



Westinghouse Electric Company LLC  
Nuclear Fuel  
Columbia Fuel Site  
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USA

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Our ref: LTR-RAC-10-53  
August 19, 2010

SUBJECT: WESTINGHOUSE REPORTED EVENT 30 DAY FOLLOW UP REPORT

The following information is being provided by Westinghouse Electric Company LLC (Westinghouse) in accordance with 10CFR70.50(c)(2). A summary of the initial notification report, Event Report # 46122, is attached and provides the applicable information provided at that time pursuant to 10CFR70.50(c)(1). The attachment also contains the additional information required in accordance with 10CFR70.50(c)(2).

If you have any questions regarding this report, please contact me at (803) 647-2045.

Sincerely,

Gerard F. Couture, Manager  
Licensing & Regulatory Programs  
Westinghouse Columbia Fuel Fabrication Facility  
Docket No. 70-1151, License No. SNM-1107

Attachment

cc: U. S. Nuclear Regulatory Commission  
Attn. Mr. Richard Gibson Region II  
245 Peachtree Center Avenue NE, Suite 1200  
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South Carolina - Department of Health and Environmental Control  
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Columbia, SC 29201-1708

IE72

NRC Notification  
Page 1 of 1  
Fax# 301-816-5151

July 23, 2010  
Event Report # 46122  
Time 1633 EDT

**Initial Notification Report Pursuant to 10CFR50(c)(1)**

Facility

Westinghouse Electric Company LLC (WEC), Commercial Fuel Fabrication Facility, (CFFF) Columbia SC, low enriched ( $\leq 5.0$  wt.% U-235) fuel fabricator for commercial light water reactors. License: SNM-1107.

Time and Date of Event

July 23, 2010, 1:27 PM

It was reported to EH&S Management that on July 23, 2010, two filter plates (P1 and P2) in the Integral Fuel Burnable Absorber (IFBA) waste water system filter press were found to be missing pegs utilized in the "peg-and-hole" passive design of feature SSC-IFBA-MISC-101. The press did not contain more than the allowed four filter press plates. Operations involving the filter press were immediately stopped and EH&S notified of the event by phone and the "Redbook" reporting system. (Redbook Issue #16126.) The actual configuration remained bounded by the analysis evaluated in the criticality safety calculations and sub-critical margins were not compromised. There was no actual safety consequence to the workers, the public or the environment.

Notification is made based on 10CFR70 Appendix A (b)(1) "Any event or condition that results in the facility being in a state that was not analyzed, was improperly analyzed, or is different from that analyzed in the Integrated Safety Analysis, and which results in failure to meet the performance requirements of 10CFR70.61." The potential for an inadvertent criticality event was evaluated in Criticality Safety Evaluation (CSE) CSE-14-C for Miscellaneous Operations in the Integrated Fuel Burnable Absorber Area and the applicable Integrated Safety Analysis for this system.

The CSE evaluated scenarios addressing the installation of the incorrect number or type of filter plates which had the potential to lead to an inadvertent criticality event. These scenarios were determined to be not-credible. Certain safeguards were identified, including SSC-IFBA-MISC-101, to maintain the basic process design of the system. Failure to identify this sequence event was credible led to that event not being included in the ISA Summary and therefore no Items Relied on For Safety (IROFS) were designated for this accident sequence.

Immediate Corrective Actions:

As stated previously, the IFBA area Filter Press operation was shutdown and will remain so until appropriate analysis is completed and IROFS are properly selected and identified.

Similar Filter Press operations in the Uranium Recovery and Recycle System were shutdown and will remain so until appropriate analysis is completed and IROFS are properly selected and identified.

This event has been entered into the Facility Corrective Action Process CAPS#10-204-C012.

**10CFR70.50 (c)(2) Information:**

*(2) Written report. Each licensee that makes a report required by paragraph (a) or (b) of this section, or by § 70.74 and Appendix A of this part, if applicable, shall submit a written follow-up report within 30 days of the initial report. Written reports prepared pursuant to other regulations may be submitted to fulfill this requirement if the report contains all the necessary information, and the appropriate distribution is made. These written reports must be sent to the NRC's Document Control Desk, using an appropriate method listed in § 70.5(a), with a copy to the appropriate NRC regional office listed in appendix D to part 20 of this chapter. The reports must include the following:*

*(i) Complete applicable information required by § 70.50(c)(1);*

This information provided at the time is set forth above.

*(ii) The probable cause of the event, including all factors that contributed to the event and the manufacturer and model number (if applicable) of any equipment that failed or malfunctioned;*

The equipment involved in this event is a Sperry™ filter press used in various applications throughout the chemical industry. The failure involved a plant specific modification which is not part of the vendor design. The modification was to install a series of “pegs” in a configuration which would limit the number of filter plates which could be utilized in the equipment. This design was designated a Safety Significant Control (SSC).

An Apparent Cause Analysis was completed. Two apparent causes were identified:

- 1) The pegs fell out of the modified filter press plates due to an inadequacy of the design of the “peg and hole” joint because the design engineer and design review team concluded without verification of facts that the joint would hold up indefinitely. Because the modifications were considered a simple engineering modification (not complex), and failure or degradation was not considered possible, the design/project engineer and design review team did not evaluate possible failure modes and effects.
  - a. OMs, PMs or periodic inspections of the passive design features also were not deemed necessary.
  - b. The adhesive bond securing the pegs to the press plates was not robust because the general purpose PVC glue specified and used is not recommended by industry for use on polypropylene.
  - c. The joint did not employ mechanical means to secure/lock the peg into the hole.
  - d. The peg/hole joint was subjected to mechanical vibration of hammering on the press plates to install filter cloth and/or shearing/compression forces when plates were installed incorrectly and the hydraulic ram is used to push plates together.
- 2) Operators and Maintenance observed that the pegs came out of the modified plates and did not report the problem to management, process engineer or create a Redbook because they believed that the pegs were only for alignment and did not realize the pegs were SSCs. The process for instilling expected knowledge and awareness of this SSC does not clearly identify the SSC for operator/mechanics in a user friendly manner or include effective means for acquisition and retention of this awareness.
  - a. The SSC nature of the pegs is not clearly identified in operating procedure for operators or mechanics.
  - b. This SSC is not labeled in the field.

- c. Training on this SSC was not retained for those who received it.
- d. Training on this SSC was not performed for operators who moved into the functional area after the SSC was implemented.

(iii) *Corrective actions taken or planned to prevent occurrence of similar or identical events in the future and the results of any evaluations or assessments;*

Completed Corrective Actions:

An Apparent Cause Analysis has been completed. This analysis includes an extent of condition review. The ACA analyst searched past events (CAPs database searches, interviews of personnel). The results of the extent of condition evaluation did not locate a High Level CAPS with similar causal factors in which a failed corrective action to prevent recurrence (CATPR) contributed to this event. This event is not considered a Repeat Event as defined by Westinghouse CAPs procedures.

- 1) In this case, the passive engineered control that failed involved modified polypropylene filter press plates. The only equipment where this modification was implemented (and the condition extends to) are in the IFBA mop water filter press, the Uranium Recycling and Recovery Services (URRS) dirty dissolver filter press and the URRS fluoride stripper filter press.
- 2) The potential exists for there to be other passive engineered controls implemented in the June 2009 timeframe involving minor modifications of existing equipment, having error precursors in common with this event.
- 3) Passive engineered controls meeting these criteria in which failure modes and effects evaluations and implementation of additional barriers were not deemed necessary by virtue of concluding criticality is not credible in the CSE should be reviewed and the CSE analysis revised to identify/implement IROFs for these operations.
- 4) Several commitments and actions have been identified to address potential extent of condition with the *targeted* due dates provided:
  - a. Develop alternative improved design for securing pegs in polypropylene filter press plates. *September 2010*
  - b. Complete revised Criticality Safety Evaluation (CSE) analysis and identify/implement IROFs for filter press operations utilizing modified polypropylene filter plates for the IFBA mop water filter press. *September 2010*. The IFBA mop water filter press, the URRS dirty dissolver filter press and the URRS fluoride stripper filter press will remain shut down until revised CSEs are approved and implemented.
  - c. Confirm extent of condition relative to other passive engineered controls involving minor modifications to existing equipment and complete revised CSE analysis and identify/implement IROFS for these operations. This item is being tracked as part of an overall Improvement Project in CAPS #10-210-C002.
  - d. Incorporate findings and lessons learned from this event and causal analysis into training case studies, Nuclear Safety Qualification Training (NSQT), Environmental Health and Safety (EH&S) Training, Knowledge Worker Human Performance (HUP) and Operations HUP training as deemed appropriate. *November 2010*
  - e. Evaluate the feasibility of developing and implement visual standards and methods for labeling/identifying SSCs in the field. *November 2010*
  - f. Develop user friendly methods to list/identify SSCs. *November 2010*
  - g. Any revised ISA and ISA summaries for the filter press CSE revisions will be available at the CFFF for NRC review during inspections and applicable ISA Summaries will be transmitted to NRC as part of annual update in accordance with 10CFR70.72(d)(3). *January 2011*

*(iv) For licensees subject to Subpart H of this part, whether the event was identified and evaluated in the Integrated Safety Analysis.*

The Columbia Fuel Fabrication Facility is subject to Subpart H. As described in the body of the initial event report the potential for this type of event was recognized and discussed in the Integrated Safety Analysis. The event report deals with a potential inadequacy in that evaluation.

The initial event report described the “as found” configuration as not exceeding four plates, with a preliminary conclusion that the actual configuration remained bounded by the analysis evaluated in the criticality safety calculations and therefore the sub-critical margins were not compromised. This was based on review of the governing calculation which concluded “The model configuration was within the  $k_{(95/95)} = 0.95/0.98$  (normal condition / upset condition, respectively) acceptance criteria with a press configuration limited to 2 of the current polypropylene press plates (2 full plates + end plates).” Subsequent verifications of the system configuration after the event notification, revealed that the as modeled polypropylene press plate dimensions used in the calculation were inaccurate. Additional calculations were performed with the correct dimensions, and the results concluded that a Sperry™ filter press equipped with two double-sided, polypropylene plates between two single-sided, polypropylene end plates (total of 4 plates) meets the 0.98 acceptance criterion for credible abnormal configurations. The normal condition acceptance criterion was not met when the system was modeled with the correct dimensional configuration, and as such the actual configuration was not fully compliant with SNM-1107 license requirements. This use of the incorrect dimensional information in the development of the CSE has been entered into CAPS for further investigation and development of appropriate corrective actions.