March 27, 1987

Docket Nos. 50-338
and 50-339

DISTRIBUTION

Docket File	J. Partlow
NRC PDR	T. Barnhart (8)
Local PDR	W. Jones
PAD#2 Rdg	E. Butcher
T. Novak	N. Thompson
D. Miller	V. Benaroya
L. Engle	Tech Branch
OGC-Bethesda	ACRS (10)
L. Harmon	C. Miles, OPA
E. Jordan	L. Tremper, LFMB
B. Grimes	Gray File

Mr. W. L. Stewart
Vice President - Nuclear Operations
Virginia Electric and Power Company
Post Office Box 26666
Richmond, Virginia 23261

Dear Mr. Stewart:

The Commission has issued the enclosed Amendment Nos. 91 and 76 to Facility Operating License Nos. NPF-4 and NPF-7 for the North Anna Power Station, Units No. 1 and No. 2 (NA-1&2). The amendments revise the Technical Specifications (TS) in response to your letter dated September 12, 1986. The amendments are effective within sixty days of the date of issuance.

The amendments revise the Technical Specifications in order to allow the tie-in, startup, and operation of a replacement spray system for the existing service water spray system and its related components.

Based on discussions between VEPCO and the NRC staff, VEPCO committed to separate by seven days the two 168 hour LCO's required to complete the tie-in, startup, and declaration of operability for headers A and B.

A copy of the Safety Evaluation is also enclosed. The notice of issuance will be included in the Commission's next regular bi-weekly Federal Register notice.

Sincerely,

/s/

Leon B. Engle, Project Manager
PWR Project Directorate #2
Division of PWR Licensing-A
Office of Nuclear Reactor Regulation

Enclosure:
1. Amendment No. 91 to NPF-4
2. Amendment No. 76 to NPF-7
3. Safety Evaluation

cc w/enclosures:
See next page

*See previous concurrence

*LA:PAD#2	*PM:PAD#2	*OGC	PD:PAD#2
DMiller	LEngle:hc		LRubenstein
1/ /87	1/ /87	1/ /87	3/5 /87

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PDR ADOCK 05000338
P PDR

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and 50-339

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B. Grimes	Gray File

Mr. W. L. Stewart
Vice President - Nuclear Operations
Virginia Electric and Power Company
Post Office Box 26666
Richmond, Virginia 23261

Dear Mr. Stewart:

The Commission has issued the enclosed Amendment Nos. and to Facility Operating License Nos. NPF-4 and NPF-7 for the North Anna Power Station, Units No. 1 and No. 2 (NA-1&2). The amendments revise the Technical Specifications (TS) in response to your letter dated September 12, 1986. The amendments are effective within sixty days of the date of issuance.

The amendments revise the Technical Specifications in order to allow the tie-in, startup, and operation of a replacement spray system for the existing service water spray system and its related components.

A minimum period of seven days shall separate the 168 hour LCO's required for the tie-in, startup and declaration of operability for the new spray array headers A and B.

A copy of the Safety Evaluation is also enclosed. The notice of issuance will be included in the Commission's next regular bi-weekly Federal Register notice.

Sincerely,

Leon B. Engle, Project Manager
PWR Project Directorate #2
Division of PWR Licensing-A
Office of Nuclear Reactor Regulation

Enclosure:
1. Amendment No. to NPF-4
2. Amendment No. to NPF-7
3. Safety Evaluation

cc w/enclosures:
See next page

LA:PAD#2	PM:PAD#2	OGC	PD:PAD#2
DMiller	LEngle:hc	MYoung	LRubenstein
2/3/87	1/3/87	2/11/87	1/ /87

Mr. W. L. Stewart
Virginia Electric & Power Company

North Anna Power Station
Units 1 and 2

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Resident Inspector/North Anna
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Senior Resident Inspector
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Board Panel
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Regional Administrator, Region II
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

VIRGINIA ELECTRIC AND POWER COMPANY

OLD DOMINION ELECTRIC COOPERATIVE

DOCKET NO. 50-338

NORTH ANNA POWER STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 91
License No. NPF-4

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Virginia Electric and Power Company, et al., (the licensee) dated September 12, 1986, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

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PDR ADOCK 05000338
P PDR

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.D.(2) of Facility Operating License No. NPF-4 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 91 , are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective within sixty days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

L S Rubenstein

Lester S. Rubenstein, Director
PWR Project Directorate #2
Division of PWR Licensing-A
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: March 27, 1987

ATTACHMENT TO LICENSE AMENDMENT NO. 91

TO FACILITY OPERATING LICENSE NO. NPF-4

DOCKET NO. 50-338

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed pages as indicated. The revised pages are identified by amendment number and contain vertical lines indicating the area of change. The corresponding overleaf pages are also provided to maintain document completeness.

Page
3/4 3-53a
3/4 7-72
3/4 7-74
3/4 8-4a
3/4 8-4b
B3/4 7-8

TABLE 3.3-11

FIRE DETECTION INSTRUMENTATION

INSTRUMENT LOCATION	MINIMUM DETECTORS REQUIRED HEAT	SMOKE
1. Reactor Containment		
a. Reactor Coolant Pumps	1/pump*	
b. Residual Heat Removal Pump Area	3	
c. Cable Penetration Area	7	8
d. Recirculation Air System		2
2. Control Room		
a. Under Floor - Loop 1	2	2
b. Under Floor - Loop 2	2	
c. Normal Air Supply#		1
d. Emergency Air Supply		1
e. Ceiling Area		10
f. Return Air Duct		1
3. Cable Spreading Room	3	4
4. Primary Cable Vault and Tunnel	2	3
5. Service Building Cable Vault and Tunnel	5	4
6. Emergency Switchgear Rooms		
a. Emergency Air Supply		1
b. Emergency Switchgear and Air Conditioning Rooms		7
7. Station Battery Room		1/room
8. Diesel Generators	2/room	
9. Fuel Oil Pump House#		
a. Room 1	1	1
b. Room 2	1	1
c. Motor Control Center Room		1
10. Rod Control Equipment and Motor Control Center Room (Elevation 280.0)		2
11. Auxiliary Building		
a. Charging Pump Cubicles		1/cubicle
b. Exhaust Duct (Northeast-Cubicles)#		1
c. Exhaust Duct (South Central-Cubicles)#		1
d. Exhaust Duct (Northwest-Cubicles)#		1

TABLE 3.3-11

FIRE DETECTION INSTRUMENTATION

INSTRUMENT LOCATION	MINIMUM DETECTORS REQUIRED HEAT	SMOKE
Auxiliary Building (cont'd)		
e. General Area Elevation 244'#		1
f. General Area Elevation 259'#		4
g. General Area Elevation 274'#		14
h. General Area Elevation 291'#		4
i. Charcoal Filters		
1. Intake Side#	3/room	
2. Outlet Side#	3/room	
12. Service Water Pump House#		8
13. Auxiliary Service Water Pump House#		1
14. Auxiliary Feed Water Pump House		
a. Turbine Pump Room		1
b. Motor Pump Room		3
15. Quench Spray Pump House		
a. Main Floor		2
b. Basement		4
16. Safeguards Area Ventilation		
a. System Exhaust Duct		1
17. Main Steam Valve House		1
18. Fuel Building#		10
19. Casing Cooling Pump House		1
20. Post Accident Hydrogen Recombiner Vault#		1
21. Fire Pump House#		1
22. Control Room Air Conditioning Chiller Room		1
23. Service Water Valve House#		
a. West Room	2	
b. Northeast Room	1	
c. Southeast Room	1	

* An RCP bearing or motor temperature may be substituted for an inoperable RCP heat detector provided the bearing or motor temperature(s) is monitored at least once per hour when the RCP is in operation.

\# Common to Units 1 and 2.

TABLE 3.7-5

ALLOWABLE TOTAL SETTLEMENT OR DIFFERENTIAL SETTLEMENT FOR CLASS 1 STRUCTURES

SETTLEMENT POINT	STRUCTURE	SETTLEMENT POINT	STRUCTURE/COMPONENT	ALLOWABLE TOTAL SETTLEMENT* (FEET)	ALLOWABLE DIFFERENTIAL SETTLEMENT* (FEET)
130	Containment Unit 1	223	Fuel Building	N/A	0.12
130	Containment Unit 1	129	Auxiliary Building	N/A	0.12
143	Containment Unit 1	142	Unit 1 Safeguards Area	N/A	0.04
144	Containment Unit 1	145	Unit 1 Safeguards Area	N/A	0.04
149	Containment Unit 1	239	Unit 1 Main Steam Valve House	N/A	0.12
144	Containment Unit 1	243,199,132	Service Building	N/A	0.12
146	Safeguards Unit 1	239	Unit 1 Main Steam Valve House	N/A	0.07
128	Auxiliary Building	238	Unit 1 Main Steam Valve House	N/A	0.08
129	Auxiliary Building	239	Unit 1 Main Steam Valve House	N/A	0.08
129	Auxiliary Building	223	Fuel Building	N/A	0.05
123	Auxiliary Building	224	Fuel Building	N/A	0.05
122	Auxiliary Building	119	Service Building Tunnel	N/A	0.07
7 or 10	Service Water Pump House	15,16, 17, 18	North Side of Expansion Joint Service Water Piping at SWPH	N/A	0.22 from 7/77
243,132	Service Building (E-5, E-6)	238	Unit 1 Main Steam Valve House	N/A	0.04
117	**Service Building (E-14)	113	Unit 2 Main Steam Valve House	N/A	0.03 from 7/77
222	Auxiliary Feedwater Pump House - Unit 1	248	Pipe Tunnel	N/A	0.12

TABLE 3.7-5

ALLOWABLE TOTAL SETTLEMENT OR DIFFERENTIAL SETTLEMENT FOR CLASS 1 STRUCTURES

SETTLEMENT POINT	STRUCTURE	SETTLEMENT POINT	STRUCTURE/COMPONENT	ALLOWABLE TOTAL SETTLEMENT* (FEET)	ALLOWABLE DIFFERENTIAL SETTLEMENT* (FEET)
15,16,17,18	North Side of Expansion Joint Service Water Piping at SWPH			0.22 from 8/78	N/A
228	Decontamination Building	250	Pipe Tunnel	N/A	0.06
226	Fuel Building	251	Waste Gas Decay Tank Enclosure	N/A	0.06
8	Service Water Pump House	H-569,H-584	Pipe Hanger in Reservoir	N/A	0.17
114	Service Building (E-17)			0.09	N/A
141	Safeguards Area - Unit 1	253	Unit 1-Casing Cooling Bldg.	N/A	0.12 from 2/79
158	***Turbine Building (B-9 1/2)			0.06	N/A
245,246	Fuel Oil Pump House			0.03	N/A
206,207, 208,209	Boron Recovery Tank Dike			0.03	N/A
204	Circulating Water Intake Structure			0.15	N/A
25,26, 27,28	Service Water Valve House			0.32 (see note)	N/A
29,30 31,32	Service Water Tie-in Vault			0.12 (see note)	N/A

NOTE: From date of Piping Tie-in

* Unless otherwise indicated, allowable settlements are from baseline established in May 1976 or reference evaluations corrected to the May 1976 survey.

** Critical differential settlement is downward of Point 117 with respect to Point 113.

*** Not Class 1 structure, but settlements affects Class 1 pipeline.

3/4.7.13 GROUNDWATER LEVEL-SERVICE WATER RESERVOIR

LIMITING CONDITION FOR OPERATION

3.7.13 The goundwater level of the service water reservoir shall not exceed the elevation at the locations listed in Table 3.7-6. The flow of groundwater from the drains beneath the pumphouse shall not exceed the values given in Table 3.7-6.

APPLICABILITY: All MODES.

ACTION:

With the groundwater level of the service water reservoir or the groundwater flow rate exceeding any of the limits of Table 3.7-6, an engineering evaluation shall be performed by a Licensed Civil Engineer to determine the cause of the high ground water or flow rates and the influence on the stability of the service water reservoir and pumphouse. A Special Report shall be prepared and submitted to the Commission pursuant to Specification 6.9.2 within 90 days, containing the results of the evaluation and any corrective action determined to be necessary.

SURVEILLANCE REQUIREMENTS

4.7.13.1 The groundwater level within the dike of the service water reservoir as determined by monitoring the piezometers shall be within limits presented in Table 3.7-6. Measurements shall be performed at least once per 6 months. The groundwater flow rate shall be determined by measurements at the drain outlet gallery. Flow rate measurements shall be taken at the same frequency as the piezometers (that is once per every 6 months) and the flow rate shall not exceed that established in Table 3.7-6. A visual inspection of the clarity of the outflow from each drain shall be performed in conjunction with the flow monitoring effort.

TABLE 3.7-6

ALLOWABLE GROUNDWATER LEVELS - SERVICE WATER RESERVOIR

PIEZOMETER NO.	PIEZOMETER LOCATION	ALLOWABLE GROUNDWATER ELEVATION, Mean Sea Level (feet)
10	SE, toe	277
11	SWPH, (Units 1 & 2) crest	280
12	SWPH, (Units 1 & 2) toe	285
13	SWPH, (Units 1 & 2) crest	280
14	SWPH, (Units 1 & 2) crest	280
15	SE, crest	280
16	SE, crest	280
17	SE, crest	280
18	SWVH (Units 1 & 2)	295

DRAIN OUTLETS	LOCATION	ALLOWABLE DRAIN FLOW RATE (gallons per minute)
1 through 6	Drainage Gallery	FLOW RATE SHALL NOT EXCEED 8.5 GALLONS PER MINUTE (gpm)

TABLE 4.8-1

LIST OF LOAD SEQUENCING TIMERS AND DESIGN SETPOINTS
"H" BUS

TIMER IDENTIFICATION	SET POINT (SECONDS)	INITIATING[1] SIGNAL	TOLERANCE (SECONDS)
1FWEA01-62	20	SI	±1.00
1FWEA01-62A	25	LOP	±1.25
1SWEA03-62	10	LOP	±0.50
1RSOA01-62B	35	LOP	±1.75
1RSOA01-62A	210	CDA	±21.0
1CCPA01-62Y	15	LOP	±0.75
1CCPA01-62X	20	LOP	±1.00
1RSIA01-62A	20	LOP	±1.00
1RSIA01-62	195	CDA	±9.75
1QSSA01-62A	15	LOP	±0.75
1HVRA03-62	30	LOP	±1.50
1HVRA04-62	10	LOP	±0.50
1HVRB04-62	10	LOP	±0.50
1PGSA02-62A	10	(2)	±0.50
1ENSH06-62A	15	LOP	±0.75
1HVRC04-62	10	LOP	±0.50
1SWSA35-62A1A	15	SI	±1.50
1SWSA35-62B1A	15	SI	±1.50

TABLE 4.8-1 (Continued)

LIST OF LOAD SEQUENCING TIMERS AND DESIGN SETPOINTS
"J" BUS

TIMER IDENTIFICATION	SET POINT (SECONDS)	INITIATING SIGNAL (1)	TOLERANCE (SECONDS)
1FWEB01-62	20	SI	±1.00
1FWEB01-62A	25	LOP	±1.25
1SWEB03-62	10	LOP	±0.50
1RSOB01-62B	35	LOP	±1.75
1RSOB01-62A	210	CDA	±21.0
1CCPB01-62Y	15	LOP	±0.75
1CCPB01-62X	20	LOP	±1.00
1RSIB01-62A	20	LOP	±1.00
1RSIB01-62	195	CDA	±9.75
1QSSB01-62A	15	LOP	±0.75
1HVRB03-62	30	LOP	±1.50
1HVRD04-62	10	LOP	±0.50
1HVRE04-62	10	LOP	±0.50
1HVRF04-62	10	LOP	±0.50
1PGSB02-62A	10	(2)	±0.50
1ENSJ06-62A	15	LOP	±0.75
1SWSB35-62A1B	15	SI	±1.50
1SWSB35-62B1B	15	SI	±1.50

(1) SI - Safety Injection
LOP - Loss of Offsite Power
CDA - Containment Depressurization Actuation
(2) Low primary grade water header pressure

Reference	Monitoring Points	Limiting Item
Containment Unit 1	Fuel Building	Fuel Transfer Tube
Containment Unit 1	Auxiliary Building	3"-WGCB-14
Containment Unit 1	Unit 1 Safeguards Area	12"-SI-1
Containment Unit 1	Unit 1 Main Steam Valve House	6"-SI-16
Containment Unit 1	Service Building (E-3)	32"-SHP-2
Safeguards Area Unit 1	Unit 1 Main Steam Valve House	8"-Q5-3
Auxiliary Building	Unit 1 Main Steam Valve House	8"-WS-113
Auxiliary Building	Fuel Building	4"-RP-28
Auxiliary Building	Service Building Tunnel	24"-WS-102
Service Water Pump House	Service Water Piping @ SWPH	Expansion Joint
Service Water Pump House	Pipe Hanger in Reservoir	24" -WS-11-151-Q3
Service Water Pump House	Service Water Pump House	Mat
Service Bldg. (E-5,E-6)	Unit 1 Main Steam Valve House	24"-WS-26-151-Q3
Service Bldg. (E-14)	Unit 2 Main Steam Valve House	24"-WS-426-151-Q3
Auxiliary Feedwater Pump House - Unit 1	Pipe Tunnel	3"-WAPD-9-601-Q3
Decontamination Bldg.	Pipe Tunnel	3"-CC-90-151-Q3
Fuel Building	Waste Gas Decay Tk. Enclosure	4"-GW-30-154-Q3
Safeguards Area Unit 1	Unit 1 Casing Cooling Building	6"-RS-E15-153A-Q3

The items limiting total settlement of structures are as follows:

Monitoring Points	Limiting Items
Service Water Piping at SWPH	36"-WS-1-151-Q3
Service Building (E-17)	36"-WS-1-151-Q3
Turbine Building (B-9 1/2)	24"-WS-25-151-Q3
Fuel Oil Pump House	2 1/2"-FOF-151-S
Boron Recovery Tank Dike	NOTE (1)
Circulating Water Intake Structure	Service Water Piping expansion joint
Service Water Valve House	32 1/4" - WS-D84-151-Q3
Service Water Tie-in Vault	36" - WS-1-151-Q3

Note (1) No settlement expected; settlement in excess of 0.03 ft. would indicate an abnormality.

(2) Measurements of certain points are required to be performed at least once per 31 days for the first five years of facility operation to provide additional settlement information.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

VIRGINIA ELECTRIC AND POWER COMPANY

OLD DOMINION ELECTRIC COOPERATIVE

DOCKET NO. 50-339

NORTH ANNA POWER STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 76
License No. NPF-7

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Virginia Electric and Power Company, et al., (the licensee) dated September 12, 1986, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-7 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 76 , are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective within sixty days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

L.S. Rubenstein

Lester S. Rubenstein, Director
PWR Project Directorate #2
Division of PWR Licensing-A
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: March 27, 1987

ATTACHMENT TO LICENSE AMENDMENT NO. 76

TO FACILITY OPERATING LICENSE NO. NPF-7

DOCKET NO. 50-339

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed pages as indicated. The revised pages are identified by amendment number and contain vertical lines indicating the area of change. The corresponding overleaf pages are also provided to maintain document completeness.

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3/4 8-24
3/4 8-25
B3/4 7-8

TABLE 3.3-11

FIRE DETECTION INSTRUMENTATION

INSTRUMENT LOCATION	MINIMUM DETECTORS REQUIRED HEAT	MINIMUM DETECTORS REQUIRED SMOKE
Auxiliary Building (cont'd)		
e. General Area Elevation 244'#		1
f. General Area Elevation 259'#		4
g. General Area Elevation 274'#		14
h. General Area Elevation 291'#		4
i. Charcoal Filters		
1. Intake Side#	3/room	
2. Outlet Side#	3/room	
12. Service Water Pump House#		8
13. Auxiliary Service Water Pump House#		1
14. Auxiliary Feed Water Pump House		
a. Turbine Pump Room		1
b. Motor Pump Room		3
15. Quench Spray Pump House		
a. Main Floor		2
b. Basement		4
16. Safeguards Area Ventilation		1
a. System Exhaust Duct		1
17. Main Steam Valve House		10
18. Fuel Building#		1
19. Casing Cooling Pump House		1
20. Post Accident Hydrogen Recombiner Vault#		1
21. Fire Pump House#		1
22. Control Room Air Conditioning Chiller Room		
23. Service Water Valve House#		
a. West Room	2	
b. Northeast Room	1	
c. Southeast Room	1	

* A RCP bearing or motor temperature may be substituted for an inoperable RCP heat detector provided the bearing or motor temperature(s) is monitored at least once per hour when the RCP is in operation.

\# Common to Units 1 and 2.

TABLE 3.7-5 (Continued)

ALLOWABLE TOTAL SETTLEMENT OR DIFFERENTIAL SETTLEMENT FOR CLASS 1 STRUCTURES

SETTLEMENT POINT	STRUCTURE	SETTLEMENT POINT*	STRUCTURE/COMPONENT	ALLOWABLE TOTAL SETTLEMENT* (FEET)	ALLOWABLE DIFFERENTIAL SETTLEMENT* (FEET)
226	Fuel Building	251	Waste Gas Decay Tank Enclosure	N/A	0.06
104	Safeguards Area Unit 2	254	Unit 2 Casing Cooling Building	N/A	0.12 from 2/79
7, 10	Service Water Pump House	15, 16, 17, or 18	Service Water Piping at SWPH North Side of Expansion Joint	N/A	0.22 from 7/77
8	Service Water Pump House	H-569 H-584	Pipe Hanger in Reservoir	N/A	0.17
15,16, 17, 18	Service Water Piping at SWPH North Side of Expansion Joint			0.22 from 8/78	N/A
204	Circulating Water Intake Structure			0.15	N/A
158	***Turbine Building (B-9 1/2)			0.06	N/A
114	Service Building (E-17)			0.09	N/A
245, 246	Fuel Oil Pump House			0.03	N/A
206 207, 208, 209	Boron Recovery Tank Dike			0.03	N/A
25,26,27,28	Service Water Valve House			0.32 (see note)	N/A
29,30,31,32	Service Water Tie-in Vault			0.12 (see note)	N/A

NOTE: From date of piping tie-in

TABLE 3.7-5 (Continued)

ALLOWABLE TOTAL SETTLEMENT OR DIFFERENTIAL SETTLEMENT FOR CLASS 1 STRUCTURES

* Unless otherwise indicated, allowable settlements are from base-line elevations established in May 1976 or reference elevations corrected to the May 1976 survey.

** Critical differential settlement is downward movement of Point 117 with respect to Point 113.

***Not Class 1 structure, but settlement affects Class 1 pipeline.

3/4.7.13 GROUNDWATER LEVEL-SERVICE WATER RESERVOIR

LIMITING CONDITION FOR OPERATION

3.7.13 The groundwater level of the service water reservoir (common to Units 1 and 2) shall not exceed the elevation at the locations listed in Table 3.7-6. The flow of groundwater from the drains beneath the pumphouse shall not exceed the values given in Table 3.7-6.

APPLICABILITY: All MODES.

ACTION:

With the groundwater level of the service water reservoir or the ground water flow rate exceeding any of the limits of Table 3.7-6, an engineering evaluation shall be performed by a Licensed Civil Engineer to determine the cause of the high ground water or flow rates and the influence on the stability of the service water reservoir and pumphouse. A Special Report shall be prepared and submitted to the Commission pursuant to Specification 6.9.2 within 90 days, containing the results of the evaluation and any corrective action determined to be necessary.

SURVEILLANCE REQUIREMENTS

4.7.13.1 The groundwater level within the dike of the service water reservoir as determined by monitoring the piezometers shall be within limits presented in Table 3.7-6. Measurements shall be performed at least once per 6 months. The groundwater flow rate shall be determined by measurements at the drain outlet gallery. Flow rate measurements shall be taken at the same frequency as the piezometers (that is once per every 6 months) and the flow rate shall not exceed that established in Table 3.7-6. A visual inspection of the clarity of the outflow from each drain shall be performed in conjunction with the flow monitoring effort.

TABLE 3.7-6

ALLOWABLE GROUNDWATER LEVELS - SERVICE WATER RESERVOIR

PIEZOMETER NO.	PIEZOMETER LOCATION	ALLOWABLE GROUNDWATER ELEVATION Mean Sea Level (feet)
10	SE, toe	277
11	SWPH, (Units 1 & 2) crest	280
12	SWPH, (Units 1 & 2) toe	285
13	SWPH, (Units 1 & 2) crest	280
14	SWPH, (Units 1 & 2) crest	280
15	SE, crest	280
16	SE, crest	280
17	SE, crest	280
18	SWVH (Units 1 & 2)	295

DRAIN OUTLETS	LOCATION	ALLOWABLE DRAIN FLOWRATE (gallons per minute)
1 through 6	Drainage Gallery	FLOW RATE SHALL NOT EXCEED 8.5 GALLONS PER MINUTE (gpm)

TABLE 4.8-1

LIST OF LOAD SEQUENCING TIMERS AND DESIGN SETPOINTS
"H" BUS

TIMER IDENTIFICATION	SET POINT (SECONDS)	INITIATING[1] SIGNAL	TOLERANCE (SECONDS)
2FWEA01-62	20	SI	±1.00
2FWEA01-62A	25	LOP	±1.25
2SWEA03-62	10	LOP	±0.50
2RSOA01-62B	35	LOP	±1.75
2RSOA01-62A	210	CDA	±21.0
2CCPA01-62Y	15	LOP	±0.75
2CCPA01-62X	20	LOP	±1.00
2RSIA01-62A	20	LOP	±1.00
2RSIA01-62	195	CDA	±9.75
2QSSA01-62A	15	LOP	±0.75
2HVRA03-62	30	LOP	±1.50
2HVRA04-62	10	LOP	±0.50
2HVRB04-62	10	LOP	±0.50
2HVRC04-62	10	LOP	±0.50
2ENSH06-62A	15	LOP	±0.75
2SWSA35-62A2A	15	SI	±1.50
2SWSA35-62B2A	15	SI	±1.50

TABLE 4.8-1 (Continued)

LIST OF LOAD SEQUENCING TIMERS AND DESIGN SETPOINTS
"J" BUS

TIMER IDENTIFICATION	SET POINT (SECONDS)	INITIATING[1] SIGNAL	TOLERANCE (SECONDS)
2FWEB01-62	20	SI	±1.00
2FWEB01-62A	25	LOP	±1.25
2SWEB03-62	10	LOP	±0.50
2RSOB01-62B	35	LOP	±1.75
2RSOB01-62A	210	CDA	±21.0
2CCPB01-62Y	15	LOP	±0.75
2CCPB01-62X	20	LOP	±1.00
2RSIB01-62A	20	LOP	±1.00
2RSIB01-62	195	CDA	±9.75
2QSSB01-62A	15	LOP	±0.75
2HVRB03-62	30	LOP	±1.50
2HVRD04-62	10	LOP	±0.50
2HVRE04-62	10	LOP	±0.50
2HVRF04-62	10	LOP	±0.50
2ENSJ06-62A	15	LOP	±0.75
2SWSB35-62A2B	15	SI	±1.50
2SWSB35-62B2B	15	SI	±1.50

(1) SI - Safety Injection
LOP - Loss of Offsite Power
CDA - Containment Depressurization Actuation

MOTOR-OPERATED VALVES THERMAL OVERLOAD PROTECTION AND/OR BYPASS DEVICES

LIMITING CONDITION FOR OPERATION

3.8.2.6 The thermal overload protection and/or bypass devices, integral with the motor starter, of each valve listed in Table 3.8.2 shall be OPERABLE.

APPLICABILITY: Whenever the motor-operated valve is required to be OPERABLE.

ACTION:

With one or more of the thermal overload protection and/or bypass devices inoperable, declare the affected valve(s) inoperable and apply the appropriate ACTION Statement(s) for the affected valve(s).

SURVEILLANCE REQUIREMENTS

4.8.2.6 The above required thermal overload protection and/or bypass devices shall be demonstrated OPERABLE;

a. At least once per 18 months, by the performance of a CHANNEL FUNCTIONAL TEST of the bypass circuitry for those thermal overload devices which are either:

   1. Continuously bypassed and temporarily placed in force only when the valve motors are undergoing periodic or maintenance testing, or

   2. Normally in force during plant operation and bypassed under accident conditions.

b. At least once per 18 months by the performance of a CHANNEL CALIBRATION of a representative sample of at least 25% of all thermal overload devices which are not bypassed, such that each non-bypassed device is calibrated at least once per 6 years.

TABLE 3.8-2

MOTOR-OPERATED VALVES-THERMAL OVERLOAD PROTECTION AND/OR BYPASS DEVICES

Valve Number	Function	Bypass Device
MOV-QS200A	Quench Spray Pump Suction Valve	No
MOV-QS200B	Quench Spray Pump Suction Valve	No
MOV-QS201A	Quench Spray Pump Discharge Valve	No
MOV-QS201B	Quench Spray Pump Discharge Valve	No
MOV-QS202A	Chemical Addition to Refueling Water Storage Tank Valve	No
MOV-QS202B	Chemical Addition to Refueling Water Storage Tank Valve	No
MOV-RS200A	Casing Cooling to Outside Recirculation Spray Pump	No
MOV-RS200B	Casing Cooling to Outside Recirculation Spray Pump	No
MOV-RS201A	Casing Cooling to Outside Recirculation Spray Pump	No
MOV-RS201B	Casing Cooling to Outside Recirculation Spray Pump	No
MOV-RS255A	Outside Recirculation Spray Pump Suction Valve	No
MOV-RS255B	Outside Recirculation Spray Pump Suction Valve	No
MOV-RS256A	Outside Recirculation Spray Pump Discharge Valve	No
MOV-RS256B	Outside Recirculation Spray Pump Discharge Valve	No
MOV-SW201A	Recirculation Spray Heat Exchanger Supply Header Isolation	No
MOV-SW201B	Recirculation Spray Heat Exchanger Supply Header Isolation	No
MOV-SW201C	Recirculation Spray Heat Exchanger Supply Header Isolation	No
MOV-SW201D	Recirculation Spray Heat Exchanger Supply Header Isolation	No
MOV-SW203A	Recirculation Spray Heat Exchanger Supply Shutoff	No
MOV-SW203B	Recirculation Spray Heat Exchanger Supply Shutoff	No
MOV-SW203C	Recirculation Spray Heat Exchanger Supply Shutoff	No
MOV-SW203D	Recirculation Spray Heat Exchanger Supply Shutoff	No
MOV-SW202A	Recirculation Spray Heat Exchanger Supply Header Crossover Isolation Valve	No
MOV-SW206A	Recirculation Spray Heat Exchanger Supply Header Crossover Isolation Valve	No
MOV-SW202B	Recirculation Spray Heat Exchanger Supply Header Isolation	No
MOV-SW206B	Recirculation Spray Heat Exchanger Supply Header Isolation	No
MOV-SW204A	Return from Recirculation Spray Heat Exchanger	No
MOV-SW204B	Return from Recirculation Spray Heat Exchanger	No
MOV-SW204C	Return from Recirculation Spray Heat Exchanger	No
MOV-SW204D	Return from Recirculation Spray Heat Exchanger	No
MOV-SW205A	Recirculation Spray Heat Exchanger Return Header Isolation	No
MOV-SW205B	Recirculation Spray Heat Exchanger Return Header Isolation	No

TABLE 3.8-2 (Continued)

MOTOR-OPERATED VALVES-THERMAL OVERLOAD PROTECTION AND/OR BYPASS DEVICES

Valve Number	Function	Bypass Device
MOV-SW205C	Recirculation Spray Heat Exchanger Return Header Isolation	No
MOV-SW205D	Recirculation Spray Heat Exchanger Return Header Isolation	No
MOV-SW208A	Component Cooling Heat Exchanger Supply Valve	No
MOV-SW208B	Component Cooling Heat Exchanger Supply Valve	No
MOV-SW210A	Supply to Air Cooling Coils	No
MOV-SW210B	Supply to Air Cooling Coils	No
MOV-SW214A	Return from Air Cooling Coils	No
MOV-SW214B	Return from Air Cooling Coils	No
MOV-SW215A	Auxiliary S.W. Pump Discharge Header Isolation Valve	No
MOV-SW215B	Auxiliary S.W. Pump Discharge Header Isolation Valve	No
MOV-SW217	Auxiliary S.W. Pump Discharge Header Isolation Valve	No
MOV-SW213A	Fuel Pit Coolers Supply Header	No
MOV-SW213B	Fuel Pit Coolers Supply Header	No
MOV-SW219	Cir. Water Intake Service Water Pump Make-up Isolation Valve	No
MOV-SW220A	S.W. Discharge to Circ. Tunnel	No
MOV-SW220B	S.W. Discharge to Circ. Tunnel	No
MOV-SW221A	SWR Spray Header	No
MOV-SW221B	SWR Spray Header	No
MOV-SW222A	SWR Spray Header	No
MOV-SW222B	SWR Spray Header	No
MOV-SW223A	SWR Spray Bypass	No
MOV-SW223B	SWR Spray Bypass	No
MOV-FW200A	Aux. Steam Generator Feedpump Discharge Valve	No
MOV-FW200B	Aux. Steam Generator Feedpump Discharge Valve	No
MOV-FW200C	Aux. Steam Generator Feedpump Discharge Valve	No
MOV-FW200D	Aux. Steam Generator Feedpump Discharge Valve	No
MOV-HV204-1	Emergency Control Room Vent	No
MOV-HV204-2	Emergency Control Room Vent	No
MOV-HV211A	A/C Control Room Chiller Outlet	No
MOV-HV211B	A/C Control Room Chiller Outlet	No
MOV-HV211C	A/C Control Room Chiller Outlet	No
MOV-HV213A	A/C Cond. Water Discharge	No
MOV-HV213B	A/C Cond. Water Discharge	No
MOV-HV213C	A/C Cond. Water Discharge	No
MOV-HV218-1	Emergency Air Supply	No
MOV-HV218-2	Emergency Air Supply	No
MOV-2700	Residual Heat Removal Inlet Isolation Valve	No
MOV-2701	Residual Heat Removal Inlet Isolation Valve	No
MOV-2720A	Residual Heat Removal Outlet Isolation	No
MOV-2720B	Residual Heat Removal Outlet Isolation	No
MOV-2590	Reactor Coolant System Loop A Hot Leg Stop Valve	No
MOV-2592	Reactor Coolant System Loop B Hot Leg Stop Valve	No
MOV-2594	Reactor Coolant System Loop C Hot Leg Stop Valve	No
MOV-2591	Reactor Coolant System Loop A Cold Leg Stop Valve	No

TABLE 3.8-2 (Continued)

MOTOR-OPERATED VALVES-THERMAL OVERLOAD PROTECTION AND/OR BYPASS DEVICES

Valve Number	Function	Bypass Device
MOV-2593	Reactor Coolant System Loop B Cold Leg Stop Valve	No
MOV-2595	Reactor Coolant System Loop C Cold Leg Stop Valve	No
MOV-2585	Reactor Coolant System Loop A Bypass	No
MOV-2586	Reactor Coolant System Loop B Bypass	No
MOV-2587	Reactor Coolant System Loop C Bypass	No
MOV-2381	RCP Seal Leakoff Isolation Valve	No
MOV-2380	RCP Seal Leakoff Isolation Valve	No
MOV-2535	Reactor Coolant System Pressurizer Relief Isolation Valve	No
MOV-2536	Reactor Coolant System Pressurizer Relief Isolation Valve	No
MOV-2115B	Charging Pump Suction from Refueling Water Storage Tank	No
MOV-2115C	Charging Pump Suction from Volume Control Tank	No
MOV-2115D	Charging Pump Suction from Refueling Water Storage Tank	No
MOV-2115E	Charging Pump Suction from Volume Control Tank	No
MOV-2286A	Charging Pump A Discharge	No
MOV-2287A	Charging Pump A Alternate Discharge	No
MOV-2286B	Charging Pump B Discharge	No
MOV-2287B	Charging Pump B Alternate Discharge	No
MOV-2286C	Charging Pump C Discharge	No
MOV-2287C	Charging Pump C Alternate Discharge	No
MOV-2289A	Charging Pumps Discharge Line Stop Valve	No
MOV-2289B	Charging Pumps Discharge Line Stop Valve	No
MOV-2373	Charging Pumps Recirculation Stop Valve	No
MOV-2275A	Charging Pump A Recirc. Stop Valve	No
MOV-2275B	Charging Pump B Recirc. Stop Valve	No
MOV-2275C	Charging Pump C Recirc. Stop Valve	No
MOV-2350	Emergency Borate Valve	No
MOV-2370	Charging Pump to Seal Water Recirc. Stop Valve	No
MOV-2836	High Head Cold Leg Safety Injection Isolation Valve	No
MOV-2869A	Charging Pump Discharge Header Safety Injection Stop Valve	No
MOV-2869B	Charging Pump Discharge Header Safety Injection Stop Valve	No
MOV-2267A	Charging Pump A Suction Valve (VCT)	No
MOV-2267B	Charging Pump A Suction Valve (LHSI)	No
MOV-2269A	Charging Pump B Suction Valve (VCT)	No
MOV-2269B	Charging Pump B Suction Valve (LHSI)	No
MOV-2270A	Charging Pump C Suction Valve (VCT)	No
MOV-2270B	Charging Pump C Suction Valve (LHSI)	No
MOV-2860A	Low Head Safety Injection Pump A Suction Valve	No
MOV-2860B	Low Head Safety Injection Pump B Suction Valve	No
MOV-2862A	Low Head Safety Injection Pump A Suction Valve	No
MOV-2862B	Low Head Safety Injection Pump B Suction Valve	No

TABLE 3.8-2 (Continued)

MOTOR-OPERATED VALVES-THERMAL OVERLOAD PROTECTION AND/OR BYPASS DEVICES

Valve Number	Function	Bypass Device
MOV-2863A	Low Head Safety Injection Pump A Discharge to Charging Pumps	No
MOV-2863B	Low Head Safety Injection Pump B Discharge to Charging Pumps	No
MOV-2864A	Low Head Safety Injection Pump A Discharge Valve	No
MOV-2864B	Low Head Safety Injection Pump B Discharge Valve	No
MOV-2885A	Low Head Safety Injection Pump A Rec. Valve	No
MOV-2885B	Low Head Safety Injection Pump B Rec. Valve	No
MOV-2885C	Low Head Safety Injection Pump A Recirc. Valve	No
MOV-2885D	Low Head Safety Injection Pump B Recirc. Valve	No
MOV-2890A	Low Head Safety Injection Pump A Discharge Line Stop Valve	No
MOV-2890B	Low Head Safety Injection Pump B Discharge Line Stop Valve	No
MOV-2890C	Low Head Safety Injection Pump Discharge Line Stop Valve	No
MOV-2890D	Low Head Safety Injection Pump Discharge Line Stop Valve	No
MOV-2867A	Boron Injection Tank Inlet Valve	No
MOV-2867B	Boron Injection Tank Inlet Valve	No
MOV-2867C	Boron Injection Tank Inlet Valve	No
MOV-2867D	Boron Injection Tank Inlet Valve	No
MOV-2865A	Accumulator Tank Discharge Valve	No
MOV-2865B	Accumulator Tank Discharge Valve	No
MOV-2865C	Accumulator Tank Discharge Valve	No

3/4.7.11 SEALED SOURCE CONTAMINATION

The limitations on sealed source removable contamination ensure that the total body or individual organ irradiation does not exceed allowable limits in the event of ingestion or inhalation of the source material. The limitations on removable contamination for sources requiring leak testing, including alpha emitters, is based on 10 CFR 70.39(c) limits for plutonium. Leakage of sources excluded from the requirements of this specification represent less than one maximum permissible body burden for total body irradiation if the source material is inhaled or ingested. Sealed sources are classified into three groups according to their use, with surveillance requirements commensurate with the probability of damage to a source in that group. Those sources which are frequently handled are required to be tested more often than those which are not. Sealed sources which are continuously enclosed within a shielded mechanism (i.e., sealed sources within radiation monitoring or boron measuring devices) are considered to be stored and need not be tested unless they are removed from the shielded mechanism.

3/4.7.12 SETTLEMENT OF CLASS 1 STRUCTURES

In order to assure that settlement does not exceed allowable values, a program has been established to conduct a survey of a specified number of points at the site on a semiannual basis. The first survey was conducted in May 1976 to establish baseline elevations for most of the points. Where applicable, the baseline elevations of points established subsequent to the May 1976 survey have been adjusted to the May 1976 survey by an evaluation of the settlement records of settlement points on the same structure or on nearby structures. Baseline elevations for points established on dates other than May 1976 are indicated in Table 3.7-5. Additional surveys will be performed semiannually. The determination of the elevation of the points shall be by precise leveling with second order Class II accuracy as defined by the U.S. Department of Commerce National Oceanic and Atmospheric Administration, National Ocean Survey, 1974. When any settlement point listed in Table 3.7-5 is inaccessible during a survey, comparison to allowable settlement shall be based on settlement of other points on the same structure or on nearby structur having similar foundation conditions. When any settlement point listed in Table 3.7-5 is dislocated or replaced, a documented review of the settlement records of points on the same structure and additionally points on nearby structures having similar foundation conditions shall provide a new reference elevation for the point that reflects the estimated settlement since the baseline survey. If the total settlement or differential settlement exceeds 75 percent of the allowable value, the frequency of surveillance shall be increased as dictated by the engineering review. Measurements of certain points are required to be performed at least once per 31 days for the first five years of facility operation to provide additional settlement information.

3/4.7.12 SETTLEMENT OF CLASS 1 STRUCTURES (Continued)

Allowable differential movement is controlled by pipe deflections permitted by fixation points in buildings. The items limiting differential settlement are as follows:

Reference	Monitoring Points	Limiting Item
Containment Unit 2	Fuel Building	Fuel Transfer Tube
Containment Unit 2	Auxiliary Building	3"-SI-417
Containment Unit 2	Unit 2 Safeguards Area	6"-RH-418
Containment Unit 2	Unit 2 Main Steam Valve House	6"-SI-416
Containment Unit 2	Service Building (E-15)	16"-WFPD-409
Safeguards Area Unit 2	Unit 2 Main Steam Valve House	24"-WS-426
Auxiliary Building	Unit 2 Main Steam Valve House	8"-SI-440
Auxiliary Building	Fuel Building	4"-RP-28
Auxiliary Building	Service Building Tunnel	24"-WS-102
Service Building (E-5, E-6)	Unit 1 Main Steam Valve House	24"-WS-26-151-Q3
Service Building (E-14)	Unit 2 Main Steam VAlve House	24"-WS-426-151-Q3
Auxiliary Feedwater Pump House Unit 2	Pipe Tunnel	6"-WCMU-412-151-Q3
Decontamination Building	Pipe Tunnel	3"-CC-90-151-Q3
Fuel Building	Waste Gas Decay Tank Enclosure	4"-GW-30-154-Q3
Safeguards Area Unit 2	Unit 2 Casing Cooling Building	6"-RS-455-153A-Q3
Service Water Pump House	Service Water Piping @ SWPH	Expansion Joint
Service Water Pump House	Pipe Hanger in Reservoir	24"-WS-11-151-Q3
Service Water Pump House	Service Water Pump House	Mat

The items limiting total settlement of structures are as follows:

Monitoring Points	Limiting Items
Service Water Piping @ SWPH	36"-WS-1-151-Q3
Circulating Water Intake Structure	Service Water Piping Expansion Joint
Turbine Building (B-9 1/2)	24"-WS-425-151-Q3
Service Building (E-17)	36"-WS-1-151-Q3
Fuel Oil Pump House	2 1/2"-FOF-151-S
Boron Recovery Tank Dike	No settlement expected; settlement in excess of 0.03 feet would indicate an abnormality.
Service Water Valve House	32 1/4"-WS-D84-151-Q3
Service Water Tie-in Vault	36"-WS-1-151-Q3

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 91 AND 76 TO

FACILITY OPERATING LICENSE NOS. NPF-4 AND NPF-7

VIRGINIA ELECTRIC AND POWER COMPANY

OLD DOMINION ELECTRIC COOPERATIVE

NORTH ANNA POWER STATION, UNITS NO. 1 AND NO. 2

DOCKET NOS. 50-338 AND 50-339

INTRODUCTION

By letter dated September 12, 1986, the Virginia Electric and Power Company (the licensee) requested a change to the Technical Specifications (TS) for the North Anna Power Station, Units No. 1 and No. 2 (NA-1&2). Specifically, the proposed change would allow for the tie-in, startup and operation of an improved replacement spray system for the present service water spray system and its related components. The replacement spray system includes an increased number of spray networks arranged in a more efficient configuration and the addition of spray bypass headers for winter operation. These improvements include the utilization of a new service water valve house, a tie-in vault structure and the expansion of the spray-array system and its support structures. Our discussion and evaluation of the replacement spray system and proposed TS changes is provided below.

DISCUSSION

Service Water Spray System

The original service water system (SWS) design (NA-1&2 SER Section 9.2.1) used the SWS ultimate heat sink (UHS) (NA-1&2 SER Section 9.2.3). The reservoir, using 2 spray headers and 4 spray arrays (2 arrays per header), was the primary heat sink and Lake Anna was the backup source. The same operating conditions will exist using the improved spray network design, or spray network bypass, i.e., the reservoir will continue to be the primary source of water and Lake Anna will continue to be the backup source.

The new SWS spray system consists of four pairs (eight total) of individually controlled spray arrays, i.e., each array will have its own motor operated valve (MOV) for isolation. Each pair of arrays is capable of handling 100% of the flow and heat load generated by one unit during normal operation and Design Basis Accident (DBA) conditions, including a Loss of Coolant Accident (LOCA). Therefore, either of the two main headers can handle 100 percent of the flow and heat load generated by both units during normal operation and DBA conditions.

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The new spray system has a total spray area approximately 1.5 times the original system. Additionally, the individual nozzle-to-nozzle spacing will be increased from 6 feet to 10 feet and the individual riser spacing will be increased from 5 feet to 7 feet. The increased spacing will enhance cooling by promoting increased air flow, thus providing a more efficient system. This allows the system to obtain a closer approach to ambient wet bulb temperature and thus lowers the bulk temperature of the reservoir. The new system, as with the existing system, is capable of maintaining the SWS supply temperature at no greater than 110 degrees Farenheit (°F) during a 30 day period following a LOCA in one unit and shutdown/cooldown of the other unit. As with the previous design, the spray system will not be protected against tornado missiles. Lake Anna will be the UHS in the event of a tornado.

A winter bypass system will be provided for bypassing the spray arrays during the low flow, low heat load periods experienced during the winter months. The spray piping will be provided with self-draining capability in order to maintain a dry condition to prevent freezing during bypass operation. As in the original design, the spray system will be operating with the MOV's in the open position during normal power operation. The MOVs for the bypass headers (two in series in each header) will be closed. During the winter months, the spray header MOVs will be closed and the bypass headers MOVs will be open. Two MOVs in series are provided in the bypass headers to meet the single failure criterion for isolating the headers when necessary for spray operation in the event of a safety injection signal.

The spray system, including the bypass headers, will be designed to seismic Category I requirements. The structural support structure for the spray-array system is located within the reservoir and provides support to pipe system that make-up the spray-array. The structural support structure consists of galvanized ASTM A36 structural members erected as braced frames on concrete footings founded at the top of the reservoir clay liner. The structural support structure is a Category I structure and is designed to meet the NRC acceptance criteria in Standard Review Plan, NUREG-0800, Section 3.8.4. The structure has been designed to resist dead, live, hydrodynamic, thermal, seismic and pipe reaction loads. In addition, the licensee has committed to monitor the water for PH-level and to provide surveillance of the system and structures in conformance with the requirements of ASME Section XI, Class III, which meets NRC requirements.

The MOVs in the spray-array supply line and bypass piping will be 316L stainless steel high performance butterfly valves with extended bonnets to Limitorque operators. These MOVs are seismically and environmentally qualified. New Category I electrical power equipment (motor control centers, motor operators, cable, etc.) will be Class 1E, and seismically and environmentally qualified (IEEE 344 and 323).

The branching and valving for the spray and bypass piping will occur inside the new service water valve house. The spray and bypass piping will enter the reservoir through the valve house and require no piping interface with either the existing spray piping or the existing service water pump house (SWPH).

New Service Water Valve House

The licensee will utilize the partially completed North Anna Units 3 and 4 Service Water Pump House (SWPH) with new modifications as the new Service Water Valve House (SWVH). The SWVH is a reinforced concrete Category I structure founded on a layer of fill. The structure is approximately 45 feet wide by 59 feet long with a 52 foot height.

The structure is designed to resist the dead, live, wind, tornado and seismic loads specified in the NA-1&2 FSAR and/or the acceptance criteria of NRC Standard Review Plan (SRP) Section 3.8.4. The licensee has had in effect for this structure a settlement monitoring program since 1975, and has utilized a preload, consisting of concrete blocks that provided a load of 1200 kips per square foot, to accelerate predicted settlements.

The preloading was applied in 25% increments in order to avoid unwanted loading and monitoring was utilized throughout the preloading operation. The settlement monitoring benchmarks consist of rods embedded into bed rock. Monitoring will continue to follow the original NA-1&2 TS that requires monitoring at one-month intervals for the first year and six-month intervals thereafter.

The part of the SWVH that lies below the water level has been provided with 3 inch impervious clay liner to mitigate water effects on the reinforced concrete structure. Access pipes are provided with sleeves at access points and their expansion joints can accommodate a 4 inch expansion.

The staff requested the licensee to identify changes in stress at key locations resulting from the changes to the structure (SWPH to SWVH). The licensee has reported these results using the governing load combinations, which considers the dead, live, and seismic loads. The results were provided for the base of three SWVH piers. These results indicate no change in stress level for one pier and a decrease in stress for the other two piers.

The safety-grade, seismic Category I ventilation system for the valve house will maintain valve house temperature below 120°F prior to accident scenarios in order to protect the equipment in the valve house. The ventilation system will be load shed in the event of a loss of offsite power, and will be manually loaded onto the emergency buses within 24 house in accordance with plant emergency procedures. Loss of ventilation during this 24-hour period will not result in safety-related equipment degradation.

New Service Water Tie-In Vault Structure

The tie-in vault structure is a new reinforced concrete Category I structure that meets the design requirements of the SWVH. This structure, approximately 31 feet x 30 feet x 27 feet high, will be provided at the tie-in to the presently existing service water lines to protect the four service water headers, four new service water line expansion joints, and two new access ports from the adverse effects of tornado generated missiles and effects due to earthquake induced ground motion.

The tie-in piping, buried piping, expansion joints, and access hatches are designed to QA Category I, ANSI B31.7, Class 3 piping requirements. Seismic pipe supports will be provided for piping inside the tie-in pit to maintain the integrity of the service water system. The construction of the tie-in vault will be such as to protect the seismic adequacy of the operational service water headers.

ASME Section XI Code Applicability

The SWR improvements program is being implemented under the Repair and Replacement rules outlined in ASME Boiler and Pressure Vessel Code, Section XI Rules for Inservice Inspection of Nuclear Power Plant Components. North Anna Power Station Administrative Procedures reference specific editions and addenda of the code. Repairs and replacements will meet the requirements of ASME Section XI, 1980 Edition through Winter 1981 Addenda, Subsections IWA, IWB, IWC, and IWD 4000. Where reference is made to other subsections of the code, the subsection requirements of ASME Section XI 1974 Edition through Summer 1975 Addenda apply. For determining the suitability of replacements, the requirements of Subsections IWA, IWB, IWC and IWD 7000 of the 1980 code and subsequent addenda were used for guidance by the licensee.

Article IWA-7210 of Section XI (1980) states that replacements must meet the requirements of the original construction code for the component or part being replaced. The original construction code for NA-1&2 Service Water System is ANSI (formerly USAS) B31.7-1969 Edition with Addenda through 1970. The Service Water System is governed by Class III requirements of that code for design, materials, dimension, fabrication, assembly, erection, inspection and testing.

The design basis, system description, design evaluation, and components of the existing Service Water Systems are addressed in the NA-1&2 Updated Final Safety Analysis Report, Section 9.2.1.

Technical Specification Changes

As a result of the above design change, certain TA-1&2 TS need to be changed. The need to revise the TS arises primarily from the addition of equipment and structures (service water valve house and the tie-in vault).

TS 3/4.3.3.7 for NA-1&2 discusses fire detection instrumentation, and references Table 3.3-11 which identifies the instrument location, the minimum number required and the type. As a result of the design change, the service valve house was added to Table 3.3-11, and is required to have two heat detectors for the west rooms and a minimum of one heat detector for each of the east rooms. The service water valve house is common to both units. A total of seven heat detectors will be installed, four in the west room and two in each of the east rooms. The proposed specification change is consistent with the rest of the fire protection program for NA-1&2 and is, therefore, acceptable.

TS 3/4.3.1, "AC Sources," for NA-1&2 addresses the AC electrical power sources, and Table 4.8-1 provides a listing of load sequencer timers associated with loading on the emergency diesel generators. Because of the negative starting effects, the MOVs (12 total, 8 spray and 4 bypass) would have on the emergency

electrical distribution system a time delay of 15 seconds between the occurrence of a safety injection (SI) signal, and the actuation of the spray and bypass valves has been added. There are eight timers used to delay operation of the twelve valves, two times with each unit's "J" bus and two timers with each unit's "H" bus. All spray array MOVs will receive an open signal and the bypass MOVs will receive a close signal.

Delaying the operation of the MOVs would not detrimentally affect the service water system (SWS) for the following reasons:

1. The additional heat dissipation requirement (above normal heat load) on the SWS, during the first 15 seconds following a SI signal, is negligible with the delayed opening of the spray valves.

2. The most significant heat load generated from the accident unit and removed by the SWS, originates from the recirculation spray (RS) coolers, which do not function until 195 seconds after the accident when the RS pumps start, provided a containment depressurization signal (CDA) is present.

Because the SWS can operate via the bypass headers during this 15 second period or via the spray arrays if the spray valves are already open (either the spray or bypass MOVs will be open during normal operation), and because the TS do not specify response times for the SWS spray system, the staff concludes that the proposed time delay and, therefore, the TS change, are acceptable.

TS 3/4.8.2 "Onsite Power Distribution System" for NA-2 includes Table 3.8-2, which identifies MOVs with thermal overload protectors and/or bypass devices. This table has been revised to delete the MOVs of the existing spray system and add the spray and bypass MOVs of the new SWS spray system. The revised table will also show no bypass devices for the new valves, which is consistent with the existing spray MOVs and the other MOVs identified in the table.

Because the proposed deletions and additions are required to be consistent with the proposed design changes and the new valves meet or exceed the original design requirements, including the motor thermal overload protection, the staff concludes the proposed changes to Table 3.8-2 are acceptable.

The NA-1&2 TS 3/4.7.12 addresses settlement of Class 1 structures. The new service water valve house and tie-in vault need to be included in the settlement monitoring program. Table 3.7-5 requires revision to include these two structures. In addition to the Limiting Condition for Operation (LCO) listed in Table 3.7-5, the Bases section of 3/4.7.12 also requires revision to include the valve house and tie-in vault monitoring points and their associated limiting items.

Four settlement markers will be added to the valve house and tie-in vault. Baseline elevations will be established for the points prior to final system tie-in. At intervals defined in the TS, the elevations of these points will be measured by accurate survey. The baseline elevations will be periodically compared to current values; if the change exceeds prescribed limits, appropriate action is taken. The settlement monitoring points, limiting values and

monitoring frequencies for the service water valve house and tie-in vault are consistent with the requirements for other Class I structures and satisfy the requirements outlined in the bases of the NA-1&2 TS and NA-1&2 UFSAR Section 3.8.4. Therefore, the staff concludes the proposed changes to Table 3.7.5 and Bases 3/4.7.12 are acceptable.

NA-1&2 TS 3/4.7.13 addresses the groundwater level in the service water reservoir. Table 3.7-6 requires revision to show the location of Piezometer No. 18 at the new service water valve house. This location is currently monitored as part of 3/4.7.13. The change proposed here is to change the designation of this point from "SWPH, (Units 3 and 4)" to "SWVH, (Units 1 and 2)." The staff finds this change to be acceptable.

EVALUATION

As discussed above, the new improved replacement system for the NA-1&2 SW spray system meets the seismic Category I design requirements specified in the NA-1&2 UFSAR and/or the NRC acceptance criteria identified in Standard Review Plan, Section 3.8.4. New Category I electrical power equipment will be Class 1E, and seismically and environmentally qualified (IEEE 344 and 323) and meet NRC requirements. The new system meets the ASME, Class III requirements for design, materials, dimensions, fabrication, assembly, erection, inspection and testing specified in the NA-1&2 UFSAR. Also, the licensee has implemented proper controls for settlement and water monitoring, water stop control, potential pipe expansion at support locations, and surveillance of the system and structures to follow the requirements of ASME XI, Class 3, which meets NRC requirements. In addition, the new design meets the NA-1&2 design criteria that SW spray system temperature shall be maintained at less than or equal to 110°F during a 30 day period following a LOCA in one unit and shutdown/cooldown of the other unit. Finally, the new design meets the single failure criteria specified in the NA-1&2 UFSAR for the SW spray system and the new design is basically operated in the same configuration as the original NA-1&2 SW spray system design. It is noted that the new design has improved efficiency for winter and summer months of operation. Therefore, based on all of the above, the staff finds the new improved service water system to be acceptable and the TS changes required by the new design to be acceptable.

IMPLEMENTATION

The amendments for NA-1&2 shall be effective within sixty days of the date of issuance. Components associated with each service water loop's new spray array header (i.e., MOV-SW123B, MOV-SW223A, MOV-SW221A, MOV-SW222A, MOV-SW121B, and MOV-SW122B for header B; MOV-SW123A, MOV-SW223B, MOV-SW121A, MOV-SW122A, MOV-SW221B, and MOV-SW222B for header A), shall be operable when each new spray array header is declared operational. The components associated with each service water loop's old spray array header (i.e., MOV-SW100A and MOV-SW200A for header B; and MOV-SW100B and MOV-SW200B for header A) are no longer required to be operable once the corresponding service water loop's new spray array header has been declared operational. Based on discussions between the licensee and the NRC staff, the licensee committed to separate by seven days the two 168 hour LCO's required to complete the tie-in, startup, and declaration of operability for headers A and B. The seven day interval will provide added assurance that the initial tie-in, startup, and operability of header A or B (whichever comes first) is functioning properly, and also, allow the licensee additional time to prepare for the final tie-in, startup, and operation of header A or B (whichever comes second).

ENVIRONMENTAL CONSIDERATION

These amendments involve a change in the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously published a proposed finding that these amendments involve no significant hazards consideration and there has been no public comment on such finding. Accordingly, these amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR §51.22(c)(9). Pursuant to 10 CFR §51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of these amendments.

CONCLUSION

We have concluded, based on the considerations discussed above, that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

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