



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

November 8, 2017

Ms. Mary J. Fisher, Senior Director
of Decommissioning
Omaha Public Power District
Fort Calhoun Station
9610 Power Lane, Mail Stop FC-2-4
Blair, NE 68008

SUBJECT: FORT CALHOUN STATION – NRC INSPECTION REPORT 05000285/2017-012

Dear Ms. Fisher:

This letter refers to the U.S. Nuclear Regulatory Commission (NRC) inspection conducted on October 23-26, 2017, at the Fort Calhoun Station located near Blair, Nebraska. The NRC inspectors discussed the results of this inspection with you and other members of your staff during a final exit meeting conducted on October 26, 2017. The inspection results are documented in the enclosed report 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 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 recently authorized certified fuel handler training program; implementation of your effluent and environmental monitoring programs; and your radiological controls and transportation programs. No violations were identified and no response to this letter is required.

In accordance with 10 *Code of Federal Regulations* (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). ADAMS is accessible from the NRC's Website 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 05000285/2017-012;
w/Attachment: Supplemental Information

U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket No. 05000285

License No. DPR-40

Report No. 05000285/2017-012

Licensee: Omaha Public Power District

Facility: Fort Calhoun Station

Location: 9610 Power Lane
Blair, Nebraska

Dates: October 23-26, 2017

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

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 05000285/2017-012

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 05000285/2017-012. In summary, the licensee was conducting these activities in accordance with site procedures, license requirements, and applicable NRC regulations.

Organization, Management, and Cost Controls at Permanently Shutdown Reactors

- The licensee had implemented a certified fuel handler training program in accordance with its procedures and regulatory requirements. (Section 1.2)

Decommissioning Performance and Status Review at Permanently Shutdown Reactors

- The licensee had benchmarked decommissioning activities in preparation of the SAFSTOR strategy with other decommissioned facilities. The licensee was using a methodical approach to identify and safely prepare the facility for SAFSTOR in accordance with its procedures and the Post-Shutdown Decommissioning Activities Report (PSDAR). The licensee was monitoring completion of its commitment to implement the design and licensing basis reconstitution for sections directly associated with the spent fuel pool, spent fuel pool cooling, and required supporting structures, systems, and components in condition report CR0842. (Section 2.2)

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 3.2)

Occupational Radiation Exposure

- The licensee effectively implemented its ALARA program in accordance with procedures and regulatory requirements. The licensee demonstrated initiatives to implement methods and practices to maintain doses ALARA. Based on a review of the licensee's exposure tracking for 2017 and review of several ALARA committee meeting agenda and reports, the inspectors concluded there was adequate management support for, and cooperation with, radiation protection planning for radiological work activities. (Section 4.2)

Radioactive Waste Treatment, Effluent, and Environmental Monitoring

- The licensee maintained effluent monitoring and control systems as required, to support the condition of the facility since permanently ceasing operations. The effluent flow paths and monitoring systems reviewed aligned with descriptions in the Offsite Dose Calculation Manual (ODCM) and were calibrated, functional, and the alarm setpoints met

regulatory requirements. The licensee's effluent monitoring program was being conducted in accordance with the appropriate regulatory requirements as prescribed by the licensee's ODCM. The licensee's radiological environmental monitoring program was also being conducted in accordance with the appropriate regulatory requirements as prescribed by the licensee's ODCM. (Section 5.2)

Solid Radioactive Waste Management and Transportation of Radioactive Materials

- The inspectors concluded that the licensee was knowledgeable of the transportation requirements and adequately trained to implement the program. The licensee maintained a solid radioactive waste management and transportation program that met the regulatory requirements. (Section 6.2)

Adverse Weather Protection

- The licensee had initiated its adverse weather preparations in accordance with regulatory and license requirements. (Section 7.2)

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 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). The licensee committed to complete these actions by December 29, 2017.

1 Organization, Management, and Cost Controls at Permanently Shutdown Reactors (36801)

1.1 Inspection Scope

The inspectors verified that the certified fuel handler training program was being implemented in accordance with licensee procedures and NRC requirements.

1.2 Observations and Findings

The inspectors as part of this inspection module reviewed the following against licensee Procedure TQ-DC-FC-101, "Certified Fuel Handler Training and Retraining Program" and the NRC approval of this program dated June 21, 2017 (ADAMS Accession Number ML17144A246):

- CFH (Certified Fuel Handler) retraining exam materials
- CFH training program course descriptions
- Medical exams for three CFH operators to ensure biennial requirement met
- Control Room card in data for three CFH operators to verify watch proficiency
- CFH organizational structure
- Exam security requirements

To date the licensee currently has 26 Certified Fuel Handlers who were previously licensed operators. There was no current class in progress although the licensee is prepared to implement a class should one become necessary due to personnel reductions as part of the decommissioning process. The inspectors have determined through personnel interviews and program material review that the licensee was correctly implementing the CFH program in a systematic approach to training (SAT) manner as defined in 10 CFR 55.4.

1.3 Conclusion

The licensee had implemented a certified fuel handler training program in accordance with its procedures and regulatory requirements.

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

2.1 Inspection Scope

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

2.2 Observations and Findings

The licensee had issued Revision 2, dated October 2017, of its SAFSTOR Timeline that provided an overall project plan for SAFSTOR, along with staffing adjustments. The overarching activities identified by color-codes on the timeline included: 1) fuel management, 2) Technical Specifications and Offsite Dose Calculation Manual (ODCM), 3) Defueled Safety Analysis Report and Accident Analysis, 4) hazard reduction, environmental and radioactive waste, 5) emergency planning, 6) security plan,

7) engineering programs, and 8) modifications. These activities were scheduled to be completed to support the transition to SAFSTOR by end of the 4th quarter, 2021. The licensee communicated the plan revisions to the employees on Wednesday, October 25, 2017.

Based on the licensee's evaluation of activities to support SAFSTOR and the schedule to complete the movement of all spent fuel to the Independent Spent Fuel Storage Installation by the close of 4th quarter 2020, the licensee determined to implement its design and licensing basis reconstitution for sections directly associated with the spent fuel pool, spent fuel pool cooling, and directly required supporting structures, systems, and components. The licensee generated condition report CR0842 to track the commitments documented under NRC letter (EA-13-243) dated April 12, 2017, Closure of Confirmatory Action Letter Commitments, (ADAMS Accession Number ML17102B737).

The licensee continued to implement benchmarking with other decommissioned reactor facilities, including Zion, Vermont Yankee and Kewaunee, in which source term reduction was identified as a specific project. During the Station ALARA Committee (SAC) meeting on September 27, 2017, the licensee discussed the removal of the source term activity from primary systems, with consideration of working area dose rates, as well as reducing the number of high radiation areas and locked high radiation areas. The high and locked-high radiation areas were located in containment, and the auxiliary and radwaste buildings. The licensee explained that the efforts in removing the source term would require 10 CFR Part 61 analyses for the waste streams to support waste characterization and classification for transportation and disposal. The licensee further discussed possibly using a portable gamma imaging camera that would enhance the survey capabilities of the staff by estimating and mapping the dose rate in areas to support the identification of systems to be removed, while maintaining exposures ALARA.

The mechanical systems that supported spent fuel pool safety had not undergone any changes since the last inspection. These systems included raw water, which discharges into the Missouri River as the ultimate heat sink; component cooling water; spent fuel pool cooling; instrument air and turbine plant cooling water. All major secondary systems had been drained, as well as primary systems not required for SAFSTOR and spent fuel safety. In the areas toured, the licensee had implemented radiation protection controls, including postings and labeling that were in compliance with regulatory and procedure requirements. The inspectors also observed the status of boundaries, postings, and labeling to ensure compliance with regulatory and procedural requirements.

2.3 Conclusion

The licensee had benchmarked decommissioning activities in preparation of the SAFSTOR strategy with other decommissioned facilities. The licensee was using a methodical approach to identify and safely prepare the facility for SAFSTOR in accordance with its procedures and the PSDAR. The licensee maintained an overall organizational structure to support decommissioning activities. The licensee was monitoring completion of its commitment to implement the design and licensing basis reconstitution for sections directly associated with the spent fuel pool, spent fuel pool cooling, and required supporting structures, systems, and components in condition report CR0842.

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

3.1 Inspection Scope

The inspectors conducted a review of the spent fuel pool (SFP) safety at the facility. Specifically, the inspectors reviewed records of SFP water level monitoring, water chemistry logs, other routine surveillances, and condition reports. In addition, the inspectors performed walk-downs of the SFP support systems and associated piping, including the SFP to component cooling water heat exchanger. These inspections were performed to ensure that the licensee was maintaining its spent fuel pool in accordance with Technical Specifications and other procedural requirements.

3.2 Observations and Findings

Technical Specifications Section 3.2, Table 3.5, Item 20 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. The NRC inspectors reviewed the SFP level operational logs for the period June 1, 2017 through October 17, 2017. 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 SFP temperature was procedurally required to be maintained between 45 and 100 degrees Fahrenheit (°F). The temperatures were 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. NRC inspectors reviewed the SFP temperature trends between June 1, 2017 through October 17, 2017, and observed that the temperatures increased steadily during the summer months to a peak of approximately 94°F on July 20, 2017, and then decreased steadily to approximately 66°F at the time of the inspection. The heat load of the spent fuel pool will continue to decrease, as presented in the graph documented in the licensee's Procedure OP-FC-108-117-1001, "Spent Fuel Storage Pool Heat-Up Rate with Loss of Normal Cooling," Revision 6; therefore, the inspectors concluded that the recorded temperatures of the spent fuel pool during the summer of 2017, would likely be the highest observed.

The NRC inspectors reviewed the boron concentration in the SFP for the period June 7, 2017, through October 11, 2017. The NRC determined that the level remained above 2,160 parts per million (ppm); therefore, the licensee was operating within its administrative limits and met its license requirements in Technical Specification 2.8.3(6) for greater than or equal to 800 ppm.

The licensee had completed the spent fuel characterization campaign using RWP 17-0328. At the time of the inspection, the licensee was conducting the SFP non-fuel characterization and inventory, under RWP 17-0330. The characterization will provide the licensee information regarding items that are Greater than Class C (GTCC) that are currently stored in the pool. The inspectors reviewed the inventory of non-fuel related materials that were stored in the spent fuel pool, which primarily consisted of Tri-Nuclear equipment and filters from the spent fuel characterization campaign.

The licensee was continuing to monitor the leaks from the spent fuel pool to the liner and subsequently to the drain lines. The licensee elected to clean the drain line, which removed the build-up from the system. 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.

3.3 Conclusion

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.

4 **Occupational Radiation Exposure (83750)**

4.1 Inspection Scope

The inspectors evaluated the licensee's implementation of its occupational radiation safety program.

4.2 Observations and Findings

The licensee implemented Procedure RP-4000, "ALARA Program," Revision 1, for its ALARA program. The procedure specified that the members of the SAC consisted of the chair along with a minimum quorum of four voting positions. The inspectors reviewed the ALARA meeting minutes from the second committee meeting for 2017, conducted on April 11, 2017. There were eight voting members including the chairman and four additional non-voting members, for a total of 12 attendees. The attendees represented a cross-section of the plant site and appeared to contribute to the discussions on the agenda. The meeting minutes noted there was proactive discussion on the fuel characterization campaign and the members also discussed the characterization of non-fuel materials stored in the spent fuel pool to identify potentially GTCC waste items for potential cask disposal.

The inspectors reviewed several radiation work permits, including 17-0328, "Fuel Characterization in Preparation for Dry Cask Storage" and the associated ALARA Plan. The work was reviewed at 50 percent and 80 percent completion of the activities associated with the RWP. The exposure estimate and job scope was modified, well documented and approved in accordance with licensee's Procedure RP-4010, "ALARA Planning and Controls," Revision 0. The ALARA Plan 17-0325 was reviewed for the spent resin shipments. The estimated exposure was 0.330 person-rem for approximately 800 person-hours. The licensee had captured several operational experiences and lessons learned that were also pertinent to the activity. The inspectors concluded the ALARA planning packages, documented hold points and exposure reduction measures were well thought-out and provided conservative decision making in controlling exposures ALARA.

Since the licensee entered into decommissioning status for the facility, it had chosen to assign an overall station dose goal in lieu of departmental dose goals, which is consistent with a number of other decommissioned facilities. The station dose goal for 2017 was 3.0 rem, with a SAC goal of 2.6 rem. Based on the most recent data presented to the SAC during the last ALARA Committee meeting conducted on September 27, 2017, the station had 2.08 rem through August 2017. The licensee evaluated the remaining work activities and recommended a new SAC goal of 2.924 rem for calendar year 2017.

At the time of the inspection, the licensee's exposure was 2.561 rem, with approximately 59,418 person-hours of work activity. The primary activities that contributed to the calendar year dose was the fuel and non-fuel characterizations and the spent resin transfers and shipments. The inspectors observed that the licensee was planning work activities, holding frequent ALARA Committee meetings with adequate management support, and monitoring work activities to achieve its ALARA dose goals.

The inspectors observed that current radiological surveys were captured electronically and 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 March 13, 2018, and determined the results were consistent with the licensee's radiological survey results.

4.3 Conclusions

The licensee effectively implemented its ALARA program in accordance with procedures and regulatory requirements. The licensee demonstrated initiatives to implement methods and practices to maintain doses ALARA. Based on a review of the licensee's exposure tracking for 2017 and review of several ALARA committee meeting agenda and reports, the inspectors concluded there was adequate management support for, and cooperation with, radiation protection planning for radiological work activities.

5 Radioactive Waste Treatment, Effluent, and Environmental Monitoring (84750)

5.1 Inspection Scope

Technical Specifications Section 5.16 requires in part, that the licensee establish, implement, and maintain a radiological effluents and environmental monitoring programs as specified in the Offsite Dose Calculation Manual (ODCM) and regulatory requirements. The ODCM provided the methodology and parameters for monitoring, sampling, performing analyses, and reporting of radiation and radionuclides in the environment. In addition, the Technical Specifications, Sections 5.9.4.a and 5.9.4.b requires the licensee to submit the Radiological Effluent Release Report and Radiological Environmental Operating Report to the NRC before May 1 of each year.

The inspectors reviewed the reports submitted on April 27, 2016, (ADAMS Accession Number ML17116A472) for calendar year 2015, and April 26, 2017, (ADAMS Accession Number ML16125A132) for calendar year 2016, as required by the Technical Specifications. The Annual Radioactive Effluent Release Report submittals also included a copy of the ODCM, as required by Technical Specifications, Section 5.17.d.

a. Gaseous and Liquid Effluents Monitoring

The inspectors reviewed the licensee's effluents monitoring program and determined that it was implemented in accordance with the ODCM. The review consisted of the annual radioactive effluent release reports that covered periods 2015 and 2016; transition to reduced effluent pathways since the fuel was permanently removed from the reactor vessel in November 2016; observation of a routine chemistry surveillance; and review of several effluent release packages.

Parameter	Gaseous Effluent	
	2015	2016
Noble Gas	1.31 curies	1.04 curies
Iodines & Particulates with half-lives greater than eight days (excluding noble gases)	3.7E-6 curies	0.0 curies
Carbon-14	1.97 curies	1.97 curies
Tritium	2.88 curies	2.99 curies
Total Body Dose at unrestricted boundary	0.0997 mrem	0.0868 mrem
Critical Organ Dose at unrestricted boundary	0.483 mrem	0.420 mrem
Parameter	Liquid Effluent	
	2015	2016
Liquid Activity released, excluding tritium, dissolved gases, and alpha	0.0121 curies	0.0434 curies
Tritium	158 curies	149 curies
Total Body Dose at site discharge	0.0311 mrem	0.211 mrem
Critical Organ Dose at site discharge	0.0440 mrem	0.326 mrem

The inspectors reviewed the annual reports and selected data used in the development of the reports and compared the information provided against the requirements in the ODCM. As summarized above, the effluents released during 2015 and 2016 did not exceed the limits established in the ODCM. In addition, the doses were calculated in accordance with the ODCM and were less than 1 mrem and did not exceed the dose to members of the public as specified under 10 CFR 20.1302. The inspectors also reviewed several effluent release packages and confirmed the licensee was adequately implementing its ODCM for release of liquid and gaseous effluents during the review period.

The licensee was no longer using the circulating water system for liquid effluent releases and instead was using two raw water pumps. The licensee continued to monitor the releases by radiation monitor (RM-055). The licensee had calculated new ODCM liquid effluent alert and high alarm setpoint values for RM-055, because the flow was reduced from 120,000 gallons per minute (gpm) to approximately 7200 gpm.

The inspectors observed a routine chemistry surveillance of the laboratory and radioactive waste processing building exhaust stack (RM-043) for radioactive gases, particulates, and iodines. The inspectors observed good use of licensee Procedure CH SMP-RE-0018, "Laboratory and Radioactive Waste Processing Building Exhaust Stack Sampling," Revision 32, for initiating the sample preparation, sample collection, and restoring the monitor to service. The chemistry technician and accompanying radiation protection technician used good radiological protection techniques to ensure the samples were not mishandled or contaminated. The chemistry technician followed the guidance provided in the procedure for initiating actions after observing the flow return to

normal after sample change-out and the flow fault continued in alarm. The licensee initiated condition report CR 2017 02480.

The licensee was prepared to implement compensatory measures by collecting an alternate effluent sample every 12 hours for noble gas, as required by the ODCM, Table 3.2.1. The on-shift radiation protection technicians had recently been trained to collect alternate samples of the effluent stack under training Course 1927278. The licensee was able to clear the fault and no further actions were necessary.

b. Environmental Monitoring

The Technical Specifications, Section 5.16 requires the licensee to monitor the radiation and radionuclides in the environs of the plant. It further states that the program shall provide: (1) representative measurements of radioactivity in the highest potential exposure pathways, and (2) verification of the accuracy of the effluent monitoring program and modeling of environmental exposure pathways. In addition, the program shall be contained in the ODCM and conform to the guidance of Appendix I to 10 CFR Part 50.

The ODCM, Section 5.1.2, states in part, that the Radiological Environmental Monitoring Program (REMP) samples shall be collected at specific locations and frequency provided in Tables 5.1 and 5.2 and analyzed in accordance with the detection capabilities for environmental sample analysis lower limits of detection provided in Table 5.3. The inspectors compared the REMP sample results as documented in the Radiological Environmental Operating Reports for 2015 and 2016, and concluded that the sample collection and frequency for air, surface water, ground water, milk, vegetation, fish, sediment, food crops and direct radiation exposure as measured by thermoluminescent dosimeters (TLDs) were performed in accordance with the collection and frequency prescribed in the ODCM. The sample results reflected historical data or were less than the lower limits of detection. The inspectors concluded that the results verified the effluent monitoring program was satisfactory.

The licensee was required to perform a biennial environmental land use survey in accordance with the Technical Specifications Section 5.16, and ODCM, Section 5.2, between the dates of June 1 and October 1. The licensee performed the survey for 2015 and 2016, which were documented in the annual Radiological Environmental Operating Reports. The inspectors confirmed there were no changes in the use of areas at and beyond the site boundary that would require changes to the radiological environmental monitoring program.

c. Groundwater Monitoring Wells

The inspectors reviewed the licensee's Procedure SO-G-118, "Site Groundwater Protection Program," Revision 5a, which provided sampling, reporting, and testing protocols as recommended by NEI Industry Initiative on Groundwater Protection (NEI 07-07). The program consisted of 19 wells, in which 6 of the well locations had both, a 25-foot and 50-foot well pair. The remaining 7 wells were located at 25-feet below the surface. In addition, the licensee sampled from 2 surface water sites, and 4 storm water headers within the site property, as part of the groundwater program. The licensee indicated that the geology of the area was comprised of limestone at approximately 75-feet below the ground surface. The groundwater monitoring well data

was captured in the 2015 and 2016 Radiological Effluent Technical Specification reports. The inspectors reviewed the groundwater data, which indicated all of the quarterly sample results were less than detectable.

5.3 Conclusions

The licensee maintained effluent monitoring and control systems as required, to support the condition of the facility since permanently ceasing operations. The effluent flow paths and monitoring systems reviewed aligned with descriptions in the ODCM and were calibrated, functional, and the alarm setpoints met regulatory requirements. The licensee's effluent monitoring program was being conducted in accordance with the appropriate regulatory requirements as prescribed by the licensee's ODCM. The licensee's radiological environmental monitoring program was also being conducted in accordance with the appropriate regulatory requirements as prescribed by the licensee's ODCM.

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

6.1 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.

6.2 Observations and Findings

The inspectors reviewed the licensee's 2016 and 2017 radioactive shipment tracking summary, generated as of October 10, 2017. The licensee performed 14 shipments during 2016, in which 2 of the shipments were dry, active waste shipments to Bear Creek Operations in Tennessee. These 2 shipments were captured in the licensee's Radiological Effluent Release Report dated April 26, 2017, as required. The licensee had also completed sixteen shipments during 2017, in which 6 shipments were dry, active waste shipments to Bear Creek Operations and 1 shipment of Category 2 resins transported to Erwin Resin Solutions, located in Erwin, Tennessee, for processing.

The inspector's reviewed the procedures that governed the shipment of radioactive materials, including RP-6000, "Radioactive Material/Waste Shipments," Revision 0 and RP-6110, "Surveying Radioactive Material Shipments," Revision 0. Several transportation packages were reviewed for compliance with the regulations under 10 CFR 71.5, "Transportation of Licensed Material" and the licensee's procedure. The inspectors concluded that the shipping packages were generated in accordance with regulatory requirements and the packages contained thorough supporting documentation. The packages reviewed included:

- 17-08, Dry, Active Waste Shipment to Bear Creek Operations
- 17-05, Dry, Active Waste Shipment to Bear Creek Operations
- 17-16, Category 2 Resins to Erwin Resin Solutions

The licensee demonstrated that they had accurately determined the waste characterization for the dry, active waste stream and the resins that were shipped. The licensee used a

dose rate to curie calculation to determine the quantity of radioactive materials in the shipment based on the analyzed waste stream and subsequently, the classification for the shipments. The inspectors confirmed that the licensee maintained copies of licenses of the recipients of the radiological waste shipments. The inspectors verified that the dynamometer used for determining the weight of the shipment was last calibrated on August 11, 2017. Based on the shipment packages reviewed, the inspectors determined that the packages were generated in accordance with the licensee's procedures and regulatory requirements.

Since the licensee had not recently performed a Category 2 shipment, the licensee performed mock-ups to ensure clearance for the movement of equipment and the travel path of the overhead crane, and to obtain lessons learned to reduce exposures prior to initiating the resin transfer and shipment. The licensee performed the initial Category 2, resin shipment on October 10, 2017 and was planning to perform 4 additional shipments of resins during the remainder of 2017, for a total of 5 shipments. The licensee implemented the lessons learned during the mock-ups and informed the inspectors that the initial resin transfer and shipment went smoothly.

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 accordance with the requirements under 49 CFR Subpart H. In addition, since the resins were exempt only from 10 CFR Part 37, Subparts B, C, and D, these wastes were still subject to the requirements under 10 CFR 37.11(c)(1) through 10 CFR 37.11(c)(4). As such, material accountability and training were required to the extent necessary to identify the materials as Part 37 exempt waste. The inspectors verified that the individuals involved with the Category 2 resin shipment had the appropriate training for 10 CFR Part 37, to the extent necessary to meet this Part.

6.3 Conclusions

The inspectors concluded that the licensee was knowledgeable of the transportation requirements and adequately trained to implement the program. The licensee maintained a solid radioactive waste management and transportation program that met the regulatory requirements.

7 **Adverse Weather Protection (71111.01)**

7.1 Inspection Scope

The inspectors reviewed the licensee's procedural guidance for actions necessary to protect important systems during extreme cold weather conditions.

7.2 Observations and Findings

The inspectors reviewed several of the licensee's procedures including OI-EW-1, "Extreme Weather," Revision 37, Procedure OI-EW-2, "Cold Weather Operations with Auxiliary Steam Unavailable," Revision 6, SY-FC-101-146, "Severe Weather Preparation and Response," Revision 1, and SA-FC-2114, "Winter Safety," Revision 3. The inspectors discussed the preparations and lessons learned with several licensee staff members regarding the actions taken by the licensee to ensure those systems important

to decommissioning safety would not be impaired due to extreme cold weather. Based on the actions taken during the 2016 winter, the licensee did not experience any pipe breaks or impacts to those systems important to decommissioning safety. In preparation for the 2017 winter readiness, the licensee had initiated several work orders to perform the actions necessary for cold weather preparations.

7.3 Conclusions

The licensee had initiated its adverse weather preparations in accordance with regulatory and license requirements.

8 Exit Meeting Summary

On October 26, 2017, 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

C.Longua, Assistant Plant Manager Operations
D.Whisler, Radiation Protection Manager
R.Beck, Manager, Chemistry
S.Lemieux, Shift Manager, Operations
J.Hoffman, Supervisor, Chemistry Operations
B.Pearson, RP Supervisor, Transportation
S.Arora, Supervisor, Nuclear Engineering
M.Marcellus, Chemistry Technical Support Specialist
C.Cameron, Principal Regulatory Specialist

INSPECTION PROCEDURES USED

IP 36801 Organization, Management, and Cost Controls at Permanently Shutdown Reactors
IP 71801 Decommissioning Performance and Status Review at Permanently Shutdown Reactors
IP 60801 Spent Fuel Pool Safety at Permanently Shutdown Reactors
IP 83750 Occupational Radiation Exposure
IP 84750 Radioactive Waste Treatment, Effluent, and Environmental Monitoring
IP 86750 Solid Radioactive Waste Management and Transportation of Radioactive Materials
IP 71111.01 Adverse Weather Protection

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened/Closed

None

Discussed

None

LIST OF ACRONYMS

ADAMS	Agencywide Documents Access and Management System
ALARA	As Low As is Reasonably Achievable
CFH	Certified Fuel Handler
CFR	<i>Code of Federal Regulations</i>
CR	Condition Report
FCS	Fort Calhoun Station
GTCC	Greater than Class C
IMC	Inspection Manual Chapter
NRC	Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
OPPD	Omaha Public Power District
PSDAR	Post-Shutdown Decommissioning Activities Report
SAC	Station ALARA Committee
SAT	Systematic Approach to Training
SFP	Spent Fuel Pool
TS	Technical Specifications

FORT CALHOUN STATION – NRC INSPECTION REPORT 05000285/2017-012 - DATED
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