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

EA-16-173

March 11, 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 INSPECTION REPORT NUMBER 70-1151/2020-006 AND CONFIRMATION OF IMPLEMENTATION OF CONFIRMATORY ORDER EA-16-173

Dear Mr. Annacone:

This letter refers to inspections conducted from January 1 through March 3, 2020, at the Westinghouse Columbia Fuel Fabrication Facility in Hopkins, SC. The purpose of this report is to acknowledge Westinghouse's letter dated March 3, 2020, detailing completion of required actions in Section V of Confirmatory Order (CO) EA-16-173 (Agencywide Documents Access and Management System (ADAMS) accession number ML20063M239), and to document completion of the NRC's inspections of your actions required by the CO.

The enclosed inspection report presents the results of this inspection and summarizes the results of previous inspections of CO commitments. At the conclusion of the inspections, the inspectors discussed their findings with members of your staff during an exit meeting held on March 4, 2020.

Based on the cumulative results of these inspections, the NRC has verified that the commitments detailed in the CO have been implemented and 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 ADAMS, which is accessible from the NRC Website at http://www.nrc.gov/reading-rm/adams.html.

If you have any questions, please contact Eric Michel of my staff at (404) 997-4555.

Sincerely,

/RA/

Laura A. Dudes
Regional Administrator

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

Enclosure:
NRC Inspection Report 70-1151/2020-006
w/Supplemental Information

cc: Distribution via LISTSERV®

SUBJECT: WESTINGHOUSE ELECTRIC COMPANY – NUCLEAR REGULATORY COMMISSION INSPECTION REPORT NUMBER 70-1151/2020-006 AND CONFIRMATION OF IMPLEMENTATION OF CONFIRMATORY ORDER EA-16-173 dated March 11, 2020

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.:	70-1151
License No.:	SNM-1107
Report No.:	70-1151/2020-006
Enterprise Identifier	I-2020-006-0052
Licensee:	Westinghouse Electric Company
Facility:	Columbia Fuel Fabrication Facility
Location:	Hopkins, SC 29061
Dates:	January 1, 2020 through March 4, 2020
Inspectors:	T. Vukovinsky, Senior Fuel Facility Inspector
Approved by:	Laura A. Dudes Regional Administrator

Enclosure

EXECUTIVE SUMMARY

Westinghouse Electric Company
Columbia Fuel Fabrication Facility
Nuclear Regulatory Commission Inspection Report 70-1151/2020-006
January 1, 2020 through March 4, 2020

The inspection was conducted by Nuclear Regulatory Commission (NRC) regional inspectors during normal shifts in areas associated with Confirmatory Order EA-16-173. 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.

Other

- Acknowledgement of Westinghouse's letter of implementation of Confirmatory Order commitments (Paragraph A.1)

- Review of completed Confirmatory Order commitments (Paragraph A.2, A.3)

- Summary of completed Confirmatory Order commitments (Paragraph B.1)

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 (UF_6) 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. Review of Completed Confirmatory Order Commitments (Inspection Procedure 88020)

1. Review of Confirmatory Order Section V Item 11

a. The inspectors reviewed the licensee's actions regarding CO (ML17221A112), Section V, Item 11. This item required that the licensee submit a letter to the NRC discussing its basis for concluding that the CO had been satisfied. The letter was to be provided within three months of completing implementation of the terms of the CO. On March 3, 2020, Westinghouse provided the NRC with a letter discussing its basis for concluding that the Confirmatory Order (CO) has been satisfied (ML20063M239). The NRC acknowledges the receipt of this letter and inspectors have verified that the corrective actions detailed in Section V of the CO were implemented as described. The results of these inspections are detailed in the following sections of this report.

b. Conclusion

Based on the review of all completed actions, the NRC concludes that Westinghouse has completed implementation of actions detailed in CO Section V. The licensee has met the requirements stated in CO Section V, Item 11, and this item is considered closed.

2. Review of Confirmatory Order Section V Item 2 (Inspection Procedure 40100)

a. Inspection Scope

The inspectors reviewed the licensee's actions regarding CO Section V, Item 2, which required the licensee to conduct an additional nuclear safety culture (NSC) survey by the Westinghouse corporate nuclear safety culture organization or an experienced independent third party, consistent with the depth and scope of the NSC survey completed under the Confirmatory Action Letter (CAL) dated August 11, 2016 (ML16224B082). Identified deficiencies shall be entered into the Corrective Action Program (CAP) for tracking corrective actions to completion.

The inspectors noted that the independent third-party nuclear safety culture assessment was conducted in October 2019. The survey was completed by Westinghouse's global NSC organization, in accordance with BMS-NSC-3, "Nuclear Safety Culture Surveys and Assessments Procedure." This organization was independent of the Westinghouse Columbia Fuel Fabrication Facility (CFFF). The assessment results were based on a pre-assessment survey of CFFF personnel and a week of direct interviews with selected CFFF personnel. The results of the survey were reviewed, and a gap analysis was performed by the Nuclear Safety Council Monitoring Panel (NSCMP). The areas identified in the gap analysis were entered in the CAP for tracking to completion. The inspectors reviewed the NSCMP meeting minutes and CAP entries to verify that any deficiencies were entered in the CAP and are being tracked under CAP 2019-16772.

The inspectors interviewed the Employee Concerns Program (ECP) manager and noted that this position is now a full-time on-site position and that a healthy number of interactions were occurring within the ECP. In addition, the inspectors noted that numerous initiatives are underway to increase employee awareness of the ECP.

b. Conclusion

The licensee completed an independent nuclear safety culture survey and any identified deficiencies were entered into the CAP to track to completion. Based on a review of the NSC survey, NSCMP minutes, and interviews with licensee management, the NRC concluded that the licensee has met the requirements as stated in the CO, Section V, Item 2. This item is considered closed.

3. Review of Confirmatory Order (CO) Section V Item 3(3) (Inspection Procedure 88020)

a. Inspection Scope

The inspectors reviewed the licensee's actions regarding CO Section V, Item 3(3), which required the licensee to implement improvements identified in the engineering evaluation of the calciner and calciner off-gas scrubber design and operation to determine methods to reduce uranium carry-over into the S-1030 scrubber.

For the calciner off-gas scrubber, the inspectors noted that the licensee had completed the engineering evaluation and had also completed the installation of improvements based upon the evaluation. The inspectors reviewed the evaluation and noted that the licensee completed installation of four improvements to the calciner system:

i. Automatic pH Control – Installed online pH monitoring with display in the Conversion Control Room and means to control ammonia addition to maintain pH at the desired level.

ii. Off-Gas Condenser Spray Nozzle Flow Indication – Installed a flow meter with remote indication and low flow alarm in the Conversion Control Room. This provides indication of reduced or loss of flow to the spray nozzle at the off-gas condenser.

iii. Improved Scrubber Slab Tank Level Indication – Improved the ability to accurately monitor water level in the slab tank to assure appropriate level is maintained. Improved monitoring ability via means by adding an automatic flush on the level transmitter sensing line.

iv. Scrubber Solution Temperature Indication – Provided indication of scrubber solution temperature through a display in the Conversion Control Room and high temperature alarm. This provides enhanced capability to maintain scrubber solution within the optimal operating range.

The inspectors reviewed the completed new instrumentation and controls associated with the calciner and calciner off-gas scrubber and noted that these modifications were completed on time as required by the CO.

b. Conclusion

The licensee has completed implementation of modifications to the calciner off-gas scrubber as required by CO Section V, Item 3(3). Based on the review of engineering evaluations and design changes, the NRC concludes that Westinghouse has met the requirements stated in CO Section V, Items 3(3), and this item is considered closed.

B. Summary of completed Confirmatory Order commitments

The table below lists modifications to the SNM-1107 license as required by the CO and the corresponding inspection report which details the NRC's inspection of the CO Item:

CO Item	**Description**	**Due Date**	**Inspection Report** (NOTE 1)
CO V.1	Westinghouse agrees to submit a written statement or explanation to the Director, OE. This reply should include the following for each of the four violations: (1) the reason for the violation; (2) the corrective steps that have been taken to restore compliance; and (3) additional corrective actions and enhancements taken to preclude repetition.	9/9/17	IR 2017-004
CO V.2	Westinghouse shall conduct an additional NSC survey by the Westinghouse corporate nuclear safety culture organization or an experienced independent third party, consistent with the depth and scope of the NSC survey completed under the CAL dated August 11, 2016. Identified deficiencies shall be entered into the CAP for tracking corrective actions to completion.	2/9/2019 - 2/9/2020	IR 2020-006
CO V.3(1)	An engineering evaluation of the calciner and calciner off-gas scrubber design and operation shall be completed to determine methods to reduce uranium carry-over into the S-1030 scrubber.	2/9/19	IR 2019-002
CO V.3(2)	An engineering evaluation of the Conversion Scrap Cage Blue M oven shall be completed to determine methods to improve the functionality of the Blue M oven in a wet environment and improve accessibility for inspection and maintenance activities.	2/9/19	IR 2019-002
CO V.3(3)	Within three (3) years of issuance of the CO, improvements based on the engineering evaluations described in V.3(1) and V.3(2) shall be implemented.	8/9/20	The Blue-M modifications V.3(2), were documented in IR 2019-002 Calciner modifications V.3(1), were

			documented in IR 2020-006
CO V.4	Westinghouse shall notify the NRC within fifteen (15) working days prior to implementing changes to the modifications to the S-1030 scrubber system, as discussed below. This requirement ends once the Regional Administrator determines that the CO has been satisfied. These modifications were incorporated as corrective actions prior to the October 20, 2016, system restart authorization (ML16294A296) and support, in part, the safety basis for the S-1030 scrubber.	15 days prior to implementation of modifications	Not Applicable (N/A)
CO V.5	Westinghouse shall develop and implement additional methods to monitor system parameters that are early indicators of an abnormal accumulation in the S-1030 scrubber from a process upset that could challenge the accumulation rate and/or criticality safety mass limits. The methods will provide timely indications to enable the operators to take appropriate actions in accordance with approved procedures.	8/9/19	IR 2019-004
CO V.6	Westinghouse shall develop and implement a criticality safety basis/IROFS database to maintain the proper flow down of the safety basis into implementing documents.	2/9/19	IR 2018-005
CO V.7	Westinghouse shall develop a method to reinforce positive NSC leadership behavior and monitor for effectiveness in the NSC monitoring panel. Westinghouse shall implement such method for three (3) years, after which it may evaluate the need to continue this item.	2/9/18	IR 2018-006
CO V.8	Westinghouse shall develop and implement a new metric or periodic report that creates an aggregate picture of the health of the criticality safety program. This shall include items such as IROFS challenges, trends, audit and inspection finding status, violations, and health of management measures and be made available for inspection. Identified deficiencies shall be evaluated in accordance with the CAP.	11/9/17	IR 2017-009
CO V.9	Westinghouse shall implement risk-informed standards for the preparation of procedures and data sheets informed by appropriate guidance in INPO 11-003, “Guideline for Excellence in Procedure and Work Instruction Use and Adherence.” This shall consist of issuance of a procedure writers’ guide, procedure format template, and a procedure use and adherence standard.	5/9/18	IR 2018-004

CO V.10.a	Westinghouse shall implement the remaining corrective actions to prevent recurrence (CAPR) identified in their Root Cause Analysis (RCA) (detailed below).	N/A	IR 2018-004
CAL 1.1	Corrective Action to Prevent Recurrence (CAPR) 1: Revise TA-500, "Config Control" procedure (planning meeting). Revise RA-104, "Review of Config Change Authorizations" procedure (detailed checklists)	N/A	IR 2017-004
CAL 1.2	CAPR2: Revise CA-002, "ETAPS" (formal review for process changes to procedures)	N/A	IR 2017-004
CAL 1.3	CAPR 3: Revise TA-500, "Config Control" procedure and FA-114, "Independent Technical Reviews" if a change modifies an SSC in a CSE	N/A	IR 2017-004
CAL 1.4	CAPR 4: Conduct assessment IAW INPO guidance for configuration management	N/A	IR 2017-004
CAL 1.5	CAPR 5: Revise COP-815021, "S-1030 Inspection and Cleanout," to specify data to be recorded, and review of data.	N/A	IR 2017-004
CAL 1.6	CAPR 6: Develop or revise procedures to ID personnel who need training on the safety basis for CSEs.	N/A	IR 2018-004
CO V.10.b	Westinghouse shall conduct effectiveness reviews of corrective actions to prevent recurrence as specified in their RCA.	N/A	IR 2019-003
CO V.10.c	Westinghouse shall evaluate the results of the independent third-party nuclear safety culture assessment (conducted on 5/2/2017), and any identified deficiencies will be entered into the CAP to track to completion.	N/A	IR 2018-006
CO V.11	Within three (3) months of completing implementation of the terms of the CO, Westinghouse will provide the NRC with a letter discussing its basis for concluding that the CO has been satisfied.	CO completion + 3 months	IR 2020-006

NOTE 1: ADAMS accession numbers and hyperlink to documents are included in the supplemental information section of this report

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 March 4, 2020 to Amanda Spalding and staff. Proprietary information was discussed but not included in this report.

SUPPLEMENTAL INFORMATION

1. KEY POINTS OF CONTACT

Name	Title
M. Cudd	Employee Concerns Manager
C. Hudson	Conversion Area Manager
A. Pope	Director, Organizational Effectiveness
A. Spalding	Licensing Manager

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

2. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Closed

CO Item 2	CO	Westinghouse shall conduct an additional NSC survey by the Westinghouse corporate nuclear safety culture organization or an experienced independent third party, consistent with the depth and scope of the NSC survey completed under the CAL dated August 11, 2016. Identified deficiencies shall be entered into the CAP for tracking corrective actions to completion.
CO Item 3(3)	CO	Complete installation of improvements identified in the Calciner and Calciner off-gas scrubber engineering evaluation.
CO Item 11	CO	Within three (3) months of completing implementation of the terms of the CO, Westinghouse will provide the NRC with a letter discussing its basis for concluding that the CO has been satisfied.

3. LIST OF PUBLICLY AVAILABLE DOCUMENTS IN ADMAS ASSOCIATED WITH THE CO

Inspection Report Number	ADAMS ML Number and Hyperlink
AIT Report 2016-007	ML16301A001
Confirmatory Acton Letter	ML16224B082
IR 2017-007	ML17058A448
Confirmatory Order	ML17221A112
IR 2017-004	ML17303A023
IR 2017-009	ML17356A091
IR 2018-004	ML18284A095
IR 2018-005	ML19023A349
IR 2018-006	ML18089A060
IR 2019-002	ML19101A274
IR 2019-003	ML19212A687
IR 2019-004	ML19326C453

4. INSPECTION PROCEDURES (IP) USED

IP 40100, Independent Safety Culture Assessment Follow-up
IP 88015, Criticality Safety
IP 88020, Operational Safety
IP 88070, Plant Modifications
IP 88072, Plant Modifications (Triennial)

5. DOCUMENTS REVIEWED

Procedures:
COP-811101, Calciner Off-Gas Scrubber, Rev. 84

Corrective Action Program Document Reviewed:
2019-16772

Other Documents:
CCF 19141, Conversion Line 1-5 Calciner Scrubber Confirmatory Order I&C/Elec/Mech Level Improvements
CCF, 19131, Conversion Line 1-5 Calciner Scrubber Confirmatory Order I&C/Electrical PH Improvements
Columbia Fuels Fabrication Facility (CFFF) NSC Survey Report, October 2019

6. ACRONYMS AND INITIALISMS

ADAMS	NRC's document system
ALARA	As Low as Reasonably Achievable
CAL	Confirmatory Action Letter
CAP	Corrective Action Program
CAPR	Corrective Action to Prevent Recurrence
CFFF	Columbia Fuel Fabrication Facility
CFR	Code of Federal Regulations
CO	Confirmatory Order
ECP	Employee Concerns Program
IP	Inspection Procedure
IR	Inspection Report
IROFS	Items Relied on for Safety
N/A	Not Applicable
NRC	Nuclear Regulatory Commission
NSC	Nuclear Safety Culture
NSCMP	Nuclear Safety Culture Monitoring Panel
PM	Preventative Maintenance
RCA	Root Cause Analysis
REM	Roentgen Equivalent Man
Rev.	Revision