



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

September 13, 2023

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 05000285/2023-004

Dear Troy Via:

This letter refers to the U.S. Nuclear Regulatory Commission (NRC) decommissioning inspection conducted August 21-24, 2023, at the Fort Calhoun Station near Blair, Nebraska. The NRC inspectors discussed the results of this inspection with you and members of your staff on August 24, 2023. The inspection results are documented in the enclosure to this letter.

During this inspection, the NRC inspectors examined activities conducted under your licenses as they relate to public health and safety, the environment, and to confirm compliance with the Commission's rules and regulations, as well as with the conditions of your license. Within these areas, the inspection consisted of the examination of procedures and representative records, observation of activities, and interviews with personnel. Specifically, the inspectors reviewed your decommissioning performance, occupational radiation exposure, radioactive waste treatment, and effluent and environmental monitoring program. Within the scope of the inspection, no violations were identified and a response to this letter is not 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's 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.

If you have any questions regarding this inspection report, please contact Stephanie Anderson at 817-200-1213, or the undersigned at 817-200-1249.

Sincerely,



Signed by Warnick, Gregory
on 09/13/23

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

Docket No. 050-00285
License No. DPR-40

Enclosure:
Inspection Report 050-00285/2023-004

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SEPTEMBER 13, 2023.

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FORT CALHOUN STATION – NRC INSPECTION REPORT 05000285/2023-004

ADAMS ACCESSION NUMBER: **ML23254A220**

➔ SUNSI Review By: MTJ	ADAMS: ➔ Yes <input type="checkbox"/> No	<input type="checkbox"/> Sensitive ➔ Non-Sensitive	<input type="checkbox"/> Non-Publicly Available ➔ Publicly Available	Keyword NRC-002
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**U.S. NUCLEAR REGULATORY COMMISSION
REGION IV**

Docket No.	050-00285
License No.	DPR-40
Report No.	050-00285/2023-004
Licensee:	Omaha Public Power District
Facility:	Fort Calhoun Station
Location:	9610 Power Lane Blair, Nebraska
Dates:	August 21-24, 2023
Inspectors:	Stephanie G. Anderson, Senior Health Physicist Decommissioning, ISFSI, and Operating Reactor Branch Division of Radiological Safety and Security M. Troy Johnson, Health Physicist Decommissioning, ISFSI, and Operating Reactor Branch Division of Radiological Safety and Security
Accompanied By:	Geoffrey B. Miller, Director (Acting) Division of Radiological Safety and Security Eric S. McManus, Health Physicist Decommissioning, ISFSI, and Operating Reactor Branch Division of Radiological Safety and Security
Approved By:	Gregory G. Warnick, Chief Decommissioning, ISFSI, and Operating Reactor Branch Division of Radiological Safety and Security

Enclosure

EXECUTIVE SUMMARY

Fort Calhoun Station
NRC Inspection Report 050-00285/2023-004

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 inspectors 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 conducted decommissioning activities in accordance with license and regulatory requirements. The inspectors determined that the licensee was adequately controlling decommissioning activities and radiological work areas at the facility. Staffing levels were commensurate with the current facility activities. (Section 1.2)

Occupational Radiation Exposure

- The licensee has effective procedures in place to maintain doses below regulatory limits and to accurately perform bioassay in order to assign doses from events that cause internal dose. The licensee is using good as low as reasonably achievable (ALARA) practices and is maintaining all required area postings in accordance with regulatory and procedural requirements. (Section 2.2)

Radioactive Waste Treatment, and Effluent and Environmental Monitoring

- The licensee was satisfying the radioactive effluent sampling and analysis requirements so that discharges of radioactive materials were adequately quantified and evaluated from all established release points. Additionally, the radiological environmental monitoring programs were effectively implemented consistent with technical specifications and the offsite dose calculation manual. (Section 3.2)

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 of the 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.

Title 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). On July 13, 2022, the NRC held a public meeting at Blair Public Library & Technology Center and discussed the NRC's process and timeline for reviewing the LTP.

Since the previous NRC inspection in June 2023, the licensee and contractors have continued with active deconstruction and demolition around the site. The licensee was actively removing insulation around the reactor vessel, completing demolition on the administrative building, and shipping radioactive waste to licensed disposal sites.

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

1.1 Inspection Scope

The objectives of this portion of the inspection were to: (1) verify status of

decommissioning and verify whether the licensee is conducting decommissioning and maintenance activities in accordance with regulatory and license requirements; (2) evaluate licensee awareness of work activities to assess their control and conduct of decommissioning; and (3) evaluate the licensee's decommissioning staffing, personnel qualifications, and training requirements, including that of the contracted workforce, to ensure that license requirements are met, as applicable to the current decommissioning status.

1.2 Observations and Findings

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

The inspectors attended several routine meetings during the inspection, including the bi-weekly senior leadership performance challenge meeting and the plan of the day meetings for the contractor staff. The licensee's conversations were detailed. Management facilitated knowledgeable and wide-ranging discussions to evaluate the risk of ongoing and upcoming planned activities and reviewed the project schedule and milestones. The inspectors concluded that licensee management was maintaining appropriate oversight of decommissioning activities, with a focus on safety.

The inspectors toured the facility, including the reactor containment building, the containment waste structure (CWS), and the waste processing structure (WPS). While touring containment, the inspectors observed the work activities for the reactor vessel insulation removal. The radiation safety staff was found to be knowledgeable about the radiological and industrial safety hazards. The inspectors concluded that there was sufficient radiation safety oversight to keep the contractors informed of changing hazardous conditions.

Through observations, plant tours, discussions with staff, and records reviews, the inspectors determined that the licensee was appropriately controlling and conducting facility operations in the radiologically restricted areas in a safe manner. General observations by the inspectors identified good housekeeping practices and appropriate radiological postings and labeling. The inspectors did not identify any radiation area that was not already identified and posted by the licensee.

The inspectors evaluated staff levels and training for select radiation protection staff. The inspectors determined that staffing levels for these groups were commensurate with the current facility activities. Staff records reviewed indicated an appropriate level of qualification for the position with initial and annual refresher training being up to date as required by licensee procedures.

1.2 Conclusion

The licensee conducted decommissioning activities in accordance with license and regulatory requirements. The inspectors determined that the licensee was adequately controlling decommissioning activities and radiological work areas at the facility. Staffing

levels were commensurate with the current facility activities.

2 Occupational Radiation Exposure at Permanently Shutdown Reactors (IP 83750)

2.1 Inspection Scope

The inspectors 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

The inspectors reviewed the qualifications and training of select members of the licensee's radiation protection personnel and noted that all required training and qualifications were adequate and current.

Reactor vessel insulation removal is controlled by procedure FCSD-WM-110-F-03, "Reactor Vessel (RV) Segmentation Activities Insulation Removal," revision 0. The inspectors attended the pre-job briefing for reactor vessel insulation removal and noted that the briefing was conducted with a focus on safety and on maintaining radiation dose as low as reasonably achievable (ALARA). During walkdowns of the containment structure the inspectors observed reactor vessel insulation removal work in progress and specifically noted use of good ALARA practices as discussed in the earlier pre-job briefing in addition to good housekeeping and observance of sound safety practices. Radiological air sampling is controlled by procedure FCSD-RP-310, "Radiological Air Sampling," revision 1. During observation of the work in progress, the inspectors noted several work area samplers in place and noted the presence of two operating continuous air monitors. All samplers were operated consistent with procedures and located to adequately monitor potential personnel exposures.

The inspectors walked down radiological control areas (RCA) inside the containment structure and the waste processing structure to verify, in part, appropriate radiological postings, high radiation area control, and to evaluate material conditions. Overall material condition inside the RCAs was noted to be adequate with an emphasis on good housekeeping. Procedure FCSD-RP-460, "Controls for High and Locked High Radiation Areas," revision 3, was used for the establishment and posting of high and locked high radiation areas. The inspectors verified all high and locked high radiation areas and noted they were posted and controlled in accordance with procedures and regulatory requirements.

Site dosimetry is processed by Landauer Incorporated. Landauer Incorporated maintains a National Voluntary Laboratory Accreditation to International Organization for Standardization/International Electrotechnical Commission (ISO/IEC) 17025:2017.

The ISO/IEC 17025:2017 standard specifies the general requirements for the competence, impartiality, and consistent operation of laboratories. Inspectors reviewed onsite storage of dosimeters before their issuance, during use, and before being shipped for processing. Dosimeters not actively issued were stored in a container in a room where no sources of radiation were present. Issued dosimeters, when not actually being

worn, were stored in an area for common access which was monitored for background radiation by a control dosimeter that was posted in the immediate vicinity. All dosimetry actively being worn by personnel was noted to be located appropriately on the body for the radiation exposure expected to be received.

The inspectors reviewed the licensee's occupational exposure records for calendar year 2022 to ensure compliance with regulatory requirements. Based on the licensee's records, 718 individuals were monitored in 2022. Of the individuals monitored, 387 received no measurable exposure, 258 received measurable exposure less than 0.10 rem, 29 received between 0.10 and 0.25 rem, 20 received between 0.25 and 0.50 rem, 11 received between 0.50 and 0.75 rem, 6 received between 0.75 and 1.00 rem, 6 received between 1.00 and 2.00 rem, and 1 received between 2.00 and 3.00 rem. All occupational exposures were below the regulatory limit of 5 rem as provided in 10 CFR 20.1201(a).

The inspectors reviewed procedure FCSD-RP-202, "Exposure Control and Authorization," revision 2. This procedure described the program by which the Radiation Protection Department evaluates and controls personnel occupational exposure. Section 4.2.1 established an Administrative Dose Control Level (ADL) for total effective dose equivalent (TEDE) at 2 rem routine cumulative per year for adults. Once the ADL is reached, authorization must be obtained to increase the ADL in .5 rem increments with increasing levels of supervisory and management approval not to exceed the limits in 10 CFR 20.1201(a). The inspectors then reviewed the licensee's most risk significant population occupational exposure records, those being personnel that have entered an RCA. Records from January 1, 2023, to July 12, 2023, were reviewed to ensure compliance with procedural and regulatory requirements. Based on the licensee's records, 378 individuals in this category were monitored during this time period. Of this number, 26 individuals had received a TEDE greater than 1 rem. This is an increase from 2022 where a total of 7 individuals received a TEDE greater than 1 rem. This increase is attributed to reactor vessel segmentation work and associated higher dose rates encountered. The highest occupational exposure at the time of the inspection for 2023 was 1.760 rem which is below the ADL and the regulatory limit of 5 rem as provided in 10 CFR 20.1201(a).

The inspectors reviewed the licensee's bioassay program. Procedure FCSD-RP-220, "Bioassay Program," revision 4, established the requirements for a comprehensive bioassay program and the methods for evaluation of bioassay. The inspectors reviewed two select bioassay in-vivo internal dose assessment reports. Both intakes reviewed were calculated based on intake method and effective half life of the decay. While in both cases the Committed Effective Dose Equivalent (CEDE) was less than 10 mrem and not required by procedure to be recorded on NRC form 5, FCS chose to record the CEDE dose of 9.6 mrem on NRC form 5 for one of the individuals since it was close to 10 mrem. In both cases, the dose assessments were found to be completed in accordance with procedures.

The inspectors reviewed the procedure FCSD-RP-221, "Collection and Handling of In-Vitro Bioassay Samples," revision 0. The procedure provided guidance for collecting, packaging, documenting, and tracking of bioassay samples. At the time of the inspection there were no in-vitro bioassay assessments for the inspectors to review. Inspectors evaluated FCS stored collection and packaging components and found them to be

adequate to perform an in-vitro bioassay evaluation in accordance with the procedure if required.

2.3 Conclusion

The licensee has effective procedures in place to maintain doses below regulatory limits and to accurately perform bioassay in order to assign doses from events that cause internal dose. The licensee used good ALARA practices and maintained all required area postings in accordance with regulatory and procedural requirements.

3 **Radioactive Waste Treatment, and Effluent and Environmental Monitoring (IP 84750)**

3.1 Inspection Scope

The inspectors reviewed documents and interviewed plant personnel to assess the licensee's performance in the following areas: (1) radioactive waste treatment systems are maintained and operated to keep offsite doses ALARA; (2) licensee effectively controls, monitors, and quantifies releases of radioactive materials in liquid, gaseous, and particulate forms to the environment; (3) radiological environmental monitoring programs are effectively implemented to ensure effluent releases are being adequately performed as required to minimize public dose; and (4) licensee implementation of the voluntary NEI/Industry Ground Water Protection Initiative.

3.2 Observations and Findings

Technical specification requirements associated with the Offsite Dose Calculation Manual (ODCM) and the Radiological Environmental Monitoring Program (REMP) were moved to the Quality Assurance Topical Report (QATR) Appendix E upon the issuance of License Amendment No. 299 on December 19, 2019 (ML19297D677).

The inspectors reviewed the latest QATR NO-FC-10, revision 17, effective January 1, 2023, and noted revision 17 changes were made in accordance with 10 CFR 50.54(a). The QATR assigns major functional responsibilities for decommissioning activities at the site and provides the criteria for the ODCM, effluent monitoring programs, environmental monitoring programs, and associated reports. The inspectors noted at the time of the inspection the licensee was using revision 38 to the ODCM. The ODCM contains the methodology and parameters used in the calculations of offsite doses resulting from gaseous and liquid effluents and the licensee's environmental radiological monitoring program. This revision of the ODCM was previously reviewed by inspectors as documented in the NRC Inspection Report 050-00285/2022-005 (ML22290A061).

The inspectors reviewed the licensee's annual Radiological Environmental Operating Report (REOR) for calendar year 2022. The REOR is required by the QATR Appendix E.4.2 and provided an overview of the associated REMF for calendar year 2022. The inspectors examined the REMF to determine if it was compliant with the requirements established within the QATR Appendix E.3.1. and verified that the report was submitted to the NRC by the required date. Additionally, the inspectors reviewed select portions of the REMF presented data for 2022 and noted the data was within expected ranges when compared with historical results.

The inspectors reviewed the licensee's Annual Radioactive Effluent Release Report (ARERR) for 2022. The ARERR is required by Appendix E.4.1 of the QATR. The ARERR contained the results of the effluent report as well as quarterly dose calculations performed in accordance with the ODCM by quarter for the period January 1, 2022, through December 31, 2022. The inspectors reviewed select portions of the data within the ARERR and noted no anomalies in presented data or associated calculation methodologies.

The inspectors reviewed the licensee's groundwater protection and monitoring program. Procedure SO-G-118, "Site Groundwater Protection Program," revision 7, provided guidance to preclude inadvertent releases to groundwater, prevent migration of radioactive materials to offsite groundwater, and to quantify any potential impacts of decommissioning activities. Procedure FCSD-CH-104, "Ground Sampling and Analysis Process Manual," revision 2, provided guidance regarding the collection of groundwater and well water samples to support the Site Groundwater Protection Program. The inspectors reviewed select independent laboratory analysis for the groundwater samples that were collected by the licensee and noted no anomalies in the presented data.

The inspectors performed walk downs of the air effluent monitoring systems at the WPS and the CWS. During the walkdowns inspectors observed site Chemistry personnel perform weekly effluent air monitor sample collection. Sample collection was performed in accordance with procedures FCSD-CH-110, "Waste Processing Structure Sampling and Analysis," revision 1, and FCSD-CH-111, "Containment Waste Structure Sampling and Analysis," revision 1, respectively. Review of these procedures by the inspectors showed them to be comprehensive and written with the end user in mind. The observed sample collection was performed in accordance with procedures and the associated equipment was well maintained and within calibration.

The inspectors performed a walk down of the monitored release system as well as the associated hoses and equipment for the decanting of a "Baker tank" and observed site personnel performing the monitored release. The release was performed in accordance with Special Radiological Liquid Release Permit, release number: 2023069, issued: August 22, 2023, which was reviewed by the inspectors. Monitoring of the release was performed in accordance with procedure OI-WDL-3, "Liquid Waste Disposal Release," revision 39, "Attachment 9 - Normal Release of a Banker Tank". The inspectors noted the typographical error in the title of the attachment. Radiological monitoring of the release is performed with an RM-055 monitor that provided real time monitoring of counts per minute, gallons per minute, and total counts using a Honeywell Minitrend QX. The RM-055 unit had an associated audible and visual alarm in the unlikely event the predetermined count rate set point was exceeded so the release could be terminated and the cause rectified. The inspectors noted during the walk down of the monitored liquid release system that there was a cracked section of piping that protected one of the monitored release hoses and condition report CR-2023-00140; OP-2023-0077 "Monitored Release PVC Pipe from FIX to RM-055 is cracked" was generated. The observed release was performed in accordance with procedures and the associated equipment was within calibration where applicable.

3.3 Conclusion

The licensee was satisfying the radioactive effluent sampling and analysis requirements so that discharges of radioactive materials were adequately quantified and evaluated from all established release points. Additionally, the radiological environmental monitoring programs were effectively implemented consistent with technical specifications and the offsite dose calculation manual.

4 Exit Meeting Summary

On August 24, 2023, the inspectors presented the final inspection results to the licensee's staff. All proprietary information was returned by the NRC inspection team.

SUPPLEMENTAL INSPECTION INFORMATION

KEY POINTS OF CONTACT

Licensee and Contractor Personnel

A. Barker, Regulatory Assurance & Emergency Planning Manager
A. Hanson, Principle Regulatory Specialist
T. Maine, Plant Manager, Decommissioning
J. Nowak, Project Manager, Decommissioning
T. Uehling, Senior Director, FCS Decommissioning
D. Whisler, Manager Radiation Protection & Chemistry

INSPECTION PROCEDURES USED

IP 71801	Decommissioning Performance and Status Review at Permanently Shutdown Reactors
IP 83750	Occupational Radiation Exposure at Permanently Shutdown Reactors
IP 84750	Radioactive Waste Treatment, and Effluent and Environmental Monitoring

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Open
None

Closed
None

Discussed
None

LIST OF ACRONYMS

ADAMS	Agencywide Documents Access and Management System
ADL	Administrative Dose Control Level
ALARA	As Low As Reasonably Achievable
ARERR	Annual Radioactive Effluent Release Report
CEDE	Committed Effective Dose Equivalent
CWS	Containment Waste Structure
FCS	Fort Calhoun Station
ISO/IEC	International Organization for Standardization/ International Electrotechnical Commission
NRC	Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
QATR	Quality Assurance Topical Report
RCA	Radiological Control Area
REMP	Radiological Environmental Monitoring Program

REOR	Radiological Environmental Operating Report
TEDE	Total Effective Dose Equivalent
WPS	Waste Processing Structure