

RESOLUTION OF WESTINGHOUSE ELECTRIC COMPANY
COMMENTS ON DRAFT SAFETY EVALUATION FOR
TOPICAL REPORT WCAP-10965-P-A, ADDENDUM 2/WCAP-10966-A, ADDENDUM 2,
“QUALIFICATION OF THE NEW PIN POWER RECOVERY METHODOLOGY”

WESTINGHOUSE ELECTRIC COMPANY

(TAC NO. ME1420)

By letter dated July 2, 2010, Westinghouse Electric Company (Westinghouse) provided twelve comments on the draft safety evaluation (SE) for Topical Report (TR) WCAP-10965-P-A, Addendum 2/WCAP-10966-A, Addendum 2, “Qualification of the New Pin Power Recovery Methodology.” 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 NRC staff’s resolution of these comments:

Draft SE comments for TR WCAP-10965-P-A, Addendum 2:

1. The fourth and fifth sentences of Section 1.0, Paragraph 1, read:

The advent of new PWR core designs, wherein control rod insertion is not precluded, has presented the likelihood of introducing significant heterogeneities that the conventional methodology with homogenized cross sections over the fuel assembly will not capture. Moreover, such a deficiency in capturing heterogeneity changes will also affect the cumulative values of parameters such as fuel pin power.

Westinghouse proposed the following change for the fourth and fifth sentences of Section 1.0, Paragraph 1:

The advent of new PWR core designs, wherein some control rod insertion is a typical mode of operation, has presented the likelihood of introducing significant heterogeneities, the cumulative effect of which will not be captured in fuel pin powers using conventional pin power methodology.

ENCLOSURE 3

NRC Resolution for Comment 1 on Draft SE:

The NRC staff reviewed the Westinghouse recommendation and found it acceptable, because the suggested revision clarifies the staff scope and context of the staff review. The NRC staff agrees that such a revision is consistent with the staff's review findings and provides additional clarification.

The fourth and fifth sentences of Section 1.0, Paragraph 1, are changed to read:

The advent of new PWR core designs, wherein some control rod insertion is a typical mode of operation, has presented the likelihood of introducing significant heterogeneities, the cumulative effect of which will not be captured in fuel pin powers using conventional pin power methodology.

2. The first sentence of Section 3.1, Paragraph 1, reads:

The conventional methodology for reconstruction of the k-th pin power consists of the summation over energy groups of the product of three terms: the energy release per fission times the macroscopic fission cross section for the g-th energy group homogenized over the fuel assembly; the value of the g-th group flux at the k-th pin location of the smooth assembly flux; and a g-th group pin factor that corrects for the error introduced due to the homogenized cross sections in the ANC calculation with pre-calculated fine-mesh PARAGON assembly calculations.

Westinghouse proposed the following change for the first sentence of Section 3.1, Paragraph 1:

The conventional methodology for reconstruction of the k-th pin power consists of the summation over energy groups of the product of three terms: the energy release per fission times the macroscopic fission cross section for the g-th energy group homogenized over the fuel assembly; the value of the g-th group flux at the k-th pin location of the smooth assembly flux; and a g-th group pin factor that captures the heterogeneity of the individual pins and is based pre-calculated fine-mesh PARAGON assembly calculations.

NRC Resolution for Comment 2 on Draft SE:

The NRC staff reviewed the Westinghouse recommendation and found it acceptable, because the suggested revision clarifies the staff scope and context of the staff review. The NRC staff agrees that such a revision is consistent with the staff's review findings and provides additional clarification.

The first sentence of Section 3.1, Paragraph 1, is changed to read:

The conventional methodology for reconstruction of the k-th pin power consists of the summation over energy groups of the product of three terms: the energy release per fission times the macroscopic fission cross section for the g-th energy group homogenized over the fuel assembly; the value of the g-th group flux at the k-th pin location of the smooth assembly flux; and a g-th group pin factor that captures the heterogeneity of the individual pins and is based pre-calculated fine-mesh PARAGON assembly calculations.

3. The first sentence of Section 3.1, Paragraph 2, states:

To overcome some of these shortcomings of the conventional methodology, the new methodology [

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Westinghouse proposed the following change for the first sentence of Section 3.1, Paragraph 2:

To overcome some of these shortcomings of the conventional methodology, the new methodology [

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NRC Resolution for Comment 3 on Draft SE:

The NRC staff reviewed the Westinghouse recommendation and found it acceptable, because the suggested revision clarifies the staff scope and context of the staff review. The NRC staff agrees that such a revision is consistent with the staff's review findings and provides additional clarification.

The first sentence of Section 3.1, Paragraph 2, is changed to read:

To overcome some of these shortcomings of the conventional methodology, the new methodology [

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4. The fourth sentence of Section 4.0, Paragraph 1, of the draft SE states:

Thus, the use of ANC with the new pin power recovery methodology described in the WCAP-10965-P-A, Addendum 2, TR in licensing applications requires the concomitant application of the NRC approved lattice code Paragon and the NRC approved cross section parameterization and reconstruction methodology of the NEXUS code.

Westinghouse proposed the following change to the fourth sentence of Section 4.0, Paragraph 1:

Thus, the use of ANC with the new pin power recovery methodology described in the WCAP-10965-P-A, Addendum 2, TR in licensing applications requires the concomitant application of the NRC approved lattice code Paragon and the NRC approved cross section parameterization and reconstruction methodology of the NEXUS code system.

NRC Resolution for Comment 4 on Draft SE:

The NRC staff reviewed the Westinghouse recommendation and found it acceptable, because the suggested revision clarifies the staff scope and context of the staff review. The NRC staff agrees that such a revision is consistent with the staff's review findings and provides additional clarification.

The fourth sentence of Section 4.0, Paragraph 1, is changed to read:

Thus, the use of ANC with the new pin power recovery methodology described in the WCAP-10965-P-A, Addendum 2, TR in licensing applications requires the concomitant application of the NRC approved lattice code Paragon and the NRC approved cross section parameterization and reconstruction methodology of the NEXUS code system.

5. Westinghouse provided several comments related to typographical errors and stylistic changes.

NRC Resolution for Comment 5 on Draft SE:

The NRC staff reviewed the Westinghouse recommendation and found it acceptable, because the changes are editorial in nature.