VIRGINIA ELECTRIC AND POWER COMPANY

RICHMOND, VIRGINIA 23261

December 8, 1989

United States Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D. C. 20555

Serial No. 89-541
NO/CGL:vlh R5
Docket Nos. 50-280
50-281
50-338
50-339
License Nos. DPR-32
DPR-37
NPF-4
NPF-7

Gentlemen:

VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION UNITS 1 AND 2
NORTH ANNA POWER STATION UNITS 1 AND 2
MODIFICATION OF STARTUP PHYSICS TEST PROGRAM
INSPECTOR FOLLOWUP ITEM 280, 281/88-29-01

Virginia Electric and Power Company's Topical Report VEP-FRD-36A, "Control Rod Reactivity Worth Determination by the Rod Swap Technique," provides a description of the startup physics test program using the rod swap technique for determination of control rod worths. The rod swap methodology is utilized in startup physics test programs at both the Surry and North Anna Stations. As a result of a comparison of the Startup Physics Test Program presented in Topical Report VEP-FRD-36A to the actual tests performed for the Surry Unit 1 Cycle 10 startup, Inspector Follow-up Item 280, 281/88-29-01 was generated and documented in NRC Inspection Report 50-280, 281/88-29 dated August 24, 1988. This item noted the deletion of the rodded zero power flux map and the deletion of the measurement of the isothermal temperature coefficient with the reference bank inserted as deviations from Topical Report VEP-FRD-36A. The purpose of this letter is to formally document and address these modifications in our startup physics test program for Surry. Letter Serial No. 204, dated April 8, 1982, advised the NRC of these modifications in the startup physics test program for North Anna Unit 2. The modifications discussed in letter Serial No. 204, as well as in this letter, are also applicable to the North Anna Unit 1 startup physics test program. As discussed in the following paragraphs, these modifications have no significant impact on the adequacy of the startup physics testing program and are consistent with ANSI/ANS Standard, ANSI/ANS - 19.6.1 - 1985, "Reload Startup Physics Tests for Pressurized Water Reactors."

Deletion of the Rodded Zero Power Flux Map - The startup physics test program in Topical Report VEP-FRD-36A specifies performance of flux maps at hot zero power (HZP) for both all rods out (ARO) and rodded conditions (Refer to Attachment 1). The purpose of these maps is to detect anomalies in the core loading by measuring the degree of azimuthal symmetry of the neutron flux at as low a power as practical and to verify the power peaking limits established in the Technical Specifications. The

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rodded flux map was eliminated as a requirement of the startup physics testing since it provides little additional information concerning flux symmetry versus the ARO map. Currently, the test programs in place require an ARO flux map to be taken at less than or equal to 30 percent power. The ARO HZP flux map was replaced with one taken at less than or equal to 30 percent power for consistency with ANSI/ANS-19.6.1-1985. However, in order to verify compliance with Technical Specification limits for peaking factors for rodded at-power conditions, a comparison is made of parameters (a) and (b), defined as follows:

(a) the margin between the predicted rodded F-delta-H values and the Technical Specification F-delta-H limits
(b) the maximum positive measured to predicted F-delta-H deviation from the ARO flux map.

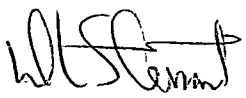
If the predicted margin (a) is less than the measured to predicted deviation (b), then a rodded flux map is required.

Deletion of the Measurement of the Isothermal Temperature Coefficient with the Reference Bank Inserted - Topical Report VEP-FRD-36A also specifies the use of a measured isothermal temperature coefficient with the reference bank inserted to adjust the measured data for temperature changes from the nominal test conditions. In practice, a predicted value is used for the rodded isothermal temperature coefficient. The use of the predicted, rather than a measured value, has very little impact on the measured rod worth since the moderator temperature is controlled to within +/-1 degree Fahrenheit of the nominal test conditions during the test. Additionally, the uncertainty for predicted versus measured isothermal temperature coefficients is +/-3 pcm/degree Fahrenheit as indicated in Topical Report VEP-FRD-20A, "The PDQ07 One Zone Model." The ARO isothermal temperature coefficient at HZP is measured and the acceptance criteria are verified. This provides a check on the predicted values. If the measured value does not meet the acceptance criteria, an evaluation is performed to determine the reason.

Attachment 2 provides a table describing the minimum HZP startup physics test program currently in place at both the Surry and North Anna Power Stations.

Please contact us should you have questions concerning these modifications in our startup physics test program.

Very truly yours,



W. L. Stewart
Senior Vice President - Nuclear

Attachments

1. Original Hot Zero Power Startup Physics Testing Program with Rod Swap
2. Current Minimum Hot Zero Power Startup Physics Testing Program with Rod Swap

cc: U. S. Nuclear Regulatory Commission
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ATTACHMENT 1

ORIGINAL HOT ZERO POWER STARTUP PHYSICS TESTING PROGRAM WITH ROD SWAP

(Table A.2 From VEP-FRD-36A)

Reactivity Computer Checkout

Boron Endpoint - ARO

Temperature Coefficient - ARO

M/D Flux Map - ARO

Reference Bank Worth

Boron Endpoint - Reference Bank In

Temperature Coefficient - Reference Bank In

M/D Flux Map - Rodded

Control Rod Bank Worths (Control and Shutdown)

ATTACHMENT 2

CURRENT MINIMUM HOT ZERO POWER STARTUP PHYSICS TESTING PROGRAM WITH ROD SWAP

Reactivity Computer Checkout

Boron Endpoint - ARO

Temperature Coefficient - ARO

Reference Bank Worth

Boron Endpoint - Reference Bank In

Control Rod Bank Worths (Control and Shutdown)

*M/D Flux Map - ARO

* The M/D flux map for reload startup physics testing is taken to measure the degree of azimuthal symmetry of the neutron flux at as low a power as practical. Virginia Electric and Power Company uses the flux distribution method described in ANSI/ANS-19.6.1-1985, which indicates the nuclear power level shall be less than or equal to thirty percent of rated thermal power.