



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

May 12, 2017

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 NO. 70-1151/2017-006**

Dear Mr. Annacone:

The Nuclear Regulatory Commission (NRC) conducted announced inspections from December 7, 2016 through April 18, 2017, at the Westinghouse Columbia Fuel Fabrication Facility (CFFF) in Hopkins, SC. The purpose of these inspections were to validate completion of commitments made in the Confirmatory Action Letter (CAL) dated August 11, 2016 (ML16224B082) and CFFF's restart request letter dated October 19, 2016 (ML16293A175). The enclosed report presents the results of these inspections. At the conclusion of these inspections, the results were discussed with you and members of your staff at an exit meeting on April 18, 2017.

The inspections 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. The inspections consisted of facility walk-downs, selective examinations of relevant procedures and records, interviews with plant personnel, and plant observations. Within these areas, the inspections consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel. No violations of NRC requirements 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 70-1151/2017-006
w/Supplemental Information

cc:
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SUBJECT: WESTINGHOUSE ELECTRIC COMPANY – NUCLEAR REGULATORY
 COMMISSION INTEGRATED INSPECTION REPORT NO. 70-1151/2017-006

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U. S. NUCLEAR REGULATORY COMMISSION
REGION II

Docket No.: 70-1151

License No.: SNM-1107

Report No.: 70-1151/2017-006

Licensee: Westinghouse Electric Company

Facility: Columbia Fuel Fabrication Facility

Location: Hopkins, SC 29061

Dates: December 7, 2016 to April 18, 2017

Inspectors: K. Kirchbaum, Fuel Facility Inspector (Section A.1)
N. Pitoniak, Senior Fuel Facility Inspector (Section A.1)
T. Vukovinsky, Senior Fuel Facility Inspector (Sections A.1 and B.1)

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

Enclosure

EXECUTIVE SUMMARY

Westinghouse Electric Company
Columbia Fuel Fabrication Facility
NRC Inspection Report 70-1151/2017-006
December 7, 2016 through April 18, 2017

The inspection was conducted by Nuclear Regulatory Commission (NRC) regional inspectors during normal shifts in areas of Safety Operations. 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. No violations of NRC requirements were identified.

Safety Operations

- In the area of the Operational Safety, no violations were identified. (Paragraph A.1)

Other

- Review of impact to the Columbia Fuel Fabrication Facility due to Westinghouse's petition for bankruptcy relief under Chapter 11 of Title 11 of the United States Code. The licensee is meeting their obligations to comply with NRC requirements, including the license, and that inspections and other NRC regulatory actions were not terminated upon filing of the petition for bankruptcy. (Paragraph B.1)

Attachment:

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

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, however, while the inspectors were on site, conversion operations were shutdown to facilitate the S-1030 scrubber system six-week cleanout inspections.

A. Safety Operations

1. Operational Safety (Inspection Procedures 81815, 88020, and 88070)

a. Inspection Scope and Observations

The inspectors conducted a focused supplemental inspection in the areas of plant modifications, operational safety, and nuclear criticality safety (NCS). This inspection was a result of the program adjustment described in the letter to the Westinghouse Columbia Fuel Fabrication Facility (CFFF) on December 20, 2016 (ML16355A078).

The inspectors reviewed the selected Criticality Safety Evaluations (CSEs) and associated assumptions and calculations to verify consistency with the commitments in the License Application, including the consideration of the Double Contingency Principle, assurance of subcriticality under normal and credible abnormal conditions with the use of subcritical margin, technical practices and methodologies, and treatment of NCS parameters. The inspectors reviewed the selected CSEs to determine whether approved CSEs were available, were of sufficient detail and clarity to permit independent review, and whether calculations were performed within the validated area of applicability and consistent with the validation report. The CSEs were selected based on factors such as risk-significance, if new or revised, the use of unusual control methods, and operating history. The CSEs reviewed included: CSE-11-B; Uranium Scrap Cage Precipitation, CSE-11-D, Scrap Cage Tanks; CSE-1-E, S-1030 Scrubber System; and CSE-1-O, Pellet Inspection Hood Ventilation.

The inspectors reviewed the licensee's generation of accident sequences to determine whether the CSEs systematically identified normal and credible abnormal conditions for the analysis of process upsets in accordance with the commitments and methodologies in the License Application. This effort included the review of accident sequences that the licensee determined to be not credible in order to determine whether the bases for incredibility were consistent with the commitments, definitions, and methodologies in the License Application and were documented in sufficient detail to permit an independent assessment of credibility. This review was conducted for the following: CSE-11-B, CSE-11-D, CSE-1-E, and CSE-1-O.

The inspectors performed walk-downs of the Conversion area, Scrap Cage Tanks area, and the Pelleting Area systems to determine whether existing plant configuration and operations were covered by, and consistent with, the process description and safety basis in the CSEs. The inspectors reviewed the associated items relief upon for safety (IROFS) detailed in the above mentioned CSEs to determine if they were available and reliable to perform their intended safety function as described in the licensee's Integrated Safety Analysis (ISA). The inspectors reviewed process and system descriptions and

setpoint analyses to verify that engineered controls established in the CSEs were included. The inspectors reviewed operating procedures and postings to verify that selected administrative controls established in the CSEs were included. The inspectors interviewed operators and engineers to verify that administrative actions established in the CSEs were understood and implemented properly in the field.

S-1030 Scrubber System Cleanout Inspections

The inspectors reviewed procedures and data sheets associated with the cleaning and inspection evolutions performed on the S-1030 scrubber and the associated IROFS as described in CSE-1-E. The inspectors verified that the procedures provided an adequate method to conservatively calculate the amount of material present in the scrubber packing and transition areas. The inspectors observed the initial basket removal and weighing performed on all six baskets per procedure COP-815021, S-1030 Inspection and Clean Out. The inspectors were able to observe the licensee's initial visual inspections for material accumulation in the packing and baskets as they were individually removed from the scrubber housing assembly. Process and Criticality Safety Engineers were on the job site to provide guidance and oversight of the evolution. The inspectors interviewed the project and nuclear engineers to gain insight on the material calculation and quantification processes.

The inspectors observed the pre-job briefing and shift turnover of the operating crews. The pre-job brief was focused on job status, safety, and each individual's job responsibilities. Procedure stop points and decision points were discussed in detail with the crew as well as lessons learned from the previous shift. Safety and procedural compliance were emphasized over schedule adherence.

The inspectors reviewed the technique used by CFFF to assay the packing which was removed from the S-1030 scrubber. The inspectors reviewed CSE-13-E, URRS Trash and Assay Operations, and procedures COP-835510, Operation of Assay 3 (Canberra Q2 System) and COP-831012, Operation of Assay 2 (Canberra Segmented Gamma Scanner) which are used during assay operations of the packing material. The inspectors reviewed the Calibration Verification Report for Assay of 55 Gallon Drums dated March 23, 2016, and verified that the calibration of the assay machines were within their calibration periodicity and that operators were correctly following the approved procedures while assaying material.

The inspectors reviewed CF-81-250, S1030 Conversion Scrubber Mass Quantification, which details the total quantification of material removed from the scrubber during the six-week cleanouts, and verified that the amount of material removed was below the CSE-1-E limits. The inspectors noted that the amount of uranium material removed from the scrubber during the six-week cleanouts was approximately 5 percent of the amount of material which was removed during the previous six-week cleanout prior to modifications made to the S-1030 scrubber system.

The inspectors reviewed the S-1030 Packing Void Fraction Verification letter dated February 24, 2017. CSE-1-E establishes a bounding assumption for the packing in the S-1030 scrubber. Specifically, the void fraction, which is the open volume not taken up by the packing material or any accumulated solids, is assumed to never drop below 50 percent. The inspectors reviewed the analysis of the void fraction of the S-1030

scrubber and noted that the void fractions calculated were approximately 92.4 percent which is above the required limit of 50 percent which meets the requirements as specified in CSE-1-E.

Performance Evaluation of the S-1030 Scrubber System

The inspectors reviewed the “Performance Evaluation of the S-1030 Scrubber System After the Third Completion of OM81037 6 Week OM – S1030 Packing Baskets, Scrubber Body, Inlet Transition and Chevron Baffle Inspection and Cleaning, Revision (Rev.) 2,” hereafter referred to as the “Performance Evaluation.” The Performance Evaluation was conducted by CFFF to document their technical justification to adjust the frequency of the S-1030 scrubber inspections from a six-week frequency to a 13-week frequency (quarterly). The IROFS reviewed included: VENT-S1030-105; -126; -127; -128; -129; -135; -137; and -140. These IROFS are detailed in CSE-1-E, S-1030 Scrubber System. The Performance Evaluation documented the results of the first three completions of the six-week scrubber inspections as well as the completion of the first twenty-one weekly inspections of OM81038, “Weekly OM S-1030 Inlet Transition, Elbow and Front of Basket Media Inspection.” The inspectors reviewed the Performance Evaluation, including the quantified data and margin of error calculations for the basket mass quantifications, as well as the projected future scrubber system uranium loading for the periodicity change from six to thirteen weeks. The inspectors noted that the predicted loading for a frequency change to 13-weeks was within the safety limits described in CSE-1-E, Rev. 12.

b. Conclusion

No violations of NRC requirements were identified.

B. Other Areas

1. Bankruptcy Review on Licensee Activities (Inspection Procedure 88005)

a. Inspection Scope and Observations

On March 29, 2017, Westinghouse Electric Company, LLC, (Westinghouse) filed for bankruptcy under Chapter 11 in Federal Bankruptcy Court (ML17115A413). An inspection was conducted on April 18, 2017, to review the effects, if any, on Westinghouse’s CFFF. The inspectors interviewed the vice-president of CFFF and the licensing manager in regards to the effect of the bankruptcy on CFFF. The inspectors noted that CFFF is meeting its obligations in regards to complying with NRC requirements, including those relating to the security and control of licensed material, safeguards information, decontamination, and decommissioning of contaminated facilities. The inspectors noted that CFFF was retaining the personnel required by NRC requirements (e.g., Radiation Safety Officer, NCS engineers, Emergency Response personnel, etc.).

b. Conclusion

Westinghouse’s CFFF is meeting their obligations to comply with NRC requirements, including the license, inspections, and other NRC regulatory actions were not terminated upon filing of the petition for bankruptcy.

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 April 18, 2017, to M. Annacone 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>
M. Annacone	VP, Columbia Fuel Operation and Manager, Columbia Plant
A. Batten	Engineering
R. Bates	Maintenance Supervisor
P. Bartman	QA Manager
G. Byrd	Licensing Engineer
R. Byrd	I&C Manager
J. Howell	Environmental, Health and Safety (EH&S) Manager
C. Miller	Acting NCS manager
A. McGehee	Senior NCS Engineer
N. Parr	Licensing Manager
M. Trayers	Maintenance Engineering Manager
J. Vining	Senior NCS Engineer
T. Wells	Manager of Work Management
E. Wills	Recovery Manager

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

2. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Not Applicable.

3. INSPECTION PROCEDURES USED

IP 88005, Management Organization and Controls
IP 88015, Nuclear Criticality Safety
IP 88020, Operational Safety
IP 88070, Plant Modifications

4. DOCUMENTS REVIEWED

Records:

CSE-13-E, URRS Trash and Assay Operations, Rev. 1
CSE-11-D, Scrap Cage Tanks, Revs. 12 and 13
CSE-11-B, Uranium Scrap Cage Precipitation, Rev. 6
CSE-1-E, S-1030 Scrubber System, Revs. 11 and 12
CSE-1-O, Pellet Inspection Hood Ventilation, Rev. 3

Procedures:

COP-835510, Operation of Assay 3 (Canberra Q2 System), Rev. 23
COP-836053, URRS Processing of Scrubber Cleanout Material, Rev. 3
COP-831012, Operation of Assay 2 (Canberra Segmented Gamma Scanner), Rev. 19
COP-815021, S-1030 Inspection and Clean Out, Revs. 13 and 14,
COP-830251, Standard and Replicate Checks for URRS NDA Systems, Rev. 24

Other Documents:

S-1030 Packing Void Fraction Verification, dated February 24, 2017
S-1030 Scrubber PM Pre-Job Brief, dated January 16, 2017
Performance Evaluation of the S-1030 Scrubber System after the Third Completion of
OM81037 6 Week OM – S1030 Packing Baskets, Scrubber Body, Inlet Transition
and Chevron Baffle Inspection and Cleaning, Rev. 2
Calibration Verification Report for Assay of 55 Gallon Drums Using the Canberra Q2
Assay System at Westinghouse Columbia Nuclear Fuel Division, dated March 26,
2016
Justification for Changes to S-1030 Inspection and Clean Out Procedure COP-815021,
Rev. 13
NCS Monitoring Panel Charter, Rev. 1

CAPAL Entries:

100443352
100443345
100443352
100443287
100443745

Redbook Entry:

72026

Records:

CF-81-246, Conversion Scrubber Cleanout Material Record, various dates
CF-81-248, S1030 Inspection Data Sheet, various dates
CF-81-250, S1030 Conversion Scrubber Mass Quantification, dated December 8, 2016
CF-83-097, Standard Calibration Form for Q2 Combustible Trash in Drums, various
dates
CF-83-226, Scrubber Packing Drum Log, various dates
PM81265, 26 Week PM – Scrap Cage Gamma Monitor 3-way Valve
WO745329, 26 Week PM – Scrap Cage Gamma Monitor 3-way Valve, dated October 5,
2016
FAF-106-3, Project Pre-Job/Post-Job Review, Rev. 8