



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

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

DOCKET NO. STN 50-528

PALO VERDE NUCLEAR GENERATING STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 10
License No. NPF-41

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment, dated July 23, 1986, as supplemented by letters dated August 26 and September 26, 1986, by the Arizona Public Service Company (APS) on behalf of itself and the Salt River Project Agricultural Improvement and Power District, El Paso Electric Company, Southern California Edison Company, Public Service Company of New Mexico, Los Angeles Department of Water and Power, and Southern California Public Power Authority (licensees), complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of Act, and the 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;
 - 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 enclosure to this license amendment, and paragraph 2.C(2) of the Facility Operating License No. NPF-41 is hereby amended to read as follows:

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(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 10, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in this license. APS shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



E. A. Licitra, Project Manager
PWR Project Directorate No. 7
Division of PWR Licensing-B

Enclosure:
Change to the Technical
Specifications

Date of Issuance: October 7, 1986



ENCLOSURE TO LICENSE AMENDMENT NO. 10

FACILITY OPERATING LICENSE NO. NPF-41

DOCKET NO. STN 50-528

Replace the following pages of the Appendix A Technical Specifications with the enclosed pages. The revised pages are identified by Amendment number and contain vertical lines indicating the areas of change. Also to be replaced are the following overleaf pages to the amended pages.

Amendment Pages

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Overleaf Pages

2-4
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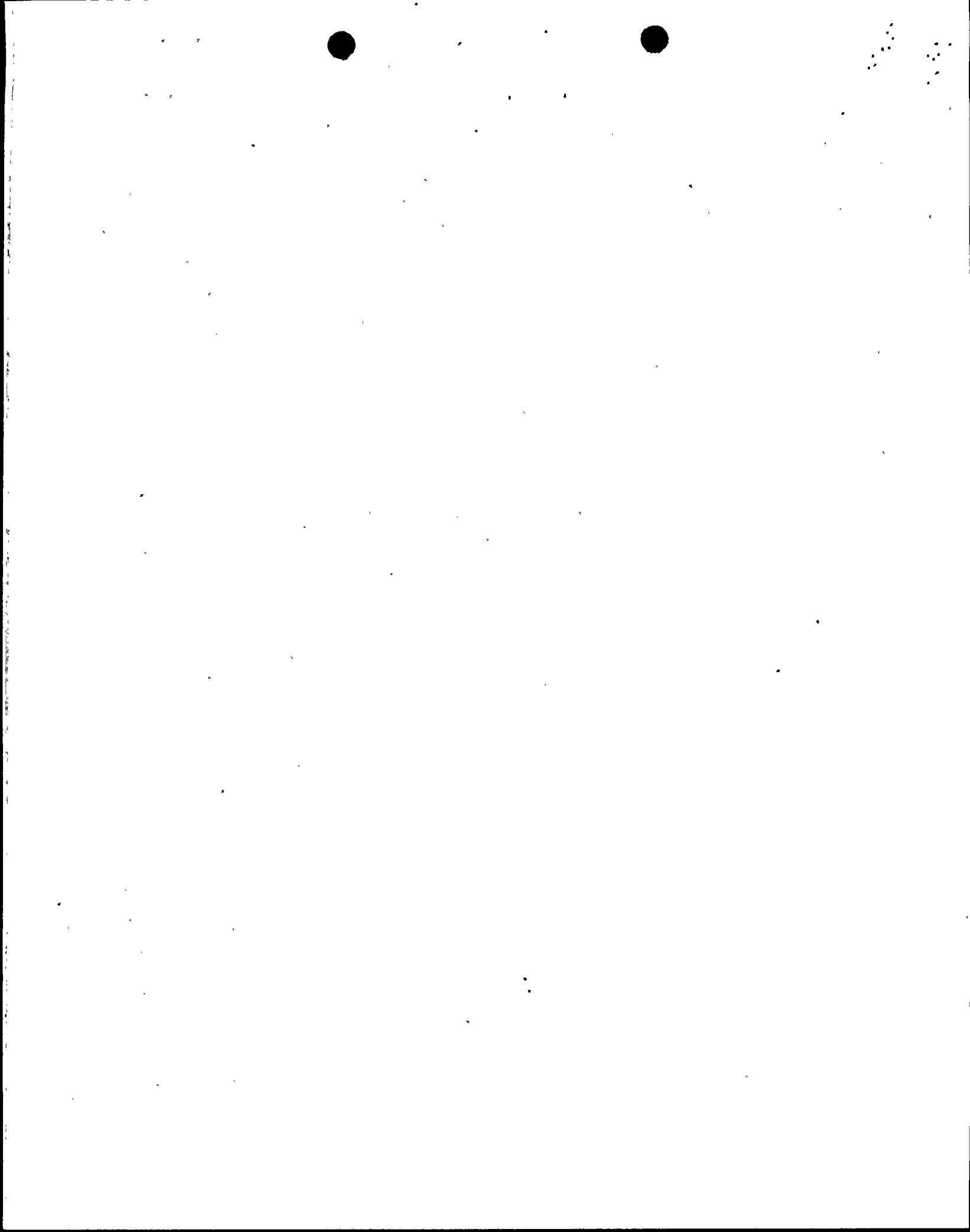


TABLE 2.2-1

REACTOR PROTECTIVE INSTRUMENTATION TRIP SETPOINT LIMITS

<u>FUNCTIONAL UNIT</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUES</u>
I. TRIP GENERATION		
A. Process		
1. Pressurizer Pressure - High	\leq 2383 psia	\leq 2388 psia
2. Pressurizer Pressure - Low	\geq 1837 psia (2)	\geq 1822 psia (2)
3. Steam Generator Level - Low	\geq 44.2% (4)	\geq 43.7% (4)
4. Steam Generator Level - High	\leq 91.0% (9)	\leq 91.5% (9)
5. Steam Generator Pressure - Low	\geq 919 psia (3)	\geq 912 psia (3)
6. Containment Pressure - High	\leq 3.0 psig	\leq 3.2 psig
7. Reactor Coolant Flow - Low		
a. Rate	\leq 0.115 psi/sec (6)(7)	\leq 0.118 psi/sec (6)(7)
b. Floor	\geq 11.9 psid (6)(7)	\geq 11.7 psid(6)(7)
c. Band	\leq 10.0 psid (6)(7)	\leq 10.2 psid (6)(7)
8. Local Power Density - High	\leq 21.0 kW/ft (5)	\leq 21.0 kW/ft (5)
9. DNBR - Low	\geq 1.231 (5)	\geq 1.231 (5)
B. Excure Neutron Flux		
1. Variable Overpower Trip		
a. Rate	$<$ 10.6%/min of RATED THERMAL POWER (8)	$<$ 11.0%/min of RATED THERMAL POWER (8)
b. Ceiling	$<$ 110.0% of RATED THERMAL POWER (8)	$<$ 111.0% of RATED THERMAL POWER (8)
c. Band	$<$ 9.8% of RATED THERMAL POWER (8)	$<$ 10.0% of RATED THERMAL POWER (8)

TABLE 2.2-1 (Continued)

REACTOR PROTECTIVE INSTRUMENTATION TRIP SETPOINT LIMITS

<u>FUNCTIONAL UNIT</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUES</u>
2. Logarithmic Power Level.- High (1)		
a. Startup and Operating	< 0.798% of RATED THERMAL POWER	< 0.895% of RATED THERMAL POWER
b. Shutdown	< 0.798% of RATED THERMAL POWER	< 0.895% of RATED THERMAL POWER
C. Core Protection Calculator System		
1. CEA Calculators	Not Applicable	Not Applicable
2. Core Protection Calculators	Not Applicable	Not Applicable
D. Supplementary Protection System		
Pressurizer Pressure - High	≤ 2409 psia	≤ 2414 psia
II. RPS LOGIC		
A. Matrix Logic	Not Applicable	Not Applicable
B. Initiation Logic	Not Applicable	Not Applicable
III. RPS ACTUATION DEVICES		
A. Reactor Trip Breakers	Not Applicable	Not Applicable
B. Manual Trip	Not Applicable	Not Applicable

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TABLE 2.2-1 (Continued)

REACTOR PROTECTIVE INSTRUMENTATION TRIP SETPOINT LIMITS

TABLE NOTATIONS

- (1) Trip may be manually bypassed above 10⁻⁴% of RATED THERMAL POWER; bypass shall be automatically removed when THERMAL POWER is less than or equal to 10⁻⁴% of RATED THERMAL POWER.
- (2) In MODES 3-6, value may be decreased manually, to a minimum of 100 psia, as pressurizer pressure is reduced, provided the margin between the pressurizer pressure and this value is maintained at less than or equal to 400 psi; the setpoint shall be increased automatically as pressurizer pressure is increased until the trip setpoint is reached. Trip may be manually bypassed below 400 psia; bypass shall be automatically removed whenever pressurizer pressure is greater than or equal to 500 psia.
- (3) In MODES 3-6, value may be decreased manually as steam generator pressure is reduced, provided the margin between the steam generator pressure and this value is maintained at less than or equal to 200 psi; the setpoint shall be increased automatically as steam generator pressure is increased until the trip setpoint is reached.
- (4) % of the distance between steam generator upper and lower level wide range instrument nozzles.
- (5) As stored within the Core Protection Calculator (CPC). Calculation of the trip setpoint includes measurement, calculational and processor uncertainties, and dynamic allowances. Trip may be manually bypassed below 1% of RATED THERMAL POWER; bypass shall be automatically removed when THERMAL POWER is greater than or equal to 1% of RATED THERMAL POWER.

The approved DNBR limit is 1.231 which includes a partial rod bow penalty compensation. If the fuel burnup exceeds that for which an increased rod bow penalty is required, the DNBR limit shall be adjusted. In this case a DNBR trip setpoint of 1.231 is allowed provided that the difference is compensated by an increase in the CPC addressable constant BERR1 as follows:

$$BERR1_{new} = BERR1_{old} \left[1 + \frac{RB - RB_0}{100} \times \frac{d (\% POL)}{d (\% DNBR)} \right]$$

where $BERR1_{old}$ is the uncompensated value of BERR1; RB is the fuel rod bow penalty in % DNBR; RB_0 is the fuel rod bow penalty in % DNBR already accounted for in the DNBR limit; POL is the power operating limit; and $d (\% POL)/d (\% DNBR)$ is the absolute value of the most adverse derivative of POL with respect to DNBR.

TABLE 2.2-1 (Continued)

REACTOR PROTECTIVE INSTRUMENTATION TRIP SETPOINT LIMITS

TABLE NOTATIONS (Continued)

- (6) RATE is the maximum rate of decrease of the trip setpoint. There are no restrictions on the rate at which the setpoint can increase.
FLOOR is the minimum value of the trip setpoint.
BAND is the amount by which the trip setpoint is below the input signal unless limited by Rate or Floor.
Setpoints are based on steam generator differential pressure.
- (7) The setpoint may be altered to disable trip function during testing pursuant to Specification 3.10.3.
- (8) RATE is the maximum rate of increase of the trip setpoint. There are no restrictions on the rate at which the setpoint can decrease.
CEILING is the maximum value of the trip setpoint.
BAND is the amount by which the trip setpoint is above the input signal unless limited by the rate or the ceiling.
- (9) % of the distance between steam generator upper and lower level narrow range instrument nozzles.

TABLE 3.3-2

REACTOR PROTECTIVE INSTRUMENTATION RESPONSE TIMES

<u>FUNCTIONAL UNIT</u>	<u>RESPONSE TIME</u>
I. TRIP GENERATION	
A. Process	
1. Pressurizer Pressure - High	≤ 1.15 seconds
2. Pressurizer Pressure - Low	≤ 1.15 seconds
3. Steam Generator Level - Low	≤ 1.15 seconds
4. Steam Generator Level - High	≤ 1.15 seconds
5. Steam Generator Pressure - Low	≤ 1.15 seconds
6. Containment Pressure - High	≤ 1.15 seconds
7. Reactor Coolant Flow - Low	≤ 0.58 second
8. Local Power Density - High	
a. Neutron Flux Power from Excure Neutron Detectors	≤ 0.75 second*
b. CEA Positions	≤ 1.35 second**
c. CEA Positions: CEAC Penalty Factor	0.75 second**
9. DNBR - Low	
a. Neutron Flux Power from Excure Neutron Detectors	≤ 0.75 second*
b. CEA Positions	≤ 1.35 second**
c. Cold Leg Temperature	≤ 0.75 second##
d. Hot Leg Temperature	≤ 0.75 second##
e. Primary Coolant Pump Shaft Speed	≤ 0.75 second#
f. Reactor Coolant Pressure from Pressurizer	≤ 0.75 second###
g. CEA Positions: CEAC Penalty Factor	0.75 second**
B. Excure Neutron Flux	
1. Variable Overpower Trip	≤ 0.55 second*
2. Logarithmic Power Level - High	
a. Startup and Operating	< 0.55 second*
b. Shutdown	< 0.55 second*

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Amendment No. 10

TABLE 3.3-2 (Continued)

REACTOR PROTECTIVE INSTRUMENTATION RESPONSE TIMES

<u>FUNCTIONAL UNIT</u>	<u>RESPONSE TIME</u>
C. Core Protection Calculator System	
1. CEA Calculators	Not Applicable
2. Core Protection Calculators	Not Applicable
D. Supplementary Protection System	
Pressurizer Pressure - High	≤ 1.15 second
II. RPS LOGIC	
A. Matrix Logic	Not Applicable
B. Initiation Logic	Not Applicable
III. RPS ACTUATION DEVICES	
A. Reactor Trip Breakers	Not Applicable
B. Manual Trip	Not Applicable

* Neutron detectors are exempt from response time testing. The response time of the neutron flux signal portion of the channel shall be measured from the detector output or from the input of first electronic component in channel.

** Response time shall be measured from the output of the sensor. Acceptable CEA sensor response shall be demonstrated by compliance with Specification 3.1.3.4.

#The pulse transmitters measuring pump speed are exempt from response time testing. The response time shall be measured from the pulse shaper input.

##Response time shall be measured from the output of the resistance temperature detector (sensor). RTD response time shall be measured at least once per 18 months. The measured response time of the slowest RTD shall be less than or equal to 13 seconds. Adjustments to the CPC addressable constants given in Table 3.3-2a shall be made to accommodate current values of the RTD time constants. If the RTD time constant for a CPC channel exceeds the value corresponding to the penalties currently in use, the affected channel(s) shall be declared inoperable until penalties appropriate to the new time constant are installed.

###Response time shall be measured from the output of the pressure transmitter. The transmitter response time shall be less than or equal to 0.7 second.



UNITED STATES
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ARIZONA PUBLIC SERVICE COMPANY, ET AL.

DOCKET NO. STN 50-529

PALO VERDE NUCLEAR GENERATING STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 5
License No. NPF-51

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment, dated July 23, 1986, as supplemented by letters dated August 26 and September 26, 1986, by the Arizona Public Service Company (APS) on behalf of itself and the Salt River Project Agricultural Improvement and Power District, El Paso Electric Company, Southern California Edison Company, Public Service Company of New Mexico, Los Angeles Department of Water and Power, and Southern California Public Power Authority (licensees), complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of Act, and the 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;
 - 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 enclosure to this license amendment, and paragraph 2.C(2) of the Facility Operating License No. NPF-51 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 5, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in this license. APS shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of issuance.

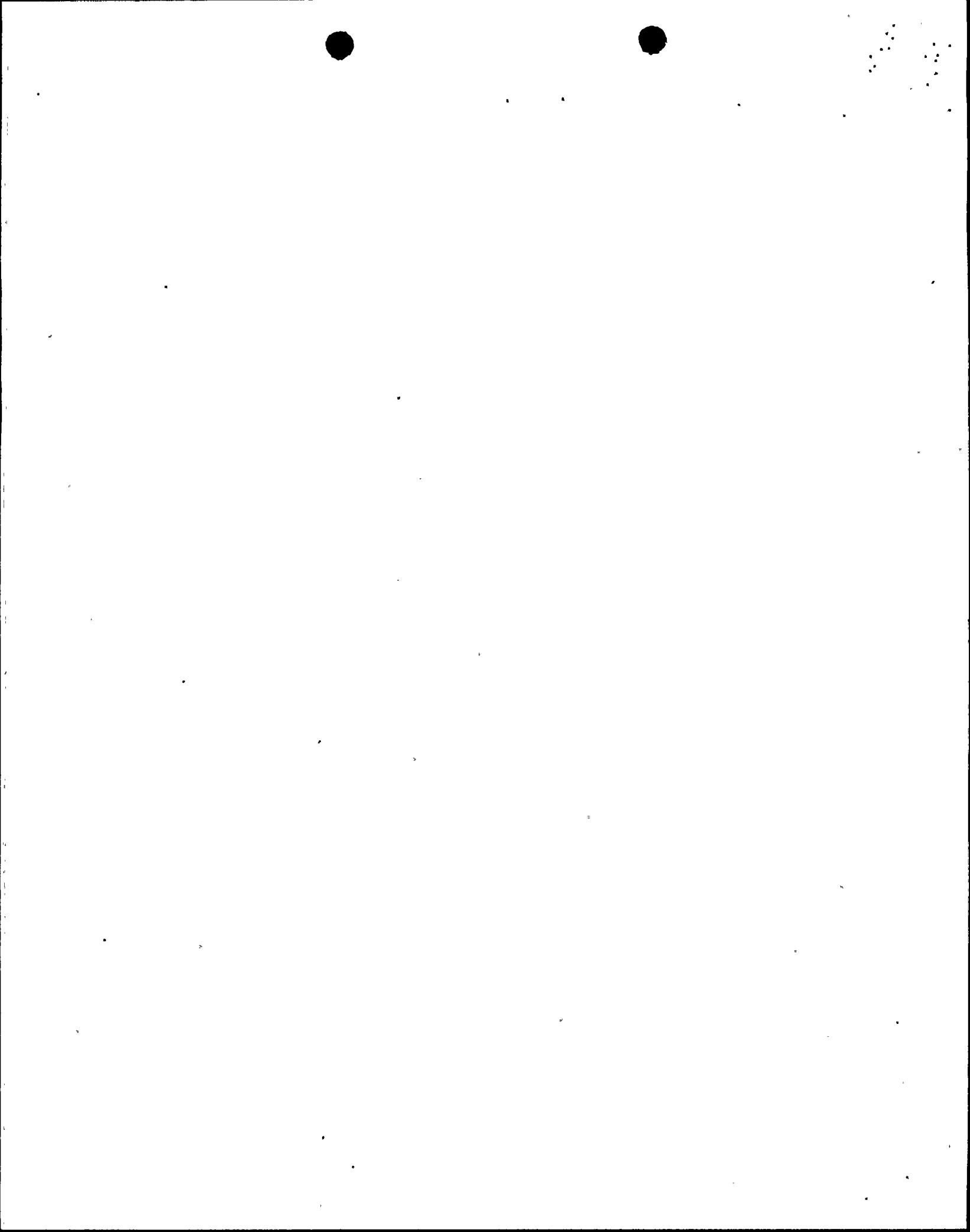
FOR THE NUCLEAR REGULATORY COMMISSION



E. A. Licitra, Project Manager
PWR Project Directorate No. 7
Division of PWR Licensing-B

Enclosure:
Change to the Technical
Specifications

Date of Issuance: October 7, 1986



ENCLOSURE TO LICENSE AMENDMENT NO. 5FACILITY OPERATING LICENSE NO. NPF-51DOCKET NO. STN 50-529

Replace the following pages of the Appendix A Technical Specifications with the enclosed pages. The revised pages are identified by Amendment number and contain vertical lines indicating the areas of change. Also to be replaced are the following overleaf pages to the amended pages.

Amendment Pages

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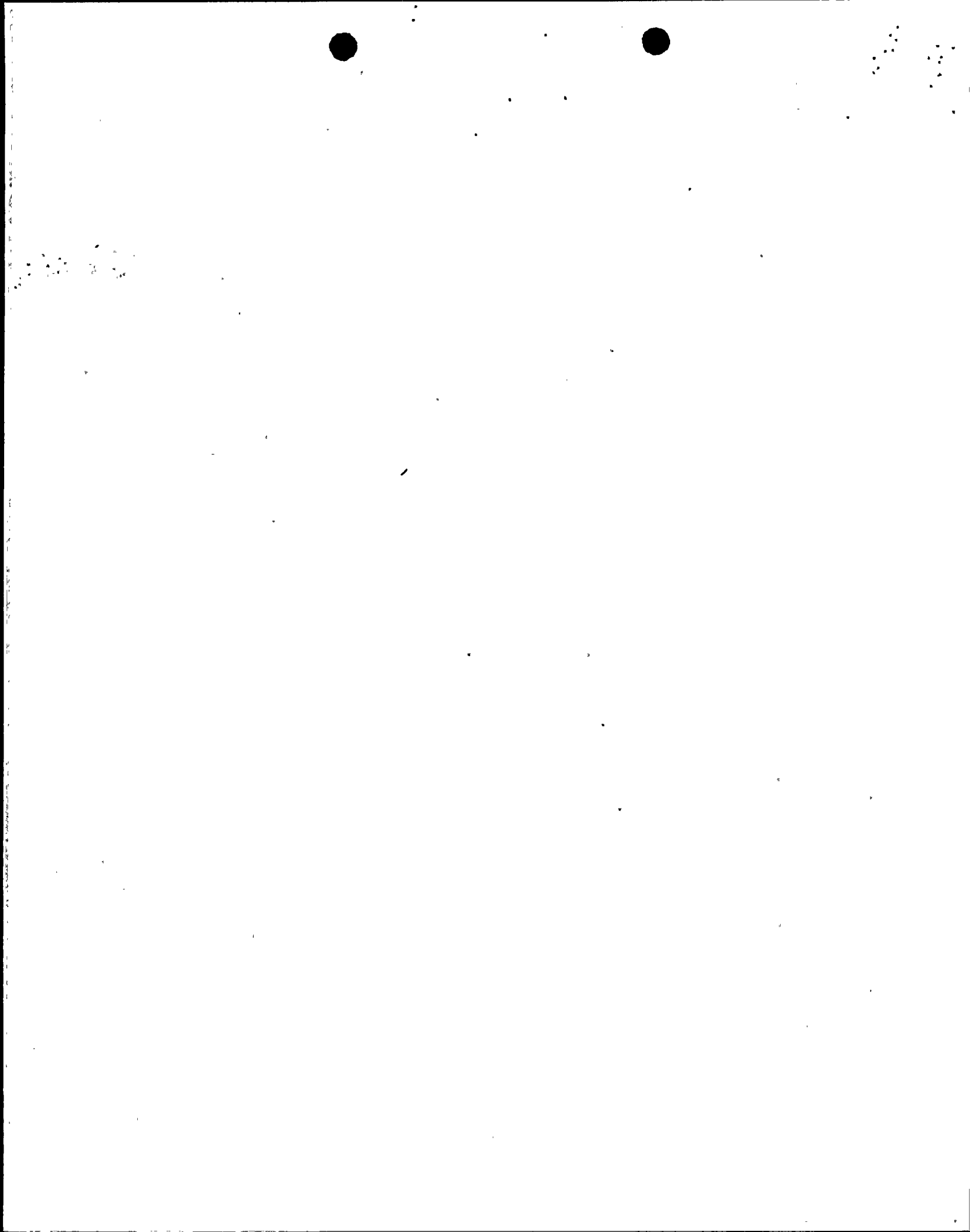


TABLE 2.2-1

REACTOR PROTECTIVE INSTRUMENTATION TRIP SETPOINT LIMITS

<u>FUNCTIONAL UNIT</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUES</u>
I. TRIP GENERATION		
A. Process		
1. Pressurizer Pressure - High	≤ 2383 psia	≤ 2388 psia
2. Pressurizer Pressure - Low	≥ 1837 psia (2)	≥ 1822 psia (2)
3. Steam Generator Level - Low	$\geq 44.2\%$ (4)	$\geq 43.7\%$ (4)
4. Steam Generator Level - High	$\leq 91.0\%$ (9)	$\leq 91.5\%$ (9)
5. Steam Generator Pressure - Low	≥ 919 psia (3)	≥ 912 psia (3)
6. Containment Pressure - High	≤ 3.0 psig	≤ 3.2 psig
7. Reactor Coolant Flow - Low		
a. Rate	≤ 0.115 psi/sec (6)(7)	≤ 0.118 psi/sec (6)(7)
b. Floor	≥ 11.9 psid (6)(7)	≥ 11.7 psid(6)(7)
c. Band	≤ 10.0 psid (6)(7)	≤ 10.2 psid (6)(7)
8. Local Power Density - High	≤ 21.0 kW/ft (5)	≤ 21.0 kW/ft (5)
9. DNBR - Low	≥ 1.231 (5)	≥ 1.231 (5)
B. Excure Neutron Flux		
1. Variable Overpower Trip		
a. Rate	$< 10.6\%$ /min of RATED THERMAL POWER (8)	$< 11.0\%$ /min of RATED THERMAL POWER (8)
b. Ceiling	$< 110.0\%$ of RATED THERMAL POWER (8)	$< 111.0\%$ of RATED THERMAL POWER (8)
c. Band	$< 9.8\%$ of RATED THERMAL POWER (8)	$< 10.0\%$ of RATED THERMAL POWER (8)

TABLE 2.2-1 (Continued)

REACTOR PROTECTIVE INSTRUMENTATION TRIP SETPOINT LIMITS

<u>FUNCTIONAL UNIT</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUES</u>
2. Logarithmic Power Level - High (1)		
a. Startup and Operating	< 0.798% of RATED THERMAL POWER	< 0.895% of RATED THERMAL POWER
b. Shutdown	< 0.798% of RATED THERMAL POWER	< 0.895% of RATED THERMAL POWER
C. Core Protection Calculator System		
1. CEA Calculators	Not Applicable	Not Applicable
2. Core Protection Calculators	Not Applicable	Not Applicable
D. Supplementary Protection System		
Pressurizer Pressure - High	≤ 2409 psia	≤ 2414 psia
II. RPS LOGIC		
A. Matrix Logic	Not Applicable	Not Applicable
B. Initiation Logic	Not Applicable	Not Applicable
III. RPS ACTUATION DEVICES		
A. Reactor Trip Breakers	Not Applicable	Not Applicable
B. Manual Trip	Not Applicable	Not Applicable

TABLE 2.2-1 (Continued)

REACTOR PROTECTIVE INSTRUMENTATION TRIP SETPOINT LIMITS

TABLE NOTATIONS

- (1) Trip may be manually bypassed above 10⁻⁴% of RATED THERMAL POWER; bypass shall be automatically removed when THERMAL POWER is less than or equal to 10⁻⁴% of RATED THERMAL POWER.
- (2) In MODES 3-4, value may be decreased manually, to a minimum of 100 psia, as pressurizer pressure is reduced, provided the margin between the pressurizer pressure and this value is maintained at less than or equal to 400 psi; the setpoint shall be increased automatically as pressurizer pressure is increased until the trip setpoint is reached. Trip may be manually bypassed below 400 psia; bypass shall be automatically removed whenever pressurizer pressure is greater than or equal to 500 psia.
- (3) In MODES 3-4, value may be decreased manually as steam generator pressure is reduced, provided the margin between the steam generator pressure and this value is maintained at less than or equal to 200 psi; the setpoint shall be increased automatically as steam generator pressure is increased until the trip setpoint is reached.
- (4) % of the distance between steam generator upper and lower level wide range instrument nozzles.
- (5) As stored within the Core Protection Calculator (CPC). Calculation of the trip setpoint includes measurement, calculational and processor uncertainties, and dynamic allowances. Trip may be manually bypassed below 1% of RATED THERMAL POWER; bypass shall be automatically removed when THERMAL POWER is greater than or equal to 1% of RATED THERMAL POWER.

The approved DNBR limit is 1.231 which includes a partial rod bow penalty compensation. If the fuel burnup exceeds that for which an increased rod bow penalty is required, the DNBR limit shall be adjusted. In this case a DNBR trip setpoint of 1.231 is allowed provided that the difference is compensated by an increase in the CPC addressable constant BERR1 as follows:

$$BERR1_{new} = BERR1_{old} \left[1 + \frac{RB - RB_0}{100} \times \frac{d (\% POL)}{d (\% DNBR)} \right]$$

where BERR1_{old} is the uncompensated value of BERR1; RB is the fuel rod bow penalty in % DNBR; RB₀ is the fuel rod bow penalty in % DNBR already accounted for in the DNBR limit; POL is the power operating limit; and d (% POL)/d (% DNBR) is the absolute value of the most adverse derivative of POL with respect to DNBR.

TABLE 2.2-1 (Continued)

REACTOR PROTECTIVE INSTRUMENTATION TRIP SETPOINT LIMITS

TABLE NOTATIONS (Continued)

- (6) RATE is the maximum rate of decrease of the trip setpoint. There are no restrictions on the rate at which the setpoint can increase.
FLOOR is the minimum value of the trip setpoint.
BAND is the amount by which the trip setpoint is below the input signal unless limited by Rate or Floor.
Setpoints are based on steam generator differential pressure.
- (7) The setpoint may be altered to disable trip function during testing pursuant to Specification 3.10.3.
- (8) RATE is the maximum rate of increase of the trip setpoint. There are no restrictions on the rate at which the setpoint can decrease.
CEILING is the maximum value of the trip setpoint.
BAND is the amount by which the trip setpoint is above the input signal unless limited by the rate or the ceiling.
- (9) % of the distance between steam generator upper and lower level narrow range instrument nozzles.

TABLE 3.3-2

REACTOR PROTECTIVE INSTRUMENTATION RESPONSE TIMES

<u>FUNCTIONAL UNIT</u>	<u>RESPONSE TIME</u>
I. TRIP GENERATION	
A. Process	
1. Pressurizer Pressure - High	≤ 1.15 seconds
2. Pressurizer Pressure - Low	≤ 1.15 seconds
3. Steam Generator Level - Low	≤ 1.15 seconds
4. Steam Generator Level - High	≤ 1.15 seconds
5. Steam Generator Pressure - Low	≤ 1.15 seconds
6. Containment Pressure - High	≤ 1.15 seconds
7. Reactor Coolant Flow - Low	≤ 0.58 second
8. Local Power Density - High	
a. Neutron Flux Power from Excore Neutron Detectors	< 0.75 second*
b. CEA Positions	< 1.35 second**
c. CEA Positions: CEAC Penalty Factor	< 0.75 second**
9. DNBR - Low	
a. Neutron Flux Power from Excore Neutron Detectors	< 0.75 second*
b. CEA Positions	< 1.35 second**
c. Cold Leg Temperature	< 0.75 second##
d. Hot Leg Temperature	< 0.75 second##
e. Primary Coolant Pump Shaft Speed	< 0.75 second#
f. Reactor Coolant Pressure from Pressurizer	< 0.75 second###
g. CEA Positions: CEAC Penalty Factor	< 0.75 second**
B. Excore Neutron Flux	
1. Variable Overpower Trip	≤ 0.55 second*
2. Logarithmic Power Level - High	
a. Startup and Operating	< 0.55 second*
b. Shutdown	< 0.55 second*

TABLE 3.3-2 (Continued)

REACTOR PROTECTIVE INSTRUMENTATION RESPONSE TIMES

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<u>FUNCTIONAL UNIT</u>	<u>RESPONSE TIME</u>
C. Core Protection Calculator System	
1. CEA Calculators	Not Applicable
2. Core Protection Calculators	Not Applicable
D. Supplementary Protection System	
Pressurizer Pressure - High	≤ 1.15 second
II. RPS LOGIC	
A. Matrix Logic	Not Applicable
B. Initiation Logic	Not Applicable
III. RPS ACTUATION DEVICES	
A. Reactor Trip Breakers	Not Applicable
B. Manual Trip	Not Applicable

* Neutron detectors are exempt from response time testing. The response time of the neutron flux signal portion of the channel shall be measured from the detector output or from the input of first electronic component in channel.

** Response time shall be measured from the output of the sensor. Acceptable CEA sensor response shall be demonstrated by compliance with Specification 3.1.3.4.

The pulse transmitters measuring pump speed are exempt from response time testing. The response time shall be measured from the pulse shaper input.

Response time shall be measured from the output of the resistance temperature detector (sensor). RTD response time shall be measured at least once per 18 months. The measured response time of the slowest RTD shall be less than or equal to 13 seconds. Adjustments to the CPC addressable constants given in Table 3.3-2a shall be made to accommodate current values of the RTD time constants. If the RTD time constant for a CPC channel exceeds the value corresponding to the penalties currently in use, the affected channel(s) shall be declared inoperable until penalties appropriate to the new time constant are installed.

Response time shall be measured from the output of the pressure transmitter. The transmitter response time shall be less than or equal to 0.7 second.