VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

November 20, 2006

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

Serial No. 06-387B
NLOS/GDM R1
Docket Nos. 50-280/281
License Nos. DPR-32/37

VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION UNITS 1 AND 2
PROPOSED TECHNICAL SPECIFICATIONS CHANGE
REVISION OF MAIN CONTROL ROOM AND EMERGENCY SWITCHGEAR ROOM AIR CONDITIONING SYSTEM REQUIREMENTS
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

By letter dated July 5, 2006 (Serial No. 06-387), Virginia Electric and Power Company (Dominion) requested amendments to Facility Operating License Numbers DPR-32 and DPR-37 for Surry Power Station Units 1 and 2. The proposed change will revise the Main Control Room (MCR) and Emergency Switchgear Room (ESGR) Air Conditioning System (ACS) Technical Specifications (TS) to reflect the completion of permanent modifications to the equipment and associated power supply configuration.

By letter dated September 21, 2006 (Serial No. 06-387A), Dominion responded to a staff request for additional information pertaining to the electrical loading associated with the MCR and ESGR ACS modifications reflected in the TS change request. On October 16, 2006, the Surry NRC Project Manager submitted three follow-up questions associated with the MCR/ESGR ACS electrical information that we provided in our earlier response. Dominion's response to the three additional questions is provided in the attachment.

The additional information provided herein does not affect the significant hazards consideration determination or the environmental assessment that were previously provided in support of the proposed TS change request.

If you have any questions or require additional information, please contact Mr. Gary D. Miller at (804) 273-2771.

Very truly yours,

Gerald T. Bischof
Vice President – Nuclear Engineering

Commitments made in this letter: None

Attachment: Response to Request for Additional Information - Impact of MCR and ESGR ACS Modifications on the Electrical Distribution System

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COMMONWEALTH OF VIRGINIA)
)
COUNTY OF HENRICO)

The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by Gerald T. Bischof, who is Vice President – Nuclear Engineering, of Virginia Electric and Power Company. He has affirmed before me that he is duly authorized to execute and file the foregoing document in behalf of that Company, and that the statements in the document are true to the best of his knowledge and belief.

Acknowledged before me this 20TH day of November, 2006.

My Commission Expires: May 31, 2010.

Vicki L. Hull
Notary Public

(SEAL)

Attachment

Proposed Technical Specifications Change
Revision of Main Control Room and Emergency Switchgear Room Air Conditioning System Requirements

Response to Request for Additional Information
Impact of MCR and ESGR ACS Modifications on the Electrical Distribution System

Virginia Electric and Power Company
(Dominion)
Surry Power Station Units 1 and 2

Response to Request for Additional Information
Impact of the MCR and ESGR ACS Modifications
on the Electrical Distribution System

On October 16, 2006, the Surry NRC Project Manager provided three follow-up questions associated with the MCR/ESGR ACS electrical information that Dominion previously provided in a letter dated September 21, 2006 (Serial No. 06-387A). The three NRC questions and Dominion's responses are provided below.

NRC Question 1

The licensee indicated that actual test data was used to determine worst case loading for the equipment. Based on the information provided by the licensee, we find that actual test data is less than the nameplate data. How did you determine that the test data is the worst case value? Provide justification that the test data will not change in the future.

Dominion Response

The power required by an operating chiller includes the power needed for the compressor motor(s), the service water (SW) pump motor, and the chilled water pump motor. The chilled water system for the Control Room Envelope (CRE) is a closed-loop, constant flow system. Similarly, for a given alignment (e.g., single-chiller operation), the SW pump power does not vary significantly with space heat load. The major heat load-related power change is that of the compressor. The actual test data used to determine worst case electrical loading was taken during single chiller tests conducted during conservative ambient and SW conditions (i.e., late summer). As discussed in the response to the initial NRC request for additional information, the D and E chillers were operating essentially at nameplate rating during the tests. The A, B, and C chillers were operating below nameplate rating. During the tests, the temperature of the chilled water leaving the A, B, and C chillers was several degrees above the chilled water setpoint, indicating that the maximum available chiller refrigeration capacity had been reached. Regardless of which component of the chiller (compressor, evaporator, or condenser) was limiting, the A, B, and C compressors were essentially operating at the maximum level allowed by the chiller and chilled water system. Any further increase in space heat load would result in higher space temperatures, but would not increase the compressor power requirements.

NRC Question 2

The licensee stated that EDG load calculations were updated with test data and stated that loading values are conservative. The staff does not understand how the EDG loading is conservative when less conservative test data is used. Provide the worst case (assuming chillers D and E are operating) EDG loading (KW & KVA) with a single

chiller and more than one chiller operating. Provide EDG continuous rating (KW & KVA) also. Explain why the nameplate data is not used.

Dominion Response

The D and E chillers cannot be operated simultaneously because of hydraulic limitations (chilled water flow due to pipe size). By procedure, only one chiller can be aligned to an emergency bus at a time. Also, two chillers can not be operated on one chilled water loop simultaneously. Therefore, no more than two chillers will be operated simultaneously, and there will never be more than one chiller loaded on an emergency diesel generator (EDG) at any given time. The chiller heat loading, and thus electrical requirement, is based on the CRE heat load. Testing demonstrated that when a single chiller is providing all of the heat removal, the chiller electrical power requirement is higher than when two chillers are operating. Testing also proved that when two chillers are operating, they share the heat removal and electrical loading is reduced on both running chillers. The following was the data obtained during testing:

B chiller (Single Chiller Operating) = 150.10 Amps at 460 Volts = 119.59 KVA and 105.24KW

B chiller (Two Chillers Operating) = 141.74 Amps at 460 Volts = 112.93 KVA and 99.38KW

The Surry EDGs have a cumulative 2000 hours/year rating of 2750 KW and 3440 KVA. The Surry Power Station Technical Specifications do not permit the station EDGs to exceed the 2000 hours/year rating. Current loading margin with a single chiller operating on an EDG is as follows: emergency bus 1H = 73.13 KW; emergency bus 1J = 197.75 KW; emergency bus 2H = 170.10 KW; and emergency bus 2J = 88.76 KW. Due to the power supply arrangement, the D and E chillers can only be powered by the 1H and 2J emergency buses; therefore, they are already accounted for in the EDG loading calculation for the 1H and 2J emergency buses. The D and E chiller testing demonstrates that the electrical loading is essentially nameplate loading; thus, there would be no effect on the 1H and 2J buses. The 1J and the 2H emergency buses can only power the A, B, and C chillers. The response to Question 1 documents that the recorded test values are the maximum possible load and are therefore conservative. If the chiller nameplate data were to be used, there would be a 6.94 KW increase in EDG loading on the 1J and the 2H emergency buses, which have adequate margin to accommodate the increased load. However, this increase would not be representative of actual conditions and adequate conservatism already exists in the EDG loading calculations.

NRC Question 3

The licensee stated that currently only two chillers are operating under normal conditions on any two emergency buses and the results of the voltage calculation were acceptable. Provide actual voltage values for starting/running conditions.

Dominion Response

The chillers do not have automatic start features in response to a design basis accident (DBA). Current station procedures allow one or two chillers to be operated, depending on space heat load and ambient conditions. During the initial load block in response to a DBA, the chillers that are running will continue to run because power is not interrupted to the emergency buses powered from the offsite source of power. The Surry Offsite Voltage Profiles assume that there is a chiller operating on each of the four emergency buses for each accident scenario. This is a conservative assumption due to the voltage drop on the emergency buses from the accident loads starting on the affected unit and represents the worst case voltages on the affected unit's motor control centers (MCCs). The worst case actual voltage that is seen during the initial load block of the accident (on offsite power) is 420.60 Volts and occurs on the 2K1 MCC, which powers the B chiller. The emergency bus powers the 2K1 MCC. The required running voltage for the B chiller is 460 Volts x 90% + the Running Voltage Drop for the B chiller (1.77 Volts) = 415.77 Volts. A review of the Voltage Profile Calculation shows that the 2K1 MCC voltage for the B chiller only drops to 420.60 Volts for a short duration and then recovers to 476.80 Volts steady state and is therefore acceptable for continued operation. The B chiller represents the worst case voltage drop condition and is therefore bounding for the remaining chillers.