

June 27, 1988

Docket Nos. 50-272/311

Mr. Steven E. Miltenberger  
Vice President and Chief Nuclear  
Officer  
Public Service Electric & Gas Company  
Post Office Box 236  
Hancocks Bridge, New Jersey 08038

Dear Mr. Miltenberger:

SUBJECT: TECHNICAL SPECIFICATION CHANGES - TRIP REDUCTION P-7 PERMISSIVE TO  
P-9 PERMISSIVE (TAC NOS. 66039 AND 66040)

RE: SALEM NUCLEAR GENERATING STATION, UNIT NOS. 1 AND 2

The Commission has issued the enclosed Amendment Nos. 85 and 58 to Facility  
Operating License Nos. DPR-70 and DPR-75 for the Salem Nuclear Generating  
Station, Unit Nos. 1 and 2. These amendments consist of changes to the  
Technical Specifications (TSs) in response to your application dated July 2,  
1987 as supplemented July 7, 1987.

These amendments would revise the reactor trip block with a turbine trip from  
the P-7 (11%) permissive up to P-9 (50%) permissive.

A copy of our safety evaluation is also enclosed. Notice of Issuance will be  
included in the Commission's biweekly Federal Register notice.

Sincerely,

/s/

Donald C. Fischer, Project Manager  
Project Directorate I-2  
Division of Reactor Projects I/II  
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 85 to  
License No. DPR-70
2. Amendment No. 58 to  
License No. DPR-75
3. Safety Evaluation

cc w/enclosures:  
See next page

8807120640 880627  
PDR ADDCK 05000272  
P PDR

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WButler	JPartlow	CMiles, GPA/PA	
DFischer/MThadani	TBarnhart (8)	RDiggs, ARM/LFMB	

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WButler  
6/12/88



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

June 27, 1988

Docket Nos. 50-272/311

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RE: SALEM NUCLEAR GENERATING STATION, UNIT NOS. 1 AND 2

The Commission has issued the enclosed Amendment Nos. 85 and 58 to Facility Operating License Nos. DPR-70 and DPR-75 for the Salem Nuclear Generating Station, Unit Nos. 1 and 2. These amendments consist of changes to the Technical Specifications (TSs) in response to your application dated July 2, 1987 as supplemented July 7, 1987.

These amendments would revise the reactor trip block with a turbine trip from the P-7 (11%) permissive up to P-9 (50%) permissive.

A copy of our safety evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

A handwritten signature in cursive script, reading "Donald C. Fischer", is written above the typed name.

Donald C. Fischer, Project Manager  
Project Directorate I-2  
Division of Reactor Projects I/II  
Office of Nuclear Reactor Regulation

Enclosures:

1. Amendment No. 85 to  
License No. DPR-70
2. Amendment No. 58 to  
License No. DPR-75
3. Safety Evaluation

cc w/enclosures:  
See next page

Mr. Steven E. Miltenberger  
Public Service Electric & Gas Company

Salem Nuclear Generating Station

cc:

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Regional Administrator, Region I  
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Lower Alloways Creek Township  
c/o Mary O. Henderson, Clerk  
Municipal Building, P.O. Box 157  
Hancocks Bridge, NJ 08038

Robert Traee, Mayor  
Lower Alloways Creek Township  
Municipal Hall  
Hancocks Bridge, NJ 08038

Mr. Bruce A. Preston, Manager  
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Nuclear Department  
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Hancocks Bridge, NJ 08038

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Bureau of Nuclear Engineering  
Department of Environmental Protection  
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CN 411  
Trenton, NJ 08625

Delmarva Power & Light Company  
c/o Jack Urban  
General Manager, Fuel Supply  
800 King Street  
P.O. Box 231  
Wilmington, DE 19899



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

PUBLIC SERVICE ELECTRIC & GAS COMPANY

PHILADELPHIA ELECTRIC COMPANY

DELMARVA POWER AND LIGHT COMPANY

ATLANTIC CITY ELECTRIC COMPANY

DOCKET NO. 50-272

SALEM NUCLEAR GENERATING STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 85  
License No. DPR-70

1. The Nuclear Regulatory Commission (the Commission or the NRC) has found that:
  - A. The application for amendment filed by the Public Service Electric & Gas Company, Philadelphia Electric Company, Delmarva Power and Light Company and Atlantic City Electric Company (the licensees) dated July 2, 1987 as supplemented July 7, 1987 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 set forth in 10 CFR Chapter I;
  - 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. DPR-70 is hereby amended to read as follows:

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P PDR

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 85 , 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 the next refueling outage, cycle 8, currently scheduled for April 1989.

FOR THE NUCLEAR REGULATORY COMMISSION

/s/

Walter R. Butler, Director  
Project Directorate I-2  
Division of Reactor Projects I/II

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: June 27, 1988

RDI-2/CA  
M. Boyen  
6/14/88

PDI-2/PM  
DFischer:mr  
6/14/88

OGC  
Sachmann  
6/18/88

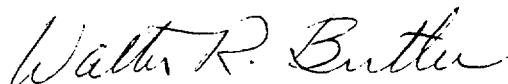
PDI-2/D  
WButler  
6/24/88

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 85, 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 the next refueling outage, cycle 8, currently scheduled for April 1989.

FOR THE NUCLEAR REGULATORY COMMISSION



Walter R. Butler, Director  
Project Directorate I-2  
Division of Reactor Projects I/II

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: June 27, 1988

ATTACHMENT TO LICENSE AMENDMENT NO. 85

FACILITY OPERATING LICENSE NO. DPR-70

DOCKET NO. 50-272

Revise Appendix A as follows:

Remove Pages

B 2-7

3/4 3-7

3/4 3-8

Insert Pages

B 2-7

3/4 3-7

3/4 3-8

## LIMITING SAFETY SYSTEM SETTINGS

### BASES

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reliability of the Reactor Protection System. This trip is redundant to the Steam Generator Water Level Low-Low trip. The Steam/Feedwater Flow Mismatch portion of this trip is activated when the steam flow exceeds the feedwater flow by  $> 1.42 \times 10^6$  lbs/hour. The Steam Generator Low Water level portion of the trip is activated when the water level drops below 25 percent, as indicated by the narrow range instrument. These trip values include sufficient allowance in excess of normal operating values to preclude spurious trips but will initiate a reactor trip before the steam generators are dry. Therefore, the required capacity and starting time requirements of the auxiliary feedwater pumps are reduced and the resulting thermal transient on the Reactor Coolant System and steam generators is minimized.

### Undervoltage and Underfrequency - Reactor Coolant Pump Busses

The Undervoltage and Underfrequency Reactor Coolant Pump bus trips provide reactor core protection against DNB as a result of loss of voltage or underfrequency to more than one reactor coolant pump. The specified set points assure a reactor trip signal is generated before the low flow trip set point is reached. Time delays are incorporated in the underfrequency and undervoltage trips to prevent spurious reactor trips from momentary electrical power transients. For undervoltage, the delay is set so that the time required for a signal to reach the reactor trip breakers following the simultaneous trip of two or more reactor coolant pump bus circuit breakers shall not exceed 0.9 seconds. For underfrequency, the delay is set so that the time required for a signal to reach the reactor trip breakers after the underfrequency trip setpoint is reached shall not exceed 0.3 seconds.

### Turbine Trip

A Turbine Trip causes a direct reactor trip when operating above P-9. Each of the turbine trips provide turbine protection and reduce the severity of the ensuing transient. No credit was taken in the accident analyses for operation of these trips. Their functional capability at the specified trip settings is required to enhance the overall reliability of the Reactor Protection System.



TABLE 3.3-1 (Continued)

- ACTION 9 - With a channel associated with an operating loop inoperable, restore the inoperable channel to OPERABLE status within 2 hours or be in HOT STANDBY within the next 6 hours; however, one channel associated with an operating loop may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.1.1.
- ACTION 10 - With one channel inoperable, restore the inoperable channel to OPERABLE status within 2 hours or reduce THERMAL POWER to below P-8 within the next 2 hours. Operation below P-8 may continue pursuant to ACTION 11.
- ACTION 11 - With less than the Minimum Number of Channels OPERABLE, operation may continue provided the inoperable channel is placed in the tripped condition within 1 hour.
- ACTION 12 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or be in HOT STANDBY within the next 6 hours and/or open the reactor trip breakers.

REACTOR TRIP SYSTEM INTERLOCKS

<u>DESIGNATION</u>	<u>CONDITION AND SETPOINT</u>	<u>FUNCTION</u>
P-6	With 2 of 2 Intermediate Range Neutron Flux Channels $< 6 \times 10^{-11}$ amps.	P-6 prevents or defeats the manual block of source range reactor trip.
P-7	With 2 of 4 Power Range Neutron Flux Channels $\geq 11\%$ of RATED THERMAL POWER or 1 of 2 Turbine impulse chamber pressure channels $\geq$ a pressure equivalent to 11% of RATED THERMAL POWER.	P-7 prevents or defeats the automatic block of reactor trip on: Low flow in more than one primary coolant loop, reactor coolant pump undervoltage and under-frequency, pressurizer low pressure, and pressurizer high level.

TABLE 3.3-1 (Continued)

<u>DESIGNATION</u>	<u>CONDITION AND SETPOINT</u>	<u>FUNCTION</u>
P-8	With 2 of 4 Power Range Neutron Flux channels $\geq$ 36% of RATED THERMAL POWER.	P-8 prevents or defeats the automatic block of reactor trip on low coolant flow in a single loop.
P-9	With 2 of 4 Power Range neutron flux channels $\geq$ 50% RATED THERMAL POWER.	P-9 prevents or defeats the automatic block of reactor trip on turbine trip.
P-10	With 3 of 4 Power range neutron flux channels $<$ 9% of RATED THERMAL POWER.	P-10 prevents or defeats the manual block of: Power range low setpoint reactor trip, Intermediate range reactor trip, and intermediate range rod stops.  Provides input to P-7.



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

PUBLIC SERVICE ELECTRIC & GAS COMPANY

PHILADELPHIA ELECTRIC COMPANY

DELMARVA POWER AND LIGHT COMPANY

ATLANTIC CITY ELECTRIC COMPANY

DOCKET NO. 50-311

SALEM NUCLEAR GENERATING STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 58  
License No. DPR-75

1. The Nuclear Regulatory Commission (the Commission or the NRC) has found that:
  - A. The application for amendment filed by the Public Service Electric & Gas Company, Philadelphia Electric Company, Delmarva Power and Light Company and Atlantic City Electric Company (the licensees) dated July 2, 1987, as supplemented July 7, 1987 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 set forth in 10 CFR Chapter I;
  - 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. DPR-75 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 58, 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 the next refueling outage, cycle 4, currently scheduled for September 1988.

FOR THE NUCLEAR REGULATORY COMMISSION

/s/

Walter R. Butler, Director  
Project Directorate I-2  
Division of Reactor Projects I/II

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: June 27, 1988

PDI-2/LA  
M. A. Brien  
6/14/88

PDI-2/PM  
D. Fischer:mr  
6/14/88

OGC  
R. Bachman  
6/13/88

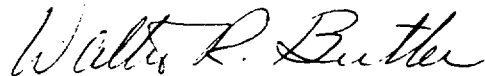
PDI-2/D  
W. Butler  
6/24/88

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 58, 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 the next refueling outage, cycle 4, currently scheduled for September 1988.

FOR THE NUCLEAR REGULATORY COMMISSION



Walter R. Butler, Director  
Project Directorate I-2  
Division of Reactor Projects I/II

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: June 27, 1988

ATTACHMENT TO LICENSE AMENDMENT NO. 58

FACILITY OPERATING LICENSE NO. DPR-75

DOCKET NO. 50-311

Revise Appendix A as follows:

Remove Pages

B 2-7

3/4 3-7

3/4 3-8

Insert Pages

B 2-7

3/4 3-7

3/4 3-8

## LIMITING SAFETY SYSTEM SETTINGS

### BASES

#### Undervoltage and Underfrequency - Reactor Coolant Pump Busses

The Undervoltage and Underfrequency Reactor Coolant Pump bus trips provide reactor core protection against DNB as a result of loss of voltage or underfrequency to more than one reactor coolant pump. The specified set points assure a reactor trip signal is generated before the low flow trip set point is reached. Time delays are incorporated in the underfrequency and undervoltage trips to prevent spurious reactor trips from momentary electrical power transients. For undervoltage, the delay is set so that the time required for a signal to reach the reactor trip breakers following the simultaneous trip of two or more reactor coolant pump bus circuit breakers shall not exceed 0.9 seconds. For underfrequency, the delay is set so that the time required for a signal to reach the reactor trip breakers after the underfrequency trip setpoint is reached shall not exceed 0.3 seconds.

#### Turbine Trip

A Turbine Trip causes a direct reactor trip when operating above P-9. Each of the turbine trips provide turbine protection and reduce the severity of the ensuing transient. No credit was taken in the accident analyses for operation of these trips. Their functional capability at the specified trip settings is required to enhance the overall reliability of the Reactor Protection System.

#### Safety Injection Input from ESF

If a reactor trip has not already been generated by the reactor protective instrumentation, the ESF automatic actuation logic channels will initiate a reactor trip upon any signal which initiates a safety injection. This trip is provided to protect the core in the event of a LOCA. The ESF instrumentation channels which initiate a safety injection signal are shown in Table 3.3-3.

#### Reactor Coolant Pump Breaker Position Trip

The Reactor Coolant Pump Breaker Position Trips are anticipatory trips which provide reactor core protection against DNB resulting from the opening of any one pump breaker above P-8 or the opening of two or more pump breakers below P-8. These trips are blocked below P-7. The open/close position trips assure a reactor trip signal is generated before the low flow trip set point is reached. No credit was taken in the accident analyses for operation of these trips. Their functional capability at the open/close position settings is required to enhance the overall reliability of the Reactor Protection System.

TABLE 3.3-1 (Continued)

- ACTION 9 - With a channel associated with an operating loop inoperable, restore the inoperable channel to OPERABLE status within 2 hours or be in HOT STANDBY within the next 6 hours; however, one channel associated with an operating loop may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.1.1.
- ACTION 10 - With one channel inoperable, restore the inoperable channel to OPERABLE status within 2 hours or reduce THERMAL POWER to below the P-8 (Low Reactor Coolant Pump Flow and Reactor Coolant Pump Breaker Position) setpoint, within the next 2 hours. Operation below the P-8 (Low Reactor Coolant Pump Flow and Reactor Coolant Pump Breaker Position) setpoint, may continue pursuant to ACTION 11.
- ACTION 11 - With less than the Minimum Number of Channels OPERABLE, operation may continue provided the inoperable channel is placed in the tripped condition within 1 hour.
- ACTION 12 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or be in HOT STANDBY within the next 6 hours and/or open the reactor trip breakers.

REACTOR TRIP SYSTEM INTERLOCKS

<u>DESIGNATION</u>	<u>CONDITION AND SETPOINT</u>	<u>FUNCTION</u>
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TABLE 3.3-1 (Continued)

<u>DESIGNATION</u>	<u>CONDITION AND SETPOINT</u>	<u>FUNCTION</u>
P-8	With 2 of 4 Power Range Neutron Flux channels $\geq$ 36% of RATED THERMAL POWER.	P-8 prevents or defeats the automatic block of reactor trip on low coolant flow in a single loop.
P-9	With 2 of 4 Power range neutron flux channels $\geq$ 50% of RATED THERMAL POWER.	P-9 prevents or defeats the automatic block of reactor trip on turbine trip.
P-10	With 3 of 4 Power range neutron flux channels $<$ 9% of RATED THERMAL POWER.	P-10 prevents or defeats the manual block of: Power range low setpoint reactor trip, Intermediate range reactor trip, and intermediate range rod stops.  Provides input to P-7.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NOS. 85 AND 58 TO FACILITY OPERATING

LICENSE NOS. DPR-70 AND DPR-75

PUBLIC SERVICE ELECTRIC & GAS COMPANY

PHILADELPHIA ELECTRIC COMPANY

DELMARVA POWER AND LIGHT COMPANY

ATLANTIC CITY ELECTRIC COMPANY

SALEM NUCLEAR GENERATING STATION, UNIT NOS. 1 AND 2

DOCKET NOS. 50-272 AND 50-311

1.0 INTRODUCTION

By letter dated July 2, 1987, as supplemented July 7, 1987, Public Service Electric & Gas Company (PSE&G) requested an amendment to Facility Operating License Nos. DPR-70 and DPR-75 for the Salem Nuclear Generating Station, Unit Nos. 1 and 2. The proposed amendments would revise the reactor trip system interlocks given in Table 3.3-1 of the Technical Specifications by changing the reactor trip block with a turbine trip from the P-7 (11% power) permissive up to the P-9 (50% power) permissive. This would allow the reactors to sustain a turbine trip without causing a reactor trip below 50% of rated thermal power.

2.0 EVALUATION AND SUMMARY

Currently, there is a reactor trip at the Salem Units in the event of a loss of external electrical load or a turbine trip when operating above 11% of rated thermal power. This setpoint is designated the P-7 permissive interlock and is specified in Table 3.3-1 of the Technical Specifications. Although this reactor trip is not required for any design basis events, Item II.K.3.12 of NUREG-0737, "Clarification of TMI Action Plan Requirements" requires licensees with Westinghouse designed operating plants to confirm that their plants have this anticipatory reactor trip upon turbine trip.

In order to assess the impact of increasing the turbine-reactor trip setpoint to 50% from 11% of rated thermal power, PSE&G has reevaluated various plant transients and accidents previously analyzed in the Updated Final Safety Analysis Report (UFSAR). Since these analyses did not take credit for the anticipatory reactor trip on turbine trip they are still valid and remain a conservative bound for the proposed setpoint increase. These reevaluations have also confirmed that the consequences

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of a turbine trip event below 50% of rated thermal power with or without turbine-generator motoring is bounded by the UFSAR accident analyses. The turbine-generator motoring feature is provided so that full reactor coolant flow can be maintained for at least 30 seconds during Condition II overpower transients to remove core heat and to prevent any pump overspeed conditions.

The steam generator system turbine bypass system provides the capability to dump up to 40% of full load steam flow directly to the condenser. Since the nuclear steam supply system has the inherent capability to accept a 10% step load change, the plant can, therefore, accept a step load decrease of 50% of full load from full load without a reactor trip. Therefore, with the operation of the steam dump system, a reactor trip when the plant is operating below 50% of rated thermal power is not required following a loss of load or turbine trip from a pressure standpoint.

In addition, PSE&G presented the results of a Westinghouse study concerning the potential for increased pressurizer power operated relief valves (PORV) opening from a turbine trip without a reactor trip at 50% of rated thermal power. The NRC has previously expressed concerns regarding the potential increase in probability of a stuck-open pressurizer PORV following the implementation of deletion of reactor trip on turbine trip below 50% power.

The staff position is addressed in NUREG-0737, Item II.K.3.10. The results of the Westinghouse analysis indicate that a turbine trip below 50% of rated thermal power will not result in opening the PORVs even with degraded control system performance (i.e., steam dump system, pressurizer spray system or rod control system failure). These results are acceptable to the staff and the analytical study was performed with approved methods and suitably conservative assumptions.

The staff has reviewed the proposed changes to Technical Specification Table 3.3-1 for Salem Units 1 and 2. These changes would increase the reactor trip block with a turbine trip to 50% power from 11% power. As discussed above the staff finds the proposed changes meet the applicable NRC requirements and are, therefore, acceptable.

In addition, typographical errors were corrected that were made in the licensee's submittal.

### 3.0 ENVIRONMENTAL CONSIDERATION

These amendments involve a change to a requirement with respect to 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 issued a proposed finding that the amendments involve no significant hazards consideration and there has been no public comment on such finding. Accordingly, the 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.

#### 4.0 CONCLUSION

The Commission made a proposed determination that the amendments involve no significant hazards consideration which was published in the Federal Register (52 FR 39305) on October 21, 1987 and consulted with the State of New Jersey. No public comments were received and the State of New Jersey did not have any comments.

The staff 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, 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 nor to the health and safety of the public.

Principal Contributor: L. Kopp

Dated: June 27, 1988