



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, ILLINOIS 60532-4352

March 18, 2021

Mr. David Rhoades
Senior VP, Exelon Generation Company, LLC
President and CNO, Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: CLINTON POWER STATION – DESIGN BASIS ASSURANCE INSPECTION
(PROGRAMS) INSPECTION REPORT 05000461/2021010

Dear Mr. Rhoades:

On March 11, 2021, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Clinton Power Station and discussed the results of this inspection with Mr. T. Chalmers, Site Vice President and other members of your staff. The results of this inspection are documented in the enclosed report.

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

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/

Karla K. Stoedter, Chief
Engineering Branch 2
Division of Reactor Safety

Docket No. 05000461
License No. NPF-62

Enclosure:
As stated

cc w/ encl: Distribution via LISTSERV®

Letter to David Rhoades from Karla K. Stoedter dated March 18, 2021.

SUBJECT: CLINTON POWER STATION – DESIGN BASIS ASSURANCE INSPECTION
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**U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report**

Docket Number: 05000461

License Number: NPF-62

Report Number: 05000461/2021010

Enterprise Identifier: I-2021-010-0029

Licensee: Exelon Generation Company, LLC

Facility: Clinton Power Station

Location: Clinton, IL

Inspection Dates: February 22, 2021 to March 12, 2021

Inspectors: J. Corujo-Sandin, Senior Reactor Inspector
J. Glisan, General Engineer Nran
M. Jones, Reactor Inspector
B. Jose, Senior Reactor Inspector
E. Magnuson, Reactor Inspector

Approved By: Karla K. Stodter, Chief
Engineering Branch 2
Division of Reactor Safety

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting a design basis assurance inspection (programs) inspection at Clinton Power Station, 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.

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. Starting on March 20, 2020, in response to the National Emergency declared by the President of the United States on the public health risks of the Coronavirus Disease (COVID-19), regional inspectors were directed to begin telework. During this time regional baseline inspections were evaluated to determine if all or portions of the objectives and requirements stated in the IP could be performed remotely. In some cases, portions of an IP were completed remotely and on-site. The inspection documented below was determined that the objectives and requirements stated in the IP could be completed remotely.

REACTOR SAFETY

71111.21N.02 - Design-Basis Capability of Power-Operated Valves Under 10 CFR 50.55a Requirements

POV Review (IP Section 03) (11 Samples)

The inspectors reviewed the valves listed below to evaluate the following:

- a. Whether the sampled power operated valves (POVs) are being tested and maintained in accordance with NRC regulations along with the licensee's commitments and/or licensing bases.
- b. Whether the sampled POVs are capable of performing their design-basis functions.
- c. Whether testing of the sampled POVs is adequate to demonstrate the capability of the POVs to perform their safety functions under design-basis conditions.
- d. Maintenance activities through performance of a walkdown of the sampled POVs (if accessible).

- (1) 1C11-139; Control Rod Drive (CRD) Hydraulic Control Unit Scram Pilot Solenoid Operated Valve
- (2) 1C11F011; CRD Scram Drain Line Flow Control (FC) Air Operated Valve (AOV)
- (3) 1C41F004A; Standby Liquid Control (SLC) Pump A, Discharge Explosive (Squib) Valve
- (4) 1E51F063; Reactor Core Isolation Cooling Steam Line Inboard Isolation Motor Operated Valve (MOV)
- (5) 1SX041A; Shutdown Service Water (SSW) 1VY085A High Pressure Core Spray Pump Room Service Water Outlet FC – AOV
- (6) 1E12F042B; Residual Heat Removal (RHR) Pump1B, Low Pressure Core Injection MOV
- (7) 1E21F005; Low Pressure Core Spray (LPCS) Shut Off MOV
- (8) 1C11F180; CRD Scram Vent Line FC – AOV
- (9) 1E12F064A; RHR Pump 1A, Minimum Flow (MF) MOV

- (10) 1E12F068A; RHR Heat Exchanger 1A, SSW Outlet MOV
- (11) 1E22F012; HPCS Suppression Pool MF Bypass MOV

INSPECTION RESULTS

No findings were identified.

EXIT MEETINGS AND DEBRIEFS

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

- On March 11, 2021, the inspectors presented the design basis assurance inspection (programs) inspection results to Mr. T. Chalmers, Site Vice President and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.21N.02	Calculations	1E12F042B (CPS-1)	MIDACALC Result 1E12F042B (CPS-1) AC Motor Operated GL96-05 Gate Valve	5
		1E12F068A (CPS-1)	MIDACALC Results 1E12F068A (CPS-1) AC Motor Operated GL96-05 Gate Valve	12/05/2013
		1E21F005 (CPS-1)	MIDACALC Results 1E21F005 (CPS-1) AC Motor Operated GL96-05 Gate Valve	2
		1E22F012 (CPS-1)	MIDACALC Results 1E22F012 (CPS-1)	8
		AD Report R90.162	Maximum and Required Thrust Analysis Report	02/07/1991
		AD Report R90.168	Maximum and Required Thrust Analysis Report - 1E22F012	12/14/1990
		AD Report R90.202	Maximum and Required Thrust Analysis Report	1
		AD Report R90.207	Maximum and Required Thrust Analysis Report	01/14/1991
		AOV-MARG-CPS-1C11F011	ACE (Air Operated Valve Calculation Engine) Calculation for 1C11F011	0
		CL-MISC-005	CL-MISC-005 - REV. 004 - MOV Program Risk Ranking Input	4
		CL-MISC-011	Air Operated Valve (AOV) Program Risk Ranking Input	1
		DC-ME-09-CP	Equipment Environmental Design Conditions	07/20/2020
		IP-CL-023	Seismic Qualification of Motor Operated Valves (MOVs) Tag No. 1E12-F014A/B, 1E12-F068A/B	04/21/1998
		IP-CL-023	Seismic Qualification of MOVs 1E12-F014 A/B, 1E12-F0068 A/B with SMB-0-25 Operator	0
		IP-CL-028	Seismic Qualification of MOV 1E22-F012 Anchor Darling (A/D) 4" - 900# Gate Valve with SB-0-25 Operator	0
		IP-CL-032	Seismic Qualification of MOVs 1E12-F064A, B, C, A/D, 4"-300# Gate with SB-00-10 Operator	1
		IP-M-0001	Bounding Differential Pressure Calculation for Selected High Pressure System MOVs	1

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		IP-M-0129	Residual Heat Removal (RHR) Loop A and B Differential Pressure Calculation for GL 89-10	4-E
		IP-M-0612	Design Basis System Parameters for AOVs 1C11F010, 1C11F011, 1C11F180, and 1C11F181	0
		IP-M-0612	Design Basis System Parameters for AOVs 1C11F010, 1C11F011, 1C11F180, and 1C11F181	10/06/2000
		IP-M-0622	ACE Calculation for 1C11F180	1
		ME-04.00	Stem Thrust/Torque Evaluation for MOVs	12
		Mida F064A	MIDACALC MOV Datasheet [1E12F064A]	4
		Corrective Action Documents	00687545	Water Hammer on Service Water Piping to High Pressure Core Spray (HPCS) Room Coolers
	04270721		Change 1E22F012 Replacement Date	08/09/2019
	4135906		Valve Stem Broken for 1E22-F012	05/09/2018
	Corrective Action Documents Resulting from Inspection	04404920	(POV) NRC ID: Ambiguity in ER-AA-300	02/26/2021
		04406232	1C11F011 Model Number Does Not Match Information on E02-1RP99-02A	03/03/2021
		04407939	NRC ID No IRs For UNSAT As-Found Data	03/10/2021
		04408159	NRC ID Oil/Grease Leak on 1E12F042B	03/11/2021
	Drawings	93-14626	4"- 300 Weld Ends, Carbon steel Flex Wedge Gate Valve with SB-00 Limitorque	B
		93-15009	18"-150 Weld Ends, Carbon Steel Flex Wedge Gate Valve with SMB-0 Limitorque and Indicator Rod	B
		E02-1AP53	Key Diagram, Auxiliary Building Motor Control Center (MCC) 1B3	X
		E02-1RI99	Schematic Diagram, Reactor Core Isolation Cooling (RCIC) Steam Isolation Valves 1E51-F063 & 1E51-F064	M
		E02-1SC99, Sh. 2	Electrical Schematic Diagram, Standby Liquid Control (SLC) System	W
		M05-1002, Sh. 1	Piping and Instrumentation Drawing (P&ID), Main Steam System	V
		M05-1046	P&ID Containment Building Equipment Drain System	M
		M05-1073	P&ID Low Pressure Core Spray (LPCS) System	AH
		M05-1074	P&ID High Pressure Core Spray (HPCS)	AH
	M05-1075, Sh. 1	P&ID RHR System	AO	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		M05-1075, Sh. 2	P&ID RHR System	AZ
		M05-1076, Sh. 1	P&ID, RCIC System	AH
		M05-1077, Sh. 1	P&ID, SLC System	AC
		VPF3736-500	1" Control Rod Drive (CRD) Vent Valve	10
	Engineering Changes	624558	Evaluation of 1E22F012 Valve Seat Degradation	0
	Engineering Evaluations	ME-04.00	Stem Thrust/Torque Evaluation for MOVs	12
	Miscellaneous	EVP 070925	EVP 070925 - Magnesium Rotor Inspection for MOV Motors	09/26/2007
		FCD LMAIM1401-00	Limitorque SMB/SB Series Installation and Maintenance Manual	3
		N-CL-OPS-209002	HPCS System	5
	Procedures	CPS 9051.02	HPCS Valve Operability Test	42d
		CPS 9053.04	RHR A/B/C Valve Operability Checks	46a
		CPS 9843.01	In Service Test (IST) Category "A" Valve Leak Rate Test	36d
		ER-AA-300	MOV Program Administrative Procedure	12
		ER-AA-302	MOV Program Engineering Procedure	7
		ER-AA-302-1001	Rising Stem MOV Thrust and Torque Sizing and Set-Up Window Determination Methodology	11
		ER-AA-410	AOV Program Implementing Procedure	6
		MA-AA-723-300	Diagnostic Testing of MOVs	14
		MA-AA-743-310	Diagnostic Testing and Evaluation of AOVs	8
		MA-CA-723-301-3001	Clinton Specific MOV PM Information	4
		MA-CL-301-1001	Preventive Maintenance (PM) for MOVs	1
		WC-AA-120-F-01	PM Work Order (WO) Disposition Sheet	2
		Work Orders	00155728	Verify MOV Thermal Overload Bypass 1E51-F063
	00155756		MOV Stem Lubrication 1E51-F063	01/29/2017
	00500056		Perform MOV Thrust Verification 1E51-F063	12/29/2003
	00973837		Overhaul Actuator and Replace Accessories for 1C11F011 AOV	01/30/2008

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		01074425-01	During 1SX041A/B Stroking Water Hammer Heard, Relief Lift	11/29/2017
		01150752-01	Thrust Verification 1E12-F042B	01/29/2010
		01308071-01	1E12-F042B - Inspect Magnesium Rotor for Degradation	12/17/2011
		01329366	Perform MOV Thrust Verification and Clean/Inspect 1E21F005	12/14/2011
		01414304	Perform Thrust Verification and MOV Clean and Inspect 1E12F068A	03/26/2012
		01456808	MOV Stem Lubrication 1E12F042B	10/23/2013
		01518247	Perform Flow Scan in Support of the AOV Program for 1C11F011	11/04/2013
		01580626	Perform MOV Thrust Verification and Clean/Inspect 1E21F005	05/19/2017
		01585738	Perform Thrust Verification and MOV Clean and Inspect 1E12F068A	10/20/2017
		01614767	MOV Stem Lubrication 1E12F064A	10/17/2017
		01686197-01	1E12-F042B Clean & Inspect/Thrust Verification	05/15/2015
		01697759	Perform Thrust Verification/Clean and Inspect - 1E22F012	03/14/2017
		01759037	Overhaul Actuator and Replace Accessories for 1C11F011 AOV	07/07/2017
		01760312	Scram Discharge Volume (SDV) Vent and Drain Valve Operability Test	10/29/2015
		01858827-01	1E12-F042B Perform Boroscopic Motor Inspection	05/24/2017
		01878384	MOV Stem Lubrication	05/19/2017
		01922633	SDV Vent and Drain Valve Operability Test	10/24/2017
		04629180	MC021K01 Local Leak Rate Test (LLRT) RHR A System	09/04/2019
		04630521	MC037K05 LLRT HPCS System	05/16/2018
		04632095	9053.04C001/D001 Operations Perform RHR A Valve Position Indication Test	10/16/2018
		04645310	1C11F180 Bench Set Low, Friction High	10/11/2019
		04668604	Replace Limitorque Actuator 1E12F068A	04/08/2019
		04702113-01	Perform Flowsan in Support of the AOV Program 1SX041A	01/10/2019

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		04711083	Perform Flow Scan in Support of the AOV Program for 1C11F011	10/17/2019
		04711186	Perform Flowscan in Support of the AOV Program 1C11F180	10/07/2019
		04774071	1E12-F042B Clean & Inspect/Thrust Verification	10/04/2019
		04780605	Hydraulic Control Unit (HCU) 40-45 Scram Pilot Solenoid Vent Valve Leaking Air, Replace Valve	09/28/2019
		04782517	Valve Stem Broken for 1E22-F012	05/12/2018
		04788521	1E22-F012 MOV Stem Lubrication	04/06/2020
		048668135	Perform Thrust Verification and Clean/Inspect MOV 1E51-F063	12/18/2019
		04964521	Repair/Replace Field Wiring on MOV 1E51-F063	10/04/2019
		04993658	9051.02A21 HPCS Valve Operability (Stroke Time)	03/10/2020
		05016755	9051.02A21 HPCS Valve Operability (Stroke Time)	06/10/2020
		05051514	9051.02A21 HPCS Valve Operability (Stroke Time)	09/11/2020
		05078817	9051.02A21 HPCS Valve Operability (Stroke Time)	12/10/2020
		1922633	9012.01B20 SDV Vent and Drain Valve Operability Test	10/24/2017
		4779767	9012.01B20 SDV Vent and Drain Valve Operability Test	10/29/2019
		4805097	LLRT LPCS System Water Test	09/04/2019
		4975558	9012.01A20 SDV Vent and Drain Valve Operability (Stroke Time)	01/20/2020
		5002645	9012.01A20 SDV Vent and Drain Valve Operability (Stroke Time)	04/21/2020
		5035342	9012.01A20 SDV Vent and Drain Valve Operability (Stroke Time)	07/21/2020
		5066132	9012.01A20 SDV Vent and Drain Valve Operability (Stroke Time)	10/20/2020