



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

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

October 17, 2016

EA-16-155

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

SUBJECT: RESPONSE TO DISPUTED NON-CITED VIOLATION; LASALLE COUNTY
STATION, UNITS 1 AND 2 - INSPECTION REPORT 05000373/2016007;
05000374/2016007

Dear Mr. Hanson:

On July 22, 2016, Mr. William J. Trafton, Site Vice President, LaSalle County Station, provided a response (Agencywide Documents Access and Management System [ADAMS] Accession Number ML16204A307) to an U.S. Nuclear Regulatory Commission (NRC) inspection report issued on June 22, 2016, concerning activities conducted at the LaSalle County Station. Specifically, the July 22, 2016, letter contested one of the Non-Cited Violations (NCVs) contained in the Inspection Report, namely NCV 05000373/2016007-04; 05000374/2016007-04, "Alternate Shutdown Procedures Failed to Ensure RCIC [Reactor Core Isolation Cooling] MOVs [Motor Operated Valves] Supply Breakers Were Closed." By our letter (ML16231A395) dated August 18, 2016, the NRC acknowledged Mr. Trafton's letter and advised him that NRC staff was evaluating his reply and would inform him of the results of our evaluation.

In the July 22, 2016, letter your staff stated that the NRC had inappropriately evaluated the current Exelon Generating Company analysis and approach as a performance deficiency and stated that the NCV should be rescinded. Your staff provided the following specific bases for contesting the NCV:

1. The NRC's postulated fire-induced circuit failures involving shorts are outside the published and accepted standards.
2. The valves identified by the NRC in the NCV [1(2)E51-F019 and 1E51-F059] do not fall under the trip reset requirements since their function is not necessary to support the system's fire safe shutdown capability.

The NRC conducted a detailed review of your response and the applicable regulatory requirements, in accordance with Part I, Section 2.2.8, of the NRC Enforcement Manual. The evaluation was conducted by a knowledgeable individual independent from the NRC staff in the Division of Reactor Safety who originally identified the violation and issued the inspection report. After careful consideration of the basis for your denial of the NCV, the NRC has determined that

the NCV is valid as stated in the original inspection report. The NRC staff, in its independent assessment, has determined that the issue qualifies as a performance deficiency due to the published and accepted standards and the LaSalle Safety Evaluation Report, NUREG-0519, which required the consideration of fire-induced circuit failures involving shorts. Details of the evaluation are provided in the enclosure to this letter.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice," a copy of this letter, its enclosure, your staff's July 22, 2016 letter, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Darrell J. Roberts
Deputy Regional Administrator

Docket Nos. 50-373; 50-374
License Nos. NPF-11; NPF-18

Enclosure:
Independent Assessment of LaSalle Contested Violation

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Independent Assessment of LaSalle Contested Violation

The independent assessment of the LaSalle County Station contested Non-Cited Violation (NCV) 05000373/2016007-04; 050i00374/2016007-04, "Alternate Shutdown Procedures Failed to Ensure RCIC [Reactor Core Isolation Cooling] MOVs [Motor Operated Valves] Supply Breakers Were Closed," concluded that the NCV in the original inspection report was valid. A review of the NCV is provided below.

The independent assessment included a review of the following documents:

- Calculation L-004017, "250 Vdc Breaker Fuse Coordination for RCIC," Revision 000
- Generic Letter 86-10, "Implementation of Fire Protection Requirements," April 24, 1986
- LaSalle County Station, Units 1 and 2 - Response to NRC Component Design Basis Inspection, Inspection Report 05000373/2016007; 05000374/2016007, July 22, 2016 (ADAMS Accession No. ML16204A307)
- Letter from S. Collins, NRC, to R. Beedle, Nuclear Energy Institute, "Assessment of NEI Concerns Regarding NRC Information Notice 92-18 'Potential for Loss of Remote Shutdown Capability During a Control Room Fire,'" March 11, 1997 (ADAMS Accession No. ML003716454)
- Letter from M. Jeffers, NRC, to W. Trafton, LaSalle County Station, "LaSalle County Station Acknowledgment of Disputed Violation of NRC Inspection Report 05000373/2016007; 05000374/2016007," August 18, 2016 (ADAMS Accession No. ML16231A395)
- NRC Inspection Report 05000373/2016007; 05000374/2016007, "LaSalle County Station, Units 1 and 2 - NRC Component Design Bases Inspection," June 22, 2016 (ADAMS Accession No. ML16174A094)
- NUREG-0519, "Safety Evaluation Report Related to the Operation of LaSalle County Station Units 1 and 2," March 1981
- NUREG-0800, "Standard Review Plan," July 1981
- Operating Abnormal Procedure LOA-FX-101, "Unit 1 Safe Shutdown with a Fire in the Control Room or AEER," Revision 27
- Operating Abnormal Procedure LOA-FX-201, "Unit 2 Safe Shutdown with a Fire in the Control Room or AEER," Revision 29
- Title 10, *Code of Federal Regulations*, Part 50, Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979"

In the July 22, 2016 letter, Exelon claimed that the valves identified by the NRC in the NCV were not required to achieve and maintain safe shutdown; therefore, would not be required to be proceduralized. Exelon further stated that the U.S. Nuclear Regulatory Commission (NRC) had not identified or produced any documented requirement, position, or guidance applicable to LaSalle County Station that specifically describes the additional short circuits they [the NRC] are contending must be analyzed. Exelon also stated that, "Absent a documented standard for which it was reasonable for LaSalle to foresee, this issue does not qualify as a performance deficiency."

Enclosure

Exelon disagreed with two of the NRC's key positions that formed the basis for the NCV. Exelon stated that:

1. The NRC postulated fire-induced circuit failures involving shorts are outside the published and accepted standards.
2. The valves identified by the NRC in the NCV [1(2)E51-F019 and 1E51-F059] do not fall under the trip reset requirements since their function is not necessary to support the system's fire safe shutdown capability.

Exelon Position 1

Exelon's position is that the finding/non-cited violation is based on the NRC inspectors postulating fire-induced circuit failures that are outside the scope of the current requirements or any NRC endorsed industry guidance applicable to LaSalle County Station. Specifically, Exelon stated that the inspectors identified short circuit cable lengths shorter than those analyzed in calculation L-004017 (250 VDC Breaker Fuse Coordination For Reactor Core Isolation Cooling (RCIC)) by postulating shorts between cables associated with the valves in question (i.e., 1(2)E51-F019 or F059) and another valve from the same power source, or shorts between cables associated with these valves and the ground, and cables associated with other valves and the ground that would end up with a short circuit via the ground.

Exelon further stated that the NRC position on the methodology used in calculation L-004017 was based on Nuclear Energy Institute (NEI) Document 00-01, "Guidance for Post-Fire Safe Shutdown Circuit Analysis," which LaSalle is not currently committed to. Exelon stated that, "Neither during the inspection, nor in the inspection report, has the NRC provided reference to any formal NRC guidance or endorsed industry document that supports their position that these additional shorts need to be postulated." Exelon further stated that the NRC had not clearly described their basis for the performance deficiency.

Response to Exelon's Position 1

Section III.G.2 of Title 10 of the *Code of Federal Regulations* (CFR), Part 50, Appendix R requires, in part, that, "where cables or equipment, including associated non-safety circuits that could prevent operation or cause maloperation due to hot shorts, open circuits, or shorts to ground, of redundant trains of systems necessary to achieve and maintain hot shutdown conditions are located within the same fire area outside of primary containment, one of the following means of ensuring that one of the redundant trains is free of fire damage shall be provided..." Further, for those fire areas not meeting the criteria of III.G.2 Sections III.G.3 and III.L apply. Section III.L.7 states, in part, that, "The safe shutdown equipment and systems for each fire area shall be known to be isolated from associated non-safety circuits in the fire area so that hot shorts, open circuits, or shorts to ground in the associated circuits will not prevent operation of the safe shutdown equipment."

Plants licensed on or after January 1, 1979 (which includes LaSalle) are not required to meet the requirements of Appendix R. The NRC staff reviewed these plants' Fire Protection Programs against the Standard Review Plan, NUREG-0800. The Standard Review Plan, Section C.5c(7), contains nearly identical language to Section III.L.7 of Appendix R and states, in part, that, "The safe shutdown equipment and systems for each fire area should be known to be isolated from associated circuits in the fire area so that hot shorts, open circuits, or shorts to ground in the associated circuits will not prevent operation of the safe shutdown equipment."

The NRC developed Generic Letter 86-10, "Implementation of Fire Protection Requirements," to provide guidance and interpretations of Appendix R requirements. In section 5.3.1, "Circuit Failure Modes," the industry asked, "What circuit failure modes must be considered in identifying circuits associated by spurious actuation?" The NRC responded, in part, that:

Sections III.G.2 and III.L.7 of Appendix R define the circuit failure modes as hot shorts, open circuits, and shorts to ground. For consideration of spurious actuations, all possible functional failure states must be evaluated, that is, the component could be energized or de-energized by one or more of the above failure modes. Therefore, valves could fail open or closed...

The discussion of Generic Letter 86-10 is included here because the licensee specifically referred to the generic letter in the July 22, 2016, response letter and the generic letter contains the standard fire protection license condition that most, if not all, licensees previously adopted. As such, the generic letter serves as a guidance document that is applicable to LaSalle County Station.

The documents discussed above are included in order to show that the NRC staff position regarding the need for licensees to consider hot shorts has been consistent for the past 35 years.

Regarding the LaSalle County Station licensing basis, the NRC discussed the need to consider hot shorts in the LaSalle Safety Evaluation Report, NUREG-0519, dated March 1981. In Section 9.5.3, "Alternate Shutdown," of the Safety Evaluation Report, the NRC stated the following:

- (2) For the design basis fire affecting the control room, cable spreading room, or remote shutdown locations, we require electrical circuits between these control locations to be sufficiently isolated so that both safe (hot and cold) shutdown capability will not be lost at both locations. To assure this shutdown capability, we required the applicant to provide the following information.
 - (d) The results of an analysis that demonstrates that failure (open, ground, or hot short) of each circuit identified will not affect the capability to achieve safe shutdown.

In the licensee's July 22, 2016, letter Exelon stated that the NRC based their conclusions regarding the licensee's methodology in calculation L-004017 on guidance provided in NEI 00-01. However, in the Inspection Report 05000373/2016007; 05000374/2016007 write-up of the issue, the NRC inspectors did not refer to NEI 00-01. The inspectors based their conclusion on regulatory requirements and long-standing guidance.

The NRC staff has concluded, in its independent review of Exelon Position 1, that the fire-induced circuit failures involving shorts that the NRC inspectors postulated in the inspection report are within the published and accepted standards and that the basis for the performance deficiency is valid. The preceding discussion provides a 35-year history of regulations and published staff positions and guidance supporting the need for licensees to consider fire-induced hot shorts.

Exelon Position 2

Exelon's position is that the valves identified by the NRC in the NCV [1(2)E51-F019 and 1E51-F059] do not fall under the trip reset requirements since their function is not necessary to support the system's fire safe shutdown capability. The LaSalle Fire Protection Report credits RCIC injection to the reactor pressure vessel to support fire safe shutdown. Therefore, as described in the requirements above, it is not necessary to provide alternate instructions for these valves in the procedures.

Response to Exelon's Position 2

In the letter Exelon stated that, "valves 1(2)E51-F019 and F059 do not impact the RCIC injection into the reactor and are not essential for the RCIC system to perform this credited fire safe shutdown function." Exelon stated that a spurious opening of valves 1(2)E51-F059 would not divert water from the RCIC injection path because that valve is in series with the normally closed 1(2)E51-F022 valve. They also stated that the RCIC minimum flow valve 1(2)E51-F019 is normally closed and should it spuriously open the RCIC system would be able to maintain the desired flow rate.

The concern that the NRC inspectors documented in the inspection report was that the AOPs did not include alternative instructions to verify that breakers for valves 1(2)E51-F019 and F059 would close in the event the circuit breakers open, preventing the MOVs from being operated. If these valves could not be opened the centrifugal RCIC pump could be damaged as a result of the pump deadheading and overheating in a very short period of time. This event could occur upon startup of the RCIC turbine and pump and fire damage to circuits associated with valves 1(2)E51-F019 and F059 due to the hot shorts. The previous response to Exelon Position 1 validated that LaSalle was required to consider the impacts of hot shorts.

By not providing alternate instructions for the operators in the AOPs in the event that valves 1(2)E51-F019 and F059 could not be opened LaSalle did not ensure that fire damage to circuits associated with those valves would not affect the capability to achieve safe shutdown. The failure to open those valves could result in damage to the RCIC system, which is the credited system for alternate shutdown from the remote shutdown panel.

The NRC staff has concluded, in its independent review of Exelon Position 2, that the valves 1(2)E51-F019 and 1E51-F059 do need to be considered under the trip reset requirements because their failure to open could result in damage to RCIC system components and an inability of the RCIC system to perform its safe shutdown actions.

Overall Conclusion

In conclusion, the NRC staff has determined that the issue qualifies as a performance deficiency due to the published and accepted standards (as documented in Title 10 of the *Code of Federal Regulations* (CFR), Part 50, Appendix R; NUREG-0800; and Generic Letter 86-10) and the LaSalle Safety Evaluation Report, NUREG-0519, which required the consideration of fire-induced circuit failures involving shorts. The regulatory requirements, staff positions, and guidance on the need to consider fire-induced hot shorts have been well documented over the past 35 years.

B. Hanson

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the NCV is valid as stated in the original inspection report. The NRC staff, in its independent assessment, has determined that the issue qualifies as a performance deficiency due to the published and accepted standards and the LaSalle Safety Evaluation Report, NUREG-0519, which required the consideration of fire-induced circuit failures involving shorts. Details of the evaluation are provided in the enclosure to this letter.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice," a copy of this letter, its enclosure, your staff's July 22, 2016 letter, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,
/RA/
Darrell J. Roberts
Deputy Regional Administrator

Docket Nos. 50-373; 50-374
License Nos. NPF-11; NPF-18

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