

**VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261**

November 21, 2005

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

Serial No. 05-742
NL&OS/ETS R0
Docket Nos. 50-338/339
License Nos. NPF-4/7

VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA POWER STATION UNITS 1 AND 2
10 CFR 50.9 CORRECTION OF INFORMATION PROVIDED TO SUPPORT
TECHNICAL SPECIFICATION CHANGE FOR
QUENCH SPRAY AND RECIRCULATION SPRAY NOZZLES
SURVEILLANCE FREQUENCY

In a February 26, 2002 letter (Serial No. 02-124), Virginia Electric and Power Company (Dominion) requested amendments, in the form of changes to the Technical Specifications to Facility Operating Licenses Numbers NPF-4 and NPF-7 for North Anna Power Station Units 1 and 2, respectively. The proposed changes revised the surveillance frequency of the Quench Spray and Recirculation Spray System spray header nozzles from a periodic surveillance to a performance-based surveillance. The NRC approved the proposed amendments on October 1, 2002, as amendments 233 and 215 for Units 1 and 2, respectively.

During the review of the proposed changes, the NRC staff requested additional information to complete their review of the proposed amendments. This included information on pre-operational testing performed on the spray headers. Dominion provided the requested information in a July 15, 2002 letter (Serial No. 02-452). During a recent review of the pre-operational testing, which was completed to support ongoing maintenance activities on Unit 2, it was identified that each recirculation spray header was not completely full-flow tested on Unit 2 as identified in the July 15, 2002 response. The attachment to this letter provides the corrected pre-operational test information and details of the recent inspection and testing activities performed by Dominion to ensure the spray headers were free of any significant debris. These inspection activities support the initial conclusion provided in the Dominion amendment request that the recirculation spray headers were free of debris that could have significantly reduced their capability to perform their intended safety function. Mr. D. A. Sommers of Dominion discussed this issue with Mr. K. D. Landis of Region II on October 21, 2005 and Mr. S. R. Monarque of NRR on October 24, 2005.

The results of the inspection activities for the spray system headers are included in the attachment to this letter. If you have any further questions or require additional information, please contact Mr. Thomas Shaub at (804) 273-2763.

Very truly yours,



Leslie N. Hartz
Vice President – Nuclear Engineering

Attachment

Commitments made in this letter: None

cc: U.S. Nuclear Regulatory Commission
Region II
Sam Nunn Atlanta Federal Center
Suite 23T85
61 Forsyth Street, SW
Atlanta, Georgia 30303

Mr. J. T. Reece
NRC Senior Resident Inspector
North Anna Power Station

Commissioner
Bureau of Radiological Health
1500 East Main Street
Suite 240
Richmond, VA 23218

Mr. J. E. Reasor, Jr.
Old Dominion Electric Cooperative
Innsbrook Corporate Center
4201 Dominion Blvd.
Suite 300
Glen Allen, Virginia 23060

Mr. S. R. Monarque
NRC Project Manager
U. S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Mail Stop 8-H12
Rockville, Maryland 20852

10 CFR 50.9 Correction of Information Provided to Support Technical Specification Change for Quench Spray and Recirculation Spray Nozzles Surveillance Frequency

COMMONWEALTH OF VIRGINIA)
)
COUNTY OF HENRICO)

Acknowledged before me this 21st day of November, 2005.

My Commission Expires: August 31, 2008.

Margaret B. Bennett
Notary Public

Attachment

**10 CFR 50.9 Correction of Information Provided to Support
Technical Specification Change for
Quench Spray and Recirculation Spray Nozzles
Surveillance Frequency**

**North Anna Power Station
Units 1 and 2
Virginia Electric and Power Company
(Dominion)**

**10 CFR 50.9 Correction of Information Provided to Support
Technical Specification Change for
Quench Spray and Recirculation Spray Nozzles
Surveillance Frequency**

NRC Question 2 from July 15, 2002 letter:

“Experience at D. C. Cook, Units 1 and 2 (LER 98-027-02) indicates that the typical test for blockage in the containment spray lines and nozzles may not be effective in detecting debris in the spray lines at the amounts reported in this LER.

Please indicate if your testing records show any evidence that the containment spray flow blockage test may have a sensitivity to debris in the lines or nozzles, which cannot be detected by this test. For example, has construction debris or other debris been found in the containment spray system from later inspections, tests or repair work that was not discovered by the containment spray system blockage test required by your technical specifications?”

Dominion July 17, 2002 Response to Question 2:

UFSAR Sections 6.2.2.4.1 and 6.2.2.4.2 describe testing and inspections performed on the Quench Spray (QS) and Recirculation Spray (RS) subsystems. A partial description of the testing performed on each system is provided below.

Following installation of the QS subsystems, temporary drain lines were connected to blind flanges and pipe plugs were placed in the spray nozzle sockets. The QS pumps were started and water was circulated through the spray header supply lines to the spray headers and out the temporary drain connections. This pre-operational testing provided a full system capability test and provided a complete system flush to remove all particulate matter prior to installation of the spray nozzles. At the completion of this testing, the temporary drain lines were removed, blind flanges were replaced, pipe plugs removed, and the spray nozzles were installed. After installation of the nozzles, a nozzle air test was conducted and verified that the spray nozzles remained unobstructed after the full-flow testing. The QS system pre-operational flow and air/smoke tests established that the QS spray headers and spray nozzles were free of debris.

A pre-operational, full-flow system test was performed with water on the RS subsystems. With the spray nozzle sockets plugged, permanently installed spray header drain lines running between the spray nozzle headers and the containment sump were temporarily connected. Water was then added to the containment sump, surrounded by a portable dike so that each RS pump could circulate water up through its respective heat exchanger and spray nozzle headers. The full flow test through the shell side of each RS heat exchanger ensured that the required flow and head for effective spray nozzle operation and system operation was achieved. This testing also

provided a complete system flush to remove all particulate matter prior to installation of the spray nozzles. Upon completion of the system test, water was drained, temporary connections were removed and the spray nozzles were installed. A nozzle air test was conducted and verified that the spray nozzles remained unobstructed after the full-flow testing. The RS system pre-operational flow and air/smoke tests established that the RS spray headers and spray nozzles were free of debris.

Based on this pre-operational testing, it is assumed that construction debris was removed from the QS and RS systems prior to declaring them operable. Subsequent 10-year air/smoke tests performed to date have not identified any nozzle blockage caused by debris in the spray ring headers. These air tests are performed with station service air, which provides air at approximately 100 psig, to verify the nozzles are unobstructed.

Since the original pre-operational testing, the QS and RS spray ring headers have not been opened for maintenance, inspection, or testing. Therefore, we have not identified any additional construction debris in the spray headers during maintenance or testing of the spray system headers and nozzles.

Corrected information:

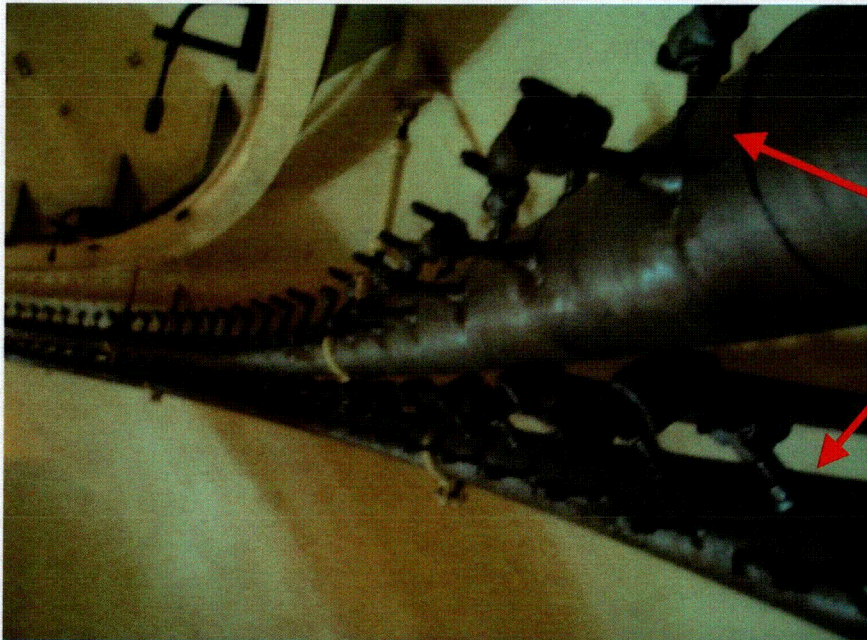
During a recent review of the pre-operational testing completed for the spray systems to support ongoing maintenance activities, it was identified that not each recirculation spray header in Unit 2 was completely full-flow tested as identified in our July 15, 2002 response. Since only one of the two downcomers was aligned on each spray header, only half of each spray header was flowed during pre-operational testing. When this inconsistency was identified, actions were taken to ensure that the spray headers were free of debris that could potentially cause nozzle blockage that would reduce the spray systems' ability to reduce containment pressure and temperature. The inspection activities included:

- ◆ A boroscope inspection of the portions of the Unit 2 RS spray headers that were not full flow tested. This included the spray headers - pipe segment 8"-RS-420-153A-Q2, 8"-RS-421-153A-Q2, 8"-RS-422-153A-Q2, and 8"-RS-423-153A-Q2 (see attached drawings). Experienced engineering, operations, and project management personnel performed the inspections. There was not significant debris identified in the spray array piping. See attached pictures.
- ◆ A portion of the pipe that was inspected was also vacuumed to obtain a sample of the dust observed in the spray headers. The dust would not have affected the operation of the spray arrays.
- ◆ An air flow test of RS spray headers was successfully performed with no indications of any obstructed spray nozzles.
- ◆ Unit 1 RS pre-operational testing was reviewed to re-verify that the entire spray headers were flow tested. They had been completely flow tested.

- ◆ Unit 1 and 2 pre-operational testing of the QS System was reviewed to re-verify that the entire spray headers were flow tested.

None of the original records indicated debris in the containment spray system nor did any of the pre-operational test results indicate any reduced system flow; however, foreign material was discovered on the top of the inlet tube sheets in the recirculation spray heat exchangers (RSHXs) of Units 1 and 2 during last refueling outages in October 2004 and 2005, respectively. The debris found was assessed to be construction related. The foreign material was removed from the shells of all RSHXs to the extent practical due to limited access into and within the RSHXs. Assessments of the "as found" and "as left" condition of the RSHXs was performed for Units 1 and 2. It was determined that the RSHXs remained capable of performing the Design Basis functions of the NAPS Units 1 and 2 Recirculation Spray Systems.

Although a portion of the Unit 2 RS spray headers were not flow tested during pre-operational testing, the RS spray headers were confirmed to be free of significant debris and capable of performing their intended safety function based on the inspection results. The inspection results continue to support the NRC's SER conclusion that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation (revised surveillance frequency of the spray headers) in the proposed manner, and (2) the activities continue to be conducted in accordance with the commission's regulations and the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.



**North Anna Unit 2
Recirc. Spray system
nozzles in the
containment dome**

**Boroscope camera
view of the inside of
the RS piping.**

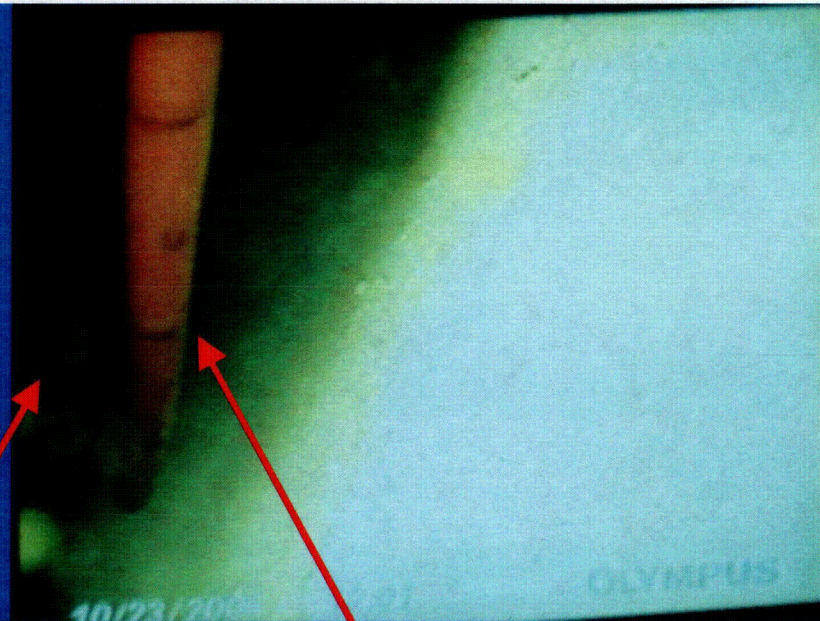
**The majority of the
piping looked like this.**



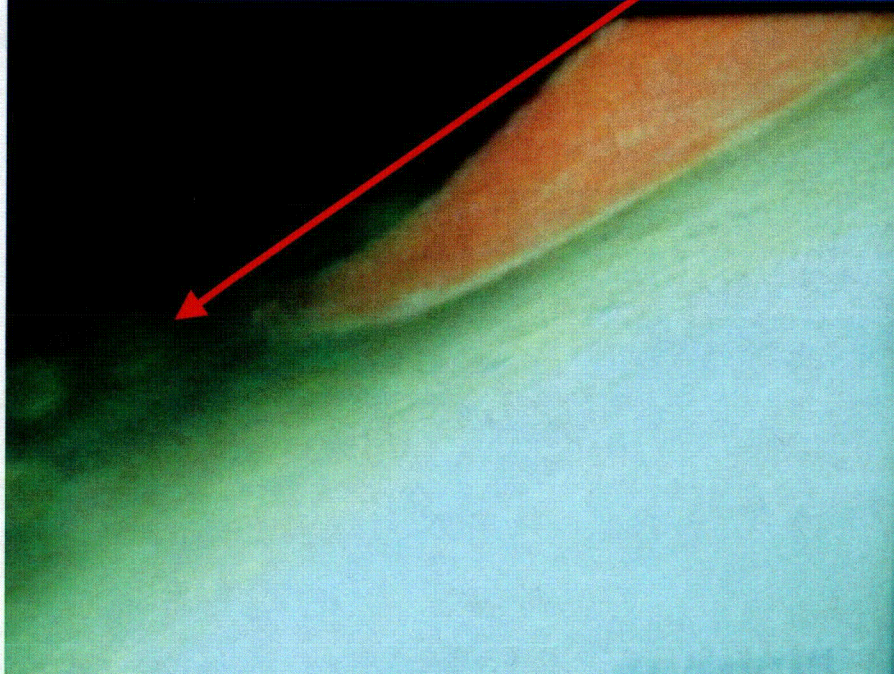
**Dust like material found in
bottom of piping.**

**RED tubing in picture is 1/4
outside diameter test tubing.**

**Also note that movement of the
tubing and boroscope caused
dust to float in the air**



**Note that an inch scale
was drawn on the
outside of the tubing to
provide a reference**

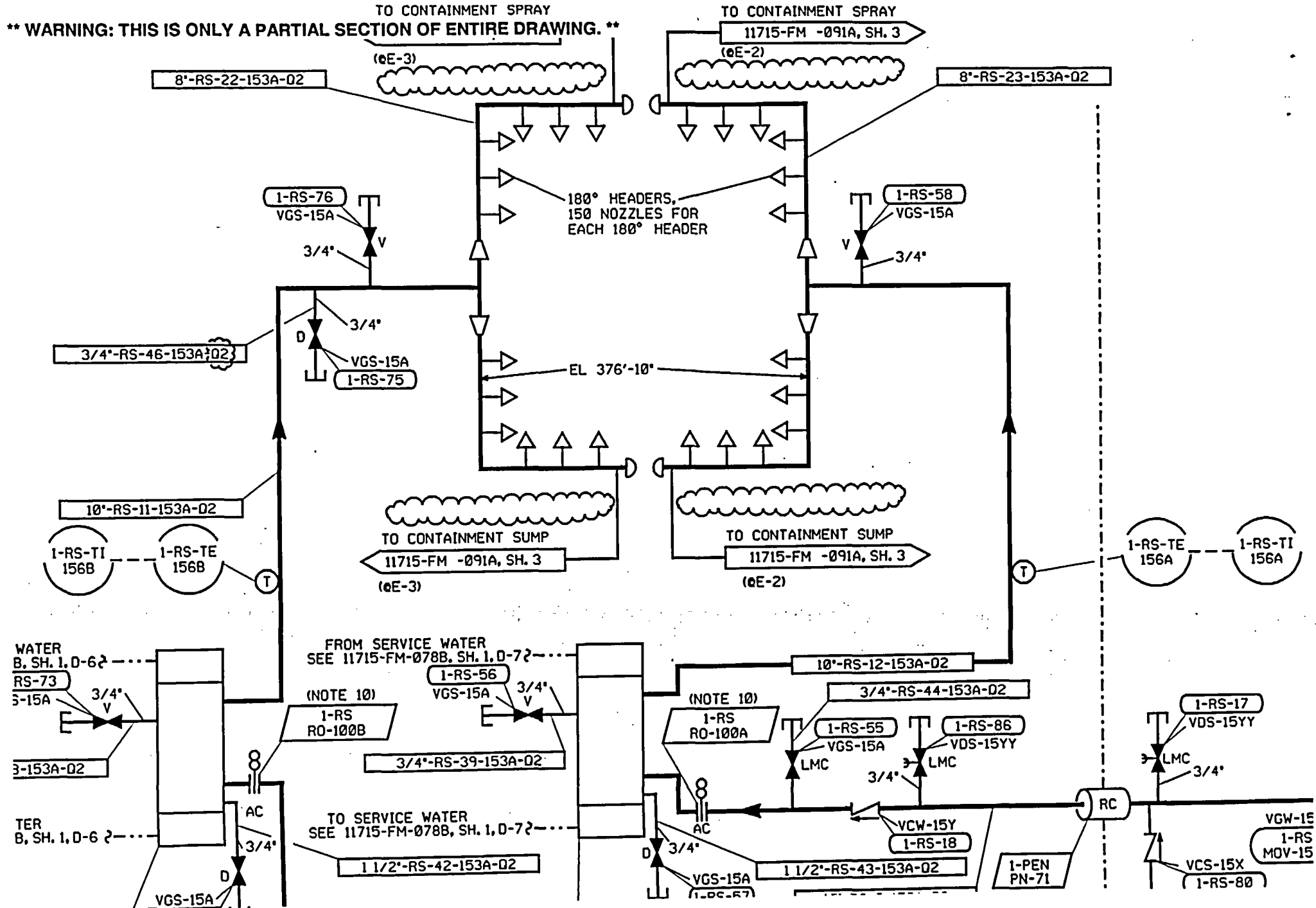




REVISED PER RCR 2000-1981 THIS TAG SUPPRESSED REV B1		CAGE CODE 6-74000 100% INSPECTION REQUIRED DRAWING NO. 12050-FM -091A
QORN QTY	SCALE: NONE	UNLESS OTHERWISE NOTED ON 3 OF

NOTES	
1. FOR NOTES, SEE SHEET 1 OF THIS DRAWING.	
THIS CAD DRAWING SHEET IS 1 OF 4 SHEETS OF THE DRAWING. THIS SHEET HAS THE FOLLOWING NUMBERING SCHEME: 12000-P0-0700 (P0-77) AND 12000-P0-0700 (P0-78) RESPECTIVELY.	
REFERENCE DRAWINGS	TITLE
01. FOR ADDITIONAL REFERENCE DRAWINGS, SEE SHEET 1 OF THIS DRAWING.	
02. 12000-P0-0700	FLOW/VALVE OPERATING NUMBERS DIAGRAM
03. 12000-P0-0700	FLOW/VALVE OPERATING NUMBERS DIAGRAM
04. 12000-P0-0700	FLOW/VALVE OPERATING NUMBERS DIAGRAM
PRODUCT INFORMATION	
1. 12000-P0-0700, DL 1	DL CLASSIFICATION: SUBSYSTEM DRAWING
2. 12000-P0-0700, DL 2	DL SYSTEM PREVIEW: TESTING DRAWING
3. 12000-P0-0700, DL 3	
PRODUCT NOTES	
NOT APPLICABLE	
DRAWING DESCRIPTION	
VIRGINIA POWER NORTH CAROLINA POWER NUCLEAR ENGINEERING SERVICES DICKINSON, VIRGINIA	
FLOW/VALVE OPERATING NUMBERS DIAGRAM CANT QUENCH & RECIRC SPRAY SUB SYS NORTH ANNA POWER STATION UNIT 2 VIRGINIA POWER	
DRAWING REVISIONS REVISION NO. DATE BY 12000-P0-0700	CAD FILE: C:\Users\jgordon\OneDrive\Documents\12000-P0-0700.dwg DRAWING FILE: 12000-P0-0700
FROM: AEC SCALE: NONE UNLESS OTHERWISE NOTED SHEET 1 OF 4	

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