Site Visit At The Westinghouse Columbia Fuel Fabrication Facility
on December 8 and 9, 2015:
Technical Questions For Discussion in Responding to Generic Letter 2015-01

1. High Winds and Tornadoes
    a. As stated in response requested action 1.b.i and ISA Summary section 4.2.1; provide the basis for obtaining an annual exposure of a tornado striking the site of 8.8X 10-5. Specifically, provide the basis for the multiplier of (7/32) tornadoes.
    b. Consistent with the concept of defense in depth, and considering the potential range of wind speed that can be expected at the site under tornado event, provide a description of preventative and/or mitigation measures to limit the potential consequences under an event. In addition, if performed, provide a description of the assessment for the potential for tornado missile impacts at the site.
2. Provide the following calculations:
    a. CPE-RUH-13-008, Rev 0, Seismic Induced Chemical Releases at the CFFF Consequence Analysis.
    b. CN-SB-07-01 Rev 2, UF6 Releases Consequence Analysis.
    c. "Evaluation of Potential Chemical Spills at the Columbia Fuel Fabrication Facility" by Tetra Tech NUS, Inc. dated August 4, 2010. It is used to establish the relationship between ERPG values and spill quantities presented in Table A-1 on page 145 of the 2015 version of ISA 03 Sum.
    d. LTR-EHS-10-83 (Offsite Consequences Due to HF Release)
    e. LTR-EHS-10-99 (Offsite Consequences Due to Aqueous Ammonia Release)
    f. LTR-EHS-10-86 (Offsite Consequences Due to Perchloroethylene Release)
3. CFFF Seismic Evaluation
    a. Provide the basis for the "Mitigative Index" used in the risk assessment. Specifically, provide the basis for the use of the index under seismic conditions, considering that the component performance depends on the performance under seismic loading and not normal operating conditions.
    b. Provide the basis for the use of earthquake initiating event (IE) frequency of (-3) in the risk assessment when failure of the masonry wall was not quantified. In addition, provided the basis for the IE of (-2) that was used in the criticality risk assessment.
    c. Provide the basis for assigning a Mitigating Index of -2 to Plant-SEP-901 and 902. Specifically, explain how the controls are independent. In addition, explain the basis for assigning a "self-reveling" (SR) score of (-1) and how this action is independent of Plant SEP-901 and 902.
4. Columbia Fuel Fabrication Facility (CFFF) Seismic Evaluation report (Westinghouse, 2013a)
    a. NUREG-2115 provides seismic source characterization model for all of the central and eastern United States and can be used in combination with ground motion models from Electric Power Research Institute (EPRI, 2013) to obtain site specific hazard curves for the CFFF site rather than relying on the hazard curves for Savannah River site, which is located more than 60 mi away. Why was the Savannah River Site seismic hazard curve used instead? As an alternative, the United States Geologic Survey (USGS) provides interactive tools that allow users to develop site specific seismic hazard information for any site in the contiguous United States.
    b. The CFFF analysis relies on a combination of building code provisions, site soil characteristics, and seismic hazard information to estimate the capacity of the facility

to withstand seismic ground motion and by back-comparison to the seismic hazard curve, to estimate the failure probability of the facility.

i. Why did the CFFF analysis rely on PGA? The building code provisions rely on spectral accelerations ta 1 Hz and 5 Hz, not PGA. Depending on the seismic site response, the slopes of these spectra acceleration hazard curves may be different than the PGA curve for the Savannah River Site, and thus the spectral acceleration curves may provide a different values for the risk reduction than the PGA curve.
ii. The CFFF analysis was done using hard rock curves, yet the V_S data indicate that the site best characterized as a soft soil (soil class C or D). Site specific hazard curves that account for the site seismic response are needed to accurately depict the probabilistic seismic hazard at the CFFF.
iii. The use of the importance factor as a simple multiplier on the hazard curve acceleration is an incongruous mix of seismic design concepts and seismic hazard information. Why not use information about the "generic structural fragility" to estimate the actual capacity of the CFFF, then use the site specific hazard curve (spectral accelerations between 1Hz and 10Hz, not PGA) to determine the corresponding AEP for this estimate of capacity?
iv. Westinghouse (2013a) conducted seismic analysis of buildings using static equivalent seismic loads that is one of the methods specified by ASCE 4-98 (ASCE, 2000). The analysis followed Direct Analysis Method procedure that is specified by AISC Manual 14th edition. However, Westinghouse used a combination of original building drawings, walk downs, and three editions of AISC Manual to develop the finite element model for each building. Idealizations and assumptions made to use these information to develop the model play important role on the seismic analysis results. Provide information on idealizations and assumptions made to develop the finite element models to conduct seismic analyses of the building structures.
v. Westinghouse (2013b) conducted seismic analyses of equipment using seismic response spectrum analysis method according to industry codes and standards. However, idealizations and assumptions made to the available information play important role in determining the natural frequencies and mode shapes of the equipment. Provide information on idealizations and assumptions made to develop the finite element models to calculate the eigenvalues of the equipment.

References

Westinghouse. Seismic Evaluation of the Columbia Fuel Fabrication Facility (CFFF). NSA-TR-COL-13-01. Rev. 0. Hopkins, SC: Westinghouse Electric Company LLC. October 28, 2013a.

Westinghouse. Seismic Evaluation of Equipment and Tanks at the Columbia Fuel Fabrication Facility (CFFF). NSA-TR-COL-13-53. Rev. 0. Hopkins, SC: Westinghouse Electric Company LLC. October 28, 2013b.