Westinghouse

Westinghouse Electric Company
Nuclear Services
P.O. Box 355
Pittsburgh, Pennsylvania 15230-0355
USA

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555-0001

Direct tel: (412) 374-4643
Direct fax: (412) 374-4011
e-mail: greshaja@westinghouse.com

Our ref: LTR-NRC-05-32

Attn: J. S. Wermiel, Chief
Reactor Systems Branch
Division of Systems Safety and Analysis

May 4, 2005

Subject: Westinghouse Response to the Proposed Draft SER for WCAP-16259-P, Rev.0, "Westinghouse Methodology for Application of 3-D Transient Neutronics to Non-LOCA Accident Analysis" (Non-Proprietary) dated May 2005, TAC No. MC3036

Dear Mr. Wermiel:

Enclosed is a copy of Westinghouse Response to the Proposed Draft SER for WCAP-16259-P, Rev. 0, "Westinghouse Methodology for Application of 3-D Transient Neutronics to Non-LOCA Accident Analysis" (Non-Proprietary) dated May 2005, TAC No. MC3036.

Westinghouse accepts the proposed limits and conditions identified in the preliminary Draft SER.

Very truly yours,

J. A. Gresham, Manager
Regulatory Compliance and Plant Licensing

Attachment

cc: F. M. Akstulewicz/NRR
A. C. Attard/NRR
B. J. Benney/NRR
E. D. Kendrick/NRR
L. M. Feizollahi/NRR

T008

## Copyright Notice

The reports transmitted herewith each bear a Westinghouse copyright notice. The NRC is permitted to make the number of copies of the information contained in these reports which are necessary for its internal use in connection with generic and plant-specific reviews and approvals as well as the issuance, denial, amendment, transfer, renewal, modification, suspension, revocation, or violation of a license, permit, order, or regulation subject to the requirements of 10 CFR 2.390 regarding restrictions on public disclosure to the extent such information has been identified as proprietary by Westinghouse, copyright protection notwithstanding. With respect to the non-proprietary versions of these reports, the NRC is permitted to make the number of copies beyond those necessary for its internal use which are necessary in order to have one copy available for public viewing in the appropriate docket files in the public document room in Washington, DC and in local public document rooms as may be required by NRC regulations if the number of copies submitted is insufficient for this purpose. Copies made by the NRC must include the copyright notice in all instances and the proprietary notice if the original was identified as proprietary.

# Westinghouse Response to the Proposed Draft SER for WCAP-16259-P, Rev. 0, "Westinghouse Methodology for Application of 3-D Transient Neutronics to Non-LOCA Accident Analysis"

TAC No. MC3036

May 2005

Westinghouse Electric Company LLC
P.O. Box 355
Pittsburgh, PA 15230-0355

© 2005 Westinghouse Electric Company LLC
All Rights Reserved

Following are comments for consideration on the DRAFT SER for WCAP-16259-P. Additions are indicated in **BOLD** type: deletions are indicated by ~~strikethrough~~.

1. On page 4, third paragraph: The last sentence in the paragraph, starting "Since the impact of the previous cycle length is significant only...", is enclosed in brackets. This sentence should be removed.
2. On page 5, Section 3.1.2, third paragraph: Westinghouse suggests the following change to the second sentence: "In addition, because of the large flexibility in user-supplied input selection and choice of ~~notarization~~ **nodalization** schemes, the NRC staff required that proposed applications of RETRAN-02 be accompanied by a detailed review of the suitability of the code for each specific application."
3. Also on page 5: Table 1 lists the events for which Westinghouse received NRC staff approval for use of the RETRAN methodology in WCAP-14882-P-A. Westinghouse also explicitly analyzed the Asymmetric Steam Generator Transient (specific to the CE designed plants) for a licensed nuclear power plant with the RETRAN computer codes and Westinghouse methods, and the staff concluded that the analysis was acceptable. Please add a sentence, after Table 1, stating that the asymmetric steam generator transient for CE plants is also considered acceptable, per the SER issued for the analyzed licensed nuclear power plant. We suggest the following addition: "In addition to the events listed above, the Westinghouse methods and codes have been successfully applied to the analysis of Asymmetric Steam Generator Transients (ASGT) for a CE design plant. The thermal-hydraulic response of ASGT is within the range for other PWR events analyzed with RETRAN-02, such as the loss of load, turbine trip or steamline break events. Therefore, the WCAP-16529-P methodology is also applicable to the analysis of ASGT for CE design plants."
4. On page 6, third paragraph: Westinghouse suggests the following change to the first sentence "For analysis of main steam break using the previous methodology, the iteration between the point kinetics model in RETRAN and more sophisticated multidimensional ~~neuron~~ **neutron** kinetics computer codes was required."
5. In the same paragraph (page 6, third paragraph), Westinghouse suggests the following change to the fourth sentence "Iteration was ~~preformed~~ **performed** until the total reactivity change during the accident was conservatively predicted by RETRAN in comparison to the multidimensional neutronics compilation."
6. On page 8, the page numbering jumps from "6" to "8", and then later from "10" to "13". The text appears to flow correctly (no missing pages). If our assessment is correct and there are no missing pages, the pages should be renumbered.

7. On Page 8, the third paragraph: Westinghouse suggests the following change to the first sentence "In April 1997, Westinghouse submitted topical report ~~WCAP-14545~~ **WCAP-14565** ...." Also, similar changes are suggested in the last sentence of the same paragraph and in the fourth sentence of the next paragraph on the same page, "... ~~WCAP-14545-P-A~~ **WCAP-14565-P-A** ..."

8. On page 8, the last paragraph: Westinghouse suggests the following change to the second sentence: "In addition, core heat transfer is ~~minimized~~ **pessimized** in the heat-up and DNBR simulations, whereas the whole core model uses more realistic assumptions to calculate core heat transfer."

   (Note that this change is being suggested because there may be cases where it is conservative to maximize heat transfer.)

9. On Page 9, the second paragraph: Westinghouse suggests the following change to the last sentence, "... and those of the design models are presented in ~~WCAP-16295~~ **WCAP-16259** Supplement 1."

10. On page 9, second paragraph of Section 3.1.4: Westinghouse suggests the following change to the third sentence: "The noding detail for the whole core model provides additional detail from ~~that~~ the DNBR standalone model which was previously shown to be adequate."

11. On page 13, the first paragraph of Section 3.1.6: Westinghouse suggests the following change to the third sentence: "Staff review of VIPRE in ~~references~~ **reference** 8 did not extend to the use of VIPRE for post-CHF heat-up calculations and the generic review of VIPRE (Ref. 7) did not extend into that range."

12. On page 14, the second full paragraph: Westinghouse suggests the following change to the third sentence: "As is permitted for FACTRAN, VIPRE can be used to show compliance with **peak clad temperature for a locked rotor event,** fuel melting, and pellet enthalpy criteria as well as for DNBR evaluation."

    (Note that this change is being suggested since both VIPRE and FACTRAN are used for this purpose using the same methodology.)

13. On Page 16, the third sentence of the first paragraph: Westinghouse suggests the following change, "The methodology utilizes the NRC-approved codes SPNOVA (References 4, 5 & 6), VIPRE-01 (References 7 & 8), ..."

14. On page 16, our interpretation of Section 4.1 is that the methodology is applicable to all Westinghouse 2-, 3- and 4-loop plants (RETRAN, VIPRE and SPNOVA are all approved for use at all Westinghouse 2-, 3- and 4-loop plants). Therefore, no specific licensing action is required to apply the methodology (other than the changes to the Chapter 15 analyses and subject to the limitations described in the RETRAN, VIPRE and SPNOVA (ANCK) topical reports). In addition, for any plant where the base codes have already been licensed for use, there is also no specific licensing action is required to apply the methodology (other than the changes to the Chapter 15 analyses and subject to the limitations described in the RETRAN, VIPRE and SPNOVA (ANCK) topical reports). If a plant has not licensed the use of the computer codes and methodology, the plant will need to

take action to license the use of the methodology and computer codes, including the three applications of VIPRE.

If Westinghouse interpretation is consistent with NRC intent, Westinghouse suggests the following changes:

4.1 Topical report WCAP-16259-P is applicable to all operating Westinghouse designed reactors with 4, 3, or 2 coolant loops.

4.2 **Topical report WCAP-16259-P** ~~In addition it~~ is applicable to any pressurized water reactor where SPNOVA, VIPRE and RETRAN computer codes and methodology are approved for use in compliance with the conditions and ... (no changes through the end of the paragraph).

4.3 In addition, Westinghouse will need to verify that the conditions and limitations imposed on each of the three (3) NRC approved codes, encompassing the RAVE methodology, will continue to be satisfied each time the RAVE methodology is utilized.

~~4.2~~ 4.4 Because of competing effects between the coupled computer codes... (no other changes in item "4.2")

~~4.3~~ 4.5 The code option selected for use... (no changes except section numbering)

~~4.4~~ 4.6 Westinghouse submitted analyses showing that for post CHF core heat-up, VIPRE input as modified by Westinghouse and FACTRAN produce virtually identical results. Therefore, the NRC staff considers VIPRE to be equivalent to FACTRAN for performing post CHF core heat-up calculations. As is permitted for FACTRAN, VIPRE can be used to show compliance with **the peak clad temperature for a locked rotor event,** fuel melting, and pellet enthalpy criteria as well as for DNBR evaluation. (remainder of paragraph unchanged)