



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

August 9, 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 05000289/2019002

Dear Mr. Hanson:

On June 30, 2019, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Three Mile Island Nuclear Station, Unit 1. On July 19, 2019, the NRC inspectors discussed the results of this inspection with Joe Dullinger, Plant Manager, and other members of your staff. The results of this inspection are documented in the enclosed report.

The NRC inspectors did not identify any finding or violation of more than minor significance.

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/*

Matthew R. Young, Chief  
Reactor Projects Branch 6  
Division of Reactor Projects

Docket No. 05000289  
License No. DPR-50

Enclosure:  
As stated

cc w/ encl: Distribution via LISTSERV®

SUBJECT: THREE MILE ISLAND NUCLEAR STATION, UNIT 1 – INTEGRATED INSPECTION REPORT 05000289/2019002 DATED AUGUST 9, 2019

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DATE	8/9/19	8/8/19			

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**U.S. NUCLEAR REGULATORY COMMISSION  
Inspection Report**

Docket Number: 05000289

License Number: DPR-50

Report Number: 05000289/2019002

Enterprise Identifier: I-2019-002-0033

Licensee: Exelon Generation Company, LLC

Facility: Three Mile Island Nuclear Station, Unit 1

Location: Middletown, PA 17057

Inspection Dates: April 1, 2019 to June 30, 2019

Inspectors: Z. Hollcraft, Senior Resident Inspector  
S. Horvitz, Resident Inspector  
B. Lin, Nuclear Systems Engineer  
N. Floyd, Senior Reactor Inspector  
J. Furia, Senior Health Physicist

Approved By: Matthew R. Young, Chief  
Reactor Projects Branch 6  
Division of Reactor Projects

## **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.

### **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 May 29, 2019, the unit was down powered to 77 percent as requested by Transmission for load following. The unit was returned to rated thermal power on May 29, 2019, and remained at or near rated thermal power for the remainder of the inspection period.

## 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

### 71111.01 - Adverse Weather Protection

#### External Flooding Sample (IP Section 03.04) (1 Sample)

- (1) The inspectors evaluated readiness to cope with external flooding for the following areas:
  - Flood dike on April 9, 2019, Operating Experience Smart Sample 2007/02, Revision 3

#### Impending Severe Weather Sample (IP Section 03.03) (1 Sample)

- (1) The inspectors evaluated readiness for impending adverse weather conditions for a tornado watch on May 29, 2019.

#### Summer Readiness Sample (IP Section 03.01) (1 Sample)

- (1) The inspectors evaluated summer readiness of offsite and alternate alternating current power systems on June 29, 2019.

### 71111.04 - Equipment Alignment

#### Partial Walkdown Sample (IP Section 03.01) (4 Samples)

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

- (1) Protected system lineup during the 'B' emergency diesel generator system outage window on April 8, 2019

- (2) 'B' reactor building spray pump following maintenance and quarterly pump testing on April 18, 2019
- (3) 'B' and 'C' nuclear services closed cycle cooling pump systems during 'A' pump maintenance on May 1, 2019
- (4) Fire service pump FS-P-1 system restoration following maintenance on June 27, 2019

#### 71111.04S - Equipment Alignment

##### Complete Walkdown Sample (IP Section 03.02) (1 Sample)

- (1) The inspectors evaluated system configurations during a complete walkdown of the spent fuel cooling system on May 23, 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) Auxiliary building elevation 281', makeup pump 1A, 1B, and 1C cubicles, AB-FZ-2A, AB-FZ-2B, and AB-FZ-22C on April 23, 2019
- (2) Turbine building elevation 322', TB-FA-1(3), TB-FA-1(9), and TB-FA-1(10), on April 30, 2019
- (3) Auxiliary building elevation 305', AB-FZ-7 and AB-FZ-8, on May 1, 2019
- (4) Control building elevation 322', CB-FA-2D and CB-FA-2E, on May 2, 2019
- (5) Control building elevation 380' and patio area all levels, CB-FZ-5A, CB-FZ-5B, and FH-FZ-5, on June 3, 2019

#### 71111.06 - Flood Protection Measures

##### Inspection Activities - Underground Cables (IP Section 02.02c.) (1 Sample)

The inspectors evaluated cable submergence protection in:

- (1) Manhole E-8 on May 29, 2019

#### 71111.07T - Heat Sink Performance

##### Triennial Review (IP Section 02.02) (3 Samples)

The inspectors evaluated heat exchanger/sink performance on the following:

- (1) A/B/C/D Nuclear Services Heat Exchangers, Cooled by River Water, Section 02.02b
- (2) A and B Spent Fuel Pool Heat Exchangers, Closed Loop, Section 02.02c
- (3) Ultimate Heat Sink – Nuclear Services River Water System, Section 02.02d, Specifically Sections 02.02d4, 02.02d5, 02.02d6 and 02.02d7 were completed.

## 71111.11Q - Licensed Operator Regualification 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 control room during the 'A' train emergency load sequence and high-pressure injection logic testing on April 25, 2019.

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

- (1) The inspectors observed and evaluated licensed operator regualification classroom training on May 22, 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) Title 10 of the *Code of Federal Regulations* (CFR) 50.65 (a)(3) maintenance rule periodic assessment for the period of January 1, 2017, through December 31, 2018
- (2) Instrument air system on June 5, 2019

## 71111.13 - Maintenance Risk Assessments and Emergent Work Control

### Risk Assessment and Management Sample (IP Section 03.01) (6 Samples)

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

- (1) Elevated risk during performance of 'D' 4kV bus loss of voltage/degraded grid timing relay calibration and logic test on April 4, 2019
- (2) Scheduled system outage window for the 'B' emergency diesel generator on April 7-11, 2019
- (3) Elevated risk due to 'A' train reactor building containment isolation logic and component engineered safeguards actuation system testing on May 23, 2019
- (4) Elevated risk due to 1E 4160V bus undervoltage 27-4 relay replacement post maintenance testing on May 29, 2019
- (5) Elevated risk due to inservice testing of the power operated relief valve (PORV) isolation valve and its setpoint check on June 13, 2019
- (6) Emergent work to replace a reactor coolant pressure bistable trip module for the channel 2 engineered safeguards actuation system on June 18, 2019

## 71111.15 - Operability Determinations and Functionality Assessments

### Operability Determination or Functionality Assessment (IP Section 02.02) (8 Samples)

The inspectors evaluated the following operability determinations and functionality assessments:

- (1) Operability evaluation of decay closed cooling shell bypass control valve (DC-V-65B) on April 4, 2019
- (2) Operability evaluation of electrical penetration (PP-FI-98) flow exceeding procedural acceptable limit on April 9, 2019
- (3) Operability evaluation of electrical penetration (PP-FI-130) flow exceeding procedural acceptable limit on April 9, 2019
- (4) 'B' steam generator level transmitter (FW-LT-1052) indication drifted on April 9, 2019
- (5) Operability evaluation of the 'A' nuclear service closed cooling pump (NS-P-1A) for a seal and flange leak following replacement on May 2, 2019
- (6) High silt levels at the intake screen house on May 9, 2019
- (7) Reactor coolant system heat balance evaluation results were unsatisfactory on May 27, 2019
- (8) 'A' spent fuel pool active leakage on June 3, 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) Alternate flow path for SD-P-3A/B and SD-P-4A/B to the Turbine building on June 15, 2019

#### 71111.19 - Post-Maintenance Testing

##### Post Maintenance Test Sample (IP Section 03.01) (6 Samples)

The inspectors evaluated the following post maintenance tests:

- (1) Retest of the 'B' emergency diesel generator on April 11, 2019, at the conclusion of a scheduled system outage window
- (2) Retest of the 'B' decay closed heat exchanger shell bypass control valve (DC-V-65B) on March 15, 2019
- (3) '1E' 4160V bus undervoltage 27-4 relay replacement post maintenance testing on May 29, 2019
- (4) Retest of control rod drive power supply (CRD-SRPS-22B) on May 30, 2019
- (5) Channel 2 engineered safeguards bistable replacement on June 18, 2019
- (6) Fire service pump FS-P-1 following packing replacement on June 27, 2019

#### 71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

##### Inservice Testing (IP Section 03.01) (1 Sample)

- (1) OP-TM-214-202, in-service testing of the 'B' reactor building spray pump on April 18, 2019



Reactor Coolant System (RCS) Leakage Detection Testing (IP Section 03.01) (1 Sample)

- (1) OP-TM-220-251, reactor coolant system leak rate determination on May 2, 2019

Surveillance Tests (other) (IP Section 03.01) (5 Samples)

- (1) 1302-5.31C, 4kV 'D' bus loss of voltage/degraded grid timing relay calibration and logic test on April 4, 2019
- (2) 1303-11.37B, heat sink protection system steam generator level and pressure channel II test on April 16, 2019
- (3) 1304-5.2A, 'A' emergency load sequence and high-pressure injection logic testing on April 25, 2019
- (4) 1301-3, reactor coolant system chemistry and activity sampling on May 15, 2019
- (5) 1303-4.11, engineered safeguards relay testing on June 18, 2019

**RADIATION SAFETY**

71124.07 - Radiological Environmental Monitoring Program

Groundwater Protection Initiative (GPI) Implementation (IP Section 02.02) (1 Sample)

- (1) The inspectors reviewed: groundwater monitoring results; changes to the Groundwater Protection Initiative (GPI) program since the last inspection; anomalous results or missed groundwater samples; leakage or spill events including entries made into the decommissioning files (10 CFR 50.75(g)); evaluations of surface water discharges; and evaluation of any positive groundwater sample results including appropriate stakeholder notifications and effluent reporting requirements.

Site Inspection (IP Section 02.01) (1 Sample)

The inspectors evaluated the radiological environmental monitoring program implementation.

- (1) The inspectors walked down various thermoluminescent dosimeter and air and water sampling locations and reviewed associated calibration and maintenance records. The inspectors observed the sampling of various environmental media as specified in the Offsite Dose Calculation Manual (ODCM). The inspectors reviewed the groundwater monitoring program as it applies to selected potential leaking structures, systems, and components (SSCs), and 10 CFR 50.75(g) records of leaks, spills, and remediation since the previous inspection.

**OTHER ACTIVITIES – BASELINE**

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

BI01: RCS Specific Activity Sample (IP Section 02.10) (1 Sample)

- (1) January 1, 2018, through March 31, 2019

BI02: RCS Leak Rate Sample (IP Section 02.11) (1 Sample)

(1) January 1, 2018, through March 31, 2019

71152 - Problem Identification and Resolution

Semiannual Trend Review (IP Section 02.02) (1 Sample)

(1) The inspectors reviewed the licensee's corrective action program for potential adverse trends in maintenance and incident report (IR) generation that might be indicative of a more significant safety issue.

**INSPECTION RESULTS**

Observation: Semiannual Trend Review	71152
In light of anticipated permanent cessation of operations in September 2019, inspectors reviewed trends within the maintenance program related to backlog and the corrective action program related to IR generation. The licensee's maintenance backlog has seen no appreciable change since the beginning of 2019 and is generally kept low. IR generation is slightly lower than the previous year both overall, and on a per capita basis. However given the reduced amount of work being performed due to deferred maintenance, inspectors are unable to draw specific conclusions on this. The inspectors do not see any indication of decline in performance in either of these areas. The inspectors also have noted that the licensee is closely monitoring IR generation rates along with other metrics in order to self assess any declining performance.	

**EXIT MEETINGS AND DEBRIEFS**

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

- On July 19, 2019, the inspectors presented the integrated inspection results to Joe Dullinger, Plant Manager, and other members of the licensee staff.
- On June 20, 2019, the inspectors presented the triennial heat sink inspection results to Edward Callan, Site Vice President, and other members of the licensee staff.
- On June 14, 2019, the inspectors presented the radiological environmental monitoring program (REMP) inspection results to Joe Dullinger, Plant Manager, and other members of the licensee staff.

**DOCUMENTS REVIEWED**

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.01	Corrective Action Documents	01387409		
	Procedures	3301-SA1	Dike Inspection	Revision 17
71111.04	Drawings	302-610	Nuclear Services Closed Cycle Cooling Water Flow Diagram	Revision 82
		302-645	Decay Heat Flow Diagram Closed Cycle Cooling Water	Revision 39
		302-712	Reactor Building Spray Flow Diagram	Revision 49
71111.04S	Corrective Action Documents	04260051		
		04260056		
	Drawings	302-630	Spent Fuel Cooling System Flow Diagram	Revision 35
302-728		Spent Fuel Pool & Fuel Transfer Canal Leak Detection Flow Diagram	Revision 1	
71111.05Q	Fire Plans	AB-FZ-2A, 2B AND 2C	Auxiliary Building Elevation 281', Makeup Pump 1A, 1B, and 1C Cubicles	Revision 2
		AB-FZ-7	Auxiliary Bldg. Elev. 305'; Decay Heat Removal & Nuclear Services Closed Cycle Cooling Pump Area	Revision 6
		AB-FZ-8	Auxiliary Bldg. Elev. 305'; Waste Gas Decay Tanks Area	Revision 3
		CB-FA-2D	Control Bldg. Elev. 322'; "A" Inverter Room	Revision 7
		CB-FA-2E	Control Bldg. Elev. 322'; "B" Inverter Room	Revision 7
		CB-FZ-5A	Control Bldg. Elev. 380'; North H&V Equipment Room	Revision 3
		CB-FZ-5B	Control Bldg. Elev. 380'; South H&V Equipment Room	Revision 3
		FH-FZ-5-(322 FT)	Fuel Handling Bldg. Elev. 322'; Control Bldg. Patio Area	Revision 7
		FH-FZ-5-(338 FT 6 IN)	Fuel Handling Bldg. Elev. 338'-6"; Control Bldg. Patio Area	Revision 4
		FH-FZ-5-(355/365 FT)	CB Patio Area (FH-FZ-5-355/365' I & C Shop/Office Area)	Revision 5
		FH-FZ-5-(380 FT)	Fuel Handling Bldg. Elev. 380'; Control Bldg. Patio Area	Revision 3
		TB-FA-1 (10)	Turbine Bldg. Elev. 322'; Turbine Driven Main Feedwater Pumps	Revision 5
		TB-FA-1 (3)	Electrical Equipment Room; Turbine Bldg. Elev. 322'	Revision 5
		TB-FA-1 (9)	Turbine Bldg. Elev. 322'; Main Turbine Oil Reservoir	Revision 5
71111.06	Procedures	ER-AA-300-150	Cable Condition Monitoring Program	Revision 5

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Work Orders	0486509201		
71111.11Q	Procedures	TQ-AA-150	Operator Training Programs	Revision 18
71111.12	Corrective Action Documents	03972831		
		03979144		
		04021479		
		04055198		
		04073686		
		04075335		
		04075603		
		04181275		
		04199316		
		04213052		
	04234449			
		Miscellaneous		Three Mile Island Unit 1 Maintenance Rule Periodic Assessment per 10 CFR 50.65(a)(3) January 2017 to December 2018
			Maintenance Rule System Basis Document, Instrument Air, Unit 1 System 852	May 9, 2019
	Procedures	ER-AA-310-1007	Maintenance Rule - Periodic (a)(3) Assessment	Revision 5
71111.13	Procedures	OP-AA-108-117	Protected Equipment Program	Revision 5
	Work Orders	4766855		
		4865674		
		4895823		
71111.15	Calculations	C-1101-531-E310-015	Calculation for an Acceptable Silt Accumulation in the Intake Screen and Pump House	Revision 1
	Corrective Action Documents	04208006		
		04237660		
		04237997		
		04237999		
		04245812		
		04245826		
04248669				

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		04248671		
		04249014		
		04250896		
		04251968		
		04251976		
		4247814		
		4248155		
	Procedures	1102-4	Power Operation	Revision 137
		1301-6.7	Monitoring of Silt Buildup in River Water Screen House	Revision 23
		1301-9.7	Intake Pump House Floor, Silt Accumulation and Inspections	Revision 31
	OP-TM-AOP-035	Loss of Spent Fuel Cooling	Revision 9	
Work Orders	4894086			
71111.18	Engineering Changes	628061	Reroute the SD-P-3A/B and SD-P4A/B Discharge Header to the Turbine Building	Revision 0
71111.19	Corrective Action Documents	04252235		
		04253158		
		4251535		
	Drawings	208-169 Sh. 1	Electrical Elementary Diag. 4160V Switchgear E.S. Bus 1E Undervoltage & Potential Circuits	Revision 27
		208-169 Sh. 2	Electrical Elementary Diag. 4160V Switchgear E.S. Bus 1E Undervoltage & Potential Circuits	Revision 5
		209-581	Electrical Elementary Wiring Diagram Engineered Safeguards E.S. Act. 'B' H.P. INJ & Loading Seq Channel RC1B	Revision 20
	Procedures	1107-3	Diesel Generator	Revision 153
		1301-8.2	Diesel Generator Major Inspection (Mechanical)	Revision 101
		1303-4.11	HPI/LPI Logic and Analog Channel Test	Revision 60
		1303-4.16	Emergency Power Systems	Revision 1446
		1420-EG-2	Diesel Generator Troubleshooting	Revision 11
	Work Orders	4352004	DC-V-65B: Rebuild Actuator/Replace Accessories	Revision 1
		4693222		
4715586				

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		4716376		
		4895823		
		4923932		
71111.22	Procedures	1301-3	Reactor Coolant System Chemistry and Activity	Revision 31
		1303-11.37B	HSPS - OTSG Level and Pressure Channel II Tests	Revision 36
		1303-2-5.31C	4160 V 1D Bus Loss of Voltage / Degraded Grid Timing Relay Calibration and Logic Test	Revision 19
		1303-5.2A	"A" Emergency Loading Sequence and HPI Logic Channel/Component Test	Revision 19
		CY-AA-130-3010	Dose Equivalent Iodine Determination	Revision 6
		CY-AP-120-105	Reactor Coolant System Chemistry for Three Mile Island	Revision 20
		CY-TM-130-9032	Dose Equivalent Iodine Preparation for Reactor Coolant	Revision 1
		N1807.1	Reactor Coolant & Pressurizer Sampling	Revision 20E
		OP-TM-214-202	IST of BS-P-1B and Valves	Revision 16A
	OP-TM-220-251	RCS Leak Rate Determination	Revision 14	
	Work Orders	4847623		
		4877135		
		4877805		
		4895823		
71151	Procedures	LS-AA-2090	Monthly Data Element for NRC Reactor Coolant System (RCS) Specific Activity	Revision 4
		LS-AA-2100	Monthly Data Element for NRC Reactor Coolant System (RCS) Leakage	Revision 5