



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**

REGION III  
2443 WARRENVILLE RD. SUITE 210  
LISLE, IL 60532-4352

February 27, 2017

EA-16-236

Mr. Bryan C. Hanson  
Senior VP, Exelon Generation Company, LLC  
LLC President and CNO, Exelon Nuclear  
4300 Winfield Road  
Warrenville, IL 60555

**SUBJECT: DRESDEN NUCLEAR POWER STATION, UNIT 3 - FINAL SIGNIFICANCE DETERMINATION OF A WHITE FINDING AND NOTICE OF VIOLATION; NRC INSPECTION REPORT 05000249/2017009 AND ASSESSMENT FOLLOW-UP LETTER**

Dear Mr. Hanson:

This letter provides you the final significance determination of the preliminary White finding discussed in our previous communication dated December 5, 2016, which included the subject inspection report. This report is available in the NRC's Agencywide Documents Access and Management System (ADAMS) at Accession Number ML16340B229. The finding involved the failure to verify the adequacy of design of the Unit 3 high pressure coolant injection (HPCI) auxiliary oil pump (AOP) motor shunt resistor setting during motor replacement, which eventually resulted in the HPCI pump failure and inoperability of the HPCI system.

In a telephone conversation with Mr. James Cameron of the U.S. Nuclear Regulatory Commission (NRC), Region III, on December 15, 2016, Glen Kaegi of your staff indicated that Exelon Generation Company, LLC, did not contest the characterization of the risk significance of this finding and that you declined your opportunity to discuss this issue in a Regulatory Conference or to provide a written response. However Exelon's Letter RS-17-007, dated January 12, 2017, to Mr. William Dean, Office Director of the NRC's Office of Nuclear Reactor Regulation with the Subject "Request for Improvements in the NRC SPAR Model and the RASP Handbook Use," described specific details related to this issue and indicated that it would be appropriate to modify the preliminary White finding at Dresden. Therefore, we considered this correspondence as a written response to the finding. Please note that the programmatic aspects of the Letter RS-17-007, will be addressed under separate correspondence, and that only the issues related to the Dresden HPCI failure are addressed in this letter.

In the letter dated January 12, 2017, Exelon stated that the Dresden HPCI AOP preliminary White finding was unnecessarily conservative, unrepresentative of actual risk and suggested that the NRC modify the White finding. Further, Exelon stated that the NRC obtained this substantially overestimated result by following our Risk Assessment of Operational Events (RASP) Handbook guidance and using the NRC's Standardized Plant Analysis Risk (SPAR) model to evaluate the significance of the finding. The letter did not provide any new technical

information that would change the input assumptions that were used in the significance determination.

The RASP Handbook is a guidance document and as such, does not address the details of every degraded condition that could be encountered in performing SDP analyses. Therefore, when using RASP Handbook guidance, NRC staff will exercise technical judgment and utilize the best available information on the unique circumstances associated with the finding to determine significance. For this specific Dresden finding, we have concluded that the modeling assumptions and input parameters used were realistic and reasonable and consistent with standard PRA practices in PRA modeling. Therefore, after considering the information developed during the inspection, as well as the information in the January 12, 2017 letter, the NRC has concluded that the finding is appropriately characterized in the subject inspection report as White (low to moderate safety significance).

The input assumptions regarding the characterization of the plant degraded condition were developed using technical judgment based on factual understanding of the failure event and the results of our inspection of the issue. The input assumptions were developed using the best available information. This approach is consistent with RASP Handbook guidance and industry standards used in PRA modeling. Using details in the information associated with this inspection finding, the NRC confirmed, independent from the RASP Handbook guidance, that the exposure time used for the degraded condition was an appropriate input assumption. Although the failure to verify the adequacy of the design of Unit 3 HPCI AOP motor shunt resistor setting initially occurred in 2002, it also occurred in March 2015. The NRC considered the risk exposure time to start in March 2015. Specifically, the ability of the HPCI system to restart during a 24 hour PRA mission time was impacted from the time the HPCI AOP motor was installed in March 2015 until it failed catastrophically in June 2016, which is greater than 1 year. The SDP exposure period is limited to a maximum of 1 year, as per program guidance and RASP Handbook guidance. Further, the NRC assumed that operators would trip the HPCI system with the AOP motor on fire, as this occurred during the actual failure event. Restart of HPCI would then be required but not successful during the mission time. The HPCI AOP runs continuously when the HPCI system is running at Dresden, and therefore, its failure would have impacted the system's ability to continue running and to restart.

The use of the HPCI "failure to run" basic event in the SPAR model rather than creating a new failure mode for the "failure to restart" was a modeling approach that did not impact the conclusion of the detailed risk evaluation due to the input assumptions regarding the plant degraded condition. During the development of the preliminary significance determination, the NRC reviewed Exelon's risk significance evaluation of the finding and concluded that given similar input assumptions regarding the exposure time, the output of the Dresden PRA model using basic events specific to the HPCI AOP and a "failure to restart" modeling approach for HPCI also resulted in a White finding, indicating that the risk significance estimate using the NRC SPAR model was consistent with the outcome from the Dresden PRA model and not substantially overestimated as stated in the letter.

The NRC has also determined that the failure of the licensee to verify the adequacy of the design of the Unit 3 HPCI AOP motor shunt resistor setting during motor replacement was a violation of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix B, Criterion III, "Design Control," as cited in the attached Notice of Violation (Notice). The circumstances surrounding the violation were described in detail in the subject inspection report.

In accordance with the NRC Enforcement Policy, the Notice is considered escalated enforcement action because it is associated with a White finding. Because the finding did not reflect current licensee performance, no cross cutting aspects were assigned to this finding. The NRC has concluded that the information regarding the reason for the violation was understood by the licensee as documented in inspection report 05000249/2016010. The corrective actions that the licensee plans to take and the corrective actions to prevent recurrence will be fully achieved by the time stated in Issue Report 2686163, the details of which are also documented in inspection report 05000249/2016010. Therefore, you are not required to respond to this letter unless the description therein does not accurately reflect your corrective actions or your position.

As a result of our review of Dresden Nuclear Power Station, Unit 3 performance, including this White finding, we have assessed Unit 3 to be in the Regulatory Response column of the NRC's Action Matrix as of the fourth quarter of 2016. Therefore, we plan to conduct a supplemental inspection using Inspection Procedure 95001, "Supplemental Inspection Response to Action Matrix Column 2 Inputs," when your staff has notified us of your readiness for this inspection. This inspection procedure is conducted to provide assurance that the root cause and contributing causes of risk significant performance issues are understood, the extent of condition is identified, and the corrective actions are sufficient to prevent recurrence.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response, if you choose to provide one, will be made available electronically for public inspection in the NRC Public Document Room or from ADAMS. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction.

Sincerely,

*/RA/*

Cynthia D. Pederson  
Regional Administrator

Docket No. 50-249  
License No. DPR-25

Enclosure:  
Notice of Violation

cc w/encl: Distribution via ListServ®

## NOTICE OF VIOLATION

Exelon Generation Company, LLC  
Dresden Nuclear Power Station, Unit 3

Docket No. 50-249  
License No. DPR-25  
EA-16-236

During a U.S. Nuclear Regulatory Commission (NRC) inspection conducted on June 27, 2016 a violation of NRC requirements was identified. In accordance with the NRC Enforcement Policy, the violation is listed below:

Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that design control measures shall 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.

Contrary to the above, from March of 2002, until June 27, 2016, the licensee failed to verify the adequacy of the design of the high pressure coolant injection (HPCI) auxiliary oil pump (AOP) motor, which was a component subject to the requirements of 10 CFR 50, Appendix B. Specifically, Procurement Evaluation 16258 performed by the licensee failed to verify the Unit 3 HPCI AOP motor shunt field resistor bank setting was adequate for the design of the component and ensure it would be capable of performing its design basis function.

This violation is associated with a White Significance Determination Process finding.

The NRC has concluded that information regarding the reason for the violation, the corrective actions taken and planned to correct the violation and prevent recurrence and the date when full compliance will be achieved is already adequately addressed on the docket in NRC Inspection Report No 03000249/2016010. However, you are required to submit a written statement or explanation pursuant to 10 CFR 2.201 if the description therein does not accurately reflect your corrective actions or your position. In that case, or if you choose to respond, clearly mark your response as a "Reply to a Notice of Violation," include the EA number, and send it to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001 with a copy to the Regional Administrator, Region III, and a copy to the NRC Resident Inspector at the facility that is the subject of this Notice, within 30 days of the date of the letter transmitting this Notice of Violation (Notice).

If you choose to respond, your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Document Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. Therefore, to the extent possible, the response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction.

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

Enclosure

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from ADAMS, to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days of receipt.

Dated this 27th day of February 2017

Letter to Bryan C. Hanson from Cynthia D. Pederson dated February 27, 2017.

SUBJECT: NOTICE OF VIOLATION – DRESDEN NUCLEAR POWER STATION, UNIT 3-  
FINAL SIGNIFICANCE DETERMINATION OF A WHITE FINDING AND NOTICE  
OF VIOLATION; NRC INSPECTION REPORT 05000249/2017009

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<b>DATE</b>	02/01/17	02/02/17	02/02/17	02/02/17	02/07/17
<b>OFC</b>	NRR-DRA	NRR-DIRS	NRR	RIII-EICS	RIII-ORA
<b>NAME</b>	SWeerakkody <sup>2</sup>	NSanfilippo <sup>3</sup>	BDean <sup>2</sup>	RSkokowski	CPederson
<b>DATE</b>	02/21/17	02/09/17	02/21/17	02/22/17	02/27/17

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<sup>1</sup> OE Concurrence received by M. Marshfield email dated February 7, 2017.

<sup>2</sup> NRR/NRR DRA Concurrence received by L. Casey email dated February 21, 2017.

<sup>3</sup> NRR DRIS Concurrence received by L. Casey email dated February 9, 2017