November 3, 2000

Mr. S. E. Scace - Director Nuclear Oversight and Regulatory Affairs c/o Mr. David A. Smith Northeast Nuclear Energy Company P. O. Box 128 Waterford, CT 06385-0128

### SUBJECT: MILLSTONE NUCLEAR POWER STATION, UNIT NO. 3 - ISSUANCE OF AMENDMENT RE: PRESSURE SENSOR RESPONSE TIME VERIFICATION (TAC NO. MA9360)

Dear Mr. Scace:

The Commission has issued the enclosed Amendment No. 187 to Facility Operating License No. NPF-49 for the Millstone Nuclear Power Station, Unit No. 3, in response to your application dated June 26, 2000.

The amendment changes the Millstone Nuclear Power Station, Unit No. 3, Technical Specifications (TSs) Section 1.13, Definitions, "Engineered Safety Features Response Time"; TS Section 1.28, "Reactor Trip System Response Time"; TS Section 3.3.1, "Instrumentation-Reactor Trip System Instrumentation"; and TS Section 3.3.2, "Instrumentation-Engineered Safety Features Actuation System Instrumentation" to provide for verification of response time for selected components provided that the components and the methodology for verification have been previously reviewed and approved by the Nuclear Regulatory Commission.

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

Sincerely,

#### IRA/

Victor Nerses, Sr. Project Manager, Section 2 Project Directorate I Division of Licensing Project Management Office of Nuclear Reactor Regulation

Docket No. 50-423

Enclosures: 1. Amendment No. 187 to NPF-49 2. Safety Evaluation

cc w/encls: See next page

Millstone Nuclear Power Station Unit 3

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SUBJECT: MILLSTONE NUCLEAR POWER STATION, UNIT NO. 3 - ISSUANCE OF AMENDMENT RE: PRESSURE SENSOR RESPONSE TIME VERIFICATION (TAC NO. MA9360)

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Sincerely, /RA/

Victor Nerses, Sr. Project Manager, Section 2 Project Directorate I Division of Licensing Project Management Office of Nuclear Reactor Regulation

Docket No. 50-423

Enclosures: 1. Amendment No. 187 to NPF-49

2. Safety Evaluation

cc w/encls: See next page

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#### ACCESSION NO. ML003755285

\*SE received 9/25/00. No major changes made.

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## NORTHEAST NUCLEAR ENERGY COMPANY, ET AL.

# DOCKET NO. 50-423

## MILLSTONE NUCLEAR POWER STATION, UNIT NO. 3

### AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 187 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 June 26, 2000, 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-49 is hereby amended to read as follows:
  - (2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 187 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 issuance, and shall be implemented within 60 days of issuance.

### FOR THE NUCLEAR REGULATORY COMMISSION

### IRA/

James W. Clifford, Chief, Section 2 Project Directorate I Division of Licensing Project Management Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: November 3, 2000

# ATTACHMENT TO LICENSE AMENDMENT NO. 187

### FACILITY OPERATING LICENSE NO. NPF-49

## DOCKET NO. 50-423

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

| <u>Remove</u> | Insert    |
|---------------|-----------|
| 1-3           | 1-3       |
| 1-5           | 1-5       |
| 3/4 3-1       | 3/4 3-1   |
| 3/4 3-16      | 3/4 3-16  |
| B 3/4 3-2     | B 3/4 3-2 |

# SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

# RELATED TO AMENDMENT NO. 187

# 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 June 26, 2000, Northeast Nuclear Energy Company (the licensee), proposed a license amendment to change the Technical Specifications (TS) for Millstone Nuclear Power Station, Unit No. 3 (MP3). The proposed amendment reflects changes necessary to modify the surveillances of pressure sensor response time and periodic protection channel response time for the Reactor Trip System (RTS) and the Engineered Safety Features Actuation System (ESFAS) to permit verification by means other than testing. This safety evaluation describes the staff's bases for approving the requested license amendment.

## 2.0 BACKGROUND

The Westinghouse Owner's Group (WOG) performed two analyses to assess the impact of elimination of response time testing (RTT) for instruments and instrument loops. These analyses also discussed alternate test methodologies that would confirm instrumentation was functioning correctly. The first of these analyses was Westinghouse Owners Group Licensing Topical Report WCAP 13632-P-A, Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements," dated August 1995, which was approved by a safety evaluation report (SER) dated September 5, 1995. The second analysis, WCAP-14036-P-A, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," dated December 1995, was approved in an SER dated October 6, 1998. Each of these SERs stipulates certain conditions that individual plant licensees must meet when implementing the guidelines in WCAP-13632-P-A, Revision 2 and WCAP-14036-P-A, Revision 1 on a plant-specific basis. These stipulations form the basis for approval of the licensee's requested license amendment, as discussed in the following section.

## 3.0 EVALUATION

The licensee proposes to eliminate periodic pressure sensor RTT in accordance with WCAP-13632-P-A, Revision 2, and to eliminate periodic protection channel RTT in accordance with WCAP-14036-P-A, Revision 1. The proposed license amendment modifies TS Definitions

1.13, "Engineered Safety Features Response Time"; and 1.28, "Reactor Trip System Response Time"; Surveillance Requirement (SR) 4.3.1.2 and SR 4.3.2.2 of TS 3/4.3.1 - "Reactor Trip System Instrumentation"; TS 3/4.3.2 - "Engineered Safety Feature Actuation System Instrumentation"; and TS Bases B 3/4.3.1 and B 3/4.3.2 - "Reactor Trip System Instrumentation and Engineered Safety Features Actuation System Instrumentation," to indicate that the response time for the pressure sensors, process racks, and trip logic will be determined based on the analysis and testing presented in WCAP-13632-P-A, Revision 2, and WCAP-14036-P-A, Revision 1, for these systems.

WCAP-13632-P-A, Revision 2, contains the technical basis and methodology for eliminating RTT requirements on selected pressure sensing instruments. When submitting a plant-specific license amendment request, the licensee must confirm the applicability of the generic analysis to their plant and must commit to the following actions:

#### 3.1 Plant-Specific Commitments and Generic Analysis Applicability

a) Perform a hydraulic RTT prior to installation of a new transmitter/switch or following refurbishment of the transmitter/switch (e.g., sensor cell or variable damping components) to determine an initial sensor-specific response time value.

Consistent with the proposed changes to TS 3.3.1 and TS 3.3.2 (including the associated Bases) and EPRI Report NP-7243, Revision 1, "Investigation of Response Time Testing Requirements," the licensee states that applicable plant procedures will include requirements that pressure sensor response times be verified by performance of an appropriate response time test prior to placing a sensor into operational service and re-verified following maintenance that may adversely affect sensor response time. These actions are consistent with the WCAP-13632-P-A, Revision 2, technical basis and methodology for eliminating RTT requirements on selected pressure sensing instruments and, therefore, are acceptable.

b) For transmitters and switches that use capillary tubes, perform an RTT after initial installation and after any maintenance or modification activity that could damage the capillary tubes.

The licensee states that there are no transmitters or switches that use capillary tubes in any MP3 RTS or ESFAS application for which RTT is required. Therefore, the licensee concludes, no procedure changes or enhanced administrative controls are necessary. Further, the licensee states that should any of these sensors be replaced in the future with sensors using capillary tubes, plant procedures (and/or other administrative controls) will be revised prior to application of the WCAP methodology, to assure the sensors are response time tested after initial installation and after any maintenance or modification activity that could damage the capillary tubes. These actions are consistent with the WCAP-13632-P-A, Revision 2, technical basis and methodology for response time testing pressure sensing instruments with capillary tubes and, therefore, are acceptable.

c) If variable damping is used, implement a method to assure that the potentiometer is at the required setting and cannot be inadvertently changed, or perform hydraulic RTT of the sensor following each calibration. The licensee states that there are no pressure transmitters with variable damping in any RTS or ESFAS application for which RTT is required. Therefore, the licensee concludes that no MP3 procedure changes or enhanced administrative controls are necessary. Further, the licensee states that should any of these transmitters be replaced with transmitters having variable damping, plant procedures (and/or other administrative controls) will be revised prior to application of the WCAP methodology to assure the variable damping potentiometer cannot be inadvertently changed. These actions are consistent with the WCAP-13632-P-A, Revision 2, methodology for assuring that variable damping potentiometers cannot be inadvertently changed and, therefore, are acceptable.

d) Perform periodic drift monitoring of all Model 1151, 1152, 1153, and 1154 Rosemount pressure and differential pressure transmitters, for which RTT elimination is proposed, in accordance with the guidance contained in Rosemount Technical Bulletin No. 4 and continue to remain in full compliance with any prior commitments to Bulletin 90-01, Supplement 1. As an alternative to performing periodic drift monitoring of Rosemount transmitters, licensees may complete the following actions: (1) ensure that operators and technicians are aware of the Rosemount transmitter loss of fill-oil issue and make provisions to ensure that technicians monitor for sensor response time degradation during the performance of calibrations and functional tests of these transmitters; and (2) review and revise surveillance testing procedures, if necessary, to assure that calibrations are being performed using equipment designed to provide a step function or fast ramp in the process variable and that calibrations and functional tests are being performed in a manner that allows simultaneous monitoring of both the input and output response of the transmitter under test, thus allowing, with reasonable assurance, the recognition of significant response time degradation.

The licensee states that only Rosemount Model 1153 and Model 1154 pressure and differential pressure transmitters are used in the MP3 RTS and ESFAS instrumentation loops. These sensors are bounded by the generic analysis contained in WCAP-13632-P-A, Revision 2; however, an allocated response time for these instruments is not provided in Table 9-1 of the WCAP. As directed in the WCAP, the licensee determined baseline response time values for these transmitters by evaluating data obtained from previous plant response time testing.

Additionally, regarding use of Rosemount transmitters in MP3, the licensee provided responses to NRC Bulletins 90-01 and 90-01, Supplement 1, "Loss of Fill-Oil in Transmitters Manufactured by Rosemount," by submittals dated July 3, 1990; March 26, 1991; February 2 and March 4, 1993; and August 12, 1994. These submittals address the actions taken by the licensee with respect to the loss of fill-oil for the Rosemount transmitters. The licensee states that periodic drift monitoring of all Model 1153 and 1154 Rosemount pressure and differential pressure transmitters for which RTT elimination is proposed will continue to be performed in accordance with the guidance contained in Rosemount Technical Bulletin No. 4. The licensee further states that it will continue to remain in full compliance with prior commitments to NRC Bulletin 90-01, Supplement 1. These actions are consistent with the WCAP-13632-P-A, Revision 2, methodology for assuring that loss of fill oil issues for Rosemount transmitters are addressed and, therefore, are acceptable.

e) WCAP-14036-P-A, Revision 1 contains the technical basis and methodology for eliminating periodic RTT requirements on RTS and ESFAS functions. The NRC safety evaluation approving WCAP-10436 requires that, when submitting a plant-specific license amendment request, the licensee must verify that the failure modes and effects analysis (FMEA) performed by the WOG is applicable to the equipment actually installed in the licensee's facility, and that the analysis is valid for the versions of the boards used in the protection system.

The licensee states that the FMEA presented in WCAP-14036-P-A, Revision 1 is applicable to and valid for the equipment actually installed at MP3, and therefore, the system response time shall be verified using the methodology described in WCAP-14036-P-A, Revision 1 for determining system response times. Allocations for system response times may be obtained from the bounding criteria in WCAP-14036-P-A, Revision 1 or plant-specific configurations.

The staff reviewed the functions and response time allocations identified by the licensee in the license amendment submittal, and found the sensors acceptable for RTT elimination on the basis of the response time allocations for the sensors, 7300 nuclear instrumentation system (NIS) string plus solid-state protection system (SSPS) input relays, and the SSPS logic.

### 3.2 TS Changes

The staff reviewed the proposed revisions of TS Definitions 1.13 and 1.28, and Surveillance Requirements 4.3.1.2 and 4.3.2.2, which incorporate the methodology approved in WCAP-13632-P-A, Revision 2, and WCAP-14036-P-A, Revision 1. Specifically, the changes revise the TS Definitions to permit verification as opposed to measurement of response time, and replace the words "demonstrated," "testing," and "tested" in the Surveillance Requirements with the words "verified" and "verification." A discussion of the proposed changes was added to TS Bases Sections B 3/4.3.1 and B 3/4.3.2. These changes are applicable to selected components provided both the components and the methodology for verification meet the criteria reviewed and approved by the NRC. The specific sections of the MP3 TS to be changed are as follows:

a. Section 1.1, Definitions, ENGINEERED SAFETY FEATURE (ESF) RESPONSE TIME, page 1-3.

Proposed Change: Change the definition to incorporate verification of response time in lieu of measurement. The definition currently states:

1.13 The ENGINEERED SAFETY FEATURES (ESF) RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its ESF Actuation Setpoint at the channel sensor until the ESF equipment is capable of performing its safety function (i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc.). Times shall include diesel generator starting and sequence loading delays where applicable.

With addition of the proposed sentences, the revised definition states:

1.13 The ENGINEERED SAFETY FEATURES (ESF) RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its ESF Actuation Setpoint at the channel sensor until the ESF equipment is capable of performing its safety function (i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc.). Times shall include diesel generator starting and sequence loading delays where applicable. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured. In lieu of measurement, response time may be verified for selected components provided that the components and the methodology for verification have been previously reviewed and approved by the NRC.

This change is consistent with the WCAP-14036-P-A, Revision 1, approved TS definition 1.13 and, therefore, is acceptable.

b. Section 1.1, Definitions, REACTOR TRIP SYSTEM RESPONSE TIME, page 1-5.

Proposed Change: Change the definition to incorporate verification of response time in lieu of measurement. The definition currently states:

1.28 The REACTOR TRIP SYSTEM RESPONSE TIME shall be the time interval from when the monitored parameter exceeds its Trip Setpoint at the channel sensor until loss of stationary gripper coil voltage.

The revised definition states:

1.28 The REACTOR TRIP SYSTEM RESPONSE TIME shall be the time interval from when the monitored parameter exceeds its Trip Setpoint at the channel sensor until loss of stationary gripper coil voltage. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured. In lieu of measurement, response time may be verified for selected components provided that the components and the methodology for verification have been previously reviewed and approved by the NRC.

This change is consistent with the WCAP-14036-P-A, Revision 1, approved TS definition 1.28 and, therefore, is acceptable.

c. Change TS Surveillance Requirement 4.3.1.2, page 3/4 3-1, which states:

4.3.1.2 The REACTOR TRIP SYSTEM RESPONSE TIME of each reactor trip function shall be demonstrated to be within its limit at least once per 18 months. Neutron detectors and speed sensors are exempt from response time testing. Each test shall include at least one train such that both trains are tested at least once per 36 months and one channel (to include input relays to both trains) per function such that all channels are tested at least once every N times 18

months where N is the total number of redundant channels in a specific reactor trip function as shown in the "Total No. of Channels" column of Table 3.3-1.

The revised TS Surveillance Requirement 4.3.1.2 states:

4.3.1.2 The REACTOR TRIP SYSTEM RESPONSE TIME of each reactor trip function shall be verified to be within its limit at least once per 18 months. Neutron detectors and speed sensors are exempt from response time verification. Each verification shall include at least one train such that both trains are verified at least once per 36 months and one channel (to include input relays to both trains) per function such that all channels are verified at least once every N times 18 months where N is the total number of redundant channels in a specific reactor trip function as shown in the "Total No. of Channels" column of Table 3.3-1.

This change is consistent with the WCAP-14036-P-A, Revision 1, approved TS surveillance requirement 4.3.1.2 and, therefore, is acceptable.

d. Change TS Surveillance Requirement 4.3.2.2, page 3/4 3-16, which states:

4.3.2.2 The ENGINEERED SAFETY FEATURES RESPONSE TIME\* of each ESFAS function shall be demonstrated to be within the limit at least once per 18 months. Each test shall include at least one train such that both trains are tested at least once per 36 months and one channel (to include input relays to both trains) per function such that all channels are tested at least once per N times 18 months where N is the total number of redundant channels in a specific ESFAS function as shown in the "Total No. of Channels" column of Table 3.3-3.

The footnote states:

The provisions of Specification 4.0.4 are not applicable for response time testing of steam line isolation for entry into MODE 4 and MODE 3 and turbine driven auxiliary feedwater pump entry into MODE 3.

The revised TS Surveillance Requirement 4.3.2.2 states:

4.3.2.2 The ENGINEERED SAFETY FEATURES RESPONSE TIME\* of each ESFAS function shall be verified to be within the limit at least once per 18 months. Each verification shall include at least one train such that both trains are verified at least once per 36 months and one channel (to include input relays to both trains) per function such that all channels are verified at least once per N times 18 months where N is the total number of redundant channels in a specific ESFAS function as shown in the "Total No. of Channels" column of Table 3.3-3.

The revised footnote states:

The provisions of Specification 4.0.4 are not applicable for response time verification of steam line isolation for entry into MODE 4 and MODE 3 and turbine driven auxiliary feedwater pump entry into MODE 3.

These changes are consistent with WCAP-14036-P-A, Revision 1, approved TS surveillance requirement 4.3.2.2 and, therefore, are acceptable.

e. Change TS Bases 3/4.3.1 and 3/4.3.2, Reactor Trip System Instrumentation and Engineered Safety Features Actuation System Instrumentation, page B 3/4.3-2, which, in part, states:

The measurement for response time at the specified frequencies provides assurance that the reactor trip and the Engineered Safety Features actuation associated with each channel is completed within the time limit assumed in the safety analyses. The RTS and ESF response times are included in the "Technical Requirements Manual". Any changes to the RTS and ESF response times shall be in accordance with Section 50.59 of 10 CFR 50 and approved by the Plant Operations Review Committee. No credit was taken in the analyses for those channels with responses times indicated as not applicable. Response time may be demonstrated by any series of sequential, overlapping, or total channel test measurements provided that such tests demonstrate the total channel response time as defined. Sensor response time verification may be demonstrated by either: (1) in place, onsite, or offsite test measurements, or (2) utilizing replacement sensors with certified response time. Detector response times may be measured by the in-situ or line noise analysisresponse time degradation method described in the Westinghouse Topical Report, "The Use of Process Noise Measurements to Determine Response Characteristics of Protection Sensors in U.S. Plants," August 1983.

The revised TS Bases 3/4.3.1 and 3/4.3.2, Reactor Trip System Instrumentation and Engineered Safety Features Actuation System Instrumentation, page B 3/4.3-2, in part, state:

The verification of response time at the specified frequencies provides assurance that the reactor trip and the engineered safety features actuation associated with each channel is completed within the time limit assumed in the safety analysis. No credit is taken in the analysis for those channels with response times indicated as not applicable (i.e., N.A.).

Response time may be verified by actual response time tests in any series of sequential, overlapping or total channel measurements, or by the summation of allocated sensor, signal processing and actuation logic response times with actual response time tests on the remainder of the channel. Allocations for sensor response times may be obtained from: (1) historical records based on acceptable response time tests (hydraulic, noise, or power interrupt tests), (2) inplace, onsite, or offsite (e.g. vendor) test measurements, or (3) utilizing vendor engineering specifications. WCAP-13632-P-A, Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements" provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the WCAP. Response time verification for other sensor types must be demonstrated by test. Detector response times may be measured by the in-situ online noise analysis-response time degradation method described in the Westinghouse Topical Report, "The Use of Process Noise Measurements to Determine Response Characteristics of Protection Sensors in U.S. Plants," dated August 1983.

WCAP-14036, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests" provides the basis and methodology for using allocated signal processing and actuation logic response times in the overall verification of the protection system channel response time. The allocations for sensor, signal conditioning and actuation logic response times must be verified prior to placing the component in operational service and re-verified following maintenance that may adversely affect response time. In general, electrical repair work does not impact response time provided the parts used for repair are of the same type and value. Specific components identified in the WCAP may be replaced without verification testing. One example where response time could be affected is replacing the sensing assembly of a transmitter.

These changes are consistent with WCAP-14036-P-A, Revision 1, approved TS Bases 3/4.3.1 and 3/4.3.2, Reactor Trip System Instrumentation and Engineered Safety Features Actuation System Instrumentation, page B 3/4.3-2, and, therefore, are acceptable.

#### 3.3 Summary

On the basis of the above review and justifications for TS changes, the staff concludes that the licensee has implemented the provisions of the generic SER for RTT elimination and satisfied the applicable plant-specific conditions in accordance with the approved WCAP-13632-P-A, Revision 2 and WCAP-14036-P-A, Revision 1. Therefore, the staff concludes that the proposed TS modifications for selected instrument RTT elimination are acceptable.

#### 3.0 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.

#### 4.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and 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 (65 FR 48755). 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.

### 5.0 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: M. Waterman

Date: November 3, 2000