VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

February 10, 2017 10CFR50.90

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

Serial No.: 17-015
SPS/LIC-CGL: R1
Docket Nos.: 50-280/281
License Nos.: DPR-32/37

VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION UNITS 1 AND 2
PROPOSED LICENSE AMENDMENT REQUEST
EXTENSION OF TS 3.14 SERVICE WATER FLOW PATH ALLOWED OUTAGE TIME
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

By letter dated May 18, 2016 (Serial No. 16-180), Virginia Electric and Power Company (Dominion) submitted a license amendment request (LAR) to extend the Allowed Outage Time (AOT) in Surry Technical Specification (TS) 3.14 for only one operable Service Water (SW) flow path to the Charging Pump SW (CPSW) subsystem and to the Main Control Room/Emergency Switchgear Room (MCR/ESGR) Air Conditioning (AC) subsystem from 24 to 72 hours.

In a December 12, 2016 e-mail from Ms. Karen Cotton Gross (NRC Project Manager) to Mr. Gary Miller (Dominion Corporate Licensing), the NRC technical staff requested additional information regarding the proposed LAR. Dominion's response to the NRC request for additional information (RAI) is provided in the attachment to this letter.

The information provided in this letter does not affect the conclusions of the no significant hazards consideration or the environmental assessment included in the May 18, 2016 LAR.

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

Respectfully,

Mark D. Sartain
Vice President Nuclear Engineering and Fleet Support

Vicki L. Hull
NOTARY PUBLIC
Commonwealth of Virginia
Reg. # 140542
My Commission Expires May 31, 2018

COMMONWEALTH OF VIRGINIA)
)
COUNTY OF HENRICO)

The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by Mr. Mark D. Sartain, who is Vice President – Nuclear Engineering and Fleet Support, 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 10TH day of FEBRUARY, 2017.

My Commission Expires: MAY 31, 2018.

Vicki L. Hull
Notary Public

A001
NRR

Commitments contained in this letter: None

Attachment: Response to NRC Request for Additional Information – Proposed License Amendment Request - Extension of TS 3.14 Service Water Flow Path Allowed Outage Time

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NRC Senior Resident Inspector
Surry Power Station

Attachment

Response to NRC Request for Additional Information

Proposed License Amendment Request
Extension of TS 3.14 Service Water Flow Path Allowed Outage Time

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

**RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION
SURRY POWER STATION UNITS 1 AND 2**

By letter dated May 18, 2016 (Serial No. 16-180), Virginia Electric and Power Company (Dominion) submitted a license amendment request (LAR) to extend the Allowed Outage Time (AOT) in Surry Technical Specification (TS) 3.14 for only one operable Service Water (SW) flow path to the Charging Pump SW (CPSW) subsystem and to the Main Control Room/Emergency Switchgear Room (MCR/ESGR) Air Conditioning (AC) subsystem from 24 to 72 hours. In a December 12, 2016 e-mail from Ms. Karen Cotton Gross (NRC Project Manager) to Mr. Gary Miller (Dominion Corporate Licensing), the NRC technical staff requested additional information regarding the proposed LAR. The request for additional information and Dominion's response are provided below.

NRC RAI-1:

TS 3.14.7.A.7 requires that two service water flow paths to the main control room and emergency switchgear room (MCR/ESGR) air conditioning subsystems be OPERABLE. With five chillers in the MCR/ESGR Air Conditioning System, TS 3.23.A requires three MCR/ESGR chillers be OPERABLE in certain required combinations (NRC staff computes 6 possible combinations that meet the requirements TS 3.23.A.1.b). Neither the TS basis nor the UFSAR define what constitutes a service water flow path to a MCR/ESGR air conditioning subsystem which meet the requirements of TS 3.14.7.A.7 nor do they explain what constitutes a MCR/ESGR air conditioning subsystem.

A) Define the bounds of a MCR/ESGR air conditioning subsystem specified in TS 3.14.A.7 and describe the relationship between the MCR/ESGR air conditioning subsystems and the MCR/ESGR chillers referenced in TS 3.23.A.

B) Define what constitutes a service water flow path to a MCR/ESGR air conditioning subsystem which meet the requirements of TS 3.14.7.A.7.

Dominion Response to RAI-1 A) and B):

As stated in Surry UFSAR Section 9.9.2, "Service water is supplied to the cooling water subsystem of the control room and relay room air conditioning system chiller condensers and to the charging pump service water subsystem from three separate circulating water lines through three independent flow paths. The three flow paths provide the operating flexibility to remove a flow path from service for cleaning without entering into a Technical Specification limiting condition for operation."

Figures 1 and 2 show the Service Water (SW) supply to the Charging Pump Service Water (CPSW) subsystems located in Mechanical Equipment Room (MER) 3 and MER 4 and to the Main Control Room/Emergency Switchgear Room Air Conditioning (MCR/ESGR AC) subsystems located in MER 3 and MER 5.

The three 8-inch SW flow paths to the MCR/ESGR AC subsystem (referred to in UFSAR Section 9.9.2) are the 1D, 2A, and 2C SW supply headers to valves 1-SW-499, 2-SW-477, 2-SW-476, 2-SW-532, and 2-SW-530. Two of the three 8-inch SW headers (i.e., 1D and 2A, 1D and 2C, or 2A and 2C) are normally in service. The three 8-inch headers supply SW to two 6-inch headers to MER 3 and MER 4 and to two 6-inch lines to MER 5.

The MCR/ESGR AC subsystem is comprised of:

- the 6-inch and 4-inch piping downstream of valves 1-SW-499, 2-SW-477, 2-SW-476, 2-SW-532, and 2-SW-530,
- the rotating strainers (1-VS-S-1A/1B), duplex strainers, and bypass lines,
- the A, B, and C MCR/ESGR chiller pumps (1-VS-P-1A/1B/1C) that supply the condensers of the A, B, and C MCR/ESGR chillers (1-VS-E-4A/4B/4C), which are located in MER-3, and
- the D and E MCR/ESGR chiller pumps (1-VS-P-1D/1E) that supply the condensers of the D and E MCR/ESGR chillers (1-VS-E-4D/4E), which are located in MER-5.

As an enhancement, for future reference and clarity, the TS Bases will be revised to include a discussion of the SW flow paths and the MCR/ESGR AC subsystem.

NRC RAI-2:

TS 3.14.A.7 requires that two service water flow paths to the main control room and emergency switchgear room (MCR/ESGR) air conditioning subsystems be OPERABLE. With five chillers in the MCR/ESGR Air Conditioning System, TS 3.23.A requires three MCR/ESGR chillers be OPERABLE in certain required combinations.

The guidelines of Regulatory Guide 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications," state that when evaluating defense in depth for an AOT extension that system redundancy, independence, and diversity are maintained commensurate with the expected frequency and consequences of challenges to the system.

A. For each allowed combination of 3 OPERABLE chillers (NRC staff computes 6 possible combinations which meet the requirements TS 3.23.A.1.b) and each applicable MCR/ESGR subsystem identify all acceptable combinations of two service water flow paths that meet the requirements of TS 3.14.A.7.

Dominion Response to RAI-2 A):

As can be seen in Figures 1 and 2, the flow paths available to supply SW to the MER 3 chillers are the following:

- 1D SW supply header + rotating strainer 1-VS-S-1A line/bypass
- 2A SW supply header + rotating strainer 1-VS-S-1A line/bypass

- 2C SW supply header + rotating strainer 1-VS-S-1A line/bypass
- 1D SW supply header + rotating strainer 1-VS-S-1B line/bypass
- 2A SW supply header + rotating strainer 1-VS-S-1B line/bypass
- 2C SW supply header + rotating strainer 1-VS-S-1B line/bypass

The flow paths available to supply SW to the MER 5 chillers are the following:

- 2A SW supply header + MER 5 piping/strainer/bypass
- 2C SW supply header + MER 5 piping/strainer/bypass
- In addition, although the 1D SW supply header is not normally aligned to MER 5, it has the capability of being aligned to MER 5 by the cross-connect piping. However, procedures do not currently exist for this alignment due to significant defense in depth for the chillers and the associated flow paths.

As indicated above, there are eight possible flow paths (with capability for a ninth flow path) available to supply the MER 3 and MER 5 chillers. Significant defense in depth exists for the chillers from two aspects: 1) there are five 100% capacity chillers (three located in MER 3 and two located in MER 5), and 2) there are numerous flow paths available to supply SW to the MER 3 and MER 5 chillers.

Consistent with UFSAR Section 9.9.2, if one of the 8-inch SW headers is inoperable, no TS action statement is entered. If two of the 8-inch SW headers are inoperable, TS 3.14.C will be entered. If one of the 6-inch headers to MER 3 is inoperable, a TS 3.23.A.1.c 7-day TS action statement is entered for the MCR/ESGR AC subsystem due to inoperable chiller considerations. If one of the 6-inch lines to MER 5 is inoperable, no TS action statement is entered. If both of the 6-inch lines to MER 5 are inoperable, a TS 3.23.A.1.c 7-day TS action statement is entered for the MCR/ESGR AC subsystem due to inoperable chiller considerations. Significant defense in depth for the chillers and the flow paths to supply SW to the MER 3 and MER 5 chillers is available; however, manual action would be required to restore chiller operability.

B. *While meeting the limiting conditions for operations of TSs 3.14.A.7 do any credited two service water flow paths to any MCR/ESGR subsystem, have any common components or piping. Explain. If so, provide further justification for extending the AOT from 24 hours to 72 hours, specifically addressing redundancy and independence of the two service water flow paths.*

Dominion Response to RAI-2 B):

The three 8-inch SW flow paths to the MCR/ESGR AC subsystem (i.e., the 1D, 2A, and 2C SW supply headers to valves 1-SW-499, 2-SW-477, 2-SW-476, 2-SW-532, and 2-SW-530) have no common components or piping. However, as shown in Figures 1 and 2, there is common 6-inch and 4-inch piping within the MCR/ESGR AC subsystem. Although there is common piping within the MCR/ESGR AC subsystem, the AOT extension from 24 to 72 hours is acceptable based on the significant defense in depth for the chillers and the flow paths to supply SW to the MER 3 and MER 5 chillers. It

should also be noted that the MCR/ESGR AC subsystem and the CPSW subsystem share common components (i.e., the 6-inch headers and the rotating strainer lines/bypasses).

C. *Can any single failure in the identified service water flow paths in B above cause more than one Chiller subsystem to be INOPERABLE? If so, provide further justification for extending the AOT from 24 hours to 72 hours, specifically addressing redundancy and independence.*

Dominion Response to RAI-2 C):

As noted in the response to RAI-1 A) above, significant defense in depth exists for the chillers. No single failure in the flow paths providing SW to the MER 3 and MER 5 chillers (identified in the Response to RAI-2 A above) will result in the inability to satisfy the TS 3.23 requirements for chiller operability.

NRC RAI-3:

TS 3.14.A.5 requires that two service water flow paths to the charging pump service water pump subsystem be OPERABLE. Neither the TS basis nor the UFSAR define what constitutes a service water flow path to the charging pump service water subsystem.

The guidelines of Regulatory Guide 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications," state that when evaluating defense in depth for an AOT extension that system redundancy, independence, and diversity are maintained commensurate with the expected frequency and consequences of challenges to the system.

A. *Identify all acceptable combinations of two service water flow paths that meet the requirements of TS 3.14.A.5.*

B. *While meeting the limiting conditions for operations of TSs 3.14.A.5, do any credited two service water flow paths to any charging pump service water subsystem, have any common components or piping. Explain. If so, provide further justification for extending the AOT from 24 hours to 72 hours, specifically addressing redundancy and independence of the two service water flow paths.*

Dominion Response to RAI-3 A) and B):

As shown in Figures 1 and 2, the three 8-inch SW flow paths to the CPSW subsystem (referred to in UFSAR Section 9.9.2) are the 1D, 2A, and 2C SW supply headers to valves 1-SW-499, 2-SW-477, and 2-SW-476. The three 8-inch headers supply SW to two 6-inch headers to MER 3 and MER 4.

The CPSW subsystem is comprised of:

- the 6-inch piping downstream of valves 1-SW-499, 2-SW-477, and 2-SW-476 supplying the CPSW pumps 1 / 2-SW-P-10A and 1 / 2-SW-P-10B, which provide cooling to the Charging Pump intermediate seal coolers and to the Charging Pump lubricating oil coolers, and
- the rotating strainers (1-VS-S-1A/1B), duplex strainers, and bypass lines.

As can be seen in Figures 1 and 2, the flow paths available to supply SW to the MER 3 and MER 4 100% capacity CPSW pumps are the following:

- 1D SW supply header + rotating strainer 1-VS-S-1A line/bypass
- 2A SW supply header + rotating strainer 1-VS-S-1A line/bypass
- 2C SW supply header + rotating strainer 1-VS-S-1A line/bypass
- 1D SW supply header + rotating strainer 1-VS-S-1B line/bypass
- 2A SW supply header + rotating strainer 1-VS-S-1B line/bypass
- 2C SW supply header + rotating strainer 1-VS-S-1B line/bypass

The three 8-inch SW flow paths to the CPSW subsystem (i.e., the 1D, 2A, and 2C SW supply headers to valves 1-SW-499, 2-SW-477, and 2-SW-476) have no common components or piping. However, as shown in Figures 1 and 2, there is common 6-inch piping within the CPSW subsystem. As stated in the Response to RAI-2 B), the MCR/ESGR AC subsystem and the CPSW subsystem share common components (i.e., the 6-inch headers and the rotating strainer lines/bypasses).

Although there is common piping within the CPSW subsystem, the AOT extension from 24 to 72 hours is acceptable because no single failure in the flow paths providing SW to the MER 3 and MER 4 CPSW pumps (identified above) will result in the inability to satisfy the TS 3.3.3.A.3 requirements for high head safety injection pump operability. To preclude the loss of suction to all of the CPSW pumps, an MER SW cross-connect valve (1-SW-263) provides a method of automatically separating the MER 3 piping from the MER 4 piping in the event of a pipe failure in either room. Also, as stated in UFSAR Section 9.9.3.2, "The charging pump service water system cannot be disabled totally by a single passive failure. ... the system has been designed with cross-connect piping and sufficient valves so that any single passive failure can be isolated as necessary to allow the system to continue to operate and provide cooling to support operation of at least two charging pumps."

As stated in the Response to RAI-2 A), if one of the 8-inch SW headers is inoperable, no TS action statement is entered. If two of the 8-inch SW headers are inoperable, TS 3.14.C will be entered. If one of the two 6-inch headers to MER 3 or MER 4 is inoperable, TS 3.14.C will be entered for the CPSW subsystem because two of the three 8-inch headers are effectively rendered incapable of providing the required flow (without manual action).

As an enhancement, for future reference and clarity, the TS Bases will be revised to include a discussion of the SW flow paths and the CPSW subsystem.

NRC RAI-4:

A. When in new proposed TS 3.14.C with only one OPERABLE service water flow path to the charging pump service water subsystem or main control and emergency switchgear room, identify the possible failures in the single service water flow paths that could make the flow path inoperable.

B. Describe compensatory actions that would restore OPERABILITY to these flow paths including the time to restore OPERABILITY and the resulting impact upon plant safety.

C. Describe any possible lineups including cross connecting that would reduce the risk of having only one OPERABLE service water flow path to the charging pump service water subsystem.

Dominion Response to RAI-4 A), B), and C):

Possible failures in the flow paths available to supply SW to the MCR/ESGR AC and CPSW subsystems in MER 3, MER 4, and MER 5 (identified in the Response to RAI-2 A) and in the Response to RAI-3 A) and B) above) include obstruction of the rotating strainers (1-VS-S-1A/1B) and pipe leakage/break. In the event of an obstruction of a rotating strainer (1-VS-S-1A/1B), bypassing and cleaning the strainer would be necessary. Strainer cleaning requires less than a shift to complete. In the event of pipe leakage/break, repair of the affected piping would be necessary. Time to effect a pipe repair would be dependent upon the nature of the leak/break.

Surry has an Abnormal Procedure, titled Service Water System Abnormal Conditions, which provides guidance in the event of abnormal conditions associated with the MCR/ESGR AC and CPSW subsystems. Entry conditions into this procedure include loss of SW flow to the MCR/ESGR AC and CPSW subsystems, and probable causes identified in the procedure include an obstructed strainer and leakage.

As stated in the Response to RAI-1 A) and B), two of the three 8-inch SW headers are normally in service. The Abnormal Procedure cited above provides direction to place the third SW header into service. As stated in the Response to RAI-3 A) and B), UFSAR Section 9.9.3.2 states: "The charging pump service water system cannot be disabled totally by a single passive failure. ... the system has been designed with cross-connect piping and sufficient valves so that any single passive failure can be isolated as necessary to allow the system to continue to operate and provide cooling to support operation of at least two charging pumps." The diversity of the flow paths available to supply SW to the MCR/ESGR AC and CPSW subsystems in MER 3, MER 4, and MER 5, along with the availability of the SW header cross-connect, reduces the risk of having only one operable flow path to the MCR/ESGR AC and CPSW subsystems.

NRC Comment:

10 CFR 50.36(c)(2)i states:

> *Limiting conditions for operation are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When a limiting condition for operation of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the technical specifications until the condition can be met.*

10 CFR 50.90 states:

> *Whenever a holder of a license, including a construction permit and operating license under this part, and an early site permit, combined license, and manufacturing license under part 52 of this chapter, desires to amend the license or permit, application for an amendment must be filed with the Commission, as specified in §§ 50.4 or 52.3 of this chapter, as applicable, fully describing the changes desired, and following as far as applicable, the form prescribed for original applications.*

Surry TS 3.14.A.5, 3.14.A.6, and 3.14.A.7 require two OPERABLE service water flow paths to the charging pump service water subsystems, the recirculation spray subsystems and the main control room and emergency switchgear room air conditioning subsystems, respectively.

The current TS requirements contain remedial actions which allow 24 hours of plant operation with only one OPERABLE flow path to the charging pump service water subsystems, recirculation spray subsystems and the main control room and emergency switchgear room and emergency switchgear rooms air conditioning condensers.

Current TS 3.14.C states:

> *The requirements of Specifications 3.14.A.5, 3.14.A.6, and 3.14.A.7 may be modified to allow unit operation with only one OPERABLE flow path to the charging pump service water subsystem, the recirculation spray subsystems, and to the main control and emergency switchgear rooms air conditioning condensers. If the affected systems are not restored to the requirements of Specifications 3.14.A.5, 3.14.A.6, and 3.14.A.7 within 24 hours, the reactor shall be placed in HOT SHUTDOWN. If the requirements of Specifications 3.14.A.5, 3.14.A.6, and 3.14.A.7 are not met within an additional 48 hours, the reactor shall be placed in COLD SHUTDOWN.*

On page 3 of Attachment 1, the proposed change to TS 3.14.C states:

> *The requirements of Specifications 3.14.A.5 and 3.14.A.7 may be modified to allow unit operation with only one OPERABLE flow path to the charging pump service water subsystem and to the main control and emergency switchgear rooms air conditioning condensers. If the affected systems are not restored to the requirements of Specifications 3.14.A.5 and 3.14.A.7 within 72 hours, the reactor shall be placed in HOT SHUTDOWN within the next 6 hours. If the*

requirements of Specifications 3.14.A.5 and 3.14.A.7 are not satisfied as allowed by this Specification, the reactor shall be placed in COLD SHUTDOWN within the next 30 hours.

The proposed new TS 3.14.D states:

The requirements of Specification 3.14.A.6 may be modified to allow unit operation with only one OPERABLE flow path to the recirculation spray subsystems. If the affected system is not restored to the requirements of Specification 3.14.A.6 within 24 hours, the reactor shall be placed in HOT SHUTDOWN within the next 6 hours. If the requirements of Specification 3.14.A.6 are not met within an additional 48 hours, the reactor shall be placed in COLD SHUTDOWN within the next 30 hours.

The Service Water System supports the operability of the Main Control Room and Emergency Switchgear Room Air Conditioning System by providing a heat sink for the Main Control Room and Emergency Switchgear Room chillers. Page 7 of attachment 1 of the LAR provides a limited discussion comparing the TS 3.23.A.1c allowance of 7 days of continued operation with an inoperable chiller to the proposed allowance of continued operation with only one OPERABLE flow path to the main control and emergency switchgear rooms air conditioning condensers. The discussion does not compare the short, 1 hour, allowed continued operational time with two inoperable chillers provided by TS 3.23.A.1d with the proposed allowance of continued operation with only one OPERABLE flow path to the main control and emergency switchgear rooms air conditioning condensers.

NRC RAI-5:

The proposed change appears to increase the number of hours the plant would be allowed to operate with only one operable CPSW or MCR/ESGR AC flow path from 24 hours to 78 hours. The justification for the proposed change and the description of the proposed change only discuss a change from 24 to 72 hours. Please either provide a supplementary justification for the extra six hours of allowed operation not discussed in attachment 1 of the LAR or revise the proposed change to TS 3.14.C.

Dominion Response to RAI-5:

There are a few specifications in the Surry TS where the specification requires the unit be placed in Hot Shutdown (after expiration of the allowed out of service time) or Cold Shutdown, but the specification does not specify the time frame to be in Hot or Cold Shutdown. To place the unit in Hot Shutdown within six hours after expiration of the allowed out of service time and in Cold Shutdown (if required) within the next 30 hours is consistent with the time frames in Standard Technical Specifications.

TS 3.14.C is one of the specifications in the Surry TS where the time frame to be in Hot Shutdown or Cold Shutdown is not specified. TS 3.14.C currently states "... If the affected systems are not restored to the requirements of Specifications 3.14.5, 3.14.6, and 3.14.7 within 24 hours, the reactor shall be placed in HOT SHUTDOWN. If the requirements of Specifications 3.14.5, 3.14.6, and 3.14.7 are not met within an additional 48 hours, the reactor shall be placed in COLD SHUTDOWN." In contrast, TS 3.13.B specifies the time frame to be in Hot and Cold Shutdown and states "... If the system is not restored within 24 hours to the requirements of Specification A-1, A-2, or A-3, an operating reactor shall be placed in HOT SHUTDOWN within the next 6 hours. If the repairs are not completed within an additional 48 hours, the affected reactor shall be placed in COLD SHUTDOWN within the following 30 hours."

The new 3.14.C adds the 6 hour time frame to Hot Shutdown and the 30 hour time frame to Cold Shutdown into the specification with a total time frame of 108 hours. It should be noted that Specification 3.7.8 in NUREG-1431 (Westinghouse (Improved) Standard Specifications), which addresses the Service Water System (SWS), requires restoration of an inoperable SWS train within 72 hours and, if not met, be in Mode 3 (Hot Standby) within 6 hours and be in MODE 5 (Cold Shutdown) within 36 hours, also with a total time frame of 108 hours.

NRC RAI-6:

Likewise, the proposed addition of new TS 3.14.D appears to increase the number of hours the plant would be allowed to operate with only one operable recirculation spray subsystems flow path from 24 hours to 30 hours. The justification for the proposed change and the description of the proposed change does not discuss the extra six hours of allowed operation. Please either provide a supplementary justification for the extra six hours of allowed operation not discussed in attachment 1 of the LAR or revise the proposed addition of new TS 3.14.D

Dominion Response to RAI-6:

Refer to the Response to RAI-5. The new 3.14.D also adds the 6 hour time frame to Hot Shutdown and the 30 hour time frame to Cold Shutdown into the specification.

NRC RAI-7:

Please provide a discussion which compares the short, 1 hour, allowed continued operational time with two inoperable chillers provided by TS 3.23.A.1d with the proposed allowance of continued operation with only one OPERABLE flow path to the main control and emergency switchgear rooms air conditioning condensers. The discussion should describe why the proposed allowance is justified, despite the apparent discrepancy with the requirements of TS 3.23.A.1d. That is, please provide

detail as to how the requirements of TS 3.23 will continue to be met if one service water flow path is inoperable.

Dominion Response to RAI -7:

As noted in this question, TS 3.23.A.1.d requires that if two of the (three required) operable chillers become inoperable or are not powered as required, an inoperable chiller is required to be returned to operable status within 1 hour. The TS change request that included this 1-hour action statement was approved by the NRC by TS Amendments 182/182, which were issued on September 1, 1993. The TS change request that added this 1-hour action statement was associated with the MCR/ESGR AC System Upgrade Program, which included the installation of larger air handling units, installation of the MER 5 chillers, and repowering of the MER 3 chillers. The 1-hour action statement was added to TS 3.23 to eliminate entry into TS 3.0.1 in the event that two of the three required chillers become inoperable. Prior to the implementation of TS Amendments 182/182, TS 3.23 included only an action statement for one of the three required chillers becoming inoperable.

A noted difference between the chillers and the SW supply flow paths is that the chillers require operable chiller pumps to supply the condensers of the chillers, while the SW supply flow paths are gravity-fed. This difference introduces failure modes for the chillers (e.g., mechanical failure of or loss of power to the chiller pumps) that are not relevant to the SW supply flow paths.

Furthermore, as stated in the Response to RAI-2 A), significant defense in depth exists for the chillers as follows: 1) there are five chillers (three located in MER 3 and two located in MER 5), and 2) there are numerous flow paths available to supply SW to the MER 3 and MER 5 chillers. Considering the diversity and redundancy of the chillers and the flow paths to supply SW to the chillers, having only one operable chiller requiring entry into TS 3.23.A.1.d is highly unlikely. In the highly unlikely event that TS 3.23.A.1.d is entered, the specified actions would be taken.

Figure 1 – Simplified drawing of Service Water supplied to the Charging Service Water and MCR Chiller Service Water subsystems in MER 3, MER 4, and MER 5

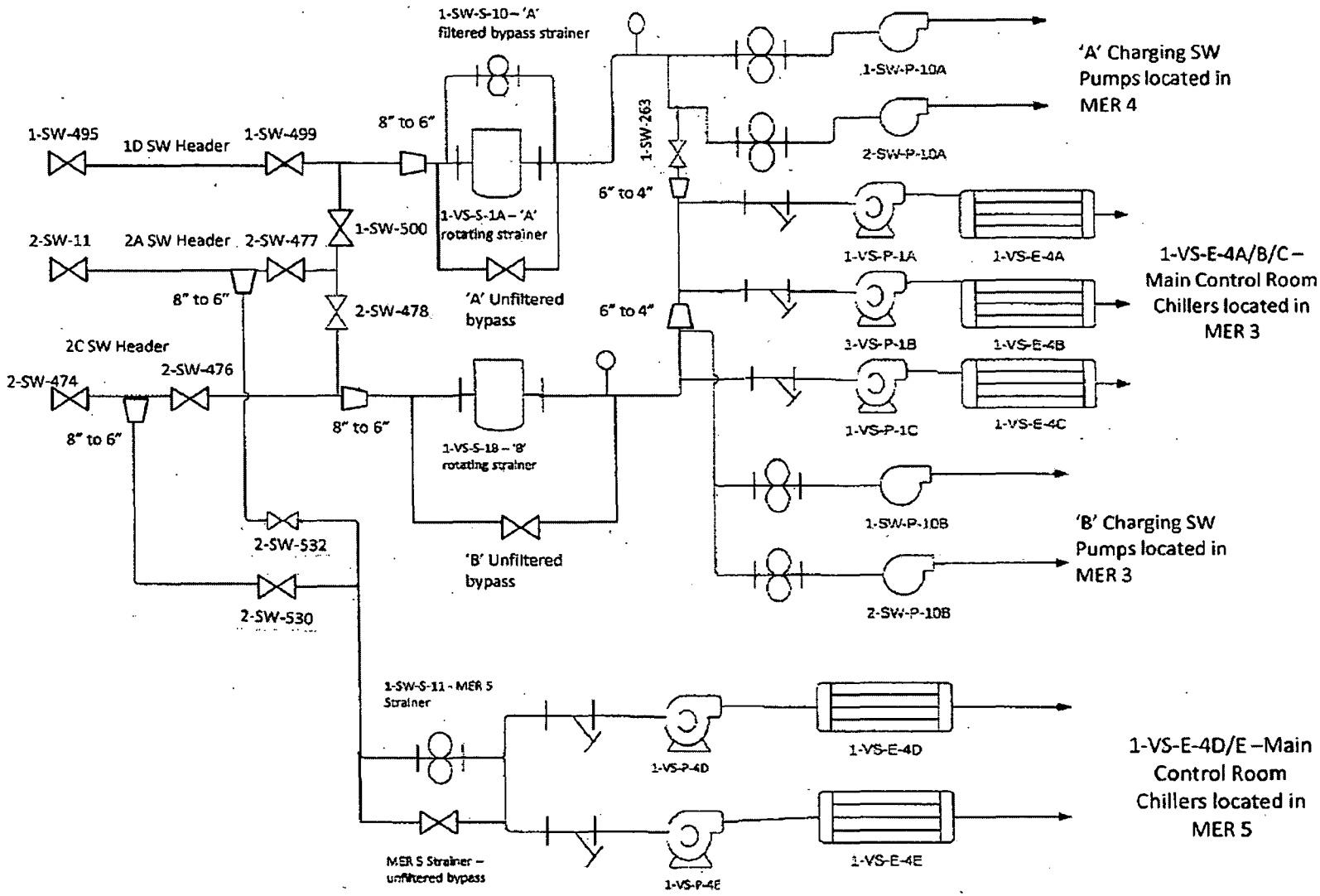

Figure 2 – Service Water Supply to the Charging Pump Service Water System and MCR/ESGR Chillers