

July 30, 1997

Mr. J. P. O'Hanlon
Senior Vice President - Nuclear
Virginia Electric and Power Company
5000 Dominion Blvd.
Glen Allen, Virginia 23060

SUBJECT: NORTH ANNA UNITS 1 AND 2 - ISSUANCE OF AMENDMENTS RE:
INTERMEDIATE RANGE NEUTRON FLUX TRIP (TAC NOS. M98045 AND M98046)

Dear Mr. O'Hanlon:

The Commission has issued the enclosed Amendment Nos. 206 and 187 to Facility Operating License Nos. NPF-4 and NPF-7 for the North Anna Power Station, Units No. 1 and No. 2. The amendments revise the Technical Specifications (TS) in response to your letter dated November 9, 1987, as supplemented March 31, 1988, June 8, 1992, and February 4, 1997. By the March 1988 letter, you provided revised surveillance requirements and by the June 1992 letter you sent the proposed revision to the TS (3.10.3 and 3.10.4) which were not included in the original submittals. By the February 1997 letter, you submitted the proposed Intermediate Range Trip Setpoints and Allowable Changes on the currently approved Technical Specification pages which included other license amendments that have been approved. The no significant hazards consideration determination submitted in November 1987 did not change.

The amendments address only the proposed change to the Intermediate Range Trip Setpoints and Allowable Values.

A copy of the Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

Original signed by:

Nageswaran Kalyanam, Project Manager
Project Directorate II-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket Nos. 50-338 and 50-339

Enclosures:

1. Amendment No. 206 to NPF-4
2. Amendment No. 187 to NPF-7
3. Safety Evaluation

cc w/enclosures: See next page

FILENAME - G:\NOANNA\M98045-6.AMN

OFFICE	PM:PDII-1	LA:PDII-1	AD:PDII-1	OGC	
NAME	NKalyanam	Dunnington	GEEdison		
DATE	7/17/97	7/17/97	7/19/97	7/17/97	
COPY	Yes/No	Yes/No	Yes/No	Yes/No	

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DATED: July 30, 1997

AMENDMENT NO. 206 TO FACILITY OPERATING LICENSE NO. NPF-4 - NORTH ANNA UNIT 1
AMENDMENT NO. 187 TO FACILITY OPERATING LICENSE NO. NPF-7 - NORTH ANNA UNIT 2

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-338

NORTH ANNA POWER STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 206
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, (the licensee) dated November 9, 1987, as supplemented by letters dated March 31, 1988, June 8, 1992, and February 4, 1997, 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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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. 206, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



Gordon E. Edison, Acting Director
Project Directorate II-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: July 30, 1997

ATTACHMENT TO LICENSE AMENDMENT NO. 206

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.

Remove Pages

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TABLE 2.2-1

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

<u>FUNCTIONAL UNIT</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUES</u>
1. Manual Reactor Trip	Not Applicable	Not Applicable
2. Power Range, Neutron Flux	Low Setpoint - $\leq 25\%$ of RATED THERMAL POWER High Setpoint - $\leq 109\%^{**}$ of RATED THERMAL POWER	Low Setpoint - $\leq 26\%$ of RATED THERMAL POWER High Setpoint - $\leq 110\%^{***}$ of RATED THERMAL POWER
3. Power Range, Neutron Flux, High Positive Rate	$\leq 5\%$ of RATED THERMAL POWER with a time constant ≥ 2 seconds	$\leq 5.5\%$ of RATED THERMAL POWER with a time constant ≥ 2 seconds
4. Power Range, Neutron Flux, High Negative Rate	$\leq 5\%$ of RATED THERMAL POWER with a time constant ≥ 2 seconds	$\leq 5.5\%$ of RATED THERMAL POWER with a time constant ≥ 2 seconds
5. Intermediate Range, Neutron Flux	$\leq 35\%$ of RATED THERMAL POWER	$\leq 40\%$ of RATED THERMAL POWER
6. Source Range, Neutron Flux	$\leq 10^5$ counts per second	$\leq 1.3 \times 10^5$ counts per second
7. Overtemperature ΔT	See Note 1	See Note 3
8. Overpower ΔT	See Note 2	See Note 3
9. Pressurizer Pressure - Low	≥ 1870 psig	≥ 1860 psig
10. Pressurizer Pressure - High	≤ 2360 psig	≤ 2370 psig
11. Pressurizer Water Level - High	$\leq 92\%$ of instrument span	$\leq 93\%$ of instrument span
12. Loss of Flow	$\geq 90\%$ of design flow per loop*	$\geq 89\%$ of design flow per loop*

* Design flow per loop is one-third of the minimum allowable Reactor Coolant System Total Flow Rate as specified in Table 3.2-1.

** The high trip setpoint for Power Range, Neutron Flux, shall be $\leq 103\%$ RATED THERMAL POWER for the period of operation until steam generator replacement.

*** The allowable value for the high trip setpoint for Power Range, Neutron Flux, is required to be $\leq 104\%$ RATED THERMAL POWER for the period of operation until steam generator replacement.

2.2 LIMITING SAFETY SYSTEM SETTINGS

BASES

2.2.1 REACTOR TRIP SYSTEM INSTRUMENTATION SETPOINTS

The Reactor Trip Setpoint Limits specified in Table 2.2-1 are the values at which the Reactor Trips are set for each parameter. The Trip Setpoints have been selected to ensure that the reactor core and reactor coolant system are prevented from exceeding their safety limits. Operation with a trip set less conservative than its Trip Setpoint but within its specified Allowable Value is acceptable on the basis that each Allowable Value is equal to or less than the drift allowance assumed for each trip in the safety analyses.

Manual Reactor Trip

The Manual Reactor Trip is a redundant channel to the automatic protective instrumentation channels and provides manual reactor trip capability.

Power Range, Neutron Flux

The Power Range, Neutron Flux channel high setpoint provides reactor core protection against reactivity excursions which are too rapid to be protected by temperature and pressure protective circuitry. The low setpoint provides redundant protection in the power range for a power excursion beginning from low power. The trip associated with the low setpoint may be manually bypassed when P-10 is active (two of the four power range channels indicate a power level of above approximately 10 percent of RATED THERMAL POWER).

Power Range, Neutron Flux, High Rates

The Power Range Positive Rate trip provides protection against rapid flux increases which are characteristic of rod ejection events from any power level. Specifically, this trip complements the Power Range Neutron Flux High and Low trips to ensure that the criteria are met for rod ejection from partial power.

LIMITING SAFETY SYSTEM SETTINGS

BASES

The Power Range Negative Rate Trip provides protection for control rod drop accidents. At high power, a rod drop accident could cause local flux peaking which could cause an unconservative local DNBR to exist. The Power Range Negative Rate Trip will prevent this from occurring by tripping the reactor. No credit is taken for operation of the Power Range Negative Rate Trip for those control rod drop accidents for which the DNBR's will be greater than the applicable design limit DNBR value for each fuel type.

Intermediate and Source Range, Nuclear Flux

The Source Range Nuclear Flux trip provides reactor core protection during shutdown (Modes 3, 4 and 5) when the reactor trip system breakers are in the closed position. The Source and Intermediate Range trips in addition to the Power Range trips provide core protection during reactor startup (Mode 2). Reactor startup is prohibited unless the Source, Intermediate and Power Range trips are operable in accordance with Specification 3.3.1.1. The Source Range Channels will initiate a reactor trip at about 10^{+5} counts per second unless manually blocked when P-6 becomes active. The Intermediate Range Channels will initiate a reactor trip at a current level proportional to approximately 35 percent of RATED THERMAL POWER unless manually blocked when P-10 becomes active. In the accident analyses, bounding transient results are based on reactivity excursions from an initially critical condition, where the source range trip is assumed to be blocked. Accidents initiated from a subcritical condition would produce less severe results since the source range trip would provide core protection at a lower power level. No credit was taken for operation of the trip associated with the Intermediate Range Channels in the accident analyses; however, their functional capability at the specified trip settings is required by this specification to enhance the overall reliability of the Reactor Protection System.

Overtemperature ΔT

The Overtemperature ΔT trip provides core protection to prevent DNB for all combinations of pressure, power, coolant temperature, and axial power distribution, provided that the transient is slow with respect to piping transient delays from the core to the temperature detectors (about 4 seconds), and pressure is within the range between the High and Low Pressure reactor trips. This setpoint includes corrections for changes in density and heat capacity of water with temperature and dynamic compensation for piping delays from the core to the loop temperature detectors. With normal axial power distribution, this reactor trip limit is always below the core safety limit as shown in Figure 2.1-1. If axial peaks are greater than design, as indicated by the difference between top and bottom power range nuclear detectors, the reactor trip is automatically reduced according to the notations in Table 2.2-1.

TABLE 3.3-1
REACTOR TRIP SYSTEM INSTRUMENTATION

<u>FUNCTIONAL UNIT</u>	<u>TOTAL NO. OF CHANNELS</u>	<u>CHANNELS TO TRIP</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ACTION</u>
1. Manual Reactor Trip	2	1	2	1, 2 and *	12
2. Power Range, Neutron Flux	4	2	3	1, 2	2 [#]
3. Power Range, Neutron Flux High Positive Rate	4	2	3	1, 2	2 [#]
4. Power Range, Neutron Flux, High Negative Rate	4	2	3	1, 2	2 [#]
5. Intermediate Range, Neutron Flux	2	1	2	1 ^{###} , 2	3
6. Source Range, Neutron Flux					
A. Startup	2	1	2	2 ^{##}	4
B. Shutdown	2	1	2	3*, 4* and 5*	15
C. Shutdown	2	0	1	3, 4 and 5	5
7. Overtemperature ΔT					
Three Loop Operation	3	2	2	1, 2	7 [#]
Two Loop Operation	3	1 ^{**}	2	1, 2	9

TABLE 3.3-1 (Continued)

TABLE NOTATION

- * With the reactor trip system breakers in the closed position and the control rod drive system capable of rod withdrawal.
- ** The channel(s) associated with the protective functions derived from the out of service Reactor Coolant Loop shall be placed in the tripped condition.
- *** With the Reactor Trip Breaker open for surveillance testing in accordance with Specification Table 4.3-1 (item 21A).
- # The provisions of Specification 3.0.4 are not applicable.
- ## High voltage to detector may be de-energized above the P-6.
- ### Below the P-10 (Low Setpoint Power Range Neutron Flux Interlock) Setpoint.

ACTION STATEMENTS

- ACTION 1 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, be in HOT STANDBY within 6 hours; however, one channel may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.1.1.1 provided the other channel is operable.
- ACTION 2 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and POWER OPERATION may proceed provided the following conditions are satisfied:
- a. The inoperable channel is placed in the tripped condition within 1 hour.
 - b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 2 hours for surveillance testing of the redundant channel(s) per Specification 4.3.1.1.1.
 - c. Either, THERMAL POWER is restricted to $\leq 75\%$ of RATED THERMAL POWER and the Power Range, Neutron Flux trip setpoint is reduced to $\leq 85\%$ of RATED THERMAL POWER within 4 hours; or, the QUADRANT POWER TILT RATIO is monitored at least once per 12 hours.
 - d. The QUADRANT POWER TILT RATIO shall be determined to be within the limit when above 75 percent of RATED THERMAL POWER with one Power Range Channel inoperable by using the moveable incore detectors to confirm that the normalized symmetric power distribution, obtained from 2 sets of 4 symmetric thimble locations or a full-core flux map, is consistent with the indicated QUADRANT POWER TILT RATIO at least once per 12 hours.
- ACTION 3 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:

TABLE 3.3-1 (Continued)

- a. Below P-6, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 Setpoint.
 - b. Above P-6 but below the P-10 setpoint, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-10 setpoint.
 - c. Above the P-10 setpoint, POWER OPERATION may continued.
- ACTION 4 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:
- a. Below P-6, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 Setpoint.
 - b. Above P-6, operation may continue.
- ACTION 5 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, verify compliance with the SHUTDOWN MARGIN requirements of Specification 3.1.1.1 or 3.1.1.2, as applicable, within 1 hour and at least once per 12 hours thereafter.
- ACTION 6 - Not applicable.
- ACTION 7 - With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and POWER OPERATION may proceed until performance of the next required CHANNEL FUNCTIONAL TEST provided the inoperable channel is placed in the tripped condition within 1 hour.
- ACTION 8 - Not applicable.

TABLE 4.3-1

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>FUNCTIONAL UNIT</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL CALIBRATION</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>MODES IN WHICH SURVEILLANCE REQUIRED</u>
1. Manual Reactor Trip	N.A.	N.A.	R ⁽⁷⁾	1, 2 and *
2. Power Range, Neutron Flux	S	D ⁽²⁾ , M ⁽³⁾ and Q ⁽⁶⁾	M	1, 2
3. Power Range, Neutron Flux, High Positive Rate	N.A.	R ⁽⁶⁾	M	1, 2
4. Power Range, Neutron Flux, High Negative Rate	N.A.	R ⁽⁶⁾	M	1, 2
5. Intermediate Range, Neutron Flux	a. S b. M ⁽¹¹⁾	R ^(6, 12) N.A.	M, S/U ⁽¹⁾ N.A.	1***, 2 3*, 4*, 5*
6. Source Range, Neutron Flux	N.A.	R ⁽⁶⁾	M, S/U ⁽¹⁾	2, 3, 4 and 5
7. Overtemperature ΔT	S	R ⁽⁶⁾	M	1, 2
8. Overpower ΔT	S	R ⁽⁶⁾	M	1, 2
9. Pressurizer Pressure – Low	S	R	M	1, 2
10. Pressurizer Pressure – High	S	R	M	1, 2
11. Pressurizer Water Level – High	S	R	M	1, 2
12. Loss of Flow – Single Loop	S	R	M	1

TABLE 4.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>FUNCTIONAL UNIT</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL CALIBRATION</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>MODES IN WHICH SURVEILLANCE REQUIRED</u>
13. Loss of Flow – Two Loops	S	R	NA.	1
14. Steam Generator Water Level – Low-Low	S	R	M	1, 2
15. Steam/Feedwater Flow Mismatch and Low Steam Generator Water Level	S	R	M	1, 2
16. Undervoltage – Reactor Coolant Pump Busses	NA.	R	NA.	1
17. Underfrequency – Reactor Coolant Pump Busses	NA.	R	NA.	1
18. Turbine Trip				
A. Low Auto Stop Oil Pressure	NA.	NA.	S/U(1)	1, 2
B. Turbine Stop Valve Closure	NA.	NA.	S/U(1)	1, 2
19. Safety Injection Input from ESF	NA.	NA.	M(4) & (5)	1, 2
20. Reactor Coolant Pump Breaker Position Trip	NA.	NA.	R	NA.
21. A. Reactor Trip Breaker	NA.	NA.	M(5), (8), & (10)	1, 2, & *
B. Reactor Trip Bypass Breaker	NA.	NA.	M(5), (8), & R(9)	1, 2, & *
22. Automatic Trip Logic	NA.	NA.	M(5)	1, 2, & *

NORTH ANNA - UNIT 1

3/4 3-13

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165

TABLE 4.3-1 (Continued)

NOTATION

- * – With the reactor trip system breakers closed and the control rod drive system capable of rod withdrawal.
- *** – Below P-10 (Low Setpoint Power Range Neutron Flux Interlock) Setpoint.
- (1) – If not performed in previous 7 days.
- (2) – Heat balance only, above 15% of RATED THERMAL POWER.
- (3) – Compare incore to excore axial offset above 15% of RATED THERMAL POWER. Adjust channel if absolute difference ≥ 3 percent.
- (4) – Manual ESF functional input check every 18 months.
- (5) – Each train or logic channel shall be tested at least every 62 days on a STAGGERED TEST BASIS.
- (6) – Neutron detectors may be excluded from CHANNEL CALIBRATION.
- (7) – The CHANNEL FUNCTIONAL TEST shall independently verify the OPERABILITY of the undervoltage and shunt trip circuits for the manual reactor trip function. The test shall also verify the operability of the Bypass Breaker Trip circuit(s).
- (8) – Local manual shunt trip prior to placing the bypass breaker into service.
- (9) – Automatic undervoltage trip.
- (10) – The CHANNEL FUNCTIONAL TEST shall independently verify the OPERABILITY of the undervoltage and shunt trip attachments of the Reactor Trip Breakers.
- (11) – Monthly Surveillance in Modes 3*, 4* and 5* shall also include verification that Permissives P-6 and P-10 are in their required state for existing plant conditions by observation of the permissive annunciator window.
- (12) – Detector plateau curves shall be obtained and evaluated. The provisions of Specification 4.0.4 are not applicable for entry into Mode 2 or 1.

SPECIAL TEST EXCEPTIONS

PHYSICS TESTS

LIMITING CONDITION FOR OPERATION

3.10.3 The limitations of Specifications 3.1.1.4, 3.1.3.1, 3.1.3.5 and 3.1.3.6 may be suspended during the performance of PHYSICS TESTS provided:

- a. The THERMAL POWER does not exceed 5% of RATED THERMAL POWER,
- b. The reactor trip setpoints on the OPERABLE Intermediate Range Channels are set at less than or equal to 35% of RATED THERMAL POWER, and
- c. The reactor trip setpoints on the OPERABLE Power Range Channels are set at less than or equal to 25% of RATED THERMAL POWER.

APPLICABILITY: MODE 2.

ACTION:

With the THERMAL POWER > 5% of RATED THERMAL POWER, immediately open the reactor trip breakers.

SURVEILLANCE REQUIREMENTS

4.10.3.1 The THERMAL POWER shall be determined to be $\leq 5\%$ of RATED THERMAL POWER at least once per hour during PHYSICS TESTS.

4.10.3.2 Each Intermediate and Power Range Channel shall be subjected to a CHANNEL FUNCTIONAL TEST within 12 hours prior to initiating PHYSICS TESTS.

SPECIAL TEST EXCEPTIONS

REACTOR COOLANT LOOPS

LIMITING CONDITION FOR OPERATION

3.10.4 The limitations of Specification 3.4.1.1 may be suspended during the performance of startup and PHYSICS TESTS provided:

- a. The THERMAL POWER does not exceed the P-7 Interlock Setpoint,
- b. The Reactor Trip Setpoints on the OPERABLE Intermediate Range Channels are set at less than or equal to 35% of RATED THERMAL POWER, and
- c. The Reactor Trip Setpoints on the OPERABLE Power Range Channels are set at less than or equal to 25% of RATED THERMAL POWER.

APPLICABILITY: During operation below the P-7 Interlock Setpoint.

ACTION:

With the THERMAL POWER greater than the P-7 Interlock Setpoint, immediately open the reactor trip breakers.

SURVEILLANCE REQUIREMENTS

4.10.4.1 The THERMAL POWER shall be determined to be less than P-7 Interlock Setpoint at least once per hour during startup and PHYSICS TESTS.

4.10.4.2 Each Intermediate, Power Range Channel and P-7 Interlock shall be subjected to a CHANNEL FUNCTIONAL TEST within 12 hours prior to initiating startup or PHYSICS TESTS.



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
WASHINGTON, D.C. 20555-0001

VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-339

NORTH ANNA POWER STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 187
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, (the licensee) dated November 9, 1987, as supplemented by letters dated March 31, 1988, June 8, 1992, and February 4, 1997, 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. 187, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION



Gordon E. Edison, Acting Director
Project Directorate II-1
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: July 30, 1997

ATTACHMENT TO LICENSE AMENDMENT NO. 187

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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TABLE 2.2-1

REACTOR TRIP SYSTEM INSTRUMENTATION TRIP SETPOINTS

<u>FUNCTIONAL UNIT</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUES</u>
1. Manual Reactor Trip	Not Applicable	Not Applicable
2. Power Range, Neutron Flux	Low Setpoint - $\leq 25\%$ of RATED THERMAL POWER High Setpoint - $\leq 109\%$ of RATED THERMAL POWER	Low Setpoint - $\leq 26\%$ of RATED THERMAL POWER High Setpoint - $\leq 110\%$ of RATED THERMAL POWER
3. Power Range, Neutron Flux, High Positive Rate	$\leq 5\%$ of RATED THERMAL POWER with a time constant ≥ 2 seconds	$\leq 5.5\%$ of RATED THERMAL POWER with a time constant ≥ 2 seconds
4. Power Range, Neutron Flux, High Negative Rate	$\leq 5\%$ of RATED THERMAL POWER with a time constant ≥ 2 seconds	$\leq 5.5\%$ of RATED THERMAL POWER with a time constant ≥ 2 seconds
5. Intermediate Range, Neutron Flux	$\leq 35\%$ of RATED THERMAL POWER	$\leq 40\%$ of RATED THERMAL POWER
6. Source Range, Neutron Flux	$\leq 10^5$ counts per second	$\leq 1.3 \times 10^5$ counts per second
7. Overtemperature ΔT	See Note 1	See Note 3
8. Overpower ΔT	See Note 2	See Note 3
9. Pressurizer Pressure – Low	≥ 1870 psig	≥ 1860 psig
10. Pressurizer Pressure – High	≤ 2360 psig	≤ 2370 psig
11. Pressurizer Water Level – High	$\leq 92\%$ of instrument span	$\leq 93\%$ of instrument span
12. Loss of Flow	$\geq 90\%$ of design flow per loop*	$\geq 89\%$ of design flow per loop*

* Design flow per loop is one-third of the minimum allowable Reactor Coolant System Total Flow Rate as specified in Table 3.2-1.

2.2 LIMITING SAFETY SYSTEM SETTINGS

BASES

2.2.1 REACTOR TRIP SYSTEM INSTRUMENTATION SETPOINTS

The Reactor Trip Setpoint Limits specified in Table 2.2-1 are the values at which the Reactor Trips are set for each parameter. The Trip Setpoints have been selected to ensure that the reactor core and reactor coolant system are prevented from exceeding their safety limits. Operation with a trip set less conservative than its Trip Setpoint but within its specified Allowable Value is acceptable on the basis that the difference between Trip Setpoint and the Allowable Value is equal to or less than the drift allowance assumed for each trip in the safety analyses.

Manual Reactor Trip

The Manual Reactor Trip is a redundant channel to the automatic protective instrumentation channels and provides manual reactor trip capability.

Power Range, Neutron Flux

The Power Range, Neutron Flux channel high setpoint provides reactor core protection against reactivity excursions which are too rapid to be protected by temperature and pressure protective circuitry. The low setpoint provides redundant protection in the power range for a power excursion beginning from low power. The trip associated with the low setpoint may be manually bypassed when P-10 is active (two of the four power range channels indicate a power level of above approximately 10 percent of RATED THERMAL POWER).

Power Range, Neutron Flux, High Rates

The Power Range Positive Rate trip provides protection against rapid flux increases which are characteristic of rod ejection events from any power level. Specifically, this trip complements the Power Range Neutron Flux High and Low trips to ensure that the criteria are met for rod ejection from partial power.

The Power Range Negative Rate Trip provides protection for control rod drop accidents. At high power, a rod drop accident could cause local flux peaking which could cause an unconservative local DNBR to exist. The Power Range Negative Rate Trip will prevent this from occurring by tripping the reactor. No credit is taken for operation of the Power Range Negative Rate Trip for those control rod drop accidents for which the DNBR's will be greater than the applicable design limit DNBR value for each fuel type.

LIMITING SAFETY SYSTEM SETTINGS

BASES

Intermediate and Source Range, Nuclear Flux

The Source Range Nuclear Flux trip provides reactor core protection during shutdown (Modes 3, 4, and 5) when the reactor trip system breakers are in the closed position. The Source and Intermediate Range trips in addition to the Power Range trips provide core protection during reactor startup (Mode 2). Reactor startup is prohibited unless the Source, Intermediate and Power Range trips are operable in accordance with Specification 3.3.1.1. The Source Range Channels will initiate a reactor trip at about 10^{+5} counts per second unless manually blocked when P-6 becomes active. The Intermediate Range Channels will initiate a reactor trip at a current level proportional to approximately 35 percent of RATED THERMAL POWER unless manually blocked when P-10 becomes active. In the accident analyses, bounding transient results are based on reactivity excursions from an initially critical condition, where the source range trip is assumed to be blocked. Accidents initiated from a subcritical condition would produce less severe results since the source range trip would provide core protection at a lower power level. No credit was taken for operation of the trip associated with the Intermediate Range Channels in the accident analyses; however, their functional capability at the specified trip settings is required by this specification to enhance the overall reliability of the Reactor Protection System.

Overtemperature Delta T

The Overtemperature Delta T trip provides core protection to prevent DNB for all combinations of pressure, power, coolant temperature, and axial power distribution, provided that the transient is slow with respect to piping transient delays from the core to the temperature detectors (about 4 seconds), and pressure is within the range between the High and Low Pressure reactor trips. This setpoint includes corrections for changes in density and heat capacity of water with temperature and dynamic compensation for piping delays from the core to the loop temperature detectors. With normal axial power distribution, this reactor trip limit is always below the core safety limit as shown in Figure 2.1-1. If axial peaks are greater than design, as indicated by the difference between top and bottom power range nuclear detectors, the reactor trip is automatically reduced according to the notations in Table 2.2-1.

Operation with a reactor coolant loop out of service below the 3 loop P-8 setpoint does not require reactor protection system setpoint modification because the P-8 setpoint and associated trip will prevent DNB during 2 loop operation exclusive of the Overtemperature Delta T setpoint. Two loop operation above the 3 loop P-8 setpoint is permissible after resetting the K_1 , K_2 and K_3 inputs to the Overtemperature Delta T channels and raising the P-8 setpoint to its 2 loop value. In this mode of operation, the P-8 interlock and trip functions as a High Neutron Flux trip at the reduced power level.

TABLE 3.3-1
REACTOR TRIP SYSTEM INSTRUMENTATION

<u>FUNCTIONAL UNIT</u>	<u>TOTAL NO. OF CHANNELS</u>	<u>CHANNELS TO TRIP</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABLE MODES</u>	<u>ACTION</u>
1. Manual Reactor Trip	2	1	2	1, 2 and *	12
2. Power Range, Neutron Flux	4	2	3	1, 2	2 [#]
3. Power Range, Neutron Flux High Positive Rate	4	2	3	1, 2	2 [#]
4. Power Range, Neutron Flux, High Negative Rate	4	2	3	1, 2	2 [#]
5. Intermediate Range, Neutron Flux	2	1	2	1 ^{###} , 2	3
6. Source Range, Neutron Flux					
A. Startup	2	1	2	2 ^{##}	4
B. Shutdown	2	1	2	3*, 4* and 5*	15
C. Shutdown	2	0	1	3, 4 and 5	5
3. Overtemperature ΔT					
Three Loop Operation	3	2	2	1, 2	7 [#]
Two Loop Operation	3	1 ^{**}	2	1, 2	9

TABLE 3.3-1(CONTINUED)

TABLE NOTATION

- * With the reactor trip system breakers in the closed position and the control rod drive system capable of rod withdrawal.
- ** The channel(s) associated with the protective functions derived from the out of service Reactor Coolant Loop shall be placed in the tripped condition.
- *** With the Reactor Trip Breaker open for surveillance testing in accordance with Specification Table 4.3-1 (item 21A).
- # The provisions of Specification 3.0.4 are not applicable.
- ## High voltage to detector may be de-energized above the P-6, (Block of Source Range Reactor Trip), setpoint.
- ### Below the P-10 (Low Setpoint Power Range Neutron Flux Interlock) Setpoint.

ACTION STATEMENTS

- ACTION 1 – With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirements, be in HOT STANDBY within 6 hours; however, one channel may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.1.1.1 provided the other channel is OPERABLE.
- ACTION 2 – With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and POWER OPERATION may proceed provided the following conditions are satisfied:
- a. The inoperable channel is placed in the tripped condition within 1 hour.
 - b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 2 hours for surveillance testing of the redundant channel(s) per Specification 4.3.1.1.1.
 - c. Either, THERMAL POWER is restricted to $\leq 75\%$ of RATED THERMAL POWER and the Power Range, Neutron Flux trip setpoint is reduced to $\leq 85\%$ of RATED THERMAL POWER within 4 hours; or, the QUADRANT POWER TILT RATIO is monitored at least once per 12 hours.
 - d. The QUADRANT POWER TILT RATIO shall be determined to be within the limit when above 75 percent of RATED THERMAL POWER with one Power Range Channel inoperable by using the movable incore detectors to confirm that the normalized symmetric power distribution, obtained from 2 sets of 4 symmetric thimble locations or a full-core flux map, is consistent with the indicated QUADRANT POWER TILT RATIO at least once per 12 hours.

TABLE 3.3-1 (CONTINUED)

- ACTION 3 – With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:
- Below the P-6, (Block of Source Range Reactor Trip) setpoint, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 Setpoint.
 - Above the P-6 (Block of Source Range Reactor Trip) setpoint, but below the P-10 setpoint, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-10 setpoint.
 - Above the P-10 setpoint, POWER OPERATION may continued.
- ACTION 4 – With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:
- Below P-6, (Block of Source Range Reactor Trip) setpoint, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 Setpoint.
 - Above P-6, (Block of Source Range Reactor Trip) setpoint, operation may continue.
- ACTION 5 – With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, verify compliance with the SHUTDOWN MARGIN requirements of Specification 3.1.1.1 or 3.1.1.2, as applicable, within 1 hour and at least once per 12 hours thereafter.
- ACTION 6 – Not applicable.
- ACTION 7 – With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and POWER OPERATION may proceed until performance of the next required CHANNEL FUNCTIONAL TEST provided the inoperable channel is placed in the tripped condition within 1 hour.
- ACTION 8 – Not applicable.

TABLE 4.31
REACTOR TRIP SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>FUNCTIONAL UNIT</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL CALIBRATION</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>MODES IN WHICH SURVEILLANCE REQUIRED</u>
1. Manual Reactor Trip	N.A.	N.A.	R ⁽⁸⁾	1, 2 and *
2. Power Range, Neutron Flux	S	D ⁽²⁾ , M ⁽³⁾ and Q ⁽⁶⁾	M	1, 2
3. Power Range, Neutron Flux, High Positive Rate	N.A.	R ⁽⁶⁾	M	1, 2
4. Power Range, Neutron Flux, High Negative Rate	N.A.	R ⁽⁶⁾	M	1, 2
5. Intermediate Range, Neutron Flux	a. S b. M ⁽¹²⁾	R ^(6, 13) N.A.	M, S/U ⁽¹⁾ N.A.	1***, 2 3*, 4*, 5*
6. Source Range, Neutron Flux	S ⁽⁷⁾	R ⁽⁶⁾	M, S/U ⁽¹⁾	2, 3, 4, 5 and *
7. Overtemperature ΔT	S	R ⁽⁶⁾	M	1, 2
8. Overpower ΔT	S	R ⁽⁶⁾	M	1, 2
9. Pressurizer Pressure – Low	S	R	M	1, 2
10 Pressurizer Pressure – High	S	R	M	1, 2
11. Pressurizer Water Level – High	S	R	M	1, 2
12. Loss of Flow – Single Loop	S	R	M	1

TABLE 4.3-1 (Continued)

REACTOR TRIP SYSTEM INSTRUMENTATION SUREVEILLANCE REQUIREMENTS

<u>FUNCTIONAL UNIT</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL CALIBRATION</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>MODES IN WHICH SURVEILLANCE REQUIRED</u>
13. Loss of Flow - Two Loops	S	R	NA.	1
14. Steam Generator Water Level - Low-Low	S	R	M	1, 2
15. Steam/Feedwater Flow Mismatch and Low Steam Generator Water Level	S	R	M	1, 2
16. Undervoltage - Reactor Coolant Pump Busses	NA.	R	M	1
17. Underfrequency - Reactor Coolant Pump Busses	NA.	R	M	1
18. Turbine Trip				
A. Low Auto Stop Oil Pressure	NA.	NA.	S/U(1)	NA.
B. Turbine Stop Valve Closure	NA.	NA.	S/U(1)	NA.
19. Safety Injection Input from ESF	NA.	NA.	M(4)** & (5)	1, 2
20. Reactor Coolant Pump Breaker Position Trip	NA.	NA.	R	1
21. A. Reactor Trip Breaker	NA.	NA.	M(5), (9), & (11)	1, 2, & *
B. Reactor Trip Bypass Breaker	NA.	NA.	M(5), (9), & R(10)	1, 2, & *
22. Automatic Trip Logic	NA.	NA.	M(5)	1, 2, & *

TABLE 4.3-1(CONTINUED)

NOTATION

- * – With the reactor trip system breakers closed and the control rod drive system capable of rod withdrawal.
- ** – Surveillance requirements for the manual ESF functional test of the safety injection input to the reactor trip breakers is suspended for the duration of Cycle 9 operation.
- *** – Below P-10 (Low Setpoint Power Range Neutron Flux Interlock) Setpoint.
- (1) – If not performed in previous 7 days.
- (2) – Heat balance only, above 15% of RATED THERMAL POWER. Adjust channel if absolute difference >2 percent.
- (3) – Compare incore to excore axial offset above 15% of RATED THERMAL POWER. Recalibrate if absolute difference \geq 3 percent.
- (4) – Manual ESF functional input check every 18 months.
- (5) – Each train or logic channel shall be tested at least every 62 days on a STAGGERED TEST BASIS.
- (6) – Neutron detectors may be excluded from CHANNEL CALIBRATION.
- (7) – Below the P-6, (Block of Source Range Reactor Trip) Setpoint.
- (8) – The CHANNEL FUNCTIONAL TEST shall independently verify the OPERABILITY of the undervoltage and shunt trip circuits for the Manual Reactor Trip Function. The test shall also verify the OPERABILITY of the Bypass Breaker trip circuit(s).
- (9) – Local manual shunt trip prior to placing the bypass breaker into service.
- (10) – Automatic undervoltage trip.
- (11) – The CHANNEL FUNCTIONAL TEST shall independently verify the OPERABILITY of the undervoltage and shunt trip attachments of the Reactor Trip Breakers.
- (12) – Monthly Surveillance in Modes 3*, 4* and 5* shall also include verification that permissives P-6 and P-10 are in their required state for existing plant conditions by observation of the permissive annunciator window.
- (13) – Detector plateau curves shall be obtained and evaluated. The provisions of Specification 4.0.4 are not applicable for entry into Mode 2 or 1.

SPECIAL TEST EXCEPTIONS

PHYSICS TESTS

LIMITING CONDITION FOR OPERATION

3.10.3 The limitations of Specifications 3.1.1.4, 3.1.1.5, 3.1.3.1, 3.1.3.5 and 3.1.3.6 may be suspended during the performance of PHYSICS TESTS provided:

- a. The THERMAL POWER does not exceed 5% of RATED THERMAL POWER,
- b. The reactor trip setpoints on the OPERABLE Intermediate Range Channels are set at less than or equal to 35% of RATED THERMAL POWER,
- c. The reactor trip setpoints on the OPERABLE Power Range Channels are set at less than or equal to 25% of RATED THERMAL POWER, and
- d. The Reactor Coolant System lowest operating loop temperature (T_{avg}) is greater than or equal to 531°F.

APPLICABILITY: MODE 2.

ACTION:

- a. With the THERMAL POWER greater than 5% of RATED THERMAL POWER, immediately open the reactor trip breakers.
- b. With a Reactor Coolant System operating loop temperature (T_{avg}) less than 531°F, restore T_{avg} to within its limit within 15 minutes or be in at least HOT STANDBY within the next 15 minutes.

SURVEILLANCE REQUIREMENTS

4.10.3.1 The THERMAL POWER shall be determined to be less than or equal to 5% of RATED THERMAL POWER at least once per hour during PHYSICS TESTS.

4.10.3.2 Each Intermediate and Power Range Channel shall be subjected to a CHANNEL FUNCTIONAL TEST within 12 hours prior to initiating PHYSICS TESTS.

4.10.3.3 The Reactor Coolant System temperature (T_{avg}) shall be determined to be greater than or equal to 531°F at least once per 30 minutes during PHYSICS TESTS.

SPECIAL TEST EXCEPTIONS

REACTOR COOLANT LOOPS

LIMITING CONDITION FOR OPERATION

3.10.4 The limitations of Specification 3.4.1.1 may be suspended during the performance of startup and PHYSICS TESTS provided:

- a. The THERMAL POWER does not exceed the P-7 Interlock Setpoint,
- b. The reactor trip setpoints on the OPERABLE Intermediate Range Channels are set at less than or equal to 35% of RATED THERMAL POWER, and
- c. The reactor trip setpoints on the OPERABLE Power Range Channels are set at less than or equal to 25% of RATED THERMAL POWER.

APPLICABILITY: During operation below the P-7 Interlock Setpoint.

ACTION:

With the THERMAL POWER greater than the P-7 Interlock Setpoint, immediately open the reactor trip breakers.

SURVEILLANCE REQUIREMENTS

4.10.4.1 The THERMAL POWER shall be determined to be less than P-7 Interlock Setpoint at least once per hour during startup and PHYSICS TESTS.

4.10.4.2 Each Intermediate, Power Range Channel and P-7 Interlock shall be subjected to a CHANNEL FUNCTIONAL TEST within 12 hours prior to initiating startup or PHYSICS TESTS.



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001**

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NOS. 206 AND 187 TO
FACILITY OPERATING LICENSE NOS. NPF-4 AND NPF-7
VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA POWER STATION, UNITS NO. 1 AND NO. 2
DOCKET NOS. 50-338 AND 50-339

1.0 INTRODUCTION

By letter dated February 4, 1997, Virginia Electric and Power Company (VEPCO) proposed changes to the setpoint and the allowable value of the intermediate range (IR) trip for the North Anna Units 1 and 2 Technical Specifications (TS). The same changes had been proposed previously in a letter dated November 9, 1987, and supplemented March 31, 1988, and June 8, 1992. VEPCO resubmitted the proposed changes on February 4, 1997, in order to take into account changes to the TS that had been made in the interim. The proposed changes are as follows: The trip setpoint specified in TS Table 2.2-1 would be changed from $\leq 25\%$ to $\leq 35\%$ of rated thermal power (RTP) and the allowable value would be changed from $\leq 30\%$ to $\leq 40\%$ of RTP. TS 3.10.3 and 3.10.4 would similarly be revised. In addition, a footnote would be added for Mode 1 in the Applicable Modes column of TS Table 3.3-1 and to the Modes in Which Surveillance Required column of TS Table 4.3-1 to limit applicability to power levels below the P-10 (low setpoint power range neutron flux interlock) setpoint.

2.0 EVALUATION

Presently, an IR trip is generated based on one-out-of-two channels exceeding a detector current equivalent to 25% of RTP. The channels can be manually bypassed when permissive P-10 (2 of 4 power range channels greater than 10% of RTP) is active. Therefore, the channels are not required to be operable for power levels above 10% of RTP, where the power range neutron flux-high setpoint trip and the power range neutron flux-high positive rate trip provide core protection for a rod withdrawal transient. The power range trips are required to be operable during Modes 1 and 2. In Modes 3, 4, or 5, the source range flux trips must be operable whenever the control rods are energized and capable of withdrawal. As a result, there is no operating condition under which the IR trip provides sole overpower protection. Therefore, the IR nuclear flux trips merely provide backup reactor core protection during reactor startup and no credit is taken for their operation in the safety analyses. Therefore, the increase in the IR setpoint from a nominal value of

25% of RTP to 35% of RTP is acceptable. In addition, retention of the 5% margin between the nominal (35%) and allowable (40%) setpoint reflects the effects of instrument drift between surveillance tests and is acceptable. With the IR setpoint at 25% of RTP, the variability in IR channel response with control rod position was such that in some conditions there was very little operating space between the P-10 permissive level, which allows the operator to block the IR trip function, and the power level at which the IR trip occurs. As a result, there was a potential for unneeded unit trips due to inadequate response time available to the operator for blocking the trip during power ascension. By raising the setpoint to 35% of RTP, the minimum amount of operating space between the interlock and a potential trip is increased, thereby allowing for more time to block the trip when normal power ascension is occurring and its protective function is not required.

The proposed footnotes to TS Tables 3.3-1 and 4.3-1 state the operability and surveillance requirements for the IR trips for those conditions where the IR trips perform a backup function to the power range low setpoint trips, i.e., in Modes 1 and 2 below the P-10 interlock. The requirement for the shutdown modes (with the trip breakers closed) involves monthly verification (via permissive checks) that the power range low setpoint and source range trips cannot be blocked below the appropriate power levels. Therefore, their ranges of protection are properly overlapped and the proposed footnotes are acceptable.

3.0 SUMMARY

Based on the above evaluation, the staff concludes that the proposed TS changes to the IR flux trip setpoint and allowable value for North Anna Units 1 and 2 are acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Virginia State official was notified of the proposed issuance of the amendments. The State official had no comment.

5.0 ENVIRONMENTAL CONSIDERATION

These amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC 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 issued a proposed finding that these amendments involve no significant hazards consideration and there has been no public comment on such finding (62 FR 33136). 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 the amendments.

6.0 CONCLUSION

The Commission has 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, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: L. Kopp

Date: July 30, 1997