed the licensee's SCWE at Byron Station. Information obtained from interviews and focus groups (including with engineering personnel) indicated that an environment was

established where licensee personnel felt free to raise nuclear safety issues without fear of retaliation. Licensee personnel were generally aware of and familiar with the corrective action program (CAP) and other processes, including the Employee Concerns Program (ECP) and the NRC's allegation process, through which concerns could be raised. In addition, a review of the types of issues in the ECP indicated that the licensee's staff members were appropriately using the CAP and ECP to identify issues. The inspection did not identify any examples where there was retaliation for raising nuclear safety issues. Documents regarding surveys and monitoring of the safety culture and SCWE generally supported the conclusions from the interviews. The inspection did not identify any chilling effect or impediment to the establishment of an SCWE at Byron Station.

5. Use Exelon's response to Item 4 above as a basis on which to determine whether to issue a "chilling effects" letter.

A chilling effect letter is a regulatory tool identified in the NRC Allegations Manual (ADAMS Accession No. ML17003A227) that the NRC uses to ensure that licensees are taking appropriate actions to foster a workplace environment that encourages employees to raise safety concerns and to feel free to do so without fear of retaliation, referred to as an SCWE. A chilling effect letter may be appropriate when there are indications of a chilled work environment, but no discrimination concern has been substantiated. Neither Exelon's voluntary response nor NRC's inspection at Byron Station, as discussed in Item 4, identified evidence of a chilled environment at the Byron Station.

III. Conclusion

The NRC staff conducted inspections at the Byron Station and Braidwood Station that assessed the licensee's compliance with the regulations under 10 CFR Part 50, Appendix B, Criterion III, "Design Control," and Criterion XVI, "Corrective Action," related to the adequacy of

the AOR for the structural design of the MSIV house and the main steam tunnel, and took enforcement action as outlined in the inspection reports identified above. The NRC staff requested that the licensee evaluate the SCWE concerns expressed in the petition, and conducted an inspection that assessed the licensee's SCWE at Byron Station. Based on the licensee's voluntary response and the results of the inspection, the NRC staff did not identify challenges to the licensee's SCWE or evidence of a chilled environment at the Byron Station and, therefore, determined that issuance of a chilling effect letter was not warranted. Because these actions address the underlying concerns raised in requests 1, 2, 4, and 5 of the petition, the petition is granted in part.

As provided in 10 CFR 2.206(c), a copy of this director's decision will be filed with the Secretary of the Commission for review. As provided by this regulation, the decision will constitute the final action of the Commission 25 days after the date of the decision unless the Commission, on its own motion, institutes a review of the decision within that time.

Dated at Rockville, Maryland, this 24th day of April, 2018.

For the Nuclear Regulatory Commission.

A handwritten signature in black ink, appearing to read "B E H", with a large, stylized flourish at the end.

Brian E. Holian, Acting Director
Office of Nuclear Reactor Regulation

SUBJECT: OEDO-17-00104 - 10 CFR 2.206 PETITION REGARDING EXELON'S BYRON AND BRAIDWOOD STATIONS DATED APRIL 24, 2018.

DISTRIBUTION: OEDO-17-00104

PUBLIC

PM File Copy

RidsACRS_MailCTR Resource

RidsEdoMailCenter Resource

RidsNrrDorl Resource

RidsNrrDorlLpl3 Resource

RidsNrrLASRohrer Resource

RidsNrrMailCenter Resource

RidsNrrOd Resource

RidsNrrPMBraidwood Resource

RidsNrrPMBYron Resource

RidsOcaMailCenter Resource

RidsOpaMail Resource

RidsRgn3MailCenter Resource

HSpeiser, SECY

TMensah, NRR

JJohnson, NRR

**ADAMS Accession Nos: Package ML17040A299; Letter ML18087A158;
Final DD ML18087A187; FRN ML18087A264 *via e-mail**

OFFICE	NRR/DORL/LPL3/PM	NRR/DORL/LPL3/LA	Tech Editor*	NRR/DSS/SRXB*
NAME	JWiebe	SRohrer	JDougherty	ASallman
DATE	4/4/18	4/2/18	3/30/18	3/29/18
OFFICE	NRR/DSS/SCPB*	Region III*	Region III*	NRR/DIRS/IRAB*
NAME	RDennig	MJeffers	EDuncan	MKeefe-Forsyth
DATE	3/30/18	4/4/18	3/30/18	3/30/18
OFFICE	OE*	NRR/DORL/LSPB*	OGC*	NRR/DORL/LPL3/BC
NAME	DJones	JJohnson	EMonteith (NLO)	DWrona
DATE	4/4/18	4/6/18	4/10/18	4/12/18
OFFICE	NRR/PRB Chair	NRR/DORL/D	NRR/D(A)	
NAME	CMiller	JGitter	BHolian	
DATE	4/17/18	4/20/18	4/24/18	

OFFICIAL RECORD COPY