

MAY 1 8 1977

Dockets Nos. 50-245  
and 50-336

Northeast Nuclear Energy Company  
ATTN: Mr. D. C. Switzer, President  
P. O. Box 270  
Hartford, Connecticut 06101

Gentlemen:

The Commission has issued the enclosed Amendment No. 37 to Provisional Operating License No. DPR-21 and Amendment No. 26 to Facility Operating License No. DPR-65 for the Millstone Nuclear Power Station, Units Nos. 1 and 2. The amendments consist of changes to the Environmental Technical Specifications in response to your application dated May 12, 1977.

This amendment will allow an increase, from 25°F to 28°F, of the maximum temperature increase as measured at the Quarry Cut above the intake water temperature.

Copies of the Safety Evaluation and the FEDERAL REGISTER Notice are also enclosed.

Sincerely,

Original signed by

George Lear, Chief  
Operating Reactors Branch #3  
Division of Operating Reactors

Enclosures:

1. Amendment No. 37 to DPR-21
2. Amendment No. 26 to DPR-65
3. Safety Evaluation and Environmental Impact appraisal
4. FEDERAL REGISTER Notice and Negative Declaration

cc w/enclosure: See page 2

Distribution  
 ✓ Docket  
 ORB #3  
 Local PDR  
 NRC PDR  
 VStello  
 KGoller  
 GLear  
 CParrish  
 DJaffe  
 Attorney, OELD  
 OI&E (5)  
 BJones (8)  
 BScharf (10)  
 JMcGough  
 ASteen  
 WPasciak  
 BHarless  
 DEisenhut  
 ACRS (16)  
 OPA (Clare Miles)  
 DRoss  
 TBAbernathy  
 JRBuchanan

*Concurred*  
*5/18/77*  
*7:00 PM*  
*JRBuchanan*

OFFICE	ORB #3	ORB #3	ORB #3	OELD	ORB #3	
SURNAME	CParrish	DJaffe	BGrimes		GLear	
DATE	5/ /77	5/18/77	5/18/77	5/ /77	5/18/77	

Northeast Nuclear Energy Company

- 2 -

cc: William H. Cuddy, Esquire  
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Department of Planning & Energy Policy  
20 Grand Street  
Hartford, Connecticut 06115

Mr. Albert L. Partridge, First Selectman  
Town of Waterford  
Hall of Records - 200 Boston Post Road  
Waterford, Connecticut 06385

Northeast Nuclear Energy Company  
ATTN: Superintendent  
Millstone Plant  
P. O. Box 128  
Waterford, Connecticut 06385

Chief, Energy Systems Analysis Branch (AW-459)  
Office of Radiation Programs  
U. S. Environmental Protection Agency  
Room 645, East Tower  
401 M Street, N. W.  
Washington, D. C. 20460

U. S. Environmental Protection Agency  
Region I Office  
ATTN: EIS COORDINATOR  
John F. Kennedy Federal Building  
Boston, Massachusetts 02203

Waterford Public Library  
Rope Ferry Road, Route 156  
Waterford, Connecticut 06385



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

CONNECTICUT LIGHT AND POWER COMPANY  
THE HARTFORD ELECTRIC LIGHT COMPANY  
WESTERN MASSACHUSETTS ELECTRIC COMPANY  
NORTHEAST NUCLEAR ENERGY COMPANY

DOCKET NO. 50-245

MILLSTONE NUCLEAR POWER STATION, UNIT NO. 1

AMENDMENT TO PROVISIONAL OPERATING LICENSE

Amendment No. 37  
License No. DPR-21

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Connecticut Light and Power Company, The Hartford Electric Light Company, Western Massachusetts Electric Company, Northeast Nuclear Energy Company (the licensees) dated May 12, 1977, 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.

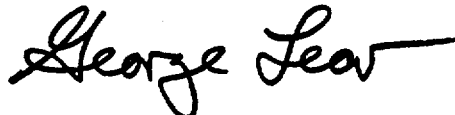
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 3.B. of Provisional Operating License No. DPR-21 is hereby amended to read as follows:

(B) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 37, 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



George Lear, Chief  
Operating Reactors Branch #3  
Division of Operating Reactors

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: May 18, 1977

ATTACHMENT TO LICENSE AMENDMENT NO. 37

TO THE TECHNICAL SPECIFICATIONS

FACILITY OPERATING LICENSE NO. DPR-21

DOCKET NO. 50-245

Replace the following page(s) of the Appendix "A". Technical Specifications with the enclosed page(s). The revised page is identified by Amendment number and contains vertical lines indicating the area of change.

<u>Remove</u>	<u>Replace</u>
2.1-1	2.1-1
2.1-2	2.1-2

2.0 LIMITING CONDITION FOR OPERATION

2.1 Thermal

2.1.1 Maximum  $\Delta T$  Across the Condenser and Maximum Discharge Temperature

Objective

The purpose of this Specification is to establish an upper limit on the thermal stress to the marine ecosystem by limiting the  $\Delta T$  across the condensers and the discharge temperature.

Specification

2.1.1.1 During Routine Operation

The maximum temperature increase as measured at the Quarry Cut above the intake water temperature shall not exceed 28°F for a period greater than 6 hours.

2.1.1.2 During Non-Routine Operation

- (a) The maximum temperature increase as measured at the Quarry Cut above the intake water temperature shall not exceed 32°F.
- (b) Under electrical load emergency conditions the temperature increase at the Quarry Cut above the intake water temperature may be increased to 44°F for a period not exceeding 24 hours.

2.1.1.3 The maximum discharge temperature of condenser cooling water as measured at the Quarry Cut shall not exceed 105°F.

2.1.1.4 Action

If the limiting conditions in 2.1.1.1 through 2.1.1.3 above are exceeded, plant operations shall be modified to restore compliance with the specifications.

Monitoring Requirement

2.1.1.5 The intake water temperature shall be monitored by a sensor in the intake bay areas of each unit. The sensor readout shall be recorded once each hour during normal power operation.

2.1.1.6 The temperature of the water at the Quarry Cut shall be monitored by two sensors located at mid-depth in the cut. The sensor readout shall be recorded once each hour during normal power operation. The sensor readout shall activate an alarm when the limit specified in 2.1.1.3 is exceeded.

- 2.1.1.7 The difference between the sensor outputs specified in 2.1.1.5 and 2.1.1.6 shall be recorded continuously during normal power operations. The output shall be alarm actuated when the limits specified on  $\Delta T$  in 2.1.1.1 and 2.1.1.2 are exceeded.
- 2.1.1.8 Temporary malfunction of the temperature monitoring systems shall not be restrictive on plant operations providing one inlet and one outlet sensor system are functional or provided that inlet and outlet temperatures are logged on an hourly basis.
- 2.1.1.9 The range of the sensors described in Specifications 2.1.1.5 and 2.1.1.6 shall be 23°F to 130°F. The total uncertainty (due to accuracy and instrument drift) of the sensor systems shall be  $\pm 1^\circ\text{F}$ .
- 2.1.1.10 An annual channel calibration of the sensor systems shall be performed.
- 2.1.1.11 A monthly channel functional test of the sensor system shall be performed.
- 2.1.1.12 Reporting Requirement
- A prompt report as described in Section 5.6.2.a.(1) shall be made when any of the limits and requirements specified in Sections 2.1.1.1 through 2.1.1.3 are exceeded.

#### Bases

The limits specified here are consistent with those contained in the NPDES permit issued by the State of Connecticut, Department of Environmental Protection.

Specification 2.1.1.1 covers the case of Routine Operation when all four condenser cooling water pumps in each unit are operating. The 23°F  $\Delta T$  across the condensers of Unit 1 and Unit 2 as indicated in the USAEC Final Environmental Statement for Millstone Nuclear Power Station dated June 1973 is basically a design value. However as has been observed during the operation of Unit 1, the  $\Delta T$  at maximum station load can be as high as 28°F especially during the cooler seasons because of variations in the plant operating efficiencies that are tied to the intake water temperature and an actual cooling water flow rate that is less than that used in the design calculations.

Specification 2.1.1.2.(a) covers the case when only three of the four condenser cooling water pumps are operating at any one unit. For this case the maximum  $\Delta T$  across the condenser is 32°F. Operation with less than four pumps can occur during periods of pump failure, inspection, maintenance or during condenser heat treatment.

Specification 2.1.1.2.(b) covers the period when a pump failure occurs during 3 pump operation. It corresponds to the 2 pump operation case at 100% power output. The 24-hour period will be sufficient to allow maintaining system load during a period of unusual electrical load demands (emergency) and permit corrective action.



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

THE CONNECTICUT LIGHT AND POWER COMPANY,  
THE HARTFORD ELECTRIC LIGHT COMPANY,  
WESTERN MASSACHUSETTS ELECTRIC COMPANY, AND  
NORTHEAST NUCLEAR ENERGY COMPANY

DOCKET NO. 50-336

MILLSTONE NUCLEAR POWER STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 26  
License No. DPR-65

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by the Connecticut Light and Power Company, The Hartford Electric Light Company, Western Massachusetts Electric Company, and Northeast Nuclear Energy Company ( the licensees), dated May 12, 1977, 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. DPR-65 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 26, 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



George Lear, Chief  
Operating Reactors Branch #3  
Division of Operating Reactors

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: May 18, 1977

ATTACHMENT TO LICENSE AMENDMENT NO. 26

FACILITY OPERATING LICENSE NO. DPR-65

DOCKET NO. 50-336

Replace the following page(s) of the Appendix "A" Technical Specifications with the enclosed page(s). The revised page is identified by Amendment number and contains vertical lines indicating the area of change.

Remove

2.1-1

2.1-2

Replace

2.1-1

2.1-2

2.0 LIMITING CONDITION FOR OPERATION

2.1 Thermal

2.1.1 Maximum  $\Delta T$  Across the Condenser and Maximum Discharge Temperature

Objective

The purpose of this Specification is to establish an upper limit on the thermal stress to the marine ecosystem by limiting the  $\Delta T$  across the condensers and the discharge temperature.

Specification

2.1.1.1 During Routine Operation

The maximum temperature increase as measured at the Quarry Cut above the intake water temperature shall not exceed 28°F for a period greater than 6 hours.

2.1.1.2 During Non-Routine Operation

(a) The maximum temperature increase as measured at the Quarry Cut above the intake water temperature shall not exceed 32°F.

(b) Under electrical load emergency conditions the temperature increase at the Quarry Cut above the intake water temperature may be increased to 44°F for a period not exceeding 24 hours.

2.1.1.3 The maximum discharge temperature of condenser cooling water as measured at the Quarry Cut shall not exceed 105°F.

2.1.1.4 Action

If the limiting conditions in 2.1.1.1 through 2.1.1.3 above are exceeded, plant operations shall be modified to restore compliance with the specifications.

Monitoring Requirement

2.1.1.5 The intake water temperature shall be monitored by a sensor in the intake bay areas of each unit. The sensor readout shall be recorded once each hour during normal power operation.

2.1.1.6 The temperature of the water at the Quarry Cut shall be monitored by two sensors located at mid-depth in the cut. The sensor readout shall be recorded once each hour during normal power operation. The sensor readout shall activate an alarm when the limit specified in 2.1.1.3 is exceeded.

- 2.1.1.7 The difference between the sensor outputs specified in 2.1.1.5 and 2.1.1.6 shall be recorded continuously during normal power operations. The output shall be alarm actuated when the limits specified on  $\Delta T$  in 2.1.1.1 and 2.1.1.2 are exceeded.
- 2.1.1.8 Temporary malfunction of the temperature monitoring systems shall not be restrictive on plant operations providing one inlet and one outlet sensor system are functional or provided that inlet and outlet temperatures are logged on an hourly basis.
- 2.1.1.9 The range of the sensors described in Specifications 2.1.1.5 and 2.1.1.6 shall be 23°F to 130°F. The total uncertainty (due to accuracy and instrument drift) of the sensor systems shall be  $\pm 1^\circ\text{F}$ .
- 2.1.1.10 An annual channel calibration of the sensor systems shall be performed.
- 2.1.1.11 A monthly channel functional test of the sensor system shall be performed.
- 2.1.1.12 Reporting Requirement

A prompt report as described in Section 5.6.2.a.(1) shall be made when any of the limits and requirements specified in Sections 2.1.1.1 through 2.1.1.3 are exceeded.

#### Bases

The limits specified here are consistent with those contained in the NPDES permit issued by the State of Connecticut, Department of Environmental Protection.

Specification 2.1.1.1 covers the case of Routine Operation when all four condenser cooling water pumps in each unit are operating. The 23°F  $\Delta T$  across the condensers of Unit 1 and Unit 2 as indicated in the USAEC Final Environmental Statement for Millstone Nuclear Power Station dated June 1973 is basically a design value. However as has been observed during the operation of Unit 1, the  $\Delta T$  at maximum station load can be as high as 28°F especially during the cooler seasons because of variations in the plant operating efficiencies that are tied to the intake water temperature and an actual cooling water flow rate that is less than that used in the design calculations.

Specification 2.1.1.2.(a) covers the case when only three of the four condenser cooling water pumps are operating at any one unit. For this case the maximum  $\Delta T$  across the condenser is 32°F. Operation with less than four pumps can occur during periods of pump failure, inspection, maintenance or during condenser heat treatment.

Specification 2.1.1.2.(b) covers the period when a pump failure occurs during 3 pump operation. It corresponds to the 2 pump operation case at 100% power output. The 24-hour period will be sufficient to allow maintaining system load during a period of unusual electrical load demands (emergency) and permit corrective action.



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

SAFETY EVALUATION AND ENVIRONMENTAL IMPACT APPRAISAL BY THE  
OFFICE OF NUCLEAR REACTOR REGULATION  
SUPPORTING AMENDMENTS NOS. 37 AND 26  
TO FACILITY OPERATING LICENSE NOS. DPR-21 AND DPR-65  
NORTHEAST NUCLEAR ENERGY COMPANY  
MILLSTONE NUCLEAR POWER STATION UNIT NOS. 1 AND 2  
DOCKET NOS. 50-245 AND 50-336

Introduction

By application dated May 12, 1977, Northeast Nuclear Energy Company requested a change to the Environmental Technical Specifications for Millstone Units Nos. 1 and 2. This change would allow an increase, from 25°F to 28°F, of the maximum temperature increase, as measured at the Quarry Cut, above the intake water temperature. Operation above 28°F would be permitted for 6 hours after which the licensee would have to take action to decrease the maximum temperature increase. This 6 hour limit previously applied to the 25°F limit.

Discussion

In their submittal of May 12, 1977, the licensee states that the limit of 25°F was based on the design  $\Delta T$  of 23°F for both Units Nos. 1 and 2 and on the early operating data for Unit No. 1. The measurement of the  $\Delta T$  for both units is made by using temperature sensors located at the intakes of Units Nos. 1 and 2 and sensors located at the Quarry Cut. Units Nos. 1 and 2 both discharge water into a large quarry; then the water flows into Long Island Sound through a narrow channel called the Quarry Cut. As recommended in the FES for Unit No. 3, the Quarry Cut contains a fish barrier to prevent fish from residing in the heated Quarry.

The licensee has found that during operation of Unit No. 1, with the circulating pumps for Unit No. 2 off, at full plant load, and with all circulating pumps for Unit No. 1 operating, the  $\Delta T$  can be as high as 28°F. The licensee attributes this to the following combination of factors:

- 1) Biofouling of the condensers and debris (mussel shells) from fouling of the pipes ahead of the condensers causes a reduction in water flow. Chlorination and heat treatment are used to reduce fouling but are not completely effective.
- 2) The capacity of the pumps is less than the design capacity.

- 3) The Quarry Cut Fish Barrier becomes fouled and increases the height of water in the quarry thereby decreasing pump capacity.
- 4) The temperature monitoring system may drift within its allowable accuracy and decrease the measured temperature margin.

The licensee concludes that the present limit of 25°F is too restrictive in that the limit does not allow for slight increases in the  $\Delta T$  due to these factors and should be increased to 28°F.

#### Safety Considerations

The proposed changes only address liquid effluent temperature limits. The changes in no way affect any safety margin nor do they affect the consequences of any accident previously considered. Thus, these changes in no way affect plant safety.

#### Conclusion

We have concluded, based on the considerations discussed above, that: (1) because the changes do not involve a significant increase in the probability or consequences of accidents previously considered and do not involve a significant decrease in a safety margin, the changes do not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

#### Environmental Impacts of Proposed Action

In their May 12, 1977 submittal, the licensee states that the 3°F temperature increase above the present  $\Delta T$  limit of 25°F would potentially affect biota in the site vicinity. The increase in thermal exposure of entrained organisms and changes to the thermal plume configuration, by increasing the discharge temperature and decreasing the flow through the Quarry Cut, are the two potential impacts of interest.

The effects on organisms being entrained through Units Nos. 1 and 2 were discussed in the FES for Unit No. 3 (p. 5-21). The FES concluded that nearly all organisms passing through the station would be killed but that the overall station effects were acceptable. Increasing the  $\Delta T$  by 3°F will not change that assessment.

The licensee estimated that the increase in size and shape of the thermal plume resulting from a 3°F increase in  $\Delta T$  would be small based upon data reported to us in Section 3.5.2 of the "Summary Report - Millstone Ecological and Hydrographic Report Docket No. 50-245, 50-336, 50-423, May 1966 - December, 1974. The increase in surface area of the 4°F isotherm would be on the order of 9% to 11%. The volume increases from 299 acre-feet to 304 acre-feet. The ecological effects of these changes would be negligible as the station discharges into Long Island Sound. We concur with the licensee's evaluation of the change in size and configuration of the thermal plume. The thermal plume would not be a barrier to fish passage, in that the size of the plume is small compared to the size of Long Island Sound, nor would it expose organisms mixed into the discharge water to a significantly higher temperature than current exposures. The maximum discharge temperature of 105°F in Specification 2.1.1.3 would not be affected by this change. With the reduction in the circulating water flow from the higher  $\Delta T$ , less organisms would be pumped into the station and killed. We concur with the licensee's assessment of the effects that this change will have on marine biota.

The staff concludes that no additional adverse impact is expected to result from operations of Millstone Units Nos. 1 and 2 at a  $\Delta T$  of 28°F.

#### Conclusion and Basis for Negative Declaration

On the basis of the foregoing analysis, it is concluded that there will be no environmental impact attributable to the proposed action other than has already been predicted and described in the Commission's FES for Millstone Nuclear Power Station Units Nos. 2 and 3. Having made this conclusion, the Commission has further concluded that no environmental impact statement for the proposed action need be prepared and that a negative declaration to this effect is appropriate.

Dated: May 18, 1977

UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKETS NOS. 50-245 AND 50-336

NORTHEAST NUCLEAR ENERGY COMPANY  
THE CONNECTICUT LIGHT AND POWER COMPANY  
THE HARTFORD ELECTRIC LIGHT COMPANY, AND  
WESTERN MASSACHUSETTS ELECTRIC COMPANY

NOTICE OF ISSUANCE OF AMENDMENT TO FACILITY

OPERATING LICENSE

AND NEGATIVE DECLARATION

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 37 to Provisional Operating License No. DPR-21 and Amendment No. 26 to Facility Operating License No. DPR-65 to Northeast Nuclear Energy Company, the Connecticut Light and Power Company, the Hartford Electric Light Company, and Western Massachusetts Electric Company, which revised Environmental Technical Specifications for operation of the Millstone Nuclear Power Station, Units Nos. 1 and 2, located in the Town of Waterford, Connecticut. The amendments are effective as of their date of issuance.

The amendment consists of changes to the Environmental Technical Specifications which will allow an increase from 25°F to 28°F of the maximum temperature increase as measured at the Quarry Cut above the intake water temperature.

The application for the amendment complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendment. Prior public notice of this amendment was not required since the amendment does not involve a significant hazards consideration.

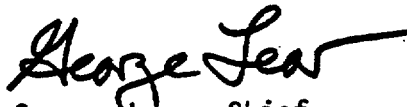


The Commission has prepared an environmental impact appraisal for the revised Technical Specifications and has concluded that an environmental impact statement for this particular action is not warranted because there will be no environmental impact attributable to the action other than that which has already been predicted and described in the Commission's Final Environmental Statement for the facility dated June 1973.

For further details with respect to this action, see (1) the application for amendment May 12, 1977, (2) Amendments Nos. 37 and 26 to Licenses Nos. DPR-21 and DPR-65, (3) the Commission's related Safety Evaluation and Environmental Impact Appraisal. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N. W., Washington, D. C. and at the Waterford Public Library, Rope Ferry Road, Route 156, Waterford, Connecticut. A copy of items (2) and (3) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Operating Reactors.

Dated at Bethesda, Maryland this 18th day of May, 1977.

FOR THE NUCLEAR REGULATORY COMMISSION



George Lear, Chief  
Operating Reactors Branch #3  
Division of Operating Reactors