



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

June 29, 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 05000285/2018-002

Dear Ms. Fisher:

This letter refers to the U.S. Nuclear Regulatory Commission (NRC) inspection conducted on June 4-7, 2018, at the Fort Calhoun Station located near Blair, Nebraska. The NRC inspectors discussed the results of this inspection with Mr. T. Maine, and other members of your staff during a final exit meeting conducted on June 7, 2018. The inspection results are documented in the enclosures to this letter.

This inspection examined activities conducted under your license as they relate to public health and safety, the common defense and security, and 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; and your exposure control program. The NRC inspectors did not identify any violation of more than minor significance during the inspection.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter, Enclosure 1, 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.

Enclosure 2 transmitted herewith contains SUNSI. When separated from Enclosure 2, this transmittal document and Enclosure 1 are decontrolled.

M. Fisher

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However, Enclosure 2 of the inspection report contains Security-Related Information, so the enclosure will not be made publically available in accordance with 10 CFR 2.390(d)(1). If you choose to provide a response that contains Security-Related Information, please mark your entire response “Security-Related Information – Withhold from Public Disclosure under 10 CFR 2.390” in accordance with 10 CFR 2.390(d)(1) and follow the instructions for withholding in 10 CFR 2.390(b)(1). The NRC is waiving the affidavit requirements for your response in accordance with 10 CFR 2.390(b)(1)(ii).

If you have any questions regarding this inspection report, please contact Rachel Browder at 817-200-1452, or the undersigned at 817-200-1151.

Sincerely,

*/RA by RJE Acting for/*

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

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

Public Enclosure:

1. Inspection Report 05000285/2018-002  
w/Attachment: Supplemental Information

Non-Public Enclosure:

1. Inspection Report 05000285/2018-002  
w/Attachment: Supplemental Information
2. Material Control and Accountability

cc: w/Enclosures  
Mr. B. Blome  
Director Licensing and Regulatory Assurance

Ms. J. Schmitt, Manager  
Radiation Control Program  
Nebraska Health & Human Services

Chairman, Washington County  
Board of Supervisors (Clerks Office)

**U.S. NUCLEAR REGULATORY COMMISSION  
REGION IV**

Docket No. 05000285

License No. DPR-40

Report No. 05000285/2018-002

Licensee: Omaha Public Power District

Facility: Fort Calhoun Station

Location: 9610 Power Lane  
Blair, Nebraska

Dates: June 4-7, 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

Stephanie G. Anderson, Health Physicist  
Fuel Cycle and Decommissioning Branch  
Division of Nuclear Materials Safety

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

Enclosure 1

## EXECUTIVE SUMMARY

Fort Calhoun Station  
NRC Inspection Report 05000285/2018-002

This U.S. Nuclear Regulatory Commission (NRC) inspection was a routine, announced inspection of decommissioning activities being conducted at the Fort Calhoun Station under Inspection Report 05000285/2018-002. 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 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)

### Solid Radioactive Waste Management and Transportation of Radioactive Materials

- The licensee was packaging and shipping radioactive wastes in accordance with regulatory requirements and with the appropriate documentation and shipping papers. (Section 3.2)

### Occupational Radiation Exposure

- The radiation protection and decommissioning programs met applicable requirements. Radioactive materials, radiation work activities, and radiation areas were being controlled in accordance with the requirements of 10 CFR Part 20 and Technical Specifications. (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 (SFP) (ADAMS Accession Number ML16319A254). On December 28, 2016, the NRC informed the licensee that it was no longer under the 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 provided 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.

The NRC issued License Amendment No. 295 (ADAMS Accession Number ML18276B286) for the permanently defueled Emergency Plan that is commensurate with the significantly reduced spectrum of credible accidents that can occur in the permanently defueled condition. The license amendment became effective on April 7, 2018, and the licensee officially implemented the Permanently Defueled Emergency Plan on April 9, 2018.

**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

The NRC inspectors observed the weekly Senior Leadership Team meeting, which was attended by management representatives for each program area at the site. The meeting focused on the scheduled tasks to place the facility in SAFSTOR condition, including the activities necessary for licensing, engineering and safety evaluations, and construction of the new Orano TN (formerly TN Americas) dry cask storage of spent fuel. The inspectors observed management involvement and knowledge of the programs discussed. There was a focus on meeting milestones while ensuring safety, as well as ensuring that system abandonments were performed correctly and at the appropriate interface with other systems and components. One example observed during the meeting involved the compressed air system in which management discussed further evaluations were being performed to ensure the system was abandoned appropriately.

There were two project presentations made at the end of the Senior Leadership Team meeting, which provided the status of the dry cask project and the radioactive materials project. The presentations provided the current status, upcoming milestones and support needs, and areas of increased focus, as well as areas of possible risks. The NRC inspectors observed a thorough awareness of each project by the respective management representative. The inspectors observed the licensee using the team meeting as an opportunity to ensure awareness and knowledge management of projects as the facility was transitioning to SAFSTOR condition and activities were being performed to support the eventual movement of spent fuel to dry cask storage.

The inspectors reviewed the system abandonment and pre-abandonment status that was being tracked by the licensee. The database indicated 17 systems were fully abandoned and 19 systems were pre-abandoned. At the time of the inspection, the licensee was developing work packages and associated radiation work permits to support the abandonment of the chemical and volume control system. There were approximately 40 systems currently required to support spent fuel safety and regulatory requirements. The licensee was continuing to work on asbestos abatement as well as supporting other maintenance activities within the District, so the work schedule was being coordinated across the District. In addition, the licensee was developing the criteria to evaluate the removal of large components and Greater-Than-Class-C materials and whether to initiate the projects prior to placing the facility into dormancy and subsequent SAFSTOR condition.

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 the weekly chemistry surveillance of the SFP. The inspectors observed that the chemistry staff used low dose waiting areas, implemented good radiological work practices and had the surveillance CH-ST-SFP-0001, “Spent Fuel Pool Boron Sampling and Analysis,” Revision 24, in hand while performing the task. The inspectors concluded that the documented surveillance was completed as required and the test results were acceptable.

The inspectors reviewed the licensee’s radiation protection survey schedule and concluded that survey frequencies reflected the condition of the facility and were reasonable to adequately meet the survey requirements under 10 CFR Part 20. 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.

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 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, when fuel assemblies are stored in the pool. The NRC inspectors reviewed the SFP level operational logs and chemistry data for the period since the last inspection. The inspectors concluded that the SFP level remained relatively steady at approximately 41 feet, which is roughly 28 feet above the top of irradiated fuel. The boron concentration in the SFP ranged between 2257-2303 parts per million since March 2018, which sufficiently met the Technical Specifications requirements, 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 ranged between 63°F-68°F since March 2018. The temperature varied according to the temperature of the Missouri River, since the river acted as the heat sink.

The inspectors reviewed the Control Room log for the recorded operating pressure for the component cooling water surge tank nitrogen overpressure. The log indicated it was steady at approximately 14 pounds per square inch gauge, which was within the 10-20 pounds per square inch gauge for the pressure range.

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 Solid Radioactive Waste Management and Transportation of Radioactive Materials (IP 86750)**

3.1 Inspection Scope

The inspectors reviewed the licensee's radioactive waste management and transportation activities to determine whether the licensee properly processed, packaged, stored, and shipped radioactive materials in accordance with regulations.

3.2 Observations and Findings

The inspectors reviewed the licensee's radioactive waste shipment log, which documented 13 shipments during calendar year 2018. The inspectors reviewed the following four shipping packages for compliance with the regulations under 10 CFR 71.5, "Transportation of Licensed Material," and the licensee's procedures, and concluded that the shipping packages were generated in accordance with requirements and contained thorough supporting documentation.

- 17-18, Resin
- 17-20, Resin
- 18-11, Resin
- 18-13, Dry Active Waste

The licensee had six individuals qualified in accordance with the requirements under 49 CFR Subpart H. The inspectors verified and concluded that individuals involved in the packaging preparation and transport had received the proper and adequate training and that the training was appropriately documented in the training records.

The licensee performed self-assessments and audits of the radioactive waste and transportation programs during 2017 and 2018, respectively. The inspectors reviewed self-assessment PI-AA-126-1005-F-01, Revision 1, dated October 19, 2017, which appeared to be a thorough review of the program. The licensee did not identify any deficiencies associated with the radioactive waste and transportation programs. Nuclear Oversight performed an audit, NOSA-FCS-18-02 (AR# 67668) dated May 16, 2018, which covered a number of programs, including radioactive waste and transportation. The audit concluded that the radioactive waste and transportation program met expectations and no recommendations were identified.

3.3 Conclusions

The licensee was packaging and shipping radioactive wastes in accordance with regulatory requirements and with the appropriate documentation and shipping papers.

**4 Occupational Radiation Exposure (83750)**

4.1 Inspection Scope

The inspectors conducted a review of the occupational radiation exposure program including work planning and preparation, training and qualifications of personnel, external and internal exposure controls, and survey and control of radioactive materials.

4.2 Observations and Findings

The inspectors reviewed the licensee's radiation protection program procedures including RP-1000, "Radiation Protection Program Description," Revision 1, which detailed the dose controls program, ALARA program, respiratory protection program, and the radioactive materials and contamination controls program, all of which reflected the regulatory requirements under 10 CFR Part 20. Licensee procedure RP-1001, "Radiation Protection Processes and Operations," Revision 0, detailed the expectations and principles for the performance of radiation protection activities, including safety culture, human performance, management standards and expectations, performance indicators, and conservative decision-making.

The inspectors reviewed the Station ALARA Committee meeting minutes dated December 20, 2017, which reviewed the 2017 year-to-date exposure of 3.32 rem, based on electronic dosimeters used at the facility. In addition, the 2018 dose estimate of 14.315 rem and goal of 13.730 rem were approved by the committee. The increased dose for calendar year 2018 was calculated based on the anticipated work load to support asbestos abatement, dry cask project, reactor vessel inspections, source term reduction, removal of the wide range detectors, and other scheduled work. As of May 2018, the current dose estimate for calendar year 2018 was 11.22 rem, primarily as a result of reductions in asbestos abatement work and dose estimates for removing the wide range detectors.

The total effective dose equivalent that was reported for calendar year 2017 was 2.770 rem total exposure for a population of 627 persons monitored during the year, based on the optically stimulated luminescence dosimeters. The number of persons that received no measurable exposure during the year was 555 persons. The highest exposure received by one individual was 293 millirem. The optically stimulated luminescence dosimeters used by the licensee were supplied by Landauer, Inc. (Lab Code: 100518-0), which holds an accreditation under the National Voluntary Laboratory Accreditation Program for the types of radionuclides expected to be present at the facility.

The inspectors reviewed several radiation work permits (RWPs) and discussed the ALARA planning with two planners. The facility had several standing RWPs that were renewed annually for programmatic activities, such as Operations, Chemistry, or Regulatory Activities. In addition, the radiation planning staff generated specific RWPs to support specific work packages. Based on a review of several RWPs including, 18-0331,

“Removal of Wide Range Detectors and preparation activities for shipment,” and discussions with the planners, the inspectors concluded that the licensee was proactively controlling and monitoring work activities through the planning process, establishing controls, and implementing training and mock-ups to minimize exposures. In addition, the licensee utilized historical data and information as necessary to develop the RWPs. Based on interviews and a review of several RWP packages, the inspectors concluded that the licensee successfully demonstrated planning skills, developed thorough RWPs in accordance with licensee procedures, and implemented an adequate exposure control program that was ALARA.

The licensee implemented a respiratory protection program consistent with engineering controls, and maintaining the total effective dose equivalent ALARA. The inspectors reviewed the respiratory protection program, including observing the licensee implement a mask fit test. The inspectors concluded that the program was implemented in accordance with licensee’s procedures that reflected guidance contained in NUREG/CR-0041, “Manual of Respiratory Protection Against Airborne Radioactive Materials,” Revision 1.

4.3 Conclusion

The radiation protection and decommissioning programs met applicable requirements. Radioactive materials, radiation work activities, and radiation areas were being controlled in accordance with the requirements of 10 CFR Part 20 and Technical Specifications.

**5 Exit Meeting Summary**

On June 7, 2018, the NRC inspectors presented the final inspection results to Mr. Ted Maine, Plant Manager, and other members of the licensee’s staff. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was provided during the inspection.

**SUPPLEMENTAL INFORMATION**

**KEY POINTS OF CONTACT**

Licensee Personnel

T. Maine, Plant Manager  
C. Longua, Assistant Plant Manager Operations  
D. Whisler, Manager, Radiation Protection  
A. Barker, RP Supervisor  
C. Waszak, Supervisor Nuclear Engineering  
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 86750 Solid Radioactive Waste Management and Transportation of Radioactive Materials  
IP 83750 Occupational Radiation Exposure  
IP 85103 Material Control and Accounting at Decommissioning Nuclear Power Reactors

**LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**

Opened/Closed/Discussed

None

**LIST OF ACRONYMS**

ADAMS Agencywide Documents Access and Management System  
ALARA As Low As is Reasonably Achievable  
CFR *Code of Federal Regulations*  
CR Condition Report  
FCS Fort Calhoun Station  
IMC Inspection Manual Chapter  
MC&A Material Control & Accounting  
NMMSS National Materials Management and Safeguards System  
NRC Nuclear Regulatory Commission  
OPPD Omaha Public Power District  
PSDAR Post-Shutdown Decommissioning Activities Report  
RWPs Radiation Work Permits  
SFP Spent Fuel Pool  
SNM Special Nuclear Material