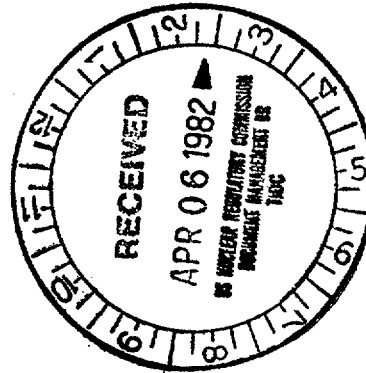


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March 31, 1982

Docket No. 50-293

Mr. A. Victor Morisi, Manager
 Nuclear Operations Support Department
 Boston Edison Company
 M/C NUCLEAR
 800 Boylston Street
 Boston, Massachusetts 02199



Dear Mr. Morisi:

The Commission has issued the enclosed Amendment No. 59 to Facility Operating License No. DPR-35 for the Pilgrim Nuclear Power Station. This amendment consists of changes to the Technical Specifications in response to your application dated January 18, 1982.

The amendment revises the Technical Specifications to increase Maximum Average Planar Linear Heat Generation Rate (MAPLHGR) operating limits by allowing credit for core spray heat transfer.

Reduced MAPLHGR limits were established as a conservatism because of uncertainties regarding core spray performance brought about by the 1980 core spray sparger inspection results. Inspection performed during the Reload 5 refueling outage resolved these uncertainties and obviated the need for the reduction in MAPLHGR operating limits.

Copies of the Safety Evaluation and Notice of Issuance are also enclosed.

Sincerely,

ORIGINAL SIGNED BY

Kenneth T. Eccleston, Project Manager
 Operating Reactors Branch #2
 Division of Licensing

Enclosures:

1. Amendment No. 59 to DPR-35
2. Safety Evaluation
3. Notice

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cc w/enclosures

See next page

OFFICE	ORB#2	ORB#2	ORB#2	AD/OR:DL	OELD	
SURNAME	S. Norris	K. Eccleston	pob: MC	D. Vassallo	T. Novak	
DATE	3/25/82	3/25/82	3/26/82	3/27/82	3/31/82	

Mr. A. Victor Morisi
Boston Edison Company

cc:

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Pilgrim Station Manager
Boston Edison Company
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Resident Inspector
c/o U.S. NRC
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Plymouth, Massachusetts 02360

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Massachusetts Wildlife Federation
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Boston, Massachusetts 02111

Plymouth Public Library
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Massachusetts Department of Public Health
ATTN: Commissioner of Public Health
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Boston, Massachusetts 02111

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

BOSTON EDISON COMPANY

DOCKET NO. 50-293

PILGRIM NUCLEAR POWER STATION
AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 59
License No. DPR-35

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by the Boston Edison Company (the licensee) dated January 18, 1982 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-35 is hereby amended to read as follows:

B. Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 59, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

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3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Domenic B. Vassallo, Chief
Operating Reactors Branch #2
Division of Licensing

Attachment:
Changes to the Technical
Specifications

Date of Issuance: March 31, 1982

ATTACHMENT TO LICENSE AMENDMENT NO. 59

FACILITY OPERATING LICENSE NO. DPR-35

DOCKET NO. 50-293

Replace the following pages of the Appendix "A" Technical Specifications with identically numbered pages.

205A

205C

205E-1

205E-2

205E-3

205E-4

205E-5

205E-6

LIMITING CONDITIONS FOR OPERATION

3.11 REACTOR FUEL ASSEMBLY

Applicability

The Limiting Conditions for Operation associated with the fuel rods apply to those parameters which monitor the fuel rod operating conditions.

Objective

The Objective of the Limiting Conditions for Operation is to assure the performance of the fuel rods.

Specifications

A. Average Planar Linear Heat Generation Rate (APLHGR)

During power operation with both recirculation pumps operating, the APLHGR for each type of fuel as a function of average planar exposure shall not exceed the applicable limiting value shown in Figures 3.11-1 through 3.11-6. The top curves are applicable for core flow greater than or equal to 90% of rated core flow. When core flow is less than 90% of rated core flow, the lower curves shall be limiting. If at any time during operation it is determined by normal surveillance that the limiting value for APLHGR is being exceeded, action shall be initiated within 15 minutes to restore operation to within the prescribed limits. If the APLHGR is not returned to within the prescribed limits within two (2) hours, the reactor shall be brought to the Cold Shutdown condition within 36 hours. Surveillance and corresponding action shall continue until reactor operation is within the prescribed limits.

SURVEILLANCE REQUIREMENTS

4.11 REACTOR FUEL ASSEMBLY

Applicability

The surveillance Requirements apply to the parameters which the fuel rod operating conditions.

Objective

The Objective of the Surveillance Requirements is to specify the type and frequency of surveillance to be applied to the fuel rods.

Specifications

A. Average Planar Linear Heat Generation Rate (APLHGR)

The APLHGR for each type of fuel as a function of average planar exposure shall be determined daily during reactor operation at $\geq 25\%$ rated thermal power.

BASES

3.11A Average Planar Linear Heat Generation Rate (APLHGR)

This specifications assures that the peak cladding temperature following the postulated design basis loss-of-coolant accident will not exceed the limit specified in the 10 CFR 50, Appendix K.

The peak cladding temperature (PCT) following a postulated loss-of-coolant accident is primarily a function of the average heat generation rate of all the rods of a fuel assembly at any axial location and is only dependent, secondarily on the rod to rod power distribution within an assembly. The peak clad temperature is calculated assuming a LHGR for the highest powered rod which is equal to or less than the design LHGR. This LHGR times 1.02 is used in the heat-up code along with the exposure dependent steady state gap conductance and rod-to-rod local peaking factors. The limiting value for APLHGR is this LHGR of the highest powered rod divided by its local peaking factor.

The calculational procedure used to establish the APLHGR limit for each fuel type is based on a loss-of-coolant accident analysis. The emergency core cooling system (ECCS) evaluation models which are employed to determine the effects of the loss of coolant accident (LOCA) in accordance with 10CFR50 and Appendix K are discussed in Reference 1. The models are identified as LAMB, SCAT, SAFE, REFLOOD, and CHASTE. The LAMB Code calculates the short term blowdown response and core flow, which are input into the SCAT code to calculate blowdown heat transfer coefficients. The SAFE code is used to determine longer term system response and flows from the various ECC systems. Where appropriate, the output of SAFE is used in the REFLOOD code to calculate liquid levels. The results of these codes are used in the CHASTE code to calculate fuel clad temperatures and maximum average planar linear heat generation rates (MAPLHGR) for each fuel type.

The significant plant input parameters and the MAPLHGR's for the present fuel types calculated by the above procedure are included in Reference 2

FIGURE 3.11-1
 MAXIMUM AVERAGE PLANAR LINEAR HEAT GENERATION RATE
 VERSUS
 PLANAR AVERAGE EXPOSURE
 FUEL TYPE 8DB219L

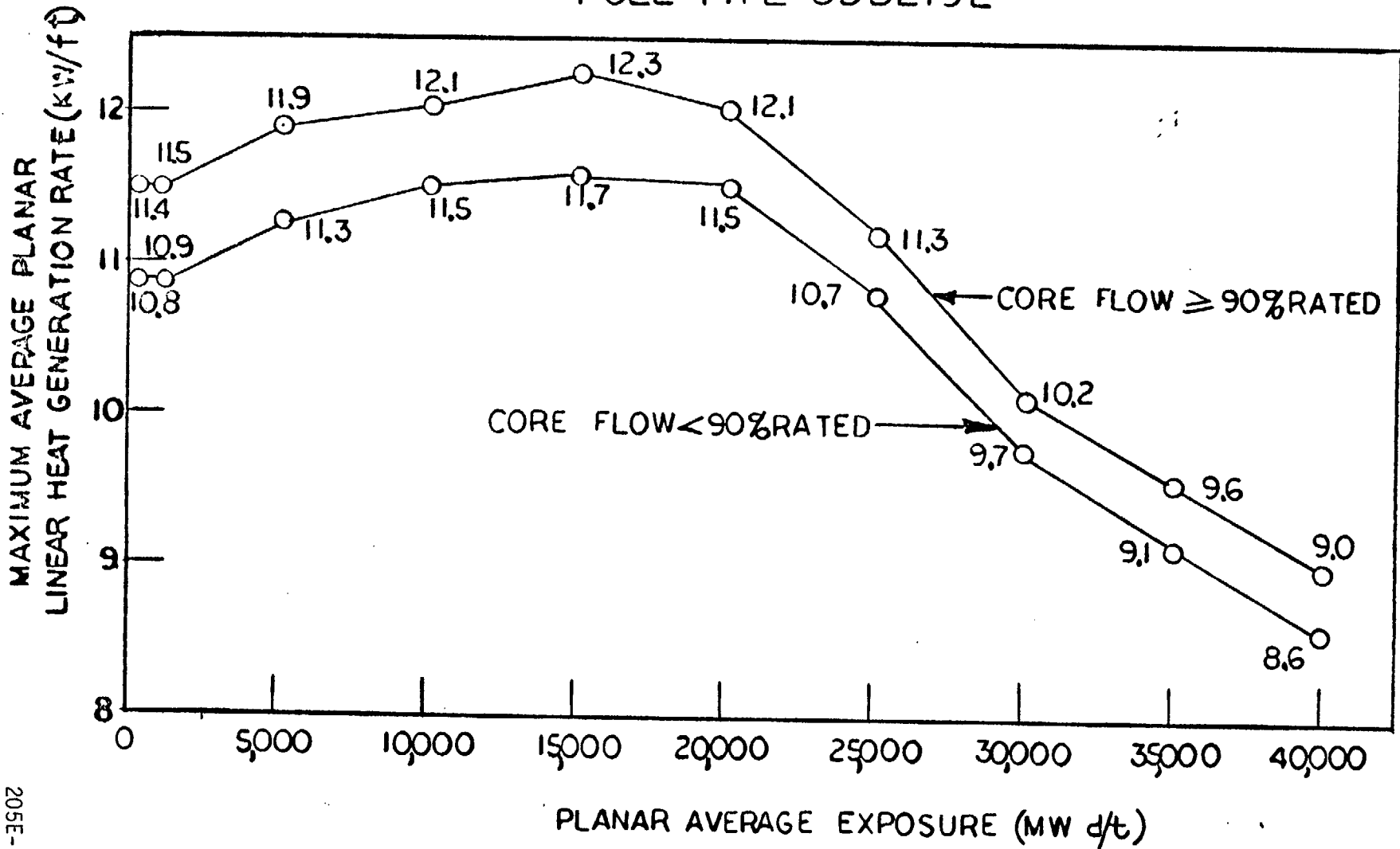


FIGURE 3.11-2
 MAXIMUM AVERAGE PLANAR LINEAR HEAT GENERATION RATE
 VERSUS
 PLANAR AVERAGE EXPOSURE
 FUEL TYPE 8DB219H

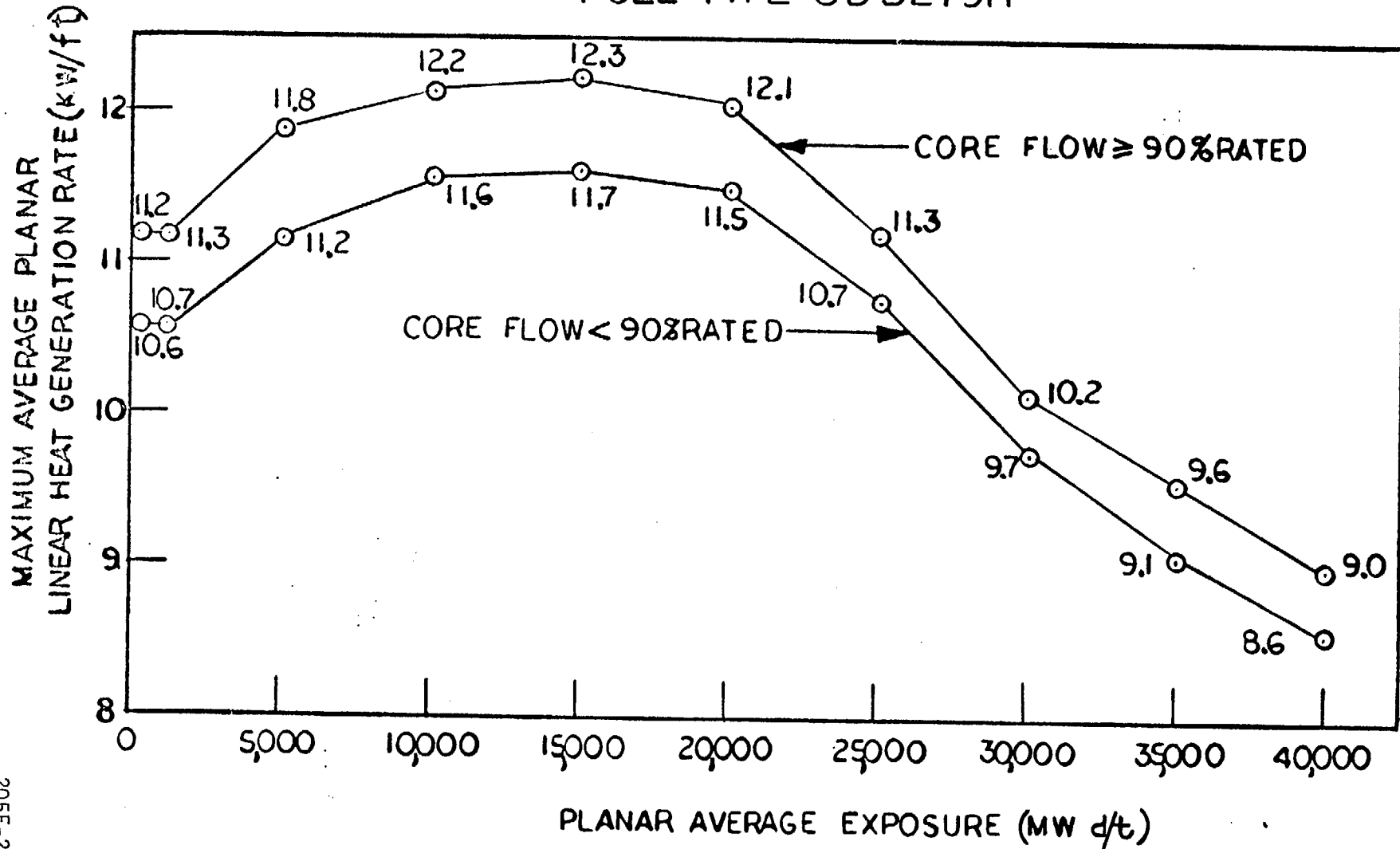


FIGURE 3.11-3
MAXIMUM AVERAGE PLANAR LINEAR HEAT GENERATION RATE
VERSUS
PLANAR AVERAGE EXPOSURE
FUEL TYPE 8DB262

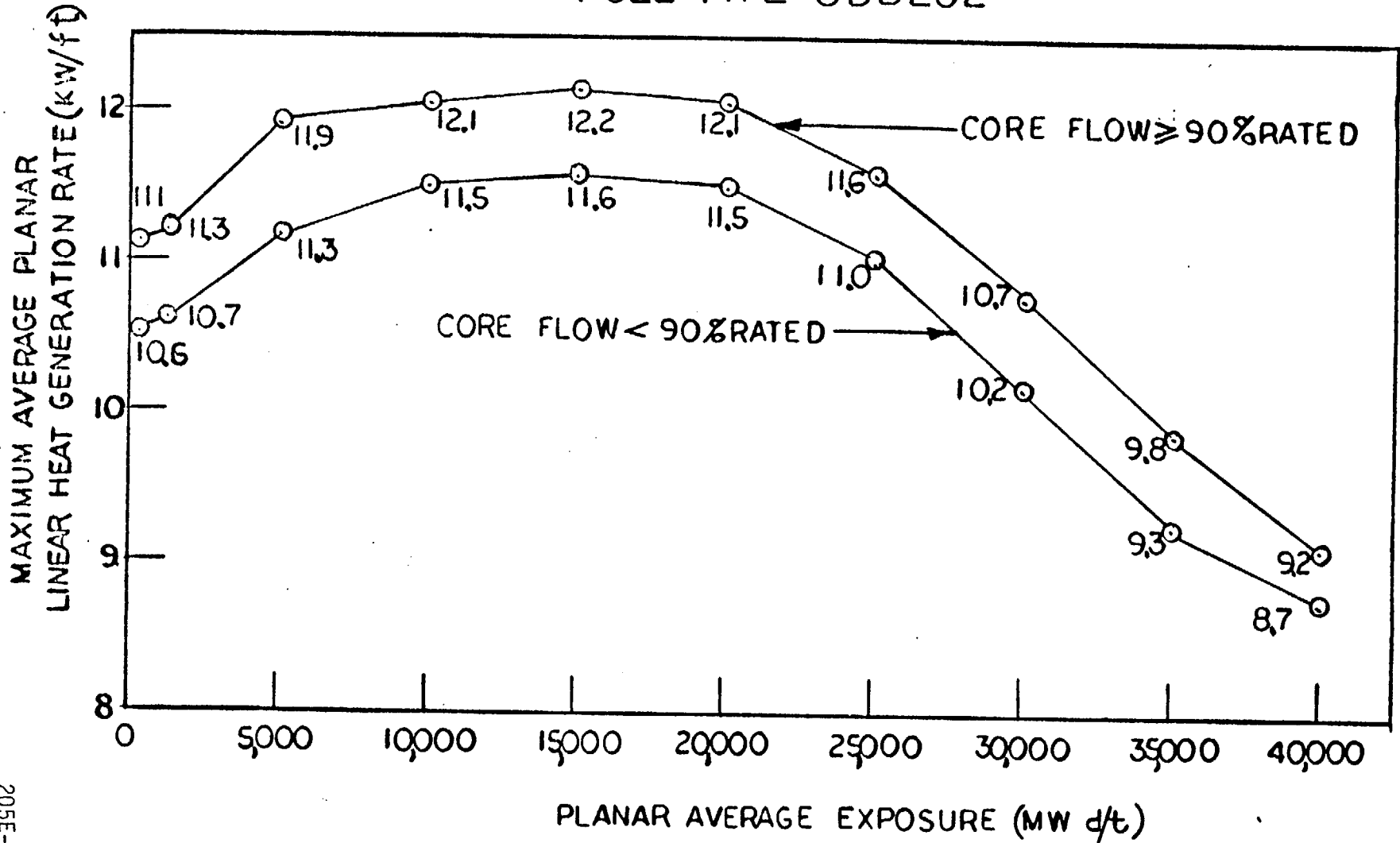


FIGURE 3.11-4
 MAXIMUM AVERAGE PLANAR LINEAR HEAT GENERATION RATE
 VERSUS
 PLANAR AVERAGE EXPOSURE
 FUEL TYPE P8DRB265L

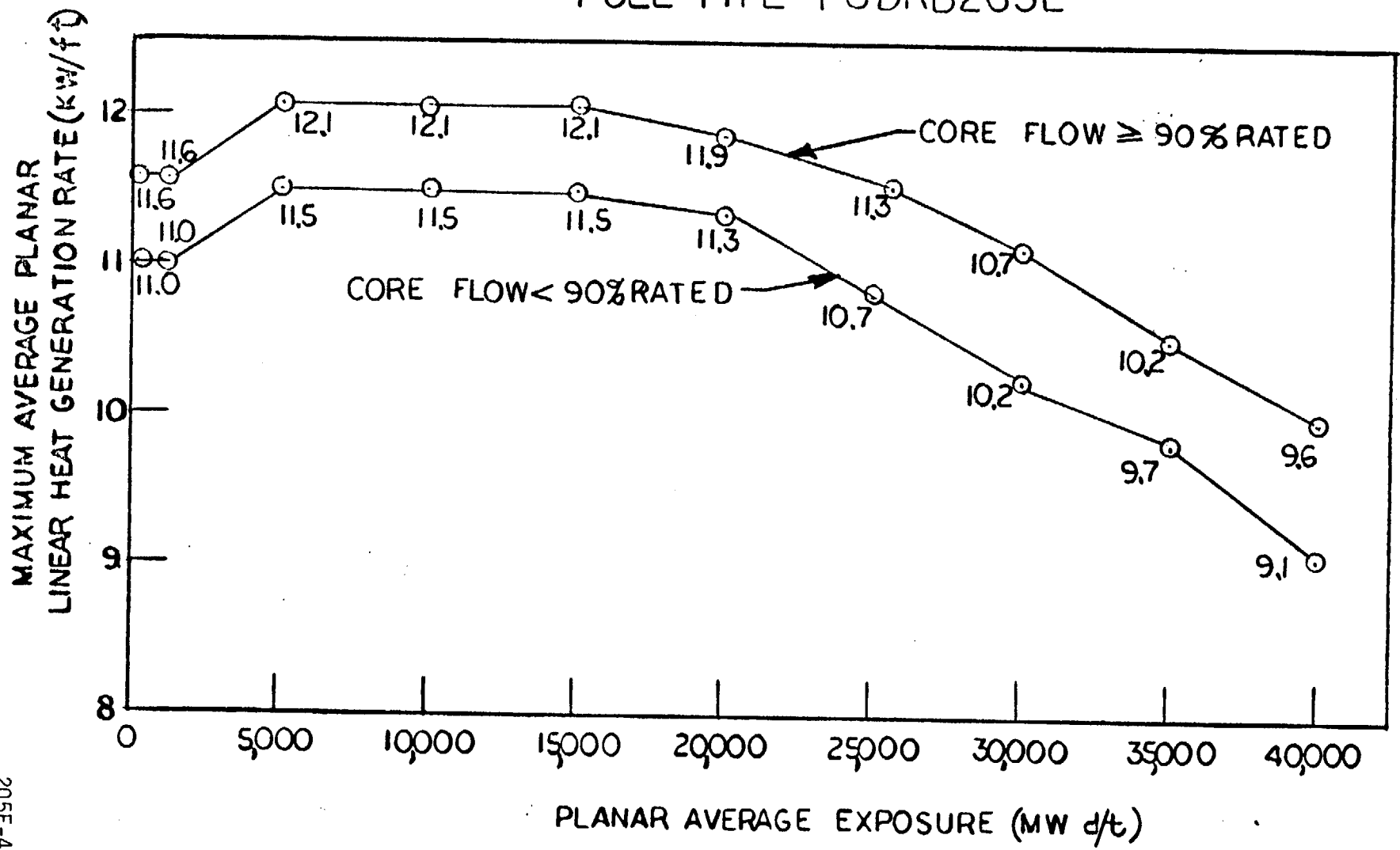


FIGURE 3.11-6
 MAXIMUM AVERAGE PLANAR LINEAR HEAT GENERATION RATE
 VERSUS
 PLANAR AVERAGE EXPOSURE
 FUEL TYPE P8DRB265H

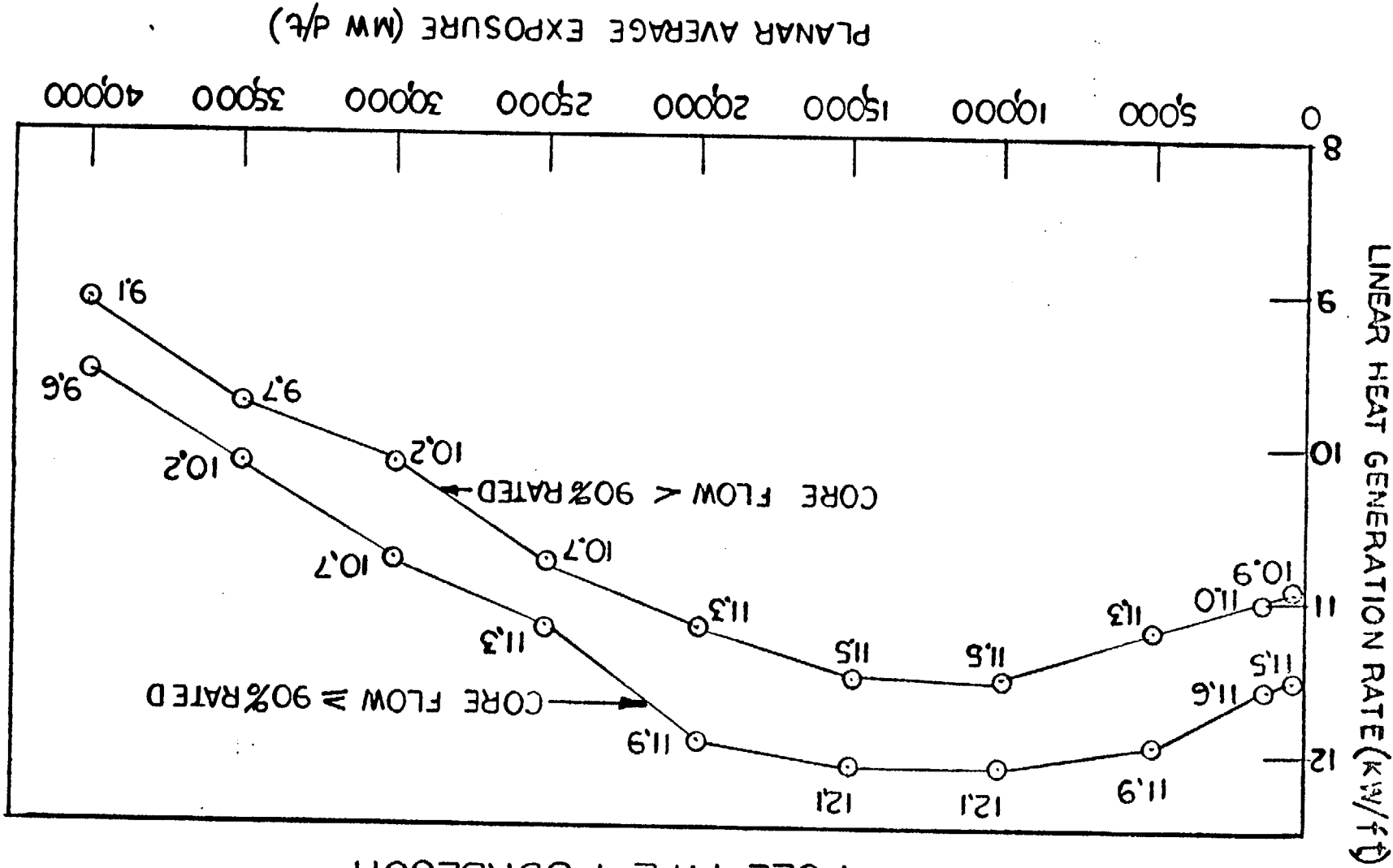
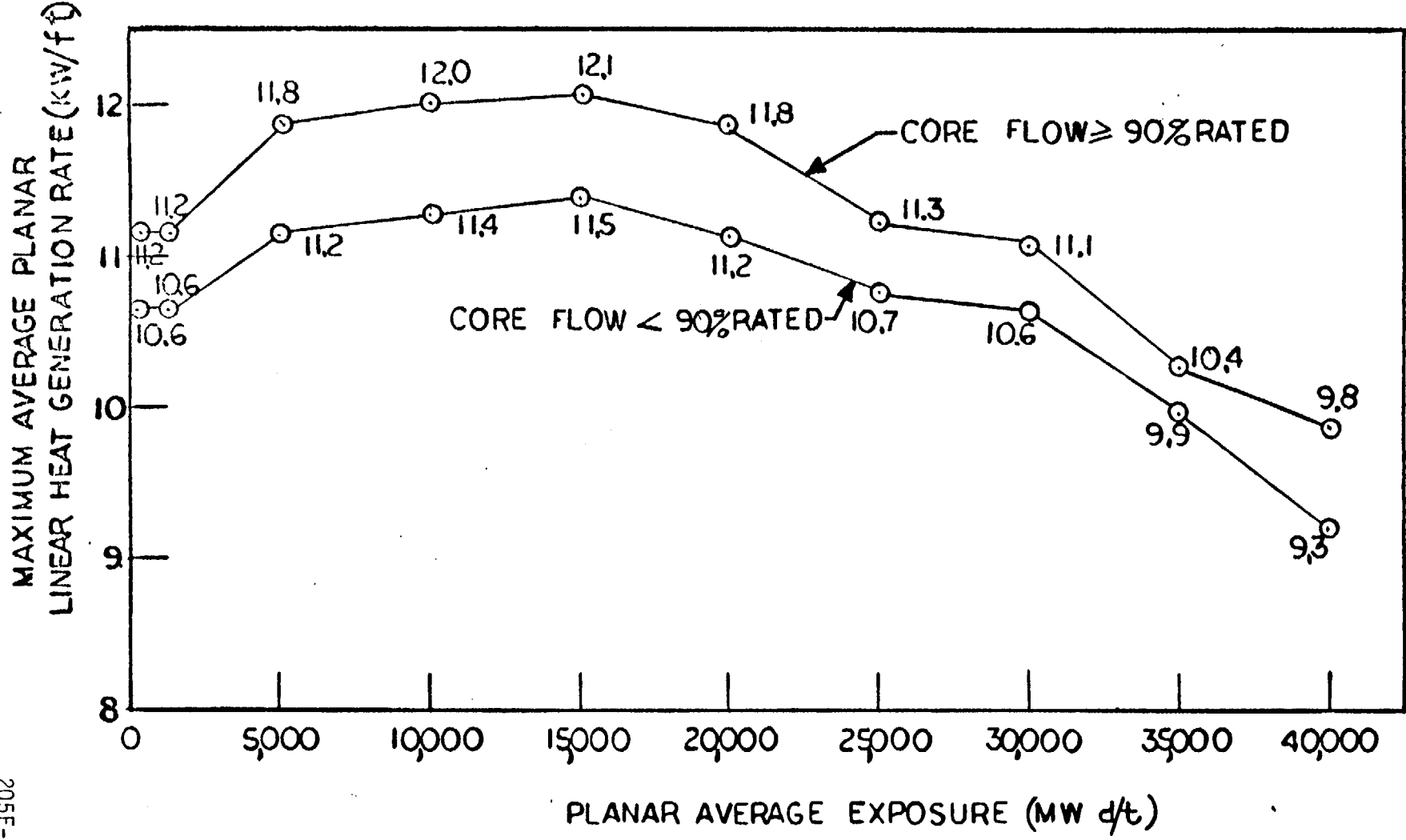


FIGURE 3.11-5
MAXIMUM AVERAGE PLANAR LINEAR HEAT GENERATION RATE
VERSUS
PLANAR AVERAGE EXPOSURE
FUEL TYPE P8DRB282





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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 59 TO FACILITY LICENSE NO. DPR-35

BOSTON EDISON COMPANY

PILGRIM NUCLEAR POWER STATION

DOCKET NO. 50-293

Authors: Kenneth T. Eccleston, W. Hazelton, B. Hardin

1.0 Introduction

By letter dated April 3, 1980, Boston Edison Company (the licensee) requested Technical Specification (TS) changes which reflected the fact that no credit for core spray heat transfer was assumed in the supporting LOCA analyses. The purpose of these requested TS changes and the accompanying analyses was to address concerns related to the discovery of crack-like indications observed on the Pilgrim core spray spargers during the 1980 refueling outage.

Improved lighting and inspection techniques were utilized during the 1981 refueling outage to produce better images to enable more detailed evaluation of the indications detected during the 1980 refueling outage. Computer enhancement techniques were also employed to improve contrast and resolution of both the 1980 and 1981 video signals.

Based on the results of its subsequent evaluations, the licensee requested, by letter dated January 18, 1982, changes to the Technical Specifications to increase Maximum Average Planar Linear Heat Generation Rate (MAPLHGR) operating limits by taking credit for core spray heat transfer based on the licensee's conclusion that the core spray spargers are fully operational. The licensee concluded that structural integrity of the core spray spargers will be maintained through the next fuel cycle.

2.0 Evaluation

2.1 Core Spray Sparger Integrity

Proceeding under the conservative assumption that the linear indications were actual cracks, a crack growth analysis using fracture mechanics methodology was performed to assess the possible growth of the cracks assuming an intergranular stress corrosion cracking mechanism.

The results of the inspections and the crack growth predictions were presented by the licensee in a preliminary report, "Structural Evaluation of the Pilgrim Station Core Spray Spargers Based upon Results from the October 1981 Remote Visual Inspection." Major conclusions of the report are:

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1. Six indications found during the 1980 inspection were resolved as not significant, because they were determined to be caused by grinding marks, other mechanical marks, or could not be found during the 1981 inspection.
2. One area, described as "B header to pipe weld and the (adjacent) area to nozzle 25B" appears to have crack-like indications, but a comparison of the 1980 and 1981 video results do not show any evidence of propagation.
3. The crack growth rate analysis supports the licensee's view that if cracks are present, further growth will be slow.
4. The licensee concludes that the Core Spray Spargers are fully operational, and, based on the results of the evaluation description above, structural integrity will be maintained through the next fuel cycle.

We have reviewed the detailed submittals provided by the licensee and agree that continued operation is justified. Our bases for this conclusion are:

1. We agree that the improved inspection procedures and computer enhancement have shown that most suspicious areas and indications are unlikely to represent cracks.
2. We also agree that the indication in the B header area have not changed significantly, if at all, from the 1980 examination. This finding is important, because it means either that the indications do not represent cracks, or if they are cracks, they are propagating at a slow rate.
3. Because there is no evidence of highly active crack growth, it is unlikely that deleterious loss of structural integrity will occur during the next operating cycle.

Consequently, we conclude that credit for core spray heat transfer should be allowed during future operation; the continued integrity of the core spray spargers will be verified as a result of the ongoing inservice inspection program.

2.2 Increased MAPLHGR Operating Limits

In order to satisfy the acceptance criteria of 10 CFR 50.46, MAPLHGR reduction factors were applied to each fuel type for Cycle 6 by assuming no credit for core spray heat transfer. These reduction factors were determined from the results of loss of coolant accident (LOCA) calculations performed both with and without core spray heat transfer.

Based upon the results of the most recent core spray sparger inspections, the licensee has requested revisions to its TS to restore credit for core spray heat transfer and to eliminate the MAPLHGR reduction factors for Cycle 6 operation.

We have previously reviewed the licensee's analyses applicable to Reload 5 (Cycle 6) operation including plant response to LOCA with benefit of core spray heat transfer in the safety evaluation supporting Amendment No. 54 to DPR-35, dated March 20, 1982. The results of these calculations show that the acceptance criteria of 10 CFR 50.46 are satisfied if no MAPLHGR reduction factors are applied and credit is given for core spray heat transfer.

Based on our review, we conclude that the LOCA calculations submitted for Cycle 6 operation (assuming credit for core spray heat transfer) satisfy the criteria of 10 CFR 50.46 and are therefore acceptable. We have also reviewed the licensee's proposed changes to Technical Specifications involving the increased MAPLHGR operating limits and conclude that these changes are in accordance with these calculations. Consequently, we find them acceptable.

2.3 Summary

Based upon our review of the licensee's submittals we find (1) that deleterious loss of core spray sparger structural integrity is unlikely to occur and that core spray heat transfer should be allowed for future operation 2) the LOCA calculations satisfy the criteria of 10 CFR 50.46 and 3) the licensee's proposed Technical Specifications are acceptable.

3.0 Environmental Considerations

We have determined that the amendment does not involve a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendment involves an action which is insignificant from the standpoint of environmental impact and pursuant to 10 CFR 51.5(d)(4) that an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of the amendment.

4.0 Conclusions

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment does 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 the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Dated: March 31, 1982

UNITED STATES NUCLEAR REGULATORY COMMISSIONDOCKET NO. 50-293BOSTON EDISON COMPANYNOTICE OF ISSUANCE OF AMENDMENT TO FACILITYOPERATING LICENSE

The U.S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 59 to Facility Operating License No. DPR-35 issued to Boston Edison Company (the licensee) which revised the Technical Specifications for operation of the Pilgrim Nuclear Power Station (the facility) located near Plymouth, Massachusetts. The amendment is effective as of its date of issuance.

The amendment revises the Technical Specifications to increase Maximum Average Planar Linear Heat Generation Rate operating limits by allowing credit for core spray heat transfer.

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 it does not involve a significant hazards consideration.

The Commission has determined that the issuance of the amendment will not result in any significant environmental impact and that pursuant to 10 CFR 51.5(d)(4) an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of the amendment.

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For further details with respect to this action, see (1) the application for amendment dated January 18, 1982, (2) Amendment No. 59 to License No. DPR-35, and (3) the Commission's related Safety Evaluation. 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 Plymouth Public Library on North Street in Plymouth, Massachusetts 02360. A single 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 Licensing.

Dated at Bethesda, Maryland this 31st day of March 1982.

FOR THE NUCLEAR REGULATORY COMMISSION



Domenic B. Vassallo, Chief
Operating Reactors Branch #2
Division of Licensing