



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

February 28, 2018

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

SUBJECT: OYSTER CREEK – DESIGN BASES ASSURANCE INSPECTION (PROGRAMS)
REPORT 05000219/2018010

Dear Mr. Hanson:

On February 14, 2018, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection of the Environmental Qualification Program implementation at Oyster Creek Nuclear Generating Station. The NRC inspectors discussed the results of this inspection with Mr. Timothy Moore, Site Vice President, and other members of your staff. The results of this inspection are documented in the enclosed report.

The NRC inspectors did not identify any findings or violations 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 the NRC's Public Document Room in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR), Part 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Glenn T. Dentel, Chief
Engineering Branch 2
Division of Reactor Projects

Docket Number: 50-219
License Number: DPR-16

Enclosure:
Inspection Report 05000219/2018010

cc w/encl:
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SUBJECT: OYSTER CREEK – DESIGN BASES ASSURANCE INSPECTION (PROGRAMS)
 REPORT 05000219/2018010 DATED FEBRUARY 28, 2018

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

Docket Number: 50-219

License Number: DPR-16

Report Number: 05000219/2018010

Enterprise Identifier: I-2018-010-0055

Licensee: Exelon Generation Company, LLC

Facility: Oyster Creek Nuclear Generating Station

Location: Forked River, NJ

Inspection Dates: January 29, 2018 to February 14, 2018

Inspectors: C. Bickett, Senior Reactor Inspector
J. Kulp, Senior Reactor Inspector
J. Schoppy, Senior Reactor Inspector

Approved By: G. Dentel, Chief
Engineering Branch 2
Division of Reactor Safety

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring Exelon's performance at Oyster Creek Nuclear Generating Station by conducting an engineering programs design bases assurance inspection of environmental qualification program implementation 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.

No findings or more-than-minor violations were identified.

INSPECTION SCOPE

This inspection was conducted using the appropriate portions of the inspection procedure (IP) 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.

REACTOR SAFETY

71111.21N – Design Bases Assurance Inspection (Programs)

Programs (Environmental Qualification) (7 Samples)

The inspectors evaluated environmental qualification program implementation by reviewing the licensed environmental qualification requirements for the following components and a sample of their associated subcomponents from January 29, 2018 to February 14, 2018:

- 1) Electromatic relief valve NR-108-A [electromatic actuator, controller, pressure switch, Raychem cable splice, and electrical connectors]
- 2) Main steam isolation valve V-1-007 [solenoid valve coil and elastomers]
- 3) Core spray pump NZ01-B [motor and motor lubrication]
- 4) Narrow range drywell pressure instrument PT-642-9A [pressure transmitter, operational amplifier, and O-ring]
- 5) Primary containment electrical penetration X-31A [epoxy sealant and thermocouple cables]
- 6) Main steam high flow sensor switch DPIS-RE0022A [differential pressure indicating switch, wire insulation, and O-ring]
- 7) Reactor fuel zone level temperature element TE-56-1A [thermocouple, head gasket and silicone sealant]

EXIT MEETINGS AND DEBRIEFS

The inspectors verified no proprietary information was retained or documented in this report. On February 14, 2018, the inspector presented the design bases assurance inspection results to Mr. Timothy Moore, Site Vice President, and other members of Exelon staff.

DOCUMENTS REVIEWED

71111.21N

Procedures

2400-SME-3918.03, EMRV Solenoid Operator Removal, Refurbishment, and Installation, Revision 25
 610.4.012, Core Spray System 1 Pump Comprehensive/Preservice In-Service Test, Revision 72
 665.3.021, Containment Electrical Penetration Nitrogen Blanket Surveillance, Revision 15
 EMG-3200.01A-FC, RPV Control – No ATWS EOP Flowchart, Revision 10
 MA-AA-716-230-1002, Vibration Analysis/Acceptance Guideline, Revision 5
 PES-S-002, Shelf Life, Revision 8
 SM-AA-102, Warehouse Operations, Revision 24

Issue Reports (*initiated in response to inspection)

280415	354622	354637	554544	756924
844027	847413	862399	875631	880917
893317	911682	983859	1008809	1147890
1426157	1518358	1568796	1680592	2394239
2397876	2424903	2532305	2567167	2640145
3946707	3975833	3998185	3998203	3998203
4065078	4074271	4074273	4075139	4080517
4086301	4099394	4098406*	4099776*	4099904*
4103093*	4103107*			

Equipment Qualification Files

OC-301, Dresser Electromatic Actuator, Model 1525VX, Revision 8
 OC-302, Dresser Controllers, Model 1539VX, Revision 6
 OC-303, General Electric Electrical Penetrations, Model F01, Revision 5
 OC-305, ITE/Gould Motor Control Center, Model 5600, Revision 5
 OC-306, General Electric Motor Control Center (MCC), Model IC-7700, Revision 5
 OC-307, General Electric Pump Motor, Revision 9
 OC-320, ITT Barton, Models 580A & 581A, Differential Pressure Indicating Switches, Revision 6
 OC-323, Barksdale Pressure Switches, Revision 7
 OC-353, Solenoid Valves, Revision 4
 OC-360, Rosemount Pressure Transmitters, Models 1153 Series B and 1154, Revision 6
 OC-365, PYCO Temperature Elements, Revision 6
 OC-392, Patel Electrical Connectors, Revision 7
 OC-396, Raychem Cable Splice, Revision 7

Test Reports

EGS-TR-23050-0074-02, Test Report for Nuclear Environmental Qualification of EGS Electrical Connectors Model 841203-7-12, dated 9/15/00
 EGS-TR-23050-0264-03, Final Report for Barksdale Pressure Switches, dated 5/19/06

EPRI Report 1016272, Turbine Oil Compatibility – Mobil DTE 372: Addition of New Generation Oil to Traditional DTE 797 and Teresstic GT 32 Oil, Technical Update, March 2008
 EPRI Report 1019593, Radiation Stability of Modern Turbine Oils – Group II Turbine Oils Exposed to Loss-of-Coolant Accident Radiation, September 2009
 GENE-189-22-0591, 500HP Core Spray Pump Motor for GPU Nuclear Corporation, November 1991
 PEI-TR-841203-05, Final Test Report on Patel Electrical Connectors Manufactured by Patel Engineers for use in Nuclear Power Plants, dated 5/5/86
 PEP No. 42963, Project Engineer Program Test – Dresser Relief Valve Actuator, dated 6/11/68
 R3-580A-9, Class 1E Qualification Test Program and Results for ITT Barton Models 580A, 581A, and 583A Differential Pressure Switches, dated 12/22/83
 Report No. 45592-3, Nuclear Environmental Qualification Test Program on Rosemount 1153 Series D Pressure Transmitters, dated 5/4/83
 Report No. 46882-0, Performance and Recertification Testing of Dresser Electromatic relief Valve (Type 1525VX-3) for GPU Nuclear, Inc., dated 2/11/99
 Report No. 58442-1, Environmental Qualification Test Report of Raychem WCSF-N Nuclear In-Line Cable Splice Assemblies for Raychem Corporation, dated 5/15/80
 Report No. 58722-2, Environmental Qualification Test Report of Raychem WCSF-N Nuclear In-Line Bolted Splice Assemblies for Raychem Corporation, dated 11/18/82

Work Orders

00028865	00028866	04348666	04357851	04584366
04682332	04688852	04700696	04712762	057890
510614	C0551610	C2013622	R2027147	R2060096
R2068283	R2094168	R2094317	R2119989	R2128488
R2132376	R2133635	R2134243	R2139132	R2145456
R2158529	R2173050	R2211760	R2215539	R2246426

Calculations

C-1302-411-5320-002, Oyster Creek EMRV Solenoid Heat Transfer Analysis, Revision 1
 C-1302-642-5350-004, Oyster Creek Containment Spray Mod Drywell Pressure Accuracy Calculation, Revision 0
 C-1302-731-E510-015, OC Degraded Grid Undervoltage Relay Setpoint Evaluation Study, Revision 3
 C-1302-822-E610-076, Flooding due to HELBs Outside of Containment, Revision 0
 GENE-0000-0027-3965, Similarity Analysis – DD233A3620P001 vs. CR9503-213CAT55 Solenoids, dated 3/26/04
 Report No. 02-0370-1336, Evaluation of Environment Conditions from High Energy Line Breaks, Revision 0

Drawings

102-0270, Sheet 1, Thermocouple Assembly, dated 4/5/84
 846D986, Sheet 1, Penetration Seal 'TH', Revision 5
 GE 729E182, Auto Depressurization SYS Electrical Elementary Diagram, Revision 35
 GU 3D-622-14-001, Reactor Plant Instrumentation Conduit Layout – RB 51', Revision 0
 GU 3D-642-15-001, Elec. Conn. and Splice Details Automatic Depressurization SYS, Revision 2
 GU 3D-642-18-001, Interconnection Diagram Automatic Depressurization SYS, Revision 4

Operating Experience

NRC Bulletin 90-01, Supplement 1, Loss of Fill-Oil in Transmitter Manufactured by Rosemount, dated 12/22/92
 NRC Information Notice 89-42, Failure of Rosemount Models 1153 and 1154 Transmitters, dated 4/21/89

Vendor Manuals

VM-OC-0002, 24" Main Steam Isolation Valve, Revision 10
 VM-OC-0030, Installation and Maintenance Manual for Electromatic Relief Valves, Revision 4
 VM-OC-0039, PYCO Temperature Elements, Revision 2
 VM-OC-0083, ASCO Solenoid Valve Installation and Maintenance Manual, Revision 11
 VM-OC-0091, Raychem Product Selection and Installation Guides, Revision 6
 VM-OC-0285, ITT Barton Model 580 A-0 DPIS, Revision 5
 VM-OC-0347, Barton Model 227A DPIS and Model 224 DPUs, and Cameron Model 227C with Model 224C DPU, Revision 5
 VM-OC-2253, Installation & Assembly Procedure for Patel Quick Disconnect Electrical Connector, Revision 1
 VM-OC-2317, Model 1154 Rosemount Pressure Transmitters, Revision 3
 VM-OC-2369, 500HP Core Spray Pump Motor EN 139149, Revision 2
 VM-OC-5016, GE Industrial Motors Including Custom 8000 Horizontal Motor (GEH-3160), Revision 8
 VM-OC-6379, GEK-13903 Penetration Seals, Revision 0

Miscellaneous

1021067, EPRI Plant Support Engineering: Nuclear Power Plant Equipment Qualification Reference Manual, Revision 1
 21A5477, Relief Valve Specification, Revision 0
 619.3.005, High Flow in the Main Steam Line Test and Calibration, performed 10/2/17
 DRF A61-00049 Tab 15, Oyster Creek Nuclear Generating Station Core Spray Pump Motor Evaluation, dated 12/4/98
 ECR ECP 15-00376, Core Spray Motor P-20-1B As-Is Acceptance of Vibration
 ECR IEC 10-00401, Canadian Core Spray Pump Motor
 EQ-301-12, Replacement/Upgrade of Components Qualified to DOR Guidelines, dated 7/7/87, and 3/30/88
 ES-027, Environmental Parameters – Oyster Creek NGS, Revision 4
 Five-Year Vibration Trend Plots – NZ01B Core Spray Main Motor P-20-1B
 LS05-85-031, Safety Evaluation for Final Resolution of Environmental Qualification of Electrical Equipment Important to Safety – Oyster Creek Nuclear Generating Station, dated 5/28/85
 OYS-01-212-E-ET-MTR-P-20-1B, Motor for Core Spray Pump NZ01-B Maintenance Strategy
 NP-6408, Guideline for Establishing, Maintaining and Extending the Shelf Life Capability of Limited Life Items, dated May 1992
 NP-6731, Guide to Optimized Replacement of Equipment Seals, dated March 1990
 NQA-1-2015, Quality Assurance Requirements for Nuclear Facility Applications
 NRC Inspection Report 05000219/86-08 (EQ Program Implementation), dated 8/8/86
 OCIS-402742-004, Installation Specification for Motor Control Center Shower Curtain Installation, Revision 0
 OYS-01-212-E-ET-S-NR108A, EMRV NR108A Maintenance Strategy, dated 6/7/17
 OYS-01-411-I-ET-SW-DPIS-RE0022A, Main Steam Flow Sensor DPIS-RE0022A Maintenance Strategy, dated 6/7/17
 OYS-01-642-I-ET-T-PT-642-9A, PT-642-9A Maintenance Strategy, dated 6/7/17
 Oyster Creek EQ Master List, dated 1/8/14
 Pre-NRC EQ DBA Self-Assessment, dated 11/13/17 (AR 03966720)
 SDBD-OC-212-A, System Design Basis Document for Low Pressure Core Spray System, Revision 3
 SE No. 000210-001, Evaluation of EQ Master List Inclusion of IA83 Pressure switches and ID13 Level Transmitters Safety Evaluation, Revision 0
 SE No. 315403-019, Drywell Design Pressure Reduction – Tech Spec Change, Revision 1
 SP 1302-12-245, Refurbishment of Electromatic Relief Valves, Revision 0
 TDR 1003, Environmental Qualification ‘Sound Reasons to the Contrary’ Guidelines, Revision 0