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ENCLOSURES:

Suppl Info concerning Tech Specs Change Reques #9.....submitted 4-16-75....concerning revised power vs rod withdrawal limit curves.....

ACKNOWLEDGED

PLANT NAME: Three Mile Island #1

FOR ACTION/INFORMATION 6-4-75 ehf

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May 29, 1975
GQL 1098

Mr. George Lear, Chief
Operating Reactors Branch #3
Revision of Reactor Licensing
Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Lear:

Three Mile Island Nuclear Station Unit 1 (TMI-1)
Docket No. 50-289
Operating License No. DPR-50

This letter and the attached enclosure are in response to the two questions stated in your letter of May 7, 1975, and serve to provide additional supplementary information in support of TMI-1 Technical Specification Change Request No. 9 (submitted April 16, 1975, and deals with revised power vs. rod withdrawal limit curves, applicable to post TMI-1 control rod interchange operations).

From the information contained in the attached enclosure, together with our submittal of April 16, 1975, we trust that your office will understand why the subject revisions to the power vs. rod withdrawal limit curves (1) are in no way inter-dependent with any past or present ECCS related issues, and (2) are in fact adequate to ensure not exceeding the ejected rod worth limits of TMI-1 Technical Specification 3.5.2.3. Should there, however, be any additional questions or concerns, please contact me.

Sincerely,

R C Arnold

R. C. Arnold
Vice President

RCA:DNG:tas

File: 20.1.1 / 7.7.4.3.3.1

ENCLOSURE

Metropolitan Edison Company
Three Mile Island Nuclear Station Unit 1 (TMI-1)
Docket No. 50-289
Operating License No. DPR-50

Responses to Nuclear Regulatory Commission (NRC) Questions Regarding TMI-1 Technical Specification Change Request No. 9

NRC Question No. 1

The Rod Group Withdrawal Limit Curves under consideration consist of the most restrictive envelope of the Interim Acceptance Criteria, the additional operating restrictions furnished to you via the Order for Modification of License dated December 27, 1974 and your proposed Technical Specification change dated April 16, 1975. For this envelope, please indicate the maximum ejected control rod worth and the power at which it occurs for the conditions represented in Figures 3.5-2A, 3.5-2B, 3.5-2C, and 3.5-2D of your application.

Response to NRC Question No. 1

Background Information

In clarification of the above question, it should be noted that:

a. in that the ECCS related Final Acceptance Criteria (FAC) limitations are not believed to be resolvable at this time, the Power vs. Rod Withdrawl Limit curves, as contained in Technical Specification Change Request (T.S.C.R.) No. 9, consist of the most restrictive of all applicable limits, except for the ECCS related Final Acceptance Criteria (FAC),

b. the limitations of the FAC continue to be the subject of another previously submitted T.S.C.R. (No. 4),

c. the most restrictive limitations of both a. and b. above are enforced--as required by the December 27, 1974, Order for Modification of License--through administrative controls (ref: TMI-1 T.S.C.R. No. 4, dated September 5, 1974), and

d. for reasons that are apparent in later parts of this discussion, utilization of either IAC or FAC based ECCS limitations does not have any effect on the maximum ejected rod worth.

Focusing now on the Technical Specification Change Request in question (i.e. No. 9), please refer to the attached Appendix I, which presents the acceptable power vs. rod withdrawal operating regions for the three criteria upon which the limits of the change request are based. As noted in Appendix I, these criteria are as follows:

1. to maintain the ability to achieve a $\geq$ 1% shutdown margin,

2. to remain within the applicable peaking limit as defined by the Interim Acceptance Criteria (denoted in Appendix I by "ECCS"), and

3. to remain within the applicable potential ejected rod worth limits.

As can be seen from Appendix I, the power vs. rod withdrawal limits as contained in Technical Specification Change Request No. 9 consist of the most restrictive of the 3 above criteria. In that the criteria that is in question is that which relates to ejected rod worths, the remainder of the response to question number 1 will be directed to this area.

Ejected Rod Worth Limit Curve

Operating within the ejected rod worth power vs. rod withdrawal limit curve of Appendix I assures--for the time period referenced on the figure--not exceeding (1) the required ejected rod worth limits of 1% $\Delta K/K$ at hot zero power, and .65% $\Delta K/K$ at rated power; and (2) assumed ejected rod worth limits between these two power levels (note: these assumed limits are derived by considering the applicable ejected rod worth limit to be a linear function of power between 0 and 100%. As an example, therefore, operating to the right of the Appendix I ejected rod worth power vs. rod withdrawal curve at 50% power would ensure not exceeding an ejected rod worth of .825% $\Delta K/K$ (i.e. 1% - .5 (1-.65%) = 1% - .175% = .825%)).

In response to the NRC question No. 1, it should be noted, however, that additional degrees of conservatism were included within the analyses (i.e. a 10% degree of conservation for Figure 3.5-2A, and a 15% degree of conservatism for Figures 3.5-2B, 2C and 2D). In response to the question, therefore, the calculated maximum ejected rod worths for the conditions represented in Figures 3.5-2A, 2B, 2C, and 2D all occur at hot zero power as follows:

Figure	Max. Ejected Rod Worth	Burnup EFPD
3.5-2A	.90	253 ± 10
3.5-2B	.85	440
3.5-2C	.85	466
3.5-2D	.85	466

NRC Question No. 2

Provide a figure (Peak Linear Heat Rate, KW/ft versus Elevation from Bottom of Core, feet) which shows (a) the LOCA limit curve of BAW-10091, (b) the maximum operating peaks which are permitted under your present Technical Specification including the December 27, 1974 Order for Modification of License and (c) the maximum operating peaks which result from the envelope referenced in (1) above.

Response to NRC Question No. 2

Response to Parts (a) and (b)

Answers to parts (a) and (b) of the question are derivable from information previously submitted by the Licensee, as follows:

a. LOCA Limit Curve of BAW 10091: Submitted on September 5, 1974, as figure 3.5-2F of TMI-1 Technical Specification Change Request No. 4; figure has been reproduced and included with this submittal, and is denoted by "FAC" in Appendix II.

b. 1. Present Technical Specification Limits: Consist of those as represented by the current TMI-1 Technical Specification Figure 3.5-2E; figure has been reproduced and included with this submittal, and is denoted by "IAC" in Appendix II.

2. December 27, 1974 Order for Modification of License Limits: Imposed the most restrictive of the limits of a. and b.1. above, and is shown by the continuous line designated a. b. c. d. e. f. g. in Appendix II; had been previously implemented by Licensee on August 5, 1974; and is implemented through administrative controls, which require conformance to the most restrictive of the IAC and FAC based power vs. rod withdrawal limit curves.

Response to Part (c)

It should first be noted that Licensee maintains that none of the ejected rod worth limit curves has any bearing on the subject maximum KW/ft operating peaks and that previous submittals in this subject area should provide adequate assurance that the combined limit curve of Appendix II is not exceeded. Reasons for having made this statement are as follows:

a. the subject KW/ft peaks are primarily a function of fuel loading, core burn-up, rod position, and power level (and not ejected rod worths),

b. there is no reason to suspect that the fuel loading and core burn-up analyses are in error,

c. the (power level, rod withdrawal) coordinates utilized in ensuring that the maximum KW/ft peaks are not exceeded were derived from the ECCS portion of the envelope shown in Appendix I, and

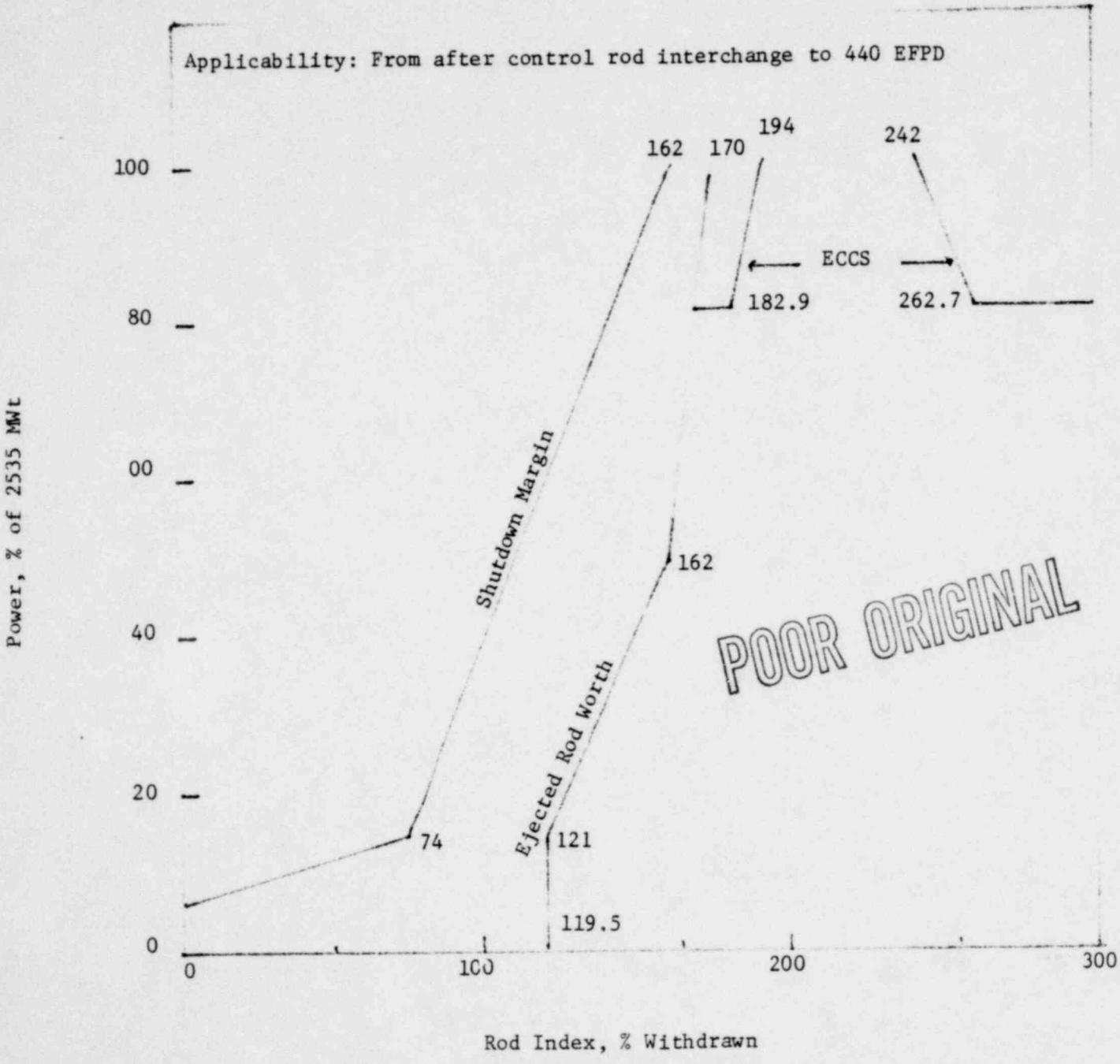
d. utilization of the (power level, rod withdrawal) coordinates represented by the ejected rod worth limit curve would result in even less severe KW/ft peaks as those derived from utilization of the coordinates described in c. above.

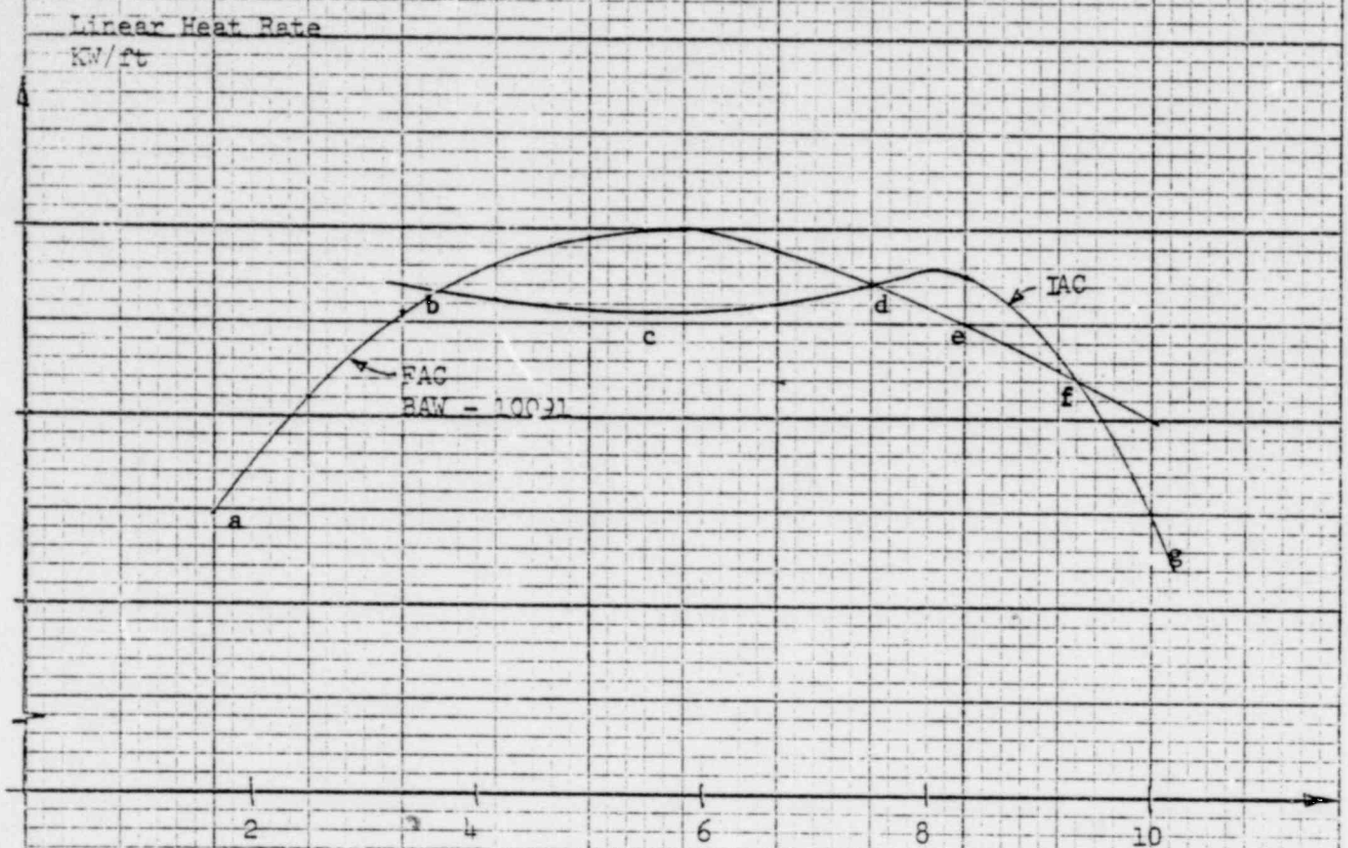
At this time, therefore, please note that the Licensee does not plan to submit any additional information in this regard. Should there, however, be any remaining NRC concerns which could serve to delay approval and issuance of Technical Specification Change Request No. 9, it is requested that the Licensee be contacted immediately.

Appendix I

TMI-1

CONTROL ROD POSITION LIMITS AFTER CONTROL ROD INTERCHANGE





LOCA Limits - Allowable Peak Linear Heat Rate vs Axial Position