UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
2100 RENAISSANCE BOULEVARD, SUITE 100
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

November 6, 2019

Mr. Bryan Hanson
Senior Vice President, Exelon Generation
Exelon Generation Company, LLC
President and Chief Nuclear Officer
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: THREE MILE ISLAND NUCLEAR STATION, UNIT 1 – INTEGRATED INSPECTION REPORT 05000289/2019003

Dear Mr. Hanson:

On September 30, 2019, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Three Mile Island Nuclear Station, Unit 1. On October 8, 2019, the NRC inspectors discussed the results of this inspection with Mr. Trevor Orth, Site Decommissioning Director, and other members of your staff. The results of this inspection are documented in the enclosed report.

No NRC-identified or self-revealing findings were identified during this inspection.

A licensee-identified violation which was determined to be of very low safety significance is documented in this report. We are treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2 of the Enforcement Policy.

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 Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Matthew R. Young, Chief
Reactor Projects Branch 5
Division of Reactor Projects

Docket No. 05000289
License No. DPR-50

Enclosure:
As stated

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SUBJECT: THREE MILE ISLAND NUCLEAR STATION, UNIT 1 – INTEGRATED INSPECTION REPORT 05000289/2019003 DATED NOVEMBER 6, 2019

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U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report

Docket Number:	05000289
License Number:	DPR-50
Report Number:	05000289/2019003
Enterprise Identifier:	I-2019-003-0034
Licensee:	Exelon Generation Company, LLC
Facility:	Three Mile Island Nuclear Station, Unit 1
Location:	Middletown, PA 17057
Inspection Dates:	July 1, 2019, to September 30, 2019
Inspectors:	Z. Hollcraft, Senior Resident Inspector S. Ghrayeb, Resident Inspector B. Lin, Nuclear Systems Engineer J. Heinly, Senior Resident Inspector R. Rolph, Health Physicist
Approved By:	Matthew R. Young, Chief Reactor Projects Branch 5 Division of Reactor Projects

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting an integrated inspection at Three Mile Island Nuclear Station, Unit 1, 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 https://www.nrc.gov/reactors/operating/oversight.html for more information. A licensee-identified non-cited violation is documented in report section: 71111.05Q.

List of Findings and Violations

No findings or violations of more than minor significance were identified.

Additional Tracking Items

None.

PLANT STATUS

Unit 1 began the inspection period at rated thermal power. On September 20, 2019, Unit 1 was shutdown for defueling outage 1D23. The unit was defueled on September 26, 2019, and Certification of Permanent Removal of Fuel Letter ML19269E480 was submitted.

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 performed plant status activities described in IMC 2515, Appendix D, "Plant Status," and conducted routine reviews using IP 71152, "Problem Identification and Resolution." 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.

REACTOR SAFETY

71111.04Q - Equipment Alignment

Partial Walkdown Sample (IP Section 03.01) (3 Samples)

The inspectors evaluated system configurations during partial walkdowns of the following systems/trains:

(1) Train 'A' decay heat river system following inservice testing on August 1, 2019
(2) Nuclear river pump 1C on August 19, 2019
(3) Train 'B' decay heat river system during elevated risk due to reactor coolant system cooldown operations on September 21, 2019

71111.05Q - Fire Protection

Quarterly Inspection (IP Section 03.01) (5 Samples)

The inspectors evaluated fire protection program implementation in the following selected areas:

(1) Intake screen pump house, 308-foot elevation, on July 2, 2019
(2) Fuel handling building, 281-foot elevation, on August 6, 2019
(3) Fuel handling building, 305/306-foot elevation, on August 6, 2019
(4) Fuel handling building, 329-foot elevation, on August 6, 2019
(5) Control building relay room, 338-foot elevation, on September 6, 2019

71111.11Q - Licensed Operator Requalification Program and Licensed Operator Performance

Licensed Operator Performance in the Actual Plant/Main Control Room (IP Section 03.01) (1 Sample)

(1) The inspectors observed and evaluated licensed operator performance in the main control room during a plant shutdown on September 20, 2019.

Licensed Operator Requalification Training/Examinations (IP Section 03.02) (1 Sample)

(1) The inspectors observed and evaluated licensed operator performance in the simulator during shutdown/cooldown just-in-time training on September 19, 2019.

71111.12 - Maintenance Effectiveness

Routine Maintenance Effectiveness Inspection (IP Section 02.01) (2 Samples)

The inspectors evaluated the effectiveness of routine maintenance activities associated with the following equipment and/or safety significant functions:

(1) Repair of station blackout diesel standby lube oil pump due to out of band lube oil temperature on May 3, 2019
(2) 'B' feedwater pipe leak near HD-V-32B on September 3, 2019

71111.13 - Maintenance Risk Assessments and Emergent Work Control

Risk Assessment and Management Sample (IP Section 03.01) (2 Samples)

The inspectors evaluated the risk assessments for the following planned and emergent work activities:

(1) 'B' main transformer 'B' phase bus connector high temperature on July 24, 2019
(2) 'B' feedwater heater drain steam leak response and repair on August 29, 2019

71111.15 - Operability Determinations and Functionality Assessments

Operability Determination or Functionality Assessment (IP Section 02.02) (6 Samples)

The inspectors evaluated the following operability determinations and functionality assessments:

(1) 'A' train steam supply to turbine driven emergency feedwater pump MS-V-13A slow actuation on July 5, 2019
(2) Diesel fuel storage tank level instrument DF-LI-152 on July 16, 2019
(3) Degraded cable supports in vault E-7 on August 7, 2019
(4) 'C' make up pump high vibrations on August 16, 2019
(5) 'B' train decay river pump elevated vibrations on August 29, 2019
(6) Nuclear service river water through-wall leak on September 6, 2019

71111.18 - Plant Modifications

Temporary Modifications and/or Permanent Modifications (IP Section 03.01 and/or 03.02) (1 Sample)

The inspectors evaluated the following temporary or permanent modifications:

(1) Spent fuel pool tell-tale drain reroute back to pool on September 19, 2019

71111.19 - Post-Maintenance Testing

Post-Maintenance Test Sample (IP Section 03.01) (2 Samples)

The inspectors evaluated the following post maintenance tests:

(1) Fire barrier seal #7 repair on July 19, 2019
(2) Leak repair of 'B' feedwater pipe upstream of HD-V-32B on September 3, 2019

71111.20 - Refueling and Other Outage Activities

Refueling/Other Outage Sample (IP Section 03.01) (1 Sample)

(1) The inspectors evaluated decomissioning outage 1D23 from September 20 to September 27, 2019. This inspection was completed in accordance with Operating Experience Smart Sample (OpESS) 2007/03.

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

Surveillance Tests (other) (IP Section 03.01) (3 Samples)

(1) 'A' emergency diesel generator monthly run on August 7, 2019
(2) MU-P-1C run on August 12, 2019
(3) Channel 1 testing of the HPI/LPI engineered safeguards system logic on September 18, 2019

Inservice Testing (IP Section 03.01) (1 Sample)

(1) Inservice testing of 'A' train decay river pump and valves on August 1, 2019

RADIATION SAFETY

71124.01 - Radiological Hazard Assessment and Exposure Controls

Instructions to Workers (IP Section 02.02) (1 Sample)

The inspectors evaluated instructions to workers including radiation work permits used to access high radiation areas.

(1) The inspectors reviewed the following:

Radiation Work Packages

- TM-1-19-00613, Outage Containment Reactor Head Disassembly/Assembly
- TM-1-19-00614, Outage Containment Reactor Upper Internals Move
- TM-1-19-00631, Outage Containment Radiation Protection Activities

Electronic Alarming Dosimeter Alarms

- No alarms occurred during the period of this inspection.

Labeling of Containers

- The inspectors verified labeling of several containers in the Containment.

Radiological Hazards Control and Work Coverage (IP Section 02.04) (1 Sample)

The inspectors evaluated in-plant radiological conditions during facility walkdowns and observation of radiological work activities.

(1) The inspectors also reviewed the following radiological work package for areas with airborne radioactivity:

- No work packages were available for review during this inspection.

High Radiation Area and Very High Radiation Area Controls (IP Section 02.05) (1 Sample)

(1) The inspectors evaluated risk-significant high radiation area and very high radiation area controls.

Radiation Worker Performance and Radiation Protection Technician Proficiency (IP Section 02.06) (1 Sample)

(1) The inspectors evaluated radiation worker performance and radiation protection technician proficiency.

71124.03 - In-Plant Airborne Radioactivity Control and Mitigation

Use of Respiratory Protection Devices (IP Section 02.02) (1 Sample)

The inspectors evaluated the licensee's use of respiratory protection devices by:

(1) There were no opportunities to observe workers using respiratory protection devices for this inspection.

71124.04 - Occupational Dose Assessment

Source Term Categorization (IP Section 02.01) (1 Sample)

(1) The inspectors evaluated the licensee's characterization of the source term and use of scaling factors for the use of hard-to-detect radionuclide activity.

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

MS05: Safety System Functional Failures (SSFFs) Sample (IP Section 02.04) (1 Sample)

(1) July 1, 2018, through June 30, 2019

MS06: Emergency AC Power Systems (IP Section 02.05) (1 Sample)

(1) July 1, 2018, through June 30, 2019

MS07: High Pressure Injection Systems (IP Section 02.06) (1 Sample)

(1) July 1, 2018, through June 30, 2019

MS08: Heat Removal Systems (IP Section 02.07) (1 Sample)

(1) July 1, 2018, through June 30, 2019

MS09: Residual Heat Removal Systems (IP Section 02.08) (1 Sample)

(1) July 1, 2018, through June 30, 2019

MS10: Cooling Water Support Systems (IP Section 02.09) (1 Sample)

(1) July 1, 2018, through June 30, 2019

OR01: Occupational Exposure Control Effectiveness Sample (IP Section 02.15) (1 Sample)

(1) July 1, 2018, through June 30, 2019

PR01: Radiological Effluent Technical Specifications/Offsite Dose Calculation Manual Radiological Effluent Occurrences (RETS/ODCM) Radiological Effluent Occurrences Sample (IP Section 02.16) (1 Sample)

(1) July 1, 2018, through June 30, 2019

71152 - Problem Identification and Resolution

Annual Follow-up of Selected Issues (IP Section 02.03) (2 Samples)

The inspectors reviewed the licensee's implementation of its corrective action program related to the following issues:

(1) History of emergency diesel exhaust fires in January 2019 most recently documented in corrective action document incident report (IR) 04207683
(2) Corrective actions taken associated with an inadequate zone of protection under IR 04093679

INSPECTION RESULTS

Licensee-Identified Non-Cited Violation	71111.05Q
This violation of very low safety significance was identified by the licensee and has been entered into the licensee corrective action program and is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.	
Violation: Three Mile Island Nuclear Station, Unit No. 1, Operating License Condition 2.C(4), "Fire Protection," requires, in part, that the licensee implement and maintain in effect all provisions of the approved fire protection program as described in the updated final safety analysis report. Administrative Procedure 1038, "Administrative Controls – Fire Protection Program," Revision 88, Exhibit 2, Section 7.0, "Fire Barrier Components," requires that all fire barrier components (penetration seals) protecting safety related areas shall be functional at all times. Contrary to the above, a fire penetration seal was determined to be nonfunctional from October 2013 to July 16, 2019. The licensee identified a 1-inch long, ½-inch wide, and 5-inch deep cavity through fire barrier foam seal #7 separating the 355-foot elevation control room from the 338.5-foot elevation relay room of the Control building. Significance/Severity: Green. Using IMC 0609, Attachment 4, "Initial Characterization of Findings," dated October 7, 2016, the finding was determined to require additional evaluation under IMC 0609, Appendix F, Attachment 1, "Fire Protection Significance Determination Process Worksheet," dated September 20, 2013. The finding was screened as a Green finding of very low safety significance in accordance with Step 1.4.4, "Fire Confinement," Question B. Corrective Action References: IR 04264804, IR 04265506	

Observation: Review of Root Cause Evalution for Human Performance Issue Documented in IR 04093679	71152
The inspectors reviewed corrective actions taken associated with an inadequate zone of protection in accordance with Exelon procedure OP-MA-109-101, "Clearance and Tagging," which was documented under IR 04093679 in Exelon's corrective action program. OP-MA-109-101 is a corporate procedure that provides the guidance and requirements to perform clearance and tagging to ensure adequate zone of protection for individuals performing maintenance on equipment. On January 15, 2018, while work was in progress to repair a fire service valve, FS-V-224, leak, it was identified that the active clearance had an inadequate zone of protection. All work was stopped and no workers were exposed to hazardous energy. Exelon entered the condition into the corrective action program under IR 04093679 and performed a root cause evaluation. The evaluation determined that a clearance boundary point had been inadvertently deleted from the clearance by the operations clearance writer. The operations supervisory review of the clearance was not performed with adequate technical rigor and failed to identify the missing clearance boundary point. Furthermore, the maintenance supervisor that held the clearance did not walk down the clearance boundary, as required, prior to commencing work to ensure an adequate zone of protection. Exelon determined that the clearance writer, approver, and maintenance supervisor did not follow the requirements of OP-MA-109-101 and personal accountability corrective actions were established to ensure the human performance errors would not be repeated. Furthermore, training exercises were given to all clearance applier/removers, writers, confirmers, and holders to re-certify them prior to performing any additional clearance activities.	

The inspectors reviewed Exelon's cause evaluation and determined that they adequately identified the causes and that the corrective actions to prevent recurrence were reasonable. Furthermore, the inspectors interviewed qualified clearance and tagging individuals and reviewed the supervisory observation data. The inspectors determined that the corrective actions have adequately reinforced clearance writing/application fundamentals and improved the station clearance and tagging performance. The inspectors did note that Exelon implemented additional improvement actions to consistently observe and track performance of all aspects of the clearance process. The inspectors did not identify any issues of concerns.

Observation: History of Emergency Diesel Exhaust Fires	71152

The inspectors reviewed the licensee's actions in response to a trend of diesel exhaust fires. Specifically, since 2005, Exelon experienced small exhaust fires on the emergency diesel generators during regularly scheduled surveillance runs. The cause of these fires was traced to a known issue with Fairbanks Morse opposed piston style diesels (the style at Three Mile Island) where excess fuel collects in the cylinders and then exhausts into the hot exhaust manifold where it can catch fire. This generic issue was discussed in NRC Information Notice 2008-05. Exelon implemented a modification to its diesels in 2017 that installed a drain on the ring catcher on the exhaust lines. By blowing down the exhaust regularly the licensee ensures there is no excess oil that can catch fire in the line.

In January 2019, during a surveillance run, the 'A' emergency diesel experienced a small fire on the exhaust manifold. Given the recently implemented corrective actions to prevent exhaust fires, the inspectors reviewed this particular issue to determine if the actions were inadequate. The licensee determined the cause to be oil weeping from the front cover that had collected over time and saturated into the outer insulation of the exhuast manifold. That is, the cause was different than the previous documented issues. This caused the inspectors to review the previously mentioned information notice which also contained instances similar to this new phenomenon. The cause of those issues at other sites was inadequately torqued fasteners on diesel top covers. The inspectors verified that the licensee correctly torqued the front cover fasteners and checked the tightness following the January event. As a corrective action, the licensee replaced the mastic coating on the insulation to ensure that the oil could not seep through to the insulation below. This issue was documented in IR 04207683.

EXIT MEETINGS AND DEBRIEFS

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

- On October 8, 2019, the inspectors presented the integrated inspection results to Mr. Trevor Orth, Site Decommissioning Director, and other members of the licensee staff.
- On September 26, 2019, the inspectors presented the radiological safety inspection results to Mr. Ed Callan, Site Vice President, and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.04Q	Drawings	302-202	Nuclear Services River Water System	Revision 84
71111.04Q	Procedures	OP-TM-533-000	Decay Heat River System	Revision 11
71111.04Q	Procedures	OP-TM-541	Primary Component Cooling	Revision 24A
71111.05Q	Fire Plans	FH-FZ-1/2/3	Fuel Handling Bldg. Elev. 281', 305'/306', 324'; General Area	Revision 4
71111.05Q	Fire Plans	IPSH-FA-2	Intake Screen Pump House Elevation 308'; FS-P-3	Revision 3
71111.05Q	Fire Plans	ISPH-FZ-1	Intake Screen Pump House Elevation 308'; 1R Switchgear and Pump Area	Revision 6
71111.05Q	Fire Plans	ISPH-FZ-2	Intake Screen Pump House Elevation 308'; 1T Switchgear and Pump Area	Revision 6
71111.05Q	Fire Plans	ISPH-FZ-3	Intake Screen Pump House Elevation 308'; Trash Rake and Screen Area	Revision 4
71111.12	Corrective Action Documents	04246208		
71111.12	Engineering Evaluations		Lube Oil Temperature Failure for the Station Blackout Diesel	Revision 0
71111.13	Procedures	OP-TM-421-429	Removing HP Heater String B from Service at Power	Revision 6
71111.13	Work Orders	04939826		
71111.15	Corrective Action Documents	04250784		
71111.15	Corrective Action Documents	04261982		
71111.15	Corrective Action Documents	04262035		
71111.15	Corrective Action Documents	04264368		
71111.15	Corrective Action Documents	04267770		
71111.15	Corrective Action Documents	04271246		
71111.15	Corrective Action Documents	04274937		

71111.15	Corrective Action Documents	42770203		
71111.15	Engineering Changes	629211	Code Case N-513 Analysis of Leak Near NR-V-12B	Revision 0
71111.18	Corrective Action Documents Resulting from Inspection	04280615		
71111.18	Engineering Changes	628655	SFP Tell-Tale Reroute Back to Pool	Revision 0
71111.19	Procedures	CC-AA-404	Maintenance Specification: Application Selection, Evaluation, and Control of Temporary Leak Repairs	Revision 8
71111.19	Work Orders	04942171		
71111.20	Corrective Action Documents Resulting from Inspection	04281100		
71111.20	Miscellaneous		T1D23 Shutdown Safety Plan	Revision 0
71111.20	Procedures	1102-10	Plant Shutdown	Revision 102A
71111.20	Procedures	1102-11	Plant Cooldown	Revision 157
71111.20	Procedures	1102-4	Power Operation	Revision 138
71111.20	Procedures	1103-11	RCS Water Level Control	Revision 77A
71111.20	Procedures	1507-1	Polar Crane Operation	Revision 27

71111.22	Procedures	1303-4.11	HPI/LPI Logic and Analog Channel Test	Revision 60
71111.22	Procedures	OP-TM-211-208	IST of MU-P-1C	Revision 9
71111.22	Work Orders	04919400		
71124.01	Corrective Action Documents	04230795		
71124.01	Corrective Action Documents	04267683		
71124.01	Corrective Action Documents	04268319		
71124.01	Corrective Action Documents	04269054		
71152	Corrective Action Documents	04207683		