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

April 13, 2018

Ms. Mary J. Fisher, Vice President-
Energy Production & Nuclear Decommissioning
Omaha Public Power District
Fort Calhoun Station
Mail Stop FC-2-4
9610 Power Lane
Blair, NE 68008

SUBJECT: FORT CALHOUN STATION – NRC INSPECTION REPORT 05000285/2018-001

Dear Ms. Fisher:

This letter refers to the U.S. Nuclear Regulatory Commission (NRC) inspection conducted on March 12-15, 2018, at the Fort Calhoun Station located near Blair, Nebraska. The NRC inspectors discussed the results of this inspection with you, and then with other members of your staff during a final exit meeting conducted on March 15, 2018. The inspection results are documented in the enclosure to this letter.

The NRC inspection examined activities conducted under your license as they relate to public health and safety, the common defense to confirm compliance with the Commission's rules and regulations, and with the conditions of your license. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel. Specifically, the inspectors reviewed your planned decommissioning activities to support SAFSTOR conditions at the facility; controls for spent fuel safety; implementation of your corrective action program and your safety and design review program. In addition, we discussed the status of your engineering and design reconstitution efforts for the structures, systems and components that support the safety of spent fuel. No violations of significance were identified and no response to this letter is required.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice and Procedure," a copy of this letter, its enclosure, and your response if you choose to provide one, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response should not include any personal privacy or proprietary, information so that it can be made available to the Public without redaction.

If you have any questions regarding this inspection report, please contact Rachel Browder at 817-200-1452, or the undersigned at 817-200-1191.

Sincerely,

/RA/

Ray L. Kellar, P.E., Chief
Fuel Cycle and Decommissioning Branch
Division of Nuclear Materials Safety

Docket No. 50-285
License No. DPR-40

Enclosure:
Inspection Report 05000285/2018-001
w/Attachment: Supplemental Information

U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket No.	05000285
License No.	DPR-40
Report No.	05000285/2018-001
Licensee:	Omaha Public Power District
Facility:	Fort Calhoun Station
Location:	9610 Power Lane Blair, Nebraska
Dates:	March 12-15, 2018
Inspectors:	Rachel S. Browder, CHP, Senior Health Physicist Fuel Cycle and Decommissioning Branch Division of Nuclear Materials Safety
	Chris D. Steely, Health Physicist Fuel Cycle and Decommissioning Branch Division of Nuclear Materials Safety
	Gerond A. George, Senior Reactor Inspector Engineering Branch 1 Division of Reactor Safety
Approved By:	Ray L. Kellar, P.E., Chief Fuel Cycle and Decommissioning Branch Division of Nuclear Materials Safety

Enclosure

EXECUTIVE SUMMARY

Fort Calhoun Station
NRC Inspection Report 05000285/2018-001

This U.S. Nuclear Regulatory Commission (NRC) inspection was a routine, announced inspection of decommissioning activities being conducted at the Fort Calhoun Station (FCS) under Inspection Report 05000285/2018-001. In summary, the licensee was conducting these activities in accordance with site procedures, license requirements, and applicable NRC regulations.

Decommissioning Performance and Status Review at Permanently Shutdown Reactors

- The licensee had implemented the decommissioning transition and site modifications as specified in the Post-Shutdown Decommissioning Activities Report (PSDAR). In addition, the licensee was appropriately implementing the decommissioning preparations as provided in the PSDAR. The inspectors determined that the licensee was adequately controlling decommissioning activities and radiological work areas. (Section 1.2)

Spent Fuel Pool Safety at Permanently Shutdown Reactors

- The licensee's spent fuel pool was being maintained in accordance with Technical Specifications and procedural requirements. The licensee was safely storing the spent fuel assemblies contained in the spent fuel pool. (Section 2.2)

Self-Assessment, Auditing, and Corrective Action at Permanently Shutdown Reactors

- The licensee was adequately implementing its corrective action program in accordance with regulatory requirements and commitments. The licensee's audit program was being conducted and maintained in accordance with the appropriate regulatory requirements as prescribed by the Quality Assurance Topical Report (QATR), Revision 10. (Section 3.2)

Safety Reviews, Design Changes, and Modifications at Permanently Shutdown Reactors

- The licensee's safety evaluation program and processes for evaluating the safety impacts of facility changes and modifications were adequate for complying with the provisions of 10 CFR 50.59 and 10 CFR 72.48. The licensee's 10 CFR 50.59 safety evaluation program provided effective periodic training for personnel preparing, reviewing, and approving safety evaluations. Additionally, the licensee's program established an adequate process to assess training effectiveness. (Section 4.2)

Report Details

Summary of Plant Status

On June 24, 2016, Omaha Public Power District (OPPD), the licensee, formally notified the NRC by letter of its intent to permanently cease operations of Fort Calhoun Station (FCS), (ADAMS Accession Number ML16176A213). By letter dated November 13, 2016, OPPD notified the NRC that it had permanently ceased power operations at FCS on October 24, 2016 and certified pursuant to 10 CFR 50.82(a)(1)(ii), that as of November 13, 2016, all fuel had been permanently removed from the FCS reactor vessel and placed into the FCS spent fuel pool (ADAMS Accession Number ML16319A254). On December 28, 2016, the NRC informed the licensee that it was no longer under NRC Inspection Manual Chapter (IMC) 0305, "Operating Reactor Assessment Program," IMC 0608, "Performance Indicator Program," and IMC 2515, "Light-Water Reactor Inspection Program" when conducting oversight activities and assessing site performance (ADAMS Accession Number ML16363A449). The licensee was informed that the NRC's oversight of licensed activities under decommissioning would be conducted under the provisions in IMC 2561, "Decommissioning Power Reactor Inspection Program."

The licensee submitted its Post-Shutdown Decommissioning Activities Report (PSDAR) on March 30, 2017, (ADAMS Accession Number ML17089A759). The PSDAR is not a licensing action and therefore is not approved by the NRC; however, the NRC reviews the report. The licensee's PSDAR described the decommissioning activities and schedule to support SAFSTOR strategy for the facility, which is one of the options allowed by the NRC for decommissioning. The NRC subsequently held a public meeting in Omaha, Nebraska on May 31, 2017, to discuss and accept comments regarding the FCS PSDAR. The transcript of the public meeting is available on the NRC's Website at http://www.nrc.gov/reading-rm/adams.html, under ADAMS Accession Number ML17160A394.

The licensee selected the SAFSTOR decommissioning option, as described in the PSDAR. The licensee plans to continue in SAFSTOR until the spent fuel is transferred to the U.S. Department of Energy in 2058, at which time decommissioning activities will commence. The deferred decontamination and dismantling activities are scheduled to be conducted between 2059 through 2066, to support the termination of the operating license within the required 60-year time period.

On April 12, 2017, Region IV closed the Confirmatory Action Letter regarding the resolution of design issues that had been documented during the Inspection Manual Chapter 0350 operation period, based on FCS's commitment to either: 1) complete the design and licensing basis reconstitution for spent fuel pool/cooling and supporting structures, systems, and components, or 2) submit a license amendment request for an independent spent fuel cooling system (ADAMS Accession Number ML17102B737). On December 14, 2017 (ADAMS Accession Number ML17348A383) the licensee requested to remove Option 2 above, and committed to complete Option 1 by June 25, 2018.

On March 7, 2018, the NRC issued License Amendment No. 297 for the Decommissioning Technical Specifications (ADAMS Accession Number ML18010A087). The license amendment establishes a licensing and safety basis that reflects the permanently shut down and defueled condition of the facility. In general, the amendment eliminated the requirements for operation MODES and MODES where fuel was emplaced in the reactor vessel.

1 Decommissioning Performance and Status Review at Permanently Shutdown Reactors (71801)

1.1 Inspection Scope

The inspectors evaluated the status of the planned decommissioning activities in accordance with the license and regulatory requirements.

1.2 Observations and Findings

At the time of the inspection the licensee had fully abandoned 15 systems using its engineering change process and pre-abandoned 19 systems. This allowed the licensee to drain the systems of fluids, as part of its hazard mitigation in preparation for SAFSTOR. The licensee was performing asbestos abatement on the systems in preparation for decommissioning and dismantlement.

The inspectors observed the weekly Senior Leadership Team meeting, which focused on the scheduled tasks to place the facility in SAFSTOR condition. The licensee stated that the calculated time period when a zirconium fire of the spent fuel cladding could occur in the SFP absent sufficient cooling water ended on April 7, 2018. The licensee was making efforts to reduce the combustibles at the facility. The inspectors performed tours of the facility and observed that the licensee was maintaining good housekeeping and had attention to maintaining doses “as low as is reasonably achievable” (ALARA).

The inspectors observed that current radiological surveys were captured electronically that allowed the surveys to be viewed at various kiosk locations at the plant site. The surveys were legible and clearly provided the radiological conditions of the respective area. The NRC inspectors compared general area survey results inside the plant using a Ludlum Model 2401-S survey meter, Serial Number 079971, calibration due date October 21, 2018, and determined the results were consistent with the licensee’s radiological survey results.

The licensee had installed and was using a Ludlum Model 4525 Truck Radiation Portal Monitor. The sensitivity of the detectors was similar to the portal monitors used by waste and scrap yards. The system had real-time data acquisition and analysis, as well as camera identification that was captured and logged with the data. The licensee was not using the system for material release purposes, but for passive verification purposes. The system had an alarm, which the licensee indicated could be heard across the site property.

1.3 Conclusion

The licensee had implemented the decommissioning transition and site modifications as specified in the PSDAR. In addition, the licensee was appropriately implementing the decommissioning preparations as provided in the PSDAR. The inspectors determined that the licensee was adequately controlling decommissioning activities and radiological work areas.

2 Spent Fuel Pool Safety at Permanently Shutdown Reactors (60801)

2.1 Inspection Scope

The inspectors conducted a review of the spent fuel pool (SFP) operations to ensure that the licensee was maintaining the pool in accordance with technical specifications and procedural requirements.

2.2 Observations and Findings

The Technical Specifications Section 2.8.3 requires the SFP water level be maintained greater than or equal to 23 feet over the top of the irradiated fuel assemblies stored in the SFP and the SFP boron concentration to be greater or equal to 500 parts per million (ppm). The NRC inspectors reviewed the SFP level operational logs and reviewed chemistry data for the period since the last inspection. The inspectors concluded that the SFP level remained relatively steady at 41 feet, which is roughly 28 feet above the top of irradiated fuel, for the monitoring periods reviewed. The boron concentration in the SFP ranged between 2272 - 2235 ppm since October 2017, which sufficiently met the refueling operational requirements in the Technical Specifications as stated above.

The SFP temperature was procedurally required to be maintained between 45 and 100 degrees Fahrenheit (°F). The temperature was tracked in the control room, where alarm panel annunciators were set to alert operators if SFP temperatures exceeded 120°F or fell below 50°F. The SFP temperature was approximately 64.8°F at the time of the inspection.

The licensee was continuing to monitor the leaks from the spent fuel pool to the liner and subsequently to the drain lines. The licensee monitored the leak rate monthly and calculated the approximate leak rate at 1.5 quarts per day (total for both SFP and fuel transfer canal). All leakage was contained and had not impacted the external environment.

2.3 Conclusion

The licensee's SFP was being maintained in accordance with Technical Specifications and procedural requirements. The licensee was safely storing the spent fuel assemblies contained in the SFP.

3 Self-Assessment, Auditing, and Corrective Action at Permanently Shutdown Reactors (IP 40801)

3.1 Inspection Scope

The inspectors reviewed the licensee's implementing procedures that govern the corrective action program to verify compliance with the applicable regulatory requirements and decommissioning documents.

3.2 Observations and Findings

The inspectors reviewed the Quality Assurance Topical Report (QATR), Revision 10, Chapter 16, “Corrective Action” that described the licensee’s program to identify and correct conditions adverse to quality and reviewed Licensee’s Procedure PI-FC-125, “Decommissioning Corrective Action Program,” Revision 1, which governs the corrective action program. The procedure had been recently revised to reflect changes in the licensee’s organization. The inspectors discussed with licensee management and the corrective action program owner the changes in the policies and the procedure. The inspectors determined that the procedure was in compliance with the applicable regulatory requirements and decommissioning documents.

The inspectors observed a Management Review Committee (MRC) meeting that was typically held weekly. The MRC had representatives from the different functional areas and a quorum was met as specified by the procedure PI-FC-125. The inspectors observed a good discussion by the MRC members regarding the appropriate significance level, ownership, and task assignments of the condition reports (CRs) on the agenda.

The inspectors reviewed approximately twenty CRs, and concluded that the CRs provided adequate documentation and description of the condition adverse to quality or condition adverse to regulatory compliance as defined by the licensee’s procedure. In addition, the inspectors determined that the significance levels assigned to the respective CRs were appropriate. The inspectors also verified that the corrective actions adequately addressed the deficiencies described in the documentation.

The licensee’s assessment and audit program requirements was specified in the QATR, Revision 10, Chapter 18, which described the elements of the program that implemented the requirements under 10 CFR Part 50, Appendix B. The QATR also provided the internal audit frequency under Appendix B for the different programs and activities identified under the audit program. The inspectors reviewed the licensee’s master audit schedule and implementing procedures and concluded that licensee was in compliance with the regulatory requirements.

The inspectors reviewed audits NOSA-FCS-17-07, “Engineering Design Control Audit Report,” dated August 11, 2017, and NOSA-FCS-17-04, “Corrective Action Program Audit Report,” dated May 9, 2017. The audits were performed within the frequency as required by the QATR. The licensee developed audit plans prior to the initiation of the audit that identified the purpose and scope of the audit, as well as the applicable criteria for evaluation. The audit results documented the personnel contacted, the audit findings, and any recommendations that were generated. Appropriate findings were entered into the corrective action program. The audit report provided a detailed executive summary and documented results that reflected a thorough audit was performed for the two functional areas reviewed.

The Nuclear Oversight group was an independent organization as required by 10 CFR Part 50, Appendix B. The licensee was conscientiously reviewing the audit schedule to ensure the program was being implemented with qualified staff, which was being supplemented by qualified contractor staff when necessary. The inspectors reviewed a sample of the training and qualification records of lead auditors and auditors and confirmed that the personnel had completed all required training and maintained qualification and certification in accordance with the licensee’s policies and procedures.

3.3 Conclusions

The licensee was adequately implementing its corrective action program in accordance with regulatory requirements and commitments. The licensee's audit program was being conducted and maintained in accordance with the appropriate regulatory requirements as prescribed by the QATR, Revision 10.

4 Safety Reviews, Design Changes, and Modifications at Permanently Shutdown Reactors (IP 37801)

4.1 Inspection Scope

The inspectors reviewed the licensee's safety review processes, procedures, and training to verify that the safety review program was effective at contributing to protection of public health and safety and the environment. Additionally, the inspectors reviewed selected design changes and facility modifications to determine if changes, tests, experiments, and modifications were effectively conducted, managed, and controlled during plant decommissioning. The inspectors verified that major and minor decommissioning activities were being implemented in accordance with the requirements of 10 CFR 50.59, 10 CFR 50.71, 10 CFR 72.48, and 10 CFR Part 50, Appendix B.

4.2 Observations and Findings

a. Decommissioning Safety Review Program

The regulations under 10 CFR 50.59 and 10 CFR 72.48 allows a licensee to make changes in the facility as described in the final safety analysis report (as updated), make changes in the procedures as described in the final safety analysis report (as updated), and conduct tests or experiments not described in the final safety analysis report (as updated) without obtaining a license amendment, provided the criteria established in the regulations are met. The inspectors reviewed the licensee's 10 CFR 50.59 safety evaluation program, as implemented by Procedure LS-FC-104, "Fort Calhoun Station 50.59 Review Process," Revision 1 and Procedure LS-FC-114, "Fort Calhoun Station 72.48 Review Process," Revision 0. The inspectors compared these procedures with the NRC-endorsed acceptable method for complying with the provisions of 10 CFR 50.59, Nuclear Energy Institute NEI 96-07, "Guidelines for 10 CFR 50.59 Implementation," Revision 1, and NEI 96-07, Appendix B "Guidelines for 10 CFR 72.48 Implementation," Revision 1. The inspectors determined that the licensee's safety evaluation program procedure and processes were adequate for complying with the provisions of 10 CFR 50.59 and 10 CFR 72.48. In addition, the licensee's 10 CFR 50.59 safety evaluation program provided effective periodic training for personnel preparing, reviewing, and approving safety evaluations. Additionally, the licensee's program established an adequate process to assess training effectiveness.

The Defueled Safety Analysis Report (DSAR) Section 12.5 described the Plant Operations Review Committee (PORC) as one of the bodies that review plant operation's nuclear safety activities. Further detailed requirements were provided in the Quality Assurance Topical Report, Revision 10, Section 2.1.4, which described the functions and responsibilities of the PORC. The licensee implemented the requirements through Licensee Procedure LS-FC-106, "Plant Operations Review Committee," Revision 1. The inspectors determined that the procedure was adequate to implement the licensee's commitments of the DSAR and QATR.

b. Design Changes, Test, Experiments, and Modifications

The inspectors reviewed procedures that controlled and provided implementation of design changes, tests, experiments, and modifications. The inspectors determined that the procedures provided adequate instructions to assure proper implementation, review, and approval of design changes.

The inspectors reviewed 8 screenings, where licensee personnel had determined that a 10 CFR 50.59 evaluation was not necessary. The inspectors performed an in-depth review of 3 evaluations performed pursuant to 10 CFR 50.59, to determine whether the evaluations were adequate and that prior NRC approval was obtained as appropriate. The inspectors completed in-depth reviews for five engineering changes that had been completed since the licensee permanently shut down in August 2016. The following engineering changes were reviewed:

- EC 69283, DSAR Implementation, February 26, 2018
- EC 68813, Reanalysis of Auxiliary Building Structure, Revision 0
- EC 69762, Removal of Frazile Ice Monitoring from Station Operating Procedures, Revision 0
- EC 69765, Technical Specifications/Amendment No. 293, Revision 0
- EC 69102, Change to USAR Section 9.11 Fire Protection System, Revision 0

During the inspection, the inspectors identified a concern with changes to the normal operating pressure range for the component cooling water surge tank nitrogen overpressure. The inspectors continued in-office review of this issue until March 29, 2018. The licensee had changed the component cooling water normal operating procedure, Operating Instruction OI-CC-1, "Component Cooling System Normal Operation, to reflect operation of the system for permanent shutdown. The change lowered the nitrogen overpressure range from 38.5 to 42 psig, to 10 to 20 psig. Lowering of the pressure range was supported by design calculations which demonstrated the component cooling water pumps would have adequate net positive suction head. However, the lowered pressure range caused the low pressure annunciator to be continuous illuminated because the setpoint was not modified after the procedure change. Additionally, control room annunciator response procedures were not modified or amended to provide control room operators with additional guidance to take action on a loss of nitrogen pressure in the component cooling water surge tank. The licensee entered this concern into the corrective action process as Condition Report 2018-00252. The inspectors determined that a safety concern did not exist because

design calculations supported component cooling water operation at the lower pressure range and control room operators were monitoring component cooling water conditions.

c. Major and Minor Decommissioning Activities

The inspectors reviewed the licensee's work activities, which included removal of systems from service that were no longer required to maintain the integrity of the reactor coolant pressure boundary, shutdown the reactor, and maintain the reactor in a shutdown condition. The inspectors confirmed that these activities were completed in accordance with the licensee's safety review processes.

4.3 Conclusions

The licensee's safety evaluation program and processes for evaluating the safety impacts of facility changes and modifications were adequate for complying with the provisions of 10 CFR 50.59 and 10 CFR 72.48. The licensee's 10 CFR 50.59 safety evaluation program provided effective periodic training for personnel preparing, reviewing, and approving safety evaluations. Additionally, the licensee's program established an adequate process to assess training effectiveness.

5 Exit Meeting Summary

On March 15, 2018, the NRC inspectors presented the preliminary inspection results to Ms. Mary J. Fisher, Senior Director FCS Decommissioning, and other members of the licensee's staff. No proprietary information was identified with the exception of certain Exelon procedures, which were marked as proprietary and were being converted to FCS decommissioning procedures.

SUPPLEMENTAL INSPECTION INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel
T.Maine, Plant Manager
C.Longua, Assistant Plant Manager Operations
S.Lemieux, Shift Manager, Operations
J.Cate, Manager, Engineering Design and Program
J.Shuck, Manager, System Engineering
S.Arora, Supervisor, Nuclear Engineering
B.Phillips, Supervisor Nuclear Engineering
C.Waszak, Supervisor Nuclear Engineering
M.Walker, Supervisor Nuclear Engineering
J.Dolton, Engineering
C.Scofield, Engineering
E.Steele, Engineering
R.Steeb, Senior Auditor, NOS
A.Hansen, Principal Regulatory Specialist
C.Cameron, Principal Regulatory Specialist

INSPECTION PROCEDURES USED

IP 71801	Decommissioning Performance and Status Review at Permanently Shutdown Reactors
IP 60801	Spent Fuel Pool Safety at Permanently Shutdown Reactors
IP 40801	Self-Assessment, Auditing, and Corrective Action at Permanently Shutdown Reactors
IP 37801	Safety Reviews, Design Changes, and Modifications at Permanently Shutdown Reactors

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened/Closed

None

Discussed

None

LIST OF ACRONYMS

ADAMS	Agencywide Documents Access and Management System
CFR	*Code of Federal Regulations*
CR	Condition Report
DSAR	Defueled Safety Analysis Report
FCS	Fort Calhoun Station
IMC	Inspection Manual Chapter
MRC	Management Review Committee
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
OPPD	Omaha Public Power District
PORC	Plant Operations Review Committee
PSDAR	Post-Shutdown Decommissioning Activities Report
QATR	Quality Assurance Topical Report
SFP	Spent Fuel Pool
TS	Technical Specifications

FORT CALHOUN STATION – NRC INSPECTION REPORT 05000285/2018-001 - DATED APRIL 13, 2018

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ADAMS ACCESSION NUMBER: ML18101A018

☒ SUNSI Review By: RSB	ADAMS: ☒ Yes ☐ No	☐ Sensitive ☒ Non-Sensitive	☐ Non-Publicly Available ☒ Publicly Available	Keyword NRC-002

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