



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

June 15, 2022

Troy Via, Chief Operations Officer
and Vice President Utility Operations
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 050-00285/2022-003

Dear Mr. Via:

This letter refers to the U.S. Nuclear Regulatory Commission (NRC) decommissioning inspection conducted May 16-19, 2022, at the Fort Calhoun Station near Blair, Nebraska. The NRC inspector discussed the results of the decommissioning inspection with members of your staff during the final exit meeting on May 19, 2022. 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 and security, and 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, observation of activities, and interviews with personnel. Specifically, the inspector reviewed decommissioning performance and the occupational radiation exposure program. No violations were noted, and no response to this letter is required.

In accordance with 10 CFR 2.390 of the NRC's "Agency 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 Website at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response, if you choose to provide one, should not include any personal privacy or proprietary information so that it can be made available to the public without redaction.

T. Via

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If you have any questions regarding this inspection report, please contact Dr. Robert Evans at 817-200-1234, or the undersigned at 817-200-1249.

Sincerely,



Signed by Warnick, Gregory
on 06/15/22

Gregory G. Warnick, Chief
Decommissioning, ISFSI, Operating Reactors
Branch
Division of Radiological Safety and Security

Docket No.: 050-00285

License No.: DPR-40

Enclosure:

Inspection Report 050-00285/2022-003

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

Docket No.: 050-00285

License No.: DPR-40

Report No.: 050-00285/2022-003

Licensee: Omaha Public Power District

Facility: Fort Calhoun Station

Location: 9610 Power Lane
Blair, Nebraska

Dates: May 16-19, 2022

Inspector: Robert J. Evans, PhD, CHP, PE, Senior Health Physicist
Decommissioning, ISFSI, Operating Reactors Branch
Division of Radiological Safety and Security

Approved By: Gregory G. Warnick, Chief
Decommissioning, ISFSI, Operating Reactors Branch
Division of Radiological Safety and Security

Enclosure

EXECUTIVE SUMMARY

Fort Calhoun Station
NRC Inspection Report 050-00285/2022-003

This U.S. Nuclear Regulatory Commission (NRC) inspection was a routine, announced inspection of decommissioning activities being conducted at the Fort Calhoun Station. In summary, the inspector concluded that the licensee was conducting activities in accordance with site procedures, license requirements, and applicable NRC regulations.

Decommissioning Performance and Status Review at Permanently Shutdown Reactors

- The licensee was conducting decommissioning activities in accordance with license and regulatory requirements. The radiation safety staff was adequately overseeing work activities in containment. (Section 1.2.a)
- The licensee was proactive in its efforts to identify and resolve a potential negative trend involving industrial-related incidents. The licensee experienced a dropped load event inside of containment, and at the time of the inspection, the licensee was in the process of conducting a root cause analysis of the event. (Section 1.2.b)
- The licensee conducted and documented surveys in accordance with site procedures to justify the unconditional release of the turbine building and intake structure. (Section 1.2.c)

Occupational Radiation Exposure

- The licensee established and implemented an air sampling program in accordance with regulatory requirements and site procedures. (Section 2.2)

Report Details

Summary of Plant Status

On June 24, 2016, Omaha Public Power District, the licensee, formally notified the NRC of its intent to permanently cease operations at Fort Calhoun Station (FCS) (Agencywide Documents Access and Management System [ADAMS] Accession No. ML16176A213). The licensee permanently ceased power operations on October 14, 2016, and certified pursuant to Title 10 *Code of Federal Regulations* (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 spent fuel pool (ML16319A254).

The licensee submitted its Post-Shutdown Decommissioning Activities Report (PSDAR) to the NRC on March 20, 2017 (ML17089A759). The PSDAR described the licensee's proposed decommissioning activities and schedule. At that time, the licensee selected the SAFSTOR decommissioning option. SAFSTOR is a method of decommissioning in which a nuclear facility is placed and maintained in a condition that allows the facility to be safely stored and subsequently decontaminated (deferred decontamination) to levels that permit release for unrestricted use.

In April 2019, the licensee changed its decommissioning approach from SAFSTOR to DECON. DECON is a method of decommissioning in which structures, systems, and components that contain radioactive contamination are removed from the site and safely disposed at a commercially operated low-level waste disposal facility or decontaminated to a level that permits the site to be released for unrestricted use shortly after it ceases operation. By letter dated December 16, 2019, FCS submitted an updated PSDAR to reflect the change from SAFSTOR to DECON (ML19351E355).

On May 13, 2020, FCS removed the last canister of fuel and all special nuclear material from the spent fuel pool (ML20139A138). Accordingly, FCS entered the Independent Spent Fuel Storage Installation (ISFSI)-only Technical Specifications and Emergency Plan on May 18, 2020, and ISFSI-only Security Plan on June 24, 2020.

Regulation 10 CFR 50.82(a)(9) specifies that an application for license termination must be accompanied or preceded by a license termination plan (LTP). On August 3, 2021, FCS submitted its LTP to the NRC (ML21271A178). The NRC accepted the LTP for a detailed technical review on February 10, 2022 (ML22038A675). At the time of this inspection, the NRC planned to hold a public meeting in the vicinity of the site to discuss the proposed LTP during the summer of 2022.

Since the previous inspection in March 2022 (ML22112A158), the licensee continued to segment the reactor vessel internals. The licensee started the work in November 2021. During this inspection period, the licensee's contractor was cutting the upper core barrel thermal shield. The next planned activities included the removal of the mid-core barrel, upper guide structure, upper support plate, and lower core barrel.

The demolition of the turbine and auxiliary buildings was in progress during the inspection. The licensee had completed the removal of the condenser tubes and continued with the disassembly of the turbine-generator systems and components. One of the next buildings scheduled to be demolished was the upper part of the intake structure. Prior to demolition, the licensee planned to isolate the intake structure from the river water.

The licensee also continued to package and ship radioactive and non-radioactive wastes for disposal. The radioactive wastes were being shipped by rail, while the non-radioactive wastes were being shipped by truck to the respective disposal sites. In addition, the licensee was conducting final status surveys of land areas outside of the radioactive restricted area. This work was being conducted at risk pending NRC review and approval of the LTP. In other words, the licensee implemented the surveys using the procedures provided in the LTP; although, the LTP had not been approved by the NRC at the time of the inspection.

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

1.1 Inspection Scope

The inspector conducted interviews, attended licensee meetings, reviewed procedures, and conducted site tours to: (1) evaluate the status of decommissioning and verify whether the licensee is conducting decommissioning and maintenance activities in accordance with regulatory and license requirements; and (2) maintain awareness of work activities to assess licensee control and conduct of decommissioning.

1.2 Observations and Findings

The PSDAR, Section 2.0, provides a general description of the planned decommissioning activities. The PSDAR states that decommissioning activities will be performed in accordance with written, reviewed, and approved site procedures. The inspector reviewed selected decommissioning activities in progress, interviewed staff responsible for the work, and reviewed selected procedures and other related documents to ensure that decommissioning activities were being conducted as described in the PSDAR.

a. Site Tours

The inspector toured the facility including the containment, turbine building, and intake structure. While touring containment, the inspector discussed the ongoing work activities with the radiation safety staff who were overseeing contractor's work to ensure safe radiation practices were being followed. The radiation safety staff was found to be knowledgeable about the radiological and industrial safety hazards. The inspector concluded that there was sufficient radiation safety oversight of work activities.

During the tour of containment, the inspector conducted independent radiological surveys using a Ludlum Model 2401-EC2 survey meter, NRC No. 016294G, calibration due date of January 28, 2023, calibrated to cesium-137. The inspector did not identify any radiation area that was not already identified and posted by the licensee.

Through observations during plant tours, discussions with staff, and reviews of records, the inspector determined that the licensee was appropriately controlling and conducting facility decommissioning in a safe manner. The licensee appeared to be conducting good housekeeping practices with appropriate radiological postings and labeling.

b. Review of Recent Site Events

The inspector conducted a review of recent site events. Several industrial-related events occurred during 2022 that resulted in a safety stand down on March 29, 2022. Corrective actions included the development of a subcontractor performance improvement plan and training. The stand down ended on April 5, 2022. A second stand down occurred on May 3, 2022, due to inconsistencies in the subcontractor's implementation of the performance improvement plan. This second stand down was lifted on May 9, 2022. The corrective actions planned in response to the second stand down included further trending to monitor the safety performance of the subcontractor.

A third stand down occurred on May 16, 2022, due to a near-miss incident involving the potential for clean demolition debris almost falling into the radiologically restricted area. Although no debris fell into the restricted area, the work was stopped until an investigation was complete, and the event discussed with the subcontractor. The stand down was lifted two days later.

The inspector reviewed the three stand down events and concluded that none were reportable to the NRC, and that the licensee demonstrated a proactive concern for safety by supporting the stand downs.

On April 20, 2022, the licensee was in the process of removing a liner containing radioactive wastes from the reactor cavity when the transfer bell (transfer cask) hoist, rated at approximately 15,000-pound capacity, unexpectedly failed, resulting in the drop of the 10,000-pound liner. The liner fell approximately 26 feet back into the reactor cavity and landed in its original location. Site staff monitored the cavity pool for leakage and the area for increased radiological levels, but none were identified.

In response to the incident, the licensee chose to conduct a root cause analysis. The cause of the hoist failure was still under investigation at the conclusion of the onsite inspection. The licensee provided a courtesy notification to the NRC, but since the event was not related to nuclear safety, the licensee did not formally notify the NRC Operations Center of the incident. The inspector observed the status of the reactor cavity, transfer bell, and liner during routine tours of containment.

c. Demolition of Turbine Building and Intake Structure

The demolition of the turbine building was in progress during the inspection. The building rubble was being released as non-radioactive material. The licensee also plans to demolish portions of the intake structure in the future. The inspector reviewed the licensee's records demonstrating that the two structures could be free-released, and the resultant rubble could be disposed at a non-radioactive material landfill. The inspector toured the two structures and discussed the survey results with applicable site staff. In summary, the licensee's records indicate that the two buildings were free of radioactive material and the building could be released for unrestricted use.

Prior to demolition of the turbine building, the licensee conducted a review of the activities that had to be completed to support the planned decommissioning effort. A technical review was conducted by the licensee and documented in evaluation EC 70323, Abandonment of Turbine Building, Revision 0. The evaluation identified several activities that must be completed prior to demolition of the building. The activities

included abandonment and removal of potentially radioactive contaminated piping and capping of all piping penetrations traversing the walls of the building. One potentially contaminated line was the liquid radwaste discharge line which was capped and removed from the turbine building in March 2021. The other two potentially contaminated lines, the raw water and auxiliary feedwater lines, were also capped at the wall. Work Order Package 00607535 provided the detailed instructions to physically cap and remove selected pipes and systems from the turbine building. The inspector reviewed selected portions of this procedure

Based on interviews and the licensee's records, there were no potentially radioactive lines entering or passing through the intake structure. The liquid radwaste line was connected to the discharge tunnel structure which is located adjacent to the intake structure. A section of the liquid radwaste discharge line was still in place at the time of the inspection. This section was located below the ground surface between the turbine building and the discharge tunnel structure, and the licensee planned to remediate this piping at a later date.

As part of the historical site assessment, the licensee reviewed the radiological events that could have impacted the turbine building and intake structure. Records indicate that the safety injection refueling water tank experienced an overflow event in 1984 that spilled radioactive liquids into the rooms and floors of the turbine building. However, as discussed in Section 2.1.5 of the LTP, ordinarily, historical events that resulted in contamination were remediated immediately at the time of discovery, meaning that the 1984 contamination event should have been cleaned up immediately after discovery of the spill.

The inspector reviewed the licensee's radiological surveys of the two buildings. The licensee conducted at least two surveys of each of the two buildings, a characterization survey and an unconditional release survey. The results of the characterization surveys were documented in the LTP, and the results of the unconditional release surveys were documented in survey packages. The characterization survey included volumetric concrete sampling, surface scans, fixed point measurements, and swipe sampling. The unconditional release survey included surface scans, fixed point measurements, and swipe sampling. Both sets of records indicate that the survey results were indistinguishable from background. When survey results were distinguishable from background, the licensee analyzed samples to demonstrate the radioactivity was the result of naturally occurring radioactive material and not licensed material. As a final check, the rubble left the site through a truck monitor which ensured that the rubble did not contain radioactive material.

In summary, the inspector confirmed that the unconditional release surveys were conducted in accordance with the instructions provided in the respective survey procedure FCSD-RA-LT-307, Unconditional Release Surveys, Revision 2.

1.3 Conclusion

The licensee was conducting decommissioning activities in accordance with license and regulatory requirements. The radiation safety staff was adequately overseeing work activities in containment. The licensee was proactive in its efforts to identify and resolve a potential negative trend involving industrial-related incidents. The licensee experienced a dropped load event inside of containment, and at the time of the inspection, the

licensee was in the process of conducting a root cause analysis of the event. The licensee conducted and documented surveys in accordance with site procedures to justify the unconditional release of the turbine building and intake structure.

2 Occupational Radiation Exposure (37801)

2.1 Inspection Scope

The inspector reviewed documents, interviewed plant personnel, and conducted site tours to ensure adequate protection of worker health and safety from exposure to radiation or radioactive material and to evaluate whether the licensee adequately identified problems and implemented appropriate and timely corrective actions related to occupational radiation safety.

2.2 Observations and Findings

Regulation 10 CFR 20.1501(a) states, in part, that each licensee shall make or cause to be made, surveys that are reasonable under the circumstances to evaluate: (1) the magnitude and extent of radiation levels; (2) concentrations or quantities of residual radioactivity; and (3) the potential radiological hazards of the radiation levels and residual radioactivity detected. The inspector reviewed the licensee's control and implementation of air sampling during decommissioning. The inspector observed the status of area air samplers, continuous air monitors, breathing zone monitors, and access control point monitors. The inspector also reviewed the licensee's analysis of air sampling filters. In summary, the licensee was conducting air sampling in accordance with site procedures.

The inspector observed the licensee conducting air sampling during routine decommissioning activities within containment. The samplers in use included two continuous air monitors, three area "gooseneck" air samplers, at least one high-volume air sampler, and breathing zone samplers. The continuous air monitors were located near ongoing work being conducted in the vicinity of the reactor cavity. The area air samplers were located near containment openings to monitor for potential releases of radioactive material, a high-volume air sampler was located near the reactor cavity work, and selected workers were assigned breathing zone monitors to monitor for potential inhalation of radioactive material.

Procedure FCSD-RP-310, Revision 1, "Radiological Air Sampling," provides the instructions for collecting, handling, and analyzing air samples for the purpose of assessing airborne radioactivity. The inspector reviewed the licensee's implementation of the procedure requirements inside of containment. The inspector concluded that the licensee was conducting air sampling in accordance with procedure requirements.

The inspector reviewed the records from the last time that a decommissioning activity resulted in airborne radioactivity. The last activity was the sump demolition work that occurred in March 2022. The work created an airborne radioactivity area, but the workers were conducting the work with air supplied respirators. Due to the protection factor provided by the respirators, the workers did not receive an assignable quantity of internal dose.

Finally, the inspector reviewed the licensee's methodology for analyzing air sampler filters. The filters are usually analyzed by gamma spectroscopy. The licensee also could analyze the filters for gross alpha and gross beta radioactivity as needed. Following filter analyses, the licensee's staff created the paperwork documenting the estimated derived air concentrations and potential internal doses, if any, to site workers.

The inspector questioned the licensee's staff about the validation and verification of the software used to calculate the derived air concentrations and worker doses since the process was highly automated. The licensee's staff provided documentation that the software was validated and verified by the software vendor

2.3 Conclusions

The licensee established and implemented an air sampling program in accordance with regulatory requirements and site procedures.

3 Exit Meeting Summary

On May 19, 2022, the inspector presented the final inspection results to the licensee's staff. All proprietary information was returned to licensee representatives.

SUPPLEMENTAL INSPECTION INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

- A. Barker, Regulatory Assurance & Emergency Planning Manager
- C. Cameron, Principal Regulatory Specialist
- S. Eidem, Director, Engineering Services
- C. Heimes, Manager, IOF Security
- R. Hugenroth, Manager, Nuclear Oversight
- C. Longua, Assistant Plant Manager, Operations
- T. Maine, Plant Manager, Decommissioning
- J. Nowak, Project Manager, Decommissioning
- J. Shuck, Manager, System Engineering
- A. Staebell, Manager, Maintenance Services
- R. Stohlmann, Manager, Design Engineering
- T. Uehling, Senior Director, FCS Decommissioning
- T. Via, Chief Operations Officer and Vice President Utility Operations
- D. Weaver, Manager Project Control
- D. Whisler, Manager, Radiation Protection and Chemistry

INSPECTION PROCEDURES (IPs) USED

- IP 71801 Decommissioning Performance and Status Review at Permanently Shutdown Reactors
- IP 83750 Occupational Radiation Exposure at Permanently Shutdown Reactors

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Open

None

Closed

None

Discussed

None

LIST OF ACRONYMS

ADAMS	Agencywide Documents Access and Management System
CFR	<i>Code of Federal Regulations</i>
FCS	Fort Calhoun Station
IP	Inspection Procedure
ISFSI	Independent Spent Fuel Storage Installation
LTP	License Termination Plan
NRC	U.S. Nuclear Regulatory Commission
PSDAR	Post-Shutdown Decommissioning Activities Report