VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

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

Serial No. 98-012
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Docket Nos. 50-280/281
50-338/339
License Nos. DPR-32/37
NPF-4/7

Gentlemen:

VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION UNITS 1 AND 2
NORTH ANNA POWER STATION UNITS 1 AND 2
AMSAC INTERLOCK PERMISSIVE (C-20) SETPOINT CLARIFICATION

By letters dated July 31 and September 30, 1987, Virginia Electric and Power Company submitted detailed design descriptions of the ATWS mitigating systems proposed for installation in Surry and North Anna. The submittals were in accordance with 10 CFR 50.62 and consistent with the Westinghouse Owners Group conceptual ATWS mitigating system actuation circuitry (AMSAC) design. The NRC reviewed the designs and found them to be acceptable in a Safety Evaluation Report (SER) issued on May 26, 1988. However, the basis for the interlock permissive (C-20) setpoint established by the generic Westinghouse design and referenced in the NRC SER may be subject to interpretation resulting in a licensing compliance concern. Therefore, the attachment to this letter clarifies our licensing commitment for Surry and North Anna Power Stations by more explicitly identifying how the functional basis of limiting RCS voiding during an ATWS is ensured by the existing AMSAC interlock permissive (C-20) setpoint.

If you have any further questions regarding this clarification of commitment, please contact us.

Very truly yours,

James P. O'Hanlon

James P. O'Hanlon
Senior Vice President - Nuclear

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Attachment 000006

There are no commitments in this letter.

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cc: U.S. Nuclear Regulatory Commission
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Mr. R. A. Musser
NRC Senior Resident Inspector
Surry Power Station

Mr. M. J. Morgan
NRC Senior Resident Inspector
North Anna Power Station

Attachment 1

AMSAC Arming Setpoint Basis for Surry and North Anna Power Stations

The ATWS rule (10 CFR 50.62) requires specific improvements in the design and operation of commercial nuclear power facilities to reduce the probability of failure to shut down the reactor following anticipated transients and to mitigate the consequences of an ATWS event. Paragraph (c)(1) of 10 CFR 50.62 specifies the basic ATWS mitigation system requirements for Westinghouse PWRs. The ATWS rule requires equipment, diverse from the Reactor Protection System, to initiate the auxiliary feedwater (AFW) system and a turbine trip for ATWS events. In response to Paragraph (c)(1), the Westinghouse Owners Group developed a set of conceptual ATWS Mitigating System Actuation Circuitry (AMSAC) designs generic to Westinghouse plants. These conceptual designs are described in WCAP-10858, Rev. 1 -P-A.

By letters dated July 31 and September 30, 1987, Virginia Electric and Power Company (Virginia Power) submitted detailed design descriptions of the ATWS mitigating systems proposed for installation in Surry and North Anna consistent with the generic Westinghouse design. The NRC reviewed the Surry and North Anna designs and found them to be acceptable as documented in a May 26, 1988 Safety Evaluation Report (SER) which references 40% reactor power as the AMSAC interlock permissive setpoint.

The AMSAC generic design specified in WCAP-10858, Rev. 1 -P-A called for AMSAC to be enabled when first stage turbine impulse pressure was at or exceeded 40% (nominal) turbine load. This generic setpoint applies to all Westinghouse PWRs and is based on representative ATWS analyses which show that below 40% reactor power an ATWS event without AMSAC produced only limited reactor coolant system (RCS) voiding. In some of the WCAP-10858, Rev. I -P-A discussions, turbine load and reactor power are used interchangeably.

However, turbine load, as represented by impulse pressure, and reactor power are not linearly related. In reality, the two values tend to diverge as power and load are reduced (i.e., turbine load indicates lower than reactor power). The Virginia Power AMSAC design specified a nominal permissive (C-20) setpoint based on the generic setpoint of 40% turbine load minus an allowance for channel inaccuracies in the turbine impulse pressure channels themselves. The setpoint development did not specifically address the nonlinearity between turbine impulse pressure and reactor power.

As discussed in WCAP-10858, Rev. 1-P-A and supporting documents, it has been shown generically that below 70% Rated Thermal Power (RTP) AMSAC is not required to maintain the peak RCS pressure below the 3200 psig faulted stress limit for an ATWS. Westinghouse further stated that below 40% reactor power, an ATWS with no AMSAC would limit RCS voiding in the first 10 minutes to values less than obtained for the full power case with AMSAC.

For reactor power levels between 40% and 70%, voiding is not predicted to occur until well after the peak RCS pressure is reached. Westinghouse has performed additional studies on the loss of feedwater ATWS and concluded that for a C-20 setpoint corresponding to 50% RTP, the voiding that would occur without AMSAC was still less than that expected for the full power case with AMSAC. Engineering has reviewed the recent Westinghouse information and confirmed the applicability of the analysis for both Surry and North Anna.

The intention of the original design was to enable AMSAC protection at 40% turbine load (not reactor power) with a design allowance for measurement channel variations on turbine load. Therefore, Virginia Power is clarifying the licensing commitment on ATWS/AMSAC for the permissive interlock C-20 setpoint at Surry and North Anna Power Stations as follows: Consistent with the original AMSAC design, the C-20 setpoint will be enabled for turbine loads at or exceeding 40% nominal turbine load to ensure the design function of minimizing RCS voiding during an ATWS. Forty percent (40%) nominal turbine load correlates only approximately with 40% nominal RTP, but is well below 50% reactor power which is considered bounding for the purpose of ensuring minimal RCS voiding during an ATWS.