VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

February 28, 2000

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Serial No. 00-096
NL&OS/ETS
Docket Nos. 50-338/-339
License Nos. NPF-4/-7

Gentlemen:

VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA POWER STATION UNITS 1 AND 2
REGULATORY GUIDE 1.97, ACCIDENT MONITORING INSTRUMENTS
CLARIFICATION OF AFW FLOW INDICATION RANGE REQUIREMENTS

In a letter dated January 31, 1984 (Serial No. 054) Virginia Electric and Power Company (Virginia Power) identified the extent by which the existing plant design complied with Regulatory Guide (RG) 1.97. The NRC reviewed the submittal as the basis of Virginia Power's commitment to Regulatory Guide 1.97. That review is documented in a NRC letter dated February 8, 1985. This letter clarifies how the instrument range requirements of RG 1.97 continue to be met for Auxiliary Feedwater (AFW) flow instruments for normal accident flow conditions.

In our January 31, 1984 letter, Virginia Power indicated that AFW flow indication met the RG 1.97 range requirements of 0-110% of design flow for accident conditions. However, during our ongoing licensing/design basis validation project it was identified that the steam generator pressure profile was not modeled conservatively for the steam generators during steam line break (MSLB) accidents. This results in initial AFW flow rates in the affected generator, as well as the intact generators, exceeding the range of the installed instruments. Initial indication of flow to the generators could be greater than the 110% requirement for both the Turbine Driven AFW and Motor Driven AFW pumps during a MSLB. The present indicators have a range of 0-500 GPM on a linear scale that can be read within 10 GPM at flows greater than 100 GPM.

AFW flow is the primary variable used to determine if the AFW system is operating as required to remove decay heat from the primary system during accident conditions. Since AFW flow is not used to identify the faulted generator in a MSLB accident, the high flow (off scale high) indications will not provide misleading or confusing information to the operator during the initial response to the accident since operator action in all cases is to throttle AFW flow.

RG 1.97 states that the range for AFW flow is 0-110% of the design flow where the design flow is the maximum normal flow expected during a design basis accident. As noted above, the AFW flow indicators meet this range for each accident/incident scenario except the initial flow conditions during a MSLB scenario. Replacing the

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existing AFW flow indicators with a larger range flow indicator to include initial AFW flow during a MSLB scenario would have the unintended consequences of degrading the operator's ability to accurately verify the lower flows necessary to ensure adequate decay heat removal during transient situations associated with all accident responses other than the MSLB. In such accident conditions, the operator verifies that flow exists to the steam generators (AFW system operation) and that the total AFW flow is greater than 340 GPM. If all three steam generators are intact, an operator must be capable of identifying flows as low as 110-115 GPM.

Instead of modifying the AFW flow indication range and reducing the operator's ability to accurately identify the lower flow rates, AFW pump discharge pressure indicators will be added as a Type D variable for verification of AFW pumps operation. Using the pump discharge pressure indication during the time AFW flow is off scale high is acceptable, since knowing the actual flow rate in that situation is not important to ensuring adequate heat removal. This is because operators are procedurally required to take manual actions in all cases to throttle AFW flow.

Using AFW pump discharge pressure indication in conjunction with AFW flow rate indication to ensure system operation is consistent with the position that the measurement of one key variable may not be sufficient to indicate the accomplishment of a given safety function and that multiple variables may be needed. Therefore, AFW pump discharge pressure indication will be added to our RG 1.97 commitment and used in conjunction with AFW flow indication to fulfill the RG 1.97 requirement for AFW flow indication (variable D-21).

If you have any further questions, please contact us.

Very truly yours,

David A. Christian
Vice President - Nuclear Operations

Attachment

Commitments made in this letter:

1. The AFW pump discharge pressure indication will be added to our RG 1.97 commitment and used in conjunction with AFW flow indication to fulfill the RG 1.97 requirement for AFW flow indication (variable D-21).

cc: U.S. Nuclear Regulatory Commission
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Mr. M. J. Morgan
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