

CORE OPERATING LIMITS REPORT
FOR
LIMERICK GENERATING STATION UNIT 1
RELOAD 4, CYCLE 5

Prepared By:

J. L. McHale
J. L. McHale
Engineer

Date: 9-28-93

Reviewed By:

A. M. Olson
A. M. Olson
Independent Reviewer

Date: 9/28/93

Approved By:

J. M. Carmody
J. M. Carmody
Manager
Nuclear Design Branch

Date: 9/28/93

LIST OF EFFECTIVE PAGES

Page(s)	Revision
5-11, 18-22	0
1-4, 12-17	2

INTRODUCTION AND SUMMARY

This report provides the cycle-specific parameter limits for: Average Planar Linear Heat Generation Rate (APLHGR); Minimum Critical Power Ratio (MCPR); Flow Adjustment Factor (K_f); Linear Heat Generation Rate (LHGR); Rod Block Monitor flow biased upscale and high flow clamped setpoints; and Turbine Bypass Valve parameters for Limerick Generating Station Unit 1, Cycle 5, Reload 4. These values have been determined using NRC-approved methodology and are established such that all applicable limits of the plant safety analysis are met.

The revision, Rev. 2, accounts for the changes in MCPR due to the new upper limits for Increased Core Flow (from 105% to 110% of rated core flow) and Final Feedwater Temperature Reduction (from 60°F to 105°F). This revision makes changes to Rev. 0 of this document and not Rev. 1. Revision 1 was not issued.

This report is submitted in accordance with Technical Specification 6.9.1 of Reference (1). Preparation of this report was performed in accordance with PECO Fuel Management Section Procedure FM-105.

APLHGR LIMITS

The limiting APLHGR value for the most limiting lattice (excluding natural uranium) of each fuel type as a function of average planar exposure is given in Figures 1 through 6. These figures are used when hand calculations are required as specified in Technical Specification 3.2.1. The reduction factor for use during single recirculation loop operation is given in Table 1.

MCPR LIMITS

The MCPR value for use in Technical Specification 3.2.3 for each fuel type is given in Figures 7 through 13. These values are based on the most limiting results provided in References 2 and 4. The K_f core flow adjustment factor for use in Technical Specification 3.2.3 is given in Figure 14.

The MCPR values shown in these figures are the bounding values for Increased Core Flow (up to 110% of rated core flow), Rated Core Flow (100% of rated core flow), Extended Load Line (down to 87% of rated core flow), Feedwater Temperature Reduction (up to 105°F), power coastdown, and a combination of all of these options. However, Feedwater Heater Out-of-Service (FWHOOS) temperature reduction is still limited to 60°F. The curves labelled "Increased Core Flow and Feedwater Temperature Reduction" represent bounding operating limit MCPRs for the ELL, RCF, ICF, and ICF plus FWTR operating domains. Curves are also provided for inoperable Recirc Pump Trip or inoperable Steam Bypass System.

ROD BLOCK MONITOR SETPOINTS

The N value for the RBM flow biased upscale and high flow clamped setpoints for use in Technical Specification 3.3.6 is given in Table 2.

LINEAR HEAT GENERATION RATES

The LHGR value for use in Technical Specification 3.2.4 for each fuel type is given in Table 3.

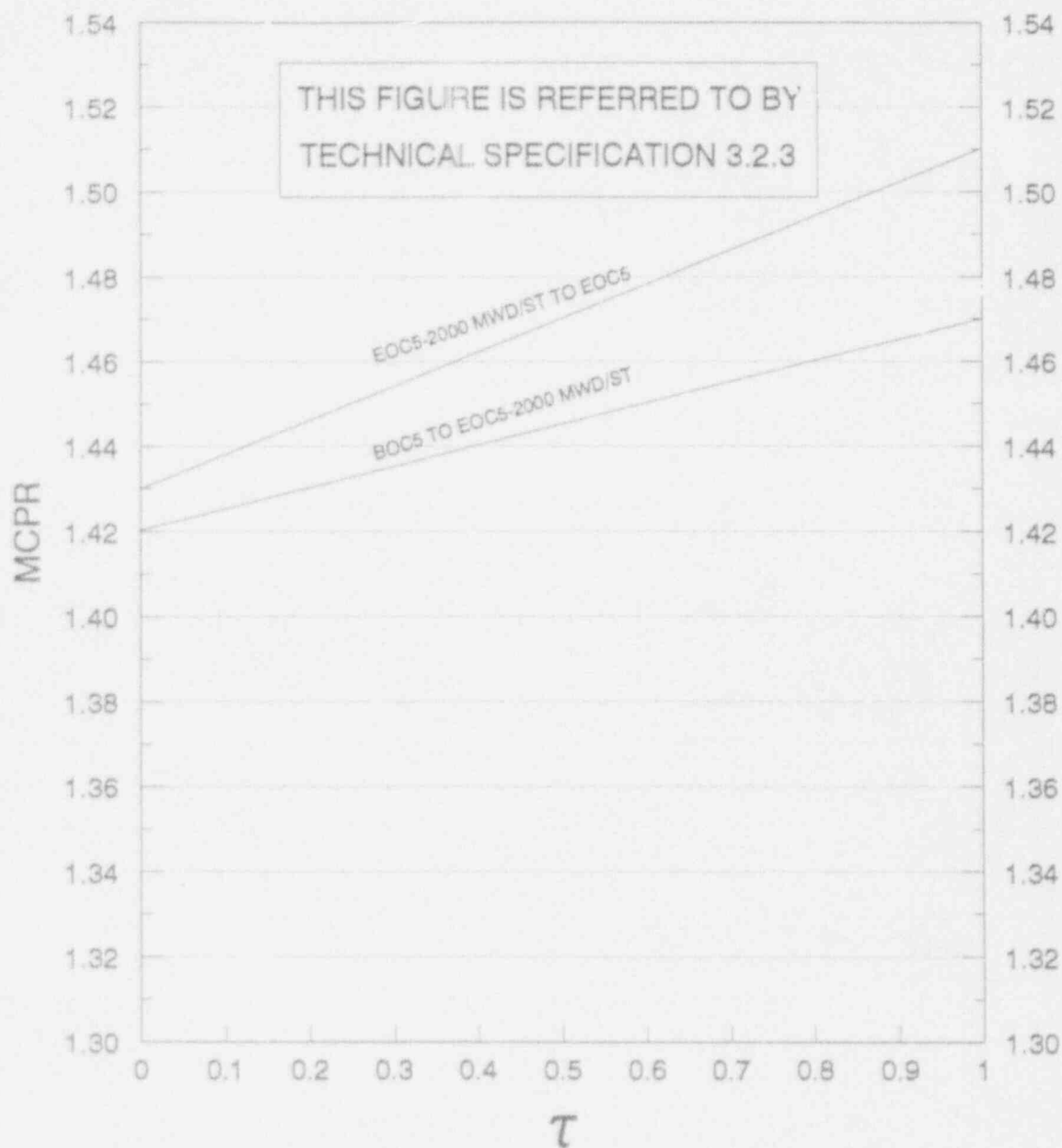
STEAM BYPASS SYSTEM OPERABILITY

The operability requirements for the steam bypass system for use in Technical Specifications 3.7.8 and 4.7.8.C are found in Table 4. If these requirements cannot be met the MCPR limits for inoperable steam bypass system must be used.

REFERENCES

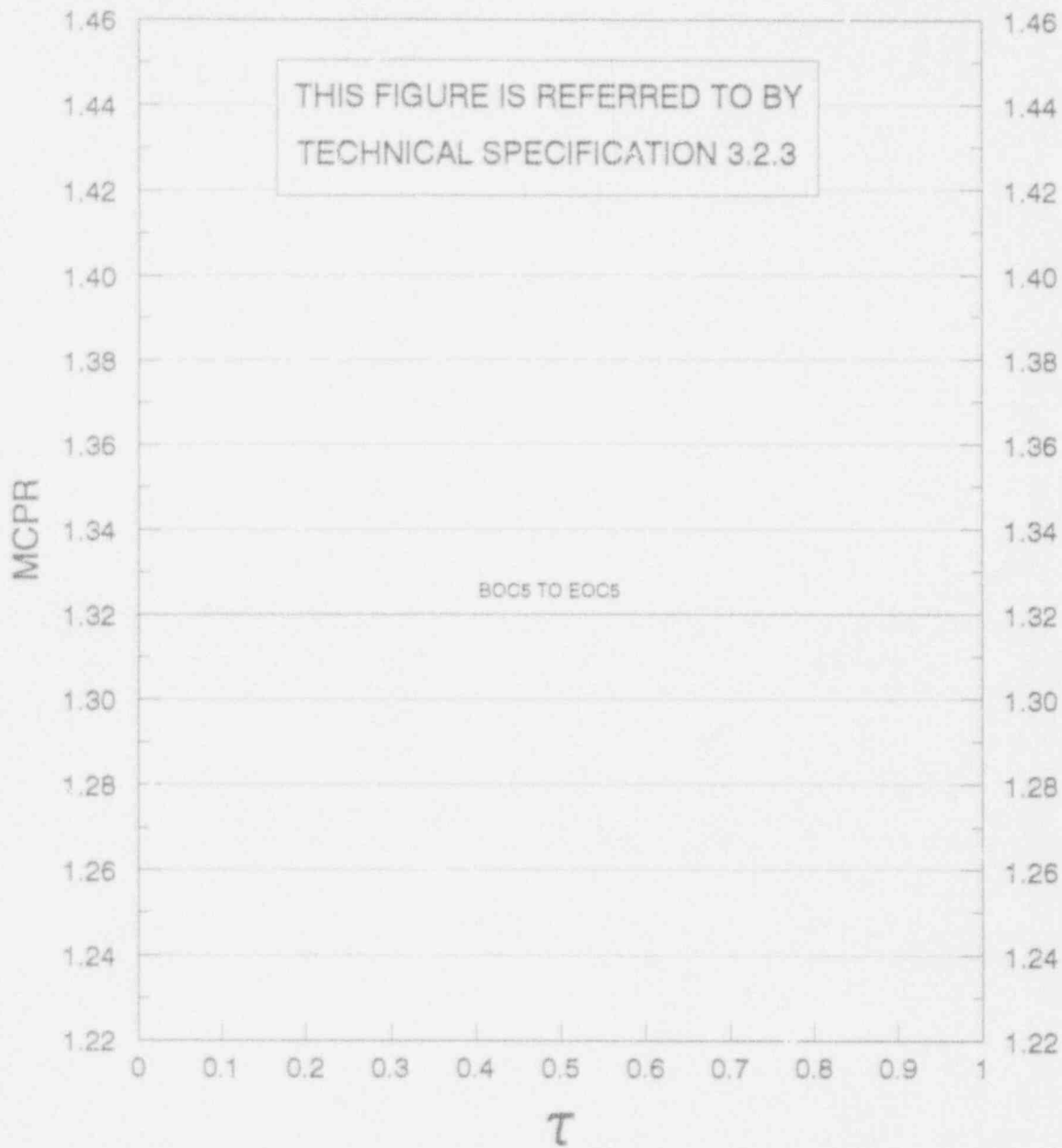
- 1) "Technical Specifications and Bases for Limerick Generating Station Unit 1", Docket No. 50-352 Appendix A to License No. NPF-39.
- 2) "Supplemental Reload Licensing Report for Limerick Generating Station Unit 1, Reload 4, Cycle 5", General Electric Company Document No. 23A7156, Rev. 0.
- 3) "Basis of M LHGR Technical Specifications for Limerick 1", NEDE-31401-P, E&A No. 4, April 1992.
- 4) "Safety Review for Limerick Generating Station Units 1 and 2 110% Increased Core Flow Operation and Final Feedwater Temperature Reduction", General Electric Company Document No. NEDC-32224P, July 1993.

FIGURE 8 Has Been Deleted
From Revision 2



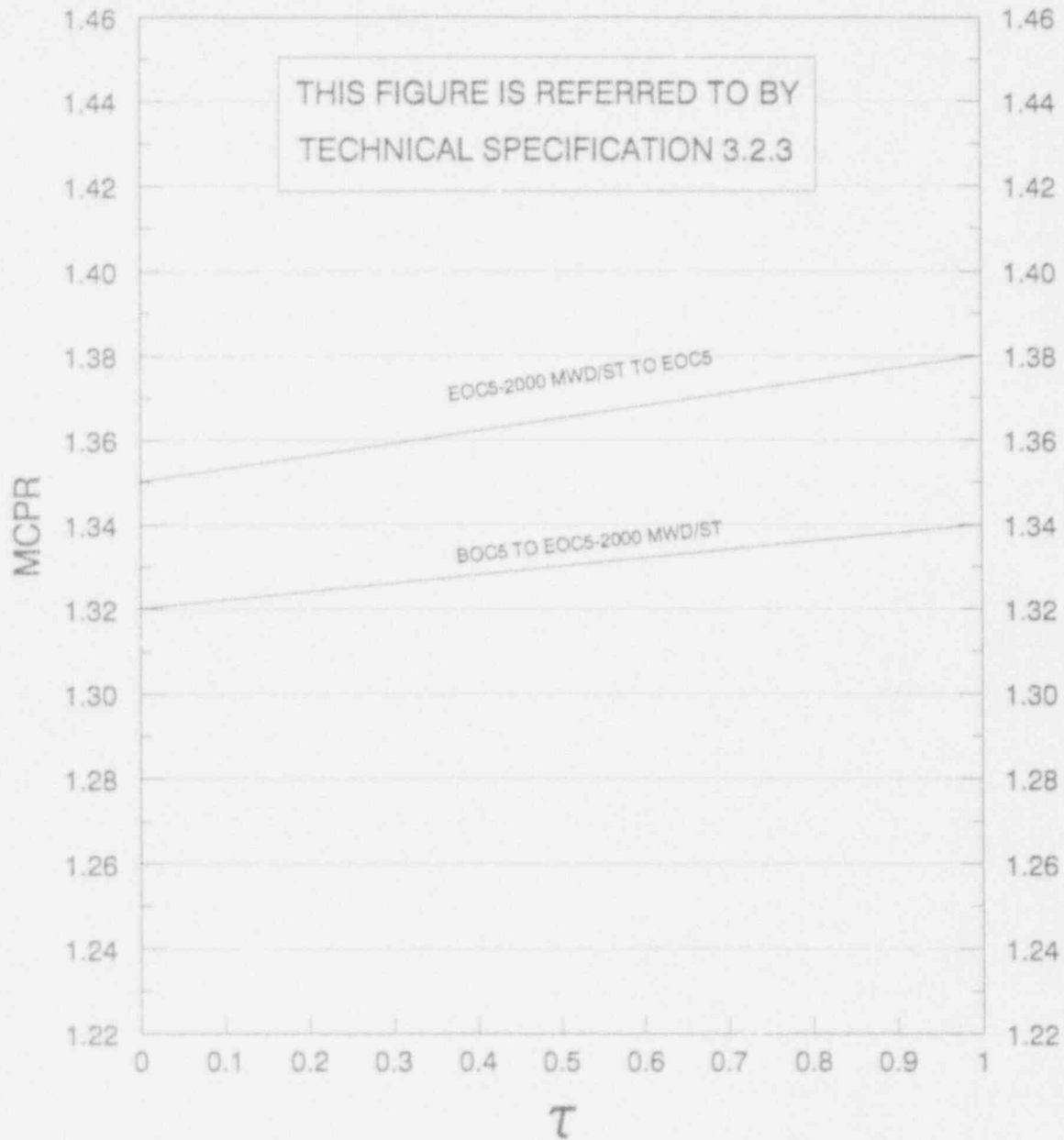
MCPR VS TAU
FUEL TYPE GE11
(WITHOUT RPT and/or TBVOOS)

FIGURE 9



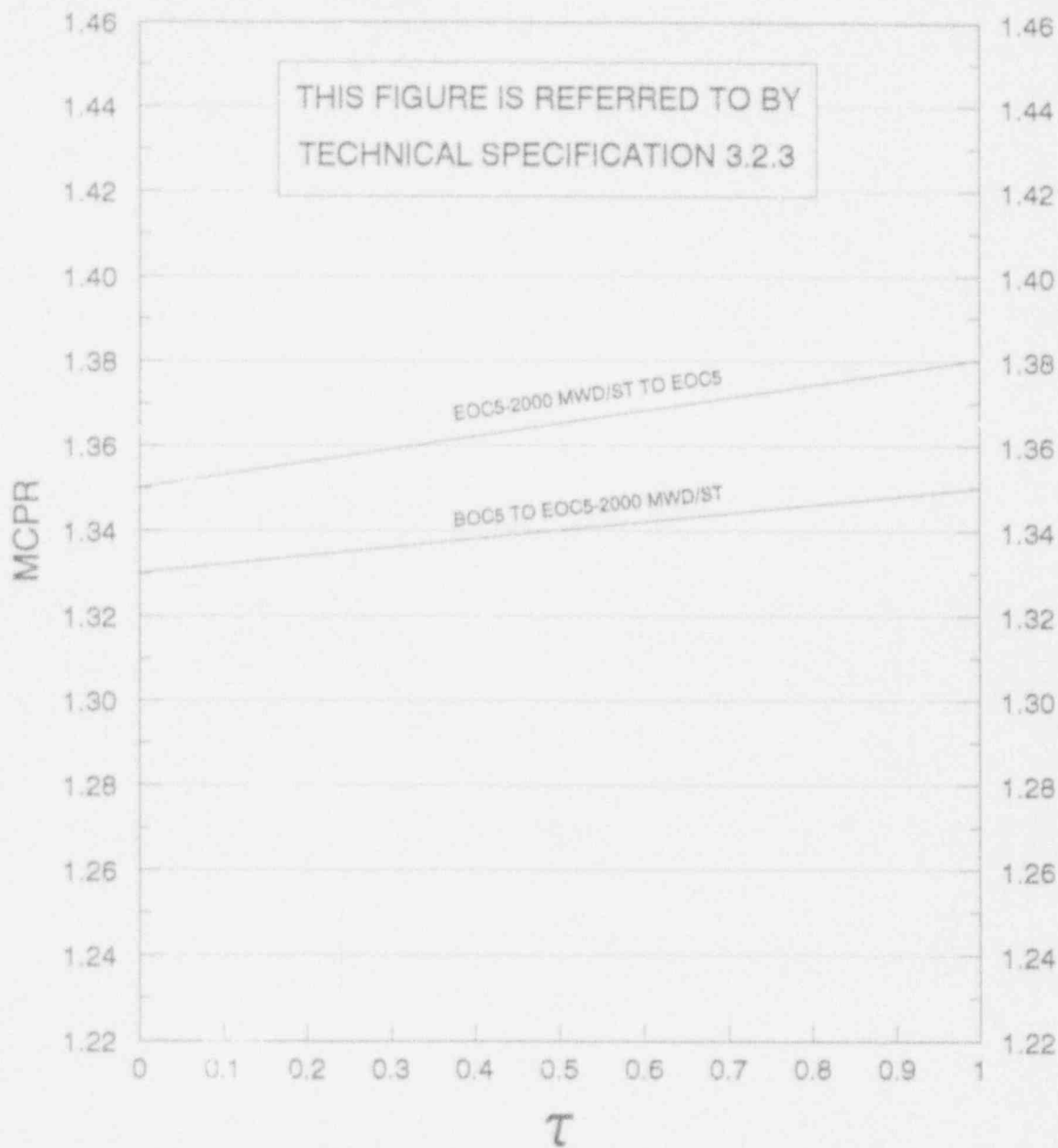
MCPR VS TAU
FUEL TYPES GE9B, GE84WR, GE82WR, and BP8x8R
(INCREASED CORE FLOW and FEEDWATER TEMPERATURE REDUCTION)

FIGURE 10



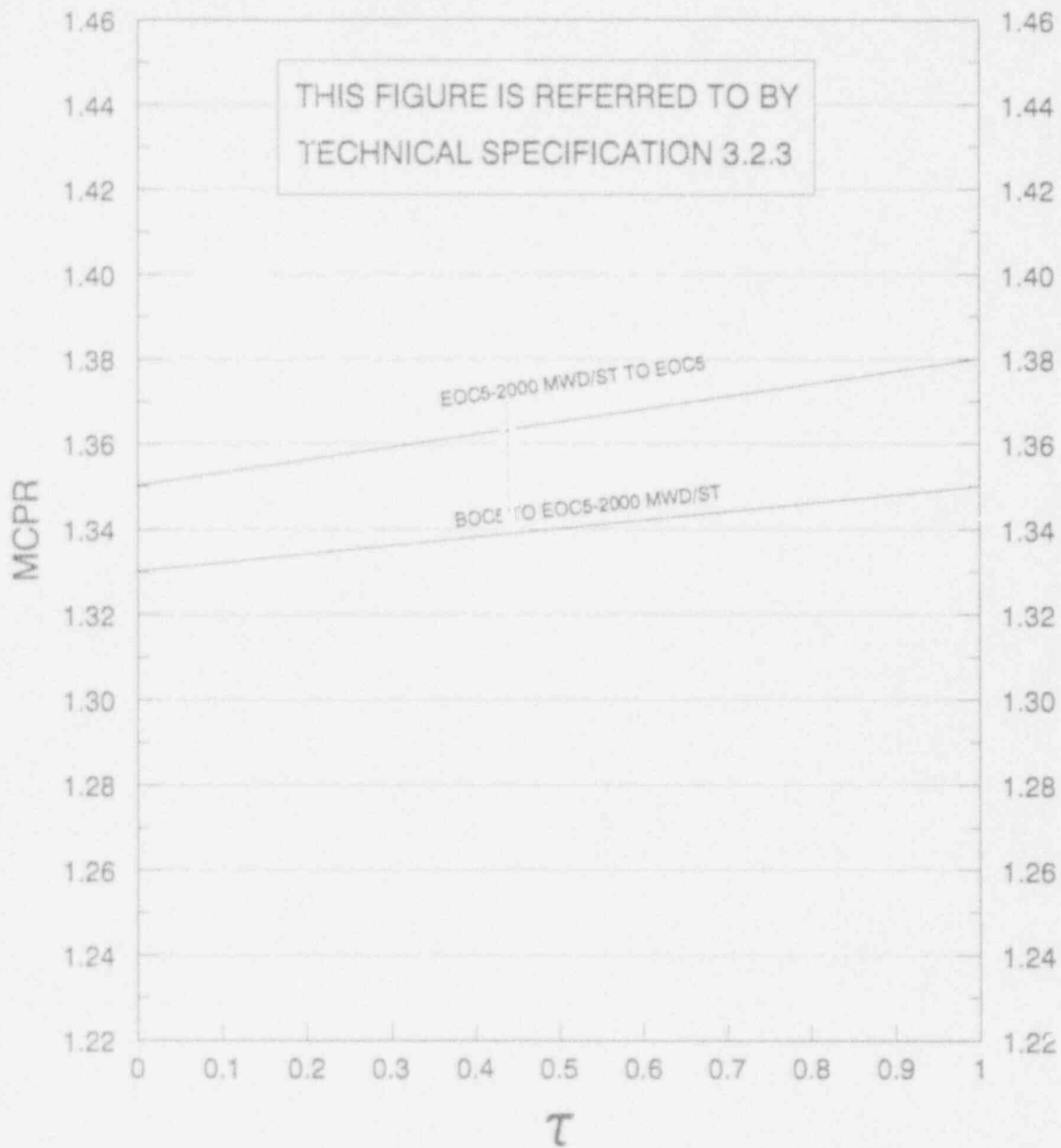
MCPR VS TAU
FUEL TYPE GE9B
(WITHOUT RPT and/or TBVOOS)

FIGURE 11



MCPR VS TAU
FUEL TYPE GE84WR
(WITHOUT RPT and/or TBVOOS)

FIGURE 12



MCPR VS TAU
FUEL TYPES GE82WR and BP8x8R
(WITHOUT RPT and/or TBVOOS)

FIGURE 13