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Our ref: LTR-NRC-11-7

March 4, 2011

**U. S. Nuclear Regulatory Commission
10 CFR 50.46 Annual Notification and Reporting for 2010**

Dear Mr. Ulses,

The purpose of this letter is to report the impact of changes or errors in the emergency core cooling system (ECCS) evaluation models used by Westinghouse Electric Company. A description of the changes to the Westinghouse small-break LOCA and large-break LOCA ECCS evaluation models for 2010 is provided as an attachment. Westinghouse has categorized these changes or errors into two separate groups:

- Non-Discretionary Changes
- Discretionary Changes

This annual notification is being provided since it affects information previously submitted in Westinghouse topical reports. It is noted that plant-specific peak cladding temperature (PCT) variations are not addressed in this letter. These should be treated, as appropriate, on a plant-specific basis in accordance with the applicable sections of 10 CFR 50. Westinghouse has notified licensees utilizing these Westinghouse ECCS evaluation models in their plant licensing basis of the appropriate reportable changes.

For future referencing convenience, the 2010 10 CFR 50.46 reportable changes provided in the attachment, together with the "2009 Formulation" offered in Reference 2 constitutes the "2010 Formulation" of the Westinghouse ECCS evaluation models.

Sincerely,

A handwritten signature in black ink, appearing to read 'J. A. Gresham'.

J. A. Gresham, Manager
Regulatory Compliance

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March 4, 2011

References:

1. ET-NRC-92-3755, "W Methodology for Implementation of 10 CFR 50.46 Reporting," N. J. Liparulo, Westinghouse to NRC Document Control Desk, October 30, 1992. (WCAP-13451)
2. LTR-NRC-10-75, "U.S. Nuclear Regulatory Commission, 10 CFR 50.46 Annual Notification and Reporting for 2009," J. A. Gresham, January 10, 2011.

Attachment:

1. Standard Format Text for Changes and Enhancements to the Westinghouse Evaluation Models for 2010 (7 pages, including cover page)

Attachment

Standard Format Text for Changes and Enhancements to the Westinghouse Evaluation Models for 2010

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Discretionary Changes

General Code Maintenance

Non-Discretionary Changes

Treatment of Vessel Average Temperature Uncertainty

Treatment of Interfacial Drag Multipliers in Upper Plenum Injection Plants

Urania-Gadolinia Pellet Thermal Conductivity Calculation

Pellet Crack and Dish Volume Calculation

**GENERAL CODE MAINTENANCE
(Discretionary Change)**

Background

Various changes have been made to enhance the usability of the codes and to help preclude errors in analyses. This includes items such as modifying input variable definitions, units, and defaults; improving the input diagnostic checks; enhancing the code output; optimizing active coding; and, eliminating inactive coding. These changes represent Discretionary Changes that will be implemented on a forward-fit basis in accordance with Section 4.1.1 of WCAP-13451.

Affected Evaluation Model(s)

1985 Westinghouse Small Break LOCA Evaluation Model with NOTRUMP

Estimated Effect

The nature of these changes leads to an estimated PCT impact of 0°F.

TREATMENT OF VESSEL AVERAGE TEMPERATURE UNCERTAINTY (Non-Discretionary Change)

Background

Historically, the overall vessel average temperature uncertainty calculated by Westinghouse considered only “-” instrument uncertainties, corresponding to the indicated temperature being lower than the actual temperature. This uncertainty was then applied as a “+/-” uncertainty in some LOCA analyses, rather than using specific “+” and “-” uncertainties. This discrepancy has been evaluated for impact on existing Large and Small Break LOCA analysis results, and its resolution represents a Non-Discretionary Change in accordance with Section 4.1.2 of WCAP-13451.

Affected Evaluation Model(s)

1985 Westinghouse Small Break LOCA Evaluation Model with NOTRUMP
1996 Westinghouse Best Estimate Large Break LOCA Evaluation Model
1999 Westinghouse Best Estimate Large Break LOCA Evaluation Model, Application to PWRs with Upper Plenum Injection
2004 Westinghouse Realistic Large Break LOCA Evaluation Model Using ASTRUM

Estimated Effect

This issue was judged to have a negligible impact on existing Large and Small Break LOCA analysis results, leading to an estimated PCT impact of 0°F.

TREATMENT OF INTERFACIAL DRAG MULTIPLIERS IN UPPER PLENUM INJECTION PLANTS

(Non-Discretionary Change)

Background

For Upper Plenum Injection (UPI) plants, condensation and interfacial drag multipliers which affect the simulated draining of the upper plenum are modeled within WCOBRA/TRAC. The interfacial drag multipliers are applied in the upper plenum and the Counter-Current Flow Limitation (CCFL) region of the vessel. For some licensing-basis analyses, these multipliers were not ranged as intended. This discrepancy has been evaluated for impact on existing licensing-basis analysis results, and its resolution represents a Non-Discretionary Change in accordance with Section 4.1.2 of WCAP-13451.

Affected Evaluation Model(s)

1999 Westinghouse Best Estimate Large Break LOCA Evaluation Model, Application to PWRs with Upper Plenum Injection

2004 Westinghouse Realistic Large Break LOCA Evaluation Model Using ASTRUM

Estimated Effect

This issue was judged to have a negligible impact on existing Large Break LOCA analysis results, leading to an estimated PCT impact of 0°F.

**URANIA-GADOLINIA PELLET THERMAL CONDUCTIVITY CALCULATION
(Non-Discretionary Change)**

Background

Two errors were discovered in the pellet thermal conductivity calculation for urania-gadolinia pellets in the SBLOCTA code. First, the calculation did not include the terms required to adjust for pellet densities other than 95% of the theoretical density. Second, the conversion from Fahrenheit to Rankine used an adder of 459 instead of 459.67. These errors have been corrected and evaluated for impact on existing Small Break LOCA analysis results. These changes represent a closely-related group of Non-Discretionary Changes in accordance with Section 4.1.2 of WCAP-13451.

Affected Evaluation Model(s)

1985 Westinghouse Small Break LOCA Evaluation Model with NOTRUMP

Estimated Effect

SBLOCTA sensitivity calculations led to an estimated PCT effect of 0°F for existing Small Break LOCA analysis results.

**PELLET CRACK AND DISH VOLUME CALCULATION
(Non-Discretionary Change)**

Background

Two errors were discovered in the calculation of the normalized pellet crack and dish volumes in the SBLOCTA code. First, an incorrect operator was used to select between two tables of normalized volume vs. linear heat generation rate. Second, the normalized volume at 18 kW/ft was incorrectly programmed in one of the tables as 1.58 instead of 1.59. These errors have been corrected in the SBLOCTA code and will be corrected (where applicable) in future versions of the BASH and LOCBART codes. These changes represent a closely-related group of Non-Discretionary Changes in accordance with Section 4.1.2 of WCAP-13451.

Affected Evaluation Model(s)

1985 Westinghouse Small Break LOCA Evaluation Model with NOTRUMP
1981 Westinghouse Large Break LOCA Evaluation Model with BASH

Estimated Effect

A combination of SBLOCTA sensitivity calculations and engineering judgment led to an estimated PCT effect of 0°F for existing Large and Small Break LOCA analysis results.