



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

July 18, 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 INTEGRATED INSPECTION REPORT NUMBER 70-1151/2017-003

Dear Mr. Annacone:

This letter refers to an inspection conducted from April 1 through June 30, 2017, at the Westinghouse Columbia Fuel Fabrication Facility in Hopkins, SC. The purpose of this inspection was to determine whether activities authorized under the license were conducted safely and in accordance with U.S. Nuclear Regulatory Commission (NRC) requirements. The enclosed inspection report presents the results of this inspection.

The inspection examined activities conducted under your license as they relate to public health and safety, the common defense and security, and to confirm compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspection consisted of a 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 70-1151/2017-003
w/Supplemental Information

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SUBJECT: WESTINGHOUSE ELECTRIC COMPANY – NUCLEAR REGULATORY
 COMMISSION INTEGRATED INSPECTION REPORT NUMBER 70-1151/2017-003

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U. S. NUCLEAR REGULATORY COMMISSION
REGION II

Docket No.: 70-1151

License No.: SNM-1107

Report No.: 70-1151/2017-003

Licensee: Westinghouse Electric Company

Facility: Columbia Fuel Fabrication Facility

Location: Hopkins, SC 29061

Dates: April 1 through June 30, 2017

Inspectors: R. Gibson, Senior Fuel Facility Inspector
N. Pitoniak, Senior Fuel Facility Inspector
L. Pitts, Senior Fuel Facility Inspector
T. Vukovinsky, Senior Fuel Facility Inspector
K. Kirchbaum, Fuel Facility Inspector
P. Startz, Fuel Facility Inspector
R. Womack, Fuel Facility Inspector

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 70-1151/2017-003
April 1 through June 30, 2017

The inspection was conducted by Nuclear Regulatory Commission (NRC) regional inspectors during normal shifts in areas of safety operations and facility support. 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.

Operational Safety

- In the area of Fire Protection, no violations of NRC requirements were identified. (Paragraph A.1)

Facility Support

- In the area of Emergency Preparedness, no violations of NRC requirements were identified. (Paragraph B.1)
- During the biennial emergency drill, no violations of NRC requirements were identified. (Paragraph B.2)

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.

A. Safety Operations

1. Fire Protection Triennial (Inspection Procedure 88054)

a. Inspection Scope

The inspectors reviewed samples of pre-fire plans and toured related production areas including the Chemical Area, UF₆ Bay, Hot Oil Room, Uranium Recovery, Incinerator, Tank Farm, Plating Room, Mechanical Maintenance Shop, Grid Assembly area, Emergency Response Building, and the Water Glass waste water treatment facility to evaluate compliance with paragraphs 8.1.2, 8.1.3, 8.1.5, and 8.1.6 of the License Application (LA), Revision (Rev.) 2.0. The pre-fire plans were reviewed to assess if they contained the required aspects and if they were being properly revised by performing confirmatory field walkdowns of areas.

The inspectors evaluated samples of fire detection and suppression systems located in uranium production areas to determine if the systems were being maintained in compliance with National Fire Protection Association (NFPA) 25 guidelines. Water sprinkler systems including stand pipes, piping, and sprinklers were observed to be adequately maintained and functional. Maintenance records of a sample of systems were reviewed to determine if the periodic maintenance of the systems and the required periodic inspections and tests were being performed in accordance with NFPA 25 requirements. Passive fire protection features including fire walls, fire doors, ventilation systems, and fire dampers were assessed to determine compliance with paragraph 8.1.2 of the LA.

The inspectors evaluated the licensee's fire protection and emergency preparedness programs to evaluate if safety controls would not be adversely effected by fire suppression activities or from the rupture or inadvertent operation of fire suppression systems, as required in paragraph 8.1.8.2 of the LA. Inspectors evaluated the fire suppression systems to determine if they were installed in a manner that was consistent with nuclear safety criticality control concepts listed in paragraph 6.1.3.2 (4) of the LA. The inspectors also reviewed the licensee's processes, systems, and equipment specific to areas protected by water-based fire suppression systems to evaluate the adequacy of drainage and environmental protection in the event of a suppression system activation to manage any releases of hazardous effluents as a result of firefighting efforts. The inspectors focused on the following production areas: Nuclear Fuel Fabrication, Integral Fuel Burnable Absorber (IFBA) Fuel, Erbia Fuel, Incinerator, Hot Oil Room and storage areas for materials awaiting incineration.

The inspectors reviewed the licensee's testing and inventory procedure for emergency equipment and supplies as specified in procedure SEP-004, "Emergency Equipment and Supplies," Rev. 12, and walked down the areas used to store emergency

communications equipment. The licensee's programs and procedures were evaluated to assess if portable radio communications and fixed emergency communications systems were available, operable, adequate, and reliable for their required performance in fire response activities.

The inspectors reviewed the licensee's procedures, training materials, and records associated with emergency responder training to evaluate the adequacy of the licensee's programs and procedures to maintain fire response capabilities in accordance with paragraph 8.1.7.2 of the LA. The inspectors reviewed selected training records and training materials associated with fire brigade qualifications and training to assess if the licensee's training program met the requirements of the license with regards to fire brigade members. The inspectors evaluated if the licensee had a method for ensuring all industrial fire brigade members received training and education at least annually and all industrial fire brigade members participated in a drill at least annually. The inspectors reviewed the licensee's process for verification that emergency response team (ERT) members maintained adequate qualification to perform the duties of emergency response positions.

Through a review of training records and interviews with emergency preparedness staff, the inspectors evaluated if offsite fire support organizations were offered the opportunity for annual site orientations and if emergency responders from the Columbia fire department had participated in these facility orientations. An additional review of the orientation program for offsite emergency responders was documented as part of the emergency preparedness inspection.

The inspectors interviewed a number of emergency preparedness staff and reviewed ERT training records to assess if the licensee's ERT training met the requirements of paragraph 7.11 of the LA. One focus training area included the decision making process of ERT members determining whether to contact an outside agency fire department depending upon the direction provided in emergency planning procedures.

The inspectors reviewed and evaluated over 30 Corrective Action Reports and one Apparent Cause Evaluation associated with the fire protection program. The inspectors evaluated if the fire protection issues were properly being identified and evaluated at the proper threshold, and corrective actions were being adequately implemented in accordance with paragraphs 3.7 and 3.8 of the LA.

The inspectors toured plant areas containing safety controls and items relied on for safety (IROFS) to assess the material condition of fire protection equipment, systems, and features to determine if they were in compliance with paragraphs 8.1.8, 8.1.2, 8.1.3, 8.1.4, 8.1.5, and 8.1.6 of the LA. The inspectors assessed if the cutting, welding, and hot work programs were being implemented in accordance with paragraph 8.1.1.5 of the LA. The inspectors assessed if flammable materials were properly stored in certified flammable storage cabinets as specified in approved procedures and that housekeeping and the control of combustible materials were adequate and consistent with paragraph 8.1.1.6 of the LA.

b. Conclusion

No violations more than minor significance were identified.

B. Facility Support

1. Emergency Preparedness (Inspection Procedure 88050)

a. Inspection Scope

The inspectors interviewed staff and reviewed records to evaluate whether changes made to the Emergency Plan (EPlan) or within the facility were properly coordinated with the emergency preparedness program, as applicable. The inspectors reviewed several EPlan implementing procedures (EIPs) revised since the last emergency preparedness inspection, as listed in the "Supplemental Information" section of this report. The inspectors evaluated revised EIPs to determine compliance with the EPlan and that there was no decrease in effectiveness as required by 10 CFR 70.32(i). The inspectors also reviewed changes made to the EPlan since the last emergency preparedness inspection and to verify if the changes did not result in a decrease in effectiveness of the program. The inspectors reviewed the licensee's emergency call list to verify if the list was periodically revised, tested, and maintained.

The inspectors interviewed licensee staff and reviewed training records related to emergency preparedness training completed since the last emergency preparedness inspection. Interviews conducted included an Emergency Director (ED), Incident Commander (IC), and other personnel with responsibilities associated with the Emergency Operations Center (EOC) and emergency response activities. The inspectors verified that the licensee provided emergency management and emergency response training for site personnel as required by section 3.4 of the License Application. Additionally, based on the records reviewed, the inspectors verified that individuals responsible for using emergency equipment were qualified as required by section 3.4. The inspectors also verified that the licensee provided training representative of various postulated emergency situations consistent with the frequency and performance objectives required in the EPlan. During the inspection, the inspectors observed the activation of the EOC in response to a severe weather event. During the observation, the inspectors confirmed that the licensee had implemented the EPlan and complied with applicable EIPs.

The inspectors reviewed the current memorandums of understanding (MOU) in place with off-site support agencies and verified that the organizations required by the EPlan had up-to-date agreements. The inspectors interviewed various off-site support agency representatives, including Columbia Fire Department, Richland County Emergency Medical Service and South Carolina Department of Health and Environmental Control and determined that they maintained an understanding of the written agreements. The inspectors also verified via interviews with off-site support personnel and records reviewed that the licensee invited off-site support agencies to participate in site specific training as required by the EPlan. The inspectors noted that off-site support personnel periodically participated in the licensee's on-site emergency drills. The inspectors also verified that the licensee performed a periodic communication check with the off-site organizations as required by the EPlan.

The inspectors observed the storage of emergency equipment in the Emergency Brigade Building and EOC and verified that inventory levels were maintained as required by the EPlan. The inspectors also verified that the EOC was readily accessible and maintained the required amount of communication equipment. The inspectors reviewed the accountability procedure and verified that assembly points were present and

accessible for performing accountability and mustering during an evacuation. The inspectors also reviewed the control, distribution, and maintenance of the site's pre-fire plan, EPlan, and EIPs and determined that the licensee was maintaining these documents as required by the EPlan. The inspectors observed a successful communication test with the NRC EOC and verified via reviewed records that the licensee conducted communications testing with all required off-site support organizations at the required frequency as outlined by the EPlan and EIPs.

The inspectors reviewed the licensee's audits of the emergency preparedness program conducted since the last inspection and verified that a system was in place for tracking and resolving audit findings. The inspectors also reviewed records associated with EOC activations which required the implementation of the EPlan, and drills that occurred since the last emergency preparedness inspection. The inspectors verified that problems or deficiencies identified, that were associated with the implementation of the EPlan, were documented during the critique process and detailed in the licensee's corrective action system.

b. Conclusions

No violations more than minor significance were identified.

2. Evaluation of Exercises and Drills (Inspection Procedure 88051)

a. Inspection Scope

The inspectors reviewed the emergency drill scenario and discussed the exercise objectives with licensee personnel at an off-site pre-exercise meeting on May 8, 2017. The inspectors discussed exercise evaluation criteria and control of simulated exercise activities with the exercise coordinator. The inspectors walked down the plant to assess the effectiveness of the visual aids and simulations used in the drill and verified that the licensee had not pre-staged equipment in anticipation of the exercise.

The inspectors observed and evaluated the licensee's graded biennial exercise conducted on May 9, 2017. The scenario involved a truck used to transport contaminated laundry to an off-site vendor catching fire as it exited a controlled access area gate. The driver of the truck received second and third degree burns, and the fire consumed over 3,000 pounds of contaminated laundry, which resulted in radiological concerns.

At the initiation of the emergency drill, the inspectors verified that the licensee assessed the accident, analyzed the plant condition, and classified the event. The event was classified as an alert in accordance with the EPlan. The inspectors observed the activation of the EOC and verified that all required positions were staffed in accordance with the EPlan.

The inspectors verified that initial and subsequent off-site notifications were completed within the time period specified in the EPlan. Personnel accountability was conducted in accordance with approved procedures.

The inspectors verified that the ED maintained command and control of the EOC. The inspectors reviewed the dose assessment conducted by the dose assessor using the Radiological Assessment System for Consequence Analysis software. The inspectors verified that the ED utilized the radiation survey and environmental monitoring results during the assessment of the accident scenario.

The inspectors observed members of the licensee's ERT, including the IC, assemble at the designated assembly area and the arrival of the off-site emergency responders. The inspectors observed the ERT's assessment of the affected area and response to additional emerging situations. The IC maintained command and control of the ERT and coordinated action with off-site emergency responders. The inspectors verified that the ERT activities were appropriate for the exercise scenario and were appropriate in meeting the drill objectives.

The inspectors observed the staff critiques of the emergency exercise. The inspectors verified that the critiques were effective at identifying areas of improvement. The inspectors verified that the licensee initiated documentation of items discussed after the emergency exercise in the corrective actions program, including Corrective Action Program and Learning (CAPAL) entries 100470277, 100470280, and 100470375.

b. Conclusion

No violations more than minor significance were identified.

D. 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 2, May 10, and May 25, 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>
R. Bates	Maintenance Supervisor
P. Bartman	QA Manager
G. Byrd	Licensing Engineer
S. Carver	Emergency Preparedness
J. Howell	Environmental, Health and Safety (EH&S) Manager
C. Kneece	Fire Protection
C. Miller	Acting NCS manager
N. Parr	Licensing Manager
J. Summers	Maintenance Records
M. Trayers	Maintenance Engineering Manager
T. Wells	Manager of Work Management
J. Williams	Fire Protection Engineer

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 88050, Emergency Preparedness
IP 88051, Evaluation of Exercises and Drills
IP 88054, Fire Protection Triennial

4. DOCUMENTS REVIEWED

Records:

Emergency Operations Center Refresher Training – Emergency Command Staff, 2017
Emergency Preparedness Internal Audits, EHS-Audit 16-5, Rev. 1, dated April 2016
Independent Audit of the Emergency Preparedness Program, EHS-Audit 17-3, dated April 2017
Radios and Telephones monthly inspection, May 2017
Emergency Lights Testing: PM20511, PM20512, PM20513, PM20514,
Inspection of Fire Hose Housings/stations: PM20229,
Incinerator Room HVAV Fire Damper Testing, PM85021
Fire Pump #1 Testing: PM20082
Fire Pump #2 Testing: PM20083
Hot Oil Room Integrity Inspection: PM81085
Fire Extinguisher Check: PM20011
Fire Alarm System: PM20202

Sprinkler System: PM 20009, PM20010, PM 20791,
 Lube and Check Hydrants: PM20002
 EHS-AUDIT-16-9, "Fire Safety Audit," dated March 29, 2016
 Sketch 836038-1, Rev. 98, URRS-Area Safety Significant Controls
 Sketch SYS-207-2, Safety Procedure Sketch, Hot Work/Fire Watch Guidelines
 Hot Work Permits: 754182, 748261, 749487, 749489, 725929, 749695, 738535,
 758512, 757076, 755621, 755621, 725238, 723214, 718435
 Training Records Forms SYF-207-3 for various Fire Safety Team Members
 Form SYF-306-4, Notification of Possible Fire Pump Use

Procedures:

SEP-001, Emergency Response Organization, Rev. 8, dated September 8, 2016
 SEP-002, Classification, Rev. 6, dated March 13, 2014
 SEP-003, Emergency Response Team, Rev. 5, dated August 4, 2016
 SEP-004, Emergency Equipment and Supplies, Rev. 12, dated September 8, 2016
 SEP-005, Evacuation, Accountability and General Response, Rev. 7, dated February 2,
 2017
 SEP-007, Notification Guidelines for NRC and other Agencies, Rev. 42, dated
 January 26, 2017
 SEP-009, Emergency Response Organization Check Sheets, Rev. 15, dated July 7,
 2016
 SEP-010, WeatherPak TRx2, Rev. 1, dated November 27, 2008
 SEP-013, Post Incident Analysis, Rev. 2, dated September 23, 2016
 SEP-016, Shelter-In-Place, Rev. 2, dated March 10, 2009
 SEP-018, Emergency Operations Center Operations, Rev. 3, dated February 18, 2016
 ROP-01-035, Operation of Staplex High Volume Air Sampler Equipped with Annular
 Kinetic Impactor, Rev. 10
 ROP-05-002, Performing Smear Surveys, Rev. 15
 ROP-05-004, Determining Gross Alpha & Beta Activity of an Aqueous Sample, Rev. 18
 ROP-07-001, Health Physics Response to Emergency Events, Rev. 11
 TR-206, Shipment of Contaminated Clothing as Laundry, Rev. 10
 MCP-202082, Rev. 7, Excess Flow Valve (Natural Gas)
 SYP-207, Cutting, Welding, and Hot Work, Rev. 31
 SYP-305, Fire Watch Safety, Rev. 7
 SYF-303-1, Fire Incident Report
 SYF-303, Housekeeping
 FFHA-13-001, Fire Hazards Analysis, Appendix YARD-01, 2017
 MCP-202082, Rev. 7, Excess Flow Valves (Natural Gas)

Other Documents:

Site Emergency Plan for the Columbia Fuel Fabrication Facility, Rev. 18, dated
 November 28, 2016
 SEPS-002-1, Classification Logic Flow Chart, Rev. 0
 SEPF-018-1, Emergency Director Checklist, Rev. 5
 SEPF-018-2, Information Officer Checklist, Rev. 1
 SEPF-018-3, Liaison Officer Checklist, Rev. 1
 SEPF-018-4, Logistics Officer Checklist, Rev 1
 SEPF-018-5, Planning Chief Checklist, Rev. 2
 SEPF-018-6, EOC Safety Officer Checklist, Rev. 3
 SEPF-018-11, Emergency Operations Center Event Timeline, Rev. 0
 Work Orders: 759013, 767276, 767309, 767278, 767441, 717309, 766635, 766602,
 741522, 741521, 766685, 741521, 759872

Emergency Operations Center Refresher Training
Off-site Support Letter of Agreement/Memorandum of Understanding:
National Nuclear Security Administration, dated September 9, 2014
Columbia Fire Department, dated February 24, 2015
Richland County EMS, dated February 24, 2015
Richland County Sheriff, dated September 5, 2014
Palmetto Health Richland Hospital, dated March 18, 2015
DHEC, dated March 19, 2015
PM20205, Natural Gas Line Leak Test, Chemical Area, SSC ID BAETPIPE-401 per
Sketch 850002-1, completed March 20, 2017

Condition Reports:

CAPAL 100470277, EOC Deficiencies Identified During the Biennial Drill, dated May 9,
2017
CAPAL 100470280, EOC Enhancements Identified During the Biennial Drill, dated
May 9, 2017
CAPAL 100470375, Considerations from 2017 Biennial Exercise, dated May 10, 2017
CAPAL 100018421, Fire Pump Hose Deficiencies