Mr. Neil S. Carns
Senior Vice President
and Chief Nuclear Officer
Northeast Nuclear Energy Company
c/o Ms. Patricia A. Loftus
Director - Regulatory Affairs
P.O. Box 128
Waterford, CT 06385

December 24, 1997

SUBJECT: ISSUANCE OF AMENDMENT (TAC NO. M99798)

Dear Mr. Carns:

The Commission has issued the enclosed Amendment No. 155 to Facility Operating License No. NPF-49 for the Millstone Nuclear Power Station, Unit No. 3, in response to your application dated October 15, 1997.

Technical Specification Surveillances 4.1.2.3.1, 4.1.2.4.1, 4.5.2, 4.6.2.1, and 4.6.2.2 require the recirculation spray, quench spray, residual heat removal, centrifugal charging, and safety injection pumps to be tested on a periodic basis and after modifications that alter subsystem flow characteristics. The amendment replaces the specific surveillance pump pressure with a statement that the test be conducted in accordance with Specification 4.0.5, Inservice Testing Program. The amendment also decreases the required individual safety injection and centrifugal charging pump injection line flow rates, increases the allowed individual safety injection pump runout flow rate, and makes editorial changes to the surveillances.

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

Sincerely,
Original signed by:
James W. Andersen, Project Manager
Special Projects Office - Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-423

Enclosures: 1. Amendment No. 155 to NPF-49
2. Safety Evaluation

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

December 24, 1997

Mr. Neil S. Carns
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and Chief Nuclear Officer
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Docket No. 50-423

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2. Safety Evaluation

cc w/encls: See next page

Northeast Nuclear Energy Company

cc:

Lillian M. Cuoco, Esquire
Senior Nuclear Counsel
Northeast Utilities Service Company
P. O. Box 270
Hartford, CT 06141-0270

Mr. Kevin T. A. McCarthy, Director
Monitoring and Radiation Division
Department of Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

First Selectmen
Town of Waterford
Hall of Records
200 Boston Post Road
Waterford, CT 06385

Mr. Wayne D. Lanning
Deputy Director of Inspections
Special Projects Office
475 Allendale Road
King of Prussia, PA 19406-1415

Michael H. Brothers
Vice President - Operations
Northeast Nuclear Energy Company
P. O. Box 128
Waterford, CT 06385

Mr. M. R. Scully, Executive Director
Connecticut Municipal Electric
Energy Cooperative
30 Stott Avenue
Norwich, CT 06360

Mr. David Amerine
Vice President - Nuclear Engineering
and Support
Northeast Utilities Service Company
P. O. Box 128
Waterford, CT 06385

Millstone Nuclear Power Station
Unit 3

Mr. William D. Meinert
Nuclear Engineer
Massachusetts Municipal Wholesale
Electric Company
P. O. Box 426
Ludlow, MA 01056

Joseph R. Egan, Esquire
Egan & Associates, P.C.
2300 N Street, NW
Washington, D.C. 20037

Mr. F. C. Rothen
Vice President -Work Services
Northeast Utilities Service Company
P. O. Box 128
Waterford, CT 06385

Ernest C. Hadley, Esquire
1040 B Main Street
P. O. Box 549
West Wareham, MA 02576

Mr. John Buckingham
Department of Public Utility Control
Electric Unit
10 Liberty Square
New Britain, CT 06051

Mr. James S. Robinson
Manager, Nuclear Investments and
Administration
New England Power Company
25 Research Drive
Westborough, MA 01582

Mr. D. M. Goebel
Vice President - Nuclear Oversight
Northeast Utilities Service Company
P.O. Box 128
Waterford, CT 06385

Deborah Katz, President
Citizens Awareness Network
P.O. Box 83
Shelburne Falls, MA 03170

Northeast Nuclear Energy Company

cc:

Senior Resident Inspector
Millstone Nuclear Power Station
c/o U.S. Nuclear Regulatory
Commission
P. O. Box 513
Niantic, CT 06357

Mr. Allan Johanson, Assistant Director
Office of Policy and Management
Policy Development and Planning Division
450 Capitol Avenue - MS# 52ERN
P. O. Box 341441
Hartford, CT 06134-1441

Citizens Regulatory Commission
ATTN: Ms. Susan Perry Luxton
180 Great Neck Road
Waterford, CT 06385

The Honorable Terry Concannon
Co-Chair
Nuclear Energy Advisory Council
Room 4035
Legislative Office Building
Capitol Avenue
Hartford, CT 06106

Mr. Evan W. Woollacott
Co-Chair
Nuclear Energy Advisory Council
128 Terry's Plain Road
Simsbury, CT 06070

Little Harbor Consultants, Inc.
Millstone - ITPOP Project Office
P. O. Box 0630
Niantic, CT 06357-0630

Mr. B. D. Kenyon
Chief Nuclear Officer - Millstone
Northeast Nuclear Energy Company
P. O. Box 128
Waterford, CT 06385

Millstone Nuclear Power Station
Unit 3

Mr. Daniel L. Curry
Project Director
Parsons Power Group Inc.
2675 Morgantown Road
Reading, PA 19607

Mr. Don Schopfer
Verification Team Manager
Sargent & Lundy
55 E. Monroe Street
Chicago, IL 60603

Mr. J. P. McElwain
Vice President (Acting) - Millstone 3
Northeast Nuclear Energy Company
P.O. Box 128
Waterford, CT 06385

Mr. G. D. Hicks
Unit Director - Millstone Unit 3
Northeast Nuclear Energy Company
P.O. Box 128
Waterford, CT 06385

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

NORTHEAST NUCLEAR ENERGY COMPANY, ET AL.

DOCKET NO. 50-423

MILLSTONE NUCLEAR POWER STATION, UNIT NO. 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 155
License No. NPF-49

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

   A. The application for amendment by Northeast Nuclear Energy Company, et al. (the licensee) dated October 15, 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.C.(2) of Facility Operating License No. NPF-49 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 155 , and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto are hereby incorporated in the license. The licensee 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 its issuance, to be implemented within 60 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

for Phillip F. McKee
Deputy Director for Licensing
Special Projects Office
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: December 24, 1997

ATTACHMENT TO LICENSE AMENDMENT NO. 155

FACILITY OPERATING LICENSE NO. NPF-49

DOCKET NO. 50-423

Replace the following pages of the Appendix A, Technical Specifications, with the attached pages. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change.

Remove	Insert
3/4 1-15	3/4 1-15
3/4 1-16	3/4 1-16
3/4 5-5	3/4 5-5
3/4 5-6	3/4 5-6
3/4 6-12	3/4 6-12
3/4 6-13	3/4 6-13

CHARGING PUMP - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.2.3 One charging pump in the boron injection flow path required by Specification 3.1.2.1 shall be OPERABLE and capable of being powered from an OPERABLE emergency power source.

APPLICABILITY: MODES 5 and 6.

ACTION:

With no charging pump OPERABLE or capable of being powered from an OPERABLE emergency power source, suspend all operations involving CORE ALTERATIONS or positive reactivity changes.

SURVEILLANCE REQUIREMENTS

4.1.2.3.1 The above required charging pump shall be demonstrated OPERABLE by verifying that its developed head at the test flow point is greater than or equal to the required developed head when tested pursuant to Specification 4.0.5.

4.1.2.3.2 All charging pumps, excluding the above required OPERABLE pump, shall be demonstrated inoperable at least once per 31 days, except when the reactor vessel head is removed, by verifying that the motor circuit breakers are secured in the open position.

REACTIVITY CONTROL SYSTEMS

CHARGING PUMPS - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.4 At least two* charging pumps shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

With only one charging pump OPERABLE, restore at least two charging pumps to OPERABLE status within 72 hours or be in at least HOT STANDBY and borated to a SHUTDOWN MARGIN equivalent to at least the limit as shown in Figure 3.1-4 at 200°F within the next 6 hours; restore at least two charging pumps to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

SURVEILLANCE REQUIREMENTS

4.1.2.4.1 At least two charging pumps shall be demonstrated OPERABLE by verifying that each pump's developed head at the test flow point is greater than or equal to the required developed head when tested pursuant to Specification 4.0.5.

4.1.2.4.2 All charging pumps, except the above allowed OPERABLE pump, shall be demonstrated inoperable at least once per 31 days whenever the temperature of one or more of the Reactor Coolant System (RCS) cold legs is less than or equal to 350°F by verifying that the motor circuit breakers are secured in the open position.

*A maximum of one centrifugal charging pump shall be OPERABLE whenever the temperature of one or more of the RCS cold legs is less than or equal to 350°F.

2) A visual inspection of the containment sump and verifying that the subsystem suction inlets are not restricted by debris and that the sump components (trash racks, screens, etc.) show no evidence of structural distress or abnormal corrosion.

e. At least once each REFUELING INTERVAL by:

1) Verifying that each automatic valve in the flow path actuates to its correct position on a Safety Injection actuation test signal, and

2) Verifying that each of the following pumps start automatically upon receipt of a Safety Injection actuation test signal:

a) Centrifugal charging pump,

b) Safety Injection pump, and

c) RHR pump.

3) Verifying that the Residual Heat Removal pumps stop automatically upon receipt of a Low-Low RWST Level test signal.

f. By verifying that each of the following pump's developed head at the test flow point is greater than or equal to the required developed head when tested pursuant to Specification 4.0.5:

1) Centrifugal charging pump

2) Safety Injection pump

3) RHR pump

4) Containment recirculation pump

g. By verifying the correct position of each electrical and/or mechanical position stop for the following ECCS throttle valves:

1) Within 4 hours following completion of each valve stroking operation or maintenance on the valve when the ECCS subsystems are required to be OPERABLE, and

2) At least once each REFUELING INTERVAL.

ECCS Throttle Valves Valve Number	Valve Number
3SIH*V6	3SIH*V25
3SIH*V7	3SIH*V27

SURVEILLANCE REQUIREMENTS (Continued)

ECCS Throttle Valves Valve Number	Valve Number
3SIH*V8	3SIH*V107
3SIH*V9	3SIH*V108
3SIH*V21	3SIH*V109
3SIH*V23	3SIH*V111

h. By performing a flow balance test following completion of modifications to the ECCS subsystems that alter the subsystem flow characteristics and verifying that:

1) For centrifugal charging pump lines, with a single pump running:

a) The sum of the injection line flow rates, excluding the highest flow rate, is greater than or equal to 310.5 gpm, and

b) The total pump flow rate is less than or equal to 560 gpm.

2) For Safety Injection pump lines, with a single pump running:

a) The sum of the injection line flow rates, excluding the highest flow rate, is greater than or equal to 423.4 gpm, and

b) The total pump flow rate is less than or equal to 675 gpm.

3) For RHR pump lines, with a single pump running, the sum of the injection line flow rates is greater than or equal to 3976 gpm.

3/4.6.2 DEPRESSURIZATION AND COOLING SYSTEMS

CONTAINMENT QUENCH SPRAY SYSTEM

LIMITING CONDITION FOR OPERATION

3.6.2.1 Two independent Containment Quench Spray subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

With one Containment Quench Spray subsystem inoperable, restore the inoperable system to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.2.1 Each Containment Quench Spray subsystem shall be demonstrated OPERABLE:

a. At least once per 31 days:

1) Verifying that each valve (manual, power operated, or automatic) in the flow path is not locked, sealed, or otherwise secured in position, is in its correct position; and

2) Verifying the temperature of the borated water in the refueling water storage tank is between 40°F and 50°F.

b. By verifying that each pump's developed head at the test flow point is greater than or equal to the required developed head when tested pursuant to Specification 4.0.5;

c. At least once each REFUELING INTERVAL, by:

1) Verifying that each automatic valve in the flow path actuates to its correct position on a CDA test signal, and

2) Verifying that each spray pump starts automatically on a CDA test signal.

d. At least once per 10 years by performing an air or smoke flow test through each spray header and verifying each spray nozzle is unobstructed.

RECIRCULATION SPRAY SYSTEM

LIMITING CONDITION FOR OPERATION

3.6.2.2 Two independent Recirculation Spray Systems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

With one Recirculation Spray System inoperable, restore the inoperable system to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours; restore the inoperable Recirculation Spray System to OPERABLE status within the next 48 hours or be in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.2.2 Each Recirculation Spray System shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power-operated, or automatic) in the flow path is not locked, sealed, or otherwise secured in position, is in its correct position;

b. By verifying that each pump's developed head at the test flow point is greater than or equal to the required developed head when tested pursuant to Specification 4.0.5;

c. At least once each REFUELING INTERVAL by verifying that on a CDA test signal, each recirculation spray pump starts automatically after a 660 ±20 second delay;

d. At least once each REFUELING INTERVAL, by verifying that each automatic valve in the flow path actuates to its correct position on a CDA test signal; and

e. At least once per 10 years by performing an air or smoke flow test through each spray header and verifying each spray nozzle is unobstructed.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 155

TO FACILITY OPERATING LICENSE NO. NPF-49

NORTHEAST NUCLEAR ENERGY COMPANY, ET AL.

MILLSTONE NUCLEAR POWER STATION, UNIT NO. 3

DOCKET NO. 50-423

1.0 INTRODUCTION

By letter dated October 15, 1997, the Northeast Nuclear Energy Company, et al. (the licensee), submitted a request for changes to the Millstone Nuclear Power Station, Unit No. 3 Technical Specifications (TS). TS Surveillances 4.1.2.3.1, 4.1.2.4.1, 4.5.2, 4.6.2.1, and 4.6.2.2 require the recirculation spray, quench spray, residual heat removal, centrifugal charging, and safety injection pumps to be tested on a periodic basis and after modifications that alter subsystem flow characteristics. The proposed changes to these surveillances include replacing the specific surveillance pump pressure with a statement that the test be conducted in accordance with TS 4.0.5, Inservice Testing (IST) Program. The proposed changes also include a decrease in the required individual safety injection and centrifugal charging pump injection line flow rates, an increase in the allowed individual safety injection pump runout flow rate, and editorial changes to the surveillances.

2.0 BACKGROUND

In its letter dated October 15, 1997, the licensee stated that throttle valves are used in the centrifugal charging and safety injection lines to limit maximum injection flow to preclude pump runout, balance the resistance in the lines, and ensure minimum injection to support design bases analyses. The licensee stated that high velocities through the throttle valves in their current throttled position could cause valve erosion; therefore, the licensee is adding an additional flow resistance, a restricting orifice, to 8 of the 12 injection lines so that the throttle valves can be opened farther. The licensee stated that opening the throttle valve will reduce the velocity through the valves so that valve erosion will not be a concern. The licensee further stated that the sizing of the restricting orifices and the associated rethrottling of the throttle valves will be done in accordance with Regulatory Guide 1.82, "Sumps for Emergency Core Cooling and Containment Spray Systems," in that the openings will be larger than the sump screen mesh opening size.

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3.0 EVALUATION

In its letter dated October 15, 1997, the licensee stated, due to the modifications described above, that (1) the requirements of surveillances 4.1.2.3.1, 4.1.2.4.1, 4.5.2.f, 4.6.2.1.b, and 4.6.2.2.b are being replaced with a statement that the test be conducted in accordance with the IST Program, (2) the requirements of surveillance 4.5.2.h are being modified to decrease the required individual centrifugal charging pump injection line flow rate sum from 339 gallons per minute (gpm) to 310.5 gpm and the safety injection pump line flow rate sum from 442.5 gpm to 423.4 gpm, and (3) the requirements of surveillance 4.5.2.h are being modified to increase the required individual safety injection pump total flow rate for Pump A from 670 gpm to 675 gpm and for Pump B from 650 gpm to 675 gpm.

3.1 TS 4.1.2.3.1, 4.1.2.4.1, 4.5.2.f, 4.6.2.1.b, and 4.6.2.2.b (Differential Pressure)

These TS currently require that the recirculation spray, quench spray, residual heat removal, centrifugal charging, and safety injection pumps be demonstrated operable by verifying that a differential pressure across the pump of greater than or equal to a specific value is developed when tested pursuant to TS 4.0.5. In the October 15, 1997, letter, the licensee stated that the numerical surveillance acceptance criteria for these pumps is being removed from the TS and is being replaced with a statement that the test be conducted in accordance with the IST Program. The licensee further stated that the acceptance criteria used in the IST Program will still, at a minimum, provide assurance that the assumptions in the design basis analysis are valid.

Periodic surveillance testing of emergency core cooling system (ECCS) pumps to detect gross degradation caused by impeller structural damage or other hydraulic component problems is required by Section XI of the ASME Code. This type of testing may be accomplished by measuring the pump developed head at only one point of the pump characteristic curve. This verifies both that the measured performance is within an acceptable tolerance of the original pump baseline performance and that the performance at the test flow is greater than or equal to the performance assumed in the plant safety analysis. Surveillance requirements are specified in the IST Program, which encompasses Section XI of the ASME Code. Section XI of the ASME Code provides the activities and frequencies necessary to satisfy the requirements.

The NRC staff has reviewed the change and finds the reference to the IST Program acceptable in that the surveillance will continue to provide assurance that the pumps will operate consistent with system evaluations, design basis assumptions, and it will provide assurance that the pumps will perform their intended safety function. Consistent with 10 CFR 50.36(c)(3), the reference to the IST Program is sufficient to assure maintenance of the necessary quality of plant systems and components and that the limiting conditions of operation will be met. The staff also notes that the change to reference the Millstone Unit 3 IST Program is consistent with the Westinghouse Standard Technical Specifications (NUREG-1431).

The change in the referenced units from differential pressure across the pump to developed head is editiorial and allows the licensee to account for the effect of water density on pump performance during each test. The NRC staff finds the change acceptable.

3.2 TS 4.5.2.h (Line Flow Rate Sum)

The TS currently require, in part, that the ECCS system be determined operable by performing a flow balance test following completion of modifications to the ECCS subsystems that alter the subsystem flow characteristics and verifying that: (1) for the charging pump lines, with a single pump running, that the sum of the injection line flow rates, excluding the highest flow rate, is greater than or equal to 339 gpm, and (2) for the safety injection pump lines, with a single pump running, that the sum of the injection line flow rates, excluding the highest flow rate, is greater than or equal to 442.5 gpm. By letter dated October 15, 1997, the licensee proposed that the charging pump injection line flow rate sum be reduced to 310.5 gpm and that the safety injection pump line flow rate sum be reduced to 423.4 gpm.

The licensee stated that the changes to decrease the required surveillance minimum flow rates for the centrifugal charging and safety injection pumps are consistent with the current Final Safety Analysis Report (FSAR) licensing basis analyses for Millstone Unit 3. Specifically, the new minimum flows are consistent with the minimum safeguards flow data that is used in the FSAR Chapter 15 accident analysis. The minimum flow requirements are established by the injection phase of a loss-of-coolant accident (LOCA) when the pump suction source is the refueling water storage tank (RWST).

The NRC staff finds the change in minimum flow rate for the centrifugal charging and safety injection pumps acceptable in that the change reflects the flows that are presently used in the design analyses, the surveillance continues to provide the necessary assurance that the pumps will function consistent with the flows used in the accident analyses, and surveillance continues to provide assurance that the pumps will perform their intended safety function.

3.3 TS 4.5.2.h (Total Flow Rate)

The TS currently require, in part, that the ECCS system be determined operable by performing a flow balance test following completion of modifications to the ECCS subsystems that alter the subsystem flow characteristics and verifying that for the safety injection pump lines, with a single pump running, the total pump flow rate is less than or equal to 670 gpm for the A pump and 650 gpm for the B pump. By letter dated October 15, 1997, the licensee proposed that the individual safety injection pump total flow rate for both pumps A and B be increased to 675 gpm.

The licensee stated that the maximum flow requirements are established during the recirculation phase of a LOCA when the suction source of the pumps is the recirculation spray pumps that provide a head boost to the safety injection pumps. This increase in flow between maximum and minimum requirements caused by widening the band will increase the design window, thereby, allowing for adequate pump performance margin, which had been limited because the original design did not adequately evaluate the head boost.

The licensee stated that the maximum flow for the safety injection pump is consistent with the runout limitations established by the pump vendor. Safety injection pump operation at a higher allowed maximum flow requires a larger pump net positive suction head (NPSH). The higher NPSH required is below the minimum NPSH available both during injection when the suction source is the RWST and during recirculation when the suction source is the recirculation spray pumps.

The licensee also noted that the safety injection pumps are disabled so that they cannot be an injection source when the cold overpressure system is required to be operable which means that the increase in maximum flow does not affect the cold overpressure accident analysis.

The NRC staff finds the change in maximum total flow rate for the safety injection pumps acceptable in that the change is consistent with the flows that are presently used in the design analyses, the surveillance continues to provide the necessary assurance that the pumps will function consistent with the flows used in the accident analyses, the flow rate is consistent with vendor recommendations, and the surveillance continues to provide assurance that the pumps will perform their intended safety function.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Connecticut State official was notified of the proposed issuance of the amendment. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes surveillance requirements. The NRC staff has determined that the amendment involves 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 amendment involves no significant hazards consideration, and there has been no public comment on such finding (62 FR 59918). Accordingly, the amendment meets 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 amendment.

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 amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: J. Andersen

Date: December 24, 1997