



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

May 8, 2018

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

SUBJECT: COOPER NUCLEAR STATION – NRC INTEGRATED INSPECTION REPORT
05000298/2018001

Dear Mr. Dent:

On March 31, 2018, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Cooper Nuclear Station. On April 16, 2018, the 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 NRC-identified or self-revealed findings were identified during this inspection.

However, inspectors documented a licensee-identified violation, which was determined to be of very low safety significance, in this report. The NRC is treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2.a of the Enforcement Policy.

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/

Jason Kozal, Chief
Project Branch C
Division of Reactor Projects

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

Enclosure:
Inspection Report 05000298/2018001
w/ Attachments:
1. Documents Reviewed
2. NRC Request for Information
3. Occupational Radiation Safety Inspection
Request for Information

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

Docket Number: 05000298

License Number: DPR-46

Report Number: 05000298/2018001

Enterprise Identifier: I-2018-001-0003

Licensee: Nebraska Public Power District

Facility: Cooper Nuclear Station

Location: 72676 648A Ave
Brownville, NE

Inspection Dates: January 1, 2018 to March 31, 2018

Inspectors: P. Voss, Senior Resident Inspector
R. Kumana, Acting Senior Resident Inspector
M. Stafford, Resident Inspector
P. Elkmann, Senior Emergency Preparedness Inspector
S. Money, Health Physicist
J. O'Donnell, CHP, Health Physicist

Approved By: J. Kozal, Branch Chief

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. A licensee-identified, non-cited violation is documented in report Section 71152.

No findings were identified.

PLANT STATUS

Cooper Nuclear Station began the inspection period at rated thermal power. On February 16, 2018, the licensee reduced power to 36 percent in order to enter single loop operation to perform maintenance on reactor recirculation motor generator B, repair condenser leaks, perform maintenance on control rod drives, and tune a reactor recirculation system motor generator set. The licensee restored power to 100 percent on February 18, 2018. On March 11, 2018, the licensee performed a normal shutdown to repair a reactor coolant leak inside the drywell. The licensee restarted the reactor on March 16, 2018, and resumed full power operation on March 19, 2018. The licensee maintained full power for the remainder of the reporting period, except for minor reductions in power to support scheduled surveillances and rod pattern adjustments.

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 plant status activities described in IMC 2515, Appendix D, "Plant Status," and conducted routine reviews using IP 71152, "Problem Identification and Resolution." 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

Seasonal Extreme Weather (1 Sample)

The inspectors evaluated readiness for seasonal extreme weather conditions prior to the onset of seasonal cold temperatures.

Impending Severe Weather (1 Sample)

The inspectors evaluated readiness for impending adverse weather conditions for a winter weather advisory on January 10, 2018.

71111.04 - Equipment Alignment

Partial Walkdown (4 Samples)

The inspectors evaluated system configurations during partial walkdowns of the following systems/trains:

- (1) Division 2 residual heat removal during service water booster pump A replacement on January 12, 2018
- (2) Division 2 reactor equipment cooling during Division 1 reactor equipment cooling

maintenance window on January 31, 2018

- (3) Emergency diesel generator 2 lube oil during emergency diesel generator 1 work window on February 7, 2017
- (4) Emergency diesel generator 1 starting air during emergency diesel generator 2 work window on March 22, 2018

71111.05AQ - Fire Protection Annual/Quarterly

Quarterly Inspection (4 Samples)

The inspectors evaluated fire protection program implementation in the following selected areas:

- (1) Reactor building 931 foot elevation, Fire Area RB-M, Zones 3C and 3D on January 31, 2018
- (2) Emergency diesel generator 1, Fire Area DG-A, Zone 14A on February 26, 2018
- (3) Condensate pump area, turbine building 882 foot elevation, Fire Area TB-A, Zone 11J on March 20, 2018
- (4) Emergency diesel generator 2, Fire Area DG-B, Zone 14B on March 26, 2018

71111.06 - Flood Protection Measures

Internal Flooding (1 Sample)

The inspectors evaluated internal flooding mitigation protections in the reactor building 931 foot elevation, reactor equipment cooling heat exchanger area on February 22, 2018.

71111.07 - Heat Sink Performance

Heat Sink (1 Sample)

The inspectors evaluated a residual heat removal heat exchanger thermal performance test on January 17, 2018.

71111.11 - Licensed Operator Requalification Program and Licensed Operator Performance

Operator Requalification (1 Sample)

The inspectors observed and evaluated a licensed operator requalification scenario in the simulator on January 23, 2018.

Operator Performance (1 Sample)

The inspectors observed and evaluated the quarterly downpower, including entry into single loop operations, power reduction to 45 percent, and planned trip of reactor recirculation motor generator set B and the associated pre-job briefs on February 17, 2018.

71111.12 - Maintenance Effectiveness

Routine Maintenance Effectiveness (1 Sample)

The inspectors evaluated the effectiveness of routine maintenance activities associated with the following equipment and/or safety significant functions:

- (1) Emergency diesel generator 2 system a(1) evaluation due to exceeding performance criteria on March 9, 2018

71111.13 - Maintenance Risk Assessments and Emergent Work Control (7 Samples)

The inspectors evaluated the risk assessments for the following planned and emergent work activities:

- (1) Service water booster pump A replacement on January 9, 2018
- (2) Service water booster pump D maintenance window on January 17, 2018
- (3) Emergent service water valve maintenance due to reactor equipment cooling heat exchanger B leakage on January 29, 2018
- (4) Emergency diesel generator 1 work window on February 6, 2018
- (5) Reactor recirculation motor generator set maintenance and single loop operation on February 17, 2018
- (6) Emergent steam leak repair affecting high pressure coolant injection on March 8, 2018
- (7) Emergency diesel generator 2 work window on March 23, 2018

71111.15 - Operability Determinations and Functionality Assessments (4 Samples)

The inspectors evaluated the following operability determinations and functionality assessments:

- (1) Jet pump 12 differential pressure reading step change on January 22, 2018
- (2) Reactor equipment cooling heat exchanger outlet valve SW-MO-651 indications of potential leak path on January 22, 2018
- (3) Scram discharge volume shielding evaluation on January 25, 2018
- (4) Emergency diesel generator 2 field flash resistor insulation issue and extent of condition for emergency diesel generator 1 on March 23, 2018

71111.18 - Plant Modifications (1 Sample)

The inspectors evaluated the following temporary or permanent modifications:

- (1) Reactor equipment cooling heat exchanger B, SW-V-126 temporary flange on February 5, 2018

71111.19 - Post Maintenance Testing (5 Samples)

The inspectors evaluated the following post maintenance tests:

- (1) Service water booster pump A replacement on January 16, 2018
- (2) Post maintenance test for emergency diesel generator 1 system maintenance on February 20, 2018
- (3) South west residual heat removal quad fan coil unit maintenance on February 23, 2018
- (4) Unplanned service water valve maintenance due to reactor equipment cooling heat exchanger B leakage on February 26, 2018
- (5) Post maintenance test for emergency diesel generator 2 system maintenance on March 23, 2018

71111.20 - Refueling and Other Outage Activities (1 Sample)

The inspectors evaluated forced outage activities due to reactor coolant system leakage from March 12, 2018, to March 16, 2018.

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

Routine (2 Samples)

- (1) Emergency diesel generator 1, 31-day operability test on January 8, 2018
- (2) Reactor recirculation motor generator set B surveillance testing on February 17, 2018

In-service (1 Sample)

- (1) Reactor core isolation cooling quarterly in-service surveillance test on March 29, 2018

Reactor Coolant System Leak Detection (1 Sample)

- (1) Drywell unidentified leakage integrator functional test and calibration on February 20, 2018

71114.04 - Emergency Action Level and Emergency Plan Changes (2 Samples)

The inspector evaluated two submitted Emergency Action Level and Emergency Plan changes in-office on January 30, 2018, and March 12, 2018. This evaluation does not constitute NRC approval.

71114.06 - Drill Evaluation

Drill/Training Evolution (1 Sample)

The inspectors evaluated the licensed operator training scenario in the simulator control room on January 23, 2018.

RADIATION SAFETY

71124.02 - Occupational As Low As Reasonably Achievable (ALARA) Planning and Controls

Radiological Work Planning (1 Sample)

The inspectors evaluated the licensee's radiological work planning by reviewing the following activities:

- (1) 2016-01, refueling outage 29 control rod drive mechanism replacements
- (2) 2016-03, reactor water cleanup pump B replace power frame
- (3) 2016-05, RE-29 refuel floor activities
- (4) 2016-12, RE-29, in-service inspection and flow accelerated corrosion exams
- (5) 2016-23, reactor recirculation pump A motor, impeller, and seal
- (6) 2017-01, spent fuel pool clean-up project (Online)

Verification of Dose Estimates and Exposure Tracking Systems (1 Sample)

The inspectors evaluated dose estimates and exposure tracking.

71124.04 - Occupational Dose Assessment

Source Term Characterization (1 Sample)

The inspectors evaluated the licensee's source term characterization.

External Dosimetry (1 Sample)

The inspectors evaluated the licensee's external dosimetry program.

Internal Dosimetry (1 Sample)

The inspectors evaluated the licensee's internal dosimetry program.

Special Dosimetric Situations (1 Sample)

The inspectors evaluated the licensee's performance for special dosimetric situations.

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below.
(2 Samples)

- (1) IE01: Unplanned Scrams per 7000 Critical Hours Sample (January 1, 2017, through December 31, 2017)
- (2) IE03: Unplanned Power Changes per 7000 Critical Hours Sample (January 1, 2017, through December 31, 2017)

71152 - Problem Identification and Resolution

Annual Follow-up of Selected Issues (1 Sample)

The inspectors reviewed the licensee's implementation of its corrective action program related to the following issues:

- (1) Both emergency diesel generators declared inoperable due to light bulb socket deficiencies

71153 - Follow-up of Events and Notices of Enforcement Discretion

Events (1 Sample)

The inspectors evaluated the failure of the primary alert and notification system and the licensee's response on March 16, 2018.

INSPECTION RESULTS

Licensee Identified Non-Cited Violation	71152
<p>This violation of very low safety significance was identified by the licensee and has been entered into the licensee corrective action program and is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.</p>	
<p>Violation: Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that for those systems, structures, and components to which this appendix applies, "Design control measures shall provide for verifying or checking the adequacy of design."</p> <p>Contrary to the above, between September 2003, and December 19, 2017, the licensee failed to verify or check the adequacy of design of quality-related components associated with the Division 1 and 2 emergency diesel generator 125 Vdc control power circuits. Specifically, in 2003, the licensee modified the design of the control power circuit through Part Evaluation (PE) 4222806 and replaced 24 original light bulb lamp assemblies with a different style of light bulb and a carbon film dropping resistor (vs. the original wire-wound design). This change created an unrecognized vulnerability that left the affected portions of the circuit with dropping resistors that provided insufficient protection from shorting due to indication light bulb failures. As a result, on December 19, 2017, the licensee declared both emergency diesel generators inoperable due to the design vulnerability.</p> <p>Significance/Severity Level: The finding created a design vulnerability in the emergency diesel generator control power circuits, and resulted in the Division 1 and 2 emergency diesel generators being declared inoperable at the time of discovery. Although the emergency diesel generators were declared inoperable, subsequent licensee analysis determined that the system retained its function, and maintained a reasonable expectation of operability while the design deficiencies existed. Accordingly, the inspectors assessed the significance of this finding in accordance with Inspection Manual Chapter 0609, Appendix A, "The Significance Determination Process (SDP) for Findings at Power," dated June 19, 2012, and determined this finding was of very low safety significance (Green) because it was a deficiency affecting the design or qualification of a mitigating structure, system, or component (SSC), but the SSC maintained its operability.</p> <p>Corrective Action Reference(s): Immediate corrective actions included compensatory measures to remove light bulbs from the vulnerable lamp assemblies in order to eliminate the shorting hazard. This issue was entered into the licensee's corrective action program as Condition Report CR-CNS-2017-07513, and the licensee initiated a root cause evaluation.</p>	

EXIT MEETINGS AND DEBRIEFS

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

On February 15, 2018, the inspectors presented the occupational radiation protection inspection results to Mr. J. Dent, Jr., Site Vice President and Chief Nuclear Officer, and other members of the licensee staff.

On March 12, 2018, the inspectors presented the results of the inspection of changes to the Cooper Nuclear Station emergency plan and emergency action levels to Mr. J. Stough, Manager, Emergency Preparedness, and other members of the licensee staff.

On April 16, 2018, the inspectors presented the quarterly resident inspector inspection results to Mr. J. Kalamaja, General Manager Plant Operations, and other members of the licensee staff.

DOCUMENTS REVIEWED

71111.01 - Adverse Weather Protection

Miscellaneous Documents

<u>Title</u>	<u>Date</u>
CNS Winter Weather Plan	January 10, 2018
List of Surveillance Procedures With Drop Dead Dates in the Next 5 Days	January 10, 2018

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
2.1.11.1	Turbine Building Data	162
2.1.11.3	Radwaste and Augmented Radwaste Building Data	103
2.1.14	Seasonal Weather Preparations	30
5.1WEATHER	Operation During Weather Watches and Warnings	19

Condition Reports (CR-CNS-)

2018-00004	2018-00198	2018-00263	2018-00284
2018-00621	2018-00744		

71111.04 - Equipment Alignment

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
KSV46-5	Lube Oil Schematic	26

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
	SWBP A Replacement Protected Equipment Program Tracking Form	January 8, 2018
2031	Flow Diagram – Reactor Building – Closed Cooling Water System, Sheet 2	N65
2040	Flow Diagram – Residual Heat Removal System Loop “B”, Sheet 2	19
2077	Flow Diagram – Diesel Gen. Bldg. Service Water, Starting Air, Fuel Oil, Sump System & Roof Drains	N78

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
VM-0245	Cooper Bessemer Diesel Generator Vendor Manual	

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
2.2A.DG.DIV1	Standby AC Power System (Diesel Generator) Component Checklist (DIV 1)	7
2.2A.DG.DIV2	Standby AC Power System (Diesel Generator) Component Checklist (DIV 2)	7
2.2A.REC.DIV2	Reactor Equipment Cooling Water System Component Checklist (DIV 2)	1
2.2A.REC.DIV3	Reactor Equipment Cooling Water System Common Divisional Component Checklist	2
2.2A.RHR.DIV2	Residual Heat Removal System Component Checklist	12
2.2B.DG.DIV2	Standby AC Power System (Diesel Generator) Instrument Valve Checklist (DIV 2)	0
2.2B.REC.DIV2	Reactor Equipment Cooling Water System Instrument Valve Checklist (DIV 2)	0

Condition Reports (CR-CNS-)

2018-01676 2018-01683

Work Orders

5145546 5167608 5201413

71111.05 - Fire Protection

Drawings

CNS-FP-218 CNS-FP-236 CNS-FP-237 CNS-FP-245

Miscellaneous Documents

<u>Number</u>	<u>Title</u>
18-0006	Transient Combustible Permit
BCP-2017-0228	Barrier Control Permit
BCP-2018-0025	Barrier Control Permit

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
0-BARRIER-MAPS	Barrier Maps	9
0-BARRIER-MISC	Miscellaneous Buildings	5
0-BARRIER-REACTOR	Reactor Building	13
0-BARRIER-TURBINE	Turbine Building	7
0.23	CNS Fire Protection Plan	78
2.3.1	General Alarm Procedure	66
15.FP.309	Fire Protection Manual Pull Station Functional Test	12

Condition Reports (CR-CNS-)

2018-01616	2018-01625	2018-01774	2018-01782
2018-01793	2018-01823		

Work Orders

5167486	5231480
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71111.06 - Flood Protection Measures

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision</u>
BCP-2017-0238	Barrier Control Permit	
NEDC 09-102	Internal Flooding – HELB, MELB, and Feedwater Line Break	2

Work Orders

5167308	5167485
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71111.07 - Heat Sink Performance

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
7.2.42.3	Heat Exchanger Tube Plugging	17

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
13.17.2	Thermal Performance Test Procedure for Residual Heat Removal Heat Exchangers	16

Condition Reports (CR-CNS-)

2018-00321

71111.11 - Licensed Operator Requalification Program and Licensed Operator Performance

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
	2018 1 st Quarter Downpower; Just In Time Training Initiation Form	January 14, 2018
	DEP Performance Evaluation and Data Collection Form – Scenario SKL052-52-17	January 23, 2018
	Operations Pre-job Brief – Single Loop Operation Evolution	February 16, 2018
EPIP 5.7.1	Emergency Classification	59
EPIP 5.7.2	Emergency Director EPIP	35
SKL052-52-17	Licensed Operator Requalification Exam Scenario 17	January 3, 2018

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
2.1.10	Station Power Changes	114
2.2.68.1	Reactor Recirculation System Operations	82
2.4RR	Reactor Recirculation Abnormal	42

Condition Reports (CR-CNS-)

2018-00892	2018-00896	2018-00898	2018-00914
2018-00919	2018-00921		

71111.12 - Maintenance Effectiveness

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision</u>
DG-PF01	Maintenance Rule Function DG-PF01 Performance Criteria Basis Document	5
DGHV-PF04	Maintenance Rule Function DGHV-PF04 Performance Criteria Basis Document	2
DGSA-PF01	Maintenance Rule Function DGSA-PF01 Performance Criteria Basis Document	3

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
3-EN-DC-204	Maintenance Rule Scope and Basis	3C1
3-EN-DC-206	Maintenance Rule (a)(1) Process	3C2
7.3.1.19	GE IJCV-51A/IFCV-51AD Overcurrent Relay Testing and Maintenance	4

Condition Reports (CR-CNS-)

2000-02070	2015-06608	2016-00141	2016-03335
2017-00551	2017-01168	2017-02533	2017-02538
2017-04451	2017-05821	2017-06408	2018-00685
2018-00832			

Work Orders

5115005

71111.13 - Maintenance Risk Assessments and Emergent Work Control

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
	DG2 LCO Protected Equipment Program Tracking Form	March 22, 2018
	Div 1 DG Maintenance Window Protected Equipment Program Tracking Form	February 6, 2018
	Remain in Service List for Div 1 DG Work Window	
	SW-MOV-651 Maintenance Protected Equipment Program Tracking Form	January 20, 2018

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
	SWBP A Replacement Protected Equipment Program Tracking Form	January 8, 2018
	SWBP D Maintenance Window Protected Equipment Program Tracking Form	January 16, 2018
11-198	Cooper Nuclear Station Service Water System Analysis	1

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
0-CNS-WM-104	On-Line Schedule Risk Assessment	4
0-CNS-WM-104A	On-Line Fire Risk Management Actions	3
0-PROTECT-EQP	Protected Equipment Program	39
2.1.1	Startup Procedure	190
2.1.10	Station Power Changes	114
2.1.4.3	Power Reduction to <25/30%	18
2.2.68.1	Reactor Recirculation System Operations	82
2.2.71	Service Water System	122
2.3_A-4	Annunciator Response Procedure – Panel A-4	44
7.0.1.7	Troubleshooting Plant Equipment	15

Condition Reports (CR-CNS-)

2018-00138	2018-00291	2018-00292	2018-00328
2018-00341	2018-00342	2018-00352	2018-00371
2018-00375	2018-00376	2018-00377	2018-00461
2018-00541	2018-00657	2018-00658	2018-01597
2018-01649			

Work Orders

5145546	5167094	5167469	5167606	5175025
5201054	5201413	5203083	5213083	5231297

71111.15 - Operability Determinations and Functionality Assessments

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision</u>
	CNS Inservice Testing Basis Document	11
	Failure Modes and Effects Analysis – SW-TE-387B Indicated Flow with SW-MOV-651MV Closed	1
2036	Reactor Building Service Water System, Sheet 1	A3
2036	Control Building Service Water System, Sheet 4	80
PAD 121987	Process Applicability Determination for Isolation of REC Division 2 SW Flow Path	1

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
6.2SW.101	Service Water Surveillance Operation, Div 2 (IST)	53

Condition Reports (CR-CNS-)

2017-03717	2017-05742	2017-05797	2017-05819
2017-06869	2018-00007	2018-00122	2018-00142
2018-00182	2018-00299	2018-00342	2018-00354
2018-00362	2018-00459	2018-00461	2018-00538
2018-01621	2018-01644	2018-01651	

Work Orders

5206535

71111.18 - Plant Modifications

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
2036	Reactor Building Service Water System, Sheet 1	A3
2036	Control Building Service Water System, Sheet 4	80
EE 2013-04	RHR SWBP FCU 50.59 Inadequate for USAR Change LCR 93-10	0
LCR 93-0010	Specify a Summer Design Temperature of 131°F for the RHR SWBP Room	February 5, 1993

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
NEDC 92-063	Maximum SWBP Room Temperatures w/ No Cooling From Control Bldg HVAC	1
NEDC 92-064	Transient Temperature Rise in SWBP Room After Loss of Cooling	3C2
PAD 121987	Process Applicability Determination for Isolation of REC Division 2 SW Flow Path	1
TCC-5231919	Temporary Configuration Change – Replacement of SW-V-126 With Blind Flange Spool Piece	0
UCR 98-019	USAR Change Request: SWBP Fan Coil Unit Description Removal	April 28, 1998

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
2.2.71	Service Water System	122
2.3_R-1	Panel R – Annunciator R-1	17, 18
7.3.50.4	SW-650MV and SW-651MV Flow Adjustment	6

Condition Reports (CR-CNS-)

2017-06120	2017-06196	2017-06241	2017-07601
2018-00342	2018-00362	2018-00461	

Work Orders

5231297	5231480	5232377
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71111.19 - Post-Maintenance Testing

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
454223426	Emergency Diesel Generator Composite Control Air Schematic	9

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision</u>
11445276	Notification	
IST RAL	IST Reference/Acceptance Limits Data File	246

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
2.2.20.1	Diesel Generator Operations	69, 70
6.1DG.101	Diesel Generator 31 Day Operability Test (IST)(DIV 1)	88
6.1HV.602	Air Flow Test of Fan Coil Unit HV-DG-1C (DIV 1)	9
6.1SWBP.101	RHR Service Water Booster Pump Flow Test and Valve Operability Test (DIV 1)	30
6.2HV.603	Air Flow Test of Fan Coil Unit for FC-R-1H (Div 2)	3
6.2SW.101	Service Water Surveillance Operation Div 2 (IST)	53
6.SW.102	Service Water System Post-LOCA Flow Verification	49
7.0.5	CNS Post-Maintenance Testing	55
7.0.8.1	System Leakage Testing	25
7.3.50.4	SW-650MV and SW-651MV Flow Adjustment	6
14.17.1	DG-1 Annual Calibration	38
14.28.1	Service Water System Instrument Calibration	52

Condition Reports (CR-CNS-)

2016-07426	2018-00388	2018-00342	2018-00425
2018-00461	2018-00521	2018-00711	2018-00715
2018-00751	2018-00765	2018-01714	2018-01715

Work Orders

4832440	5145546	5145577	5167078	5167385
5167606	5167617	5169763	5169764	5169985
5184976	5188894	5201054	5201413	5231297
5231480				

71111.20 - Refueling and Other Outage Activities

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
2.1.4	Normal Shutdown	157
6.RCS.601	Technical Specification Monitoring of RCS Heatup/Cooldown Rate	23

71111.22 - Surveillance Testing

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
	List of Drywell Possible Leak Sources	January 23, 2018
	Summary of Primary Containment Sample Results for Current Fuel Cycle	February 2, 2018
EC 18-003	6.LOG.601 Revision to Address Effects of Voiding on Drywell Floor Drain Sump Flow Indication	0, 1

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
6.DWLD.301	Drywell Floor Drain Sump Flow Measuring System Functional Test	7
6.DWLD.302	Drywell Floor Drain Sump 1F Flow Loop Channel Calibration	15
6.LOG.601	Daily Surveillance Log – Modes 1, 2, and 3	130, 131, 132
6.RCIC.102	RCIC IST and 92 Day Test	35
6.RR.601B	RRMG B Positioner Maintenance and Setting Electrical and Mechanical Stops	12
6.1DG.101	Diesel Generator 31 Day Operability Test (IST)(DIV 1)	88
15.SUMP.101	Sump Pump Operability Test	26
EN-OP-109	Drywell Leakage	2

Condition Reports (CR-CNS-)

2012-07093	2017-06119	2017-06820	2018-00123
2018-00127	2018-00310	2018-00336	2018-00340
2018-00436	2018-00905	2018-00907	

Work Orders

5047898	5099572	5101207	5103351	5114307
5115900	5123387	5167175	5177984	5190520
5231292				

71114.04 - Emergency Action Level and Emergency Plan Changes

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision</u>
	Cooper Nuclear Station Emergency Plan	70
EPIP 5.7.1	Emergency Classification	59

71114.06 - Drill Evaluation

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
	DEP Performance Evaluation and Data Collection Form – Scenario SKL052-52-17	January 23, 2018
EPIP 5.7.1	Emergency Classification	59
EPIP 5.7.2	Emergency Director EPIP	35
SKL052-52-17	Licensed Operator Requalification Exam Scenario 17	January 3, 2018

71124.02 - Occupational ALARA Planning and Controls

ALARA Committee Meeting Minutes

<u>Meeting</u>	<u>Title</u>	<u>Date</u>
February	Meeting Minutes	February 2017
August	Meeting Minutes	August 2017
October	Meeting Minutes	October 2017
December	Meeting Minutes	December 2017

ALARA Planning, In-Progress Reviews, and Post-Job Reviews

<u>Number</u>	<u>Title</u>	<u>Date</u>
2016-01	RE29 CRDM Replacements	November 5, 2016
2016-03	RWCU Pump “B” Replace Power Frame	June 8, 2016
2016-05	RE-29 Refuel Floor Activities	November 5, 2016
2016-12	RE29, ISI and FAC Exams	December 14, 2016

ALARA Planning, In-Progress Reviews, and Post-Job Reviews

<u>Number</u>	<u>Title</u>	<u>Date</u>
2016-23	RR-A Motor, Impeller and Seal	November 6, 2016
2017-01	Spent Fuel Pool Clean-Up Project (Online)	December 11, 2017

Audits and Self-Assessments

<u>Number</u>	<u>Title</u>	<u>Date</u>
LO-2017-0204	Focused Self-Assessment: Occupational ALARA Planning and Controls	December 1, 2017

Miscellaneous Documents

Title

5-Year CRE Reduction Plan (2018-2022)
RE29 Radiological Post Outage Report
2017 Cooper Nuclear Station ALARA Program

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
9.ALARA.4	Radiation Work Permits	23
9.ALARA.8	ALARA Document Control	1
9.EN-RP-110	ALARA Program	10
9.EN-RP-110-03	Collective Radiation Exposure (CRE) Reduction Guidelines	2
9.EN-RP-110-04	Radiation Protection Risk Assessment Process	12
9.EN-RP-110-05	ALARA Planning and Controls	5
9.EN-RP-110-06	Outage Dose Estimating and Tracking	0

Radiation Work Permits

<u>Number</u>	<u>Title</u>	<u>Revision</u>
2016-014	Refuel Floor Activities	01
2016-055	RWCU-P-B Replacement and RWCU-CV11 Inspection	00
2016-060	Refuel Floor General SWP Work	01
2016-406	CRDMs Support – Support Work – RWP (NO ENTRY ALLOWED INTO AN AREA POSTED SWP)	00

Radiation Work Permits

<u>Number</u>	<u>Title</u>	<u>Revision</u>
2016-506	Under vessel CRDMs Change outs Also Keyway Worker and RP Under vessel Coverage	00
2016-523	RR-A Motor and Impeller Replacement in RE29 - SWP	00
2017-107	2017 SFP Cleanup	01

Condition Reports (CR-CNS-)

2016-06415	2016-06567	2016-07197	2016-08576
2017-02319	2017-04201	2017-04896	2017-04899
2017-05538	2017-06603		

71124.04 - Occupational Dose Assessment

Audits and Self-Assessments

<u>Number</u>	<u>Title</u>	<u>Date</u>
	Radiation Protection Program Annual Report	2016
16-05	QA Audit of Radiological Controls	August 10, 2016
LO-2017-0204	Focused Self-Assessment: Occupational Dose Assessment	December 1, 2017

Miscellaneous Documents

<u>Title</u>	<u>Date</u>
2016 DAW Part 61 Analysis	March 29, 2017
100555-0 National Voluntary Laboratory Accreditation Program (NVLAP) Certificate for Mirion Technologies	July 1, 2017
Internal Dose Assessment Prospectus	2017
Internal Dose Assessment Prospectus	2018
Multiplication Factor for the Merlin Gerin DMC 2000S (White Paper)	March 22, 2012

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
9.ALARA.1	Personnel Dosimetry and Occupational Radiation Exposure	47
9.ALARA.13	Radiation Worker and Tour Group Dosimetry Management	24

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
9.EN-RP-102	Radiological Control	3
9.EN-RP-104	Personnel Contamination	16
9.EN-RP-110-05	ALARA Planning and Controls	5
9.EN-RP-122	Alpha Monitoring	4
9.EN-RP-203	Dose Assessment	10
9.EN-RP-205	Prenatal Monitoring	1
9.EN-RP-206	Dosimeter of Legal Record Quality Assurance	5
9.EN-RP-208	Whole Body Counting and In-Vitro Bioassay	4
9.EN-RP-210	Area Monitoring Program	1
9.EN-RP-311	Self-Reading Dosimeters	5
9.RADOP.1	Radiation Protection at CNS	14
9.RADOP.5	Airborne Radioactivity Sampling	30

Condition Reports (CR-CNS-)

2016-01718	2016-04881	2016-07077	2017-04996
2017-05538			

71151 - Performance Indicator Verification

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EN-LI-114	Performance Indicator Process	5C2

71152 – Problem Identification and Resolution

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
3059	EE-PNL-DG1 125VDC Load & Fuse Schedule, Sheet 11	11
3059	EE-PNL-DG2 125VDC Load & Fuse Schedule, Sheet 12	12
EE 2018-001	Characterization of Potential Risk of EDG Indicating Light Failure	0, 1
G5-262-743	Emergency Diesel Generator #1 Electrical Schematic Sheet 1	26

Miscellaneous Documents

<u>Number</u>	<u>Title</u>	<u>Revision/Date</u>
G5-262-743	Emergency Diesel Generator #2 Electrical Schematic Sheet 1	20
NPP-61852	Failure Analysis of a Lamp Assembly	November 27, 2017
PAD 121981	Process Applicability Determination – Caution Order: DG-1-DG-SW-DG2(43CM) Green Ind	0
PAD 121982	Process Applicability Determination – Caution Order: DG-1-DG #1 Bulb Control	0

Condition Reports (CR-CNS-)

2017-01168	2017-05434	2017-05456	2017-06219
2017-07078	2017-07513	2018-00124	2018-00125
2018-00685	2018-00832	2018-01281	

Work Orders

5226885

71153 - Follow-up of Events and Notices of Enforcement Discretion

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
2.0.5	Reports to NRC Operations Center	48

NRC Request for Information

System: Emergency Diesel Generators, Divisions 1 and 2

CD Date Requested by: January 2, 2018

Date Range of Document Request: December 31, 2015 - Current

Please provide the following documents:

1. Copies of all root and apparent cause evaluations performed on this system.
2. Summary list of all condition reports written on this system, sorted by CR classification
3. List of all surveillances performed on this system, sortable by component if possible.
4. Provide copies of the three most recently completed quarterly surveillances for both divisions
5. List of all corrective maintenance work orders, with description of work, performed on this system
6. Provide a list of control room deficiencies associated with this system
7. Copies of ODMI's, OWA/OWB's, prompt operability evaluations, and standing orders associated with this system
8. Summarized list of all Maintenance Rule equipment issues evaluated for the system, (including their conclusions), copies of each MRule evaluation for the system, and the MRule Basis Document(s) for the system
9. List of all work orders, with description of work, planned for this system within the next year
10. Provide a list and description of overdue PM's, deferred PM's, and PM change requests for this system
11. Provide copies of maintenance rule functional failure assessments—regardless of the result—performed on these systems. Include CR number for each item on the list.
12. System design calculations for DG loading capabilities
13. Provide fire impairments associated with this system
14. Provide copies of any QA audits or self-assessments associated with this system
15. Copies of vendor manuals, drawings (P&ID's), and system training manuals
16. System health reports and system engineering logs for this system

17. List and description of temporary modifications; completed ECs (December 31, 2015 - Current); and planned ECs (within the next year) associated with this system
18. Schedule of activities (Fragnets) for the planned AOT for the Division 1 and 2 DGs scheduled for the work weeks of 1806 and 1812.

**The following items are requested for the
Occupational Radiation Safety Inspection
at Cooper Nuclear Station
(February 12–16, 2018)
Integrated Report 2018001**

Inspection areas are listed in the attachments below.

Please provide the requested information on or before January 25, 2018.

Please submit this information using the same lettering system as below. For example, all contacts and phone numbers for Inspection Procedure 71124.01 should be in a file/folder titled "1- A," applicable organization charts in file/folder "1- B," etc.

If information is placed on *ims.certrec.com*, please ensure the inspection exit date entered is at least 30 days later than the onsite inspection dates, so the inspectors will have access to the information while writing the report.

In addition to the corrective action document lists provided for each inspection procedure listed below, please provide updated lists of corrective action documents at the entrance meeting. The dates for these lists should range from the end dates of the original lists to the day of the entrance meeting.

If more than one inspection procedure is to be conducted and the information requests appear to be redundant, there is no need to provide duplicate copies. Enter a note explaining in which file the information can be found.

If you have any questions or comments, please contact John O'Donnell at (817) 200-1441 or john.odonnell@nrc.gov. The other inspector will be Shawn Money.

PAPERWORK REDUCTION ACT STATEMENT

This letter does not contain new or amended information collection requirements subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). Existing information collection requirements were approved by the Office of Management and Budget, control number 3150-0011.

2. Occupational ALARA Planning and Controls (71124.02)

Date of Last Inspection: October 3, 2016

- A. List of contacts and telephone numbers for ALARA program personnel
- B. Applicable organization charts
- C. Copies of audits, self-assessments, and LERs, written since date of last inspection, focusing on ALARA
- D. Procedure index for ALARA Program
- E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures may be requested by number after the inspector reviews the procedure indexes.
 - 1. ALARA Program
 - 2. ALARA Committee
 - 3. Radiation Work Permit Preparation
- F. A summary list of corrective action documents (including corporate and sub-tiered systems) written since date of last inspection, related to the ALARA program. In addition to ALARA, the summary should also address Radiation Work Permit violations, Electronic Dosimeter Alarms, and RWP Dose Estimates

NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide in document formats which are “searchable” so that the inspector can perform word searches.
- G. List of work activities greater than 1 rem, since date of last inspection, Include original dose estimate and actual dose.
- H. Site dose totals and 3-year rolling averages for the past 3 years (based on dose of record)
- I. Outline of source term reduction strategy
- J. If available, provide a copy of the ALARA outage report for the most recently completed outages for each unit
- K. Please provide your most recent Annual ALARA Report.

4. Occupational Dose Assessment (Inspection Procedure 71124.04)

Date of Last Inspection: March 23, 2016

- A. List of contacts and telephone numbers for the following areas:
 - 1. Dose Assessment personnel
- B. Applicable organization charts
- C. Audits, self-assessments, vendor or NUPIC audits of contractor support, and LERs written since date of last inspection, related to:
 - 1. Occupational Dose Assessment
- D. Procedure indexes for the following areas:
 - 1. Occupational Dose Assessment
- E. Please provide specific procedures related to the following areas noted below. Additional Specific Procedures will be requested by number after the inspector reviews the procedure indexes.
 - 1. Radiation Protection Program
 - 2. Radiation Protection Conduct of Operations
 - 3. Personnel Dosimetry Program
 - 4. Radiological Posting and Warning Devices
 - 5. Air Sample Analysis
 - 6. Performance of High Exposure Work
 - 7. Declared Pregnant Worker
 - 8. Bioassay Program
- F. List of corrective action documents (including corporate and sub-tiered systems) written since date of last inspection, associated with:
 - 1. National Voluntary Laboratory Accreditation Program (NVLAP)
 - 2. Dosimetry (TLD/OSL, etc.) problems
 - 3. Electronic alarming dosimeters
 - 4. Bioassays or internally deposited radionuclides or internal dose
 - 5. Neutron dose

NOTE: The lists should indicate the significance level of each issue and the search criteria used. Please provide in document formats which are "searchable" so that the inspector can perform word searches.

- G. List of positive whole body counts since date of last inspection, names redacted if desired
- H. Part 61 analyses/scaling factors
- I. The most recent NVLAP accreditation report or, if dosimetry is provided by a vendor, the vendor's most recent results

COOPER NUCLEAR STATION – NRC INTEGRATED INSPECTION REPORT
05000298/2018001 – DATED MAY 8, 2018

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