



Westinghouse Electric Company
1000 Westinghouse Drive
Cranberry Township, Pennsylvania 16066
USA

U.S. Nuclear Regulatory Commission
Document Control Desk
11555 Rockville Pike
Rockville, MD 20852

Direct tel: (412) 374-4643
Direct fax: (724) 940-8560
e-mail: greshaja@westinghouse.com

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Subject: Notification of the Planned Critical Heat Flux Testing for the 17x17 OFA/IFM Fuel Product

References: 1) NSAL-14-5, "Lower Than Expected Critical Heat Flux Results Obtained During Departure from Nucleate Boiling Testing"

Westinghouse's plans to perform additional critical heat flux (CHF) testing (also referred to as departure from nucleate boiling, or DNB) for the 17x17 Optimized Fuel Assembly (OFA) with intermediate flow mixing (IFM) grids fuel product, also referred to as the 17x17 VANTAGE+ fuel product with the fuel rod outside diameter (OD) of 0.360". While the DNB testing and the reasons it is planned are not reportable in accordance with 10 CFR Part 21, Westinghouse voluntarily discussed this topic with the U.S. Nuclear Regulatory Commission (NRC) on Wednesday, April 19, 2017 at the NRC Headquarters. The purpose of this correspondence is to provide the NRC a summary of the information discussed during this meeting.

Background of Original Critical Heat Flux Issue:

NSAL-14-5 (Reference 1) was issued by Westinghouse on June 17, 2014, to inform customers about the discovery of a potentially non-conservative sub-region in applicable ranges of some Westinghouse CHF correlations. This discovery was a result of testing performed at the Westinghouse ODEN loop. In late 2015, Westinghouse communicated with customers the plan to resolve NSAL-14-5. One of the identified long-term corrective actions was to produce a revised WNG-1 CHF correlation by inclusion of the new ODEN DNB test data identified in NSAL-14-5.

Discovery of the Need for Additional DNB Testing:

Westinghouse is considering making the revised WNG-1 CHF correlation applicable to the 17x17 OFA/IFM fuel design. Extrapolations of data from the existing DNB tests for the 17x17 Robust Fuel Assembly (RFA) fuel design and other fuel products to the 17x17 OFA/IFM fuel design produced conflicting predictions, as compared to the original WRB-2 assessment. Currently there is a known lack of test data for the 17x17 OFA/IFM thimble sub-channel geometry. The conflicting predictions indicate a possible margin loss impact to the WRB-2 CHF correlation should this configuration be tested. To address this possibility, further DNB testing for the 17x17 OFA/IFM thimble sub-channel geometry will be performed in the ODEN loop. The results of the additional DNB tests may be part of the continued improvement of the DNB database in support of development of the revised WNG-1 CHF correlation and will be part of the WRB-2 correlation assessment.

Customer feedback received on the NSAL-14-5 communication indicated the need for Westinghouse to communicate with customers in advance of doing such testing. Since Westinghouse has decided to

perform additional tests and it is possible that the outcome of the 17x17 OFA/IFM DNB tests could have an impact on current customers utilizing the 17x17 OFA/IFM fuel product through the WRB-2 CHF correlation, Westinghouse is providing advanced communications of the testing and plant-specific risk mitigation efforts both to the NRC and to customers.

Safety Significance:

Westinghouse evaluated this issue to determine if it was potentially reportable under 10 CFR Part 21 and determined that it was not reportable and a substantial safety hazard (SSH) does not exist.

Applicable Plants:

The DNB testing and the associated risk only apply to plants that currently have the 17x17 OFA/IFM fuel product and use the WRB-2 CHF correlation. The risk is not applicable to any other plant that uses the WRB-2 CHF correlation or that uses any other Westinghouse fuel products.


Recommended Actions:

There is no SSH for the plants which are analyzed by Westinghouse that currently have the 17x17 OFA/IFM fuel product. Also, there is no conclusion at this time that there will be a negative impact on the WRB-2 DNB correlation. Therefore, there is no need for the NRC or 17x17 OFA/IFM customers to take any actions at this time.

Next Steps:

Westinghouse will be working with the plants that currently have the 17x17 OFA/IFM fuel product regarding plant-specific risk mitigation efforts before the additional DNB testing for the 17x17 OFA/IFM fuel product is scheduled to begin. The testing must be run in the ODEN loop. The testing is currently scheduled for the first half of 2018 with data analysis in the following few months. Once the test data is obtained and analyzed, the results will be applied to the updated WRB-2 assessment and may be incorporated into the revised WNG-1 CHF correlation. Westinghouse will then provide follow-up communications regarding the results.

Correspondence with respect to this submittal should be addressed to James A. Gresham, Manager, Regulatory Compliance, Westinghouse Electric Company, 1000 Westinghouse Drive, Building 3 Suite 310, Cranberry Township, Pennsylvania 16066.


James A. Gresham, Manager
Regulatory Compliance

cc:

Dennis Morey
Ekaterina Lenning