



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

EN54335
EN54298

January 28, 2020

Mr. Mike Annacone
Vice President, Columbia Fuel Operations and
Manager, Columbia Plant
Westinghouse Electric Company
5801 Bluff Road
Hopkins, SC 29061

**SUBJECT: WESTINGHOUSE ELECTRIC COMPANY – NUCLEAR REGULATORY
COMMISSION INTEGRATED INSPECTION REPORT NUMBER 70-1151/2019-005**

Dear Mr. Annacone:

This letter refers to inspections conducted from October 1 through December 31, 2019, at the Westinghouse Columbia Fuel Fabrication Facility in Hopkins, SC. The purpose of the inspections was to determine whether activities authorized under the license and implementation of programs and procedures in the areas of Radiological Controls and Facility Support were conducted safely and in accordance with Nuclear Regulatory Commission (NRC) requirements. The enclosed inspection report presents the results of this inspection. At the conclusion of the inspections, the inspectors discussed the findings with you and members of your staff during exit meetings held on December 12 and December 17, 2019.

Based on the results of this inspection, the NRC has determined that no violations of more than minor significance were identified.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390 of NRC's "Rules of Practice and Procedure," a copy of this letter and enclosure 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), which is accessible from the NRC Website at <http://www.nrc.gov/reading-rm/adams.html>.

If you have any questions, please contact Tom Vukovinsky of my staff at (404) 997-4622.

Sincerely,

/RA/

Eric C. Michel, Chief
Projects Branch 2
Division of Fuel Facility Inspection

Docket No. 70-1151
License No. SNM-1107

Enclosure:
NRC Inspection Report 70-1151/2019-005
w/Supplemental Information

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SUBJECT: WESTINGHOUSE ELECTRIC COMPANY – NUCLEAR REGULATORY
 COMMISSION INTEGRATED INSPECTION REPORT NUMBER 70-1151/2019-005
 dated January 28, 2020

*See previous page for concurrence

PUBLICLY AVAILABLE NON-PUBLICLY AVAILABLE SENSITIVE NON-SENSITIVE

ADAMS: Yes ACCESSION NUMBER **ML20028D930** SUNSI REVIEW COMPLETE FORM 665 ATTACHED

OFFICE	RII:DFFI/PB2	RII:DFFI/PB2	RII:DFFI/PB2	RII:DFFI	RII:DFFI/PB1	RII:DFFI/PB2
NAME	K. McCurry	T. Vukovinsky	R. Gibson	E. Stamm	L. Cooke	E. Michel
DATE	12/31/2019	1/24/2020	12/12/2019	12/31/2019	12/12/2019	1/28/2020
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 70-1151

License No.: SNM-1107

Report No.: 70-1151/2019-005

Enterprise Identifier I-2019-005-0030

Licensee: Westinghouse Electric Company

Facility: Columbia Fuel Fabrication Facility

Location: Hopkins, SC 29061

Dates: October 1 through December 31, 2019

Inspectors: R. Gibson, Senior Fuel Facility Project Inspector, (Paragraph A.2, B.3.b)
T. Vukovinsky, Senior Fuel Facility Inspector, (Paragraphs B.2)
E. Stamm, Technical Assistant, (Paragraphs A.1)
K. McCurry, Fuel Facility Inspector, (Paragraphs A.1, B.1)
L. Cooke, Fuel Facility Inspector, (Paragraph A.3, B.3.a)

Approved by: E. Michel, Chief
Projects Branch 2
Division of Fuel Facility Inspection

Enclosure

EXECUTIVE SUMMARY

Westinghouse Electric Company
Columbia Fuel Fabrication Facility
Nuclear Regulatory Commission Integrated Inspection Report 70-1151/2019-005
October 1 through December 31, 2019

The inspection was conducted by Nuclear Regulatory Commission (NRC) regional inspectors during normal shifts in areas of radiological controls and event follow-up. The inspectors performed a selective examination of license activities that were accomplished by direct observation of safety-significant activities and equipment, tours of the facility, interviews and discussions with licensee personnel, and a review of facility records. One non-cited Severity Level IV violation of more than minor significance was identified during the inspection.

Radiological Controls

- In the area of Radiation Protection, no violations of more than minor significance were identified. (Paragraph A.1)
- In the area of Transportation, no violations of more than minor significance were identified. (Paragraph A.2)
- In the area of Environmental, no violations of more than minor significance were identified. (Paragraph A.3)

Other

- WER 07-1151/2019-04-00: Inadequate Overflow IROFS Design (EN 54335) was closed. (Paragraph B.1)
- WER 07-1151/2019-02-00: Fire Admin IROFS Degradation (EN 54298). No violations of more than minor significance were identified. (Paragraph B.2)
- VIO 70-1151/2018-004-01, Failure to implement management measures for the Hydrofluoric Acid (HF) Spiking Station #2 was discussed. (Paragraph B.3.a)
- Violation 2019-004-001: Failure to Perform Adequate Surveys on Outgoing Shipment of 30B Cylinders was closed. (Paragraph B.3.b)

Attachment:

Key Points of Contact
List of Items Opened, Closed, and Discussed
Inspection Procedures Used
Documents Reviewed
Acronyms and Initialisms

REPORT DETAILS

Summary of Plant Status

The Westinghouse Facility converts uranium hexafluoride (UF₆) into uranium dioxide using a wet conversion process and fabricates fuel assemblies for use in commercial nuclear power reactors. During the inspection period, normal production activities were ongoing.

A. Radiological Controls

1. Radiation Protection (Inspection Procedure 88030)

a. Inspection Scope

The inspectors evaluated selected aspects of the licensee's Radiation Protection program to verify compliance with selected portions of 10 CFR Part 20, Chapter 5 of the facility's license application, and applicable procedures.

The inspectors reviewed records and interviewed the radiation protection manager and lead engineer to verify that the licensee monitored employees likely to receive an annual dose in excess of the 10 CFR 20.1502(a) levels for occupational exposure to radiation. The inspectors reviewed the dosimetry type, the monthly and quarterly exchange periods, and the licensee's procedures for evaluating and using personnel monitoring data to verify whether these aspects accurately controlled, minimized, and accounted for occupational exposures to radiation. The inspectors also reviewed certificates to verify that the personnel dosimeter processors had a National Voluntary Laboratory Accreditation Program (NVLAP) accreditation in accordance with 10 CFR 20.1501(c). The inspectors observed operators and technicians during walk-downs to verify that they were properly wearing dosimetry.

The inspectors reviewed records and interviewed licensee personnel to verify that the bioassay program was in compliance with license requirements contained in Chapter 5.0, Radiation Safety Program. The inspectors toured whole body counting facilities, reviewed records, and reviewed procedures to verify that the whole-body counting program was in compliance with the license requirements for occupational dose analysis.

The inspectors reviewed the methodology and programmatic assumptions made by the licensee for dose calculation, specifically the equations and assumptions listed in the procedure, to verify that the licensee correctly calculated the dose to workers using conservative assumptions. The inspectors also interviewed the radiation protection engineer and witnessed how the information was entered and retrieved from the Personnel Exposure System (PES) to verify that the internal dose was monitored in accordance with 10 CFR 20.1502(b) and subsequent results were determined in accordance with 10 CFR 20.1204. Lastly, the inspectors reviewed procedures, another PES demonstration, and related issue reports initiated for employees that received higher exposures than expected and were subsequently put on restriction from working in contaminated areas to verify the licensee was following their program and minimizing total exposures.

The inspectors reviewed documents and observed activities to verify that the licensee used, to the extent practical, engineering controls to achieve occupational doses as low as reasonably achievable (ALARA) in accordance with 10 CFR 20.1101(b) and 10 CFR 20.1701. The inspectors interviewed staff, reviewed procedures, and observed licensee activities to verify that the air sampling program complied with the license requirements for internal dose calculations, samples, tracking of air concentrations and the amount of time an operator spends in the relevant areas. The inspectors interviewed staff, reviewed procedures, and walked down areas to verify that the licensee maintains a program to identify and post areas as Airborne Radioactivity Areas per 10 CFR 20.1003 and 20.1902(d), respectively. The inspectors interviewed staff to verify that the licensee used access controls or limits on exposure time for high airborne radioactivity areas where process or engineered controls were not practical. The inspectors reviewed records and interviewed staff to verify that the licensee complied with procedures and license requirements for ventilation.

The inspectors reviewed procedures (listed in the Attachment) to verify that the respiratory protection program was in compliance with license requirements and 10 CFR 20.1703. The inspectors reviewed procedures and training records to verify that the respiratory protection program adequately identified potential hazards and that users were properly trained and qualified in the use of respiratory protection equipment. The inspectors interviewed staff and reviewed records to verify that maintenance and training programs for respiratory protection equipment met license requirements and procedure SYP-218, Respiratory Protection. The inspectors reviewed records and interviewed staff to verify that the licensee gave respirator users a medical exam and fit test prior to issuing respirators and required respirators be operationally tested prior to each use.

The inspectors reviewed recent calibration records and procedures to verify that the licensee had a system for identifying instruments and equipment used for quantitative radiation measurements and due dates for periodic calibration or functional testing as per 10 CFR 20.1501(c). The inspectors interviewed licensee staff to verify that the licensee appropriately responded to out-of-calibration equipment and tracked individual instruments to determine if the performance was in accordance with license requirements. The inspectors observed the personnel monitoring stations to verify that there were no conditions that could impact the functionality of the detectors. The inspectors also reviewed calibration procedures (listed in the Attachment) to verify that they contained acceptance criteria, including values for trip settings, and that the licensee had provisions to audit or evaluate the performance of offsite vendors or companies providing calibration services.

The inspectors reviewed the dose to workers recorded on a sample of NRC Form 5s as well as listed in the PES to verify that the dose results included the total effective dose equivalent, the lens dose equivalent, the shallow dose equivalent and were less than the limits in 10 CFR 20.1201. The inspectors also reviewed the fetal dose equivalent for declared pregnant women to confirm the dose received was less than the regulatory limit in 10 CFR 20.1208 and interviewed staff to verify no minors worked in radiologically controlled areas. The inspectors reviewed the sample of NRC Form 5s to verify that the assumptions used in that analysis were adequate and that the licensee-maintained records of dose in accordance with 10 CFR 20.2106.

The inspectors reviewed the 2019 annual ALARA Report, and the past six quarterly reports, to determine whether the ALARA program complied with 10 CFR 20.1101(b) and the license requirements. The inspectors interviewed staff and reviewed program

procedures and reports to determine whether the ALARA program monitored, trended, and where practical, addressed adverse exposure trends. The inspectors interviewed licensee management concerning implementation of the program and the ALARA goals to determine whether the licensee was meeting the license commitment to ALARA. The inspectors reviewed presentations and meeting minutes to determine whether the ALARA Committee conducted activities in accordance with the license application by ensuring personnel from Radiation Protection, Environmental Safety, and operations, at a minimum, were present, they met at least annually to set goals, implement required changes and review ALARA performance indicators, and that radiation exposures did not exceed 10 CFR Part 20 limits under normal operations. The inspectors reviewed procedures and training records, as well as interviewed staff, to verify that the radiation protection staff had authority to implement ALARA policies and that workers have been adequately trained to understand the ALARA philosophy and how to implement it in accordance with the license requirements. The inspectors reviewed procedural changes to determine whether modifications were made to reduce exposures and whether ALARA was considered during the engineering phase of changes, as required by the license application to incorporate and approve ALARA considerations in the design of new or modified facilities and equipment.

The inspectors reviewed event reports, issue reports, and associated corrective actions, as well as interviewed staff and management, to determine whether the licensee implemented a program to evaluate safety-significant events in the area of radiation protection. The inspectors reviewed selected entries to verify that the licensee identified issues in a timely manner; considered extents of condition, generic implications, common causes, and trending, when appropriate; identified the root and contributing causes, if required; classified and prioritized the resolution of the problem commensurate with its safety significance; and identified corrective actions to correct the problem and prevent recurrence when necessary. The inspectors also evaluated selected events to verify that the licensee complied with the reporting requirements of 10 CFR Part 20 and Part 70. The issue reports and Redbooks reviewed included those listed in Section 4 of the Attachment.

b. Conclusion

No violations of more than minor significance were identified.

2. Transportation (Inspection Procedure 86740)

a. Inspection Scope and Observations

The inspectors evaluated selected aspects of the licensee's transportation program to verify compliance with selected portions of U.S. Nuclear Regulatory Commission (NRC) and U.S. Department of Transportation (DOT) regulations, 10 CFR Parts 20 and 71 and 49 CFR Parts 171-178, respectively, Chapters 3 and 7 of the facility's license application, and applicable procedures.

The inspectors evaluated the receipt, packaging, and transportation of licensed radioactive materials. The inspectors also observed transportation activities to determine whether they complied with the applicable NRC and DOT requirements. The observed activities included the maintenance and packaging of Traveller's Standard (TS) containers in preparation for shipment of fresh fuel in accordance with procedure TR-225, "Refurbish Traveller Shipping Package," and procedure MOP-500153, "Pack and

Unpack Fuel Assembly – Traveller Package. "The observed activities also included the receipt of 30B cylinders in UX-30 overpacks in accordance with procedure TR-300, "Unload UF₆ Cylinders," and ROP-02-010, "Surveillance of Uranium Shipment from Outside Sources."

The inspectors reviewed several records (listed in the Attachment) involving the shipment and receipt of special nuclear material to verify the appropriate documentation accompanied shipped and received packages, including specific driver instructions, emergency information, and radioactive material information. The inspectors also observed the loading of packages onto flatbed trailers and inspected other packages staged for shipment to verify the required information was marked on each package, including the transportation index, criticality safety index, and labeling in accordance with procedure ROP-02-008, "Surveys of Incoming and Outgoing Shipments of Radioactive Materials."

The inspectors reviewed training records of container handlers and shippers to ensure the licensee had administered hazardous materials transportation training to applicable personnel.

The inspectors verified that the licensee met the 10 CFR 71.21 conditions required to use the general license provision for transport of licensed material. The inspectors reviewed audits of the transportation program to verify that the licensee was performing periodic audits of the program and that the results of the audits were appropriately addressed in the licensee's corrective action program.

The inspectors reviewed plant procedures for recordkeeping and interviewed the personnel involved to verify that a system was in place to maintain shipment records for the lifetime of the facility as required by 10 CFR 71.91(a).

The inspectors reviewed the licensee's corrective action program entries regarding transportation issues since the last inspection to determine whether deviations from procedures and unforeseen process changes affecting transportation were documented and investigated promptly.

b. Conclusion

No violations of more than minor significance were identified.

3. Effluent Control and Environmental Protection (Inspection Procedure 88045)

a. Inspection Scope and Observations

The inspectors reviewed the licensee's effluent control and environmental protection program to verify that the program was in compliance with Title 10 of the Code of Federal Regulations (10 CFR) Parts 20 and 70, the license application, and applicable procedures. The inspectors reviewed changes to the environmental program organizational structure and personnel technical qualifications. The inspectors reviewed environmental protection procedures listed in the Attachment that had been revised since the last inspection to verify that no safety significant changes were made without prior evaluation and approval.

The inspectors reviewed the semi-annual effluent reports from July 2018 through June 2019 to verify that the report contained the information required by regulations. The inspectors also reviewed the annual assessment of public dose in 2018 to verify that average annual effluent concentrations released did not exceed the regulatory limits.

The inspectors observed roof effluent air stack sampling and liquid effluent sampling. The inspectors reviewed the records of sampling results to verify that records were retained and that the effluent results were less than the ALARA dose constraints.

The inspectors walked down the liquid wastewater treatment facility and interviewed staff to verify that radioactivity in the process liquid waste stream is controlled.

The inspectors observed surface water sampling at the composite road, spillway, causeway, and at the inlet, exit, and pond near Sunset Lake. The inspectors also observed onsite environmental air sampling at the four onsite environmental air sampling stations to verify that the sampling was done in accordance with procedures listed in the Attachment. The inspectors also reviewed records of results from environmental sampling to verify that they were conducted at the appropriate frequency.

The inspectors reviewed the biennial audit of vendors used to analyze environmental samples to verify that the reviews were completed in accordance with the license application. The inspectors reviewed samples of non-routine events and corrective action program entries to determine whether the licensee was identifying environmental program issues at an appropriate threshold, entering them into the corrective action program, and implementing corrective actions in accordance with the license application and applicable procedures.

b. Conclusion

No violations of more than minor significance were identified.

B. Other Areas

1. Event Follow-up (Inspection Procedures 88015, 88020, 88075)

a. WER 07-1151/2019-04-00: Inadequate Overflow IROFS Design (EN 54335)

As part of an extent of condition to review the technical basis for all passive items relied on for safety (IROFS), Westinghouse completed a calculation on October 16, 2019 that demonstrated an overflow device (designated as IROFS SOLX-115) was undersized and would not perform its credited safety function to prevent backflow of uranyl nitrate from the solvent extraction (SOLX) process into 55-gallon chemical supply drums. The existing design did not meet the performance requirements of 10 CFR 70.61 and therefore was reported to the NRC as event notification (EN) 54335. The design of the second, independent passive overflow (SOLX-117) was validated to be available and reliable to perform its safety function. The initiating event and other process valves, not designated as IROFSs or safety-significant controls (SSCs), were not credited in the sequence.

Westinghouse immediately shut down the process, isolated the unfavorable geometry chemical drums from the SOLX process by installing blind flanges, and entered the event into their corrective action program under IR-2019-15590. Westinghouse then installed a new passive overflow device (SOLX-904) that mimicked the design of the overflow capable of performing its safety function to prevent backflow (now SOLX-905). The licensee also updated the criticality safety evaluation (CSE-7-A) to reflect these changes, added a maintenance requirement to require annual functional testing of the new passive overflows, and conducted SOLX Redundant Passive Overflow training for SOLX operators.

On November 15, 2019, the licensee submitted their 30-day written report in response to this event, LTR-RAC-19-90, to meet the requirements of 10 CFR 70.50(c)(2). The inspectors reviewed the licensee's written report to verify it included the probable cause of the event, corrective actions taken or planned to prevent reoccurrence, and whether the event was identified and evaluated in the Integrated Safety Analysis. The inspectors also reviewed the issue report generated for this event to determine whether the cause statement and basis, extent of conditions, and actions required and taken reflected the information submitted in the written report and were adequate to correct the issue and prevent similar events from occurring.

To verify proper implementation of corrective actions, the inspectors reviewed the calculations to verify conservative assumptions were used. The inspectors also observed the modifications made in the field to determine whether the as-built condition matched the calculations and corrective actions assigned in the issue report. Lastly, the inspectors reviewed the criticality safety evaluation to verify all accident conditions that relied on IROFS SOLX-115 were reanalyzed and remain highly unlikely.

The inspectors followed up on the event as discussed above to ensure that the causal factors had been appropriately assessed, that appropriate and comprehensive corrective actions were taken, and that no new examples of the violation existed. This extent of condition is captured under IR-2017-881, which was initiated on August 17, 2017, to capture an event regarding the S2A and S2B scrubbers, for which the licensee was issued violations 70-1151/2017-004-01 and -02. The extent of condition is expected to be completed by the end of 2020, and the licensee prioritized all IROFS needing a calculation to justify its safety basis.

b. Conclusion

Although the existing design of the overflow did not meet the performance requirements of 10 CFR 70.61, violations identified during an extent of condition review that can be classified as a non-cited violation do not require documentation in accordance with Section 11.02 of Inspection Manual Chapter 0616. This is generally justified when the licensee identifies a violation via an extent of condition effort initiated by a corrective action program. As a matter of policy, the NRC seeks to encourage licensee problem identification and resolution efforts. This item is considered closed.

2. Event Follow-up (Inspection Procedures 88015, 88020, 88075)

a. WER 07-1151/2019-02-00: Fire Admin IROFS Degradation (EN 54298)

The inspectors reviewed Event Notice 54298, "Fire Admin IROFS Degradation," which occurred on September 26, 2019 involving an IROFS which was degraded resulting in the licensee not meeting performance requirements as required by 10 CFR 70.61.

On September 27, 2019, the fire protection engineer's review of the daily corrective action report identified a procedural non-compliance which affected an administrative IROFS. During the morning of September 26, 2019, a fuel oil delivery truck escorted by plant employees drove along the road adjacent to the Uranium Hexafluoride (UF6) cylinder storage area, violating the minimum distance requirement within procedure MCP-108111, "Regulatory Compliance for Maintenance and Contractors."

IROFS UR6FIRE-901, which requires escort and a 60-foot spacing distance was not fully satisfied. Instead of 60 feet, the truck drove past the cylinder storage area over a period of a few minutes at a distance of 20 to 30 feet. The other IROFS in this accident sequence remained reliable and available as required. The basis for this administrative control is to provide separation so that if a fire did occur involving the fuel oil delivery truck, there would be no significant fire exposure to the stored UF6 cylinders.

10 CFR 70.62 requires IROFS to be available and reliable to perform their intended safety function to meet the requirements of 10 CFR 70.61. IROFS UF6FIRE-901 provides administrative controls to ensure that tank trucks hauling flammable/combustible liquids (e.g. diesel fuel and gasoline) maintain a 60-foot distance from full UF6 cylinders. MCP-108111 provides guidance to implement this IROFS including a map of the designated escort route for tanker trucks.

Contrary to the above, during the morning of September 26th, a fuel oil delivery truck escorted by plant employees drove along the road adjacent to the Uranium Hexafluoride (UF6) cylinder storage area, violating the minimum distance requirement within procedure MCP-108111. The truck drove past the area over a period of a few minutes at a distance of 20 to 30 feet from the cylinder storage area. During this short duration, the Overall Likelihood Index for this accident sequence was below 10E-4 which is required for a high consequence event.

On November 15, 2019, the licensee submitted their 30-day written report in response to this event, LTR-RAC-19-91, to meet the requirements of 10 CFR 70.50(c)(2). The inspectors reviewed the licensee's written report to verify it included the probable cause of the event, corrective actions taken or planned to prevent reoccurrence, and whether the event was identified and evaluated in the Integrated Safety Analysis. The inspectors also reviewed the issue report generated for this event to determine whether the cause statement and basis, extent of conditions, and actions required and taken reflected the information submitted in the written report and were adequate to correct the issue and prevent similar events from occurring

Corrective actions include the use of physical barriers for the fuel delivery route and the development of a new procedure, MCP-108164, "Escorting Tank Trucks Hauling Diesel and Gasoline." This new procedure delineates the requirements for escorting and handling fuel oil near the cylinder storage areas. In addition, training will be conducted annually on this procedure to ensure compliance with UR6FIRE-901.

b. Conclusion

A violation of NRC requirements was identified by the licensee for failure to meet the performance requirements of 10 CFR 70.61. This violation is being screened as a minor violation in accordance with IMC 0616 Appendix B general screening question #12 and Section 3, Fire Protection, example A. IROFS UF6FIRE-901 was degraded due to the fuel truck being within 60 feet of UF6 cylinders. However, the duration of the event was minimized, the other IROFS in the accident sequence remained reliable and available as required, and the initiating event never occurred, therefore the risk and regulatory significance were low. This item is considered closed.

3. Follow-up on Previously Identified Issues

- a. VIO 70-1151/2018-004-01, Failure to implement management measures for the Hydrofluoric Acid (HF) Spiking Station #2 (Inspection Report 2018-004, ML18278A197)

The licensee removed the old spiking station #2 and has installed a new spiking station with an improved design. The new design incorporated several safety improvements. To prevent leaks, the spiking station tank and piping were redesigned such that the side nozzles were removed, the carbon steel piping was replaced with stainless steel piping, convolution couplings were replaced with rigid couplings, the piping flange at the bottom of the tank was replaced with an elbow, and the station was attached to a seismic anchoring frame. To better detect and contain leaks, the station was lifted to allow for easier visual inspection of the floor, the liner was removed and replaced with an acid resistant coating, and polypropylene drip pans were placed under the spiking station mix tank.

With the redesign of the spiking station, new IROFS were developed. ADUHFS-123 is a passive IROFS such that the polypropylene drip pans are favorable geometry, and ADUHFS-301 is a passive IROFS such that the polypropylene drip pans are sloped towards the front of the spiking station to provide leak indication and are sized and located to prevent minor leaks from contacting the dike coating below the spiking station. The pans will be leak checked annually using Operating Maintenance (OM) 81220. ADUHFS-909 is an active IROFS such that a level sensor on the spiking station mix tank closes valves on high tank level to prevent overfilling the mix tank.

In addition to new IROFS, existing IROFS were revised. Preventative Maintenance (PM) 81291 was added to ADUHFS-502, a passive IROFS for the structural integrity of the piping. The PM is an internal and external visual inspection of the tank and connected piping. For ADUHFS-903, a vacuum break was added to the ventilation connection of the spiking station tank to prevent backflow into HF storage, plant air, or ventilation systems.

Some of the PMs for the new design of spiking station #2 are still being developed. Work Order (WO) 866117 requests engineering support to develop a PM for inspection of the floor coating in the dike area of spiking station #2, and WO 866118 requests engineering support to develop a PM for the integrity of the structural frame.

The Apparent Cause Analysis Report IR-2018-12123 detailed corrective actions for spiking station #1 and #2. One of the corrective actions related to performing maintenance on spiking station #1 included barricading the area around it and posting

instructions to put down walking pads prior to stepping on the liner. This proved to be ineffective. On the quarterly leak check for spiking station #1, performed on December 9, 2019, 13 pinhole leaks were found in the liner, indicating that the liner had been walked on. The previous quarterly leak check did not detect any pinhole leaks, and there was no evidence of the spiking station leaking between the quarterly leak checks. Spiking station #1 has been shut down and has been scheduled for replacement. If spiking station #1 is needed prior to its replacement, Westinghouse plans to install and leak check a new liner before operating spiking station #1. Furthermore, the licensee also plans to assess the concrete and soil under spiking station #1 once it is removed.

This item was discussed and remains open since the PMs for spiking station #2 are still being developed, and the concrete under spiking station #1 has not yet been assessed.

No additional violations of more than minor significance were identified.

b. Violation 2019-004-001: Failure to Perform Adequate Surveys on Outgoing Shipment of 30B Cylinders

In NRC Inspection Report (IR) 70-1151/2019-004 (ADAMS Accession Number ML19326C453), a violation was issued for the failure to make or cause to be made, surveys of areas, that may be necessary for the licensee to comply with the regulations in this part and area reasonable under the circumstances to evaluate the magnitude and extent of radiation levels, concentration, and the potential radiological hazards of the radiation levels detected, to comply with the requirements of 10 CFR 20.1501(a). Specifically, two cylinders containing UF₆ heels were shipped by the licensee with non-fixed contamination on and near the valve cover that were above NRC and DOT requirements.

During this inspection, the inspectors followed-up on the licensee corrective action taken and results achieved in their reply to the Notice of Violation in letter dated December 20, 2019, to verify actions taken by the licensee were to prevent recurrence. The inspectors reviewed revised procedures and survey forms to verify that the procedures were updated to reflect the licensee corrective actions. The inspectors inspected and walked down the location where 30B UF₆ cylinder valve covers will be staged for use after decontamination. The inspectors verified that corrective actions taken by the licensee were adequate. This item is considered closed.

C. Exit Meeting

The inspection scope and results were presented to members of the licensee's staff at various meetings throughout the inspection period and were summarized on December 12 and December 17, 2019, to A. Pope and staff. No dissenting comments were received from the licensee. Proprietary information was discussed but not included in the report.

SUPPLEMENTAL INFORMATION

1. KEY POINTS OF CONTACT

<u>Name</u>	<u>Title</u>
R. Abell	Container Refurbishes
F. Clark	Supervisor, Container Services
G. Couture	Manager, Licensing
M. Goff	Container Services
C. Hopkins	Manager, Transportation-Operation-Packaging
C. Hudson	Conversion Area Manager
N. Parr	Environmental Manager
A. Pearson	Manager, EH&S Operations
A. Pope	Director, Organizational Effectiveness
W. Stilwell	Director, Transportation
R. Williams	Container Refurbishes

Other licensee employees contacted included engineers, technicians, production staff, and office personnel.

2. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened & Closed

EN 54335	EN	An Item Relied on for Safety (IROFS) Determined to be Inadequate (Section B.1)
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Closed

70-1151/2019-004-01	VIO	Failure to Perform Adequate Surveys on Outgoing Shipments of 30B Cylinders (Section B.3.b)
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EN 54298	EN	Fire Admin IROFS Degradation (Section B.2)
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Discussed

70-1151/2018-004-01	VIO	Failure to implement management measures for Hydrofluoric Acid (HF) Spiking Station #2" (Section B.3.a)
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3. INSPECTION PROCEDURES (IP) USED

IP 88015, Criticality Safety
IP 88020, Operational Safety
IP 88030, Radiation Protection (Appendix B)
IP 88045, Effluent Control and Environmental Protection
IP 88075, Event Follow-up
IP 86740, Transportation Activities

4. DOCUMENTS REVIEWED

Records:

10 CFR 71.95, 60-day written report dated September 24, 2019
10 CFR 71.95, 60-day written report dated March 25, 2019
LR-230 In and Out bound shipping documents

UX-30/UF6 30B cylinders In and Out bound shipping documents
Internal Audit Plan dated March 9, 2018
Travellers Containers (TS/TX) shipping documents
Form ROF-02-008-01, "Surveys of Incoming Shipments of Radioactive Materials"
ISA Summary ISA 02, "Uranyl Nitrate Bulk Storage System"
LTR-EHS-18-20, Prospective Analysis – Monitoring Requirements for 2018, dated
March 12, 2018
LTR-EHS-18-46, CY 2018 1st Quarter ALARA Report, dated August 10, 2018
LTR-EHS-18-67, CY 2018 2nd Quarter ALARA Report, dated November 14, 2018
LTR-EHS-18-71, Occupational Radiation Exposure History, dated November 27, 2018
LTR-EHS-18-77, CY 2018 3rd Quarter ALARA Report, dated December 20, 2018
LTR-EHS-19-22, Prospective Analysis – Monitoring Requirements for 2019, dated
March 4, 2019
LTR-EHS-19-25, CY 2018 4th Quarter ALARA Report, dated April 2, 2019
LTR-EHS-19-58, CY 2019 1st Quarter ALARA Report, dated July 18, 2019
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ROF-03-001-5, Radiation Exposure History for New Hires, dated August 6, 2019
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ROF-05-068-2, Lapel Calibration Records, dated November 19, 2019
ROF-05-068-2, Lapel Calibration Records, dated December 17, 2019
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EHS-AUDIT-19-15, October 29, 2019
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Manager, August 24, 2019
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LTR-EHS-19-62, 2019 Semi-Annual Assessment of Public Dose from Liquid and Gaseous
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LTR-EHS-19-17, Annual Assessment of Public Dose due to Liquid and Gaseous Effluents,
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LTR-RAC-19-87, Southern Storage Area, Operable, Unit, Intermodal Container Work Plan,
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RAF-125-10, EH&S Manager Training Checklist, Rev. 3, June 26, 2014
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Procedures:

COP-810097, "UF6 Bay Handling of UF6 Cylinders", Revision 28
COP-810098, "UF6 Cylinder Installation and Removal", Revision 55
COP-833010, "Cylinder Cleaning System", Revision 58
COP-836047, "Uranyl Nitrate Offloading from LR-230", Revision 19

COP-836052, "Annual Maintenance and Inspection of LR-230 Shipping Packaging",
 Revision 3
 MOP-500153, "Pack and Unpack Fuel Assembly – Traveller Package", Revision 2
 ROP-02-008, "Surveys of Incoming and Outgoing Shipment of Radioactive Materials",
 Revision 29
 ROP-02-010, "Surveillance of Uranium Shipment from Outside sources", Revision 24
 TR-300, "Unload UF₆ Cylinders", Revision 30
 ROP-02-014, "Cylinder Cleaning and Monitoring", Revision 11
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 COP-871130, General Health and Safety Requirements – IFBA, Rev. 24
 RA-120-16, Regulatory Policy – ALARA Committee, Rev. 2
 RA-121, Redbook Internal Reporting System, Rev. 20
 RA-204, Bioassay Program, Rev. 14
 RA-206, Personnel Dosimetry Program, Rev. 16
 RA-213, Radiation Signs, Rev. 9
 RA-215, Elevated Air Sample Investigation, Rev. 12
 RA-217, Personnel Monitoring Requirements, Rev. 18
 RA-219, ALARA Program, Rev. 4
 RA-219-1, ALARA Goals, Rev. 15
 RA-222, Routine In vivo Count Program, Rev. 11
 RA-226, Performing Prospective Analysis, Rev. 6
 RA-227, Airborne Radioactivity Monitoring and Control, Rev. 3
 ROF-07-001-6, Radiation/Exposure Levels Requiring Notification of Regulator Agencies,
 Rev. 3
 ROP-03-001, Personnel Dosimetry System, Rev. 22
 ROP-03-002, Personnel Exposure System - Guide, Rev. 5
 ROP-03-003, Collecting Dosimetry Badges, Rev. 0
 ROP-04-007, Performing In vivo Counts, Rev. 14
 ROP-05-001, Preparation, Analysis and Processing of In-Plant Air Samples, Rev. 20
 ROP-05-060, Ventilation Velocity Checks, Rev. 14
 ROP-05-068, Personal (Lapel) Air Sampler Measurements, Rev. 17
 ROP-05-070, Air Sampling Representativeness, Rev. 7
 SYP-281, Respiratory Protection, Rev. 14
 MCP-108111, Regulatory Compliance for Maintenance and Contractors, Rev. 30
 CA-208, Organizational Change Control, Rev. 6, dated January 29, 2015
 CF-83-026, Process Wastewater Treatment Lagoon Discharge, Rev. 13
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 COP-831205, Filling, Sampling, and Discharging of the East, North, and South Lagoons,
 Rev. 44
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 RA-125, Indoctrination, Training, and qualification of EH&S Personnel, Rev. 25, dated
 August 22, 2019
 RA-401, Environmental Control Requirements, Rev. 21, March 14, 2019
 RA-406, Sampling Congaree River Water, Fish, and Sediment, Rev. 9, December 29, 2016
 RA-413, NRC Semi-Annual Effluent Discharge Report, Rev. 3, December 12, 2103
 RA-433, Environmental Remediation, Rev. 0, July 11, 2019
 RA-434, Environmental Data Management, Rev. 0, July 11, 2019
 ROP-06-002, Roof Effluent Air Sampling and Counting, Rev. 28, March 28, 2019
 ROP-06-003, Ambient Environmental Air Monitoring for Radioactivity, Rev. 13, July 11, 2019
 ROP-06-006, Collection of Routine NRC-Required Environmental Samples, Rev. 30,
 November 07, 2019

Issue Reports Written as a Result of the Inspection:

IR-2019-17944, Documented Comments Identified by NRC during IP 88030 inspection, dated December 10, 2019
IR-2019-18312, Documented Missing Personal (Lapel) Air Sampler Calibrations, dated December 17, 2019
IR-2019-18132, Pump Wand Found in Holster instead of Bucket
IR-2019-18102, NRC Observations for Environmental Sampling
IR-2019-18045, Implementation and Execution of Compensatory Measures
Redbook 75550, Effluent Monitoring Dewar Bottle

Corrective Action Program Document Reviewed:

IR-2018-7816, IR-2019-14539, IR-2019-978, IR-2019-8716, IR-2019-11336, IR-2019-7721, IR-2018-12123, IR-2019-18040, IR-2019-17822,
Redbook 75197, Redbook 75200, Redbook 75220, Redbook 75221, Redbook 75246, Redbook 75535, Redbook 75067, Redbook 75187, Redbook 75202

Other Documents:

PM #: OM83037, SI-Safety, Rod Line 7 SSC Checks – 52 Week OM, dated November 1, 2019
PM #: PM91004, Respirator Filter Tester – 26 Week PM, dated September 6, 2019
Work Order 851321, Equipment # EH&S-HPLB-ALRM, dated July 12, 2019
Work Order 858950, Beeper Box Operation, Conversion Area – 13 Week PM, dated December 9, 2019
815417-3, Wet End Safety Significant Controls, Rev. 76, November 21, 2019
FY19 CFFF Environmental Priorities and Risks, Rev. 18, December 05, 2019
WO866117, Engineering Assistance Needed to Develop PM for Floor Coating Inspection, November 20, 2019
WO866118, Engineering Assistance Needed to Develop a Structural Integrity PM for Frame of HF Spiking Station 2, November 20, 2019
OM81215, Spiking Station Pad Liner
OM81218, Spiking Station Mix Tank Passive Overflow Inspection
OM81219, Lexan Panel Inspection, HF Spiking Station
OM81220, Spiking Station Pan Integrity
PM81291, Internal and External Mechanical Integrity Inspection on FRP Vessels
PM81293, BPCS Interlock Verification for HF Spiking 2 High Level

Event Follow-up:

CN-SB-18-006, Criticality and Non-Criticality IROFS That Might Lead to a Reportable if One IROFS Fails, Rev. 0
IR-2017-881
IR-2019-15590
LTR-RAC-19-90, Westinghouse Reported Event # EN54335 Follow-Up Report, dated November 15, 2019

5. ACRONYMS AND INITIALISMS

ADAMS	NRC's document system
ALARA	As Low as Reasonable Achievable
CFR	Code of Federal Regulations
EN	Event Notification
HF	Hydrofluoric Acid
IP	Inspection Procedure
IROFS	Items Relied on for Safety

NRC	Nuclear Regulatory Commission
NVLAP	National Voluntary Laboratory Accreditation Program
OM	Operating Maintenance
PES	Personnel Exposure System
PM	Preventative Maintenance
REM	Roentgen Equivalent Man
Rev.	Revision
SOLX	Solvent Extraction
TEDE	Total Effective Dose Equivalent
WO	Work Order