

JUN 1 7 1976

Docket No. 50-336

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

Gentlemen:

Enclosed is a signed original of an Order for Modification of License, dated June 17, 1976, issued by the Commission for Millstone Nuclear Power Station, Unit No. 2. This Order amends Facility Operating License DPR-65 by adding the provision that the reactor shall not be operated with a peak linear heat generation rate in excess of 14.1 kW/ft. This Order also requires submittal of a corrected ECCS analysis as soon as possible.

A copy of this Order is being filed with the Office of the Federal Register for publication.

Sincerely,

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

Enclosure:
Order for Modification
of License
SEE 50-317 for referenced enclosures
cc: See next page

*Changes made to letter after
final signature by BCRusche.

FOR CONCURRENCE CHAIN SEE PREVIOUS YELLOW.

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SURNAME	DJaffe	GLear	KRGoller	VStello	EGCase	BCRusche
DATE	6/16/76	6/16/76	6/17/76	6/17/76	6/17/76	6/17/76

Northeast Nuclear Energy Company - -

cc:

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Mr. Herbert J. Davis, First Selectman
Town of Waterford
Hall of Records - 200 Boston Post Road
Waterford, Connecticut 06385

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of)

NORTHEAST NUCLEAR ENERGY COMPANY)

THE HARTFORD ELECTRIC LIGHT COMPANY)

WESTERN MASSACHUSETTS ELECTRIC COMPANY)

CONNECTICUT LIGHT AND POWER COMPANY)

(Millstone Nuclear Power Station, Unit No. 2))

Docket No. 50-336

ORDER FOR MODIFICATION OF LICENSE

I.

Northeast Nuclear Energy Company, The Hartford Electric Light Company, Western Massachusetts Electric Company, and Connecticut Light and Power Company, P. O. Box 270, Hartford, Connecticut 06101 (the Licensees), are the holders of Operating License No. DPR-65 which authorizes the operation of a nuclear power reactor known as Millstone Nuclear Power Station, Unit No. 2 (the facility) at steady state reactor power levels not in excess of 2560 thermal megawatts (rated power). The facility is a pressurized water reactor (PWR) located at the Licensees' site in Waterford, Connecticut.

II.

In conformance with the evaluation of the performance of the Emergency Core Cooling System (ECCS) of the facility submitted by the Licensees on April 21, 1975, the Technical Specifications issued August 1, 1975 for the facility limit the reactor core peak linear heat rate to 15.3 kW/ft.

The ECCS performance evaluation submitted by the Licensees was based upon a previously approved ECCS evaluation model developed by Combustion Engineering, Inc. (CE), the designer of the facility, to conform to the requirements of the Commission's ECCS Acceptance Criteria, 10 CFR

Part 50, §50.46 and Appendix K. The evaluation indicated that with peak linear heat generation rate limited as set forth above, and with the other limits set forth in the facility's Technical Specifications, the ECCS cooling performance for the facility would conform to the criteria contained in 10 CFR §50.46(b) which govern calculated peak clad temperature, maximum cladding oxidation, maximum hydrogen generation, coolable geometry and long term cooling.

On June 8, 1976, the NRC staff was informed by CE that several errors had been discovered in STRIKIN-2, the computer code used to calculate peak clad temperature and the clad oxidation percentage in their ECCS model. These errors were discovered by CE during an internal Quality Assurance audit of their LOCA evaluation model codes. While some of these errors have either no significant effect or a conservative effect on the evaluation results, some lead to non-conservative values. Based on a preliminary assessment, including information and supportive calculations by CE, the staff has determined that the following two code errors, when corrected, could produce ECCS evaluation results which would require a reduction in operating limits for Combustion Engineering plants:

- (1). Guide Tube Model - The code treated the control rod guide tube as a solid rod rather than a hollow tube. This resulted in an excess heat storage capacity in the guide tube which then led to excessive thermal radiation cooling from the hot rod to the guide tube.

- (2) View Factors for Radiation Cooling Model - The code did not conservatively treat the view factors in the thermal radiation model to account for the possible effect of rupture and ballooning of adjacent fuel rods which contact the hot rod and reduce the surface area available for radiation cooling.

For this reason the staff instructed CE and the Licensees to provide a revised calculation of peak clad temperature for the worst break area identified in previous calculations with the errors properly corrected. Using a more recent CE evaluation model which has also been approved by the NRC staff, with the code corrected for the two items discussed above, and with an additional correction of a sign error in the source term of the conduction equations (this latter error produced a conservative effect), the revised calculations demonstrate that for peak linear heat generation rates of 15.1 kW/ft the peak clad temperature and amount of cladding oxidation remain below the criteria set forth in 10 CFR §50.46(b). The improvements in the revised code offset the non-conservative effect of the two errors discussed above. The staff expects that when final revised calculations for the facility are submitted using the revised and corrected model they will demonstrate that operation with a peak linear heat generation rate of 15.1 kW/ft will fully conform to the criteria of 10 CFR §50.46(b). Such revised calculations, fully conforming to the requirements of 10 CFR §50.46, are to be provided for the facility as soon as possible.

However, since a revised evaluation for the entire break spectrum for the facility using the new evaluation model properly corrected cannot be completed for several weeks, the staff believes that it is prudent to impose an interim penalty on allowable peak linear heat generation rate to account for uncertainties that may result from the fact that calculations thus far have been made only for the worst case break previously identified. The staff concludes that an additional limitation of 1 kW/ft will eliminate uncertainties resulting from the preliminary limited break spectrum calculations thus far performed and will assure that ECCS performance at the facility will conform to all the criteria set forth in 10 CFR §50.46(b). These additional limitations will provide reasonable assurance that the public health and safety will not be endangered.

Upon notification by the NRC staff on June 11, 1976, the Licensees promptly imposed a reduced peak linear heat generation rate limit on the plant, limiting it to 14.1 kW/ft. The NRC staff believes that the Licensee's action, under the circumstances, is appropriate and that this action should be confirmed by NRC Order.

Copies of the following documents are available for public inspection in the Commission's Public Document Room, 1717 H Street, N. W., Washington, D. C., 20555 and are being placed in the Commission's Local Public Document Room, the Waterford Public Library, Rope Ferry Road, Route 156, Waterford, Connecticut: (1) Letters dated June 13, 1975 and December 9, 1975 from the NRC staff to Combustion Engineering; (2) Letter dated June 14, 1976 from Northeast


Nuclear Energy Company to G. Lear, Chief, Operating Reactors Branch No. 3;
(3) Letter dated June 15, 1976, from Combustion Engineering to the NRC staff;
and (4) This Order for Modification of License, In the Matter of Northeast
Nuclear Energy Company, The Hartford Electric Light Company, Western Massachusetts
Electric Company, and Connecticut Light and Power Company (Millstone Nuclear
Power Station, Unit No. 2), Docket No. 50-336.

III.

Accordingly, pursuant to the Atomic Energy Act of 1954, as amended, and
the Commission's Rules and Regulations in 10 CFR Parts 2 and 50, IT IS
ORDERED THAT Facility Operating License No. DPR-56 is hereby amended by
adding the following new provisions:

- (1) As soon as possible, the Licensees shall submit a re-evaluation of
ECCS cooling performance calculated in accordance with Combustion
Engineering Company's Evaluation Model approved by the NRC staff
on June 13, 1975 and December 9, 1975 and corrected for the errors
described herein.
- (2) Until further authorization by the Commission, the reactor shall not be
operated with a peak linear heat generation rate in excess of 14.1
kw/ft.

FOR THE NUCLEAR REGULATORY COMMISSION


Ben C. Rusche, Director
Office of Nuclear Reactor Regulation

Dated in Bethesda, Maryland
this 17th day of June, 1976.