

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.

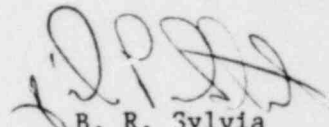
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In summary, Veeco has reassessed Appendix R to 10CFR50 and concludes that North Anna Units 1 and 2 are in compliance with 10CFR50.48.

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

Very truly yours,



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 hypotized 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 COMMITMENT</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.

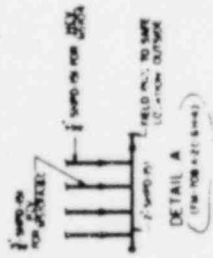
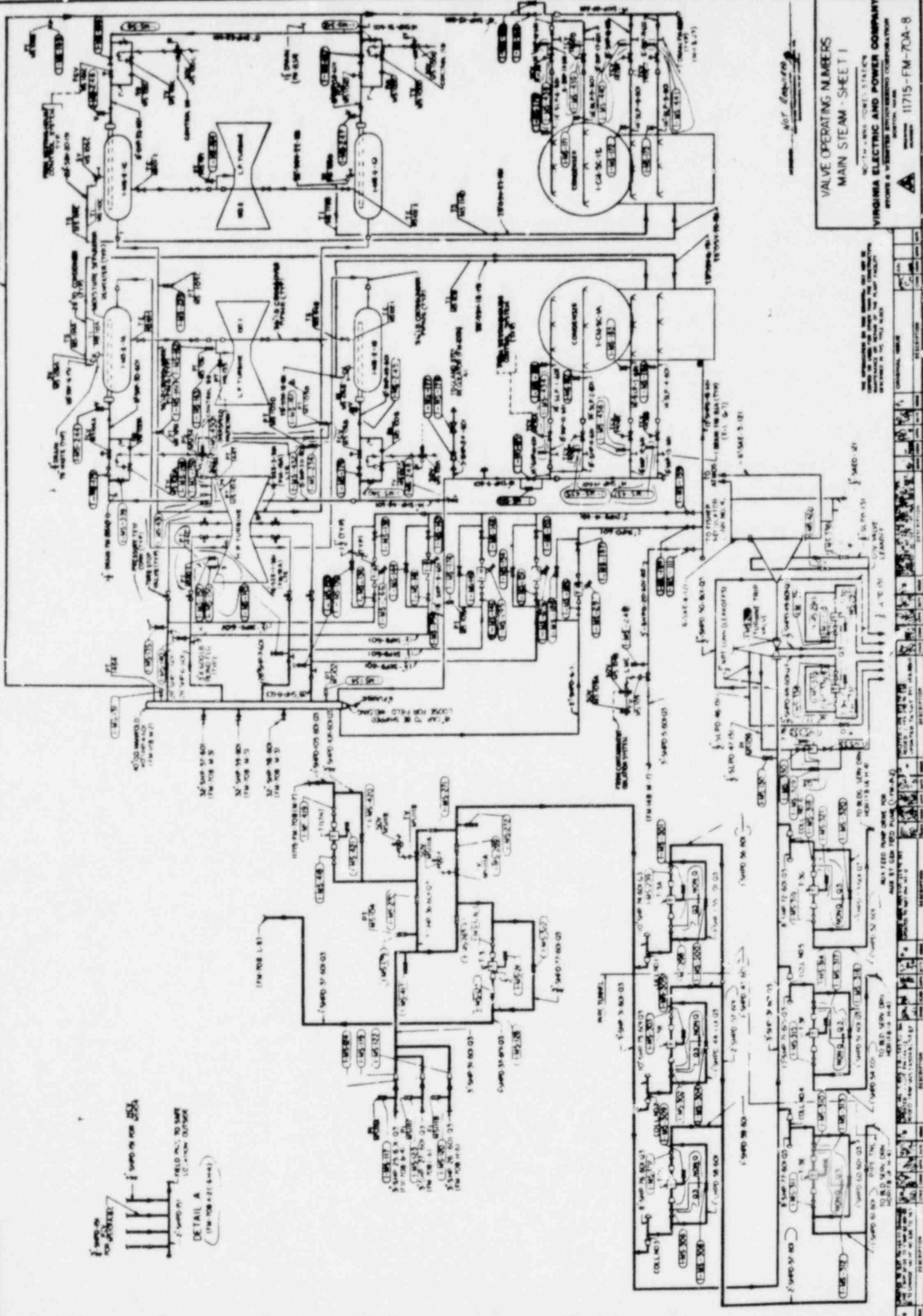
4. References

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



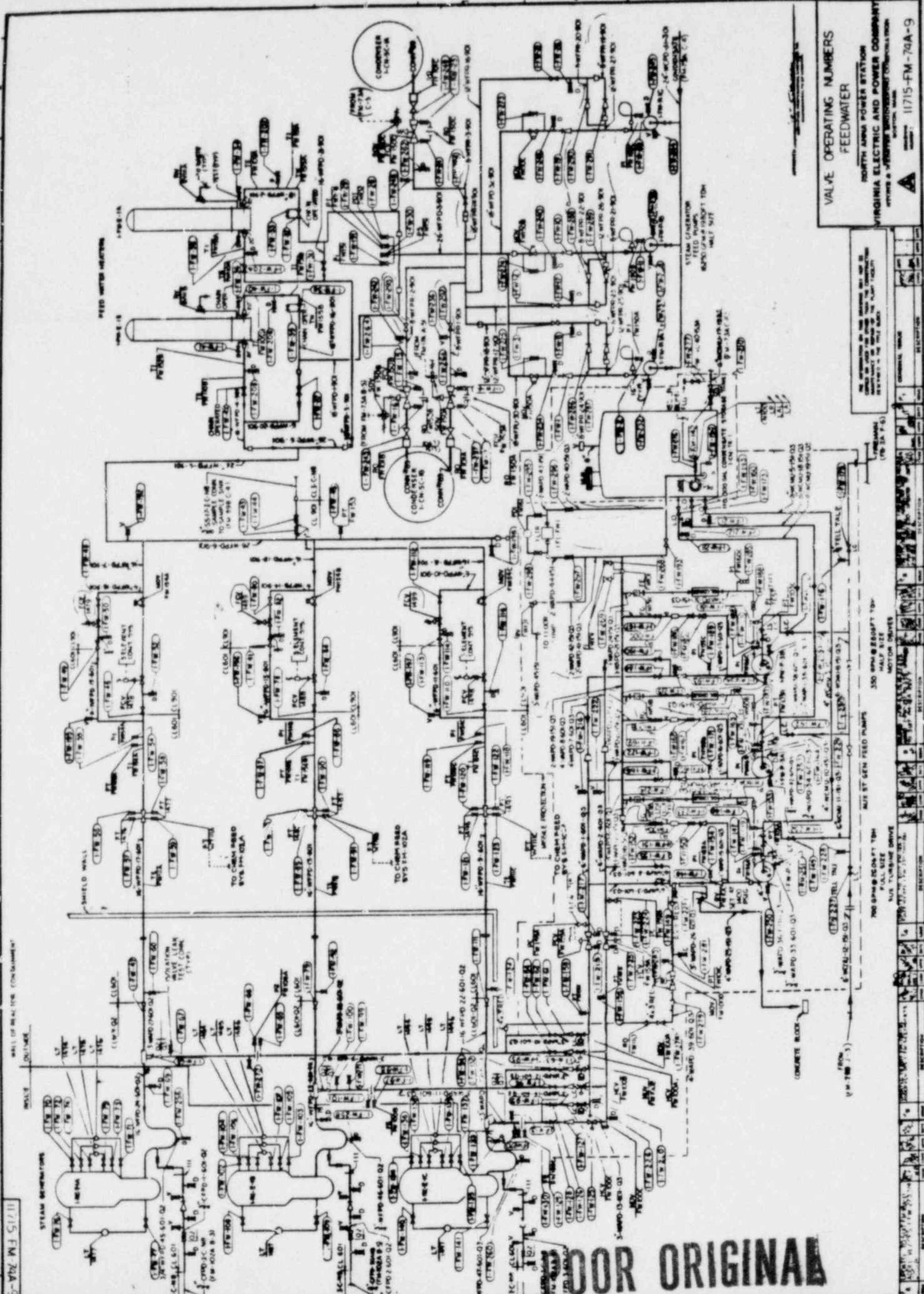
VALVE OPERATING NUMBERS
MAIN STEAM - SHEET 1

NOT TO BE USED FOR OTHER THAN ORIGINAL WORK
 VIRGINIA ELECTRIC AND POWER COMPANY
 POWER & WATER ENGINEERING CORPORATION
 11715-FM-70A-8

NO.	DESCRIPTION	REVISION	DATE	BY	CHKD.	APP'D.
1	ISSUED FOR CONSTRUCTION					
2	ISSUED FOR OPERATION					
3	ISSUED FOR MAINTENANCE					
4	ISSUED FOR REVISION					
5	ISSUED FOR MODIFICATION					
6	ISSUED FOR CORRECTION					
7	ISSUED FOR IMPROVEMENT					
8	ISSUED FOR REPLACEMENT					
9	ISSUED FOR DECOMMISSIONING					
10	ISSUED FOR FINAL REVIEW					

ATTACHMENT

11715-FM-79A-9



**VALVE OPERATING NUMBERS
FEEDWATER**

NORTH ANNE POWER STATION
 VIRGINIA ELECTRIC AND POWER COMPANY
 11715-FM-79A-9

FOR INFORMATION OF THE OPERATOR SEE THE
 VALVE OPERATING NUMBERS LIST IN THE
 FEEDWATER SECTION OF THE PLANT MANUAL

PREPARED BY
 (17F-10)

300 GPM @ 2800 PSI
 FULL SIZE
 VALVE OPERATING NUMBERS

NUT ST. GEN FEED PUMPS

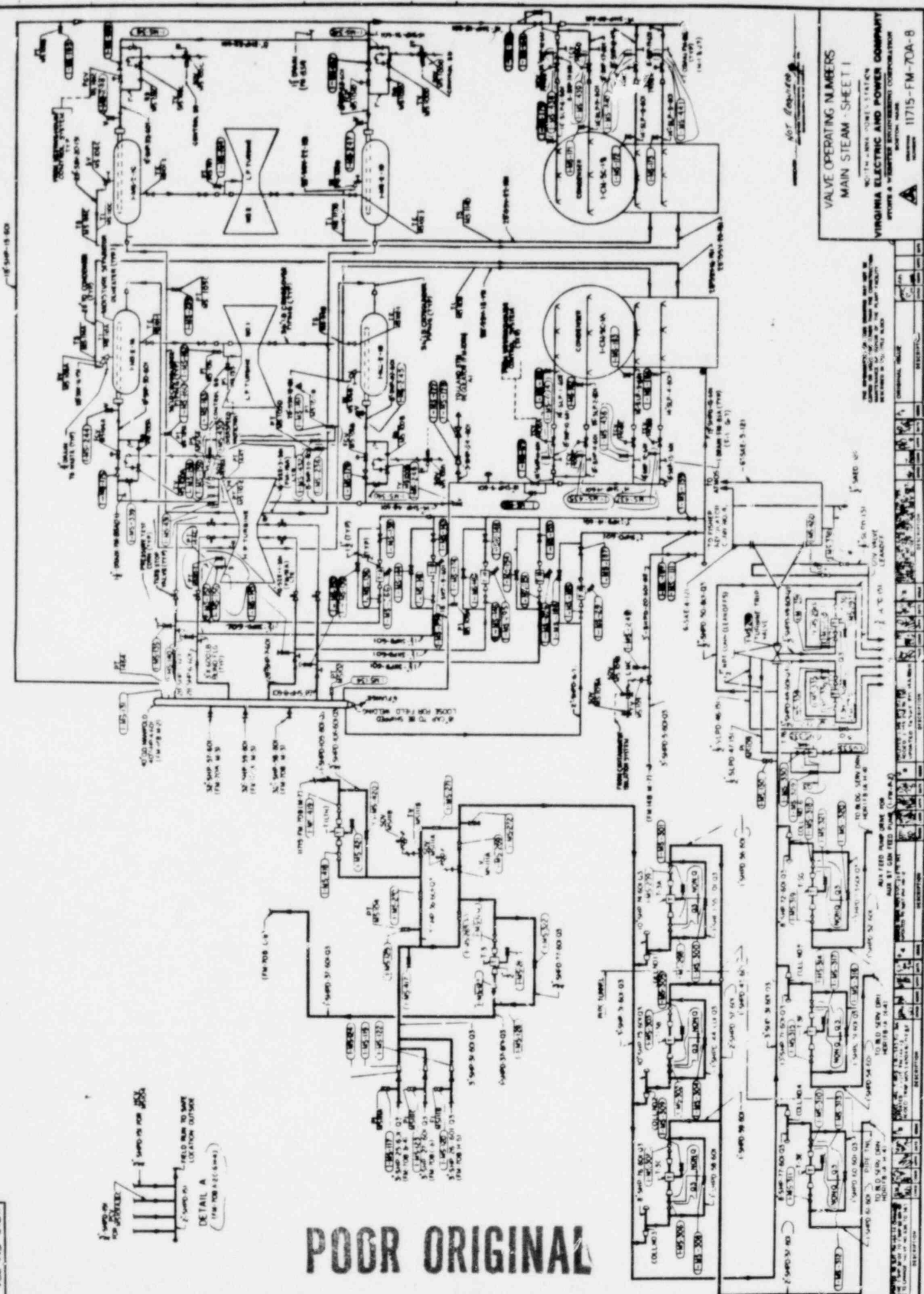
CONCRETE BLOCK

STEEL WALL

STEAM GENERATORS

CONDENSER HEATERS

FLOOR ORIGINAL



POOR ORIGINAL

Not Required

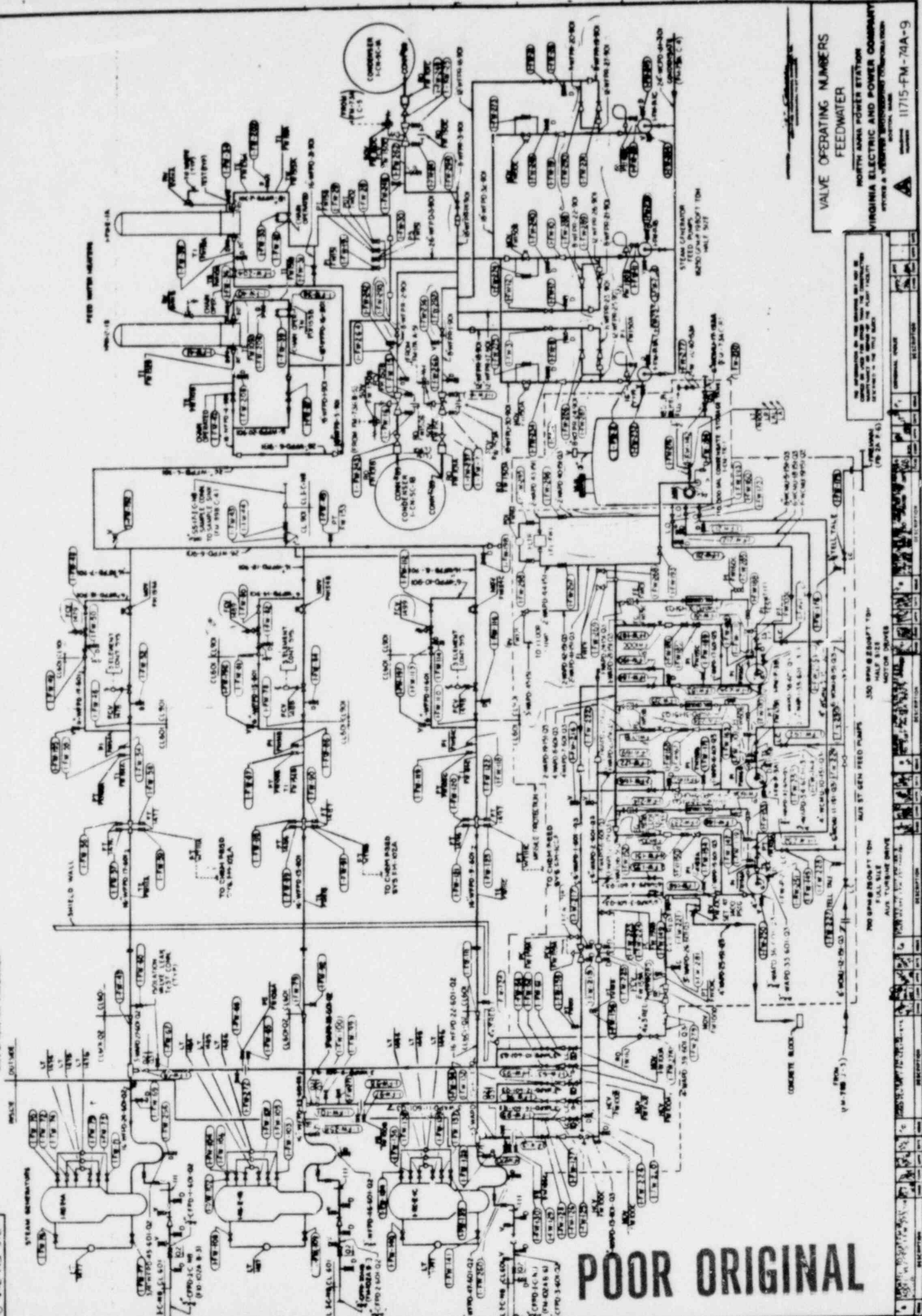
VALVE OPERATING NUMBERS
MAIN STEAM - SHEET 1

FOR THE ABOVE POWER PLANT
 VIRGINIA ELECTRIC AND POWER COMPANY
 OFFICE & WESTINGHOUSE CORPORATION
 CHARLOTTE, N.C.
 DRAWING NO. 11715-FM-70A-B

NO.	DESCRIPTION	DATE	BY	CHECKED
1	ISSUED FOR CONSTRUCTION	11/15/51	J. W. BROWN	H. W. BROWN
2	REVISION			
3	REVISION			
4	REVISION			
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50	REVISION			

ATTACHMENT

11715-FM-74A-9



VALVE OPERATING NUMBERS
FEEDWATER

NORTH ANNA POWER STATION
 VIRGINIA ELECTRIC AND POWER COMPANY
 VIRGINIA & WESTERN ENGINEERING CORPORATION
 RICHMOND, VIRGINIA

11715-FM-74A-9

NO.	DESCRIPTION	OPERATION	REVISION
1	700 RPM SHORT TEN FALL SILE		
2	AUX TURBINE DRIVE		
3	350 RPM SHORT TEN HALF SIZE		
4	AUX 37 GEN FEED PUMPS		
5	AUX 37 GEN FEED PUMPS		
6	6 INCH 12-26-53		
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POOR ORIGINAL

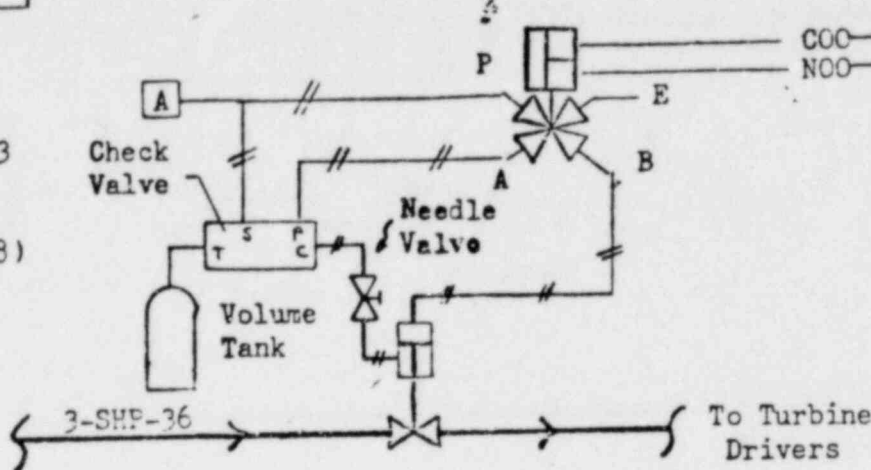
Area-MS
Elev. 0274
Col. 5.5

ATTACHMENT

SOV-MS111B Energized P to B, A to E
ASCO De-Energized P to A, B to E
HT-8344A71
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



To Turbine
Drivers

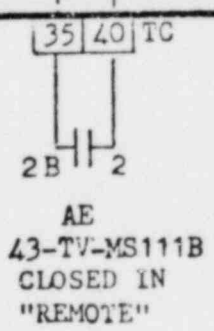
TV-MS111B
Fisher
476D-1-ES
Air To Close
Fails Open

FOR INFORMATION ONLY
NOT TO BE USED FOR CONSTRUCTION

1MSSAPC700
POWER 125VDC
1-EP-CB-23B
BKR 1
CKT1MSSB07
1MSS3FK004

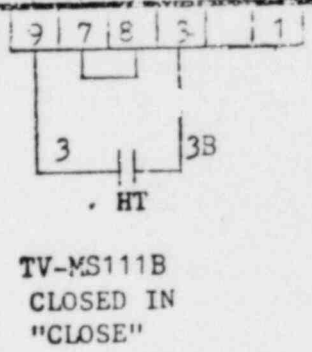
Emer. Swgn. Rm.
Elev. 0254

1-EI-CB-06B
AUX SHUTDOWN
PANEL B
Ref: FE-3CE
FE-3GD



Mn. Cont. Rm.
Elev. 0277

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



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. ⚠ Revision

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

BY			DATE			TITLE	CLIENT	
PREPARED			7/21/75			MAIN STEAM SYSTEM AUXILIARY FEED PUMP TURBINE DRIVE TRIP VALVE TV-MS111B CONTROL	VEPCO	
CHECKED			12/1/75				PROJECT	NAPS No. 1
APPROVED			11/1/75				J.O. NO	11715
REVISIONS BY			DATE				ISSUED BY	
DATE			DATE			DATE December 8, 1975		
DATE			DATE			NUMBER		
DATE			DATE			TV-MS111B		

Field Rev.

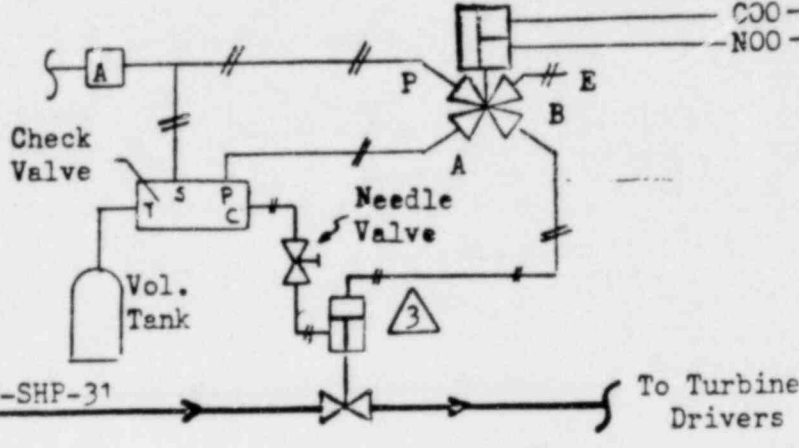
POOR ORIGINAL

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

1MSSA0C701

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



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

FOR INFORMATION ONLY
NOT TO BE USED FOR CONSTRUCTION

1MSSA0C700

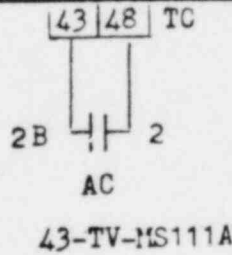
JB-595

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1-EP-CB-23A
125 VDC
BKR

1MSSA0C704

Emerg. SWGR. Rm.
Elev. 0254

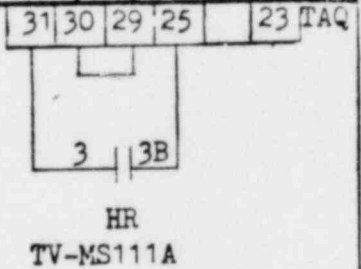
REF: FE-3CD
FE-3GC



1-EI-CB-06A

Mn. Cont. Rm.
Elev. 0277

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



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	
		MAIN STEAM SYSTEM		VEPCO	
BY	DATE	AUXILIARY FEED PUMP TURBINE DRIVE		PROJECT	NAPS No. 1
PREPARED	7/3/76	TRIP VALVE TV-MS111A CONTROL		J.O. NO.	11715
CHECKED	10/20/76			ISSUED BY	<i>[Signature]</i>
APPROVED	11/12/76			DATE	December 8, 1975
REVISIONS BY	DATE	①	②	③	④
	6/1/76	①	②		
	2-10-77				
				NUMBER	TV-MS111A

Field Rev.