UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
1600 E. LAMAR BLVD
ARLINGTON, TX 76011-4511

October 3, 2017

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

SUBJECT: COOPER NUCLEAR STATION – NRC DESIGN BASES ASSURANCE INSPECTION (PROGRAMS) REPORT 05000298/2017007

Dear Mr. Dent:

On August 31, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Cooper Nuclear Station. NRC inspectors discussed the results of this inspection with Mr. J. Kalamaja, General Manager-Plant Operations, and other members of your staff. The results of this inspection are documented in the enclosed report.

No findings 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 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Thomas R. Farnholtz, Branch Chief
Engineering Branch 1
Division of Reactor Safety

Docket No. 50-298
License No. DPR-46

Enclosure:
Inspection Report 05000298/2017007
w/Attachment: Supplemental Information

cc: Electronic Distribution

U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket:	05000298
License:	DPR-46
Report Nos.:	05000298/2017007
Licensee:	Nebraska Public Power District
Facility:	Cooper Nuclear Station
Location:	72676 648A Ave Brownville, NE
Dates:	August 14 through August 31, 2017
Team Leader:	G. George, Senior Reactor Inspector, Engineering Branch 1
Inspectors:	R. Latta, Senior Reactor Inspector, Engineering Branch 1 W. Smith, Reactor Inspector, Engineering Branch 1
Approved By:	Thomas R. Farnholtz, Branch Chief Engineering Branch 1 Division of Reactor Safety

Enclosure

SUMMARY

IR 05000298/2017007; 08/14/2017 – 08/31/2017; COOPER NUCLEAR STATION; Inspection Procedure 7111121N, Design Bases Assurance (Programs)

This inspection was performed between August 14, 2017, and August 31, 2017, by three inspectors from the NRC's Region IV office. No findings were identified during this inspection. The significance of inspection findings is indicated by their color (Green, White, Yellow, or Red), which is determined using Inspection Manual Chapter 0609, "Significance Determination Process." Their cross-cutting aspects are determined using Inspection Manual Chapter 0310, "Aspects Within the Cross-Cutting Areas." Violations of NRC requirements are dispositioned in accordance with the NRC"s Enforcement Policy. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process."

No findings were identified.

REPORT DETAILS

1. REACTOR SAFETY

1R21N Design Basis Assurance Inspection (Programs) (71111.21N)

a. Inspection Scope

The inspection team performed an inspection as outlined in NRC Inspection Procedure 71111.21N, Attachment 1, "Environmental Qualification under 10 CFR 50.49 Programs, Processes, and Procedures." The team assessed Cooper Nuclear Station's implementation of the environmental qualification program as required by 10 CFR 50.49, "Environmental qualification of electric equipment important to safety for nuclear power plants." The team evaluated whether Cooper Nuclear Station staff properly maintained the environmental qualification of electrical equipment important to safety throughout plant life, established and maintained required environmental qualification documentation records, and implemented an effective corrective action program to identify and correct environmental qualification-related deficiencies.

The inspection included review of environmental qualification program procedures, component environmental qualification files, environmental qualification test records, equipment maintenance and operating history, maintenance and operating procedures, vendor documents, design documents, and calculations. The team interviewed program owners, engineers, maintenance staff, and warehouse staff. The team performed in-plant walkdowns (where accessible) to verify equipment was installed in its qualified configuration as described in Cooper Nuclear Station's environmental qualification component documentation files. Additionally, the team performed in-plant walkdowns to determine whether equipment surrounding the components could fail in a manner that could prevent the safety functions of the components and to verify that components located in areas susceptible to a high energy line break were properly evaluated for operation in a harsh environment. The team inspected the storage of replacement parts and associated procurement records to verify environmental qualification parts approved for installation in the plant were properly identified and controlled, and that storage and environmental conditions did not adversely affect the components' qualified lives. Documents reviewed for this inspection are listed in the attachment.

The inspection procedure requires the team to select 6 to 10 components to assess the adequacy of the environmental qualification program. The team selected 10 components for this inspection. Component samples selected for this inspection are listed below:

- CNS-0-PC-PENT-X101E, Electrical Cable Penetration, Imaging and Sensing Technology Type NY 10275

- CNS-0-MS-TS-123D, Main Steam Leak Detection Temperature Switch, EGS/Fenwal Model 01-170020-090

- CNS-1-EE-PNL-AA3, 125 V dc Electric Control Power Distribution Panel Board, General Electric Model QMR

- CNS-0-EE-PNL-CA, 125 V dc Electric Distribution Panel, Hatch Inc., Model V2B221LR

- CNS-1-SW-MO-MO89A, Service Water Discharge Valve Motor, Limitorque Model SMB-3

- CNS-2-NBI-PIS-52B, Reactor Pressure Switch, Barton Model 288A

- CNS-2-RHR-MOT-RHRP1D, Residual Heat Removal Pump D Motor, General Electric Model 5K6346XC74A/5K6339XXC185A

- CNS-1-MS-LMS-AO80CA, Main Steam Isolation Valve Open Indication Limit Switch, NAMCO Model EA180-32402

- CNS-1-RHR-MO-MO34A, Residual Heat Removal Torus Loop Inboard Throttle Valve Motor, Limitorque Model SMB-4

- CNS-2-EE-MCC-RB, 480 VAC Distribution Center, ITE Gould Model 9600

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA6 Meetings, Including Exit

Exit Meeting Summary

On August 31, 2017, the inspectors presented the inspection results to Mr. J. Kalamaja, General Manager, Plant Operations, and other members of the licensee staff. The licensee acknowledged the issues presented. The licensee confirmed that any proprietary information reviewed by the inspectors had been returned or destroyed.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

A. Able, Supervisor, Design Engineering
V. Balanskas, Director/Chief Engineer, Entergy Operations, Inc.
D. Buman, Director, Nuclear Safety Assurance
L. Dewhirst, Manager, Corrective Actions and Assessments
K. Dia, Director, Engineering
R. Dia, Supervisor, Design Engineering
R. Estrada, Program Manager, Nuclear Oversight
M. Ferguson, Supervisor, Materials Purchasing and Controls
J. Grauerholz, Administrative Assistant, Design Engineering
J. Houston, Manager, Production
C. Johnson, Engineer, Design Engineering
J. Kalamaja, General Manager, Plant Operations
D. Kirkpatrick, Leader, Performance Assessment, Quality Assurance
C. Pelchat, Manager, Nuclear Projects
K. Porter, Manager, Business Services
J. Reimers, Manager, System Engineering
J. Shaw, Manager, Licensing
P. Tetrick, Manager, Operations
K. Tom, Assistant to Director, Engineering
M. Unruh, Senior Engineer, Engineering Programs and Components
D. Van Der Kamp, Technical Specialist, Licensing
M. Van Winkle, Acting Manager, Design Engineering
J. Wilson, Engineer, Design Engineering
R. Wise, EQ Subject Matter Expert, Centech

NRC Personnel

C. Jewett, Acting Resident Inspector
P. Voss, Senior Resident Inspector

LIST OF DOCUMENTS REVIEWED

Calculations

Number	Title	Revision
EE-03-108	Basis for Environmental Conditions Used In The EQ Program Basis Document	3
EE-13-44	Electrical Bus Maintenance Outage Plans	0
NEDC-00-95C	High Energy Line Break (HELB) / Loss of Coolant Accident (LOCA) Inside Containment	1
NEDC-00-95D	HELB EQ-RB Temperature/Pressure	1
NEDC-03-12	Thermal Lag Analysis for EQ Equipment	2
NEDC-03-26	Radiation Qualification of EQ Equipment	2
NEDC-94-34C	USAR Cases E & F Containment Analysis	4
NEDC-94-34D	Small Steam Line Break (SSLB) Analysis	3

Design Change Packages

Number	Title	Revision Date
CED 2000-0194	Nutherm DC Starter Door Clip Replacement	October 24, 2000
EE 16-006	Reactor Building Sumps Acceptance Criteria an AO769 Operation	0

Procedures

Number	Title	Revision
0.19	Equipment Record and Functional Location File Program	31
14.15.5	Barton Differential Pressure Indicating Switch Calibration	7
1-EN-MP-112	Shelf Life Program	4C2
1-EN-MP-125	Control of Material	8C7

Procedures

Number	Title	Revision
1-EN-MP-131	Packaging and Labeling	3C4
3.12.1	Environmental Qualification Program Implementation	13
3.12.2	Environmental Qualification Data Package	23
3.12.3	Environmental Qualification Design Input File Control	12
3-EN-DC-115	Engineering Change Process	15C9
3-EN-DC-164	Environmental Qualification (EQ) Program	3C1
6.1RCIC.301	RCIC Steam Line High Flow Calibration Division 1	11
6.PCIS.601	Steam Line Break Detection Temperature Switch Calibration Test(Bath)	13
7.13.13	Motor Control Center Examination and Maintenance	23
7.3.25	NAMCO EA180 Series Limit Switch Installation and Removal	10
7.3.36	CNS Operations Manual – RHR And CS Motor Maintenance And Inspection	9
7.3.50.5	CNS Operations Manual – Limitorque MOV Maintenance	20
7.5.8	Limitorque Mechanical /Electrical Examination	17

Drawings

Number	Title	Revision
2024 SH 5	Radwaste Building HVAC Flow Diagram Chemistry Laboratories	02
2038 SH1	Flow Diagram Reactor Building Floor & Roof Drain Systems	N54
3007 SH 7	Auxiliary One Line Diagram Motor Control Centers E, Q, R, RB & Y	84
3031 SH 3	Control Elementary Diagrams Switch Development	49

Drawings

Number	Title	Revision
3040 SH 9	Control Elementary Diagrams	38
4399-04	1 Inch – 150 lb. Gate Valve, Socket Weld End, Motor Operated (SMB-000)	2509-3A
454006581	Elementary Diagram RCIC System	36
829-3	10 Inch – 300 lb. Gate Valve, Bolted Bonnet, Cast Carbon Steel, Motor Operator	NO 6
CNS-EQ-116 SH 1	EQ Configuration Detail NAMCO Limit Switch Series EA180	4
CNS-EQ-116 SH 2	EQ Configuration Detail Tabulation Sheet EA180 Series	2
CNS-EQ-122 SH 2	EQ Configuration Terminal Boxes and Equipment Enclosures	6
CNS-EQ-129	Cooper Nuclear Station, Limitorque – Valve Actuator, EQ Configuration Detail	N0 2

Vendor Technical Document

Number	Title	Revision Date
1025-VOL8-P3B2	Instructions for Application, Installation, and Set Point Testing of Patel/EGS Temperature Switches	August 10, 1994
VM-0290	ITE-Gould 480 Volt Motor Control Center	10
VM-1726	Barton Model 288A/290A&B – 288C/290D Differential Pressure Indicating Switches	3

Condition Reports (CR-CNS-)

2005-06142	2005-06143	2012-04809	2012-04978	2012-04985
2012-05365	2012-06467	2012-06760	2012-07114	2012-08163
2012-08223	2012-08637	2012-09630	2012-10044	2012-10160
2012-10616	2013-02427	2013-03442	2013-03454	2013-05313
2013-07463	2014-02432	2014-03024	2014-03246	2014-03380
2014-05601	2015-02051	2015-04871	2016-03999	2016-04219

Condition Reports (CR-CNS-)

2016-05500	2016-05501	2016-08026	2016-08338	

Condition Reports Generated During the Inspection (CR-CNS-)

2017-04983	2017-04993	2017-05007	2017-05038	2017-05040
2017-05118	2017-05146	2017-05152	2017-05276	2017-05309
2017-05310				

Work Orders (WO)

4410583	4470064	4655476	4816322	4816323
4905930	4919981	4921132	4921470	4922236
4949336	5075510	5090650	5147640	5156760
49211132				

Miscellaneous

Number	Title	Date
LO 2017-0084-003	2017 CNS EQ Self-Assessment Report	April 27, 2017
	Equipment Classification System Work Package for Radwaste, Non-essential	June 25, 1986

Environmental Qualification Design Inputs

Number	Title	Revision Date
B0058	Limitorque Valve Actuator Qualification For Nuclear Power Station Service	0
DI 0241	BWR Equipment Qualification - GE BWROG Reports QSR-111-A-05	October 1980
DI 1009	Letter to EDS Nuclear, Inc., Attn: Terry Bevers from Nebraska Public Power District	September 9, 1982
DI 1049	Record of Conversation GE Fusible Switch Non-Metallic Material Identification	September 16, 1982
DI 1050	Record of Conversation: GE QMR Panelboards	September 14, 1982

Environmental Qualification Design Inputs

Number	Title	Revision Date
DI 153	BWR Equipment Qualification Summary, Fenwal Temperature Switch	October 11, 1980
DI 2084	EDF Changes to THFP Disconnect Switch and QMR 221 Fused Disconnect Switch	March 23, 1984
DI 2142	GE Report NEDC-30294, Qualification Test Report	October 1983
DI 2221	Environmental Qualification Report for GE QMR Panelboards at Cooper Nuclear Station	0
DI 244	ITT Barton Seismic and Radiation Qualification Test Report	3
DI 2441	Evaluation of Isomedix Part 21 Notice RE: Dosimetry Accuracy	August 4, 1989
DI 2648	Test Report for Nuclear Environmental Qualification of Patel ½ Inch Electrical Connector	March 24, 1989
DI 2880	ITE-Gould 5600 and 9600 Motor Control Center Qualification Report	0
DI 2880	Walkdown Report for EQ Terminal Boxes and Condulets with Splices	1
DI 2962	Similarity Analysis/Qualification Summary for Modified Patel Temperature Switches	September 16, 1996
DI 2963	Procedure for Assembly, Potting, and Testing of Modified Patel Temperature Switches	September 16, 1996
DI 3200	Electrical Containment Penetration Assembly	0
DI 3203	Fax to NPPD – Cooper NPS from IST Conax Nuclear, Subject: IST-Conax Nuclear Electric Penetration Assembly, Ref. Drawing E-41468 Fax of 8-8-01	August 20, 2001
DI 3358	EGS Products Memorandum No. 99-QDC-2, Use of Heat Shrink Tubing as a Strain Relief on EGS QDC	October 7, 1999
DI 3393	Aging Data Extracted from System 1000 for EQDP.4.142DOR, GE QMR Panelboards, Material # 383, 449, 1866, 829, 785, 578, and 808	0
Engineering Order No. 600198	Test of Limitorque Valve Operator, Model SMB-0, to Meet Requirements of an Electric Valve Actuator in Nuclear Reactor Containment Environment	January 2, 1996

Environmental Qualification Data Packages

Number	Title	Revision
EQDP 2.129 DOR	Environmental Qualification Data Package For SB and SMB Series Valve Actuators With Class H/RH 460V Reliance or Peerless Motors	9
EQDP.1.128 DOR	4000V RHR and CS Pump Motors, Model Number 5K6346XC74 (RHR) and 5K6346XC83A (CS)	6
EQDP.1.154	125V DC, Hatch, Incorporated, 125 V DC ITE Panelboard (Siemens/ITE, Type V2B221LR Switches)	3
EQDP.1.196DOR	Environmental Qualification Data Package ITE-Gould Motor Control Center Model 5600	9
EQDP.1.198	4000V RHR Pump Motor, General Electric, Model Number 5K6339XC185A	6
EQDP.1.199	4000V RHR Pump Motor, General Electric, Model Number 5K6346XC74A	5
EQDP.2.101DOR	Environmental Qualification Data Package ITT Barton Pressure Switch Models 288	6
EQDP.2.113	Steam Leak Detection Temperature Switch, EGS/Fenwal, 01-170020-090 and 01-170230-090 as modified by MP 91-114	5
EQDP.2.116	Environmental Qualification Data Package NAMCO Limit Switch (Containment Applications) Model EA180	4
EQDP.4.142DOR	Panel Boards, General Electric, QMR Panel Boards	6
EQDP.4.153DOR	Electrical Termination for EGS/Patel SLD Temperature Switches, PVC Sleeved STA-KON 250 Series Disconnects, Alpha Wire Corp/NATVAR Corp/Thomas & Betts	3
EQDP.4.163	Low Voltage Electrical Penetration Assembly, Imaging and Sensing Technology(IST), N/A, Serial No. 913501	3

Material Specification Sheets

Number	Title
2022345	(EQ) Rotor, Limit Switch, Black Fiberite, For All Sizes of Limitorque Operators

Material Specification Sheets

Number	Title
2035232	(EQ) Grease – Long Life, Grade 1
2047511	Kit, Gasket, and Seal, for SMB-00 Actuator
2059301	(EQ) Switch, Torque, Fiberite, For SMB, Limitorque Operators, with 1/8 In., Shear Proof Pins
2066556	(EQ) Actuator, Limitorque SMB-3, Without Motor
2098001	(EQ) Tubing – Heat Shrink, Range .11 IN to .23 IN (Raychem)
4003059	(EQ) Assembly, Fingerbase, Fiberite, For 2 Train Geared Limit Switch, Rotor Type
4003079	O-Ring, Viton, Limit Switch, Cartridge For SMB-000
4021672	(EQ) Motor, 200 Ft.-Lb., 460 Volt AC, 1800 RPM

COOPER NUCLEAR STATION – NRC DESIGN BASES ASSURANCE INSPECTION (PROGRAMS) REPORT 05000298/2017007 – October 3, 2017

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