UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, ILLINOIS 60532-4352

May 17, 2019

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

SUBJECT: QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2—NRC TEMPORARY INSTRUCTION 2515/191, MITIGATION STRATEGIES, SPENT FUEL POOL INSTRUMENTATION AND EMERGENCY PREPAREDNESS AND TEMPORARY INSTRUCTION 2515/193, IMPLEMENTATION OF RELIABLE HARDENED CONTAINMENT VENTS INSPECTION REPORT 05000254/2019011 AND 05000265/2019011

Dear Mr. Hanson:

On April 26, 2019, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Quad Cities Nuclear Power Station, Units 1 and 2 and discussed the results of this inspection with Mr. K. Ohr 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/

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

Docket Nos.: 05000254; 05000265
License Nos.: DPR-29; DPR-30

Enclosure:
IR 05000254/2019011; 05000265/2019011

cc: Distribution via LISTSERV®

Letter to Bryan Hanson from Ann Marie Stone dated May 17, 2019

SUBJECT: QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2—NRC TEMPORARY INSTRUCTION 2515/191, MITIGATION STRATEGIES, SPENT FUEL POOL INSTRUMENTATION AND EMERGENCY PREPAREDNESS AND TEMPORARY INSTRUCTION 2515/193, IMPLEMENTATION OF RELIABLE HARDENED CONTAINMENT VENTS INSPECTION REPORT 05000254/2019011 AND 05000265/2019011

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U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report

Docket Numbers:	05000254 and 05000265
License Numbers:	DPR-29 and DPR-30
Report Numbers:	05000254/2019011 and 05000265/2019011
Enterprise Identifier:	I-2019-011-0031
Licensee:	Exelon Generation Company, LLC
Facility:	Quad Cities Nuclear Power Station, Units 1 and 2
Location:	Cordova, IL
Inspection Dates:	April 22, 2019 to April 26, 2019
Inspectors:	J. Benjamin, Senior Reactor Inspector J. Gilliam, Reactor Inspector G. O'Dwyer, Reactor Engineer S. Sheldon, Project Engineer D. Tesar, Resident Inspector
Approved By:	Ann Marie J. Stone, Team Leader Technical Support Staff Division of Reactor Projects

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting a Temporary Instruction 2515/191, Mitigation Strategies, Spent Fuel Pool Instrumentation and Emergency Preparedness and Temporary Instruction 2515/193, Implementation of Reliable Hardened Containment Vents inspection at Quad Cities Nuclear Power 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 https://www.nrc.gov/reactors/operating/oversight.html for more information. Findings and violations being considered in the NRC's assessment are summarized in the table below.

List of Findings and Violations

No findings or violations were identified.

Additional Tracking Items

None.

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

2515/191 - Inspection of Licensee's Responses to Order EA-12-049, EA-12-051 & EP Info Request March 12, 2012

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).

Inspection of Licensee Responses (3 Samples)

(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 (ML18333A016) and determined that the licensee is in compliance with NRC Order EA–12–049. The inspectors verified the licensee satisfactorily:

- developed and issued FLEX Support Guidelines (FSGs) to implement the FLEX strategies for postulated external events;
- integrated their FSGs into their existing plant procedures such that entry into and departure from the FSGs were clear when using existing plant procedures;
- protected FLEX equipment from site-specific hazards;
- developed and implemented adequate testing and maintenance of FLEX equipment to ensure their availability and capability;
- trained their staff to assure personnel proficiency in the mitigation of beyond-design basis events; and
- 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:

- 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;
- installed the SFP instrumentation display in the location, environmental conditions and accessibility as described in the plant specific submittals;
- trained their staff to assure personnel proficiency with the maintenance, testing, and use of the SFP instrumentation; and
- 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:

- the licensee satisfactorily implemented required staffing changes to support a multi-unit extended loss of alternating current (ac) power (ELAP) scenario;
- emergency preparedness (EP) communications equipment and facilities are sufficient for dealing with a multi-unit ELAP scenario; and
- 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.

2515/193 - Inspection of the Implementation of EA-13-109: Order Modifying Licenses with Regard to Reliable Hardened Containment Vents Capable of Operation under Severe Accident Conditions

The inspectors verified plans for complying with NRC Order EA–13–109, "Order Modifying Licenses with regard to Reliable Hardened Containment Vents Capable of Operation under Severe Accident Conditions, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13143A321) are in place and are being implemented by the licensee.

Inspection of the Implementation of EA-13-109 (1 Sample)

Based on samples selected for review, the inspectors verified that the licensee satisfactorily implemented appropriate elements of the reliable hardened containment wetwell vent as described in the plant specific submittals and the associated safety evaluation (ADAMS Accession No. ML18348B251) and determined that the licensee is in compliance with NRC Order EA-13-109 Phase 1, "Reliable, Severe Accident Capable Wetwell Venting System." The inspectors verified that the licensee satisfactorily:

- Installed the hardened containment vent system (HCVS) to meet the performance objectives outlined in Section A.1.1 of Attachment 2 to the Order EA-13-109;
- Installed the HCVS system with the design features specified in Section A.1.2 of Attachment 2 to the Order EA-13-109;
- Designed the HCVS to meet the quality standards described in Section A.2 of Attachment 2 to the Order EA-13-109;
- Developed and implemented adequate maintenance and testing of HCVS equipment to ensure their availability and capability;
- Developed and issued procedures to safely operate the HCVS using normal power supplies, during an ELAP, and during a postulated severe accident scenario, and integrated the procedures into existing plant procedures and,
- Trained their staff to assure personnel can proficiently operate the HCVS.

Based on samples selected for review, the inspectors verified the licensee satisfactorily implemented appropriate elements of the reliable wetwell venting strategy as described in the plant specific submittals and the associated safety evaluation and determined the licensee is in compliance with NRC Order EA–13–109 Phase 2, “Reliable, Severe Accident Capable Drywell (or alternative strategy) Venting System”. The inspectors verified the licensee satisfactorily developed a strategy making it unlikely that the licensee would need to vent from the containment drywell that included the following:

- Implemented the severe accident water addition (SAWA) and severe accident water management (SAWM) systems as defined and fulfilled functional requirements for installed and portable equipment;
- Installed and/or identified the previously-installed instrumentation necessary to implement SAWM;
- Developed and implemented adequate maintenance and testing of SAWA/SAWM equipment to ensure availability and capability;
- Developed and issued procedures to safely operate the SAWA/SAWM during an ELAP and during postulated severe accident scenario, and integrated their procedures into their existing plant procedures such that entry into and exiting from the procedures are clear when using existing plant procedures; and
- Trained their staff to assure personnel can proficiently operate the HCVS during an ELAP and accident scenario.

The inspectors verified noncompliances 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

No findings were identified.

EXIT MEETINGS AND DEBRIEFS

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

- On April 26, 2019, the inspector presented the Temporary Instruction 2515/191 and Temporary Instruction 2515/193 inspection results to Mr. K. Ohr and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
2515/191	Corrective Action Documents	02474611-02	QDC-0000-5-2153 Impact on Robust FLEX Bldg Roll-Up Door	12/31/2015
		04098335	Workorder to Set SAWA Flow Meter Parameter	01/29/2018
		04137905	PM's for FLEX/SAWA Installed Valves	05/15/2018
		04224363	Local Intense Precipitation Response Procedure Clarification	02/28/2018
		04240219	EOID: SAWA Flow Meter Needs Troubleshooting/Calibration	04/16/2019
		04240525	FLEX SAWA Flow Meter Pushbutton Broken	04/16/2019
	Corrective Action Documents Resulting from Inspection	04202046	Recommend Installing Jack Stands on Flex Diesel Generators	12/11/2018
		04242835	NRC Identified Potential Base Metal Corrosion on Deep Well Pump Casing	4/23/2019
		04242950	Flex Inspection - LIP Procedure Change Documentation	04/24/2019
		04243132	FLEX Inspection - FLEX Equipment Refueling Methods	04/24/2019
		04243508	FLEX - Evaluate Enhancement Alternatives to Yanmar Placement	04/28/2019
	Drawings	4E-1791	Unit 1 External Wiring Diagram, Spent Fuel Pool Level Instrumentation	A
		4E-2661A	Local Intense Precipitation Response Procedure Clarification	F
		4E-2791	Unit 2 External Wiring Diagram, Spent Fuel Pool Level Instrumentation	A
	Engineering Changes	EC 0000399944	FLEX Diesel Fuel Oil Plan Fukushima	2/24/2015
		EC 395862	Fuel Oil Storage Tanks FLEX Vent Installation	1
		EC 398181	EOC - FLEX Robust Storage Building	2
	Miscellaneous	Lesson N-QC-EP-FLEX-REC4	GAP Training for Flex Core Cooling	0
		LN-1602	Containment Auxiliaries Training	11
		LN-1900	Operator Initial/ Continuing Training- Fuel Pool Cooling	4
		LN-Flex 1	Diverse and Flexible Coping Strategies	2
		LN-Flex 2	Flex Equipment	5
		RS-13-035	Overall Integrated Plan in Response to Commission Order Modifying Licenses with Regard to Requirements for Reliable Spent Fuel Pool Instrumentation	02/28/2013
		RS-18-087	Final Integrated Plan Document Mitigating Strategies NRC	08/14/2018

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			Order EA-12-049	
	Procedures	189937-01	PMID Preventive Maintenance Monthly Check for FLEX and B.5.b. Pumps, Equipment and Trailers	4
		CC-AA-118	Diverse and Flexible Coping Strategies (FLEX), Spent Fuel Pool Instrumentation (SFPI), and Hardened Containment Vent System (HCVS) Program Document	4
		CC-QC-118	Site Implementation of Diverse and Flexible Coping Strategies	6
		CC-QC-118 Attachment 3	FLEX Periodic Activities	6
		EP-AA-100-200	Dose Assessment	12
		EP-AA-110-200-F-39	URI Detailed Assessment - Summing Dose Assessments	A
		EP-AA-110-201	On Shift Dose Assessment	6
		OU-AA-103	Shutdown Safety Management Program	20
		OU-AA-103	Shutdown Safety Management Program	20
		QCAP 1500-07	Administrative Tracking Requirements For Unavailable FLEX, HCVS, And SAWA	6
		QCIPM 1900-01	Spent Fuel Pool Indication System Calibration	0
		QCOA 0010-22	Local Intense Precipitation Response Procedure	15
		QCOA 6100-02	Loss of Offsite Power	42
		QCOA 6100-04	Station Blackout	24
		QCOP 0050-01	Unit 1 FLEX DC Load Shed	4
		QCOP 0050-02	Unit 2 FLEX DC Load Shed	4
		QCOP 0050-04	FLEX Refuel Floor Action	3
		QCOP 0050-05	FLEX/SAWA Fire Hose Deployment	5
		QCOP 0050-06	FLEX RPV, Suppression Pool, and Spent Fuel Pool Level Control	7
		QCOP 0050-07	FLEX Generator and Pump Power Cable Deployment	4
		QCOP 0050-08	FLEX Electrical Restoration	7
		QCOP 0050-09	FLEX Response Instrumentation and Communication Equipment	8
		QCOP 0050-10	FLEX Battery Room Ventilation	3
		QCOP 0050-11	FLEX Control Room Ventilation	1

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		QCOP 0050-12	FLEX RCIC System Operation	002
		QCOP 0050-13	FLEX Generator/Pump Refueling	6
		QCOP 0050-16	FLEX National SAFER Response Center Interface	3
		QCOP 0050-17	FLEX RCIC Room Cooler Lineup	2
		QCOP 1300-10	Bypassing RCIC Isolations: Low RPV Pressure or High Area Temperature	7
		QCOS 0050-01	Flex Generator Test	1
		QCOS 0050-01-05	Flex Well Pump Test	2
		QCOS 0050-06	HCVS Rupture Disc Integrity Test	0
		QGA 100	RPV Control	12
		QGA 200	Primary Containment Control	12
		QGA 500-4	RPV Flooding	15
		QGA 6900-07	Loss of AC Power to the 125 VDC Battery Chargers	24
	Self-Assessments		Quad Cities Nuclear Power Station NEI 12-01 Phase 2 Staffing Assessment Report	11/03/2014
	Work Orders	04678198	480 VAC Annual Inspection and Load Test (DG-1)	03/17/2019
		04760168 01	Pre-Outage - SFP Level Probe Camera Inspect and Calibration Check	12/18/2018
		047771006	Emergency Portable Pump “A” Surveillance	09/03/2018
		04796512	FLEX Deep Well Flow Rate Test	12/06/2018
		04825926	Security Event Support Equipment Surveillance	11/25/2018
		04828799	Emergency Portable Pump “C” Surveillance	03/12/2019
		04896251 01	PMID Preventive Maintenance Monthly Check for FLEX and B.5.b. Pumps, Equipment and Trailers Completed 4/10/2019	4/10/2019
		1740593	FLEX Robust Storage Building Construction EC 398181	05/04/2016
2515/193	Corrective Action Documents	02473798	Potential Hardened Vent Tower Fabrication Issues	10/07/2016
		04024472	HCVS AOV Assembly Bettis Actuator Part 21 Applicability	05/18/2017
		04035644	NOS ID: HCVS EC DCS Not Updated to Reflect Calc Revision	07/24/2017
		04036129	NOS ID: HCVS Nitrogen Pipe Model Omitted Elements	03/27/2017
		04072155	HCVS Battery Charger Not Functioning	11/07/2017
	Engineering Changes	624618	HCVS Phase 2 Validation Evaluation	0

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Miscellaneous	Initial and Requal Training N-AN-EP-SAM	Severe Accident Guidelines Management	1
	Procedures	QCOP 1600-13	Venting of Containment	31
		QCOP 6900-56	Hardened Containment Vent 125 VDC Battery System	1
		QCOS 1600-59	Hardened Containment Vent System Test	1
		QCOS 1600-60	Hardened Containment Vent System (HCVS) Operating Cycle Walkdown	0
		SAMG-1	RPV and Primary Containment Injection	6
		SAMG-2	RPV, Containment, and Radioactivity Release Control	8
	Work Orders	04627858	EC 618667 U1 Hardened Containment Vent System (HCVS) Phase 2	03/06/2019
		04802810	Hardened Containment Vent System Test (IST)	03/18/2019