RECOMMENDED AREAS FOR INSPECTION AT THE WESTINGHOUSE COLUMBIA FUEL FABRICATION FACILITY

FEBRUARY 28, 2014

INTRODUCTION

On January 14, 2014, the Westinghouse Electric Company, LLC, submitted a list of changes that were made in calendar year 2013 to the Columbia Fuel Fabrication Facility (Ref. 1).

The U.S. Nuclear Regulatory Commission (NRC) staff in the Office of Nuclear Material Safety and Safeguards reviewed each of the changes. The review confirmed the licensee's perspective that all of the criteria listed in Title 10 of the *Code of Federal Regulations* (10 CFR) § 70.72(c) have been met. Therefore, prior NRC approval was not required.

The changes amounted to the following:

- Replace corroded and worn components.
- Replace component models that can no longer be purchased.
- Replace components with more reliable components to reduce failure rates.
- Remove unused components to eliminate clutter.
- Improve the ergonomics of the work area.
- Relocate components to improve accessibility to other components.
- Modify processes to reduce hazards to workers.
- Modify processes to improve products.

Components cited in the facility change report and the Integrated Safety Analysis (ISA) summary (Ref. 2) are described in footnotes. Some controls are items relied on for safety (IROFS); such controls are indicated with an asterisk next to the footnote letter (e.g.,[f*]). Other components are safety significant controls (SSCs), but are not necessarily IROFS.

Based on the review of the facility changes, the following items may be considered during the next routine inspection to ensure that the changes were properly implemented. Configuration Change Form (CCF) numbers refer to the facility change report (Ref. 1).

FACILITY CHANGES FOR INSPECTION CONSIDERATION

Criticality Safety

1. Inside and outside of the water glass building. Ventilation, process and service/utility piping were installed in the new Favorable Geometry Waterglass Cake Dissolution Process. The piping design was based on the new SSCs defined in the criticality safety evaluation (CSE) for the Warm Caustic Waterglass Cake Dissolution System, CSE-15-D, Rev 0, attached to this CCF. CCF number 10024. ISA-15, URRS Wastewater Treatment System.

2. Inside the water glass building. A steel platform is designed, constructed and installed to support favorable geometry vessels and piping associated with the Warm Caustic Waterglass Cake Dissolution Process. The process design and installation is covered

under CCF number 10024. CCF number 12451. ISA-15, URRS Wastewater Treatment System.

3. Waterglass building. A cleaning table for filter plates was built. The table is to have a criticality safe depth so that the plates can be cleaned in a hot water bath. CSE-15-D for the Warm Caustic Waterglass Cake Dissolution System requires that the dirty plates from the F-1168 rotary filter be cleaned in a criticality safe hot water bath. The previous process used half of a 55 gallon drum for cleaning the plates. CCF number 12710. ISA-15, URRS Wastewater Treatment System.

4. Install a one inch stainless steel overflow pipe on top of vessel 1016. The pipe will perform as a passive overflow that will be piped to the Scrap Cage floor. This is to meet the requirements that are depicted in CSE-1-D. CCF number 12235. ISA-01 Plant Ventilation System.

5. Solvent extraction process. In order to implement a CSE and allow processing of IFBA filter press cleanout in the hood, a second drain must be added to the 706 hood per the following control: the 706 hood shall be equipped with more than one, independent (from SSC URSSCRP-141[a]) drain (or open drain path) installed such that solution cannot collect deeper than 5.08 cm (2 inches). CCF number 13093. ISA-04, Safe Geometry Dissolver.

6. Pelleting Oxidation Computer Station. An NRC finding noted that a set of weight Line in standards was missing and the box left open. Further investigation determined that the cause was that a set of standards was left on the front Station end of a line during a check. Adding an additional set of weight standards mitigate this risk. Install an additional weight standards box on the front end of each line near the computer station. This box will be identical in dimension to the existing weight standards box found at the D&V hoods. The box dimensions are 12"x6"x6". It is fabricated with .07" thick type 304 stainless steel. All boxes have a hinged top lid. 3 1/8" holes are drilled in the bottom of the box. CCF number 13158. ISA-08, Pelleting.

7. URRS Wastewater Treatment System. Install a new catch pan below the F1168 filter that will allow the improve pan to slide out like a drawer for easy cleaning. Improve the ease of cleaning the pan and to meet new CSE-JS-D dimensional requirements for the Fll68 filter operations start-up. CCF number 13201. URRS, Waterglass.

8. Criticality Alarm System. Replace the 24vac operated horns with 120vac horns. Use a separate UPS 120 vac source to allow for future expansion if necessary as well as to reduce the load on the existing circuit. The Criticality Alarm Accident System has areas in the plant where the horns cannot be heard. The current horns use 24 vac. With the long distances between many of these horns and the front desk results in a significant voltage drop to the affect that the outlying horns do not operate at their peak sound levels. By increasing the voltage, the voltage drop will not be as much of a factor. In addition, the 120vac rated horns use 1/3 of the amperage than the current 24 vac horns, allowing additional horns on the existing loops. CCF numbers 12680, 12697, 13157, 13159, 13160, 13161, 13162, 13229, 13232, 13236, and 13267. Site grounds.

[a] Hood drain. Refers to a SSC, not an IROFS.

9. Chern Lab. Install a Criticality Alarm System / Hazard Warning Blue Light on the Chern Lab side of the Line 4 step off pad. CAPs Issue 12-332-C005. There was a uranium hexafluoride (UF_6) Release on Conversion Line 4. Before an audible announcement was made, a Chem Lab technician walked into the area that was taped off as fresh air only. The installation of the light on the Chem Lab side of their step off pad will increase the safety of personnel using that step off pad. The ITR is attached in PSEDoc0001313. CCF number 13260. Chem lab.

10. Uranyl nitrate bulk storage. Install an Additional Overflow on Top of T-1 039, UN Bulk Storage Tank. An additional passive overflow is desired by nuclear criticality safety for the UN Bulk Storage tanks that are available for offloading LR-230 trailers. CCF number 13324 and 13325. ISA-02, Uranyl Nitrite Bulk Storage Tanks.

11. Criticality Monitoring System (CMS) Upgrade. This is an upgrade to replace the current Lab View PC based CMS with a new Allen Bradley PLC/HMI based monitoring system. The new system will also have a remote HMI at the guard station at Gate #1. This is an approved capital project (AR EF1251401) to replace the current CMS. Intermittent problems with the main guard station computer/monitor have been experienced. The controls for the monitoring (PC based) system will be replaced with a new plant standard Allen Bradley PLC/HMI based control system providing more robust industrial controls and reliability. The project also provides redundant monitoring at Gate #1. CCF number 13548. Plant grounds.

Fire Safety

12. ADU sintering furnace. Replace the current mechanical drum store controller. Install a PLC. Migrate the used Low N2 Press, Main N2 Press, and Zone 2 Low Temp obsolete Interlocks from the GE PLC and wire these SSCs through a Electricians Safety Relay. The SSID's are PELSINT-904 (zone 2 low temp), controller PELSINT-903 (low pressure in main nitrogen supply line), and parts. PELSINT-905 (Individual furnace N2 supply loss interlock). PELSINT-903, 904, and 905 were removed as IROFS per LTR-EHS-12-72.[b] PELSINT-401 and 402 were also removed as IROFS. CCF number 12496. ISA-08, Pelleting.

13. Hot oil room. New fire doors are to be added to replace the existing doors of the Hot Oil room at the west end. The new doors are a custom fit so the threshold that filled the under door gap is no longer needed. CCF number 13012. ISA-03, ADU Conversion.

14. Hot oil room. Cover the dampers in the south wall of the hot oil room. A piece of sheet metal will be installed over the openings. ADUHOS-906[c]* will need to be inspected when work is complete. Eliminating these penetrations through the fire wall improves the fire safety of the room. The dampers are no longer needed for air flow in the room. CCF number 13431. ISA-03, ADU Conversion.

[b] in the January 2013 ISA update, the licensee determined that the controls did not meet the criteria for designation as an IROFS (fire safety) and therefore, were declassified. However these controls remained as SSCs. The hardwiring of these controls through the safety relay is a safety improvement.

[c] The component, a 1.5-hour fire rated barrier, is an IROFS. See page 349 of ISA-03 (i.e., ADAMS accession number ML14028A006) from Reference 2.

15. IFBA line 7 PGS channels "A" and "B" in-feed and out-feed. During November 2012, a zirc fire occurred because the clean out port was blocked by a protective sheet. The addition of the screws (4 total infeed and outfeed on both channels) prevent recurrence. Install screws in the stainless steel plate that runs along the underside of the support channel to prevent the stainless from covering the zirc clean out ports. CCF number 13099. ISA-12, IFBA Fuel Rod Manufacturing.

16. Data Center. Add a fire alarm speaker in the Data Center (Computer Room). Under a separate CCF, a wall will be installed in the Data Center to divide the area. Once this is done, personnel on one side of the Data Center will not be able to hear announcements. The addition of this speaker will alleviate this issue. CCF number 13170.

17. ADU Line 2 Calciner, Scrubber, and V-212 Tank. Install instrumentation and equipment related to the Line 2 Calciner and Scrubber upgrades. In this first phase, devices will be added to the calciner hydrogen, nitrogen, and steam control systems as well as to the scrubber and V -212 surge tank systems. These devices are intended to become safety significant in future phases, but are being installed now to provide an opportunity for evaluation. These controls provide defense-in-depth in the active engineered controls systems for hydrogen and natural gas deflagration mitigation. This will also help meet the plant Safety Life Cycle objectives and improve compliance with NFPA standards. CCF number 13218. ISA-03, ADU Conversion.

18. Outside of the CFFF building. Install a "manual dry" standpipe system on the outside west wall of the CFFF, between Dock 2 and Dock 3. This system will be used to deliver fire protection water to the roof by connecting a fire truck pumper to the lower Siamese connection. CCF number 13368.

Chemical Safety

19. ADU line 1 and line 5. Activate Safety System for back end of ADU Line 1. This will activate high level at precipitator V-106 ADUPCP-901[d] and UN Tank V-106 ADUHFS-901[e] on the safety PLC. It will add two additional IROFS to the hydrolysis column, ADUHYD-106[f]* and ADUHYD-912[g]*/ADUVAP-147[h]*. Add a 3rd lROFS the fault tree for the hydrolysis column.[i] Implement Safety PLC to increase reliability of safety interlocks.

[d] A high level interlock to shut off DI water flow. The interlock is not an IROFS.

[e] An interlock that stops fluid flow on high tank level. Activation of this control would either prevent or mitigate the amount of HF overflowing a vessel. The interlock is not an IROFS.

[f] Hydrolysis column low recirculation flow interlock. Prevent UF6 release and prevent backflow from precipitator. UF6 emergency shut-off valves and shut-offvalves to the precipitator are closed if recirculation flow is < 3 gallons per minute. The interlock is an IROFS (see ISA 03, page 335).

[g] Hydrolysis column high-high level interlock closes a minimum of two in-line water shut-off valves (XV -S-X02-ll and 12) and a minimum of two in-line UF6 shut-off valves (XV-S-X02-l, -2, -3 & -4) if high level is detected in the hydrolysis column as measured by LIT-S-X02-10 (see ISA 03, page 308).

[h] Hydrolysis column high-high level interlock. The interlock is a IROFS (see ISA 03, page 305).

[i] The 3rd IROFS is for defense in depth for certain scenarios. The 10CFR 70.61 Performance requirements are met without this IROFS. Here, IROFS ADUHYD-912 was added for CSE-3-D Scenario

Separate process controls from safety controls. Upgrade two chemical safety interlock to Safety Integrity Level (SIL). CCF number 11460. ISA-03 ADU Conversion.

20. Conversion, line 1. Add a nitrogen purge mode to the Line 1 Safety Instrumented System (SIS) so that the UF_6 lines can be purged if a unexpected shutdown occurs. Operations currently have this mode of operation in the WonderWare but it was not installed in the SIS. This mode will allow trapped UF_6 to be transferred to the hydrolysis column without DI water flow for 10 minutes to allow safe shutdown of the process. Leaving UF_6 trapped between the vaporizer and x02 column could have undesirable affects if left there for extended periods of time. This creates new SSC ADUHYD-914[j] for this mode of operation. ISA-03, ADU Conversion.

Q-Tanks High Level Alarm and Interlock changes. The trip points for the Q-Tanks BPCS high level alarms will be changed from 80% to 70%. The trip points for the Q-Tanks BPCS high level interlocks will be changed from 85% to 80%. The drawings will be revised to remove the high level interlock trip points and to instead generically state "process interlock trip point", since the control form and procedures are the correct method for controllng the trip points. Also, the drawings will be revised to remove the SSC high level interlock trip point and to instead generically state "SSC trip point", since the sketches, control forms, and procedures are the correct method for documenting the trip points. The trip points for the BPCS high level alarm and high level interlock will be changed to more conservative settings. This will help prevent a potential overflow by allowing more response time to a high level condition. CCF number 13487. ISA-03, ADU Conversion.

21. See also Recommendation 14, CCF number 13431. On page 349 of ISA-03, the component is listed as an IROFS for chemical safety.

<u>Seismic Enhancements</u>

22. Vessel Modifications and UF_6 Valve Relocation. Add 4" nozzle for relocation of Kerotest UF_6 Shutoff valve. Install guarding for valve. New internal and external UF_6 piping will be installed to facilitate changes. Additional 1" 3001b flanged connection to be added on piping for future BPCS pressure transmitter. Install new lid with 8" access port and new UF_6 30B cylinder valve operator. Relocate steam supply and steam condition equipment for vaporizer to overhead manifold and install air pilot steam regulator. Add local disconnect for LOTO for each vaporizer lid actuator motor. Reconfigure nozzle attachment for UF_6 outlet on steam chest to improve seismic risk. New design limits relative movement between steam chest and UF_6 shutoff valve and protects valve from falling debris. CCF numbers 13472, 13473, and 13476. ISA-03, ADU Conversion.

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1 thru 3 (see ISA 03, page 208 thru 210). Additional IROFS ADUHYD-106 was added for CSE-3-D Scenario 4 (see ISA 03, page 211).

[j] Failure of control. Purge mode, SIS opens UF6 emergency shut-off valves (XV-S-X02-1, -2, -3 & -4) without DI water flow for 10 minutes if DI water flow was previously established at greater than 1.25 GPM for 10 minutes.

REFERENCES

1. Letter from N. Parr, Westinghouse, “Westinghouse 10 CFR 70.72 Facility Change Report”, January 14, 2014. ADAMS accession number ML14015A067.

2. Letter from N. Parr, Westinghouse, “Westinghouse January 20 14 Updated Integrated Safety Analysis Summary”, January 28, 2014. ADAMS accession number ML14028A471.