

January 20, 1988

Docket No.: 50-271

Mr. R. W. Capstick  
Licensing Engineer  
Vermont Yankee Nuclear Power  
Corporation  
1671 Worcester Road  
Framingham, Massachusetts 01701

*See correction letter  
of 2/16/88*

Dear Mr. Capstick:

SUBJECT: ISSUANCE OF AMENDMENT NO. 103 DPR-28 VERMONT YANKEE NUCLEAR POWER  
STATION (TAC NOS. 60678 and 64616)

The Commission has issued the enclosed Amendment No. 103 to Facility  
Operating License No. DPR-28 for the Vermont Yankee Nuclear Power Station.  
The amendment consists of changes to the Technical Specifications in response  
to your application dated January 24, 1986, with changes and clarifications  
as stated by letters dated May 13, 1986, June 9, 1986, January 16, 1987 and  
February 2, 1987.

The amendment changes the Technical Specifications with respect to  
radiological effluent monitoring equipment operability, sample point  
locations, and definitions.

A copy of the Safety Evaluation is also enclosed. Notice of Issuance will be  
included in the Commission's Bi-Weekly Federal Register Notice.

Sincerely,

*15/*

Vernon L. Rooney, Project Manager  
Project Directorate I-3  
Division of Reactor Projects I/II

Enclosures:

- 1. Amendment No. 103 to License No. DPR-28
- 2. Safety Evaluation

cc w/enclosure:

See next page

Distribution:

See next page

\*See previous concurrence

OFC	:PDI-3	:PDI-3	:OGC-Bethesda	:ACTDIR/PDI-3:	:	:
NAME	:VRooney:lm	:MRushbrook	:*	:*CStahle	:	:
DATE	:12/ /87	:12/ /87	:12/ /87	:12/ /87	:	:

*1/20/88*

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*OK with  
William's  
comment 11/12/87*

*Comments  
incorporated and  
attached JLR 1/20/88*

OFC	:PDI-3	:PDI-3	:OGC-Bethesda	:ACTDIR/PDI-3:	:	:
NAME	:*V Rooney, lm	:*MRushbrook	:	:*CStahle	:	:
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Docket No.: 50-271

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Project Directorate I-3  
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OFC	: PDY-3	: PDI-3	: OGC-Bethesda	: ACTDIR/PDI-3	:	:
NAME	: VRooney:lm	: MRushbrook	:	: CStahle	:	:
DATE	: 12/4/87	: 12/5/87	: 12/ /87	: 12/15/87	:	:



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

January 20, 1988

Docket No.: 50-271

Mr. R. W. Capstick  
Licensing Engineer  
Vermont Yankee Nuclear Power  
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SUBJECT: ISSUANCE OF AMENDMENT NO. 103 DPR-28 VERMONT YANKEE NUCLEAR POWER  
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The amendment changes the Technical Specifications with respect to radiological effluent monitoring equipment operability, sample point locations, and definitions.

A copy of the Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's Bi-Weekly Federal Register Notice.

Sincerely,

A handwritten signature in dark ink, appearing to read "V. Rooney", written over a horizontal line.

Vernon L. Rooney, Project Manager  
Project Directorate I-3  
Division of Reactor Projects I/II

Enclosures:

1. Amendment No. 103 to  
License No. DPR-28
2. Safety Evaluation

cc w/enclosure:  
See next page

Mr. R. W. Capstick

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Vermont Yankee Nuclear Power Station

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Mr. R. W. Capstick

Vermont Yankee Nuclear Power Corporation  
Vermont Yankee Nuclear Power Station

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Dr. James H. Carpenter  
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Washington, DC 20555

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Docket File 50-271 ←

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

VERMONT YANKEE NUCLEAR POWER CORPORATION

DOCKET NO. 50-271

VERMONT YANKEE NUCLEAR POWER STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 103  
License No. DPR-28

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Vermont Yankee Nuclear Power Corporation (the licensee) dated January 24, 1986 as supplemented May 13, 1986, June 9, 1986, January 16, 1987, and February 2, 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;
  - 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 3.B of Facility Operating License No. DPR-28 is hereby amended to read as follows:

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PDR ADOCK 05000271  
P PDR

(B) Technical Specifications

The Technical Specifications, contained in Appendix A, as revised through Amendment No. 103, 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 date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Richard H. Wessman, Acting Director  
Project Directorate I-3  
Division of Reactor Projects I/II

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: January 20, 1988

ATTACHMENT TO LICENSE AMENDMENT NO. 103

FACILITY OPERATING LICENSE NO. DPR-28

DOCKET NO. 50-271

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. The corresponding overleaf pages are provided to maintain document completeness.

Remove Pages

4a  
66  
166  
167  
168  
169  
172C  
218

Insert Pages

4a  
66  
166  
167  
168  
169  
172C  
218

VYNPS

BB. Source Check - The qualitative assessment of channel response when the channel sensor is exposed to a radioactive source.

GG. Deleted

CC. Dose Equivalent I-131 - The dose equivalent I-131 shall be that concentration of I-131 (microcurie/gram) which alone would produce the same thyroid dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134 and I-135 actually present. The thyroid dose conversion factors used for this calculation shall be those listed in NRC Regulatory Guide 1.109, Revision 1, October 1977.

HH. Deleted

DD. Solidification - Solidification shall be the conversion of wet wastes into a form that meets shipping and burial ground requirements. Suitable forms include dewatered resins and filter sludges.

EE. Member(s) of the Public - Members of the public shall include all persons who are not occupationally associated with the plant. This category does not include employees of the utility, its contractors or vendors. Also excluded from this category are casual visitors to the plant and persons who enter the site to service equipment or to make deliveries.

II. Off-Site Dose Calculation Manual (ODCM) - A manual containing the current methodology and parameters used in the calculation of off-site doses due to radioactive gaseous and liquid effluents, in the calculation of gaseous and liquid effluent monitoring alarm/trip setpoints, and in the conduction of the environmental radiological monitoring program.

FF. Site Boundary - The site boundary is shown in Figure 2.2-5 in the FSAR.

## VYNPS

### 3.2 (Continued)

standby gas treatment system operation so that none of the activity released during the refueling accident leave the reactor building via the normal ventilation stack but that all activity is processed by the standby gas treatment system. Trip settings for the monitors in the ventilation duct are based upon initiation of the normal ventilation isolation and standby gas treatment system operation at a radiation level equivalent to the maximum site boundary dose rate of 500 mrem/year as given in Specification 3.8.E.1.a. The monitoring system in the plant stack represents a backup to this system to limit gross radioactivity releases to the environs.

The purpose of isolating the mechanical vacuum pump line is to limit release of radioactivity from the main condenser. During an accident, fission products would be transported from the reactor through the main steam line to the main condenser. The fission product radioactivity would be sensed by the main steam line radiation monitors which initiate isolation.

### 4.2 PROTECTIVE INSTRUMENTATION

The protective instrumentation systems covered by this Specification are listed in Table 4.2. Most of these protective systems are composed of two or more independent and redundant subsystems which are combined in a dual-channel arrangement. Each of these subsystems contains an arrangement of electrical relays which operate to initiate the required system protective action.

The relays in a subsystem are actuated by a number of means, including manually-operated switches, process-operated switches (sensors), bistable devices operated by analog sensor signals, timers, limit switches, and other relays. In most cases, final subsystem relay actuation is obtained by satisfying the logic conditions established by a number of these relay contacts in a logic array. When a subsystem is actuated, the final subsystem relay(s) can operate protective equipment, such as valves and pumps, and can perform other protective actions, such as tripping the main turbine-generator unit.

With the dual-channel arrangement of these subsystems, the single failure of a ready circuit can be tolerated because the redundant subsystem or system (in the case of high pressure coolant injection) will then initiate the necessary protective action. If a failure in one of these circuits occurs in such a way that an action is taken, the operator is immediately alerted to the failure. If the failure occurs and causes no action, it could then remain undetected, causing a loss of the redundancy in the dual-channel arrangement. Losses in redundancy of this nature are found by periodically testing the relay circuits in the subsystems to assure that they are operating properly.

It has been the practice in boiling water reactor plants to functionally test protective instrumentation sensors and sensor relays on-line on a monthly frequency. Since logic circuit tests result in the actuation of plant equipment, testing of this nature was done while the plant was shut down for refueling. In this way, the testing of equipment would not jeopardize plant operation. However, a refueling interval could be as long as eighteen months, which is too long a period to allow an undetected failure to exist.

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TABLE 3.9.2

GASEOUS EFFLUENT MONITORING INSTRUMENTATION

Instrument	Minimum Channels Operable	Notes
1. Steam Jet Air Ejector (SJAE) a. Noble Gas Activity Monitor	1	7, 8, 9
2. Augmented Off-Gas System a. Noble Gas Activity Monitor Between the Charcoal Bed System and the Plant Stack (Providing Alarm and Automatic Termination of Release) b. Flow Rate Monitor c. Hydrogen Monitor	1   1  1	2, 5, 6, 7   1, 5, 6  3, 5, 6
3. Plant Stack a. Noble Gas Activity Monitor b. Iodine Sampler Cartridge c. Particulate Sampler Filter d. Sampler Flow Integrator e. Stack Flow Rate Monitor	1  1  1  1  1	5, 7, 10  4, 5  4, 5  1, 5  1, 5

VYNPS

TABLE 3.9.2  
(continued)

TABLE NOTATION

- NOTE 1 - With the number of channels operable less than required by the minimum channels operable requirement, effluent releases via this pathway may continue provided the flow rate is estimated at least once per 4 hours.
- NOTE 2 - With the number of channels operable less than required by the minimum channels operable requirement, effluent releases via this pathway may continue for a period of up to 7 days provided that at least one of the stack monitoring systems is operable and off-gas system temperature and pressure are measured continuously.
- NOTE 3 - With the number of channels operable less than required by the minimum channels operable requirement, operation of the AOG System may continue provided gas samples are collected at least once per 24 hours and analyzed within the following 4 hours, or an orderly transfer of the off-gas effluents from the operating recombiner to the standby recombiner shall be made.
- NOTE 4 - With the number of channels operable less than required by the minimum channels operable requirement, effluent releases via the affected pathway may continue provided samples are continuously collected with auxiliary sampling equipment.
- NOTE 5 - With the number of channels operable less than required by the minimum channels operable requirement, exert reasonable efforts to return the instrument(s) to operable status within 30 days.
- NOTE 6 - During releases via this pathway.
- NOTE 7 - The alarm/trip setpoints of these channels shall be determined and adjusted in accordance with the methodology and parameters in the Off-Site Dose Calculation Manual (ODCM). With a gaseous process or effluent monitoring instrumentation channel alarm/trip setpoint less conservative than a value which will ensure that the limits of 3.8.E.1.a and 3.8.K.1 are met, immediately take actions to suspend the release of radioactive gaseous effluents monitored by the affected channel, or declare the channel inoperable, or change the setpoint so it is acceptably conservative.

VYNPS

TABLE 3.9.2  
(continued)

TABLE NOTATION

- NOTE 8 - Minimum channels operable required only during operation of the Steam Jet Air Ejector.
- NOTE 9 - With the number of channels operable less than required by the minimum channels operable requirement, gases from the SJAE may be released to the environment for up to 72 hours provided:
1. The AOG System is not bypassed; and
  2. The AOG System noble gas activity monitor is operable.
- NOTE 10 - With the number of channels operable less than required by the minimum channels operable requirement, effluent releases via this pathway may continue provided grab samples are taken at least once per 12 hours and these samples are analyzed for gross activity within 24 hours.

VYNPS

TABLE 3.9.3

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Exposure Pathway and/or Sample	Number of Sample Locations <sup>a</sup>	Sampling and Collection Frequency	Type and Frequency of Analysis
<p>1. AIRBORNE</p> <p>a. Radioiodine and Particulates</p>	<p>Samples from 5 locations:</p> <p>1 sample from up valley, within 4 miles of Site Boundary. (major wind direction)</p> <p>1 sample from down valley, within 4 miles of Site Boundary. (major wind direction)</p> <p>1 sample each from the vicinity of two nearby communities, within 10 miles of Site Boundary.</p> <p>1 sample from a control location.</p>	<p>Continuous operation of sampler with sample collection semimonthly or more frequently as required by dust loading or plant effluent releases<sup>h</sup>.</p>	<p>Radioiodine canister: Analyze each sample for I-131.</p> <p>Particulate sampler: Gross beta radioactivity analysis on each sample following filter change<sup>c</sup>. Composite (by location) for gamma isotopic<sup>d</sup> at least once per quarter.</p>

TABLE 3.9.4

REPORTING LEVELS FOR RADIOACTIVITY CONCENTRATIONS IN ENVIRONMENTAL SAMPLES<sup>(a)</sup>

## Reporting Levels

<u>Analysis</u>	<u>Water</u> (pCi/l)	<u>Airborne Particulate</u> <u>or Gases (pCi/m<sup>3</sup>)</u>	<u>Fish</u> (pCi/Kg, wet)	<u>Milk</u> (pCi/l)	<u>Vegetation</u> (pCi/Kg, wet)	<u>Sediment</u> (pCi/Kg, dry)
H-3	2 x 10 <sup>4(b)</sup>					
Mn-54	1 x 10 <sup>3</sup>		3 x 10 <sup>4</sup>			
Fe-59	4 x 10 <sup>2</sup>		1 x 10 <sup>4</sup>			
Co-58	1 x 10 <sup>3</sup>		3 x 10 <sup>4</sup>			
Co-60	3 x 10 <sup>2</sup>		1 x 10 <sup>4</sup>			3 x 10 <sup>3(c)</sup>
Zn-65	3 x 10 <sup>2</sup>		2 x 10 <sup>4</sup>			
Zr-Nb-95	4 x 10 <sup>2</sup>					
I-131		0.9		3	1 x 10 <sup>2</sup>	
Cs-134	30	10	1 x 10 <sup>3</sup>	60	1 x 10 <sup>3</sup>	
Cs-137	50	20	2 x 10 <sup>3</sup>	70	2 x 10 <sup>3</sup>	
Ba-La-140	2 x 10 <sup>2</sup>			3 x 10 <sup>2</sup>		

(a) Reporting levels may be averaged over a calendar quarter. When more than one of the radionuclides in Table 3.9.4 are detected in the sampling medium, the unique reporting requirements are not exercised if the following condition holds:

$$\frac{\text{concentration}(1)}{\text{reporting level}(1)} + \frac{\text{concentration}(2)}{\text{reporting level}(2)} + \dots \leq 1.0.$$

When radionuclides other than those in Table 3.9.4 are detected and are the result of plant effluents, the potential annual dose to a member of the public must be less than or equal to the calendar year limits of Specifications 3.8.B, 3.8.E and 3.8.F.

(b) Reporting level for drinking water pathways. For nondrinking water pathways, a value of 3 x 10<sup>4</sup> pCi/l may be used.

(c) Reporting level for individual grab samples taken at North Storm Drain Outfall only.

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1. Shall be submitted to the Commission in the semiannual Effluent Release Report for the period in which the change(s) was made. This submittal shall contain:
  - a. Sufficiently detailed information to support the rationale for the change without benefit of additional or supplemental information.
  - b. A determination that the change did not reduce the overall conformance of the dewatered spent resins/filter media waste product to existing criteria for solid waste shipments and disposal.
  - c. Documentation of the fact that the change has been reviewed by PORC and approved by the Manager of Operations (MOO).
2. Shall become effective upon review by PORC and approval by the Manager of Operations (MOO).

6.13 OFF-SITE DOSE CALCULATION MANUAL (ODCM)

An Off-Site Dose Calculation Manual shall contain the current methodology and parameters used in the calculation of off-site doses due to radioactive gaseous and liquid effluents, in the calculation of gaseous and liquid effluent monitoring alarm/trip setpoints, and in the conduct of the environmental radiological monitoring program.

A. Licensee initiated changes to the ODCM:

1. Shall be submitted to the Commission in the semiannual Effluent Release Report for the period in which the change(s) was made effective. This submittal shall contain:
  - a. Sufficiently detailed information to support the rationale for the change without benefit of additional or supplemental information. Information submitted should consist of a package of those pages of the ODCM which were changed with each page numbered and provided with the revision number, together with appropriate analyses or evaluations justifying the change(s).
  - b. A determination that the change will not reduce the accuracy or reliability of dose calculations or setpoint determinations.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
SUPPORTING AMENDMENT NO. 103 TO FACILITY OPERATING LICENSE NO. DPR-28

VERMONT YANKEE NUCLEAR POWER CORPORATION

VERMONT YANKEE NUCLEAR POWER STATION

DOCKET NO. 50-271

1.0 INTRODUCTION

By letter dated January 24, 1986, with modifications and clarifications submitted May 13, 1986, June 9, 1986, January 16, 1987, and February 2, 1987, the Vermont Yankee Nuclear Power Corporation (Vermont Yankee, the licensee) requested changes to the Vermont Yankee Radiological Effluent Technical Specifications (RETS) as incorporated in Facility Operating License DPR-28.

2.0 EVALUATION

License Amendment No. 83 to Facility Operating License DPR-28 for the Vermont Yankee Nuclear Power Station was issued October 9, 1984. The amendment authorized the incorporation of the RETS into the Vermont Yankee Technical Specifications (TS). The RETS were implemented by Vermont Yankee on April 1, 1985.

The proposed changes are consistent with NUREG-0473, "Standard Radiological Effluent Technical Specifications for BWRs", Revision 2, February 1, 1980 (model RETS) and would: 1) modify tabular notations for noble gas activity monitors on the augmented offgas system and plant stack to reflect current plant configuration; 2) modify tabular entries for the radiological environmental monitoring program to document more clearly the required locations for radioiodine and particulate sampling; 3) modify definitions and bases entries to reflect current interpretation of staff guidance; and 4) add a CO-60 reporting level for sediment samples which are presently required to be taken but have no reporting level.

During review of the implemented RETS the licensee found that the TS did not define the actions to be taken if the plant stack noble gas activity monitor became unavailable, as Table 3.9.1 requires. The pertinent table notation currently listed for both the augmented offgas (AOG) system and the plant stack reflects only the action to be taken for the noble gas monitor on the AOG system. The proper action to be taken for the noble gas monitor on the plant stack was inadvertently omitted and the licensee requested that it be reinserted in the table as a separate note. This note prescribes what the licensee must do if the plant stack noble gas activity monitor becomes unavailable, and binds the licensee to an obligation that the TS does not currently include. Inasmuch as the proposed notation for the plant stack monitor follows the guidance of the model RETS, this change is acceptable.

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PDR ADDCK 05000271  
PDR

The second change requested involves clarification of the sample location commitments made by the licensee for radioiodine and particulate sampling. The original Vermont Yankee RETS uses the generic model RETS wording to define the radioiodine and particulate sampling locations. The Vermont Yankee site's terrain, however, renders these model RETS ambiguous. Given the Vermont Yankee RETS' ambiguity, it is not possible to determine whether the current Vermont Yankee sampling locations, which the licensee has used for a number of years, satisfy the generic commitments of the TS. The licensee's submittal substitutes more specific language for the generic descriptions in the present TS. In its original evaluation of the RETS, the staff deemed the current sampling stations to meet the intent of the model RETS. Since the requested change is strictly a matter of clarification of the generic wording by making it more specific, the revised wording is acceptable.

The third part of the licensee's request involves clerical changes. Two definitions included in the approved RETS amendment are outside the scope of the RETS and are being deleted. In addition, a typographical error is being corrected in the Basis Section. These clerical changes are acceptable.

In addition, by letter dated January 6, 1987, the licensee proposed a reporting requirement for a given activity of Co-60 measured in sediment samples taken from the north storm drain outfall. Previously, the Technical Specifications contained no such reporting requirement so this change represents an enhancement to the radiological environmental monitoring program. The staff considers the proposed reporting level acceptable.

### 3.0 ENVIRONMENTAL CONSIDERATIONS

The regulations provide for a categorical exclusion from the requirement to prepare an environmental assessment for amendments to licenses or permits pursuant to part 50 that change surveillance requirements if the amendments involve no significant hazards considerations, do not significantly change the types or amounts of any effluents released offsite, and do not significantly increase individual or cumulative occupational radiation exposure (10 C.F.R. § 51.22(c)(9)). The regulations define another categorical exclusion from the requirement to do an environmental assessment for amendments to licenses or permits pursuant to part 50 that change recordkeeping, reporting, or administrative procedures or requirements (10 C.F.R. § 51.22(c)(10)). All the changes in the instant amendment fall under one or both of these categorical exclusions because the changes involve surveillance, reporting, or administrative requirements. Further, this amendment imposes new TS requirements and makes administrative changes to the TS. Prior to this amendment the T.S. would have permitted, but not required, operation in accordance with this amendment, therefore, the 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 the amendment will not cause any 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 has not received any public comment on that finding. 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.

4.0 CONCLUSION

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

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Dated: January 20, 1988