



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION III
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LISLE, ILLINOIS 60532-4352

November 26, 2018

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

**SUBJECT: LASALLE COUNTY STATION, UNITS 1 AND 2—NRC TEMPORARY
INSTRUCTION 2515/191, MITIGATION STRATEGIES, SPENT FUEL POOL
INSTRUMENTATION AND EMERGENCY PREPAREDNESS INSPECTION
REPORT 05000373/2018011 AND 05000374/2018011**

Dear Mr. Hanson:

On October 5, 2018, the U.S. Nuclear Regulatory Commission (NRC) completed a Temporary Instruction (TI) 2515/191, "Inspection of the Implementation of Mitigation Strategies and Spent Fuel Pool Instrumentation Orders and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans" inspection at your LaSalle County Station, Units 1 and 2. On November 16, 2018, the NRC inspectors discussed the results of this inspection with Mr. W. Trafton and other members of your staff. The results of this inspection are documented in the enclosed report.

The inspection examined activities conducted under your license as they relate to the implementation of mitigation strategies and spent fuel pool instrumentation orders (EA-12-049 and EA-12-051) and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans, your compliance with the Commission's rules and regulations, and with the conditions of your operating license. Within these areas, the inspection involved examination of selected procedures and records, observation of activities, and interviews with station personnel.

Based on the results of this inspection, NRC inspectors documented one finding of very low safety significance (Green) in this report. The finding did not involve a violation of NRC requirements.

If you disagree with a cross-cutting aspect assignment or a finding not associated with a regulatory requirement in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region III; and the NRC resident inspector at the LaSalle County Station.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Ann Marie Stone, Team Leader
Technical Support Staff
Division of Reactor Projects

Docket Nos. 50-373; 50-374; 72-070
License Nos. NPF-11; NPF-18

Enclosure:
IR 05000373/2018011; 05000374/2018011

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Letter to Bryan C. Hanson from Ann Marie Stone dated November 26, 2018

SUBJECT: LASALLE COUNTY STATION, UNITS 1 AND 2—NRC TEMPORARY INSTRUCTION 2515/191, MITIGATION STRATEGIES, SPENT FUEL POOL INSTRUMENTATION AND EMERGENCY PREPAREDNESS INSPECTION REPORT 05000373/2018011 AND 05000374/2018011

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REGION III

Docket No: 50-373; 50-374

License No: NPF-11; NPF-18

Report No: 05000373/2018011; 05000374/2018011

Enterprise Identifier: I-2018-011-0036

Licensee: Exelon Generation Company, LLC

Facility: LaSalle County Station, Units 1 and 2

Location: Marseilles, IL

Dates: October 1 through October 5, 2018

Inspectors: S. Sheldon, Project Engineer, (Team Leader)
J. Hanna, Senior Reactor Analyst
J. Rutkowski, Project Engineer
J. Havertape, Resident Inspector

Approved by: A. Stone, Team Leader
Technical Support Staff
Division of Reactor Projects

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring licensee’s performance by conducting a Temporary Instruction 2515/191, “Implementation of Mitigation Strategies and Spent Fuel Pool Instrumentation Orders and Emergency Preparedness Communication/ Staffing/Multi-Unit Dose Assessment Plans” inspection at LaSalle County Station, Units 1 and 2 in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC’s program for overseeing the safe operation of commercial nuclear power reactors. Refer to <http://www.nrc.gov/NRR/OVERSIGHT/ASSESS/index.html> for more information. Additional items are summarized in the table below.

List of Findings and Violations

Failure to Validate Deployment of an Electrical Strategy			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green FIN 05000373/2018011–01 Closed	[H.13] – [Consistent Process]	TI–2515/191
The team identified a Green finding for the failure to validate one deployment path of the electrical strategy procedure was feasible. Specifically, the team identified that there was insufficient electrical cabling to implement the contingency path of LOA–FSG–002, “FLEX Electrical Strategy,” Attachment D1 and D2, Revision 9 as written.			

Additional Tracking Items

Type	Issue Number	Title	Report Section	Status
TI	2515/191	Implementation of Mitigation Strategies and Spent Fuel Pool Instrumentation Orders and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans	Other Activities	Closed

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

OTHER ACTIVITIES—TEMPORARY INSTRUCTIONS, INFREQUENT AND ABNORMAL

Temporary Instruction 2515/191—Inspection of the Implementation of Mitigation Strategies and Spent Fuel Pool Instrumentation Orders and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans

The inspectors verified plans for complying with NRC Orders EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events" (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12056A045) and EA-12-051, "Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation" (ML12054A679) are in place and are being implemented by the licensee. Additionally, the inspection verified implementation of staffing and communications information provided in response to the March 12, 2012, request for information letter (ML12053A340) and multiunit dose assessment information provided per COMSECY-13-0010, "Schedule and Plans for Tier 2 Order on Emergency Preparedness for Japan Lessons Learned", dated March 27, 2013 (ML12339A262).

- (1) Based on samples selected for review, the inspectors verified that the licensee satisfactorily implemented appropriate elements of the Diverse and Flexible Coping Strategies (FLEX) as described in the plant specific submittals and the associated safety evaluation (ML18219B835) and determined that the licensee is in compliance with NRC Order EA-12-049. The inspectors verified the licensee satisfactorily:
 - a) developed and issued FLEX Support Guidelines (FSGs) to implement the FLEX strategies for postulated external events;
 - b) integrated their FSGs into their existing plant procedures such that entry into and departure from the FSGs were clear when using existing plant procedures;
 - c) protected FLEX equipment from site-specific hazards;
 - d) developed and implemented adequate testing and maintenance of FLEX equipment to ensure their availability and capability;
 - e) trained their staff to assure personnel proficiency in the mitigation of beyond-design basis events; and
 - f) developed the means to ensure the necessary off-site FLEX equipment would be available from off-site locations.

- (2) Based on samples selected for review, the inspectors verified that the licensee satisfactorily implemented appropriate elements of the FLEX strategy as described in the plant specific submittals and the associated safety evaluation and determined that the licensee is in compliance with NRC Order NRC Order EA-12-051. The inspectors verified the licensee satisfactorily:
- a) installed the spent fuel pool (SFP) instrumentation sensors, cabling and power supplies to provide physical and electrical separation as described in the plant specific submittals and safety evaluation;
 - b) installed the SFP instrumentation display in the location, environmental conditions and accessibility as described in the plant specific submittals;
 - c) trained their staff to assure personnel proficiency with the maintenance, testing, and use of the SFP instrumentation; and
 - d) developed and issued procedures for maintenance, testing and use of the reliable SFP instrumentation.
- (3) The inspectors reviewed information provided in the licensee's multi-unit dose submittal and in response to the NRC's March 12, 2012, request for information letter, and verified that the licensee satisfactorily implemented enhancements pertaining to Near-Term Task Force (NTTF) Recommendation 9.3 response to a large scale natural emergency event that results in an extended loss of all ac power to all site units and impedes access to the site. The inspectors verified the following:
- a) the licensee satisfactorily implemented required staffing changes to support a multi-unit extended loss of alternating current (ac) power (ELAP) scenario;
 - b) emergency preparedness (EP) communications equipment and facilities are sufficient for dealing with a multi-unit ELAP scenario; and
 - c) the licensee implemented multi-unit dose assessment capabilities (including releases from spent fuel pools) using the licensee's site-specific dose assessment software and approach.

The inspectors verified that noncompliance with requirements, and standards identified during the inspection were entered into the licensee's corrective action program as appropriate. The corrective action program documents generated as a result of the inspection are listed in the Documents Reviewed section of this inspection report.

INSPECTION RESULTS

Temporary Instruction 2515/191—Inspection of the Implementation of Mitigation Strategies and Spent Fuel Pool Instrumentation Orders and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans

Failure to Validate Deployment of an Electrical Strategy			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green FIN 05000373/2018011-01 Closed	[H.13] – [Consistent Process]	TI-2515/191
<p><u>Introduction:</u></p> <p>The team identified a Green finding for the failure to validate one deployment path of the electrical strategy procedure was feasible. Specifically, the team identified that there was insufficient electrical cabling to implement the contingency path of LOA-FSG-002, “FLEX Electrical Strategy,” Attachment D1 and D2, Revision 9 as written.</p>			
<p><u>Description:</u></p> <p>The team reviewed the licensee’s procedures for implementing the Final Integrated Plan (FIP) of Mitigating Strategies Order EA-12-049. As part of this review, the team conducted a walk down of the FLEX electrical strategy on October 2, 2018. During the walk down the team identified that there was insufficient electrical cabling to accomplish the contingency path of LOA-FSG-002, FLEX Electrical Strategy, Attachment D1 and D2, Revision 9, from the FLEX diesel deployment location described in the procedure.</p> <p>As part of the electrical strategy that was described in the FIP, the licensee had a primary deployment location for emergency diesel generators that allowed access to both the primary and alternate connection points for the electrical strategy. There was no alternate path to the primary deployment location described in the FIP, but the FIP states that any equipment or structure that would block the path could be moved by the debris removal equipment. The licensee’s procedures to implement the FIP however, specified a contingency deployment location in the event 345kV lines and associated structures fell and blocked the primary deployment location.</p> <p>Additionally, LOA-FSG-008, “Overhead Lines,” Section C.2 stated that “In all cases where potentially energized high voltage power lines are encountered during implementation of FLEX strategies, the FIRST option is to find any alternate path to perform actions, even if that path was not analyzed during development of the strategies.” Discussions with operators further confirmed that they would have used the contingency location if the 345kV lines were down and would not attempt to access the primary location.</p> <p>The inspection team expressed a concern with the licensee that they would not be able to recover the electrical strategy within the necessary timeline in the event of the primary deployment location was unusable/unavailable. The licensee entered the issue into the corrective action program as AR 0417990 and evaluated the impact of the issue to their ability to accomplish the electrical strategy, including any impact that recovery actions may have had on the overall FIP timeline. The licensee determined that with the diesels staged at the contingency location, the available cables would not reach the primary or alternate electrical</p>			

connection points. The cable reels have 300 feet of cable and the distance is approximately 775 feet to the Unit 1 primary connection point and approximately 450 feet to the Unit 2 primary connection point.

The licensee determined that by moving the diesels closer to the building, and using an additional 300 feet cabling available on the N+1 trailer, as well as 50 feet of additional non-credited cable that happened to be available, the strategy could be accomplished.

To determine the impact on the overall FIP timeline the licensee validated the implementation of the contingency path, including the necessary recovery actions following the discovery by the operators 3 hours into the event that the cables were of an inadequate length. The time to implement was determined to be 3 hours and 48 minutes based on operator actions' time validation, which is 1 hour and 15 minutes longer than the primary electrical strategy path implementation time. The maximum allowed time to complete either the primary or the contingency strategy was 5 hours. Therefore, 1 hour and 12 minutes of margin existed for the implementation of the contingency electrical strategy. Therefore, the contingency primary electrical strategy as described in LOA-FSG-002, "FLEX Electrical Strategy," Revision 9, Attachment D1 for Unit 1, could have been implemented within the maximum allowed time of 5 hours.

Corrective Action: The licensee implemented a procedure change to LOA-FSG-002, "FLEX Electrical Strategy," which removed the contingency deployment location. The diesels will be deployed within 300 feet of the primary connection point and the electrical cabling will be routed over debris in the event of a 345kV tower collapse.

Corrective Action Reference: AR 04179990

Performance Assessment:

Performance Deficiency: Nuclear Energy Institute (NEI) 12-06, Section 11.4.3 "Development Guidance for FSGs" states in part: "FSG should be reviewed and validated by the involved groups to the extent necessary to ensure the strategy is feasible in accordance with Appendix E. Validation may be accomplished via walk-throughs or drills of the guidelines." Contrary to this self-imposed standard, the licensee did not ensure that the contingency path was feasible. This is a performance deficiency.

Screening: The team determined the performance deficiency was more than minor because it adversely affected the Protection Against External Factors attribute of the mitigating systems cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the inability to implement the procedure as written, would cause operators to take ad hoc recovery actions to implement the electrical strategies during an event. This challenge to the electrical strategies had the potential to affect the containment pressure control and RPV heat removal functions of the FLEX strategy.

Significance: The team assessed the significance of the finding using SDP Appendix O, "Significance Determination Process For Mitigating Strategies And Spent Fuel Pool Instrumentation (Orders EA-12-049 and EA-12-051)," dated October 7, 2016. The team determined that this finding is of very low safety significance (Green) because the team answered NO to all questions of Appendix O. The licensee asserted, and the team agreed, that reasonable recovery action would be taken in sufficient time to make the electrical strategy successful, therefore this procedural deficiency would not result in a complete loss of

one or more functions needed to maintain or restore core cooling, containment pressure control/heat removal and/or spent fuel pooling cooling capabilities.

Cross-Cutting Aspect: The team determined this finding affected the cross-cutting area of human performance in the aspect of consistent process, where individuals use a consistent, systematic approach to make decisions. Procedural guidance developed for the primary path of the electrical strategy was reviewed and validated by the involved groups to the extent necessary to ensure the strategy was feasible. However the contingency path of the electrical strategy not was reviewed and validated to ensure it was feasible to accomplish as written (i.e. there was insufficient cable to reach the primary distribution panel with the FLEX diesel parked in the location specified by licensee procedure LOA-FSG-002) and an error was missed. [H.13]

Enforcement:

The team did not identify a violation of regulatory requirements associated with this finding.

This Temporary Instruction is considered closed.

EXIT MEETINGS AND DEBRIEFS

The inspectors verified no proprietary information was retained or documented in this report.

- On November 16, 2018, the inspectors presented the Temporary Instruction 2515/191 inspection results to Mr. W. Trafton, and other members of the licensee staff.

DOCUMENTS REVIEWED

Temporary Instruction 2515/191—Inspection of the Implementation of Mitigation Strategies and Spent Fuel Pool Instrumentation Orders and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans

- AR 02464795; FLEX Vehicles in Building 22 Trip GFCI for Block Heaters; 10/03/2018
- AR 02468648; FLEX Kubota Tractor and Fuel Trailer Missing Trickle Charger; 03/14/2015
- AR 02547114; FLEX Tugger #2 Broken; 08/27/2015
- AR 02728195; The Tugger for the Hale Pump Building is Broken; 10/14/2016
- AR 03968532; FLEX TSA not Incorporated into OP-LA-102-106; 01/31/2017
- AR 03984707; FLEX Knaack Boxes Missing Items; 03/13/2017
- AR 03995276; FLEX Tugger in Bldg 23 Broken; 04/06/2017
- AR 04085992; FLEX Equipment Oil Evaluation Identified Deficiencies; 12/20/2017
- AR 04159772; FLEX Hydraulic Saw Electric Starter does not Work ; 07/19/2018
- AR 04163414; FLEX Knaack Boxes 7 & 8 Not Stored Per CC-AA-118; 08/10/2018
- AR 04178134; Change to Pressure at Which HCV is Opened During an ELAP; 09/28/2018
- AR 04179111; NRC Identified: FLEX Final Implementation Plan Minor Revision; 10/01/2018
- AR 04179796; NRC Identified – PCRA For LOA-FSG-012; 10/03/2018
- AR 04179800; NRC Identified – EPA-MCR-14 Needs Revised; 10/03/2018
- AR 04179945; NRC Identified – Reliability for Extra Radios; 10/03/2018
- AR 04179986; NRC Identified – Kubota Hitch not Rated to Tow FLEX DG; 10/03/2018
- AR 04179990; NRC Identified – LOA-FSG-002 Contingency Path Issue; 10/03/2018

- CC-LA-118-1001; Site Implementation of Diverse And Flexible Coping Strategies (FLEX) and Spent Fuel Pool Instrumentation Program; Revision 6
- CC-LA-118-1002; SAFER Response Plan for LAS; Revision 3
- Diagram 1E-2-4440AA; Internal/External Wiring Diagram for 125 VDC Distribution Bus 2B & 125 VDC Distribution Panel 212X; Revision 1
- EC 396062; FLEX U1 Primary Strategy – Electrical Install 480v Power Source To 480v Swgr Buses 235x, 235y, 236x And 236y from a Portable 480V Generator; Revision 5
- EC 619279; Mitigating Strategies Assessment Seismic Path 4 Evaluation for LaSalle County Station Units 1 and 2; Revision 0
- EP-AA-110-200; Dose Assessment; Revision 11
- EP-AA-110-200-F-10; LaSalle Detailed Assessment Release Path Board; Revision A
- EP-AA-110-201; On Shift Dose Assessment; Revision 5
- EP-AA-112-100-F-01; Shift Emergency Director Checklist; Revision Z
- EP-AA-112-200-F-01; Station Emergency Director Checklist; Revision P
- EP-AA-112-300-F-01; OSC Director Checklist; Revision P
- EPA-MCR-14; Portable Back-Up Main Control Room (MCR) Satellite Communication System Operating User Aid; Revision 0
- EPA-TSC-33; Portable TSC/OSC Satellite Communication System Operating User Aid; Revision 0
- L-003961; FLEX Pump Sizing Hydraulic Calculation; Revision 2
- L-003968; Temperature and Humidity Transient in the Reactor Building 843'-6" Operating Floor Following a BDBEE for FLEX; Revision 0
- L-003993; Robust FLEX Building Soil Liquefaction Potential; Revision 0
- L-004000; Evaluation of Liquefaction Potential for BDBEE FLEX Staging Area and Equipment Deployment Paths; Revision 0
- LaSalle County Station, Unit 1 and 2, Exelon Generation Company, LLC, Seismic Mitigating Strategies Assessment (MSA) Report For The Reevaluated Seismic Hazard Information – NEI 12-06, Appendix H, Revision 4, H.4.4 Path 4: GMRS < 2xSSE; 08/22/2017
- LFP-500-03; Fuel Pool Gate Removal and Installation; Revision 10
- LGA 1, RPV Level Control, Revision 18
- LGA-RI-101; Unit 1 RPV Injection Using RCIC Including Defeat of RCIC Isolations; Revision 7
- LGA-RI-102; Unit 1 RPV Depressurization, Defeating RCIC Isolation Signals; Revision 4
- LGA-RI-103; Unit 1 RPV Injection Using RCIC when Loss of DC is Imminent or has Occurred; Revision 7
- LIP-FC-501; Unit 1 Spent Fuel Pool Level Primary Indication Calibration; Revision 2
- LOA AP 101; Unit 1, AC Power System Abnormal; Revision 58
- LOA-AP-101; Unit 1, AC Power System Abnormal; Revision 59
- LOA-AP-201; Unit 2, AC Power System Abnormal; Revision 53
- LOA-FSG-001; Loss of Vital Instrumentation; Revision 2
- LOA-FSG-002; FLEX Electrical Strategy; Revision 9
- LOA-FSG-003; FLEX Water Supply Strategy; Revision 8
- LOA-FSG-004; FLEX Implementation During Shutdown and Refueling Modes; Revision 1
- LOA-FSG-005; Area Ventilation; Revision 6
- LOA-FSG-007; FLEX Spent Fuel Pool Level Indication; Revision 2
- LOA-FSG-008; Overhead Lines; Revision 2
- LOA-FSG-009; FLEX Equipment Fueling; Revision 3
- LOA-FSG-009; FLEX Refueling Strategy; Revision 4
- LOA-FSG-010; FLEX Communications; Revision 4
- LOA-FSG-011; FLEX Beyond Design Basis External Event Guidance; Revision 5
- LOA-FSG-012; FLEX Deployment Path Debris Removal; Revision 1
- LOA-FSG-013; Long-Term FLEX Recovery Actions; Revision 2

- LOS-FSG-A1; FLEX Equipment Annual Inventory; Revision 5
- LOS-FSG-SA1; FLEX Semi-Annual Equipment Surveillance; Revision 6
- LOS-FSG-SR1; FLEX Equipment Surveillance; Revision 11
- LOS-ZZ-A2; Preparation for Winter/Summer Operation; Revision 56
- LS-MISC-017; MAAP Analysis to Support Initial FLEX Strategy; Revision 3
- Maintenance Snow and Ice Removal Plan
- N-AN-EP-FLEX-TECH-JITT; FLEX Related ERO Technical Training; 09/24/2018
- OP-LA-102-106; LaSalle Station Operator Response Time Program; Revision 12
- Sargent and Lundy Calculation 2012-11819; Transient Analysis of RCIC Pump Room for Extended Loss of AC Power; Revision 0
- TQ-AA-113; ERO Training And Qualification; Revision 34
- WO 01697189; EM U1 FLEX Primary Strategy - Electrical (Online); Various dates
- WO 01697196; EM U2 FLEX Primary Strategy - Electrical (Online); Various dates
- WO 01808546-01; 0FF30A Hale Pump 3 YR Performance Test; 04/06/2017
- WO 01808547-01; 0FF30B Hale Pump 3 YR Performance Test; 04/06/2017
- WO 01858158-01; EWP MM Repair FLEX Tugger #2; 07/26/2016
- WO 04667114-01; FLEX Cummins DG 0FF01KA Triennial Performance Test; 03/21/2018
- WO 04667115-01; FLEX Cummins DG 0FF01KB Triennial Performance Test; 03/21/2018
- WO 04667116-01; FLEX Cummins DG 0FF01KC Triennial Performance Test; 03/21/2018
- WO 04684251-01; Semi-Annual TSC/OSC/MCR Back-Up Portable Satellite System Test; 03/29/2018
- WO 04684252-01; Semi-Annual EMNET/Fixed Satellite System Functional Test; 03/29/2018
- WR 01359258; FLEX Equipment Tugger 1 And 2 Are Out of Service; 08/08/2017