



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 - INSPECTION OF THE IMPLEMENTATION OF MITIGATION STRATEGIES AND SPENT FUEL POOL INSTRUMENTATION ORDERS AND EMERGENCY PREPAREDNESS COMMUNICATION/ STAFFING/MULTI-UNIT DOSE ASSESSMENT PLANS – INSPECTION REPORT 05000298/2018010

Dear Mr. Dent:

On March 15, 2018, the U.S. Nuclear Regulatory Commission (NRC) completed the onsite portion of this 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 of Plant Operations, and other members of your staff. The results of this inspection are documented in the enclosed report.

The inspection examined activities conducted under your license as they relate to the implementation of mitigation strategies and spent fuel pool instrumentation orders (EA-12-049 and EA-12-051) and Emergency Preparedness Communication, Staffing, and Multi-Unit Dose Assessment Plans, your compliance with the Commission's rules and regulations, and with the conditions of your operating license. Within these areas, the inspection involved examination of selected procedures and records, observation of activities, and interviews with station personnel.

NRC inspectors documented one finding of very low safety significance (Green) in this report. The finding did not involve a violation of NRC requirements.

If you disagree with a cross-cutting aspect assignment or a finding not associated with a regulatory requirement in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region IV; and the NRC resident inspector at the Cooper Nuclear Station.

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 W. Kozal, Chief
Project Branch C
Division of Reactor Projects

Docket: 50-298
License: DPR-46

Enclosure:
Inspection Report 05000298/2018010
w/Attachment:
Documents Reviewed

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

Docket Number: 05000298

License Number: DPR-46

Report Number: 05000298/2018010

Enterprise Identifier: I-2018-010-0017

Licensee: Nebraska Public Power District

Facility: Cooper Nuclear Station

Location: Brownville, Nebraska

Inspection Dates: March 12, 2018 to April 16, 2018

Inspectors: M. Stafford, Resident Inspector – Cooper (Team Leader)
R. Alexander, Sr. Project Engineer – Region IV
J. Mateychick, Sr. Reactor Inspector – Region IV
S. Sheldon, Project Engineer – Region III

Approved By: Jason Kozal
Chief, Project Branch C
Division of Reactor Projects

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring licensee's performance by conducting a Temporary Instruction 2515/191, "Implementation of Mitigation Strategies and Spent Fuel Pool Instrumentation Orders and Emergency Preparedness Communication/ Staffing/Multi-Unit Dose Assessment Plans" 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. NRC and self-revealed findings, violations, and additional items are summarized in the table below.

List of Findings and Violations

Failure to Maintain Satellite Phones in Locations That Provide Reasonable Assurance They Will Remain Available Following All Beyond Design Basis External Events			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Emergency Preparedness	Green FIN 05000298/2018010-01 Closed	H.3 – Change Management	TI 2515/191
The NRC inspection team identified a Green finding related to the licensee's failure to maintain the station satellite phones in locations that would provide reasonable assurance the phones would remain available following all beyond design basis external events.			

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

OTHER ACTIVITIES – TEMPORARY INSTRUCTIONS, INFREQUENT AND ABNORMAL

TI 2515/191 - Inspection of the Implementation of Mitigation Strategies and Spent Fuel Pool Instrumentation Orders and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans

Inspectors verified plans for complying with NRC Orders EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12056A045) and EA-12-051, Order Modifying Licenses With Regard to Reliable Spent Fuel Pool Instrumentation (ADAMS No. ML12054A679) are in place and are being implemented by the licensee. Additionally, the inspection verified implementation of staffing and communications information provided in response to the March 12, 2012, request for information letter (ADAMS No. ML12053A340) and multiunit dose assessment information provided per COMSECY-13-0010, "Schedule and Plans for Tier 2 Order on Emergency Preparedness for Japan Lessons Learned", dated March 27, 2013, (ADAMS No. ML12339A262).

- (1) Based on samples selected for review, the inspectors verified that the licensee satisfactorily implemented appropriate elements of the Diverse and Flexible Coping Strategies (FLEX) as described in the plant specific submittals [including the Final Integrated Plan (ADAMS Accession No. ML17017A166)] and the associated safety evaluation (ADAMS No. ML17226A032) and determined that the licensee is in compliance with NRC Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events. The inspectors verified the licensee satisfactorily:
 - a) developed and issued FLEX Support Guidelines (FSGs) to implement the FLEX strategies for postulated external events;
 - b) integrated their FSGs into their existing plant procedures such that entry into and departure from the FSGs were clear when using existing plant procedures;
 - c) protected FLEX equipment from site-specific hazards;
 - d) developed and implemented adequate testing and maintenance of FLEX equipment to ensure their availability and capability;

- e) trained their staff to assure personnel proficiency in the mitigation of beyond-design basis events; and
 - f) developed the means to ensure the necessary off-site FLEX equipment would be available from off-site locations.
- (2) Based on samples selected for review, the inspectors verified that the licensee satisfactorily implemented appropriate elements of the FLEX strategy as described in the plant specific submittals [including the Final Integrated Plan (ADAMS Accession No. ML17017A166)] and the associated safety evaluation (ADAMS No. ML17226A032) and determined that the licensee is in compliance with NRC Order EA-12-051, Order Modifying Licenses With Regard to Reliable Spent Fuel Pool Instrumentation. The inspectors verified the licensee satisfactorily :
- a) installed the spent fuel pool (SFP) instrumentation sensors, cabling and power supplies to provide physical and electrical separation as described in the plant specific submittals and safety evaluation;
 - b) installed the SFP instrumentation display in the location, environmental conditions and accessibility as described in the plant specific submittals;
 - c) trained their staff to assure personnel proficiency with the maintenance, testing, and use of the SFP instrumentation; and
 - d) developed and issued procedures for maintenance, testing and use of the reliable SFP instrumentation.
- (3) The inspectors reviewed information provided in the licensee's multi-unit dose submittal and in response to the NRC's March 12, 2012, request for information letter (ADAMS No. ML12053A340), and verified that the licensee satisfactorily implemented enhancements pertaining to Near-Term Task Force Recommendation 9.3 in response to a large scale natural emergency event that results in an extended loss of all ac power to all site units and impedes access to the site. The inspectors verified the following:
- a) the licensee satisfactorily implemented required staffing changes to support an extend loss of all AC power (ELAP)/loss of ultimate heat sink (LUHS) scenario;
 - b) EP communications equipment and facilities are sufficient for dealing with an ELAP/LUHS scenario; and
 - c) the licensee implemented multi-unit/-source dose assessment capabilities (including releases from spent fuel pools) using the licensee's site-specific dose assessment software and approach.

The inspectors verified that non-compliances with requirements and standards identified during the inspection were entered into the licensee's corrective action program as appropriate.

INSPECTION RESULTS

Failure to Maintain Satellite Phones in Locations That Provide Reasonable Assurance They Will Remain Available Following All Beyond Design Basis External Events			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Emergency Preparedness	Green FIN 05000298/2018010-01 Closed	H.3 – Change Management	TI 2515/191
<p>The NRC inspection team identified a Green finding related to the licensee’s failure to maintain the station satellite phones in locations that would provide reasonable assurance the phones would remain available following all beyond design basis external events.</p> <p>Description: The Cooper Nuclear Station FLEX Program Document, Revision 1, Section 5.2.27, “Support Functions – Communications,” states, in part: “NEI 12-01 provides required emergency communications capabilities during an Extended Loss of AC Power (ELAP)...Satellite phones are credited for off-site communication...Docking stations and remote antennas have been installed to allow use of the satellite phones from inside buildings.”</p> <p>NEI 12-01, “Guideline for Assessing Beyond Design Basis Accident Response Staffing and Communications Capabilities,” Revision 0, Section 4.5, “Equipment Location Requirements,” states: “to be assumed operable, a piece of on-site communications equipment should be in a location, and maintained in a manner, that maximizes survivability following a beyond design basis external event...Equipment should be stored, or otherwise available, in locations that can be readily accessed when needed...The above guidance applies to equipment at the point of use as well as any supporting infrastructure components. Such components may include portable power sources, and radio system repeaters and antennas.”</p> <p>Initially, when the licensee implemented their plans to resolve issues associated with communications during a beyond design basis external event (BDBEE), they had handheld satellite phones located in the control room and the technical support center (TSC), which required the users to relocate outdoors to acquire a usable signal. These locations are rated to withstand all BDBEE, and would therefore meet the requirements of NEI 12-01. However, in an effort to enhance the communications methods, the licensee pursued plans to provide a means for personnel to be able to communicate with satellite phones from inside buildings. These enhancements involved providing external antennas, relocating the existing satellite phones to docking stations in a structure attached to the elevated release point (ERP shack) and in a communications room (PBX room), and routing wires to control room and TSC desk phones. These enhancements are mentioned in general in a letter from the licensee to the NRC, NLS2013028, dated 2/21/13, “Response to NRC Technical Issues for Resolution Regarding Licensee Communication Submittals Associated with Near-Term Task Force Recommendation 9.3.”</p> <p>In moving the physical location of the satellite phones from the control room and TSC, the licensee failed to ensure that the new locations were suitable to withstand all BDBEE. The ERP shack is not rated for tornado wind loading, and the phones relocated from the control room may not survive this external event. Additionally, the external antennas located on the elevated release point and the meteorological tower would not be able to withstand the elevated wind speeds during a tornado or other high wind event.</p>			

The team determined that, by implementing this enhancement to communications systems, the licensee placed their satellite phone equipment in locations that are vulnerable to BDBEE. This does not meet the requirements of NEI 12-01 and therefore does not meet the requirements of the FLEX Program Document.

Corrective Action(s): In response to the team's questions, the licensee documented the concerns in the corrective action program. Additionally, the licensee is in the process of procuring three additional satellite phones to stage in the control room, thereby restoring compliance with NEI 12-01.

Corrective Action Reference(s): CR-CNS-2018-01499

Performance Assessment:

Performance Deficiency: That the station failed to maintain the satellite phones in locations that provide reasonable assurance the phones will remain available following all beyond design basis external events is a performance deficiency. Specifically, by moving the satellite phones from locations where the phones were protected from beyond design basis external events to locations where the phones were not protected was contrary to NEI 12-01, Revision 0, Section 4.5. The ERP shack is not rated for tornado wind loading and therefore the phones relocated from the control room may not survive this external event. Additionally, the antennas may not survive high wind speeds.

Screening: The inspectors determined the performance deficiency was more than minor because it adversely affected the facilities and equipment attribute of the Emergency Preparedness Cornerstone and its objective to ensure that the licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. Specifically, by moving the satellite phones to locations that are not rated for all beyond design basis external events, the licensee would not be able to contact any offsite organizations.

Significance: The team assessed the significance of the finding using Inspection Manual Chapter (IMC) 0609, Appendix O, "Significance Determination Process for Mitigating Strategies and Spent Fuel Pool Instrumentation (Orders EA-12-049 and EA-12-051)," dated October 7, 2016. The team determined that the performance deficiency did not (1) impact the spent fuel pool instrumentation order (EA-12-051); (2) did not involve a failure of FLEX equipment for 72 hours or more that would result in a complete loss of one or more of the FLEX functions; (3) did not involve deficient procedures or training that would result in a complete loss of one or more of the FLEX functions; (4) did not have a product of the exposure time and external even initiating event frequency greater than 1E-6; and (5) did not involve significant programmatic issues which reduced the effectiveness of the Mitigating Strategies. Therefore, the finding was determined to be of very low safety significance (Green).

Cross-cutting Aspect: The finding had a human performance cross-cutting aspect associated with change management, in that the licensee failed to fully evaluate implementing the enhancement to move the satellite phones from the control room and TSC to the ERP shack an the PBX room [H.3].

Enforcement: Inspectors did not identify a violation of regulatory requirements associated with this finding.

EXIT MEETINGS AND DEBRIEFS

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

- On March 15, 2018, the inspection team presented the on-site inspection results in a management debrief to Mr. J. Kalamaja, General Manager of Plant Operations, and other members of the site staff.
- On April 16, 2018, the lead inspector presented the final inspection results in an exit meeting to Mr. J. Kalamaja, General Manager of Plant Operations, and other members of the site staff.

DOCUMENTS REVIEWED

Other Activities – TI 2515/191

Procedures/Instructions

<u>Number</u>	<u>Title</u>	<u>Revision</u>
0-CNS-OU-108	Shutdown Safety Management Program	4
0.50.5	Outage Shutdown Safety	37
2.4FPC	Fuel Pool Cooling Trouble	34
5.1FLOOD	Emergency Operations Procedure: Flood	22
7.0.11	Maintenance Procedure: Flood Control Barriers	30
14.41.1.1	FPC-LIT-1 Testing	4
EOF08	Position Instruction Manual: Logistics Coordinator	30
FSG 5.10FLEX	FLEX Support Guidelines (FSGs)	2
FSG 5.10FLEX.01	125 VDC Div 1 FLEX Operations	1
FSG 5.10FLEX.02	125 VDC Div 2 FLEX Operations	1
FSG 5.10FLEX.03	250 VDC Div 1 FLEX Operations	1
FSG 5.10FLEX.04	250 VDC Div 2 FLEX Operations	1
FSG 5.10FLEX.05	Reliable Hardened Containment Vent Battery Charger Tie-in	1
FSG 5.10FLEX.06	Fuel Pool Level Instrument Electrical Tie-In	1
FSG 5.10FLEX.07	4160 "F" Bus Tie-in with Off-Site Generator	2
FSG 5.10FLEX.08	4160 "G" Bus Tie-in with Off-Site Generator	2
FSG 5.10FLEX.09	Hotwell to ECST FLEX Operations	1
FSG 5.10FLEX.10	ECST Makeup from North Well	2
FSG 5.10FLEX.11	Spent Fuel Pool Supply FLEX Operations	2
FSG 5.10FLEX.12	Reactor Building Reliable Air FLEX Operations	1
FSG 5.10FLEX.13	REC SW FLEX Supply	1
FSG 5.10FLEX.14	RHR Div 1 Shutdown Cooling FLEX Operations	1
FSG 5.10FLEX.15	RHR Div 2 Shutdown Cooling FLEX Operations	1
FSG 5.10FLEX.16	Residual Heat Removal Service Water (RHRSW) Div 1 FLEX Operations	2
FSG 5.10FLEX.17	Residual Heat Removal Service Water (RHRSW) Div 2 FLEX Operations	2
FSG 5.10FLEX.18	Alternate Reactor Building Ventilation FLEX Operations	1
FSG 5.10FLEX.19	Alternate Ventilation FLEX Operations	1
FSG 5.10FLEX.20	Debris Removal in Support of FLEX Operations	1
FSG 5.10FLEX.21	Shutdown Injection FLEX Operations	1
FSG 5.10FLEX.22	Communications and Lighting Equipment FLEX Power	1
FSG 5.10FLEX.23	Reactor Equipment Cooling FLEX Operations	1
FSG 5.10FLEX.24	Control Building Temporary Heating FLEX Operations	1

FSG 5.10FLEX.25	Alternate RPV Injection thru RHR SW Riser or RHR-B B.5.B Connection	1
FSG 5.10FLEX.26	RHR Suppression Pool Cooling Div 1 FLEX Operations	1
FSG 5.10FLEX.27	RHR Suppression Pool Cooling Div 2 FLEX Operations	1
FSG 5.10FLEX.28	Vital Instrumentation FLEX Operations	1
FSG 5.10FLEX.29	Alternate Reactor Vessel Injection from Missouri River	1
FSG 5.10FLEX.30	Hardened Containment Vent System FLEX Operations	5
FSG 5.10FLEX.31	FLEX Equipment Refueling Operations	1
5.3SBO	Station Blackout	43
5.7.17	CNS Dose Assessment	49
5.7.17.1	Dose Assessment (Manual)	3
6.FPC.701	FPC Level Transmitter Functional Test	0
OI 25	Operations Routine Duties	70
Security	Access Control Devices	50
Procedure 2.8		
Site Services	Station Security	59
Procedure 1.1		
	FLEX Final Integrated Plan	1
	FLEX Program Document	1

Preventative Maintenance Activities

<u>Number</u>	<u>Title</u>	<u>Revision</u>
5067082	SAMG Diesel Generator Testing	9/27/2016
5155721	Perform Vendor FLEX Maintenance Activities (1 year Operational Inspections)	5/23/2017
5164463	Perform Vendor FLEX Equipment Maintenance (6 month)	11/06/2017
5194852	Spent Fuel Pool Primary LI Signal PCRS	12/29/2017

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
453010422	Emergency Condensate Storage Tanks	AB/02
R110827	Cooper Nuclear Strategy Topography Survey	8/23/2012

Other Documents/Reports

<u>Number</u>	<u>Title</u>	<u>Revision</u>
EC 6036621	Install Remote Satellite Units	0
EE 01-057	Class I Restrained Seismic Design Basis of Class IIS Piping	0
EE 01-147	Summary of Main Steam Isolation Valve (MSIV) Leakage Pathway to the Condenser Seismic Qualification	2
ER 2016-002	FLEX Portable Equipment Deployment Path Liquefaction Evaluation	0

<u>Number</u>	<u>Title</u>	<u>Revision</u>
INT0350113	FLEX Modifications	1
INT0350114	FLEX Strategy	1
INT0350116	FLEX Strategy Walkdown	0
Lesson Plan IAC202-00-00	Level Measurement & Devices	8
LO#2018-0092	2018 CNS TI-2515/191 Mitigating Strategies (SFP/EP) Inspection Assessment	
MEC 500-01-01	MEC OSC Emergency Response Overview	2
ML17226A032	Cooper Nuclear Station Safety Evaluation Regarding Implementation of Mitigating Strategies and Reliable Spent Fuel Pool Instrumentation Related to Orders EA-12-049 and EA-12-051 (CAC Nos. MF0971 and MF0972)	9/20/2017
MP 800000050260	FLEX Equipment Maintenance Plans for FLEX Air Compressors; 175 kW, 60 kW, and 6 kW Diesel Generators; and FLEX Godwin Pumps	{Not Dated}
NEDC 09-102	Internal Flooding – HELB, MELB, and Feedwater Line Break	2
NEDC 14-001	Storage Facility Structural Calculation	1
NEDC 14-027	Review of ERIN Calculation C122140001-11622, “MAAP Analysis to Support Cooper FLEX Strategy”	0
NEI 12-01	Guideline for Assessing Beyond Design Basis Accident Response Staffing and Communications Capabilities	0
NEI 12-06	Diverse and Flexible Coping Strategies (FLEX) Implementation Guidelines	2
NLS2013028	Response to NRC Technical Issues for Resolution Regarding Licensee Communication Submittals Associated with Near-Term Task Force Recommendation 9.3	2/21/13
NSRC-005	SAFER Response Plan for Cooper Nuclear Station	9/15/2015
PM Notification 11417703	Maintenance Plan 800000050260 Revision	10/25/2017
Purchase Order 4500200470	Preventive Maintenance Program	3/06/17
Technical Requirements Manual Section 3.12	Beyond Design Basis Components	11/06/16
	Cooper Nuclear Station NEI 12-01 Phase 2 Staffing Assessment FLEX Validation Document NANTeL Generic Basic FLEX, ERO0010102/ILT- 56251/NAN-56252 NANTeL Generic Advanced FLEX, ERO0010103/ILT- 56253/NAN-56254	4/21/2016

Corrective Action Program Documents (CR-CNS-)

2016-02845	2016-02869	2017-01463	2017-02565
2017-02568	2017-02799	2017-02801	2017-03089
2017-03777	2017-05033	2017-05285	2017-06372
2018-01166	2018-01243	2018-01442*	2018-01443*
2018-01450*	2018-01451*	2018-01457*	2018-01458*
2018-01463*	2018-01469*	2018-01475*	2018-01494*
2018-01496*	2018-01499*	2018-01500*	2018-01509*
2018-01511*	2018-02294*		

* - Initiated as a result of this inspection

COOPER NUCLEAR STATION - INSPECTION OF THE IMPLEMENTATION OF MITIGATION STRATEGIES AND SPENT FUEL POOL INSTRUMENTATION ORDERS AND EMERGENCY PREPAREDNESS COMMUNICATION/STAFFING/MULTI-UNIT DOSE ASSESSMENT PLANS – INSPECTION REPORT 05000298/2018010 DATED MAY 8, 2018

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