

RESOLUTION OF COMMENTS ON DRAFT SAFETY EVALUATION FOR

TOPICAL REPORT SAFETY EVALUATION FOR TOPICAL REPORT

WCAP-17642-P/NP, REVISION 1,

“WESTINGHOUSE PERFORMANCE ANALYSIS AND DESIGN MODEL (PAD5)”

WESTINGHOUSE ELECTRIC COMPANY

PROJECT NO. 700

By letter dated February 22, 2017, Westinghouse Electric Company (Westinghouse) provided comments on the draft safety evaluation (SE) for Topical Report (TR) WCAP-17642-P/NP, Revision 1, “Westinghouse Performance Analysis and Design Model (PAD5).” Some information in the draft SE for this TR was identified as proprietary; therefore, the draft of this SE will not be made publicly available. The following are the U.S. Nuclear Regulatory Commission (NRC) staff’s resolution of these comments:

Draft SE comments for TR WCAP-17642-P/NP, Revision 1:

1. Westinghouse commented on the second paragraph of Section 1.1 that “The staff did not review the application of PAD5 to >62 GWd/MTU and therefore it is suggested this state that the application was not reviewed for >62 GWd/MTU. This will also be consistent with the acceptance letter regarding not reviewing burnup above 62 GWd/MTU.”

NRC Resolution for Comment 1 on Draft SE

The NRC staff has reviewed Westinghouse comment and agrees that additional clarification is needed. The NRC staff has updated second paragraph of Section 1.1 that reads now:

In examining plots in the response to RAI-1 it can be seen that PAD5 is reasonably well validated to a rod average power of [] and a peak power of [] up to a rod-average burnup of 62 GWd/MTU (the NRC staff did not review the application of PAD5 beyond 62 GWd/MTU as stated in the NRC staff acceptance letter (Agencywide Documents Access and Management System Accession No. ML14104A624). The NRC staff has determined that burnup beyond 62 GWd/MTU could not be approved based on a lack of data above this burnup other than data at very lower power.

2. Westinghouse suggested to clarify in the second sentence of the last paragraph of Section 1.2 that Westinghouse did not request the approval for Model & Method Improvement Process.

NRC Resolution for Comment 2 on Draft SE

The NRC staff reviewed Westinghouse comment and agrees that additional clarification is needed. The NRC staff updated second sentence of the last paragraph of Section 1.2 that reads now:

Because of the complex interaction between parameters in fuel performance codes, the NRC staff does not recommend and Westinghouse did not request the approval of a streamlined Model & Method Improvement Process (MMIP) whereby models, uncertainty bound, or methods would be changed from those described in the revised TR and the RAI responses with NRC review and approval.

3. Westinghouse commented that Johnson Transformation was built into Mathematica instead of Minitab.

NRC Resolution for Comment 3 on Draft SE

The NRC staff reviewed Westinghouse's comment and updated second paragraph of the Section 3.7.2.1. The second paragraph of Section 3.7.2.1 is changed to read:

In order to overcome this problem, Westinghouse used the Johnson transformation and the bounded Johnson transformation (both of which are built into Mathematica) to determine a function that could be used to transform the limited data to be normally distributed, then determine the 95/95 UTL of the transformed data from a T-distribution and use the inverse function to transform that 95/95 UTL back into a 95/95 UTL for the data. Although a reference for the Johnson transformation (Reference 28) was provided in the RAI responses (RAI-6a and RAI 9i), it is clear from discussion with Westinghouse that the data transformation was performed using the built-in features in Mathematica.

4. Second sentence of the second paragraph of Section 3.1.2.2 states: "The two model predictions are shown in Figure 13 through Figure 15 as a function of temperature for three different burnup levels at 4 wt% Gd₂O₃/Er₂O₃."

Westinghouse indicated that instead of 4 wt% Gd₂O₃/Er₂O₃ there should be 8 wt%.

NRC Resolution for Comment 4 on Draft SE

The NRC staff reviewed Westinghouse proposed change and finds it acceptable. The second sentence of the second paragraph of Section 3.1.2.2 is changed to read: "The two model predictions are shown in Figure 13 through Figure 15 as a function of temperature for three different burnup levels at 8 wt% Gd₂O₃/Er₂O₃."

5. Westinghouse indicated that Reference for WCAP-12610-P-A & CENPD-404-P-A, Addendum 2-A (Proprietary), and WCAP-14342-A & CENPD-404-NP-A, Addendum 2-A (Non-Proprietary) should be added to the list of references.

NRC Resolution for Comment 5 on Draft SE

The NRC staff reviewed the Westinghouse comment and finds it acceptable, because the suggested clarification aids the staff scope and context of the staff review. The NRC staff agrees that such a clarification is consistent with the staff's review findings. The NRC staff added Reference 31 to the list of References (WCAP-12610-P-A & CENPD-404-P-A, Addendum 2-A (Proprietary) and WCAP-14342-A & CENPD-404-NP-A, Addendum 2-A (non-proprietary), "Westinghouse Clad Corrosion Model for ZIRLO and Optimized ZIRLO," Westinghouse, October 2013.).

6. Westinghouse provided proprietary markings on the draft SE.

NRC Resolution for Comment 6 on Draft SE

The NRC staff reviewed the Westinghouse markings and incorporated them into the final SE.

7. Westinghouse provided comments related to the typographical errors and stylistic changes.

NRC Resolution for Comment 7 on Draft SE

The NRC staff reviewed the Westinghouse comments and finds them acceptable, because the changes are editorial in nature.