CORE OPERATING LIMITS REPORT

FOR

LIMERICK GENERATING STATION UNIT 2

CYCLE 2

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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); and Rod Block Monitor flow biased upscale and high flow clamped setpoints for Limerick Generating Station Unit 2, Cycle 2. These values have been determined using NRC-approved methodology and are established such that all applicable limits of the plant safety analysis are met.

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 Nuclear Group Procedure NP-11F122.

APLHGR LIMIT

The limiting APLHGR value of each fuel type as a function of AVERAGE PLANAR EXPOSURE is given in Figures 1 through 6. Figures 1 through 6 are used as specified in Technical Specification 3.2.1. The reduction factor for use during single recirculation loop operation is given in Table 1. These values are documented in Reference (5).

MCPR LIMIT

The MCPR values for use in Technical Specification 3.2.3 are given in Figures 7 through 16. The K_f core flow adjustment factor for use in Technical Specification 3.2.3 is given in Figure 17. These values are documented in Reference (2).

The MCPR values given are the bounding values for Increased Core Flow (up to 105% power), Feedwater Temperature Reduction (up to 60 degrees F), Power Coastdown, and a combination of all of these options. Curves are also provided for inoperable Recirc Pump Trip or inoperable Steam Bypass System.

ROD BLOCK MONITOR SETPOINT

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. These values are documented in Reference (2).

LINEAR HEAT GENERATION RATE

The LHGR value for use in Technical Specification 3.2.4 is given in Table 3. These values are documented in References (3), (4), and (6).

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. These values are documented in References (2) and (6).

QUALIFICATION FUEL BUNDLES

The MCPR values for the Advanced Nuclear Fuel Inc. (ANF) and ABB Atom Inc. (ABB) Qualification Fuel Bundles (QFBs) are found in Figures 13-16. The MAPLHGR values for use with the ABB and ANF QFBs are the values for the fuel type GE9B-P8CWB325-9GZ2-80M-150-T found in Figure 5. The LHGR values are found in Table 3. The MCPR and MAPLHGR values for the GE11 QFBs are found in Figures 11-12 and 6 respectively. The GE11 LHGR value is found in Table 3. Thes values are documented in References (2), (3), and (4).

REFERENCES

1) "Technical Specifications and Bases for Limerick Generating Station Unit 2", Docket No. 50-353 Appendix A to License No. NPF-85.

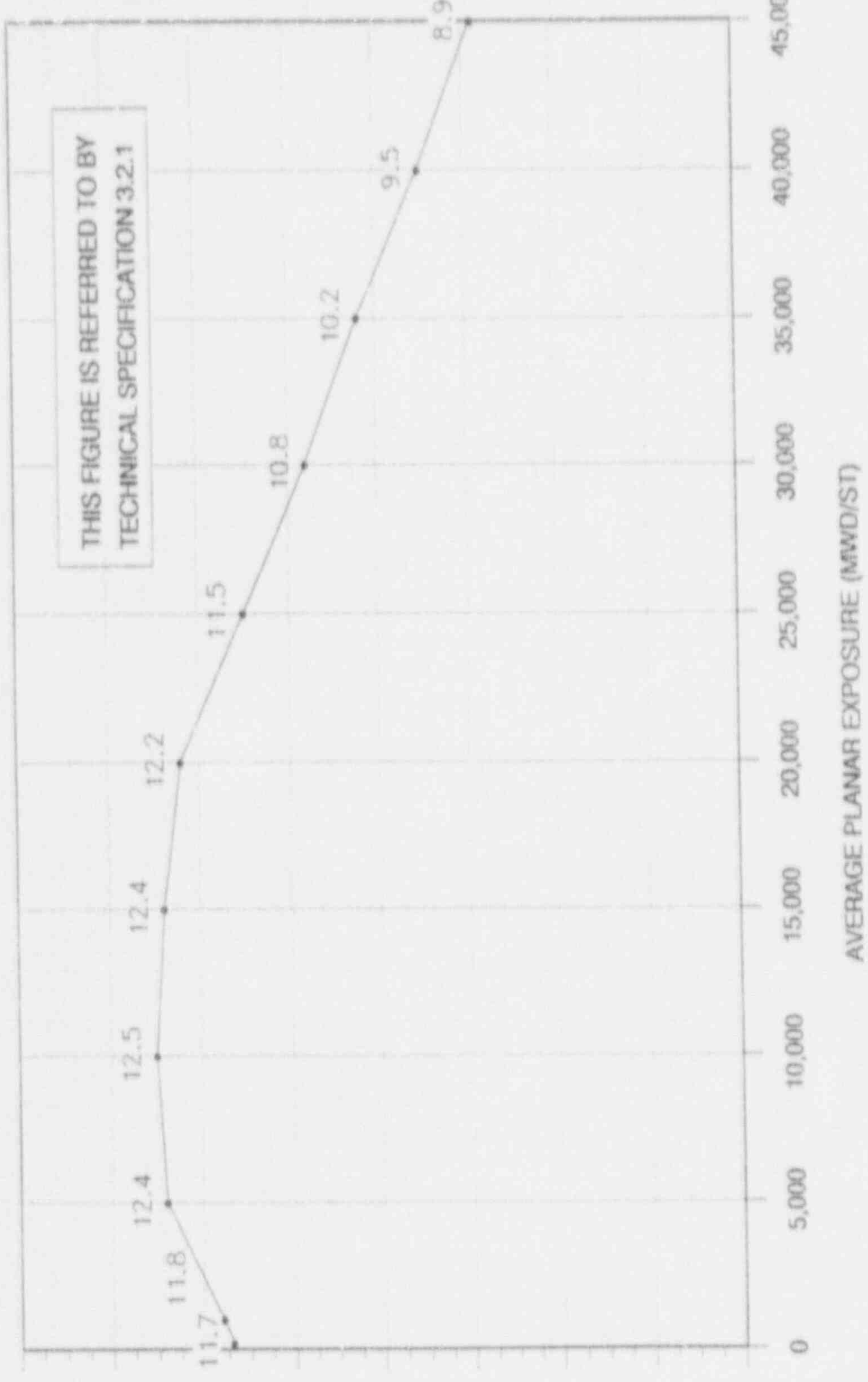
2) "Supplemental Reload Licensing Submittal for Limerick Generating Station Unit 2, Reload 1, Cycle 2", 23A6548, Rev. 0, April 1991.

3) "Limerick 2 9x9-5X+ Qualification Fuel Assembly Safety Analysis Report", ANF-90-193(P), January 1991.

4) ABB Atom Report BR 91-042, "Supplemental Lead Fuel Assembly Licensing Report, SVEA-96 LFAs for Limerick-2, Summary", January 1991.

5) "Basis for MAPLHGR Technical Specifications for Limerick Generating Station Unit 2", NEDC-31930P, April 1991.

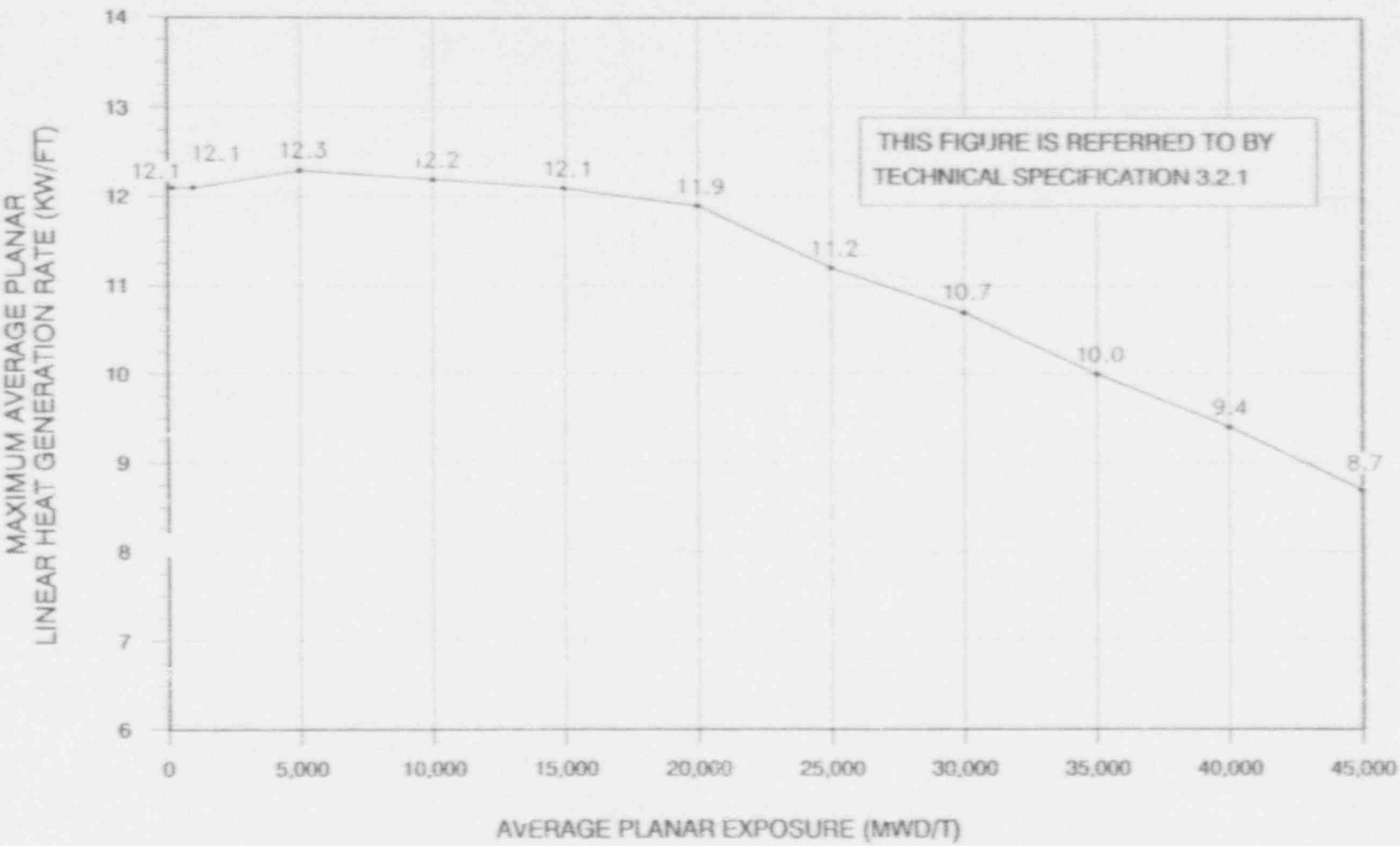
6) "General Electric Standard Application for Reactor Fuel", NEDE-24011-P-A-9, latest approved revision.



MAXIMUM AVERAGE PLANAR LINEAR HEAT GENERATION RATE VS. AVERAGF PLANAR EXPOSURE

FUEL TYPE BP8CRB278

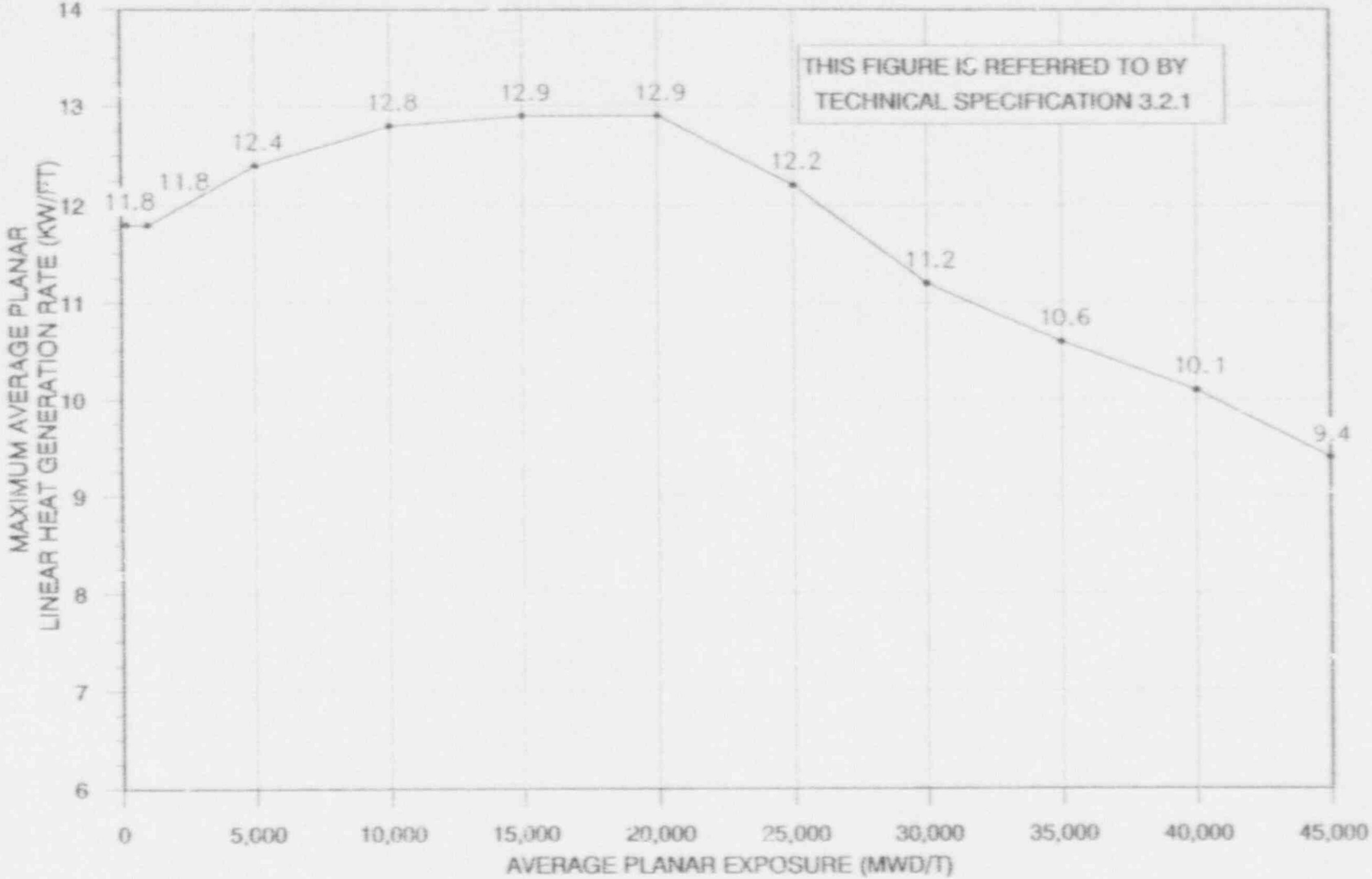
FIGURE 1



MAXIMUM AVERAGE PLANAR LINEAR HEAT GENERATION RATE VS. AVERAGE PLANAR EXPOSURE

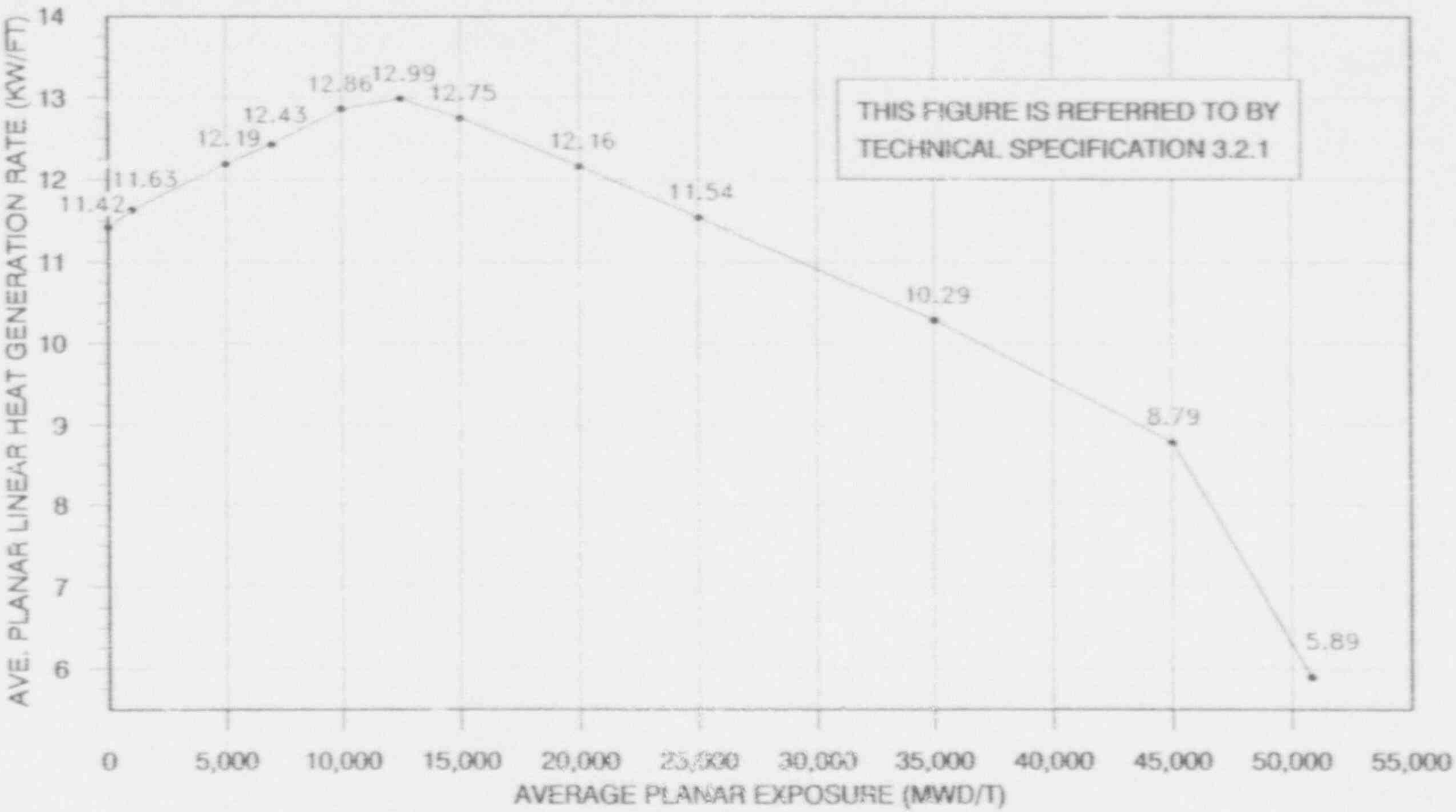
FUEL TYPE BP8CRB248

FIGURE 2



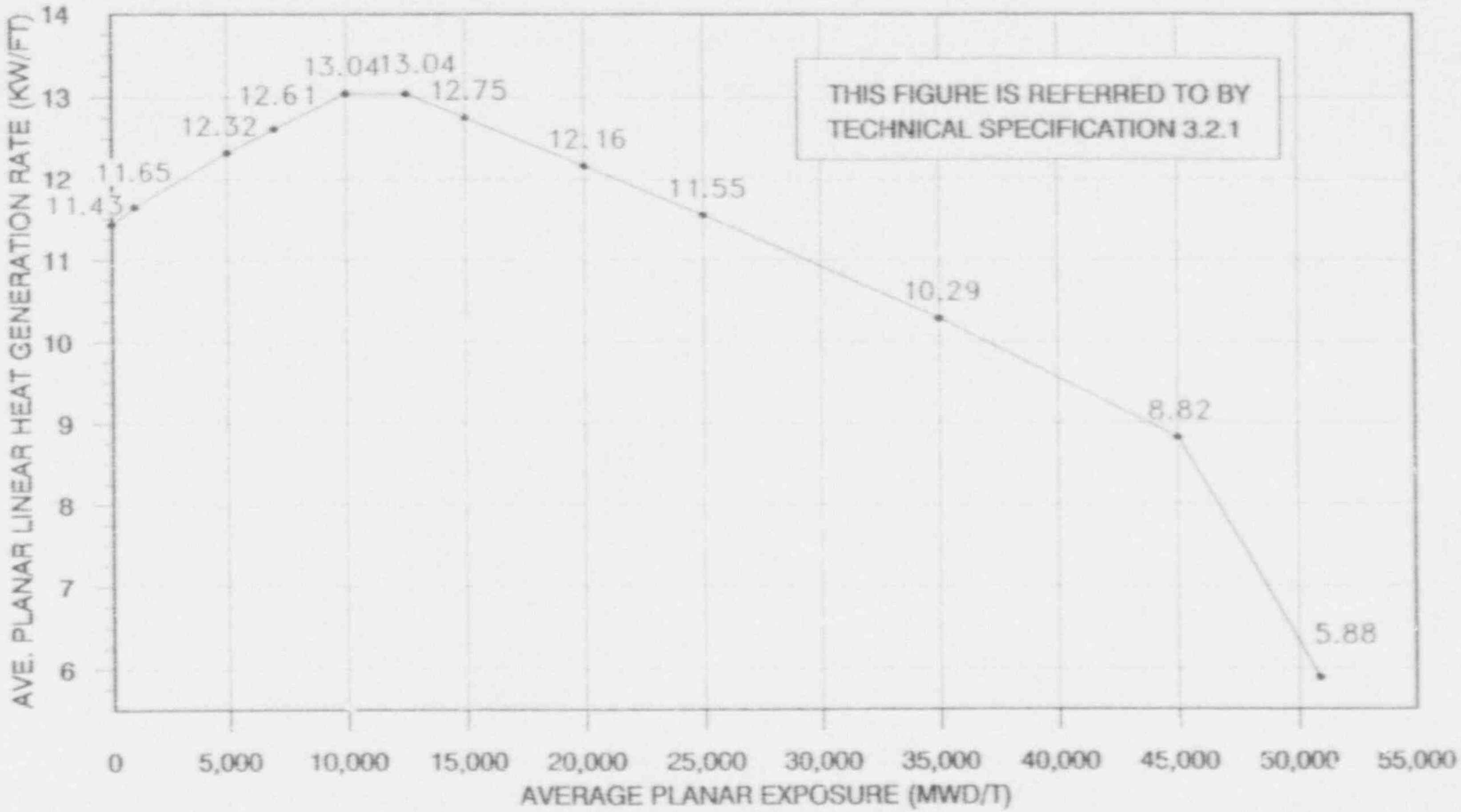
MAXIMUM AVERAGE PLANAR LINEAR HEAT GENERATION RATE VS. AVERAGE PLANAR EXPOSURE
FUEL TYPE BP8CRB163

FIGURE 3



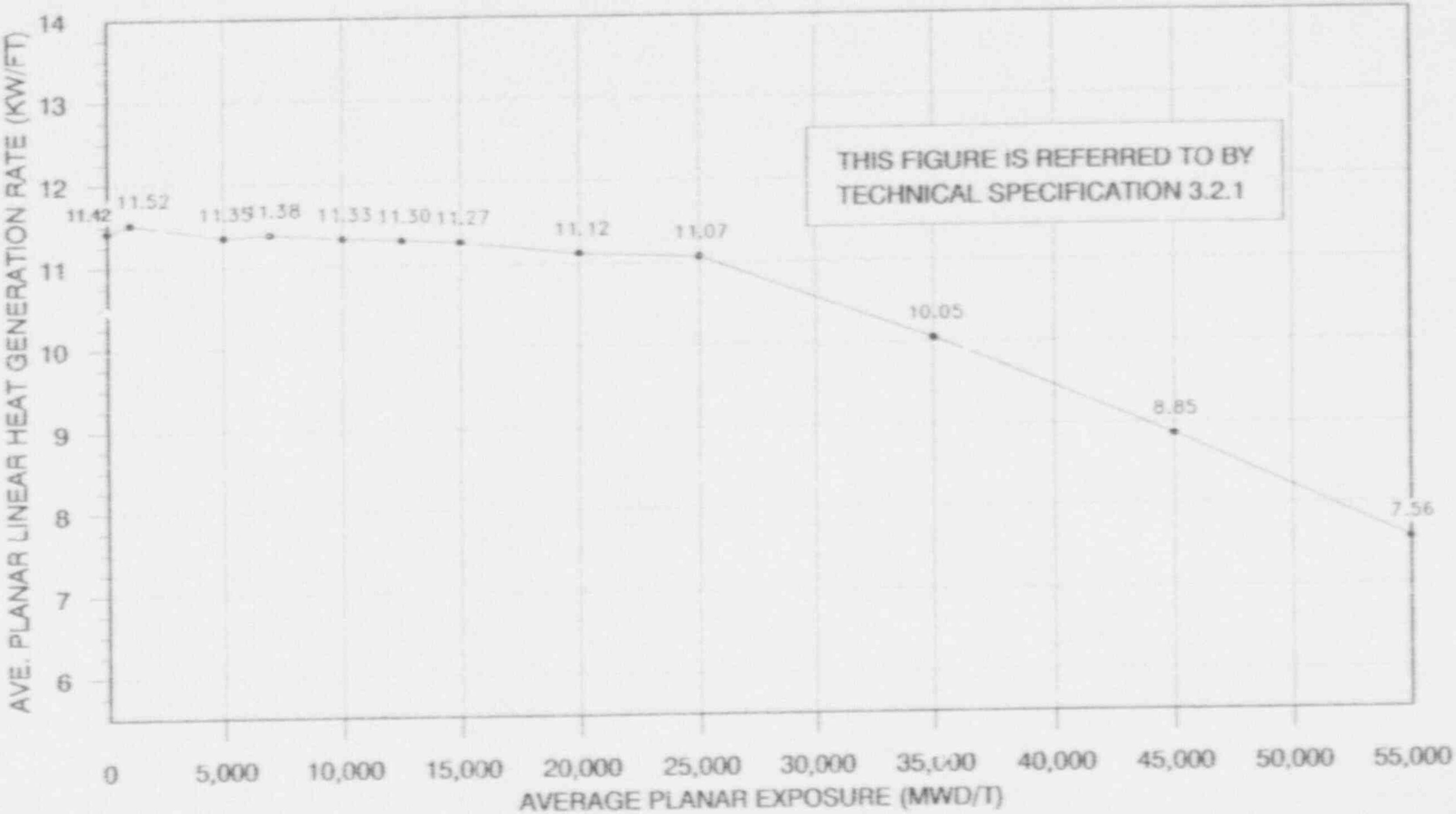
MAXIMUM AVERAGE PLANAR LINEAR HEAT GENERATION RATE VERSUS AVERAGE PLANAR EXPOSURE FUEL TYPE GE9B-P8CWB325-9GZ1-80M-150-T (GE8X8NB)

FIGURE 4



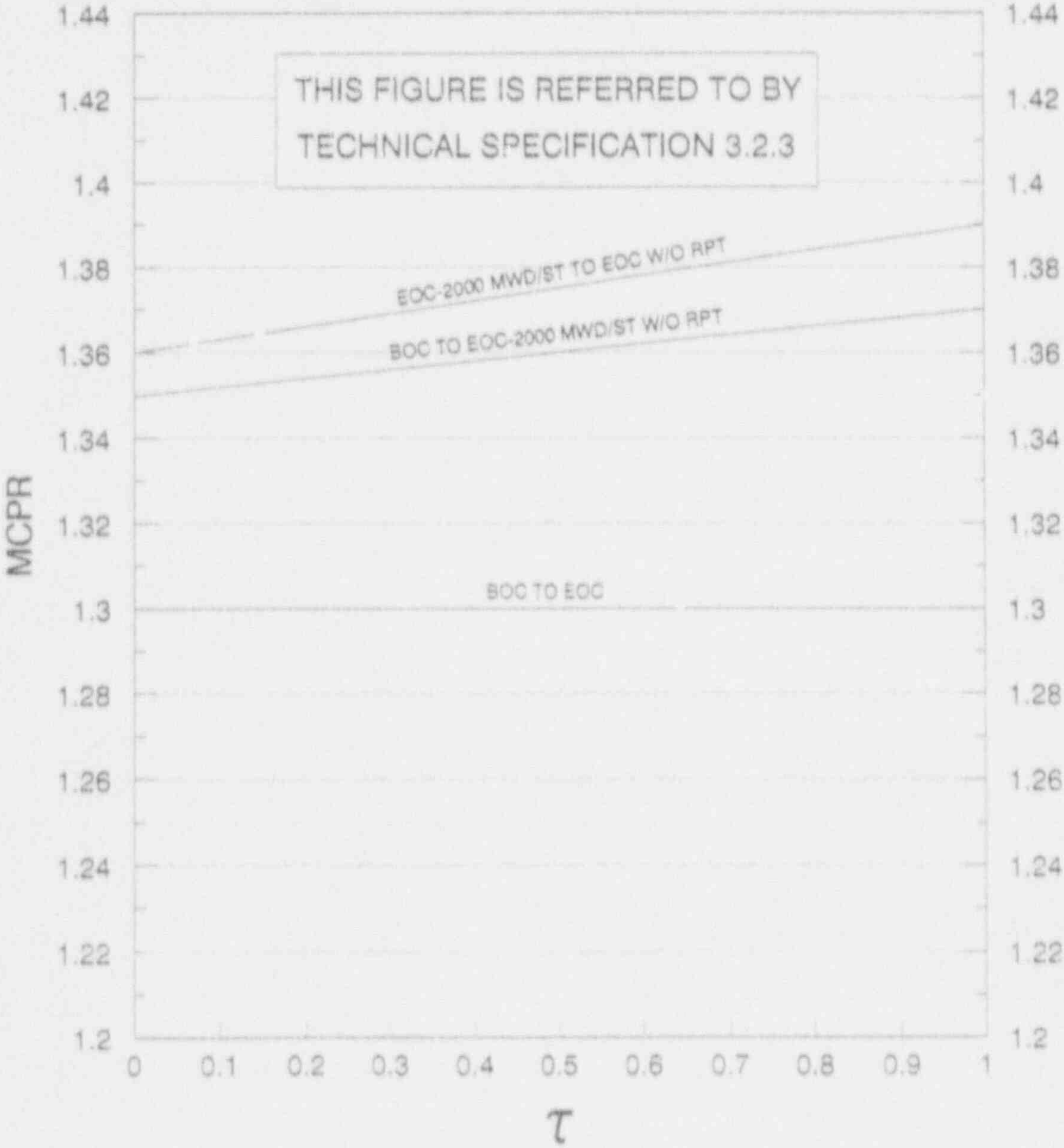
MAXIMUM AVERAGE PLANAR LINEAR HEAT
GENERATION RATE VERSUS AVERAGE PLANAR EXPOSURE
FUEL TYPE GE9B-P8CWB325-9GZ2-80M-150-T (GE8X8NB)

FIGURE 5



MAXIMUM AVERAGE PLANAR LINEAR HEAT
GENERATION RATE VERSUS AVERAGE PLANAR EXPOSURE
FUEL TYPE GE11-P9CUB304-5G5/5G4-100M-146-T-LUA

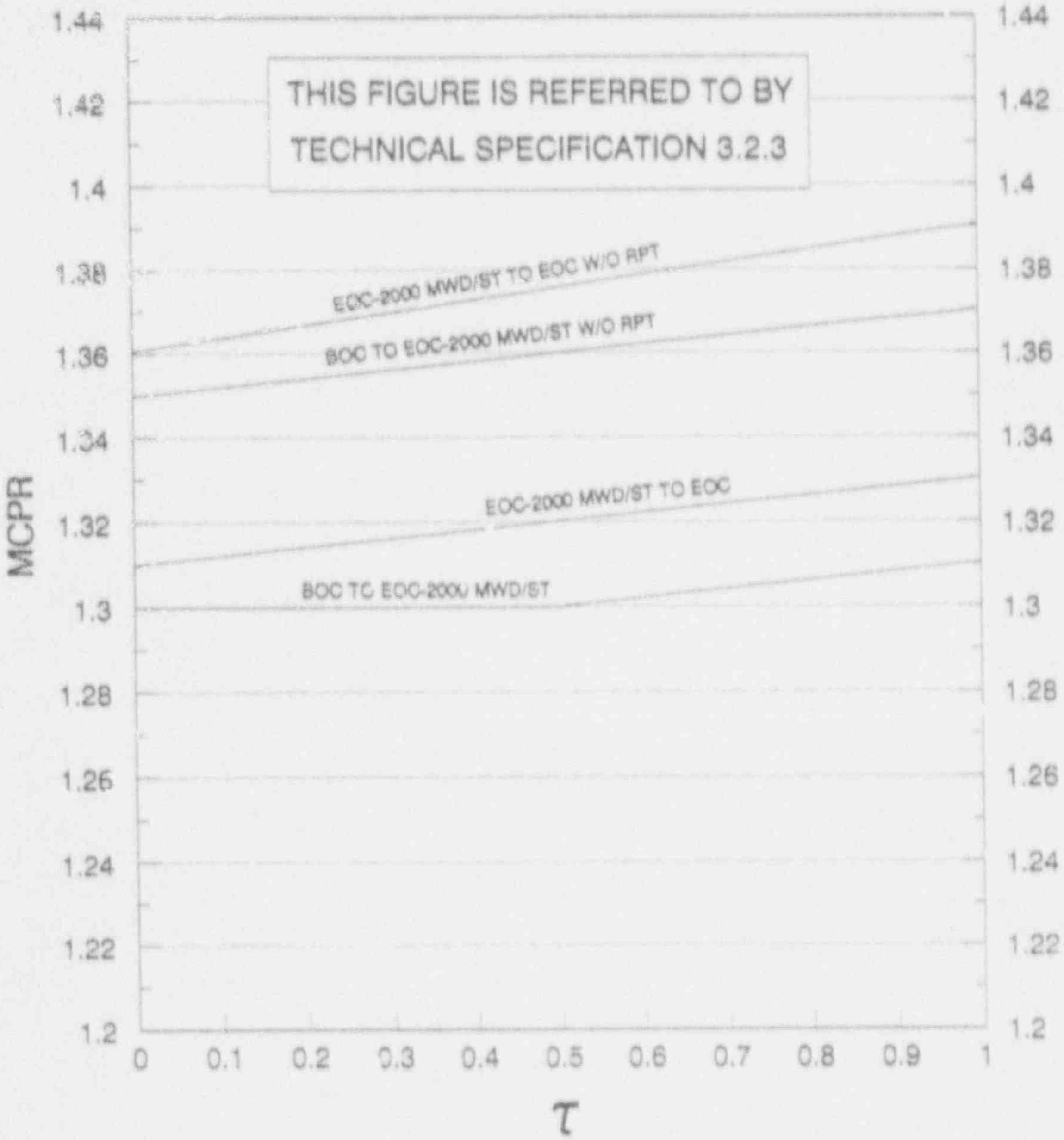
FIGURE 6



MCPR VS TAU
FUEL TYPES BP8X8R

(INCREASED CORE FLOW & FEEDWATER TEMPERATURE REDUCTION
WITH OPERABLE STEAM BYPASS)

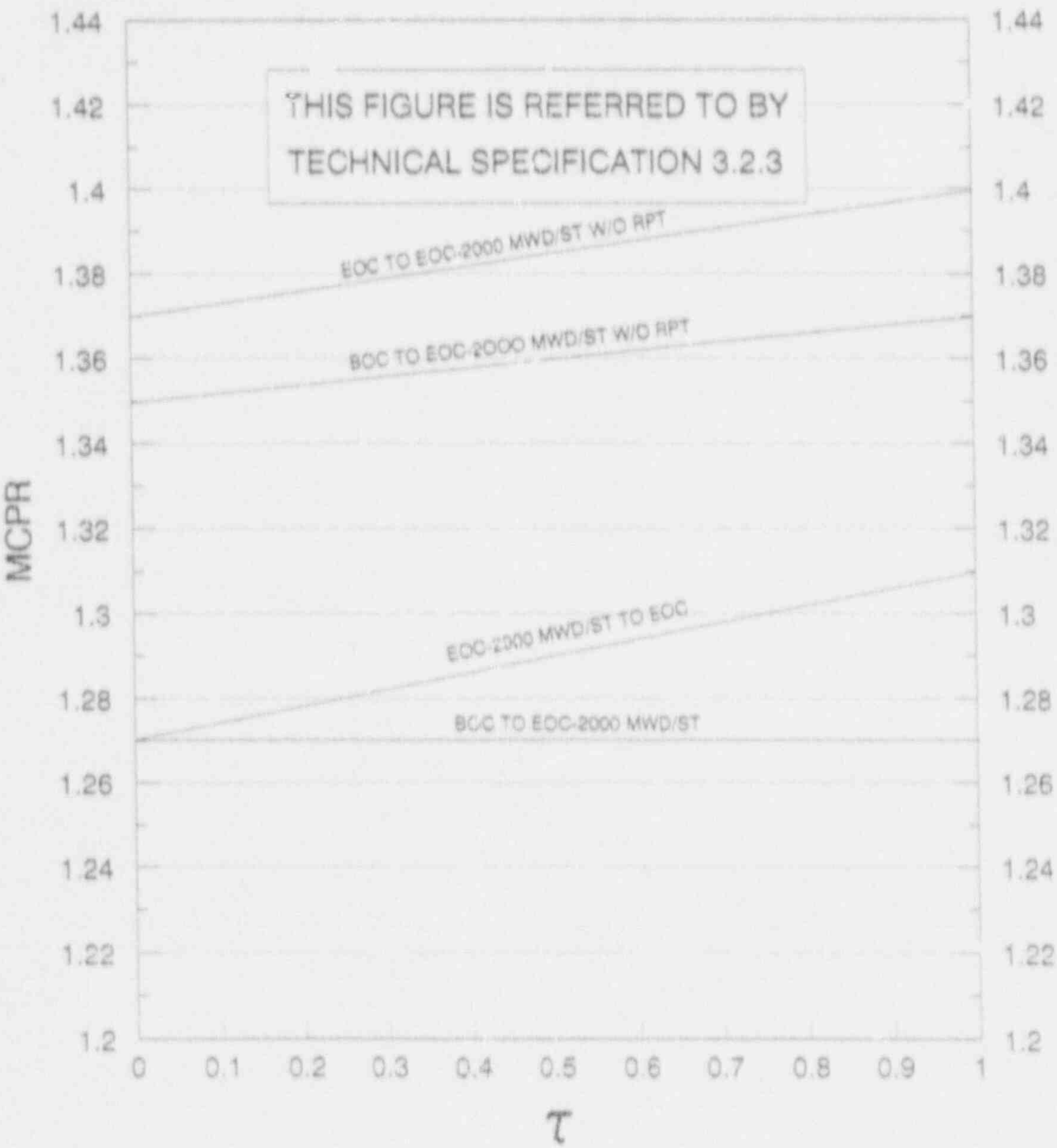
FIGURE 7



MCPR VS TAU
FUEL TYPES BP8X8R

(INCREASED CORE FLOW & FEEDWATER TEMPERATURE REDUCTION
WITH INOPERABLE STEAM BYPASS)

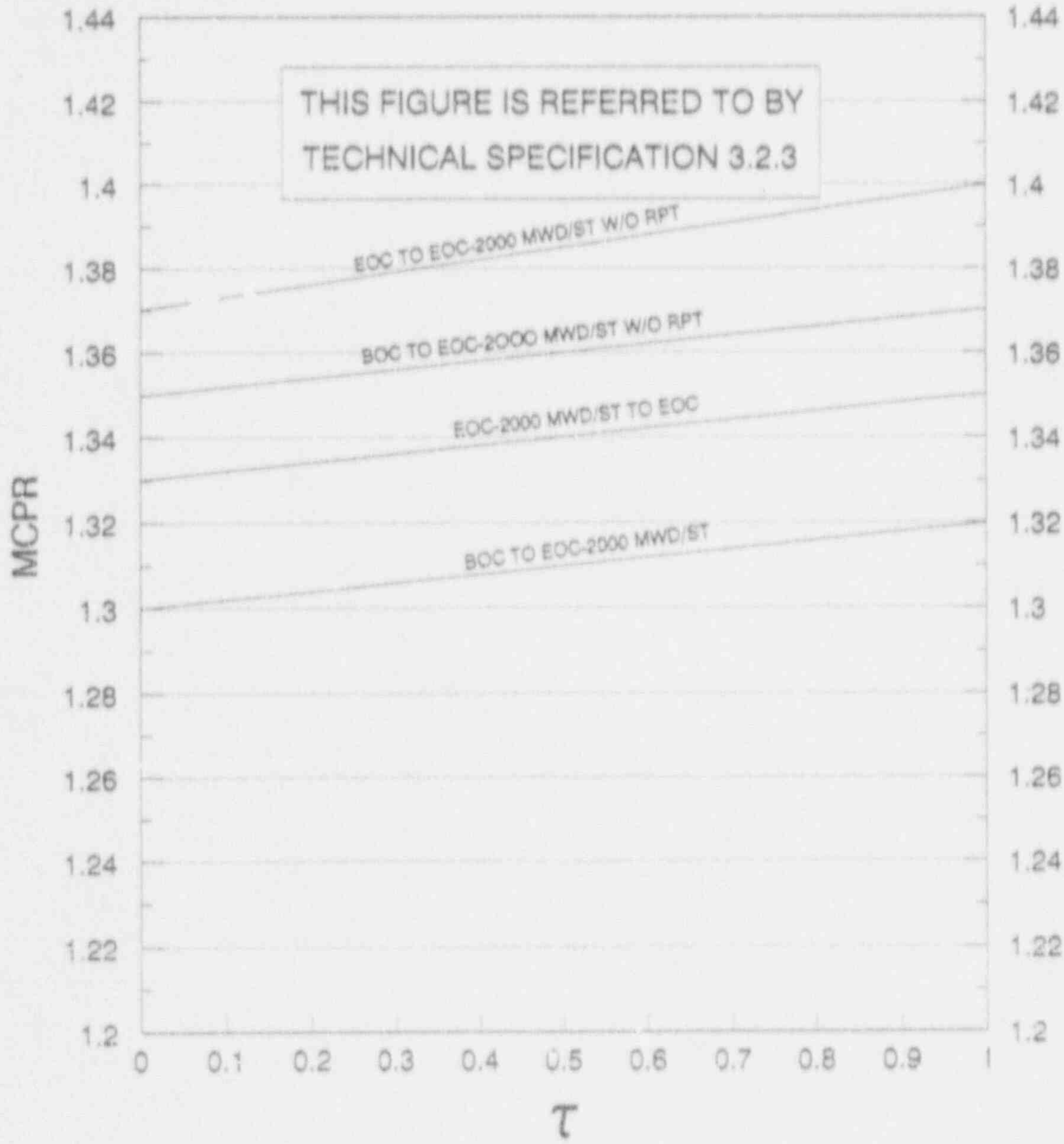
FIGURE 8



MCPR VS TAU
FUEL TYPES GE8X8NB

(INCREASED CORE FLOW & FEEDWATER TEMPERATURE REDUCTION
WITH OPERABLE STEAM BYPASS)

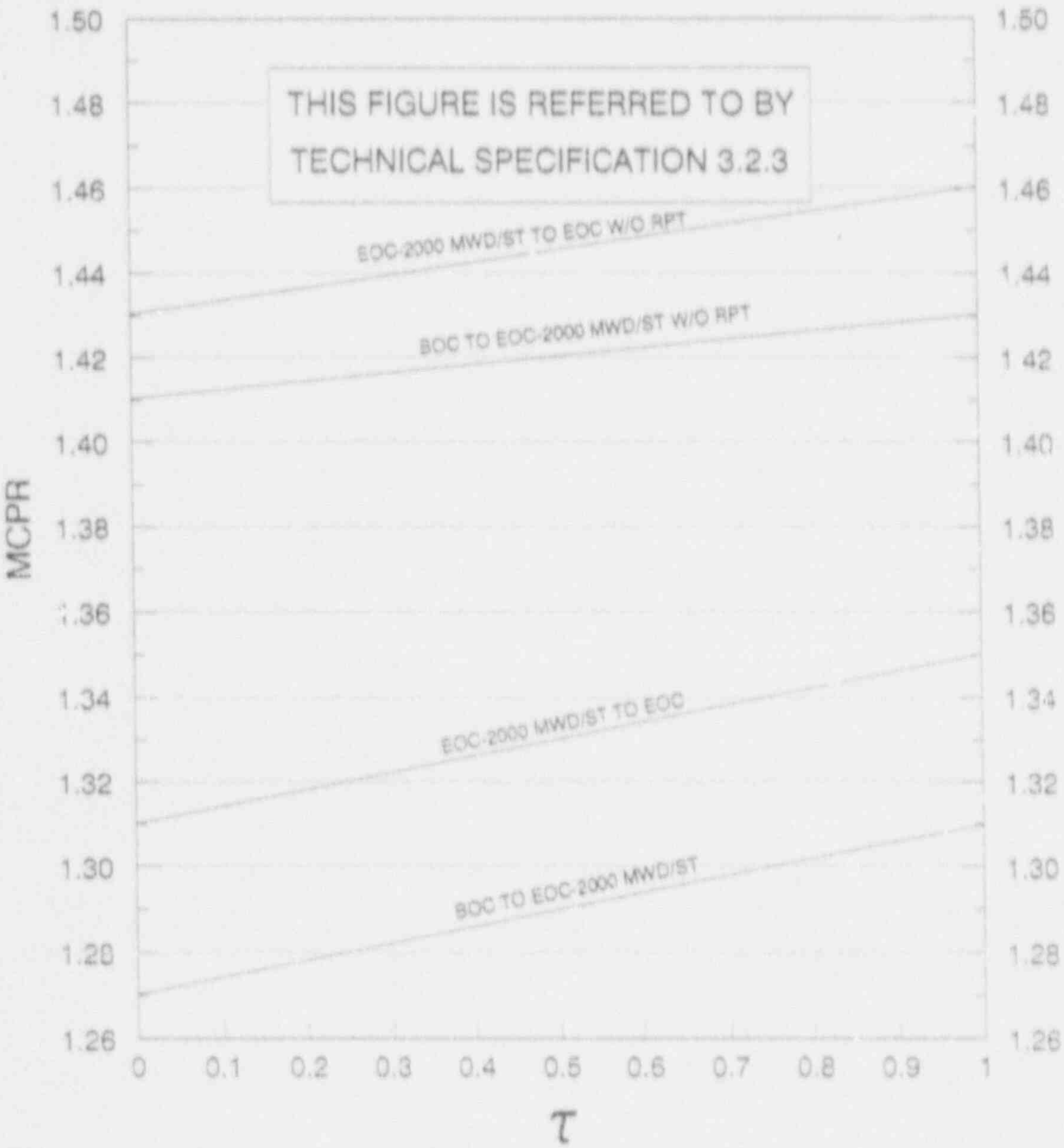
FIGURE 9



MCPR VS TAU
FUEL TYPES GE8X8NB

(INCREASED CORE FLOW & FEEDWATER TEMPERATURE REDUCTION
WITH INOPERABLE STEAM BYPASS)

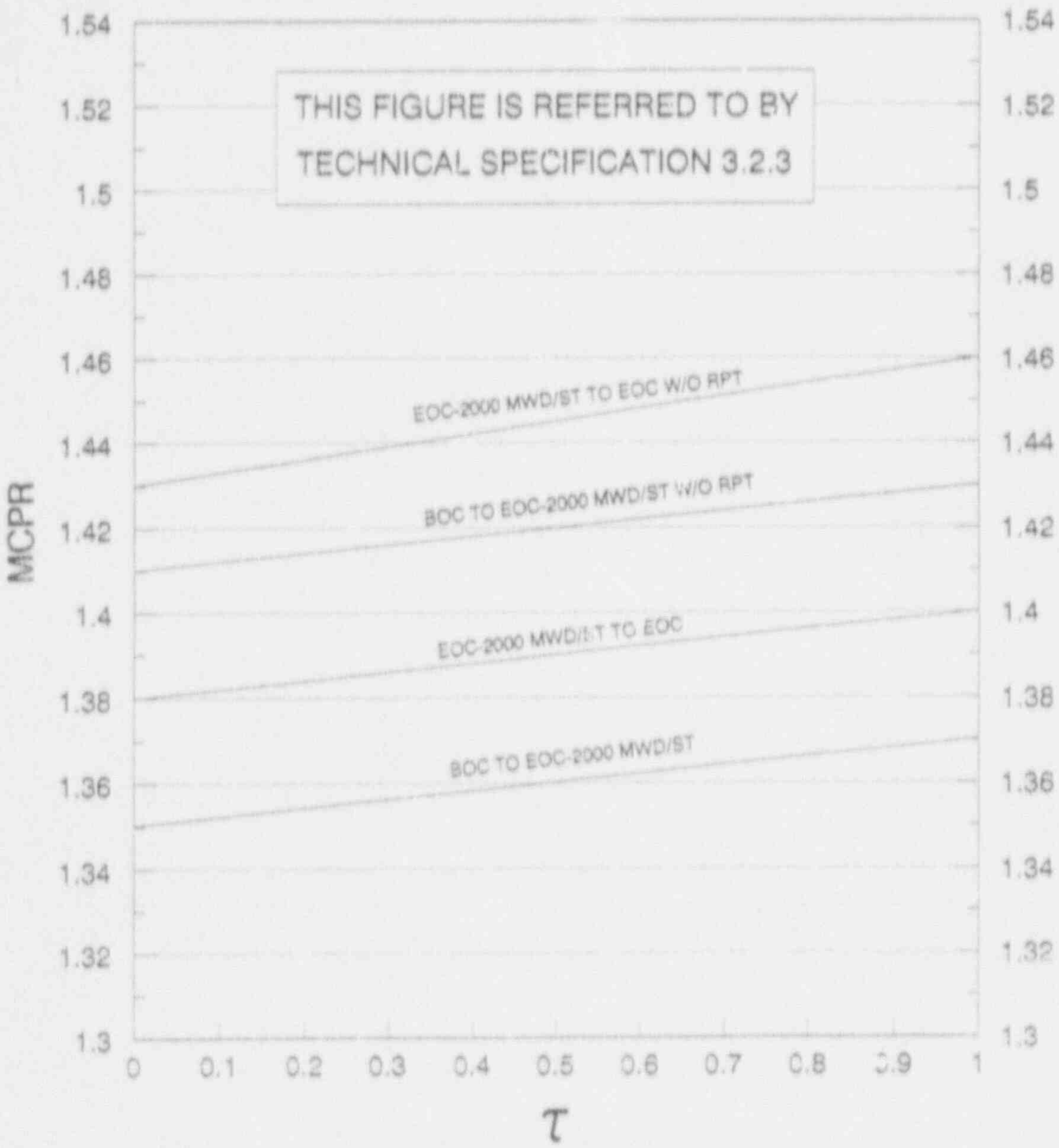
FIGURE 10



MCPR VS TAU
FUEL TYPE GE11

(INCREASED CORE FLOW & FEEDWATER TEMPERATURE REDUCTION
WITH OPERABLE STEAM BYPASS)

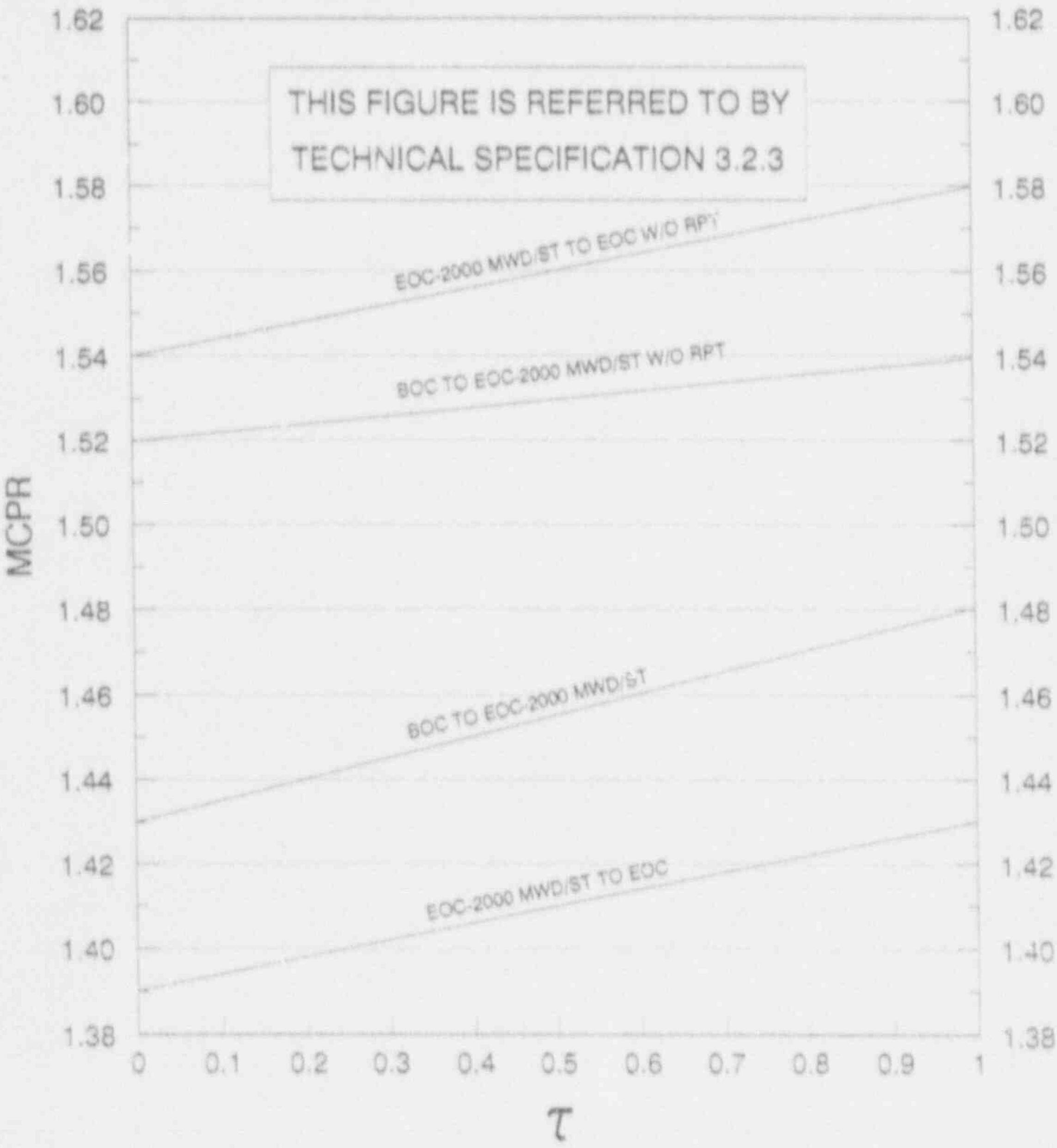
FIGURE 11



MCPR VS TAU
FUEL TYPE GE11

(INCREASED CORE FLOW & FEEDWATER TEMPERATURE REDUCTION
WITH INOPERABLE STEAM BYPASS)

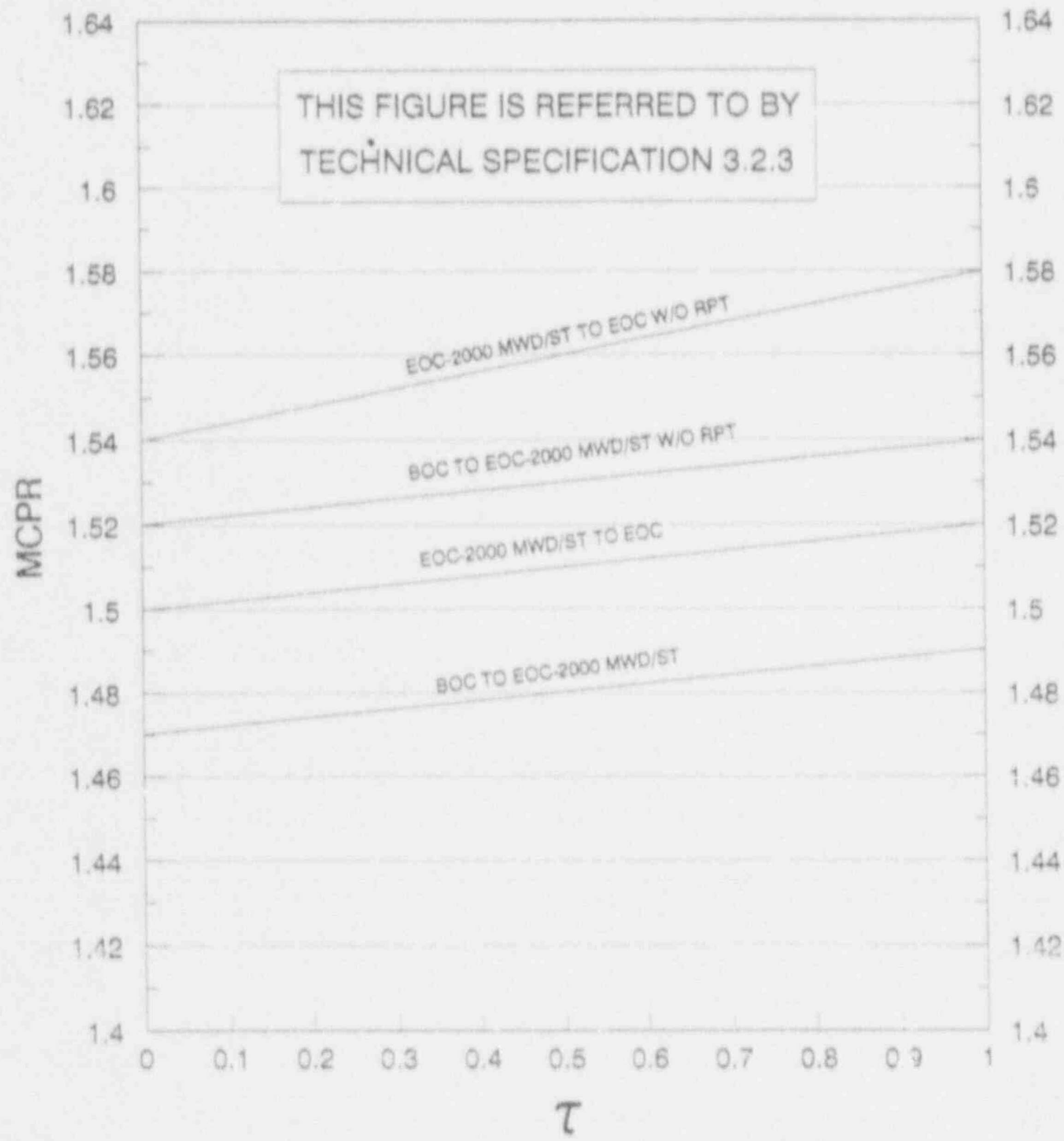
FIGURE 12



MCPR VS TAU
FUEL TYPE ANF QFB

(INCREASED CORE FLOW & FEEDWATER TEMPERATURE REDUCTION
WITH OPERABLE STEAM BYPASS)

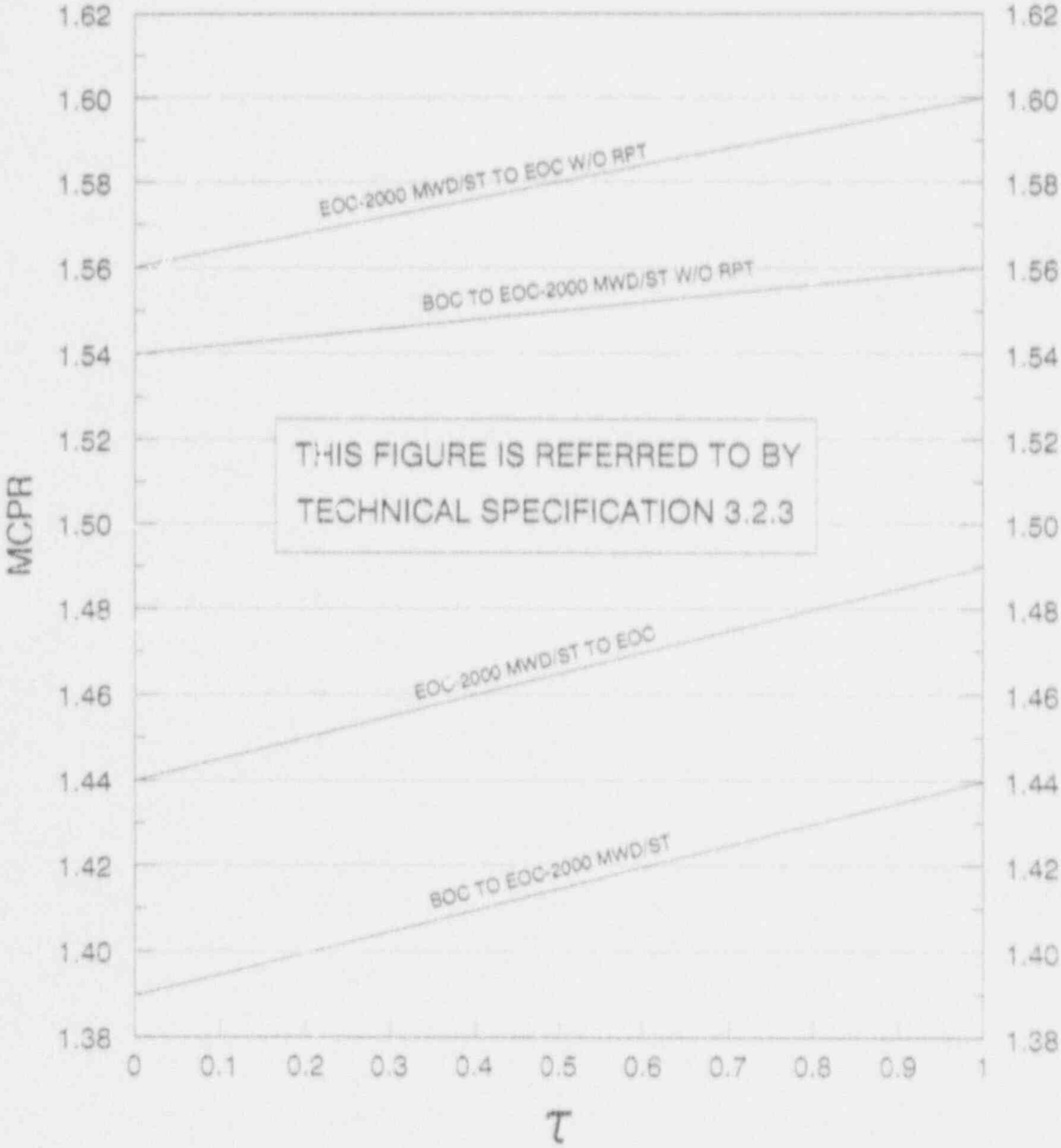
FIGURE 13



MCPR VS TAU
FUEL TYPE ANF QFB

(INCREASED CORE FLOW & FEEDWATER TEMPERATURE REDUCTION WITH INOPERABLE STEAM BYPASS)

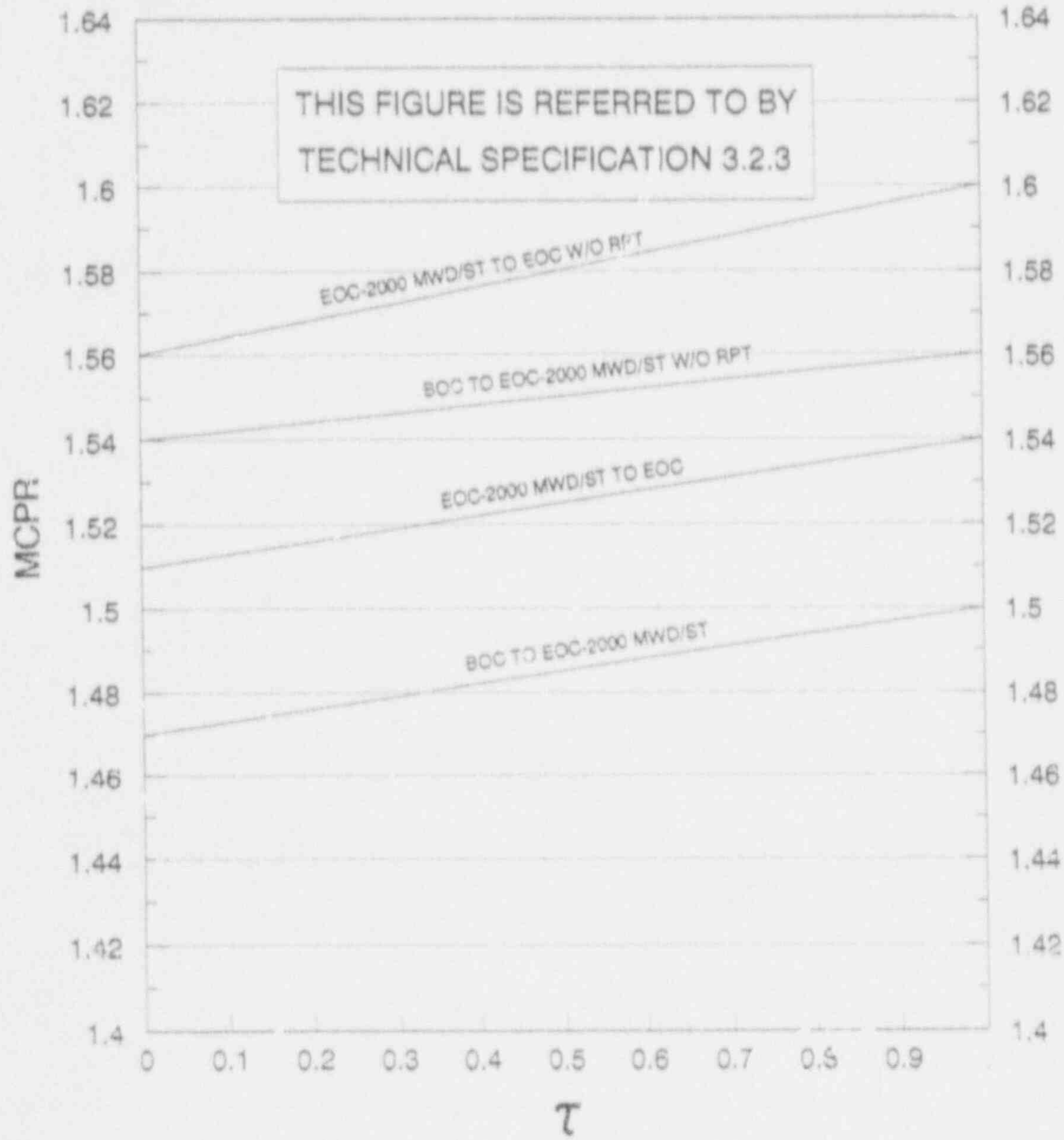
FIGURE 14



MCPR VS TAU
FUEL TYPE ABB QFB

(INCREASED CORE FLOW & FEEDWATER TEMPERATURE REDUCTION
WITH OPERABLE STEAM BYPASS)

FIGURE 15



MCPR VS TAU
FUEL TYPE ABB QFB

(INCREASED CORE FLOW & FEEDWATER TEMPERATURE REDUCTION
WITH INOPERABLE STEAM BYPASS)

FIGURE 16

K_f Factor vs Core Flow

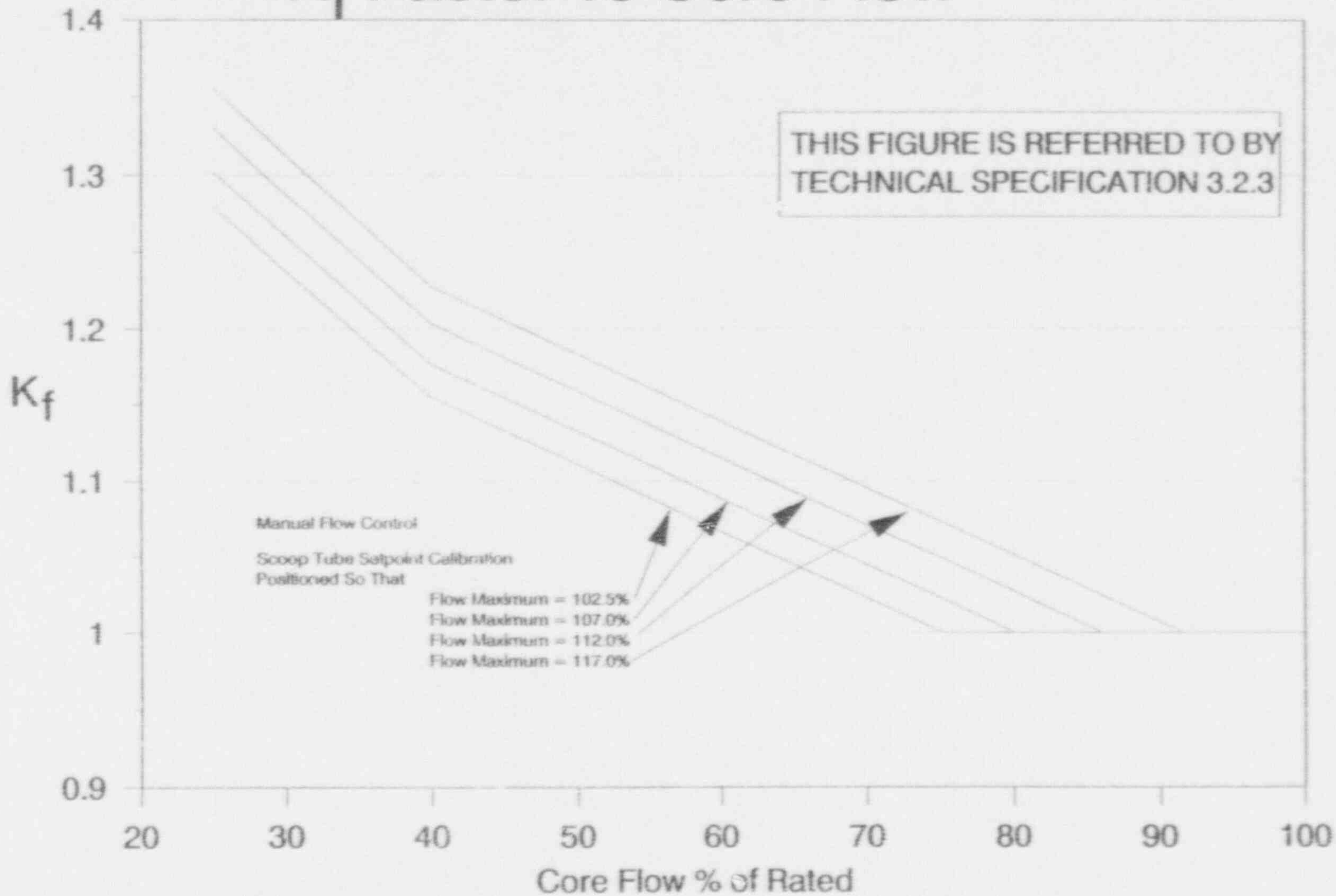


FIGURE 17

TABLE 1

SINGLE LOOP REDUCTION FACTOR

0.88

THIS FIGURE IS REFERRED TO BY
TECHNICAL SPECIFICATION 3.2.1

TABLE 2

ROD BLOCK MONITOR SETPOINT

N=107

THIS TABLE IS REFERRED TO BY
TECHNICAL SPECIFICATION 3.3.6

TABLE 3

LINEAR HEAT GENERATION RATE LIMIT

MAXIMUM VALUE

Fuel Type	Limit (KW/FT)
BP8X8R	13.4
GE8X8NB	14.4
GE11 QFB	14.4
ANF QFB	14.4
ABB QFB	14.4

THIS TABLE IS REFERRED TO BY
TECHNICAL SPECIFICATION 3.2.4

TABLE 4

TURBINE BYPASS VALVE PARAMETERS

TURBINE BYPASS SYSTEM RESPONSE TIME

Maximum delay time before start of bypass valve opening following generation of the turbine bypass valve flow signal	0.1 sec
Maximum time after generation of a turbine bypass valve flow signal for bypass valve position to reach 80% of full stroke (includes the above delay time)	0.3 sec

MINIMUM REQUIRED BYPASS VALVES TO MAINTAIN SYSTEM OPERABILITY

Number of valves = 7

THIS TABLE IS REFERRED TO BY
TECHNICAL SPECIFICATIONS 3.7.8 & 4.7.8.C