



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
245 PEACHTREE CENTER AVENUE N.E., SUITE 1200
ATLANTA, GEORGIA 30303-1200

April 18, 2022

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

SUBJECT: COLUMBIA FUEL FABRICATION FACILITY – INTEGRATED INSPECTION
REPORT 07001151/2022001

Dear Mr. Annacone:

On March 31, 2022, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Columbia Fuel Fabrication Facility. On March 3, 2022, the NRC inspectors discussed the results of this inspection with you and other members of your staff. The results of this inspection are documented in the enclosed report.

No violations of more than minor significance were identified during this inspection.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

A handwritten signature in blue ink, appearing to read "Eric Michel".

Signed by Michel, Eric
on 04/18/22

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

Docket No. 07001151
License No. SNM-1107

Enclosure:
As stated

cc w/ encl: Distribution via LISTSERV

SUBJECT: COLUMBIA FUEL FABRICATION FACILITY – INTEGRATED INSPECTION REPORT 07001151/2022001 DATED APRIL 18, 2022

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DATE	4/15/2022	4/15/2022	4/18/2022		

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**U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report**

Docket Number: 07001151

License Number: SNM-1107

Report Number: 07001151/2022001

Enterprise Identifier: I-2022-001-0079

Licensee: Westinghouse Electric Company

Facility: Columbia Fuel Fabrication Facility

Location: Hopkins, SC

Inspection Dates: February 28, 2022 to March 04, 2022

Inspectors: L. Pitts, Sr. Fuel Facility Projects Inspector
T. Sippel, Fuel Facility Inspector

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

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee's performance by conducting an integrated inspection at Columbia Fuel Fabrication Facility, in accordance with the fuel cycle facility inspection program. This is the NRC's program for overseeing the safe operation of licensed fuel cycle facilities. Refer to <https://www.nrc.gov/materials/fuel-cycle-fac.html> for more information.

List of Violations

No violations of more than minor significance were identified.

Additional Tracking Items

None.

PLANT STATUS

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

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>. Inspections were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2600, "Fuel Cycle Facility Operational Safety and Safeguards Inspection Program." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards.

SAFETY OPERATIONS

88015 - Nuclear Criticality Safety

The inspectors evaluated selected aspects of the licensee's Nuclear Criticality Safety program to verify compliance with selected portions of 10 CFR 70, including 70.24, 70.61, 70.62, Chapter 6, "Nuclear Criticality Safety (NSC) Program," of the facility's license application, and applicable licensee procedures.

Criticality Analysis (IP Section 02.01)

The inspectors interviewed licensee staff and reviewed nuclear criticality safety evaluations (CSEs), and associated assumptions and calculations, to verify compliance with 10 CFR 70 and applicable sections of the license application. Specifically, the inspectors interviewed licensee staff and reviewed the following CSEs:

- CSE-17-B, "Criticality Safety Evaluation for Final Assembly Wash Pit," Rev. 8, including the review of what-if analysis sequences 1 through 6 which cover various credible and incredible sequences involving equipment failures and human errors such as assembly drops and flooding. Which including reviewing the basis for why the licensee screened certain accident sequences as incredible.
- CSE-1-H, "Criticality Safety Evaluation (CSE) for the S-958 Solvent Extraction Scrubber," Rev. 10, including the review selected accident sequences involving backflow into the ducts and accumulations in the ducts. The inspectors conducted walkdowns and reviewed Drawing 301F07HV06 to verify that the inputs to the scrubber, and selected controls on those inputs, where consistent with the CSE.

Criticality Implementation (IP Section 02.02)

The inspectors selected engineered and administrative controls from the licensee's integrated safety analysis (ISA) summary to verify proper implementation through a review of process and system descriptions, plant walkdowns, and staff interviews to verify compliance with 10 CFR 70 and applicable sections of the license application. Specifically, the inspectors interviewed licensee staff and reviewed the following controls, and their management measures, associated with the CSEs listed above and other selected areas:

- FA-901, an administrative control to prevent dropped fuel assemblies, and associated procedures
- VENT-901, an administrative control using gamma surveys to prevent accumulations in ductwork, associated procedures and recent completed surveys records
- VENT-S1190-121, an administrative control preventing accumulations in ductwork, and associated inspection, cleanout and sampling records associated with this control, as well as implementing procedures
- VENT-SOLX-101, a passive engineered control preventing backflow into ductwork, and walked down the implementation of this control
- VENT-SOLX-108, a passive engineered control preventing overflow into ductwork, and walked down the implementation of this control
- VENT-SOLX-109, an administrative preventing accumulation in ductwork, and recent associated inspection records and implementing procedures
- VENT-SOLX-112, a passive engineered control preventing overflow into ductwork, and walked down the implementation of this control

Criticality Operational Oversight (IP Section 02.03)

The inspectors assessed the NCS staff's oversight of plant operators, procedures, and operations of systems involving special nuclear material to verify compliance with 10 CFR 70 and applicable sections of the license application. Specifically, the inspectors performed the following activities:

- interviewed NCS staff concerning criticality hazards and control methods, including monitoring for and cleaning out long-term accumulations in ducts; reviewed NCS oversight of accumulation cleanouts
- reviewed the documentation of selected NCS weekly facility walkthrough assessments (FWAs) performed by the licensee over the last year, the FWA scheduled for 2022, and selected items identified by the licensee during the FWAs

Criticality Programmatic Oversight (IP Section 02.04)

The inspectors reviewed revisions to NCS program procedures to verify compliance with 10 CFR 70 and applicable sections of the license application. Specifically, the inspectors interviewed licensee NCS staff and reviewed the following:

- procedures, work orders and records relating to the licensee's use of nondestructive assay controls (e.g., VENT-SOLX-901)
- the most recent revision to licensee procedure RA-304, Criticality Accident Alarm System

Criticality Incident Response and Corrective Action (IP Section 02.05)

The inspectors reviewed the licensee's criticality accident alarm system (CAAS) and corrective action program (CAP) to verify compliance with 10 CFR 70 and applicable sections of the license application, including section 6.1.8. Specifically, the inspectors observed activities, reviewed documents, and interviewed licensee staff concerning the following:

- selected NCS-related CAP entries over the last year
- the annual NCS evacuation drill records for 2021
- the licensee's project to upgrade the CAAS, CAAS component design and CAAS performance; including review of SEP-012 and SYP-306

FACILITY SUPPORT

88050 - Emergency Preparedness

The inspectors evaluated selected aspects of the licensee's emergency preparedness program to determine whether the program is maintained as required by the Emergency Plan, the license and license application, and NRC requirements in 10 CFR Part 70.

Emergency Preparedness Program Review and Implementation (IP Section 02.01)

The inspectors selected the following elements that support the implementation of the licensee's emergency preparedness program to verify compliance with 10CFR70(i)(3), Chapter 9 of the license application, and the Emergency Plan. Specifically, the inspectors conducted the following inspection activities:

- reviewed the plant process for evaluating plant changes and modifications that could potentially impact the emergency preparedness program
- reviewed the revisions to site emergency procedures that had been revised since the last inspection to verify that the overall effectiveness of emergency procedures had not decreased due to those changes; the following procedures were reviewed:
 - SEP-001
 - SEP-003
 - SEP-005
 - SEP-007
 - SEP-009
 - SEP-012
 - SEP-018
- reviewed the training records for ten members of the emergency response organization and interviewed four emergency response staff regarding emergency response organization training, tracking of training, the required

- number of hours for specific training topics, and the process for notifying emergency response organization staff of expiring training
- reviewed the pre-fire plans to verify they reflected special considerations such as chemical hazards and those current revisions were available in the designated locations
 - observed a tabletop training exercise that required activation of the emergency operations center, verification of communication capabilities, emergency declarations and accountability of staff
 - reviewed drill and exercise records to verify that the licensee was performing the required drills and that items identified during drill critiques were being captured and addressed
 - reviewed the letters of agreement for emergency response services, between Westinghouse Electric Company and Richland County Sheriff's Department, Columbia-Richland Fire Department, Richland County Government Emergency Services Department, Prisma Health-Midlands, and South Carolina Department of Health and Environmental Control
 - reviewed the licensee's process for providing site familiarization tours and training for offsite response organizations
 - reviewed communications between the licensee and offsite response organizations inviting the offsite response organizations for onsite walk throughs for emergency protocols
 - performed system walk-downs, observed inventory checks and reviewed inventory, maintenance and testing records to verify emergency equipment was being maintained in the required state of readiness

Identification and Resolution of Problems (IP Section 02.02)

The inspectors reviewed the licensee's identification and resolution of emergency preparedness issues to verify compliance with the license requirements. Specifically, the inspectors reviewed the following corrective action program entries, audits, and self-assessments:

- reviewed EHS-Audit-22-2 which was the external audit of the emergency preparedness program, which included the site emergency plan and emergency procedures, training activities, emergency facilities, equipment, supplies, records, and elements that have had weaknesses identified in Issue Reports from previous audits, drills, exercises, and events
- reviewed corrective action program entries generated to address the issues identified in the external EHS audit, EHS-Audit-22-2, specifically the inspectors reviewed IR-2022-1549 dated 2/25/22 and IR-2022-1826 dated 2/17/22

Event Review (IP Section 02.03)

The inspectors reviewed the licensee's safety-significant and internal events related to emergency preparedness to verify compliance with 10 CFR 70.22(i)(3), Chapter 9 of the license application, and the Emergency Plan.

- reviewed records of site events that required a response by the emergency response organization to determine:
 - if those events had been properly assessed
 - if corrective actions had been developed to address any identified issues
 - if any problems or deficiencies associated with the emergency plan had been identified

INSPECTION RESULTS

No issues were identified.

EXIT MEETINGS AND DEBRIEFS

The inspectors verified no proprietary information was retained or documented in this report.

- On March 3, 2022, the inspectors presented the integrated inspection results to Mike Annacone and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
88015	Corrective Action Documents	IR-2021-8257, IR-2021-8349, IR-2021-10152, IR-2021-10527, IR-2021-10689, IR-2021-10833, IR-2021-12208, IR-2021-12762, IR-2021-13749	Various NCS-Related CAP Entries	Various dates
	Drawings	301F07HV06	Process Ventilation System Scrubber S-958 Isometric	Rev. 3
	Engineering Evaluations	CSE-1-H	Criticality Safety Evaluation (CSE) for the S-958 Solvent Extraction Scrubber	Rev. 10
		CSE-17-B	Criticality Safety Evaluation for Final Assembly Wash Pit	Rev. 8
		CSE-3-I	Criticality Safety Evaluation (CSE) for the Columbia Fuel Fabrication Facility ADU Conversion Calciner	Rev. 9
	Miscellaneous		Annual Criticality Evacuation Drill Records for 2021	
			Criticality Accident Alarm System Replacements Project Overview and History	03/01/2022
			Analytical Chemistry Work Request - Miscellaneous Samples	12/22/2021
		Form CF-83-152	Scrubber S-958 Ventilation Duct Inspection Documentation	10/08/2020, 04/08/2021
		RAF-316-1	Various completed Nuclear Criticality Safety Checklists for NCS Facility Walkthrough Assessments	Various dates within the last year
	Procedures		Operation/Maintenance Manual for Criticality Accident Alarm System (CAAS)	
		COP-801018	Inspection and Cleanout of Area Ventilation Ducts	Rev. 10
		Form CF-83-152	Inspection Form for Ventilation Duct Inspection URRS S-958 Scrubber	Rev. 8
		Form CF-84-021	URRS ROOF VENTILATION DUCT INSPECTION QUARTERLY (13 WEEK)	Rev. 0
		Form ROF-05-	Ventilation Systems Equipment Radiation Survey Quarterly –	Rev. 1

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		062-11	S-958 Survey	
		MCP-108218	Inspection of Roof Ventilation Ducts with Boroscope	Rev. 11
		MOP-730502	FUEL ASSEMBLY CLEANING - GENERAL	Rev. 58
		RA-304	Criticality Accident Alarm System	Rev. 17
		ROP-05-062	Radiation Survey of Ventilation Equipment	Rev. 23
		SEP-012	Operation Guidelines During Loss of Criticality Accident Alarm System Coverage	Rev. 1
		SYP-306	CFFF Fire/Criticality System Impairment	Rev. 23
	Radiation Surveys	Form ROF-05-062-11	Various Quarterly Ventilation Systems Equipment Radiation Surveys for the S-958 Scrubber	Completed various dates
	Work Orders	Dispatch #69100	W/O#: 6345 - Planned Work -S-1190 Duct Inspections	
		Dispatch #85344	Clean solids from ventilation ducts	
WO 7403		Add Cleanout Port to Support SSC VENT-S1190-121		
WO: 855686, 575020		SI-Safety, S-958 Scrubber Ventilation Inspection - 26 Week OM	10/09/2019, 04/08/2020	
88050	Corrective Action Documents	IR-2022-1549	Corrective Actions from Comprehensive Independent Audit of CFFF's Emergency Preparedness Program	02/25/2022
		IR-2022-1826	Additional Items from Comprehensive Independent Audit of CFFF's Emergency Preparedness Program	02/17/2022
	Corrective Action Documents Resulting from Inspection	CFFF Dispatch #99181	Inspect and repair corroded and leaking piping in Fire Pump House #1	03/02/2022
		CFFF Dispatch #99183	Inspect and repair corroded and leaking piping in Fire Pump House #2	03/02/2022
	Miscellaneous		Post Incident Analysis dated March 17,2021	03/17/2021
		Columbia-Richland Fire Department	Emergency Response Services Agreement	01/18/2022
		Memorandum of Understanding Between Westinghouse Electric Company and South	Emergency Services Agreement	05/16/2019

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		Carolina Department of Health and Environmental Control		
		Richland County Government Emergency Services Department Letter	Emergency Response Services Agreement	01/31/2022
		Site Security Plan Letter of Agreement from the Richland County Sheriffs Department	Emergency Response Services Agreement	03/18/2021
	Procedures	Agreement between Prisma Health-Midlands and Westinghouse Electric Company	Emergency Response Services Agreement	05/15/2019
		SEP-001	Emergency Response Organization	Rev. 9
		SEP-003	Emergency Response Team	Rev. 7
		SEP-005	Evacuation, Accountability and General Response	Rev. 14
		SEP-007	Notification Guidelines	Rev. 54
		SEP-009	Emergency Response Organization Check Sheets	Rev. 18
		SEP-012	Operation Guidelines During Loss of Criticality Accident Alarm System Coverage	Rev. 1
		SEP-018	Emergency Operations Center Operations	Rev. 5
		SEPF-004-1	Haz Mat / Special Operations Truck Inventory Sheet	Rev. 29
		SEPF-004-10	Monthly Inspection of Emergency Radios and Telephones	Rev. 22
		SEPF-004-16	Hose House Equipment	Rev. 19
		SEPF-004-17	First Responder/Brush Truck Inventory Sheet	Rev. 20

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
		SEPF-004-19	Fire Engine Inventory Sheet Compartment Layout	Rev. 3
		SEPF-004-2	Emergency Response Van Inventory Sheet	Rev. 31
		SEPF-004-3	Fire Engine Inventory Sheet Compartment Layout	Rev. 25
		SEPF-004-6	Emergency SCBA Monthly Over Check Sheet	Rev. 19
		SEPF-004-7	Rescue Jump Bag Checklist	Rev. 6
	Self-Assessments	EHS-22-2	Comprehensive Independent Audit of the Emergency Preparedness Program including the Site Emergency Plan and Emergency Procedures, training activities, emergency facilities, equipment, supplies, records, and elements that have had weaknesses identified in Issue Reports from previous audits, drills, exercises, and events.	02/07/2022