VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

March 5, 2002

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

Serial No. 02-118
NLOS/GDM R3
Docket Nos. 50-280, 281
License Nos. DPR-32, 37

Gentlemen:

VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION UNITS 1 AND 2
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
PORV BACKUP AIR SUPPLY OPERABILITY/SURVEILLANCE REQUIREMENTS
PROPOSED TECHNICAL SPECIFICATION CHANGES

In a letter dated May 31, 2001 (Serial No. 01-299), Virginia Electric and Power Company (Dominion) submitted a license amendment request addressing operability and surveillance requirements for the pressurizer power operated relief valve (PORV) backup air supply. A subsequent submittal dated October 17, 2001 (01-299A) was provided in response to an NRC request for additional information. An additional set of NRC questions were received in a telephone conversation with Dr. Gordon Edison, NRC Project Manager for Surry Power Station, on November 7, 2001 and discussed with the reviewer during a conference call held on November 19, 2001. At the conclusion of the conference call, the NRC reviewer requested a written response to one question. Subsequently, additional questions were received from the NRC on February 11, 2002 and discussed with the NRC reviewer during a February 20, 2002 conference call. At the conclusion of the conference call, Dominion agreed to provide additional information to facilitate the NRC's review of the license amendment request. Our response to the NRC's request for additional information is provided in the attachment.

Should you have further questions or require additional information, please contact us.

Very truly yours,

Eugene S. Grecheck
Vice President – Nuclear Support Services

Attachment

A001

Commitments made in this letter: None.

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

Commissioner
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Richmond, VA 23218

SN: 02-118
Docket Nos.: 50-280/281
Subject: Proposed TS Change RAI
PORV Backup Air Supply Op. Surv. Rqmts

COMMONWEALTH OF VIRGINIA)
)
COUNTY OF HENRICO)

The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by Eugene S. Grecheck, who is Vice President - Nuclear Support Services, 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 5th day of March, 2002.

My Commission Expires: March 31, 2004.

Maggie McClure
Notary Public

(SEAL)

RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION PRESSURIZER PORVS BACKUP AIR SUPPLY OPERABILITY AND SURVEILLANCE REQUIREMENTS

1) *External events such as seismic, winds, fire, and floods need to be considered either quantitatively or qualitatively for the risk-informed TS amendment. It appears that external events risk contribution has been considered qualitatively for this proposed TS amendment, and it was indicated to have negligible impact on the risk measures. The basis for this conclusion should be provided for review.*

External events were qualitatively evaluated. Their contribution to the proposed Technical Specifications change was based upon the following considerations:

- The pressurizer power-operated relief valves (PORVs) are minor contributors to plant risk due to internal events.
- The Containment Instrument Air System is a support system for a minor risk contributor.
- The backup bottled air supply is less of a risk contributor than the Containment Instrument Air system. Each PORV has its own train of bottled air located in containment, a Class I seismic structure.
- The proposed TS change will not significantly impact the availability of the bottled air system, which is less than a minor risk contributor.
- A quantitative external events risk analysis would yield results comparable to the internal events analysis because any external events that would make both the Containment Instrument Air and the Turbine Building Instrument Air Systems unavailable are very low in frequency. Furthermore, critical system components and designated containment isolation features of the instrument air subsystems are designed to Seismic Class I criteria.
- The Turbine Building Fire Protection System includes a complete coverage sprinkler system below the operating deck.
- Fires were evaluated as part of the Individual Plant Examination of External Events (IPEEE). The significant areas are the Emergency Switchgear Room, the Cable Vault and Tunnel, and a small section of the Auxiliary Building. PORV failures as a result of a fire were not identified as a significant contributor to core damage frequency.
- The locations of the instrument air compressors, the service air compressors, and the bottled-air supply to the PORVs provide adequate spatial separation to limit the impact of external events.

2a) *The Surry PSA model appears to credit the Turbine Building Instrument Air system as a backup to the Containment Instrument Air system. What is the basis for crediting the Turbine Building Instrument Air system as a backup to the Containment Instrument Air system?*

The Surry model explicitly credits the Turbine Building Instrument Air System as a backup to the Containment Instrument Air System. The Turbine Building Instrument Air system is directly tied to the Containment Instrument Air System by normally isolated

headers. If required, Station Abnormal Procedures direct opening of the isolation valves. The human error probability associated with this manual action is modeled as well.

2b) What actions are required to make a cross-tie from the Turbine Building Instrument Air system to the Containment Instrument Air system if needed?

Local manual operator action is required to open two manual gate valves. These two manual gate valves are mounted in series at the containment piping penetration area of the Auxiliary Building and are opened under administrative control to cross-tie the Turbine Building Instrument Air System to the Containment Instrument Air System. Each unit's Turbine Building Instrument Air System can supply either unit's Containment Instrument Air System in this manner. This action is directed by station procedures.

- Unit 1 Turbine Building Instrument Air System valves 1-IA-446 and 1-IA-447 can be manually opened to supply the Unit 1 Containment Instrument Air System.
- Unit 1 Turbine Building Instrument Air System valves 1-IA-703 and 1-IA-704 can be manually opened to supply the Unit 2 Containment Instrument Air System.
- Unit 2 Turbine Building Instrument Air System valves 2-IA-703 and 2-IA-704 can be manually opened to supply the Unit 2 Containment Instrument Air System.
- Unit 2 Turbine Building Instrument Air System valves 2-IA-446 and 2-IA-447 can be manually opened to supply the Unit 1 Containment Instrument Air System.

3) Discuss how the Turbine Building and the Containment Instrument Air system unavailabilities provided in the October 17, 2001 response to a request for additional information were estimated.

The Turbine Building and the Containment Instrument Air Systems' unavailabilities were obtained by solving the PRA model at the top gates for these respective systems. Failure probabilities for selected components from these subsystems are provided in Table 1 below.

4) Does the loss of Containment Instrument Air impact the reliability of systems required to perform both the feed and bleed functions? Would these functions be recoverable if the Turbine Building Instrument Air system were cross-connected?

A loss of the Containment Instrument Air System does not impact the reliability of systems required to perform the feed and bleed functions. The Safety Injection System provides the feed function. There are no air-operated components in the Safety Injection System that are relied upon to provide that function. The air-operated

pressurizer PORVs provide the bleed function. These valves are provided with motive force from the following air sources on a loss of Containment Instrument Air:

- Redundant safety-related backup air bottles connected directly to the Pressurizer PORVs,
- Service air compressors powered from station service busses provide air to the Turbine Building Instrument Air System,
- In the event normal station service and/or off-site electrical power is not available, instrument air compressors powered from on-site emergency power sources can provide air to the Turbine Building Instrument Air System, and
- In the event off-site power is not available and on-site emergency power is not available, a manual start diesel driven air compressor can be aligned to either or both Turbine Building Instrument Air Systems.

These backup air systems have adequate capacity to provide for their normal system loads, as well as providing the motive force to the PORVs. Their system capacities are summarized below:

Component	Capacity
Service Air Compressors (2)	757 cfm/each
Containment Instrument Air Compressors (2)	26.5 cfm/each
Turbine Building Instrument Air Compressors (2)	373 cfm/each
Diesel-Driven Air Compressor (1)	750 cfm

The normal station instrument air load as observed on local indication is approximately 160 scfm/unit. In addition, the redundant PORV backup air bottles maintain sufficient capacity with each bottle capable of approximately 115 cycles of a PORV should other sources of compressed air be unavailable. Furthermore, the Turbine Building Instrument Air System pressure is approximately 100 – 110 psig, and the minimum air pressure required to fully stroke the PORVs is 85 psig. Procedural controls are in place and provide guidance and direction regarding the use of these air systems.

Therefore, as demonstrated by the above information, the backup air systems available for operation of the pressurizer PORVs have sufficient margin to ensure that the feed and bleed function can be performed if required by station conditions.

5) How does loss of instrument air impact the auxiliary feedwater system reliability?

The Auxiliary Feedwater System does not depend on instrument air to provide its design functions; hence auxiliary feedwater reliability is not affected by a loss of instrument air. The redundant motor driven auxiliary feedwater pumps which flow through redundant motor operated valves are powered from on-site emergency electrical power, and no instrument air is required for the auxiliary feedwater system to feed the steam generators. There are steam admission valves in the Main Steam System which provide motive force (steam) to the turbine driven auxiliary feedwater

pump. These steam admission valves are provided with backup nitrogen bottles that supply the motive force to control the steam admission valves in the event of a loss of instrument air.

6) *In the event of loss of instrument air, are air-operated valves or dampers which support room cooling or ventilation of safety-related equipment designed and installed to fail in a position to maintain room cooling or ventilation?*

On a loss of instrument air, air operated valves and dampers fail to their safe position providing room cooling or ventilation of safety-related equipment as designed and installed. Procedural controls are in place to verify proper alignment of air-operated valves and dampers if a loss of instrument air occurs.

7) *What are the success criteria of the PORVs in the Surry PSA model?*

One of two PORVs is required for feed and bleed (GFB1112) and to depressurize the Reactor Coolant System (RCS) (GOD1712). Two of two PORVs are required for an anticipated transient without scram (ATWS) (GFB3212).

		TABLE 1	
Mark Number	S0A Basic Event	Point Estimate	Noun Name
1-IA-SP-4A	1IAACU-LF-IASP4A	3.42E-05	IA COMPRESSOR 4A MOISTURE SEPARATOR
1-IA-SP-4B	1IAACU-LF-IASP4B	3.42E-05	IA COMPRESSOR 4B MOISTURE SEPARATOR
1-IA-AOV-103	1IAAOV-FC-AOV103	1.81E-02	CTMT 1A COMPR OUTSIDE SUCT
1-IA-TV-126	1IAAOV-FC-TV126	1.81E-02	DRYER BYP TRIP VALVE
1-IA-TV-125	1IAAOV-FO-TV125	1.81E-02	DRYER INLET TRIP VALVE
1-IA-TV-100	1IAAOV-SC-1TV100	1.21E-05	CTMT IA COMPR DISCH TV
1-IA-TV-101A	1IAAOV-SC-TV101A	1.21E-05	CTMT IA COMPRESSORS SUCT HDR INSIDE CTMT TV
1-IA-TV-101B	1IAAOV-SC-TV101B	1.21E-05	CTMT IA COMPR CTMT SUCT OTSD TRIP T
1-IA-938	1IACKV-C2-938983	3.17E-05	PLANT IA HDR TO CTMT CHK VALVE
1-IA-2	1IACKV-FC-1IA2	6.34E-04	1-IA-TK-1 INLET CHK VALVE
1-IA-938	1IACKV-FC-1IA938	6.34E-04	PLANT IA HDR TO CTMT CHK VALVE
1-IA-948	1IACKV-FC-1IA948	6.34E-04	IA N2 SUP HDR CHK VALVE
1-IA-949	1IACKV-FC-1IA949	6.34E-04	PRZR PORV B BOTTLE HDR CHK VALVE
1-IA-953	1IACKV-FC-1IA953	6.34E-04	PRZR PORV A BOTTLE HDR CHK VALVE
1-IA-980	1IACKV-FC-1IA981	6.34E-04	CTMT IA SUCT HDR CHK VALVE
1-IA-983	1IACKV-FC-1IA983	6.34E-04	CTMT 1A SUP HDR CHK VALVE
1-IA-C-1	1IACMP-CR-1IAC1	6.08E-04	UNIT 1 INSTRUMENT AIR COMPRESSOR
1-IA-C-1	1IACMP-CS-12IAC1	9.32E-05	UNIT 1 INSTRUMENT AIR COMPRESSOR
1-IA-C-1	1IACMP-FR-1IAC1	1.29E-02	UNIT 1 INSTRUMENT AIR COMPRESSOR
1-IA-C-4A	1IACMP-FR-1IAC4A	1.29E-02	CTMT INST AIR COMPR
1-IA-C-4B	1IACMP-FR-1IAC4B	1.29E-02	CTMT INST AIR COMPR
1-IA-C-1	1IACMP-FS-1IAC1	1.98E-03	UNIT 1 INSTRUMENT AIR COMPRESSOR
1-IA-C-4A	1IACMP-FS-1IAC4A	1.98E-03	CTMT INST AIR COMPR
1-IA-C-4B	1IACMP-FS-1IAC4B	1.98E-03	CTMT INST AIR COMPR
1-IA-C-1	1IACMP-TM-1IAC1	1.00E-06	UNIT 1 INSTRUMENT AIR COMPRESSOR
1-IA-C-4A	1IACMP-TM-1IAC4A	1.00E-06	CTMT INST AIR COMPR
1-IA-C-4B	1IACMP-TM-1IAC4B	1.00E-06	CTMT INST AIR COMPR
1-IA-COND-POLISH	1IA-CONDPOLISH	1.00E+00	CONDENSATE POLISHING AIR COMPRESSOR XTIE
1-IA-D-1	1IACON-FR-1IAD1	5.66E-04	AIR DRYER
1-IA-D-4A	1IACON-FR-1IAD4A	5.66E-04	CTMT IA AIR DRYER 4A
1-IA-D-4B	1IACON-FR-1IAD4B	5.66E-04	CTMT IA AIR DRYER 4B
1-IA-FL-1A	1IAFLT-PG-IAFL2A	9.53E-03	FILTER,AIR (CONTAINMENT IA COMPRESSOR INLET)
1-IA-FL-2B	1IAFLT-PG-IAFL2B	9.53E-03	FILTER,AIR (CONTAINMENT IA COMPRESSOR INLET)
1-IA-E-4A	1IAHEX-LU-1IAE4A	2.09E-04	IA COMPRESSOR 4A HEAT EXCHANGER
1-IA-E-4B	1IAHEX-LU-1IAE4B	2.09E-04	IA COMPRESSOR 4B HEAT EXCHANGER
1-IA-PS-PSM	1IAHS--LF-1IAPSM	2.66E-05	HAND AIR PRESSURE SWITCH FOR IA COMP
1-IA-446	1IAMV--C4-446447	6.25E-06	UNIT 1 CTMT IA SUP HDR PEN ISOL
1-IA-44	1IAMV--FC-1IA44	1.25E-04	TURB BLDG IA CROSSTIE VLV
1-IA-446	1IAMV--FC-1IA446	1.25E-04	UNIT 1 CTMT IA SUP HDR PEN ISOL
1-IA-447	1IAMV--FC-1IA447	1.25E-04	UNIT 1 CTMT IA SUP HDR PEN ISOL
1-IA-974	1IAMV--FC-1IA974	1.25E-04	IA ISOLATION VALVE
1-IA-476	1IAMV--FC-IA1476	1.25E-04	CC SYS HCV-101B ISOL
1-IA-477	1IAMV--FO-IA1477	1.25E-04	CC SYS HCV-102 ISOL
1-IA-PCV-101	1IAPCV-SC-PCV101	1.21E-05	PRZR PORV BOTTLED AIR BANK A OUTLET PCV
1-IA-PCV-102	1IAPCV-SC-PCV102	1.21E-05	PRZR PORV BOTTLED AIR BANK B OUTLET PCV
1-IA-PS-PSA	1IAPIC-LF-1IAC1	4.63E-03	AUTO AIR PRESSURE SWITCH FOR IA COMP
1-IA-RV-126	1IASV--SO-1RV126	9.33E-05	PRZR PORV B/U AIR PCV 101 OUTLET RELIEF VALVE
1-IA-RV-127	1IASV--SO-1RV127	9.33E-05	PRZR PORV B/U AIR PCV 102 OUTLET RELIEF VALVE
1-IA-RV-101	1IASV--SO-1SV101	9.33E-05	1-IA-TK-1 RELIEF VALVE
1-IA-SV-102	1IASV--SO-1SV102	9.33E-05	CTMT AIR RECEIVER B SAFETY VALVE
1-IA-RV-100	1IASV--SO-RV100	9.33E-05	AIR COMPRESSOR 1 OUTLET HDR RELIEF VALVE
1-IA-RV-101	1IASV--SO-RV101	9.33E-05	1-IA-TK-1 RELIEF VALVE

1-IA-CYL-10/11/12/13	1IATNK-LF-1455C	2.66E-06	BKUP AIR CYL FOR 1-RC-PCV-1455C
1-IA-CYL-14/15/16/17	1IATNK-LF-IA1456	2.66E-06	BKUP AIR CYL FOR 1-RC-PCV-1456
1-IA-PCV-102	1IATNK-LF-PCV102	2.66E-06	PRZR PORV BOTTLED AIR BANK B OUTLET PCV
1-IA-TK-1	1IATNK-LU-1IATK1	2.66E-06	INSTRUMENT AIR RECIEVER
1-IA-TK-2A	1IATNK-LU-IATK2A	2.66E-06	CTMT IA RECEIVER A
1-IA-TK-2B	1IATNK-LU-IATK2B	2.66E-06	CTMT IA RECEIVER B
1-IA-PCV-102	1IATNK-TM-PCV102	1.00E-06	PRZR PORV BOTTLED AIR BANK B OUTLET PCV