



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION IV
1600 EAST LAMAR BOULEVARD
ARLINGTON, TEXAS 76011-4511

April 28, 2022

Mr. John Dent, Jr.
Vice President and Chief Nuclear Officer
Nebraska Public Power District
72676 648A Avenue
P.O. Box 98
Brownville, NE 68321

SUBJECT: COOPER NUCLEAR STATION – INTEGRATED INSPECTION
REPORT 05000298/2022001

Dear Mr. Dent:

On March 31, 2022, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Cooper Nuclear Station and discussed the results of this inspection with you 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,

A handwritten signature in black ink, appearing to read "Jeffrey E. Josey".

Signed by Josey, Jeffrey
on 04/28/22

Jeffrey E. Josey, Chief
Projects Branch C
Division of Operating Reactor Safety

Docket No. 05000298
License No. DPR-46

Enclosure:
Inspection Report 05000298/2022001

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COOPER NUCLEAR STATION – INTEGRATED INSPECTION REPORT 05000298/2022001
 DATED – APRIL 28, 2022

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

Docket Number: 05000298

License Number: DPR-46

Report Number: 05000298/2022001

Enterprise Identifier: I-2022-001-0016

Licensee: Nebraska Public Power District

Facility: Cooper Nuclear Station

Location: Brownville, NE

Inspection Dates: January 1, 2022, to March 31, 2022

Inspectors: K. Chambliss, Resident Inspector
W. Cullum, Reactor Inspector
M. Doyle, Acting Senior Resident Inspector
J. Melfi, Acting Senior Resident Inspector
F. Thomas, Reactor Inspector
P. Vossmar, Senior Project Engineer

Approved By: Jeffrey E. Josey, Chief
Projects Branch C
Division of Operating Reactor Safety

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting an integrated inspection at Cooper Nuclear 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.

PLANT STATUS

Cooper Nuclear Station began the inspection period at rated thermal power. On February 11, 2022, power was lowered to approximately 65 percent for a planned rod pattern adjustment. The plant returned to rated thermal power on February 13, 2022. On February 25, 2022, power was lowered to approximately 80 percent for a rod pattern adjustment. The plant was returned to rated thermal power on February 26, 2022. The unit remained at 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 activities described in IMC 2515, Appendix D, "Plant Status," conducted routine reviews using IP 71152, "Problem Identification and Resolution," observed risk significant activities, and completed on-site portions of IPs. 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

Impending Severe Weather Sample (IP Section 03.02) (1 Sample)

- (1) The inspectors evaluated the adequacy of the overall preparations to protect risk-significant systems from impending severe weather during a Winter Weather Advisory on January 12, 2022.

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) Division 2 emergency diesel generator on January 6, 2022
- (2) Division 1 4160 Vac system on January 13, 2022
- (3) Core spray train A on March 2, 2022
- (4) High pressure coolant injection on March 17, 2022

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

- (1) The inspectors evaluated system configurations during a complete walkdown of the Division 2 125 Vdc system on February 23, 2022.

71111.05 - Fire Protection

Fire Area Walkdown and Inspection Sample (IP Section 03.01) (6 Samples)

The inspectors evaluated the implementation of the fire protection program by conducting a walkdown and performing a review to verify program compliance, equipment functionality, material condition, and operational readiness of the following fire areas:

- (1) Division 2 emergency diesel generator room, Elevations 917-foot 6-inches and 903-foot 6-inches, on January 6, 2022
- (2) Control building basement floor residual heat removal service water booster pump room, Elevation 882-foot 6-inches, on January 10, 2022
- (3) Reactor building southeast quadrant, Elevations 881-foot 9-inches and 859-foot 9-inches, on February 16, 2022
- (4) Division 1 diesel generator room, Elevations 917-foot 6-inches and 903-foot 6-inches, on March 21, 2022
- (5) Control building critical switchgear rooms, Elevation 932-foot 6-inches, on March 22, 2022
- (6) Intake structure, Elevation 903-foot 6-inches, on March 23, 2022

Fire Brigade Drill Performance Sample (IP Section 03.02) (1 Sample)

- (1) The inspectors evaluated the onsite fire brigade training and performance during an announced fire drill on February 16, 2022.

71111.06 - Flood Protection Measures

Inspection Activities - Internal Flooding (IP Section 03.01) (1 Sample)

The inspectors evaluated internal flooding mitigation protections in the:

- (1) Division 2 emergency diesel generator room on January 14, 2022

71111.07T - Heat Exchanger/Sink Performance

Heat Exchanger (Service Water Cooled) (IP Section 03.02) (2 Samples)

The inspectors evaluated heat exchanger performance on the following:

- (1) Diesel generator 2 intercoolers (DG2-AIRSUP-2A and DG2-AIRSUP-2B), cooled by service water
- (2) Diesel generator 2 jacket water heat exchanger (DG2-DGJW-HX), cooled by service water

Ultimate Heat Sink (IP Section 03.04) (1 Sample)

The inspectors evaluated the ultimate heat sink performance on the following:

- (1) Ultimate Heat Sink (UHS)

71111.11Q - Licensed Operator Requalification 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 downpower and rod pattern adjustment on February 11, 2022.

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

- (1) The inspectors observed and evaluated a simulator training scenario on March 8, 2022.

71111.12 - Maintenance Effectiveness

Maintenance Effectiveness (IP Section 03.01) (1 Sample)

The inspectors evaluated the effectiveness of maintenance to ensure the following structures, systems, and components (SSCs) remain capable of performing their intended function:

- (1) NB-F05 (nuclear fuel) at (a)(1) on February 14, 2022

71111.13 - Maintenance Risk Assessments and Emergent Work Control

Risk Assessment and Management Sample (IP Section 03.01) (3 Samples)

The inspectors evaluated the accuracy and completeness of risk assessments for the following planned and emergent work activities to ensure configuration changes and appropriate work controls were addressed:

- (1) Service water booster pump A maintenance on January 11, 2022
- (2) Residual heat removal service water booster pump D work window on January 26, 2022
- (3) Residual heat removal subsystem B on January 26, 2022

71111.15 - Operability Determinations and Functionality Assessments

Operability Determination or Functionality Assessment (IP Section 03.01) (5 Samples)

The inspectors evaluated the licensee's justifications and actions associated with the following operability determinations and functionality assessments:

- (1) Control rod drive brass fitting leaking on January 12, 2022
- (2) Valve SW-V-1116 leaking on January 13, 2022
- (3) Desk tied to secondary containment boundary piping on January 27, 2022
- (4) Air leak on control rod drive 34-39 AO-CV127 scram outlet valve diaphragm on January 27, 2022
- (5) Fuel reliability index exceeded threshold on February 25, 2022

71111.19 - Post-Maintenance Testing

Post-Maintenance Test Sample (IP Section 03.01) (4 Samples)

The inspectors evaluated the following post-maintenance testing activities to verify system operability and/or functionality:

- (1) Service water booster pump C vent pipe replacement and leakage test on January 4, 2022
- (2) Service water booster pump A valve bonnet replacement on January 13, 2022
- (3) PC-MOV-305MV post maintenance valve cycling on January 19, 2022
- (4) Reactor core isolation cooling post maintenance test after maintenance outage on March 8, 2022

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance testing activities to verify system operability and/or functionality:

Surveillance Tests (other) (IP Section 03.01) (2 Samples)

- (1) Emergency diesel generator 1 monthly surveillance test on January 12, 2022
- (2) Control rod drive exercise attachment No. 2 on March 12, 2022

Inservice Testing (IP Section 03.01) (3 Samples)

- (1) High-pressure coolant injection valve operability test on January 18, 2022
- (2) Standby liquid control pump A test on February 12, 2022
- (3) Emergency diesel generator 1 monthly surveillance run on March 7, 2022

71114.06 - Drill Evaluation

Select Emergency Preparedness Drills and/or Training for Observation (IP Section 03.01) (1 Sample)

- (1) Emergency preparedness drill on January 11, 2022

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

MS05: Safety System Functional Failures (SSFFs) Sample (IP Section 02.04) (1 Sample)

- (1) January 1, 2021, through December 31, 2021

MS06: Emergency AC Power Systems (IP Section 02.05) (1 Sample)

- (1) January 1, 2021, through December 31, 2021

MS07: High Pressure Injection Systems (IP Section 02.06) (1 Sample)

(1) January 1, 2021, through December 31, 2021

MS08: Heat Removal Systems (IP Section 02.07) (1 Sample)

(1) January 1, 2021, through December 31, 2021

MS09: Residual Heat Removal Systems (IP Section 02.08) (1 Sample)

(1) January 1, 2021, through December 31, 2021

MS10: Cooling Water Support Systems (IP Section 02.09) (1 Sample)

(1) January 1, 2021, through December 31, 2021

INSPECTION RESULTS

No findings were identified.

EXIT MEETINGS AND DEBRIEFS

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

- On February 10, 2022, the inspectors presented the heat sink performance inspection results to Mr. B. Chapin, Director of Nuclear Safety Assurance, and other members of the licensee staff.
- On April 21, 2022, the inspectors presented the integrated inspection results to Site Vice President John Dent and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.01	Procedures	2.2.73	Standby Gas Treatment System	62
		5.1Weather	Operation during Weather Watches and Warnings	22
71111.04	Drawings	DWG 3058	DC One Line Diagram	68
	Procedures	2.2.18.3.DIV1	4160 DIV 1 Distribution Support	3
		2.2.25.1	125 VDC Electrical System (DIV 1)	28
		2.2.25.2	125 VDC Electrical System (DIV 2)	34
		2.2.9	Core Spray System	88
		2.2A.CS.DIV1	Core Spray Component Checklist (DIV 1)	5
		2.2A.DG.DIV2	Standby AC Power System (Diesel Generator) Component Checklist (DIV 2)	8
		2.2A_125DC.DIV1	125 VDC Power Checklist (DIV 1)	8
		2.2A_125DC.DIV2	125 VDC Power Checklist (DIV 2)	8
		2.2A_4160.DIV0	4160 Non-Divisional Auxiliary Power Checklist	2
		2.2A_4160.DIV1	4160 VAC Auxiliary Power Checklist (DIV 1)	2
		2.2B.CS.DIV1	Core Spray Instrument Valve Checklist (DIV 1)	1
		5.3DC125	Loss of 125 VDC	45
71111.05	Fire Plans	CNS-FP-212	Reactor Building Southeast Quadrant Elevations 881'-9" and 859'-9"	6
		CNS-FP-216	Reactor Building Critical Switchgear Room 1F Elevation 932'-6"	4
		CNS-FP-217	Reactor Building Critical Switchgear Room 1G Elevation 932'-6"	4
		CNS-FP-224	Control Building Basement Floor Elevation 882'-6"	5
		CNS-FP-236	Diesel Generator Building D.G. #1 Elevations 917'-6" and 903'-6"	7
		CNS-FP-237	Diesel Generator Building D.G. #2, Elevations 917'-6" and 903'-6"	5
		CNS-FP-256	Intake Structure Elevation 903'-6"	7
		CNS-FP-265	Fire Protection Pump House Elevation 903'-6"	4
		Miscellaneous		Fire Brigade Scenario #71
	Procedures	5.1INCIDENT	Site Emergency Incident	45
71111.06	Miscellaneous	NEDC 09-102	Internal Flooding – HELB, MELB, and Feedwater Line Break	3

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Procedures	0-Barrier-MISC	Miscellaneous Buildings	8
		2.2.27	Equipment, Floor, and Chemical Drain System	62
		5.1Flood	Flood	32
71111.07T	Calculations	NEDC 11-140	Review of ZNE Calculation 11-198, "Cooper Nuclear Station Service Water System Analysis"	1
		NEDC 91-239	DGLO [Diesel Generator Lube Oil]/DGJW [Diesel Generator Jacket Water]/DG [Diesel Generator] Intercooler Heat Exchanger Evaluation	5
		NEDC 94-022	Calculation of SW Loop Pressure Ranges for One to Four Operating SW Pumps During Normal Operation	0
	Corrective Action Documents	CR-CNS-	2018-06235, 2018-06306, 2018-06320, 2018-06321, 2018-06666, 2019-03526, 2019-06302, 2019-06327, 2020-00847, 2020-00848, 2020-01617, 2020-02272	
	Corrective Action Documents Resulting from Inspection	CR-CNS-	2022-00617	
	Drawings	2006, Sheet 1	Flow Diagram Circulating, Screen Wash & Service Water System Cooper Nuclear Station	90
		2006, Sheet 3	Flow Diagram Circulating, Screen Wash & Service Water Systems Cooper Nuclear Station	59
		2006, Sheet 4	Flow Diagram Control Building Service Water System	64
		2036, Sheet 1	Flow Diagram Reactor Building Service Water System	A6
		2056	General Arrangement Intake Structure Plan and Sections	N16
		2077	Flow Diagram - Diesel Gen. [Generator] Bldg. [Building] Service Water, Starting Air, Fuel Oil, Sump System & Roof Drains Cooper Nuclear Station	80
		2120	Yard Circ. and Service Water Piping Plan and Sections	21
		2520	Civil Discharge Flume	3
4118, Sheet 1		Civil Intake Structure Guide Wall Plan, Sections, and Details Sheet 1	N08	
4118, Sheet 2		Civil Intake Structure Guide Wall Plan, Sections, and Details Sheet 2	2	
4118, Sheet 3	Intake Structure Replacement Guide Wall Elevation and	N01		

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			Sections	
		4118, Sheet 4	Intake Structure Replacement Guide Wall Sections	N01
		4118, Sheet 5	Intake Structure Replacement Guide Wall Details	N01
		43M1314A19	1314 CP Exchanger	1
		CNS-INTK-19 SH 1 of 2	River Bottom Elevation Data Plan Inspected April 14, 2000	N01
		CNS-INTK-19 SH 2 of 2	River Bottom Elevation Data Profile Inspected April 14, 2000	N01
		CNS-MISC-65	Turning Vanes at Intake Structure Guide Wall - Plan Layout and Details	N01
		KSV-47-8	Cooper Nuclear Station Diesel Generator 1 & 2 Cooling Water Schematic	N27
		KSV-47-9-NP	Jacket Water Schematic	08
	Miscellaneous	22A1259	General Electric Design Specification - Standby AC [Alternating Current] Power System	0
		VM-1778	Cooper Nuclear Station Vendor Manual, Standard XChange, ITT / American Heat Exchangers Composite Manual	4
	Procedures	2.2.3.2	System Operating Procedure - Service Water E-Bay Sediment Monitoring and Control	26
		2.2.65.1	System Operating Procedure - REC Operations	84
		2.2.71	System Operating Procedure - Service Water System	134
		3-EN-DC-316	Heat Exchanger Performance and Condition Monitoring	11C0
		3-EN-DC-340	Microbiologically Influenced Corrosion (MIC) Monitoring Program	5C0
		3.34	CNS Operations Manual, Engineering Procedure 3.34, Heat Exchanger Program Implementation	18
		3.48	CNS Operations Manual, Engineering Procedure 3.48, Service Water Program Implementation	2
		5.2SW	Emergency Procedure 5.2SW - Service Water Casualties	29
		6.1DG.101	Surveillance Procedure 6.1DG.101 Diesel Generator 31 Day Operability Test (IST) (DIV 1)	93
	6.2DG.101	Surveillance Procedure 6.2DG.101 Diesel Generator 31 Day Operability Test (IST) (DIV 2)	89	
	6.SW.102	CNS Operations Manual, Surveillance Procedure 6.SW.102,	51	

Inspection Procedure	Type	Designation	Description or Title	Revision or Date	
			Service Water System Post-LOCA [Loss of Cooling Accident] Flow Verification		
		6.SW.102	CNS Operations Manual, Surveillance Procedure 6.SW.102, Service Water System Post-LOCA [Loss of Cooling Accident] Flow Verification	52	
		7.2.42	Maintenance Procedure 7.2.42 Heat Exchanger Cleaning	32	
		7.2.42.3	Maintenance Procedure 7.2.42.3 Heat Exchanger Tube Plugging	23	
		EN-DC-184	NRC Generic Letter 89-13 Service Water Program	2C0	
	Self-Assessments	LO-2021-0201	2021 Ultimate Heat Sink Focused Self-Assessment	12/18/2021	
Work Orders	WO	5035073, 5166779, 5166780, 5210010, 5210344, 5211568, 5229716, 5233403, 5234761, 5237216, 5241993, 5245545, 5248994, 5252914, 5262049, 5265410, 5268929, 5273726, 5278419, 5336948			
71111.11Q	Miscellaneous		Simulator Scenario, Performance Mode 15	03/08/2022	
71111.12	Corrective Action Documents	CR-CNS-	2021-04902, 2021-05348		
	Miscellaneous		Adverse Condition Monitoring and Contingency Plan, Cycle 32 Fuel Defect	11/02/2021	
				Condition Analysis Template, 2021 Fuel Defect in Cell 14-39	
Work Orders	WO	5381826, 5419112, 5419282			
71111.13	Corrective Action Documents	CR-CNS-	2022-00376		
	Miscellaneous		Protected Equipment Tagout, RHWA-1-5383244 SW-P-BPA WK2202	01/11/2022	
				WW 2204 RHR B System Outage Plan Waiver	01/25/2022
		RHRB-1-RHR-SUBS-B WK2204	Protected Equipment Tagout	01/25/2022	
		RHWB-1-SW-P-BPD WK2204	Protected Equipment Tagout	01/25/2022	
	Procedures	0-CNS-WM-104	On-line Schedule Risk Assessment	12	
		0-CNS-WM-110	Significant On-line System Outages	5	
Work Orders	WO	5397758, 5398088, 5398132, 5398152			
71111.15	Corrective Action	CR-CNS-	2022-00074, 2022-00103, 2022-00264, 2022-00289, 2022-		

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
	Documents		00363, 2022-00387, 2022-00842, 2022-00871	
	Drawings	DWG 2077	Flow Diagram – Diesel Generator Building, Service Water, Starting Air, Fuel Oil, Sump System & Roof Drains	80
	Miscellaneous		Maintenance Rule (a)(1) Evaluation and Action Plan, NB-F05, Nuclear Fuel	2
			Maintenance Rule Function NB-F05 Performance Criteria Basis Document	3
		ODMI 2022-00289	Identified Diaphragm Leak on CRD-AO-CV127, 34-39 Scram Outlet Valve	
	VM-0045	Control Rod Drives	13	
	Procedures	0.41	Seismic Housekeeping	
Work Orders	WO	5433505		
71111.19	Corrective Action Documents	CR-CNS-	2021-05926, 2022-00948	
	Procedures	6.RCIC.102	RCIC IST and 92 Day Test	41
	Work Orders	WO	5339893, 5344843, 5383244, 5398088, 5430274	
71111.22	Procedures	6.1DG.101	Diesel Generator 31 Day Operability Test (IST) (DVI 1)	93
		6.1DG.401	Diesel Generator Fuel Oil Transfer Pump IST Flow Test	37
		6.CRD.301	Withdrawn Control Rod Operability IST Test	33
		6.HPCI.201	HPCI Valve Operability Test (IST)	32
	Work Orders	WO	5332022, 5332728, 5334478, 5397959	
71114.06	Miscellaneous	EPIPEALHOT	CNS EAL Wall Chart Hot	22
	Procedures	5.7.1	Emergency Classification	71
71151	Miscellaneous		MSPI Derivation Reports 1st Quarter 2021 thru 4th Quarter 2021	
			Operator Logs, 1st Quarter 2021 through 4th Quarter 2022	
	Procedures	0-EN-LI-114	Regulatory Performance Indicator Process	17C0