

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	Docket No. 70-1151
Westinghouse Electric Company, LLC	)	License No. SNM-1107
Columbia Fuel Fabrication Facility	)	
	)	EA-16-173

CONFIRMATORY ORDER  
(EFFECTIVE UPON ISSUANCE)

I

Westinghouse Electric Company (Westinghouse, or the licensee) is the holder of NRC License No. SNM-1107, issued by the U.S. Nuclear Regulatory Commission (NRC or Commission) pursuant to 10 CFR Part 70 on September 30, 2007. The license authorizes the operation of the Columbia Fuel Fabrication Facility (CFFF) in accordance with the conditions specified therein. The facility is located on the licensee's site in Hopkins, South Carolina.

This Confirmatory Order (CO) is the result of an agreement reached during an alternative dispute resolution (ADR) mediation session conducted on May 19, 2017, and follow-up discussions held between May 19, 2017, and August 3, 2017.

II

On May 28, 2016, as part of the licensee's routine maintenance activities, the licensee started the S-1030 scrubber inspection and cleanout activities. The licensee completed the S-1030 scrubber cleanout activities on June 1, 2016, removing a total of 197 kilograms (kg) of material.

The scrubber was subsequently restarted following the maintenance outage on June 2, 2016. On July 13, 2016, the preliminary results of samples taken of the material removed from the S-1030 scrubber indicated a 40-50% concentration of uranium (U) enriched to less than 5%. This equates to approximately 100 kg of U in the scrubber, exceeding the mass limit in the Criticality Safety Evaluation (CSE) of 29 kg U.

The scrubber was shut down on July 14, 2016, when the determination was made by the licensee that the mass limit in the CSE had been exceeded. The licensee reported this event to the NRC as a 24-hour event due to a high consequence event being “unlikely” (EN 52090). On July 31, 2016, the event report was updated to a one hour report per 10 CFR 70 Appendix A (a)(4) because no items relied upon for safety (IROFS) remained available and reliable to perform their function.

On August 11, 2016, the NRC issued a Confirmatory Action Letter (CAL) to Westinghouse (ML16224B082). The purpose of the CAL was to confirm the commitments made by Westinghouse regarding additional actions Westinghouse will take in response to the U buildup reported to the NRC in July 2016. These actions were intended to ensure that the causes of the U buildup have been adequately identified and evaluated and that appropriate corrective actions have been implemented to improve the performance of the Nuclear Criticality Safety (NCS) program.

On September 27, 2016, the NRC completed an Augmented Inspection at the Westinghouse facility, the details of which are documented in NRC Inspection Report 70-1151/2016-007 (ML16301A001).

A follow-up NRC inspection (70-1151/2017-007) was also conducted, the results of which were issued on February 27, 2017 (ML17058A448). This inspection report identified the following four Apparent Violations (AVs), all of which were considered for escalated enforcement in accordance with the NRC's Enforcement Policy:

1. An AV was identified for failure to ensure criticality accident sequences remain highly unlikely, as required by Title 10 of the Code of Federal Regulations (10 CFR) 10 CFR 70.61(b).
2. An AV was identified for failure to assure that under normal and credible abnormal conditions, all nuclear processes were subcritical including use of an approved margin of subcriticality, as required by 10 CFR 70.61(d).
3. An AV was identified for failure to establish adequate management measures to ensure that items relied on for safety (IROFS) perform their function when needed, as required by 10 CFR 70.62(d).
4. An AV was identified for failure to make a one hour report, as required by Appendix A (a)(4) of 10 CFR Part 70.

In response to the NRC's inspection report of February 27, 2017, Westinghouse advised the NRC of its desire to participate in the Agency's ADR program to resolve the enforcement aspects of this matter.

### III

On May 19, 2017, the NRC and Westinghouse met in an ADR session mediated by a professional mediator, arranged through Cornell University's Institute on Conflict Resolution. Additional discussions were held between the NRC and Westinghouse between May 19, 2017,

and August 3, 2017, to resolve the enforcement aspects of this matter. ADR is a process in which a neutral mediator with no decision-making authority assists the parties in reaching an agreement or resolving any differences regarding their dispute. This CO is issued pursuant to the agreement reached during the ADR process. The elements of the agreement consist of the following:

1. Westinghouse acknowledges that four violations occurred, as stated in NRC Inspection Report 70-1151/2017-007.
2. Based on ADR, the parties agreed that the safety significance of violations described in Section II above is characterized as escalated enforcement as described in the NRC Enforcement Policy.
3. Approximately two years (+/- 6 months) after issuance of the CO, Westinghouse shall 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 CAL dated August 11, 2016. Identified deficiencies shall be entered into the corrective action program (CAP) for tracking corrective actions to completion.
4. Westinghouse shall implement improvements to reduce uranium carryover from the Calciner scrubbers, and implement additional design changes to reduce U carryover from the Blue M oven filtration system. Specifically:
  - (1) For the calciner scrubbers, within eighteen (18) months of issuance of the CO, 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) For the Blue M oven, within eighteen (18) months of issuance of the CO, 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.

(3) Within three (3) years of issuance of the CO, improvements based on the engineering evaluations described above shall be implemented.

5. In response to the May 2016 event, Westinghouse implemented several modifications to the S-1030 scrubber system, as part of its overall corrective actions to preclude recurrence and enhance performance. These modifications were considered by the NRC, under the CAL, in support of a safety basis to authorize restart of conversion process equipment and the S-1030 scrubber system, as documented in the NRC's letter to Westinghouse dated October 20, 2016 (ML16294A296). The modifications included but were not limited to:

(1) The plenums for the scrap cage Blue M oven hoods were equipped with a filter to capture at least 95% of the mass entrained in the air stream based on particle size distribution and the manufacturer's published efficiency data.

(2) Packing baskets were implemented to permit complete removal and inspection of the packed media and to maintain clearance between the packed media and the scrubber floor.

(3) A feed and bleed system for the scrubber recirculating liquid was maintained at a minimum output flow of 0.5 gallons per minute. If feed and bleed is not available, a controlled shutdown of the scrubber would be initiated in accordance with plant procedures.

(4) The scrubber was opened to remove the packed media baskets, to clean and inspect the inlet transition and scrubber body on a quarterly basis.

(5) Weekly visual inspections of the scrubber inlet transition were to be conducted.

6. Within two (2) years of issuance of the CO, 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.
7. A member of senior Westinghouse leadership shall present training on lessons learned from the scrubber event at an industry forum, including NSC and criticality safety standards aspects.

This item was completed on June 14, 2017, when the site vice president of CFFF presented training on lessons learned from the scrubber event at Fuel Cycle Information Exchange (an industry-wide forum), including NSC and criticality safety standards aspects.

8. Within eighteen (18) months of issuance of the CO, Westinghouse shall develop and implement a criticality safety basis/IROFS database to help maintain the proper flow down of the safety basis into implementing documents.
9. Within six (6) months of issuance of the CO, 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 years, after which it

may evaluate the need to continue this item.

10. Within three (3) months of issuance of the CO, 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. Within nine (9) months, 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 will consist of issuance of a procedure writers' guide, procedure format template, and a procedure use and adherence standard.

12. The NRC agrees that issuance of this CO serves to close the CAL issued to Westinghouse on August 11, 2016. NRC acknowledges that Westinghouse has taken extensive actions to address items in the CAL including completing a root cause analysis (RCA), completing a review of criticality safety evaluations, performing inspections to validate system design and operating parameters, installing physical modifications to support the safety basis to improve safety performance, conducting an independent third party nuclear safety culture assessment, and completing several corrective actions designed to preclude recurrence.

NRC also acknowledges that Westinghouse has taken some actions to close post-restart CAL items 1, 3, and 5, but are not yet complete. Therefore, post-restart CAL items 1, 3, and 5, as modified below, are transferred to this CO. Upon completion of these items,

Westinghouse will notify the NRC Region II Administrator.

- a. CAL Item 1 - Westinghouse shall implement the remaining corrective actions to prevent recurrence identified in their RCA.
- b. CAL Item 3 - Westinghouse shall conduct effectiveness reviews of corrective actions to prevent recurrence specified in their RCA.
- c. CAL Item 5 - Westinghouse shall evaluate the results of the independent third party nuclear safety culture assessment, and any identified deficiencies will be entered into the CAP to track to completion.

The NRC concludes that CAL post-restart items 2 and 4 are closed because these items will be sampled as part of the NRC's inspection program.

The NRC concludes that CAL post-restart item 6 is closed because of the extensive corrective actions completed by Westinghouse to date.

13. Within three (3) months of completion 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.

14. In consideration of the commitments delineated herein, the NRC agrees to refrain from proposing a civil penalty or issuing a Notice of Violation for all four AVs identified in NRC Inspection Report 70-1151/2017-007 (EA-16-173).

15. The NRC and Westinghouse agree that the above elements will be incorporated into a CO.

16. This agreement is binding upon successors and assigns of Westinghouse.

On August 8, 2017, Westinghouse consented to issuance of this CO with the commitments, as described in Section V below. Westinghouse further agreed that this CO is to be effective upon issuance and that it has waived its right to a hearing.

#### IV

Because Westinghouse has taken corrective actions to address NRC concerns, as set forth in Section III above, and has agreed to take additional corrective actions as set forth in Section V below, the NRC has concluded that its concerns can be resolved through issuance of this CO.

I find that Westinghouse's commitments as set forth in Section V are acceptable and necessary and conclude that with these commitments, the public health and safety are reasonably assured. In view of the foregoing, I have determined that public health and safety require that Westinghouse's commitments be confirmed by this CO. Based on the above and Westinghouse's consent, this CO is effective upon issuance.

#### V

Accordingly, pursuant to Sections 104b., 161b., 161i., 161o., 182, and 186 of the Atomic Energy Act of 1954, as amended, and the Commission's regulations in 10 CFR 2.202 and 10 CFR Parts 70, IT IS HEREBY ORDERED, THAT LICENSE NO. SNM-1107 IS MODIFIED AS FOLLOWS:

1. In recognition of the corrective actions taken in response to the four violations, as discussed at the ADR, and in response to the Confirmatory Action Letter dated August 11, 2016 (ML16224B082), Westinghouse agrees to submit a written statement or explanation to the

Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, with a copy to the Document Control Desk, Washington, DC 20555-0001, within 30 days of the date of the CO. This reply should include 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.

2. Approximately two years (+/- 6 months) after issuance of the 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.
  
3. Westinghouse shall implement improvements to reduce uranium carryover from the Calciner scrubbers, and implement additional design changes to reduce U carryover from the Blue M oven filtration system. Specifically:
  - (1) For the calciner scrubbers, within eighteen (18) months of issuance of the CO, 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) For the Blue M oven, within eighteen (18) months of issuance of the CO, 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.
  - (3) Within three (3) years of issuance of the CO, improvements based on the engineering evaluations described above shall be implemented.

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. Specifically, these modifications are:

- (1) The plenums for the scrap cage Blue M oven hoods shall be equipped with a filter to capture at least 95% of the mass entrained in the air stream based on particle size distribution and the manufacturer's published efficiency data.
- (2) Packing baskets were implemented to permit complete removal and inspection of the packed media and to maintain clearance between the packed media and the scrubber floor.
- (3) A feed and bleed system for the scrubber recirculating liquid shall be maintained at a minimum output flow of 0.5 gallons per minute. If feed and bleed is not available, a controlled shutdown of the scrubber shall be initiated in accordance with plant procedures.
- (4) The scrubber shall be opened to remove the packed media baskets, to clean and inspect the inlet transition and scrubber body on a quarterly basis.
- (5) Weekly visual inspections of the scrubber inlet transition shall be conducted.

5. Within two (2) years of issuance of the CO, 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.

6. Within eighteen (18) months of issuance of the CO, Westinghouse shall develop and implement a criticality safety basis/IROFS database to maintain the proper flow down of the safety basis into implementing documents.
7. Within six (6) months of issuance of the CO, 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.
8. Within three (3) months of issuance of the CO, 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.
9. Within nine (9) months of issuance of the CO, 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.

10. The NRC agrees that issuance of this CO serves to close the CAL issued to Westinghouse on August 11, 2016. NRC acknowledges that Westinghouse has taken extensive actions to address items in the CAL including completing an RCA, completing a review of criticality safety evaluations, performing inspections to validate system design and operating parameters, installing physical modifications to support the safety basis to improve safety performance, conducting an independent third party nuclear safety culture assessment, and completing several corrective actions designed to preclude recurrence.

NRC also acknowledges that Westinghouse has taken some actions to close post-restart CAL items 1, 3, and 5, but are not yet complete. Therefore, post-restart CAL items 1, 3, and 5, as modified below, are transferred to this CO. Upon completion of these items, Westinghouse will notify the NRC Region II Administrator.

- a. CAL Item 1 - Westinghouse shall implement the remaining corrective actions to prevent recurrence identified in their RCA.
- b. CAL Item 3 - Westinghouse shall conduct effectiveness reviews of corrective actions to prevent recurrence specified in their RCA.
- c. CAL Item 5 - Westinghouse shall evaluate the results of the independent third party nuclear safety culture assessment, and any identified deficiencies will be entered into the CAP to track to completion.

This CO supersedes the CAL issued to Westinghouse on August 11, 2016. Post -restart CAL items 2 and 4 will be sampled as part of the NRC's inspection program.

Post-restart CAL item 6 is closed because of the extensive corrective actions completed by Westinghouse to date.

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.

This agreement is binding upon successors and assigns of Westinghouse.

Unless otherwise specified, all dates are from the date of issuance of the CO.

The Regional Administrator, NRC Region II, may relax or rescind, in writing, any of the above conditions upon a showing by Westinghouse of good cause.

## VI

In accordance with 10 CFR 2.202 and 10 CFR 2.309, any person adversely affected by this CO, other than Westinghouse, may request a hearing within 30 calendar days of the date of issuance of this CO. Where good cause is shown, consideration will be given to extending the time to request a hearing. A request for extension of time must be made in writing to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555, and include a statement of good cause for the extension.

All documents filed in NRC adjudicatory proceedings, including a request for hearing, a petition for leave to intervene, any motion or other document filed in the proceeding prior to the submission of a request for hearing or petition to intervene, and documents filed by interested governmental entities participating under 10 CFR 2.315(c), must be filed in accordance with the

NRC E-Filing rule (72 FR 49139, August 28, 2007, as amended at 77 FR 46562, August 3, 2012). The E-Filing process requires participants to submit and serve all adjudicatory documents over the internet, or in some cases to mail copies on electronic storage media. Participants may not submit paper copies of their filings unless they seek an exemption in accordance with the procedures described below.

To comply with the procedural requirements of E-Filing, at least ten (10) days prior to the filing deadline, the participant should contact the Office of the Secretary by e-mail at [hearing.docket@nrc.gov](mailto:hearing.docket@nrc.gov), or by telephone at (301) 415-1677, to request (1) a digital identification (ID) certificate, which allows the participant (or its counsel or representative) to digitally sign documents and access the E-Submittal server for any proceeding in which it is participating; and (2) advise the Secretary that the participant will be submitting a request or petition for hearing (even in instances in which the participant, or its counsel or representative, already holds an NRC-issued digital ID certificate). Based upon this information, the Secretary will establish an electronic docket for the hearing in this proceeding if the Secretary has not already established an electronic docket.

Information about applying for a digital ID certificate is available on NRC's public Web site at <https://www.nrc.gov/site-help/e-submittals/getting-started.html>. System requirements for accessing the E-Submittal server are detailed in NRC's "Guidance for Electronic Submission," which is available on the agency's public Web site at <https://www.nrc.gov/site-help/e-submittals.html>. Participants may attempt to use other software not listed on the Web site, but should note that the NRC's E-Filing system does not support unlisted software, and the NRC Electronic Filing Help Desk will not be able to offer assistance in using unlisted software.

If a participant is electronically submitting a document to the NRC in accordance with the E-Filing rule, the participant must file the document using the NRC's online, Web-based submission form. In order to serve documents through the Electronic Information Exchange System (EIE), users will be required to install a Web browser plug-in from the NRC Web site. Further information on the Web-based submission form, including the installation of the Web browser plug-in, is available on the NRC's public Web site at <https://www.nrc.gov/site-help/e-submittals.html>.

Once a participant has obtained a digital ID certificate and a docket has been created, the participant can then submit a request for hearing or petition for leave to intervene through the EIE System. Submissions should be in Portable Document Format (PDF) in accordance with NRC guidance available on the NRC public Web site at <https://www.nrc.gov/site-help/e-submittals.html>. A filing is considered complete at the time the documents are submitted through the NRC's E-Filing system. To be timely, an electronic filing must be submitted to the E-Filing system no later than 11:59 p.m. Eastern Time on the due date. Upon receipt of a transmission, the E-Filing system time-stamps the document and sends the submitter an e-mail notice confirming receipt of the document. The E-Filing system also distributes an e-mail notice that provides access to the document to the NRC Office of the General Counsel and any others who have advised the Office of the Secretary that they wish to participate in the proceeding, so that the filer need not serve the documents on those participants separately. Therefore, applicants and other participants (or their counsel or representative) must apply for and receive a digital ID certificate before a hearing request/petition to intervene is filed so that they can obtain access to the document via the E-Filing system.

A person filing electronically using the agency's adjudicatory E-Filing system may seek assistance by contacting the NRC Electronic Filing Help Desk through the "Contact Us" link

located on the NRC Web site at <https://www.nrc.gov/site-help/e-submittals.html>, by e-mail at MSHD.Resource@nrc.gov, or by a toll-free call at (866) 672-7640. The NRC Electronic Filing Help Desk is available between 9 a.m. and 6 p.m., Eastern Time, Monday through Friday, excluding government holidays.

Participants who believe that they have a good cause for not submitting documents electronically must file an exemption request, in accordance with 10 CFR 2.302(g), with their initial paper filing stating why there is good cause for not filing electronically and requesting authorization to continue to submit documents in paper format. Such filings must be submitted by: (1) first class mail addressed to the Office of the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, Attention: Rulemaking and Adjudications Staff; or (2) courier, express mail, or expedited delivery service to the Office of the Secretary, Sixteenth Floor, One White Flint North, 11555 Rockville Pike, Rockville, Maryland, 20852, Attention: Rulemaking and Adjudications Staff. Participants filing a document in this manner are responsible for serving the document on all other participants. Filing is considered complete by first-class mail as of the time of deposit in the mail, or by courier, express mail, or expedited delivery service upon depositing the document with the provider of the service. A presiding officer, having granted an exemption request from using E-Filing, may require a participant or party to use E-Filing if the presiding officer subsequently determines that the reason for granting the exemption from use of E-Filing no longer exists.

Documents submitted in adjudicatory proceedings will appear in NRC's electronic hearing docket which is available to the public at <https://adams.nrc.gov/ehd/>, unless excluded pursuant to an order of the Commission, or the presiding officer. Participants are requested not to include personal privacy information, such as social security numbers, home addresses, or home phone numbers in their filings, unless an NRC regulation or other law requires submission

of such information. With respect to copyrighted works, except for limited excerpts that serve the purpose of the adjudicatory filings and would constitute a Fair Use application, participants are requested not to include copyrighted materials in their submission.

If a person (other than Westinghouse) requests a hearing, that person shall set forth with particularity the manner in which his interest is adversely affected by this CO and shall address the criteria set forth in 10 CFR 2.309(d) and (f).

If a hearing is requested by a person whose interest is adversely affected, the Commission will issue an order designating the time and place of any hearing. If a hearing is held, the issue to be considered at such hearing shall be whether this CO should be sustained.

In the absence of any request for hearing, or written approval of an extension of time in which to request a hearing, the provisions specified in Section V above shall be final 30 days from the date of this CO without further order or proceedings. If an extension of time for requesting a hearing has been approved, the provisions specified in Section V shall be final when the extension expires if a hearing request has not been received.

Dated at Atlanta, Georgia, this 9th day of August 2017.

For the Nuclear Regulatory Commission

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Catherine Haney  
Regional Administrator