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Attention: F. M. Akstulewicz, Chief
Nuclear Performance & Code Review Branch
Division of Safety Systems

Our ref: LTR-NRC-06-15

March 28, 2006

Subject: WCAP-16260-P-A Compliance Interpretation, (Non-Proprietary)

Dear Mr. Akstulewicz:

Enclosed is a copy of Westinghouse's Compliance Interpretation related to WCAP-16260-P-A. It is requested that the NRC acknowledge Westinghouse's interpretation.

Correspondence with respect to this letter should be addressed to B. F. Maurer, Acting Manager, Regulatory Compliance and Plant Licensing, Westinghouse Electric Company LLC, P.O. Box 355, Pittsburgh, Pennsylvania 15230-0355.

Very truly yours,

R. M. Sloan/for

B. F. Maurer, Acting Manager
Regulatory Compliance and Plant Licensing

Enclosure

cc: G. S. Shukla/NRR

TO08

LTR-NRC-06-15

WCAP-16260-P-A Compliance Interpretation, (Non-Proprietary)

Westinghouse Electric Company
P.O. Box 355
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WCAP-16260-P-A Compliance Interpretation

This letter documents Westinghouse's interpretation of WCAP-16260-P-A compliance with respect to two previous topical reports, WCAP-8846-A and WCAP-13749-P-A, and their associated SER approvals. This interpretation applies only to WCAP-16260-P-A and does not alter the interpretation of WCAP-8846-A, WCAP-13749-P-A, or their associated SERs. Based on a phone call held between the NRC and Westinghouse on November 16, 2005, this letter documents Westinghouse's interpretation and continued compliance with the SER requirements of WCAP-8846-A and WCAP-13749-P-A using "The Spatially Corrected Inverse Count Rate (SCICR) Method for Subcritical Reactivity Measurement" testing methodology documented in WCAP-16260-P-A (also referred to as Subcritical Rod Worth Measurement – SRWM). Conditions that are specified in the SERs for WCAP-8846-A and WCAP-13749-P-A were not specifically considered in topical report WCAP-16260-P-A; however, Westinghouse's interpretation is that compliance to these SER requirements is maintained.

Background

Per the ANSI/ANS-19.6.1 standard, "Reload Startup Physics Tests for Pressurized Water Reactors", measurements are made to confirm the following characteristics. These characteristics are confirmed during the Low Power Physics Test (LPPT) and the Subcritical Physics Test (SPT) programs as follows.

Reactivity Balance

This is confirmed by the all-rods-out boron endpoint measurement as it is compared to the design prediction. Both the LPPT and SPT programs determine this value.

Capability for Shutdown Margin

This is confirmed by the sum of the bank worths (measured) as it is compared to the design prediction. Both the LPPT and SPT programs determine this value. Where the LPPT confirms the sum of the individual banks, the SPT program using SRWM confirms the total worth from all-rods-in (ARI) to all-rods-out (ARO) conditions.

Power Distribution

This is confirmed by the individual bank worth measurements as they are compared to design. The distribution of differences is an indication of how well the constructed core power distribution agrees with the design. Furthermore, if there is material loss in the control rods or differences in the makeup, the individual bank worth measurements will demonstrate this. The LPPT program achieves this by individual bank worth measurements, where the SPT program shows consistency via the MD/RMS value. If any of the banks are not worth what is expected (material loss) or the power distribution is different, the MD/RMS value will be out of spec.

Reactivity Control

This is confirmed by the Isothermal Temperature Coefficient (ITC) measurement as it is compared to the design prediction. Both the LPPT and SPT programs determine this value for the ARO critical condition. Subtracting the fuel temperature coefficient generates the MTC value for Technical Specification compliance.

B_4C Control Rod Material Item
In WCAP-8846-A

Page 7 of the SER, the NRC stated:

> *"An acceptable program might include several rod reactivity checks during the first core cycle and rod measurements of all the rod banks at refueling outages thereafter."*

Since the MD/RMS comparison in the SRWM methodology provides the equivalent assurance of correct configuration as the control rod worth measurements using either Rod Swap (WCAP-9863-P-A) or DRWM (WCAP-13360-P-A), Westinghouse considers that successful measurement results from a SRWM based test program meets the requirements of the above stated SER. Therefore, the methodology of WCAP-16260-P-A remains in compliance with the requirement specified in WCAP-8846-A. WCAP-16260-P-A contained data from one plant that uses B_4C as the primary absorber in the control rods.

End of Life (EOL) MTC Measurement Items
In WCAP-13749-P-A

Pages 6 and 8 of the SER, the NRC stated:

> *"The BOL MTC measurement is made at Hot-Zero-Power (HZP) conditions and is an accurate measurement characterized by relatively small uncertainties."*
>
> *"2) Changes in Core/Fuel Designs and the Measurement Data Base*
>
> *The predictive correction should be reevaluated if changes in core/fuel designs or the MTC calculation-to-measurement data base have a significant effect on the MTC predictive correction (Section-3)."*

Westinghouse considers that the measurement of the ITC in a sub-critical condition to be equivalent to the critical reactor measurement. With WCAP-16260-P-A, the MTC is measured (via ITC measurements) at no-load temperature, All-Rods-Out (ARO) and $k_{eff} \sim 0.99$. The measurement is adjusted to Hot-Zero-Power (HZP), ARO by the critical boron concentration only. In this situation, the no-load temperature and the HZP temperatures are the same and the only difference is the condition of being at $k_{eff} \sim 0.99$ versus $k_{eff} = 1.0$, i.e., 1000 pcm or 100 to 150 ppm. This adjustment for critical boron

concentration is based on a well-established MTC/ITC behavior as a function of boron concentration change. It is based on numerous calculations performed by Westinghouse; and it is widely used as an adjustment to the MTC measurement for Technical Specification compliance.

In WCAP-13749-P-A Appendix D

The following statements define the application process as it refers to the core performance benchmarks:

> *"All core performance benchmark criteria listed in Table 1 must be met for the current operating cycle. These criteria are confirmed from startup physics test results and routine HFP boron concentration and incore flux map surveillances taken during the cycle.*
>
> *If all core performance benchmark criteria are met, then the Revised Predicted MTC shall be calculated per the algorithm given in Table 2. The worksheet given in Table 3 should be used for performing this calculation. The required cycle specific data is provided in Table 2 and Figure 1. This methodology is also described in Reference 1. If all core performance benchmark criteria are met, and the Revised Predicted MTC is less negative than _____ pcm/°F, then a measurement is not required."*

Table 1 defines the benchmark criteria and elements, and is a duplicate of Table 3-2 in WCAP-13749-P-A. Contained within that table is the requirement that individual bank worths be measured. Per the discussion above, the SRWM approach with MD/RMS is equivalent to individual bank worths.

Therefore, the methodology of WCAP-16260-P-A remains in compliance with the requirement specified in WCAP-13749-P-A with respect to both of these items.

Conclusion

Topical report WCAP-16260-P-A describes a valid methodology of confirming the consistency of the reconstructed core as compared to the design and it is consistent with the requirements of the Westinghouse's reload safety evaluation methodology (for both W & CE NSSS units).

Westinghouse's interpretation of the SER requirements contained in WCAP-16260-P-A, as it will be implemented, meets the current regulatory requirements. Specifically, the SRWM methodology provides comparable certifications to the aforementioned characteristics. Therefore, SRWM fully complies with the SER requirements contained WCAP-8846-A and WCAP-13749-P-A.