

VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

May 19, 1981



Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
Attention: Mr. Robert A. Clark, Chief
Operating Reactors Branch No. 3
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Serial No. 310
NO/SWB:smv
Docket Nos. 50-338
50-339
License Nos. NPF-4
NPF-7

Gentlemen:

FIRE PROTECTION INFORMATION
NORTH ANNA POWER STATION

NRC letter dated February 20, 1981 requested information from all power reactor licensees licensed prior to January 1, 1979 in regard to meeting the requirements of Sections III.G, III.J, and III.O of Appendix R to 10CFR50.48. The purpose of this letter is to provide the information requested by the February 20, 1981 letter and provide additional information concerning specific smoke detector locations required by the Fire Protection Safety Evaluation Report dated February, 1979.

Attachment I provides the information required by Section 8 of the NRC letter dated February 20, 1981. In this regard, Vepco has reevaluated the equipment required for safe shutdown as prescribed by Section III.G of Appendix R and concludes that North Anna Power Station Units 1 and 2 are in compliance with that section. Section III.J which requires emergency lighting units with at least 8-hour battery power supplies in safe shutdown areas will be completed for both Units 1 and 2 no later than November 17, 1981. This modification requires no new installation of lights; only upgrading the power supplies. Section III.O requires the installation of an oil collecting system on the reactor coolant pumps. Installation of sesimically designed collection systems are complete on both Unit 1 and Unit 2.

Attachment II describes the locations of smoke detectors in three areas. The smoke detector installations listed differ from the prescribed installation given by the Safety Evaluation Report for these areas. The reasons for the change are also listed in the attachment.

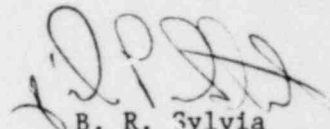
8105220383

F

In summary, Vepco has reassessed Appendix R to 10CFR50 and concludes that North Anna Units 1 and 2 are in compliance with 10CFR50.48.

If you have any questions or comments, please contact us.

Very truly yours,

A handwritten signature in dark ink, appearing to read 'B. R. Sylvia', is written over the typed name.

B. R. Sylvia
Manager - Nuclear
Operations and Maintenance

Attachments

cc: Mr. James P. O'Reilly, Director

ATTACHMENT I

INFORMATION REQUIRED FOR STAFF REVIEW

(Item designation is similar to NRC letter dated February 20, 1981.)

- (a) The North Anna Safety Evaluation Report dated February 1979 documented the evaluation conducted by your staff and Vepco's staff in regard to equipment required for safe shutdown. Further, the Safety Evaluation Report and Vepco letter Serial No. 1009 dated December 23, 1980 described the modifications required to achieve alternate shutdown capability.
- (b) Drawings showing the normal and alternate shutdown control and power circuits are being forwarded to the NRC project manager for the North Anna Power Station.
- (c) All changes to safety systems are required to be accomplished in accordance with our Quality Assurance Program which requires standards of the FSAR to be met and the safety question as defined in 10CFR50.59 addressed and satisfied.
- (d) The two areas that require the alternate shutdown system are described in the Safety Evaluation Report dated February 1979 and are the cable vault and tunnel and the Emergency Switchgear. As documented by the Safety Evaluation Report, the alternate shutdown method is independent of wiring in these areas.
- (e) As stated above, the fact that the alternate shutdown method relies on the appropriate unit's equipment, precludes that any alternate shutdown power source is routed through the area.
- (f) The alternate shutdown method at North Anna Power Station utilizes the opposite unit's equipment where a fire in a given fire area can be hypothesized to disable redundant equipment essential for safe shutdown. The modifications necessary to provide this shutdown capability are the charging pump cross connect and the fuel building redundant instrument panel. A procedure AP-48 has been developed to operate the cross connect if necessary. Available normal and abnormal procedures would be used to shutdown a plant damaged by fire that did not damage the power supply and control cables that necessitate the cross connect and fuel building instrument panel.
- (g) Spare fuses are available for all control circuits used for shutdown equipment.
- (h) The fire brigade technical specifications require five members. Three members usually are security personnel with the remaining two from operations. However, the personnel from operations are unlicensed trainees and would not be the type of personnel that would be heavily involved in a shutdown operation in the event of a fire. Operations has evaluated the demands of a fire that required emergency shutdown and have determined that sufficient manpower is available.

- (i) The auxiliary shutdown panel located in the emergency switchgear room contains certain instrumentation and controls to shutdown the plant in the event of an accident as described in the FSAR and simultaneously forced evacuation of the control room. The Safety Evaluation Report required that additional relays were to be added to ensure complete isolation of the main control board from the auxiliary shutdown panel. The modification is complete and the testing procedure associated with the design change functionally tested all equipment to assure the isolation relays functioned as required.
- (j) Revised technical specifications required for the operation of the charging pump cross connect and the fire protection technical specifications have been submitted.
- (k) The systems required for shutdown have been evaluated as documented in the Fire Protection Systems Review dated April 1, 1977 and the Safety Evaluation Report dated February 1979. The systems have been reevaluated following publication of paragraph 10CFR50.48 and the necessary systems required for safe shutdown will be available after a fire in any area in accordance with Section III.G of Appendix R.
- (l) The repair procedures that may be necessary to reach cold shutdown following a fire are re-routing power cables to the residual heat removal pumps. Procedures to reconnect and splice cables already exist. Sufficient power cable to reconnect a RHR pump will be ordered in a timely manner and will thereafter be required by administrative control to remain on site.

REQUEST FOR ADDITIONAL INFORMATION

- A. All equipment required by the alternative method of achieving and maintaining hot shutdown are given by Vepco letter Serial No. 1009 dated December 23, 1980 and the North Anna Power Station Safety Evaluation Report dated February 1979.
- B. The only fire area that contains equipment that is necessary for shutdown that cannot be circumvented by the alternate shutdown method is the cable vault. This equipment and their function are described below:
 - (1) The 480V breaker for MOV-FW-100B.
 - (2) Trip valve MS111A or MS111B.

The equipment listed above is required to operate the auxiliary feed pumps. There are two electric motor driven half size feed pumps and one full size turbine driven auxiliary feed pump. The discharge MOVs and HCVS breakers are located in the cable vault. In the worst case, MOV-FW-100B and trip valve MS111A or MS111B are required to be opened for safe shutdown. MOV-FW-100B is required to be open by technical specifications. A fire at the breaker could cause the valve to be driven closed. A fire at any point other than the breaker regardless of the severity, cannot cause the MOV to be driven closed. The valve will fail as is. If the valve is driven closed by a fire at the breaker, the valve will be manually reopened.

One trip valve MS111A or MS111B is required to be open to provide steam to the turbine drive. A fire in any one fire area can at the worst cause control power failure to the solenoid controlling the trip valve and will cause the valve to open. A fire cannot cause the valve to remain closed. Attached are drawings describing the equipment locations.

- C. The above describes the cables that may be required for shutdown that are located in an area that requires circumvention by an alternate system as described by III.G of Appendix R.
 - D. As shown in B, fire induced failure of the above mentioned cables will not prevent operation or cause a malfunction of the alternative shutdown method.
 - E. As described above, the cable is not isolated from the fire area but its failure, either by a short or being severed, will not prevent shutdown.
2. (a) The residual heat removal system is the only high-low pressure interface that uses redundant motor operated valves to isolate the primary boundary from a low pressure boundary.
- (b) The following is a routing of Unit 1 control and power cables for both RHR inlet MOVs (1700 and 1701). Unit 2 is identical.

POWER CABLES

<u>LOCATION</u>	<u>COMPONENT</u>
Cable Vault	480V Breakers
Electrical Penetration	Power Cable
Containment	MOVS

CONTROL POWER

<u>LOCATION</u>	<u>COMPONENT</u>
Control Room	Control Switch, Control Wire
Emergency Switchgear Room	Control Wire
Relay Room	Comparator, Control Wire
Cable Tunnel	Control Wire
Containment	Control Wire Limit Switch

- (c) Separation of redundant cables in all areas described above is less than 3 hours.

- (d) The only location that a fire could cause both of the valves to be driven would be a fire in the cable vault where the breakers for MOV1700 and 1701 are located. The breakers are powered from separate emergency buses and Unit 1 breakers are separated by $14\frac{1}{2}$ feet and Unit 2 breakers are separated by $19\frac{1}{2}$ feet. MOVs usually fail "as is" if the breakers are damaged. The chance of a fire damaging both breakers in such a way as to energize the MOVs is remote since the separation almost meets the 20 feet prescribed by Appendix R and the path between the breakers is made torturous by placement of other equipment.

ATTACHMENT II

CHANGES TO SMOKE DETECTOR TYPES

<u>FIRE AREA</u>	<u>DESCRIPTION FROM S.E.R., TABEL 1</u>	<u>VEPCO COMMITTMENT</u>	<u>INSTALLED DETECTOR</u>	<u>COMMENTS</u>
Quench Spray Pumphouse	Ventilation System Exhaust Duct, and General Area of lower elevation	Same as S.E.R. (Supp. 2, Item 28)	Ceiling type detectors for upper and lower elevations	See Note 1
Boron Recovery Building	General Area	None	Duct Detectors	See Note 2
Decontamination Building	General Area	Smoke Detection (Red Book, pg. III-80)	Duct Detectors	See Note 3

NOTES

1. The ventilation system exhaust for this area consists of a roof fan and no ductwork, so ceiling-type detectors were installed instead of duct detectors.
2. There are no exposed combustibles in the area and there is no room for transient combustible storage. There is not safety related equipment in this area.
3. There are no exposed combustibles in the area. Radiation levels in some parts of the building make installation and maintenance of ceiling-type detectors very difficult. There is no safety related equipment in this area.

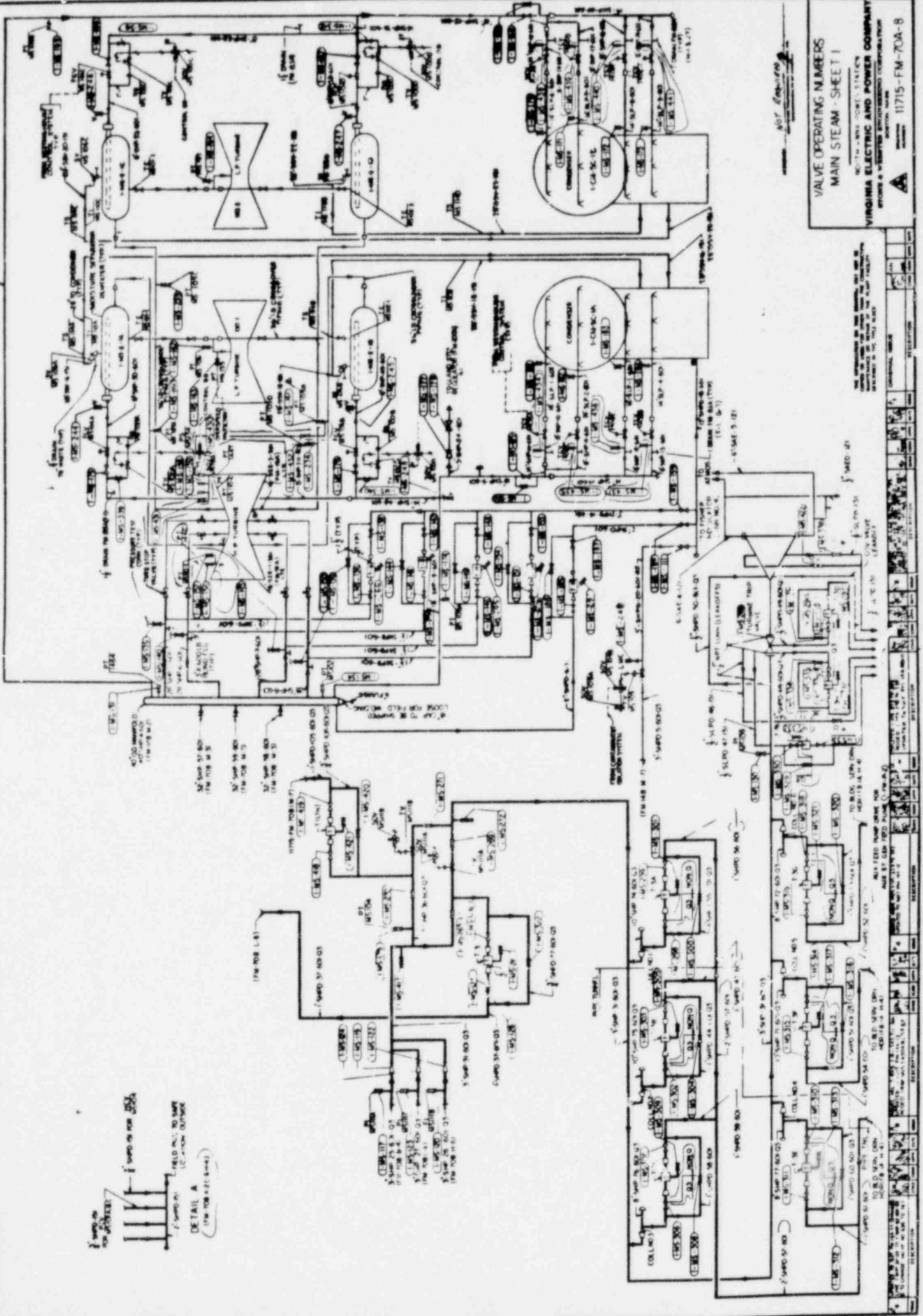
4. References

S.E.R. - Safety Evaluation Report "Fire Protection Program for North Anna Power Station, Units 1 and 2", dated February 1979.

Red Book - "Fire Protection System Review", dated April 1, 1977.

- Supp. 2 - "Supplement 2 To Fire Protection Systems Review", dated January 2, 1978.

11715-FM-70A-8



VALVE OPERATING NUMBERS MAIN STEAM - SHEET 1

NOT TO SCALE
VIRGINIA ELECTRIC AND POWER COMPANY
POWER & WATER ENGINEERING CORPORATION
11715-FM-70A-8

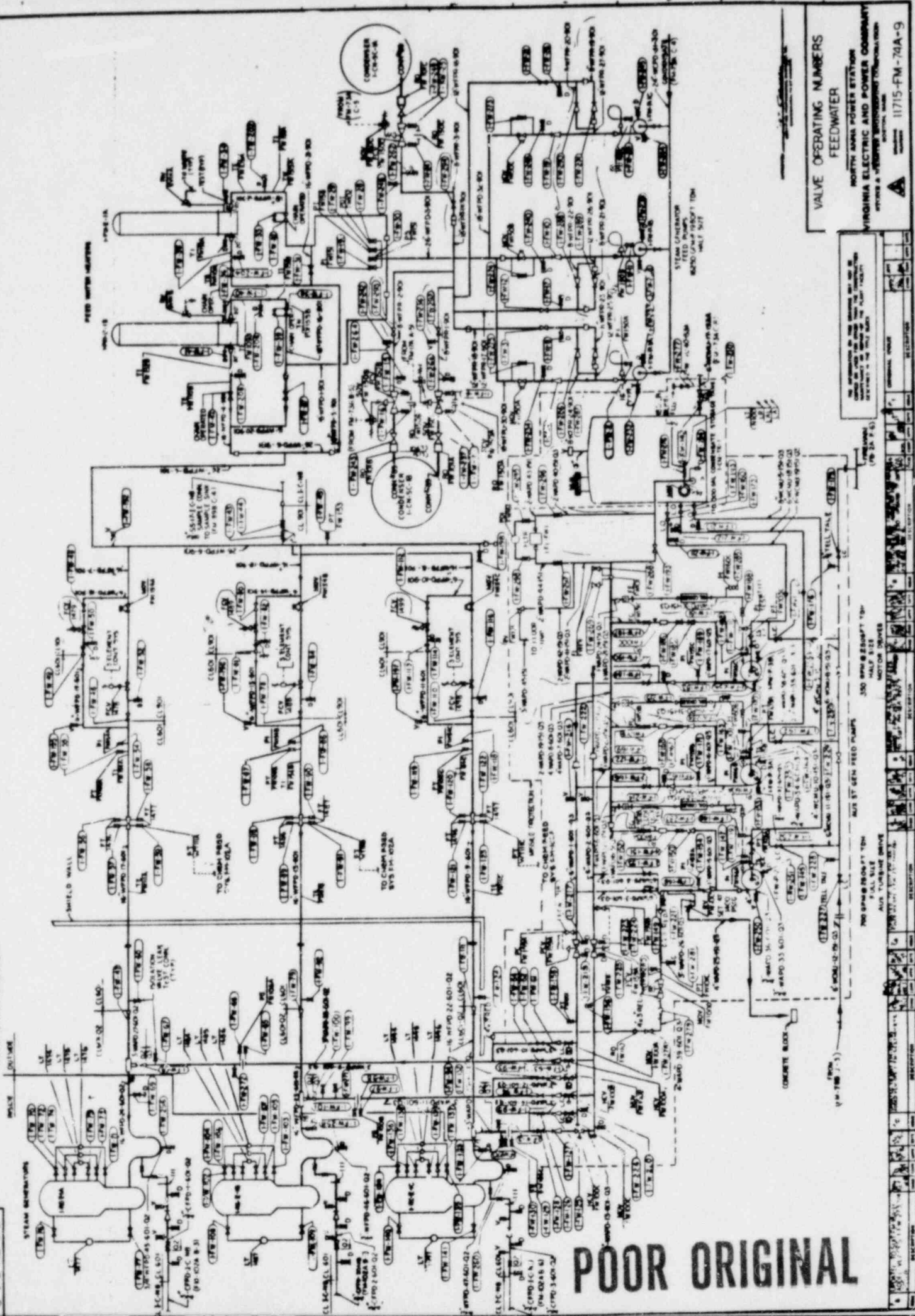
THE OPERATOR OF THE ENGINE, WHEN IN
OPERATION, SHALL BE RESPONSIBLE FOR THE
CORRECT OPERATION OF THE VALVES.

NO.	DESCRIPTION	REVISION	DATE	BY	CHKD.	APP'D.
1	1-101					
2	1-102					
3	1-103					
4	1-104					
5	1-105					
6	1-106					
7	1-107					
8	1-108					
9	1-109					
10	1-110					
11	1-111					
12	1-112					
13	1-113					
14	1-114					
15	1-115					
16	1-116					
17	1-117					
18	1-118					
19	1-119					
20	1-120					
21	1-121					
22	1-122					
23	1-123					
24	1-124					
25	1-125					
26	1-126					
27	1-127					
28	1-128					
29	1-129					
30	1-130					
31	1-131					
32	1-132					
33	1-133					
34	1-134					
35	1-135					
36	1-136					
37	1-137					
38	1-138					
39	1-139					
40	1-140					
41	1-141					
42	1-142					
43	1-143					
44	1-144					
45	1-145					
46	1-146					
47	1-147					
48	1-148					
49	1-149					
50	1-150					
51	1-151					
52	1-152					
53	1-153					
54	1-154					
55	1-155					
56	1-156					
57	1-157					
58	1-158					
59	1-159					
60	1-160					
61	1-161					
62	1-162					
63	1-163					
64	1-164					
65	1-165					
66	1-166					
67	1-167					
68	1-168					
69	1-169					
70	1-170					
71	1-171					
72	1-172					
73	1-173					
74	1-174					
75	1-175					
76	1-176					
77	1-177					
78	1-178					
79	1-179					
80	1-180					
81	1-181					
82	1-182					
83	1-183					
84	1-184					
85	1-185					
86	1-186					
87	1-187					
88	1-188					
89	1-189					
90	1-190					
91	1-191					
92	1-192					
93	1-193					
94	1-194					
95	1-195					
96	1-196					
97	1-197					
98	1-198					
99	1-199					
100	1-200					

11715 FM-74A-9



FOR ORIGINAL

VALVE OPERATING NUMBERS
FEEDWATERNORTH ANNA POWER STATION
VIRGINIA ELECTRIC AND POWER COMPANY
ATTN: A. J. VANDERKAM, ENGINEER
11715-FM-74A-9

POOR ORIGINAL

Area-MS
Elev. 0274
Col. 5.5

ATTACHMENT

SOV-MS111B
ASCO
HT-8344A71

Energized P to B, A to E
De-Energized P to A, B to E
PAGE MS 110
IR 1-8-1-2
1MSSAPC701

REF: FM-14D
FE-13B
ESK-6PR
LSK-5-13
FK-8A
FK-12C
(Det. 48)
FE-18M

From Main
Steam Lines

3-SHP-36

To Turbine
Drivers

Check
Valve

Volume
Tank

Needle
Valve

P

E

B

COO
NOO

TV-MS111B
Fisher
476D-1-ES
Air To Close
Fails Open

JB-596

FOR INFORMATION ONLY
NOT TO BE USED FOR CONSTRUCTION

1MSSAPC700

POWER 125VDC
1-EP-CB-23B
BKR 1
CKT1MSSB07
1MSS3FK004

1MSSAPC704

Emer. Swgn. Rm.
Elev. 0254

1-EI-CB-06B
AUX SHUTDOWN
PANEL B

Ref: FE-3CE
FE-3GD

35 40 TC

2B 2

AE
43-TV-MS111B
CLOSED IN
"REMOTE"

Mn. Cont. Rm.
Elev. 0277

REF: FE-3AE
FE-3V
FE-18M

TV-MS111B
CLOSED IN
"CLOSE"

1-EI-CB-C2 B.Pd. 1-2

LOOP ACTION: Selector switches located at the main control board and auxiliary shutdown panel provides manual control of TV-MS111B which provides steam flow control to the turbine driver. Note ESK-6PR. 5 Revision

2 E&DCR 6594-1 3 E&DCR 23471; Field Rev. 4 Vepco DC-80-S14 E&DCR OSD-0076-1

			TITLE MAIN STEAM SYSTEM AUXILIARY FEED PUMP TURBINE DRIVE TRIP VALVE TV-MS111B CONTROL	CLIENT VEPCO			
	BY	DATE		PROJECT NAPS No. 1			
PREPARED	077	7/2/75		J.O. NO. 11715			
CHECKED	022C	7/2/75		① ISSUED BY [Signature]			
APPROVED	(022)	7/2/75		DATE December 8, 1975			
REVISIONS BY	② 077	VEB	③ [Signature]	④ 077	⑤ 077	⑥	NUMBER TV-MS111B
DATE		6/5/76	2-10-77	5-9-80	11/19/80		

Field Rev.

POOR ORIGINAL

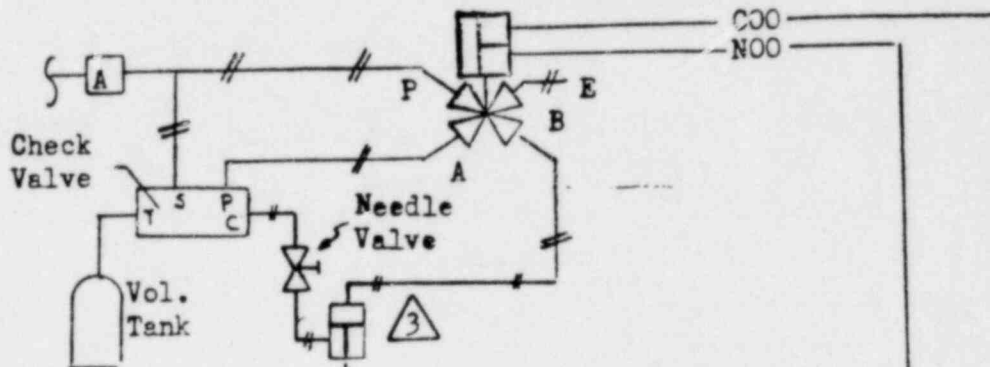
Area-MS
Elev. 0274
Col. 5.5

SOV-MS111A Energized P to B, A to E
ASCO De-Energized P to A, B to E
HT-8344A71

1MSSAOC701

REF: FM-14A
FE-13B
ESK-6PR
LSK-5-13
FK-8A
FK-12C
(Det. 48)
FE-18M

From Main Steam Lines 3-SHP-31 To Turbine Drivers



TV-MS111A
Fisher
476D-1-ES
Air To Close
Fails Open

FOR INFORMATION ONLY
NOT TO BE USED FOR CONSTRUCTION

1MSSAOC700

JB-595

5 2

1MSS20K004

1-EP-CB-23A

125 VDC

BKR

1

W

B

1MSSAOC704

Emerg. SWGR. Rm.
Elev. 0254

REF: FE-3CD
FE-3GC

43 48 TC
2B 2
AC
43-TV-MS111A

1-EI-CB-06A

Mn. Cont. Rm.
Elev. 0277

REF: FE-3AD
FE-3V
FE-18M

31 30 29 25 23 TAQ

3 3B

HR
TV-MS111A

POOR ORIGINAL

1-EI-CB-02 B.B.D. 1-2

LOOP ACTION: Selector switches located at the main control board and auxiliary shutdown panel provides manual control of TV-MS111A which provides steam flow control to the turbine driver. Automatic control can also be provided. NOTE ESK-6PR. 2 E&DCR 6594-1 3 E&DCR 23471; Field Rev.

POWER INDUSTRY GROUP			TITLE			CLIENT	
	BY	DATE	MAIN STEAM SYSTEM			PROJECT	VEPCO
PREPARED	407	7/3/73	AUXILIARY FEED PUMP TURBINE DRIVE			J.O. NO.	NAPS No. 1
CHECKED	EC	10/20/73	TRIP VALVE TV-MS111A CONTROL			ISSUED BY	11715
APPROVED	125	11/16/73				DATE	December 8, 1975
REVISIONS	BY	DATE				NUMBER	TV-MS111A
	207	6/1/76					
	2	10-77					

Field Rev.