PL-NF-92-008
REV. 0

Susquehanna SES Unit 2
Cycle 6

CORE OPERATING LIMITS REPORT

Nuclear Fuels
Engineering

November 1992

PP&L

Pennsylvania Power & Light Company

PL-NF-92-008
Rev. 0

SUSQUEHANNA SES UNIT 2 CYCLE 6
CORE OPERATING LIMITS REPORT

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PENNSYLVANIA POWER & LIGHT COMPANY

SUSQUEHANNA STEAM ELECTRIC STATION
Unit 2 Cycle 6
CORE OPERATING LIMITS REPORT

1.0 INTRODUCTION

This CORE OPERATING LIMITS REPORT for Susquehanna Unit 2 Cycle 6 is prepared in accordance with the requirements of Susquehanna Unit 2, Technical Specification 6.9.3. As required by Technical Specifications 6.9.3.2 and 6.9.3.3, the core operating limits presented herein were developed using NRC - approved methods and are established such that all applicable limits of the plant safety analysis are met. Results from the reload analysis for Unit 2 Cycle 6 are documented in Reference 1.

The following cycle specific core operating limits are included in this report:

a. Average Planar Linear Heat Generation Rate (APLHGR) (Technical Specification 3.2.1)

b. Linear Heat Generation Rate for Average Power Range Monitor (APRM) Setpoints (Technical Specification 3.2.2)

c. Minimum Critical Power Ratio (MCPR) (Technical Specification 3.2.3)

d. Linear Heat Generation Rate (LHGR) (Technical Specification 3.2.4)

e. Recirculation Loops - Two Loop Operation (Technical Specification 3.4.1.1.1)

f. Recirculation Loops - Single Loop Operation (Technical Specification 3.4.1.1.2)

2.0 AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR)

2.1 Technical Specification Reference

Technical Specification 3.2.1

2.2 Description

The APLHGRs for all fuel shall not exceed the limit shown in Figure 2.2-1.

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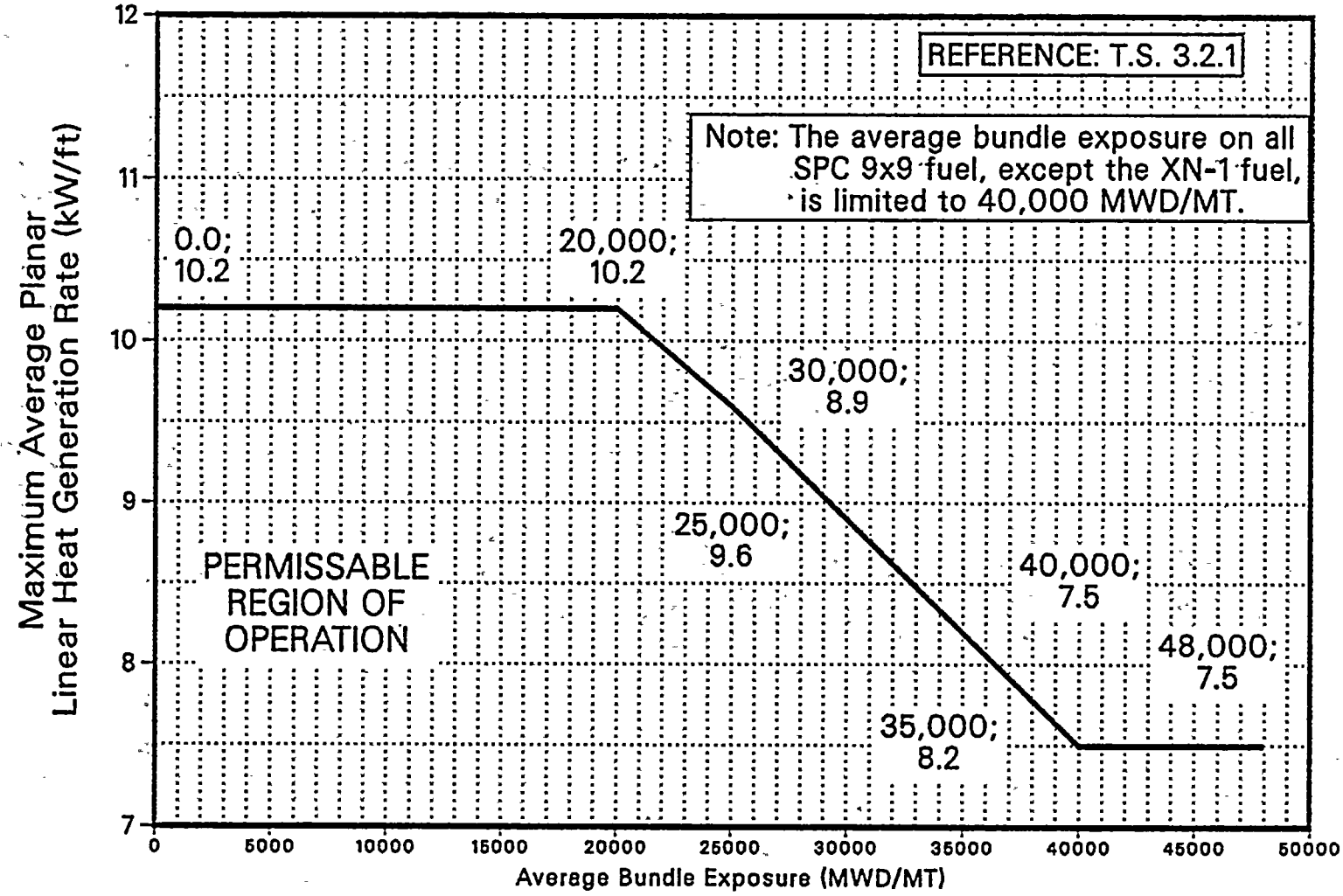

MAXIMUM AVERAGE PLANAR LINEAR HEAT GENERATION RATE (MAPLHGR) VERSUS AVERAGE BUNDLE EXPOSURE
SPC 9X9 FUEL
FIGURE 2.2-1

3.0 LINEAR HEAT GENERATION RATE FOR APRM SETPOINTS

3.1 Technical Specification Reference

Technical Specification 3.2.2

3.2 Description

The APRM flow biased simulated thermal power-upscale scram trip setpoint and flow biased neutron flux-upscale control rod block trip setpoint shall be established according to the relationships specified in Technical Specification 3.2.2. For those relationships, the maximum Fraction of Limiting Power Density (FLPD) for use in determination of "T", is the actual LHGR divided by the applicable LHGR from Figure 3.2-1 or Figure 3.2-2.

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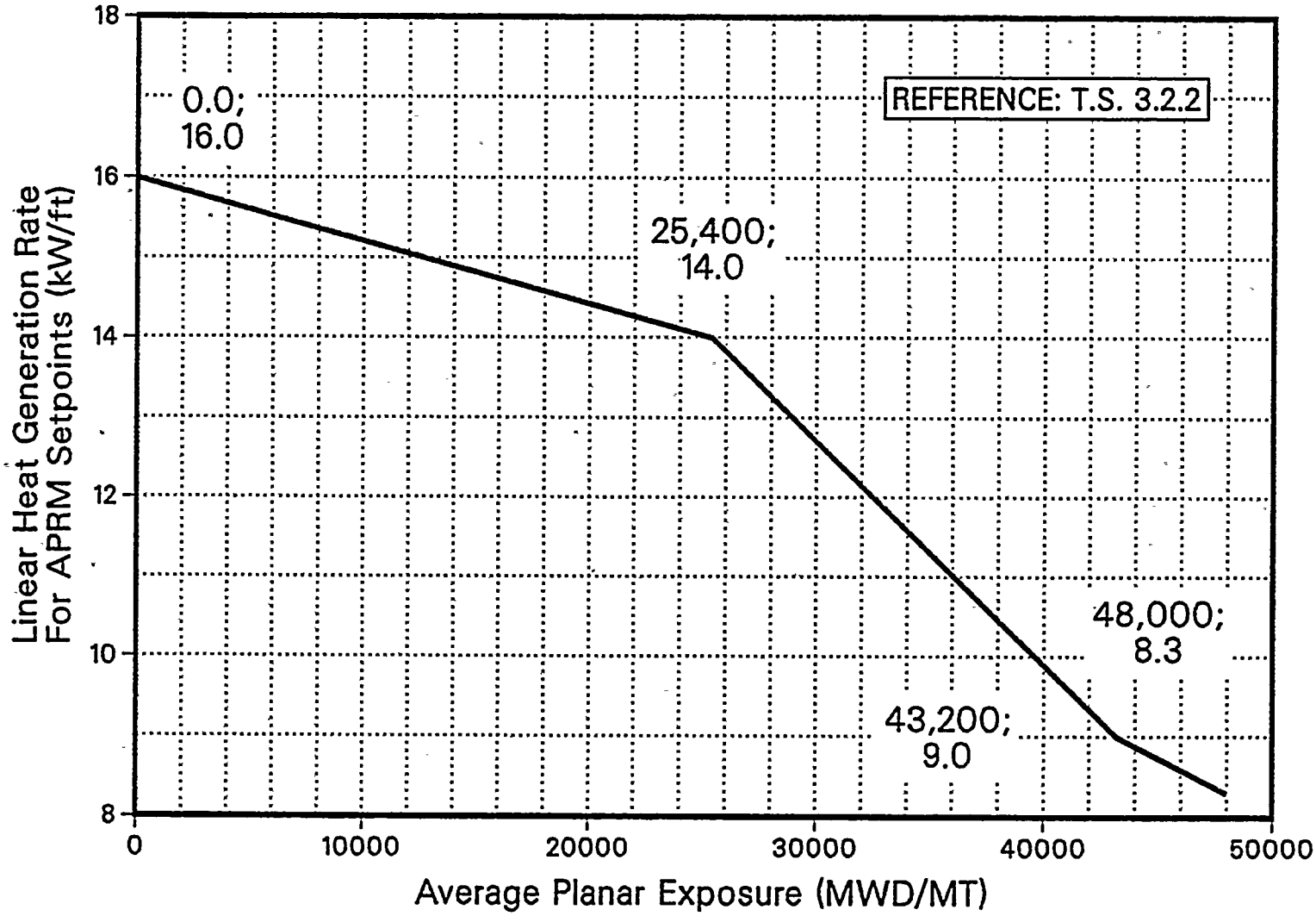
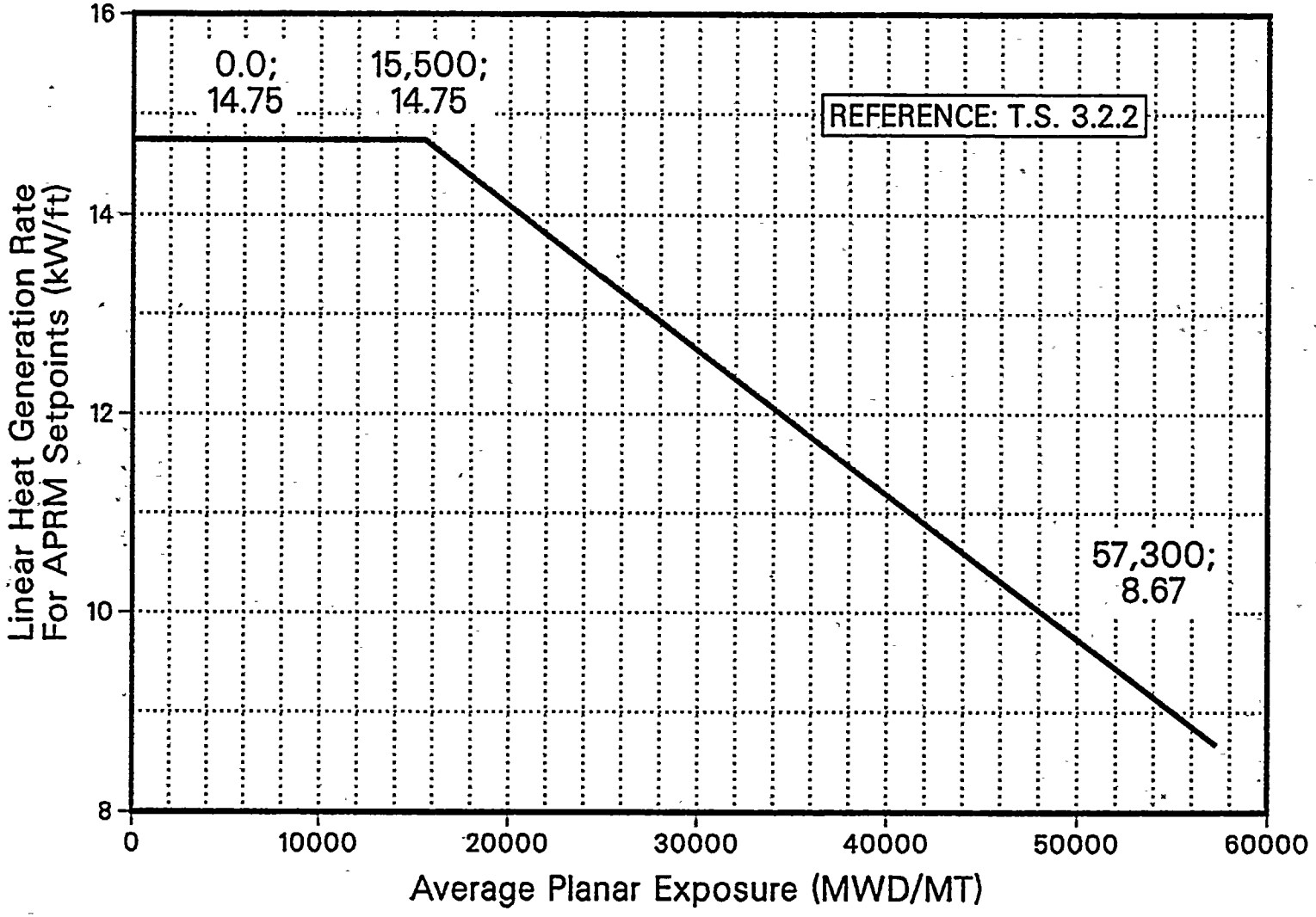


LINEAR HEAT GENERATION RATE FOR APRM SETPOINTS
VERSUS AVERAGE PLANAR EXPOSURE
SPC 9X9 (EXCLUDING XN-1) FUEL
FIGURE 3.2-1

SSES UNIT 2 CYCLE 6



LINEAR HEAT GENERATION RATE FOR APRM SETPOINTS
VERSUS AVERAGE PLANAR EXPOSURE
SPC 9X9 XN-1 FUEL
FIGURE 3.2-2

4.0 MINIMUM CRITICAL POWER RATIO (MCPR)

4.1 Technical Specification Reference

Technical Specification 3.2.3

4.2 Description

The MCPR limit is specified as a function of core power, core flow, average scram speed, and plant equipment operability status. The MCPR limit shall be the greater of:

a) The Flow-Dependent MCPR value determined from Figure 4.2-1, and

b) The Power-Dependent MCPR value determined from one of the following figures, as appropriate:

Figure 4.2-2: EOC-RPT and Main Turbine Bypass Operable

Figure 4.2-3: Main Turbine Bypass Inoperable

Figure 4.2-4: EOC-RPT Inoperable

using a linear interpolation between Curve A and Curve B of the appropriate figure, based on the results of each scram time surveillance test required by Technical Specification 4.1.3.3.

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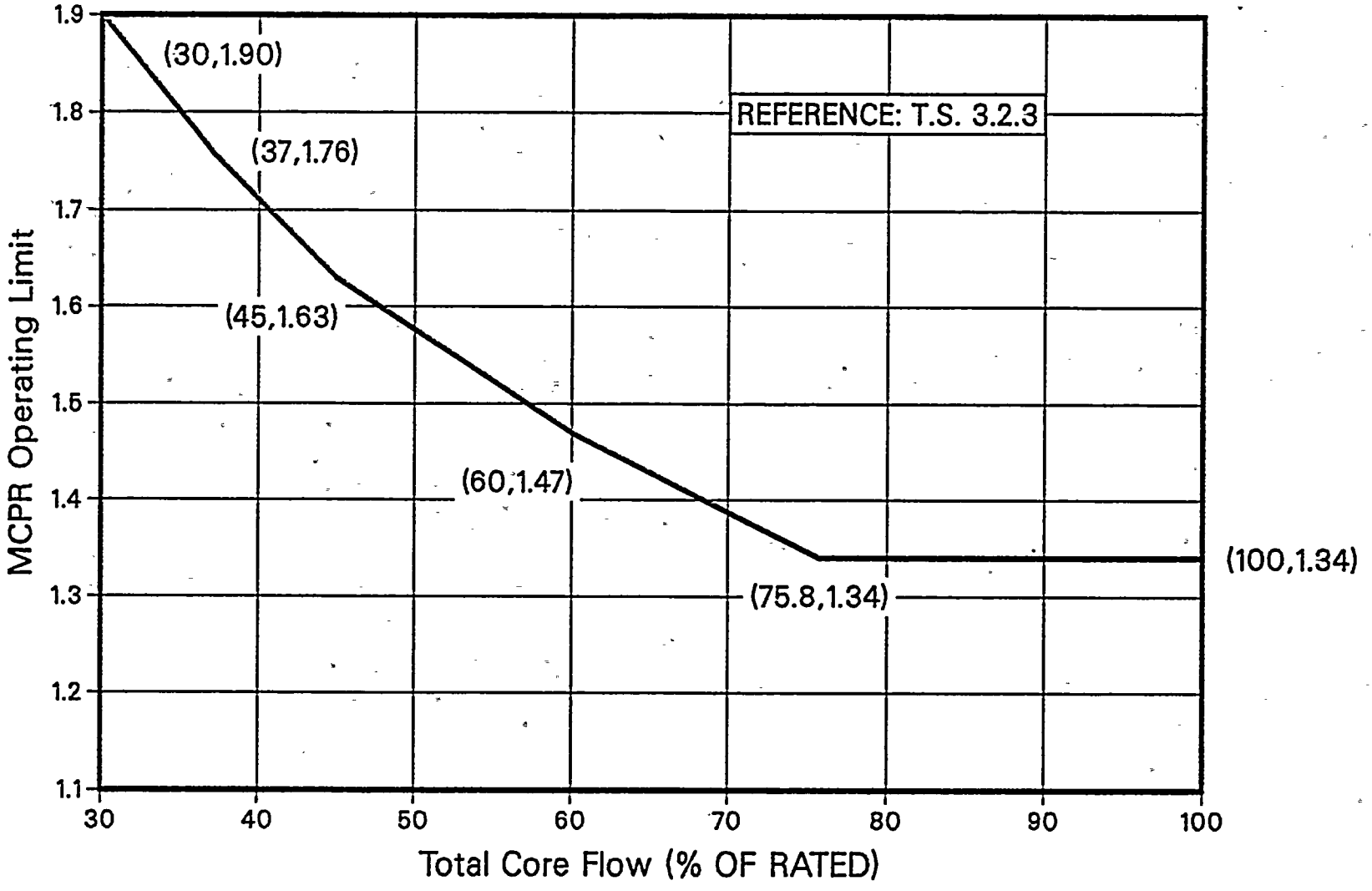

FLOW DEPENDENT MCPR OPERATING LIMIT
FIGURE 4.2-1

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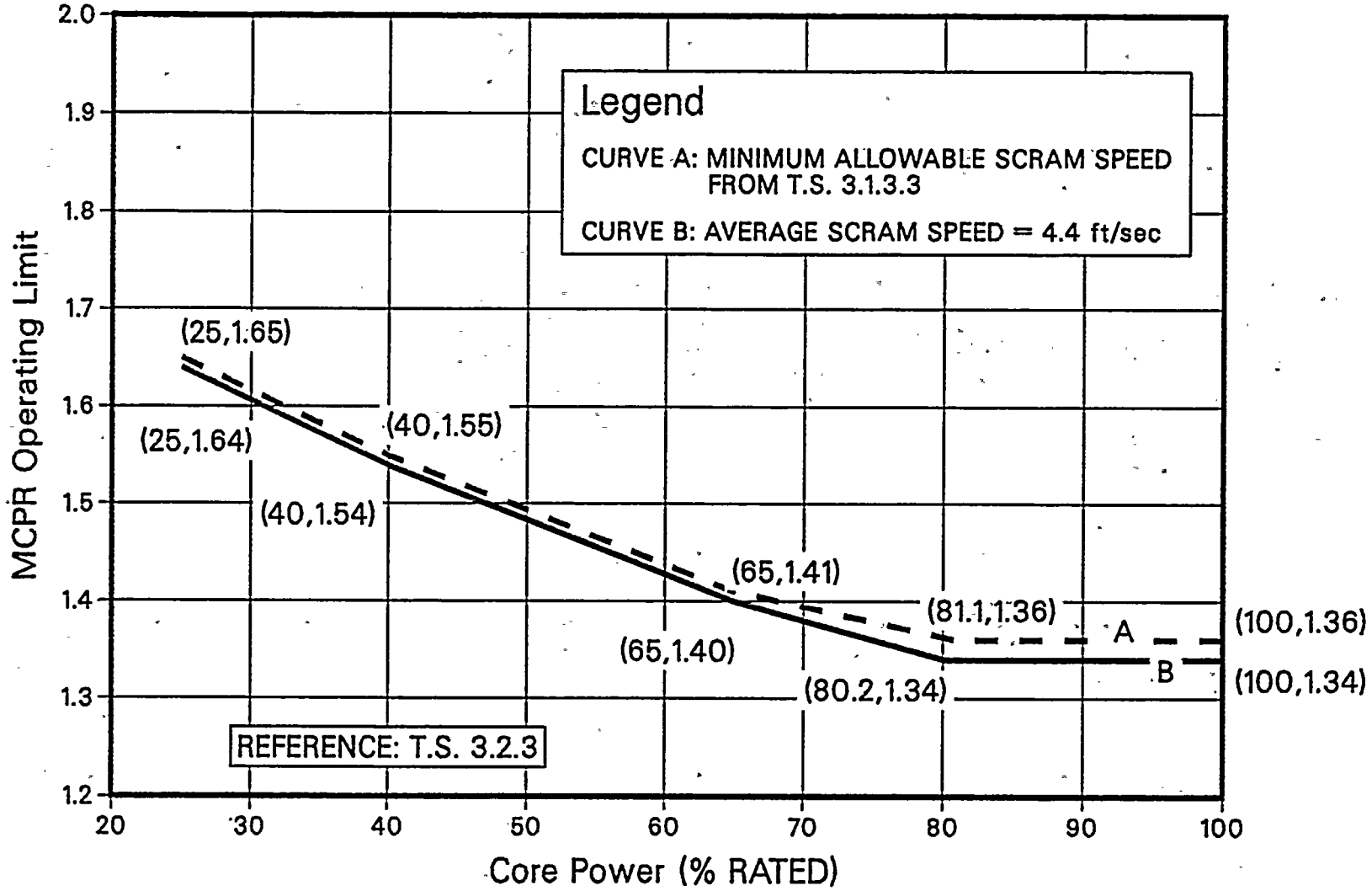
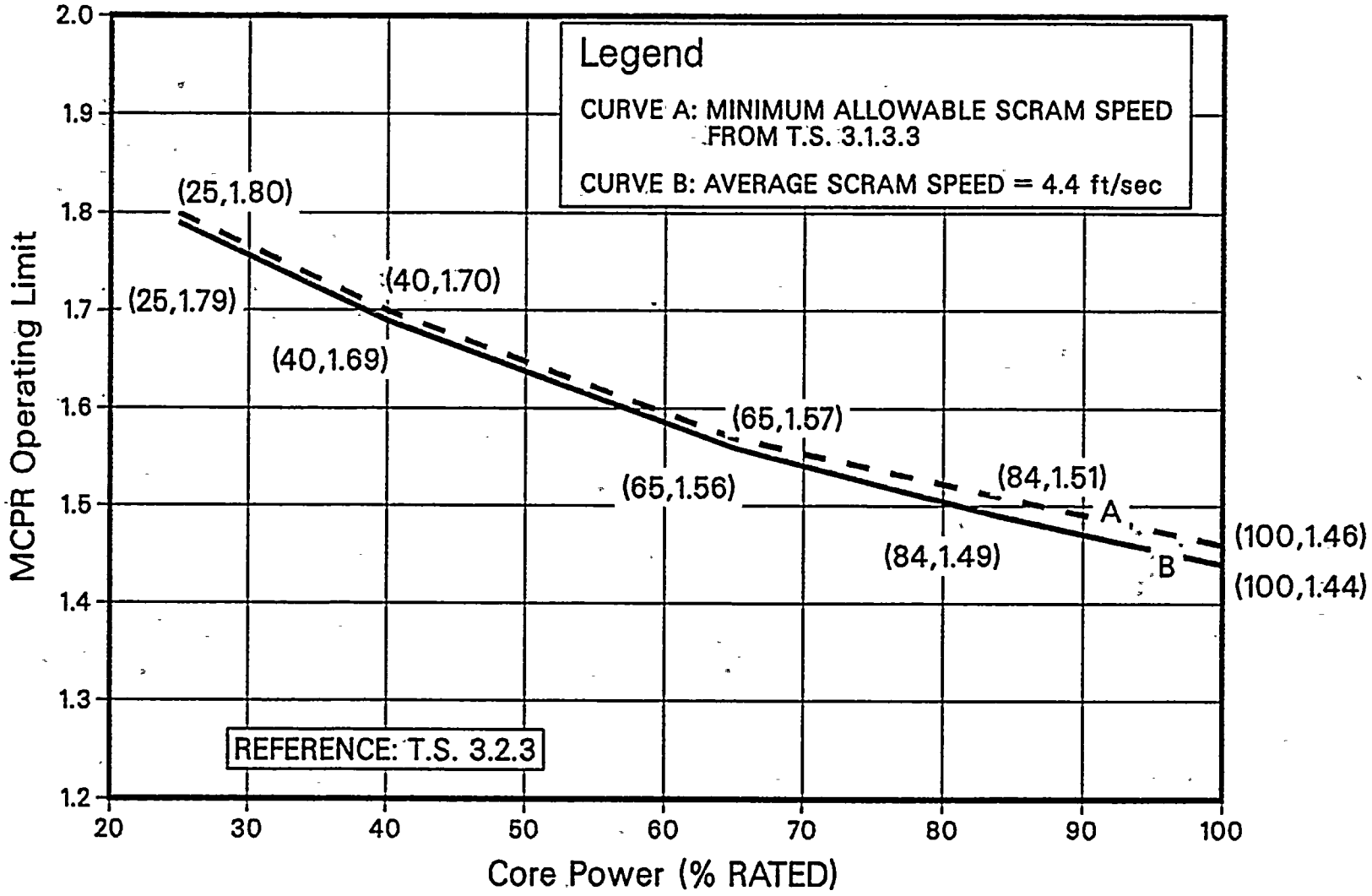


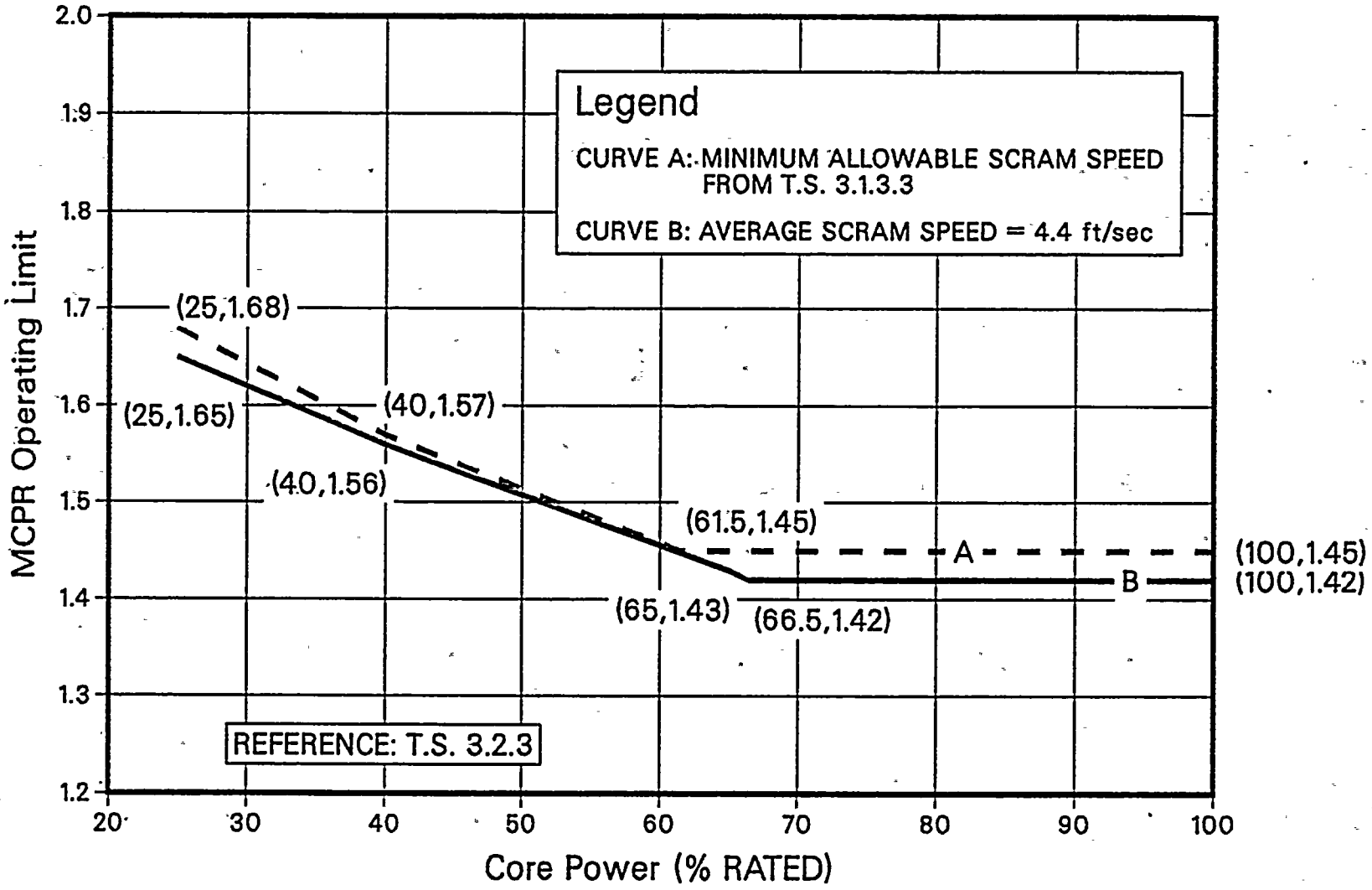
POWER DEPENDENT MCPR OPERATING LIMIT
EOC-RPT AND MAIN TURBINE BYPASS OPERABLE
FIGURE 4.2-2

SSES UNIT 2 CYCLE 6



POWER DEPENDENT MCPR OPERATING LIMIT
EOC-RPT OPERABLE AND MAIN TURBINE BYPASS INOPERABLE
FIGURE 4.2-3

SSES UNIT 2 CYCLE 6



POWER DEPENDENT MCPR OPERATING LIMIT
EOC-RPT INOPERABLE AND MAIN TURBINE BYPASS OPERABLE
FIGURE 4.2-4

5.0 LINEAR HEAT GENERATION RATE (LHGR)

5.1 Technical Specification Reference

Technical Specification 3.2.4

5.2 Description

The LHGR for all fuel shall not exceed the applicable LHGR limit determined from Figure 5.2-1 or Figure 5.2-2.

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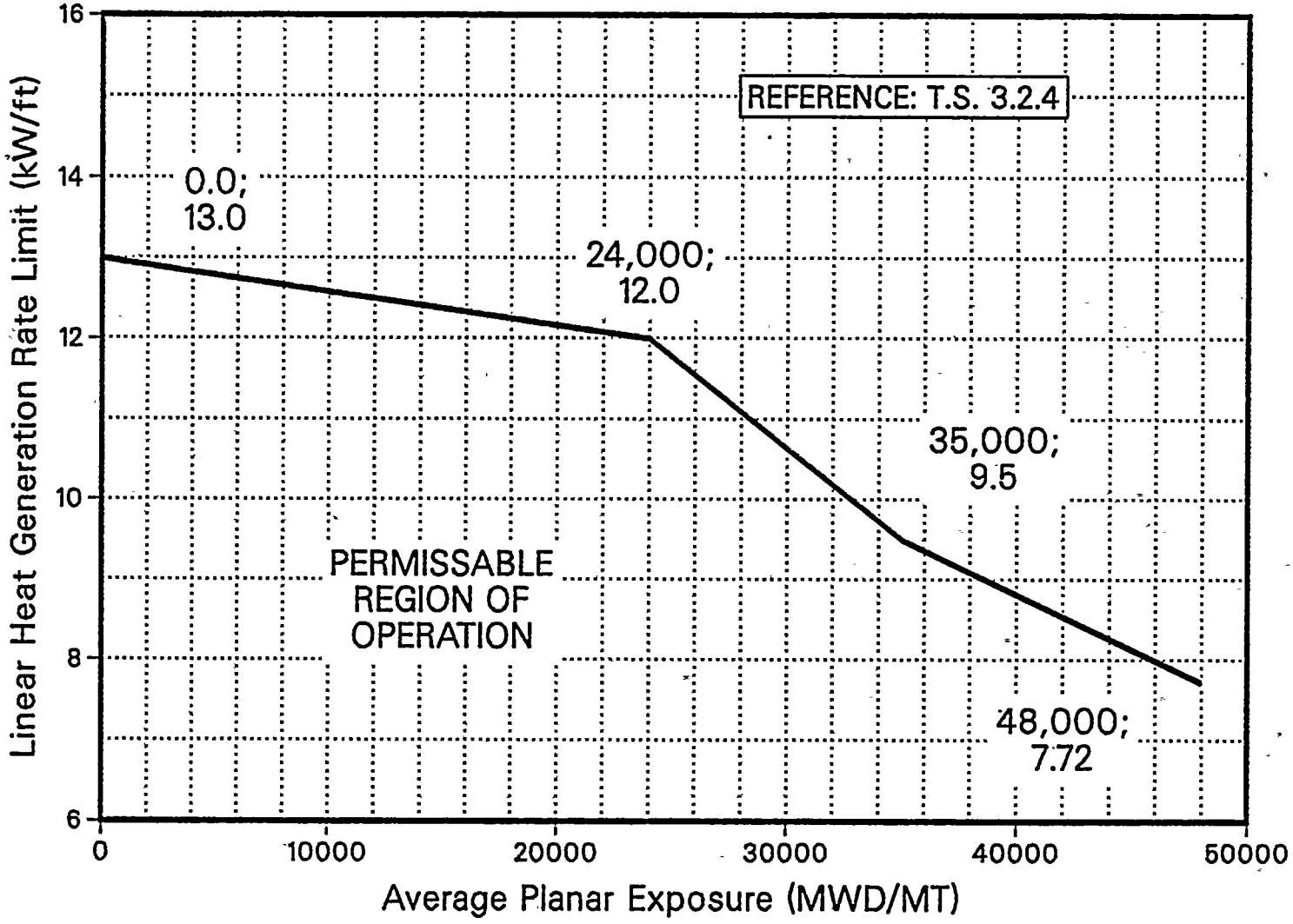
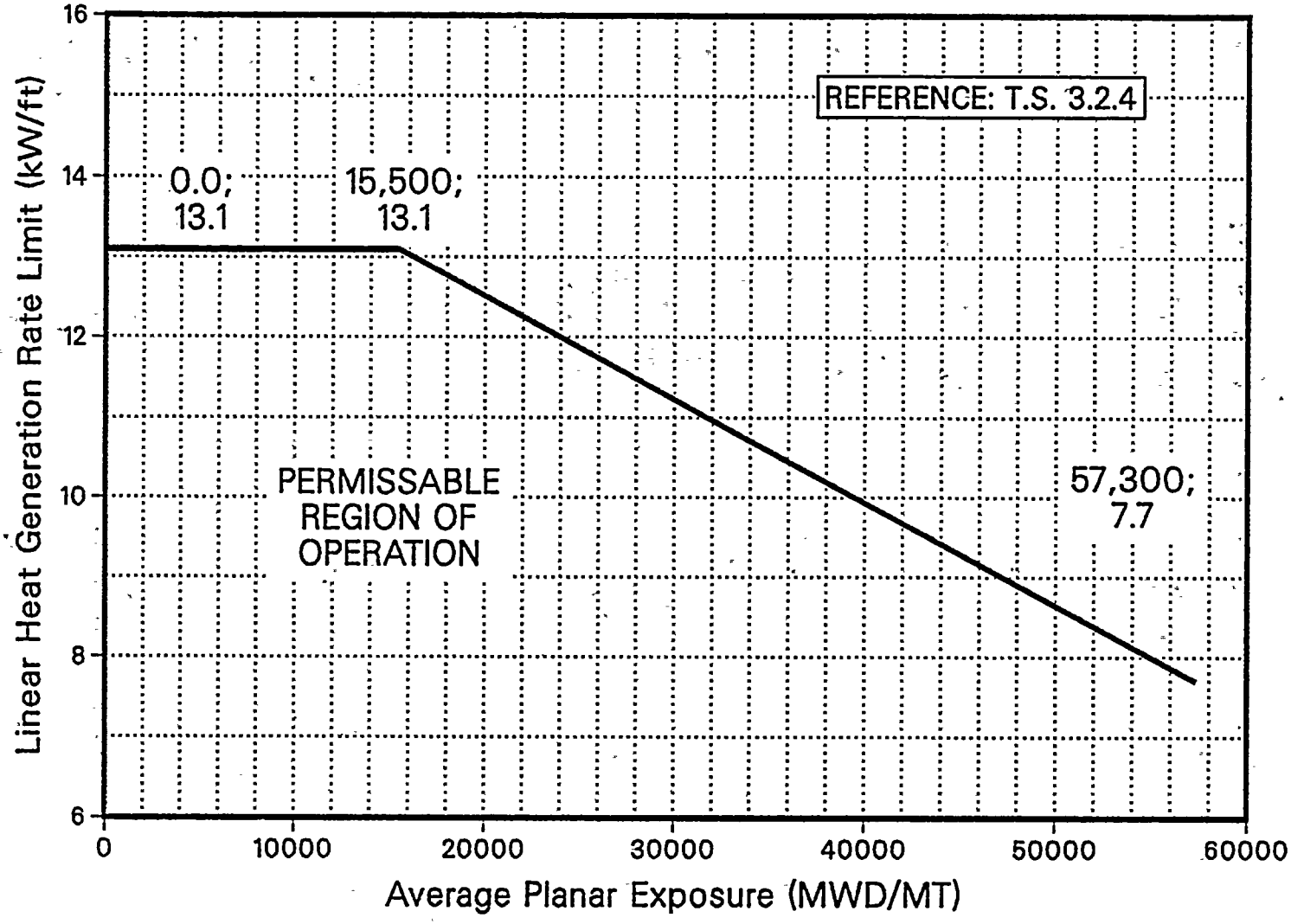


LINEAR HEAT GENERATION RATE (LHGR) LIMIT
VERSUS AVERAGE PLANAR EXPOSURE
SPC 9X9 (EXCLUDING XN-1) FUEL
FIGURE 5.2-1

SSES UNIT 2 CYCLE 6



LINEAR HEAT GENERATION RATE (LHGR) LIMIT
VERSUS AVERAGE PLANAR EXPOSURE
SPC 9X9 XN-1 FUEL
FIGURE 5.2-2

6.0 RECIRCULATION LOOPS - TWO LOOP OPERATION

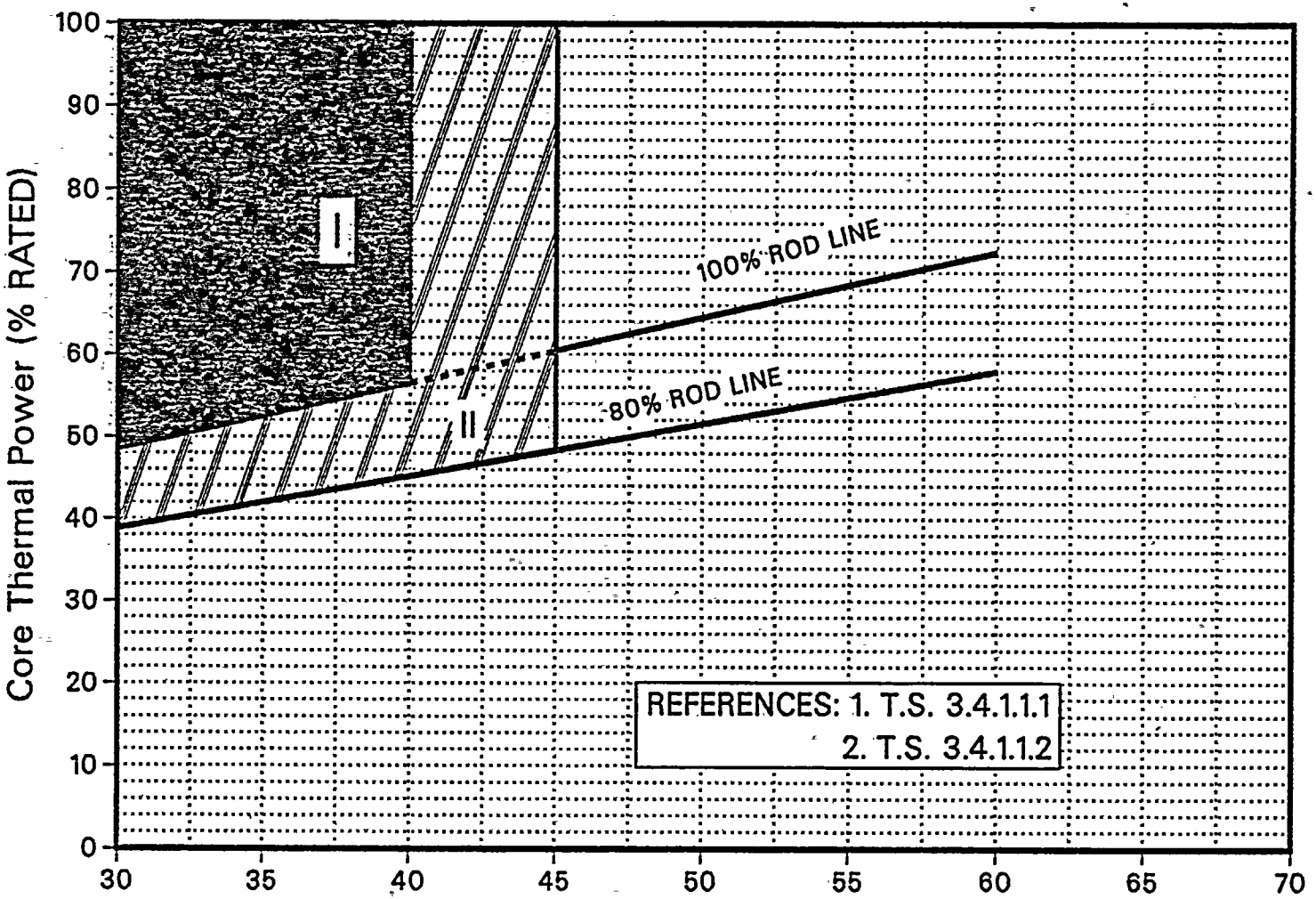
6.1 Technical Specification Reference

Technical Specification 3.4.1.1.1

6.2 Description

Two reactor coolant system recirculation loops shall be in operation with the reactor at a thermal power/core flow condition outside of Regions I and II as specified in Figure 6.2-1.

SSES UNIT 2 CYCLE 6



THERMAL POWER RESTRICTIONS
FIGURE 6.2-1

7.0 RECIRCULATION LOOPS - SINGLE LOOP OPERATION

7.1 Technical Specification Reference

Technical Specification 3.4.1.1.2

7.2 Description

7.2.1 Thermal Power Restrictions

One reactor coolant recirculation loop shall be in operation with the reactor at a thermal power/core flow condition outside of Regions I and II as specified in Figure 6.2-1.

7.2.2 Minimum Critical Power Ratio Limit

The MCPR limit shall be equal to the MCPR limit determined per Section 4.0 of this report, plus 0.01.

8.0 REFERENCE

1. PL-NF-92-001, "Susquehanna SES Unit 2 Cycle 6 Reload Summary Report," June 1992.

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