



December 19, 2018

10 CFR Part 21

United States Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, D.C. 20555-0001

Serial No.: 18-238  
NRA/GDM: R9  
Docket Nos.: 50-336  
50-338/339  
50-280/281  
License Nos.: DPR-65  
NPF-4/7  
DPR-32/37

**VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION ENERGY VIRGINIA)**  
**DOMINION ENERGY NUCLEAR CONNECTICUT, INC.**  
**MILLSTONE POWER STATION UNIT 2**  
**NORTH ANNA AND SURRY POWER STATIONS UNITS 1 AND 2**  
**UPDATED ANCHOR DARLING DOUBLE DISC GATE VALVE INFORMATION AND**  
**REPAIR STATUS**

- References:
- 1) Letter from Virginia Electric and Power Company and Dominion Nuclear Connecticut, Inc., to the US NRC dated December 18, 2017 (Serial No. 17-343A), for Millstone Power Station Units 2 and 3, North Anna and Surry Power Stations Units 1 and 2, "Anchor Darling Double Disc Gate Valve Information and Status" [ADAMS Accession No. ML17362A043]
  - 2) Letter from Virginia Electric and Power Company and Dominion Nuclear Connecticut, Inc., to the US NRC dated August 31, 2017 (Serial No. 17-343), for Millstone Power Station Units 2 and 3, North Anna and Surry Power Stations Units 1 and 2, "Commitments for Resolution of Anchor Darling Double Disc Gate Valve Part 21 Issues" [ADAMS Accession No. ML17250A157]
  - 3) BWROG Topical Report TP-16-1-112, Revision 4, "Recommendations to Resolve Flowserve 10 CFR Part 21 Notification Affecting Anchor Darling Double Disc Gate Valve Wedge Pin Failure" [ADAMS Accession No. ML17243A137]
  - 4) Part 21 Notification from Flowserve Corporation, "Part 21 – Wedge Pin Failure in Anchor Darling Motor Operated Double Disc Gate Valves with Threaded Stem to Upper Wedge Connections," dated March 1, 2013, as modified July 11, 2017 [ADAMS Accession No. ML17194A825]

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In Reference 1, Virginia Electric and Power Company (Dominion Energy Virginia) and Dominion Energy Nuclear Connecticut, Inc. (DENC), provided a listing of the Anchor Darling double disc gate valve (ADDDGV) population with active safety functions for Millstone Power Station (MPS) Unit 2 and North Anna and Surry Power Stations (NAPS and SPS, respectively) Units 1 and 2 that are subject to the Flowserve Part 21 (Reference 4). Subsequent to the submittal of Reference 1, an additional ADDDGV on each SPS unit was identified as having an active safety function. Specifically, the SPS Units 1 and 2 Charging Pump Discharge Recirculation Isolation Valves, Mark Nos. 1-CH-MOV-1373 and 2-CH-MOV-2373, respectively, were originally classified as passive valves; however, upon further review the valves were subsequently reclassified as having active safety functions. Consequently, the SPS valve information provided in Reference 1 for the ADDDGVs with active safety functions is hereby amended to include the same information for motor-operated valves (MOVs) 1-CH-MOV-1373 and 2-CH-MOV-2373. The additional information is provided in the attachment.

Reference 1 also included relevant information for each valve listed pursuant to the recommendations provided in Reference 3, as well as the valves' repair status. As noted in Reference 1, repair schedules for the listed valves were not included since our review did not identify any susceptible valves, as defined in Reference 3. Nevertheless, since the Flowserve Part 21 was issued, Dominion Energy Virginia and DENC have repaired several valves subject to the Part 21 at NAPS and SPS, and MPS, respectively, to return them to full qualification. Specifically, three of the twelve NAPS Units 1 and 2 MOVs, nine of the twenty-eight SPS Units 1 and 2 MOVs, and four of the six MPS Unit 2 MOVs have been repaired by installing new high strength Inconel pins, and new stems having integral collars that were torqued into the upper wedges of the repaired MOVs. MOVs categorized as "high risk" were prioritized for repair during the recently completed fall 2018 refueling outages at MPS Unit 2 and SPS Unit 2.

For the valves listed in Reference 1, as well as the two additional SPS valves noted above, that have not been repaired, Dominion Energy Virginia and DENC completed performance monitoring as prescribed in Reference 3 including stem rotation checks, diagnostic testing, stroke time reviews, wedge pin analyses, etc., with satisfactory results, thus providing reasonable assurance the valves are fully capable of performing their design functions. Additionally, for the valves that have been repaired and internally inspected, the following observations were noted:

- Existing wedge pins were intact with no evidence of damage caused by overloading,
- Threads of the stem-to-wedge connection threaded joint were in good condition with no evidence of excessive wear,
- Stem to wedge connections were found to be dry (unlubricated).

The condition of the wedge pins and the absence of lubrication on the threaded joints continue to validate stem-to-wedge thread coefficient of friction assumptions made in the susceptibility analysis.

In summary, the valve repairs, inspections, stem rotation checks, and diagnostic test results indicate the ADDDGVs subject to the Part 21 are capable of performing their required safety functions. Dominion Energy Virginia and DENC continue to follow and participate in industry efforts to determine whether any additional actions are required to provide further assurance that plant ADDDGVs subject to the Part 21 will continue to perform their required safety functions.

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  
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Summary of Regulatory Commitments: None

Attachment: Anchor Darling Double Disc Gate Valve Information for 01-CH-MOV-1373  
and 02-CH-MOV-2373

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**Attachment**

**ANCHOR DARLING DOUBLE DISC GATE VALVE INFORMATION**  
**FOR 01-CH-MOV-1373 AND 02-CH-MOV-2373**

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

**Updated Surry Power Station Units 1 and 2 Active Safety Function Anchor Darling Double Disc Gate Valve Listing**

Plant Name	Unit	Valve ID	System	Valve Functional Description	Valve Size (inches)	Active Safety Function  (Open, Close, Both)	Are Multiple Design Basis Post-Accident Strokes Required?  (Yes/No)	Expert Panel Risk Ranking  (High, Medium, Low)	Result of Susceptibility Evaluation  (Susceptible or not Susceptible)	Is the Susceptibility Evaluation in General Conformance with TP16-1-112R4? <sup>(A)</sup>  (Yes/No)	Does the Susceptibility Evaluation Rely on Thread Friction? If Yes, was the COF Greater than 0.10?  (No), (Yes, >0.10), (Yes, ≤0.10)	Was an Initial Stem-Rotation Check Performed? If Yes, include Rotation Criteria  (No), (Yes, ≤5 deg.)	Was the Diagnostic Test Data Reviewed for Failure Precursors Described in TP16-1-112R4?  (Yes/ No)	Valve Repair Status
SPS	1	01-CH-MOV-1373	Charging	Charging Pump Discharge Recirculation Line Isolation	3	Both	No	Low	Not Susceptible	Yes	Yes, >0.10	Yes, ≤5 deg.	Yes	Not repaired
SPS	2	02-CH-MOV-2373	Charging	Charging Pump Discharge Recirculation Line Isolation	3	Both	No	Low	Not Susceptible	Yes	Yes, >0.10	Yes, ≤5 deg.	Yes	Not repaired

(A) Applied Wedge Pin Torque must bound anticipated design basis operating torque requirements and current maximum total torque.