UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
245 PEACHTREE CENTER AVENUE N.E., SUITE 1200
ATLANTA, GEORGIA 30303-1200

June 6, 2019

Mr. Ernest J. Kapopoulos, Jr.
Site Vice President
H.B. Robinson Steam Electric Plant
Duke Energy Progress, LLC
3581 West Entrance Road, RNPA01
Hartsville, SC 29550

SUBJECT: H.B. ROBINSON STEAM ELECTRIC PLANT UNIT 2 – DESIGN BASIS ASSURANCE INSPECTION REPORT 05000261/2019010

Dear Mr. Kapopoulos, Jr.:

On May 16, 2019, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Robinson Unit 2 and discussed the results of this inspection with Mr. John Krakuszeski, 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/

Jonathan M. Montgomery, Chief
Engineering Branch 1
Division of Reactor Safety

Docket No.: 05000261
License No.: DPR-23

Enclosure:
Inspection Report 05000261/2019010

cc: Distribution via ListServ

SUBJECT: H.B. ROBINSON STEAM ELECTRIC PLANT UNIT 2 – DESIGN BASIS ASSURANCE INSPECTION REPORT 05000261/2019010 dated June 6, 2019

DISTRIBUTION:
P. Braxton, RII, DRS
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*See previous page for concurrence

☒ PUBLICLY AVAILABLE ☐ NON-PUBLICLY AVAILABLE ☐ SENSITIVE ☒ NON-SENSITIVE

ADAMS: ☒ Yes ACCESSION NUMBER: **ML 19158A358** ☒ SUNSI REVIEW COMPLETE ☐ FORM 665 ATTACHED

OFFICE	RII/DRS/EB1	RII/DRS/EB1	RII/DRS/EB1	RII/DRS/EB1	Contractor	Contractor
SIGNATURE	PXB3	CAF4	RNP1	MAR1	MXY4	SFK
NAME	PBraxton	CFranklin	RPatterson	MRiley	M. Yeminy	SKobylarz
DATE	5/31/2019	5/31/2019	5/301/2019	5/ 31/ 2019	5/29/2019	5/29/2019
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
OFFICE	RII/DRS/EB1	RII/DRP	RII/DRS/EB1			
SIGNATURE	JMM9	RXM1	JMM9			
NAME	JMontgomery	RMusser	JMontgomery			
DATE	6/5/2019	6/5/2019	6/6/2019			
E-MAIL COPY?	YES NO	YES NO	YES NO			

OFFICIAL RECORD COPY DOCUMENT NAME: G:\

U.S. NUCLEAR REGULATORY COMMISSION

Inspection Report

Docket Number(s):	50-261
License Number(s):	DPR-23
Report Number(s):	05000261/2019010
Enterprise Identifier:	I-2019-010-0027
Licensee:	Duke Energy Progress, LLC
Facility:	H.B. Robinson Steam Electric Plant, Unit 2
Location:	Hartsville, SC 29550
Inspection Dates:	April 29, 2019 to May 16, 2019
Inspectors:	P. Braxton, Reactor Inspector C. Franklin, Reactor Inspector R. Patterson, Reactor Inspector M. Riley, Reactor Inspector M. Yeminy, Mechanical Contractor S. Kobylarz, Electrical Contractor
Approved By:	Jonathan M. Montgomery, Chief Engineering Branch 1 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 (Team) at H.B. Robinson Steam Electric Plant, Unit 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.

List of Findings and Violations

No findings were identified.

INSPECTION SCOPE

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.

REACTOR SAFETY

71111.21M - Design Bases Assurance Inspection (Teams)

The inspectors evaluated the following components and listed applicable attributes, permanent modifications, and operating experience:

Design Review - Large Early Release Frequency (LERFs) (IP Section 02.02) (1 Sample)

RHR-750/751, Residual Heat Removal System Isolation Valves

- UFSAR/TS/TRM and other design and licensing basis requirements
- Design and licensing basis document accuracy
- Material condition and configuration (e.g. visual inspection during a walkdown)
- Applicable operating procedures
- Maintenance effectiveness
- Capability of design
- Corrective maintenance
- Corrective action history
- Testing adequacy and trending results
- Preventive maintenance schedule and implementation
- Translation of vendor specifications
- Calculations for valve set-up
- System health reports
- Surveillance and in-service testing procedure, acceptance criteria, and results
- Operator actions

Design Review - Risk-Significant/Low Design Margin Components (IP Section 02.02) (4 Samples)

(1) CCW-HTX-A, Component Cooling Water Heat Exchanger A

- Overall capability of heat removal capacity considering the most limiting conditions
- CCW heat exchanger design (tube length, number of tubes, tube material, wall thickness, number of passes)
- Service water supply (design flow rate and limiting temperature)
- CCW pump flow rate to each heat exchanger and number of pumps operating
- CCW maximum temperature leaving the heat exchanger
- Heat exchanger design fouling factor
- Number of tubes plugged
- Verification of turbulent flow
- Method of confirming heat removal capacity (performance testing or inspect-and-clean)
- Frequency of cleaning the CCW heat exchangers
- Licensee responses to Generic Letter 89-13 and commitments made for open cycle heat exchangers
- CCW operating procedures affecting the operation of the heat exchangers
- Impact of leaking by CCW pump discharge check valve on the CCW flow rate to the heat exchanger

(2) BAT-CHRGR-A-1, Station Battery Charger A-1

- Corrective action and preventative maintenance history
- Translation of vendor specifications
- Material condition and configuration (i.e. visual inspection and walkdown)
- Voltage profile and short circuit calculations
- Procedures that provide instructions to recover from loss of power
- Overcurrent protection and coordination
- Battery and cable sizing
- Power cables ampacity evaluation

(3) 480V-E2, 480V Emergency Bus E2

- Material condition and configuration (e.g., visual inspection during a walkdown)
- Consistency between station documentation (e.g. procedures) and vendor specifications
- Maintenance effectiveness
- Corrective action history and corrective maintenance records
- Consistency between load flow and short circuit current calculations and breaker coordination settings

(4) REFUEL-WTR-STR-TNK, Refueling Water Storage Tank

- Material condition and configuration (e.g. visual inspection during a walkdown)
- Operating procedures
- Maintenance effectiveness
- Component health reports, corrective maintenance records, and corrective action history
- Operator actions
- Surveillance and calibration testing and recent test results
- Modifications performed
- Calculation for system flow rates, vortex limits, and NPSH for each pump
- Calculation for tank size, including high and low water levels
- Requirements and analysis for tank protection from natural phenomena
- Suction flow rates, including combined pump suction capabilities and transfer of flow rate to another source when tank level is low
- Tank level and flow instrumentation, and control room indications.

Modification Review - Permanent Mods (IP Section 02.03) (5 Samples)

(1) EC 402230, Replace HVE-17 and HVE-18 Emergency Diesel Generator Room Exhaust Dampers
(2) EC 266720, Replace Transformer SST-2F
(3) EC 277392, Modify SI-869, SI-870A/B to Conform to G.L 96-05
(4) EC 412755, Remove CC-747A/B and CC-774 from In-service Testing Program
(5) EC 284187, RNP Transmission Upgrade Project

Review of Operating Experience Issues (IP Section 02.06) (2 Samples)

(1) NRC Information Notice 2012-14, Motor-Operated Valve Inoperable due to Stem-Disc Separation
(2) NRC Information Notice 2013-18, Refueling Water Storage Tank Degradation

INSPECTION RESULTS

No findings were identified.

EXIT MEETINGS AND DEBRIEFS

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

- On May 16, 2019, the inspector presented the design basis assurance inspection results to Mr. John Krakuszeski, plant manager, and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.21M	Calculations	RNP-C/STRU-1119	Analysis & Design Verification of RWST & Anchorages	Rev. 2
		RNP-E-2.009	Overcurrent Protection Emergency Bus E1 & E2 Emergency Supply	Rev. 3
		RNP-E-2.019	MCC 5,6,9,10, Protective Devices	Rev. 13
		RNP-E-5.018	Ampacity Evaluation of Safety Related 125V DC and 120 VAC Power Cables	Rev. 10
		RNP-E-5.031	Cable Sizing for Battery Charger A-1 for H.B. Robinson Steam Generating Plant Unit 2	Rev. 0
		RNP-E-6.004	DC Short Circuit Study	Rev. 8
		RNP-E-6.005	Overcurrent Protection and Coordination of the 125V DC Distribution System (TRAINS A & B)	Rev. 3
		RNP-E-6.022	DC Voltage Profile	Rev. 5
		RNP-E-6.024	Battery Charger Sizing	Rev. 4
		RNP-E-7.002	Emergency Equipment Load Factor Study	Rev. 17
		RNP-E-8.002	AC Auxiliary Electrical Distribution System Voltage/Load Flow/Fault Current Study	Rev. 10
		RNP-I/INST-1023	RWST Uncertainty and Scaling Calculation	Rev. 6
		RNP-I/INST-1084	AOP Tank Level Setpoints	Rev. 1
		RNP-I/INST-1111	RWST Level EOP Setpoint Parameters	Rev. 1
		RNP-M/MECH-1202	RWST Percent Level vs. Inventory - RNP Curve Book 8.11	Rev. 3
		RNP-M/MECH-1411	Set-up Calculation for MOV RHR-750 Set-up	Rev. 8
		RNP-M/MECH-1423	Set-up Calculation for MOV RHR-751	Rev. 9
		RNP-M/MECH-1424	Set-Up Calculation for MOV SI-870A	Rev. 12
		RNP-M/MECH-1429	Set-Up Calculation for MOV SI-870B	Rev. 12

71111.21M	Calculations	RNP-M/MECH-1528	Set-up Calculation for SI-869	Rev. 11
		RNP-M/MECH-1556	Safety Injection/Residual Heat Removal System Hydraulic Model	Rev. 3
		RNP-M/MECH-1586	Evaluation of Potential for Inadvertent MOV Opening Due to System Pressurization	Rev. 2
		RNP-M/MECH-1598	RWST and Line 16-SI-151R Temperature Calculation	Rev. 0
		RNP-M/MECH-1637	CS/SI/RHR System Hydraulic Model	Rev. 15
		RNP-M/MECH-1642	Safety Injection Pump NPSH Improvement Line Flow Calculations (Revised Piping Configuration)	Rev. 3
		RNP-M/MECH-1646	Impact of 99°F on CCW System	Rev. 1
		RNP-M/MECH-1921	Thermal Relief Valves CC-774, CC-747A, CC-747B Over-Pressure Protection Analysis	Rev. 0
	Corrective Action Documents	EN 02253092		
		NCR 00422032		
		NCR 00470257		
		NCR 02047575		
		NCR 02053938		
		NCR 02055160		
		NCR 02062735		
		NCR 02106394		
		PRR 00422679		
		PRR 00501886		
		PRR 02030371		
		PRR 02155136		
		PRR 02167812		

71111.21M	Corrective Action Documents	PRR 0501974		
	Corrective Action Documents Resulting from Inspection	NCR 02270875	CC-702A/B/C Reverse Flow Acceptance Criteria	5/1/2019
		NCR 02271007	UFSAR Markup for EC 284187 needs Updating	5/2/2019
		NCR 02271622	DBD Markup for EC 284187 needs Updating	5/7/2019
		NCR 02272100	Procedure OP-603 Minimum Battery Voltage Limits	5/9/2019
		NCR 02272568	Scope for PRR 2155136 not Complete	5/14/2019
		NCR 02272746	Station Battery D and E Restoration	5/15/2019
		NCR 02272808	EC 277392 Information Carryover Discrepancies	5/15/2019
		NCR 02272876	Applicability of Note 21 on DWG 5379-01082 Sht. 1	5/15/2019
		NCR 02272884	Review UFSAR Section 3.1.2.39	5/15/2019
		NCR 02272996	MOV Limit Switch Development SI-869	5/16/2019
		PRR 02270974	OP-306 Enhancement	5/2/2019
	Drawings	5379-01082	Safety Injection System Flow Diagram	Rev. 49
		5379-01484	Residual Heat Removal System Flow Diagram	Rev. 49
		5379-01878	3 Inch Gate Valve Motor Operated	Rev. 1
		5379-1082	Safety Injection System Flow Diagram	Rev. 55
		5379-1153	Electrical Schematic Diagram for Diesel Generator	Rev. 36
		5379-1573	RWST Vent	7/19/1968
		5379-1740	14 Inch Gate Valve Assembly	Rev. 6
		5379-1971	Reactor Coolant System Flow Diagram	Rev. 41
		5379-376	Component Cooling Water System Flow Diagram	Rev. 44
		B-190627	Auxiliary Electrical Distribution System Single Line Diagram Motor Control Center No. 5, Sheet 2	Rev. 9
		B-190628	Wiring Diagram SI-870A	Rev. 18
		B-190628	Wiring Diagram SI-870B	Rev. 16
		B-190628	Control Wiring Diagram SI-869	Rev. 20
		EC410167	HVAC Turbine Building, Auxiliary Building, Reactor Building, and Radwaste Building	Rev. 43
		G-190626 SH00001	Main and 4160 V One Line Diagram	Rev. 22
		G-190626 SH00003	125V DC and 120V Vital AC One Line Diagram	Rev. 26

71111.21M	Drawings	G-190626, Sht. 1	Main & 4160 Volt One Line Diagram	Rev. 22
		G-190626, Sht. 2	480 & 120/208 Volt One Line Diagram	Rev. 39
		G-190626, Sht. 3	125V DC & 120V AC One Line Diagram	Rev. 26
		G-190626, Sht. 4	Main & 4160 Volt One Line Diagram (Bus 6-9)	Rev. 1
		G-190626, Sht. 5	480 & 208/120 Volt One Line Diagram	Rev. 1
		N2063-LD-SUB	Robinson Louver Damper Submittal Drawing	Rev. 2
	Engineering Changes	EC 277392	Modify SI-869, SI-870A/B to Conform with JOG Requirements	Rev. 13
		EC 284187	Robinson Nuclear Plant Transmission Upgrade Project	Rev. 30
		EC 406225	Update Drawings and EDB per EARS 2063574, 2065390, and 2065463	Rev. 0
		EC 409422	TIC Cable Replacement	Rev. 8
		EC 412755	Remove CC-747A, B and CC-774 from IST Program	Rev. 0
		Mod M-835	Gag Open RCV-609	Rev. 1
	Miscellaneous		2018 RHR System Health Report 3rd and 4th Quarter	
			2018 RHR System Health Reports 1st and 2nd Quarters	
			2016-2019 RHR Maintenance Rule Trend Report	
		AH-CC523	Specification Sheet for CCW Heat Exchanger	3/25/1968
		CCW-D01	CCW Potential Over-Pressurization	Rev. 0
		CCW-D11	CCWS Relief Valve Capacities	Rev. 0
		DBD/R87038/SD03	RHR System Description	Rev. 11
		DBD/R87038/SD13	Component Cooling Water System	Rev. 12
		DBD/R87038/SD16	SYS DBD- Electrical Power Distribution System	Rev. 11
		Information Notice 2012-14	Motor Operated Valve Inoperable due to Stem-Disc Separation	7/24/2012
		Information Notice 2013-18	Refueling Water Storage Tank Degradation	9/13/2013
		LDCR 18-0037	UFSAR Change Summary Form	4/16/2019
		NLS-91-300	Letter CP&L to NRC Supplemental Response to Generic Letter 89-13	10/18/1991
		R18001	Robinson Component Cooling Water (CCW) Thermal Relief Valves (3) Require Replacement	Rev. 0
		RNP2-E-0007	Specification For 125 V Battery Charger	Rev. 1

71111.21M	Miscellaneous	SD-016	480/120 VAC Electrical Systems	Rev. 14
		WELC 5379-S8	Miscellaneous Tanks Specification	Rev. 2
	Procedures	AD-EG-ALL-1720	In-service Testing (IST) Program Implementation	Rev. 4
		AD-EG-ALL-1720	IST Program Implementation	Rev. 4
		AOP-016	Excessive Primary Plant Leakage	Rev. 27
		AOP-020	Loss of Residual Heat Removal	Rev. 50
		AOP-033	Shutdown LOCA	Rev. 22
		EDP-004	125V DC Buses	Rev. 32
		EDP-007	Power Panels	Rev. 157
		EOP-ECA-0.0	Loss of All AC Power	Rev. 6
		EOP-ES-1.3-BD	Transfer to Cold Leg Recirculation Basis Document	Rev. 1
		FRP-H.1	Response to Loss of Secondary Heat Sink	Rev. 30
		FSG-014	Electrical Power Restoration	Rev. 1
		MST-E-125DC-BATT-001	Station Battery A Test	Rev. 7
		OP-603	Electrical Distribution	Rev. 137
		OP-925	Cold weather Operation	Rev. 73
		OST 257-1	RHR Loop RWST Isolation Valves Interlocks and Valve Test	3/13/2017
		OST-151-1	SI System Components Test Pump A	Rev. 44
		OST-151-3	SI System Components Test Pump C	Rev. 43
		OST-166-A1	Battery Charger A-1 Loss of Power Test	Rev. 0
		OST-257-1	RHR Loop RWST Isolation Valves Interlocks and Valve Test	10/12/2018
		OST-257-2	RHR Loop RWST Isolation Valves Interlocks and Valve Test	10/12/2018
		OST-257-3	RHR Loop Supply Test	10/12/2018
		OST-922	Dedicated Shutdown Equipment Identification Audit	2/18/2019
		PM-440	Station Battery Charger A-1 Capacity Test	Rev. 15
		SD-038	DC Electrical System	Rev. 7
		TMM-004	In-service Testing Program	Rev. 95
		TMM-009	In-service Testing Program Administration	Rev. 9

71111.21M	Work Orders	01962215		
		02224498		
		1038942-01		
		10424446		
		10635354		
		12098522-01		
		12279803		
		13325712-05		
		13492289-01		
		13520216-01		
		20015784-05		
		20016368		
		20050646		
		20105521-01		
		20143584		
		20152841		
		20212891		
		20297104		
		774295-01		