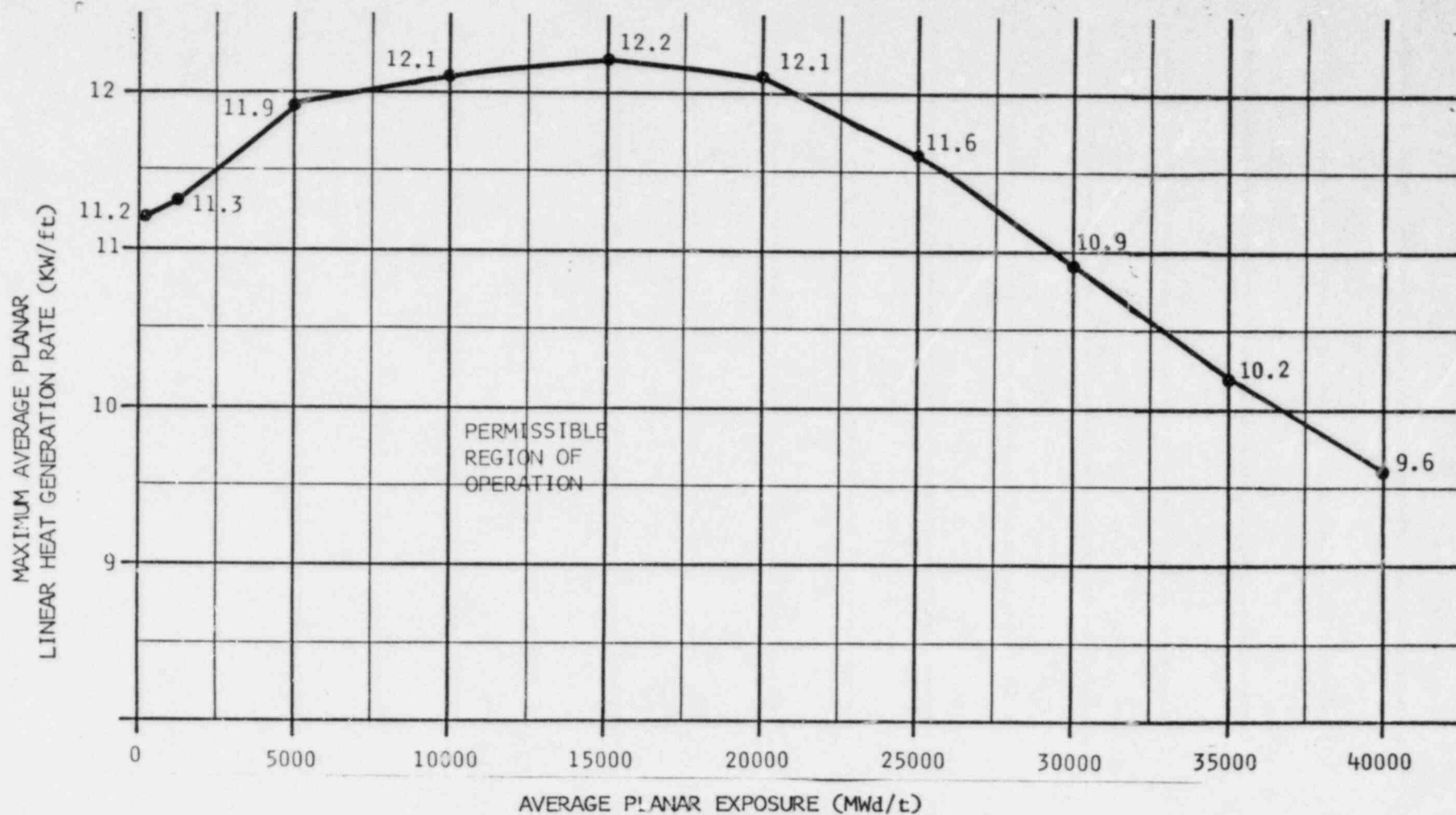


ENCLOSURE 1

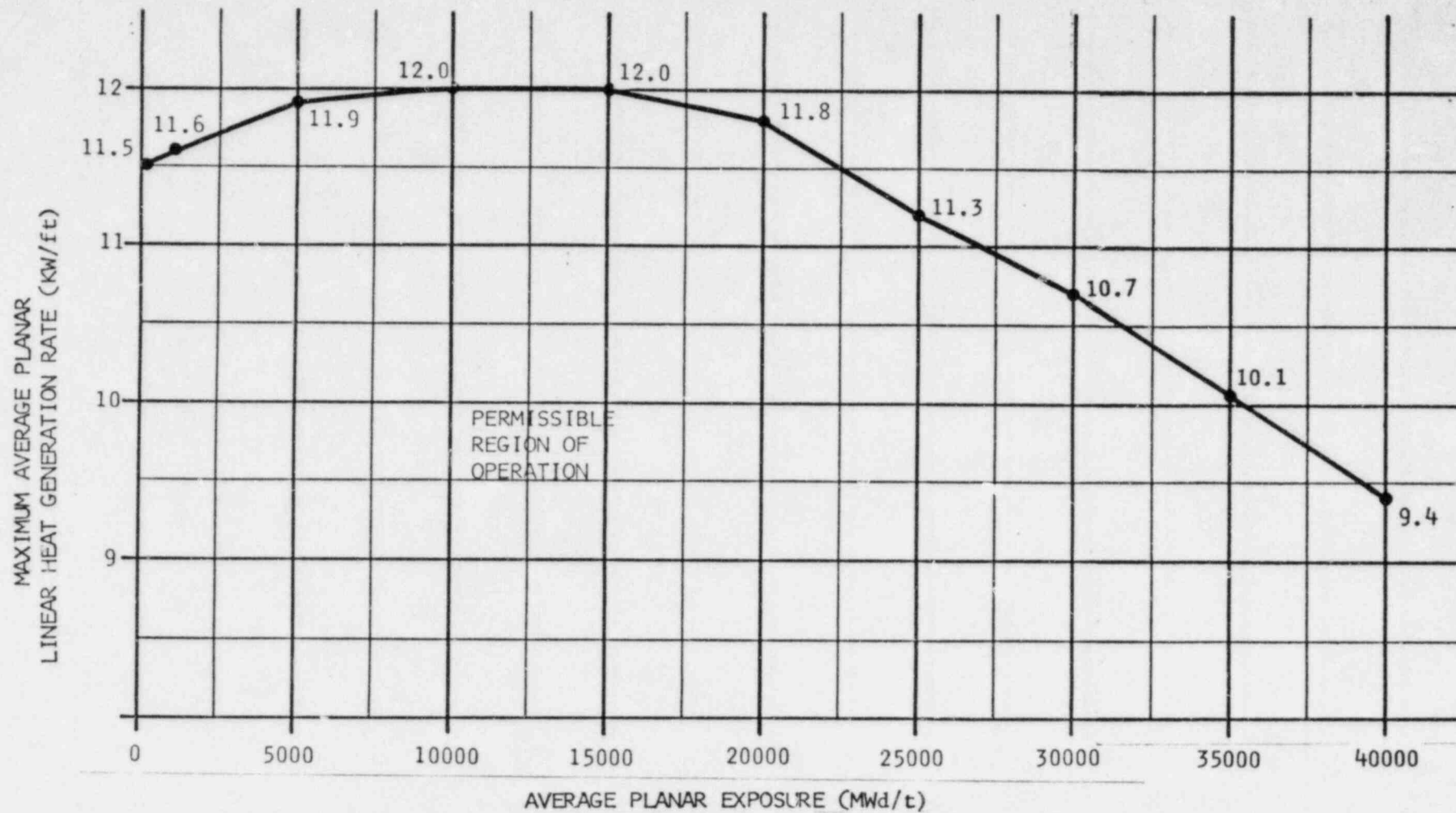
SERIAL NO.: NLS-84-274

BRUNSWICK STEAM ELECTRIC PLANT  
PROPOSED TECHNICAL SPECIFICATION PAGES - UNIT 2  
REFERENCE NUMBER 84TSB15



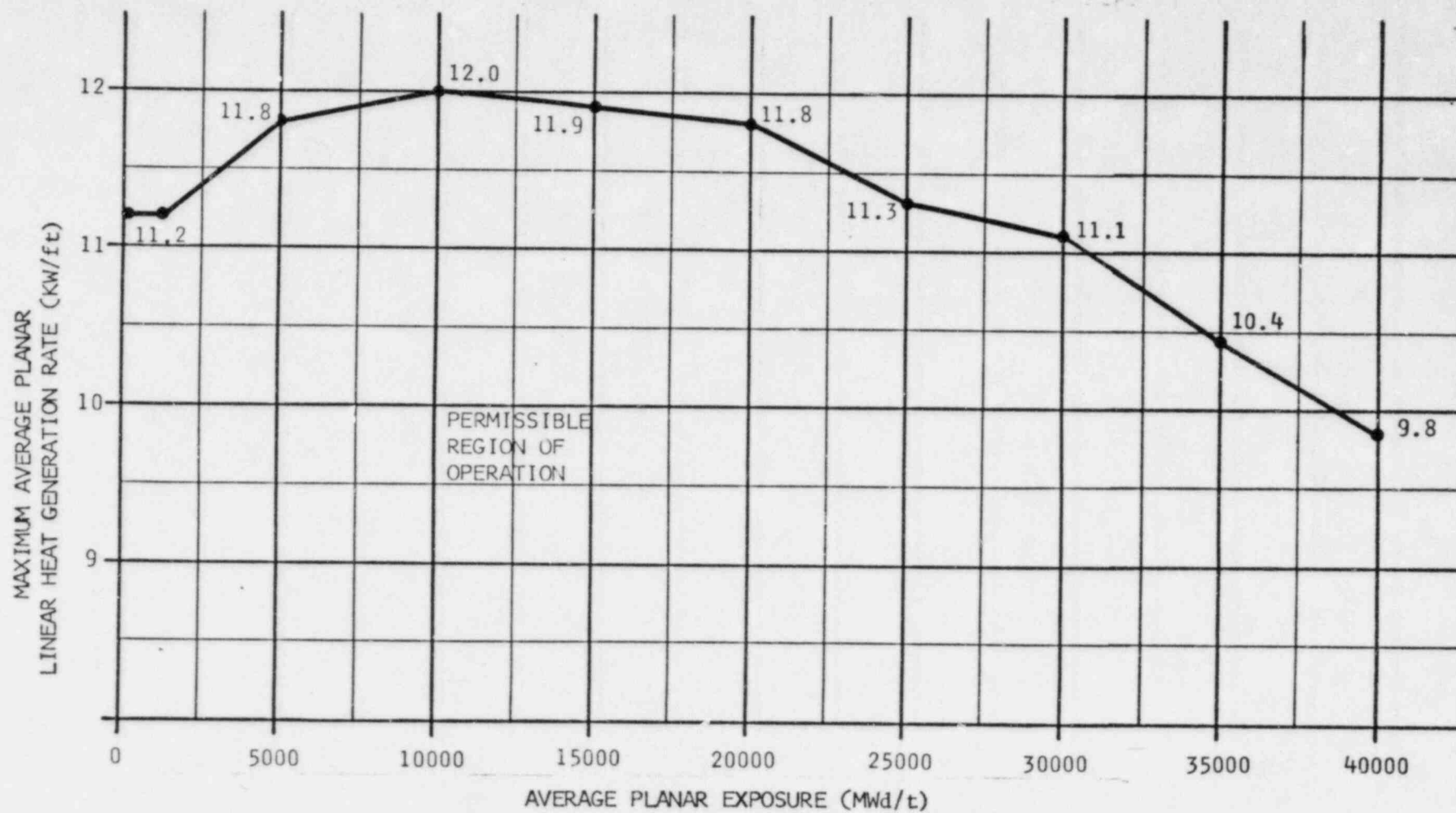
FUEL TYPE 8DB274L (8X8)  
MAXIMUM AVERAGE PLANAR LINEAR HEAT  
GENERATION RATE (MAPLHGR)  
VERSUS AVERAGE PLANAR EXPOSURE

FIGURE 3.2.1-1



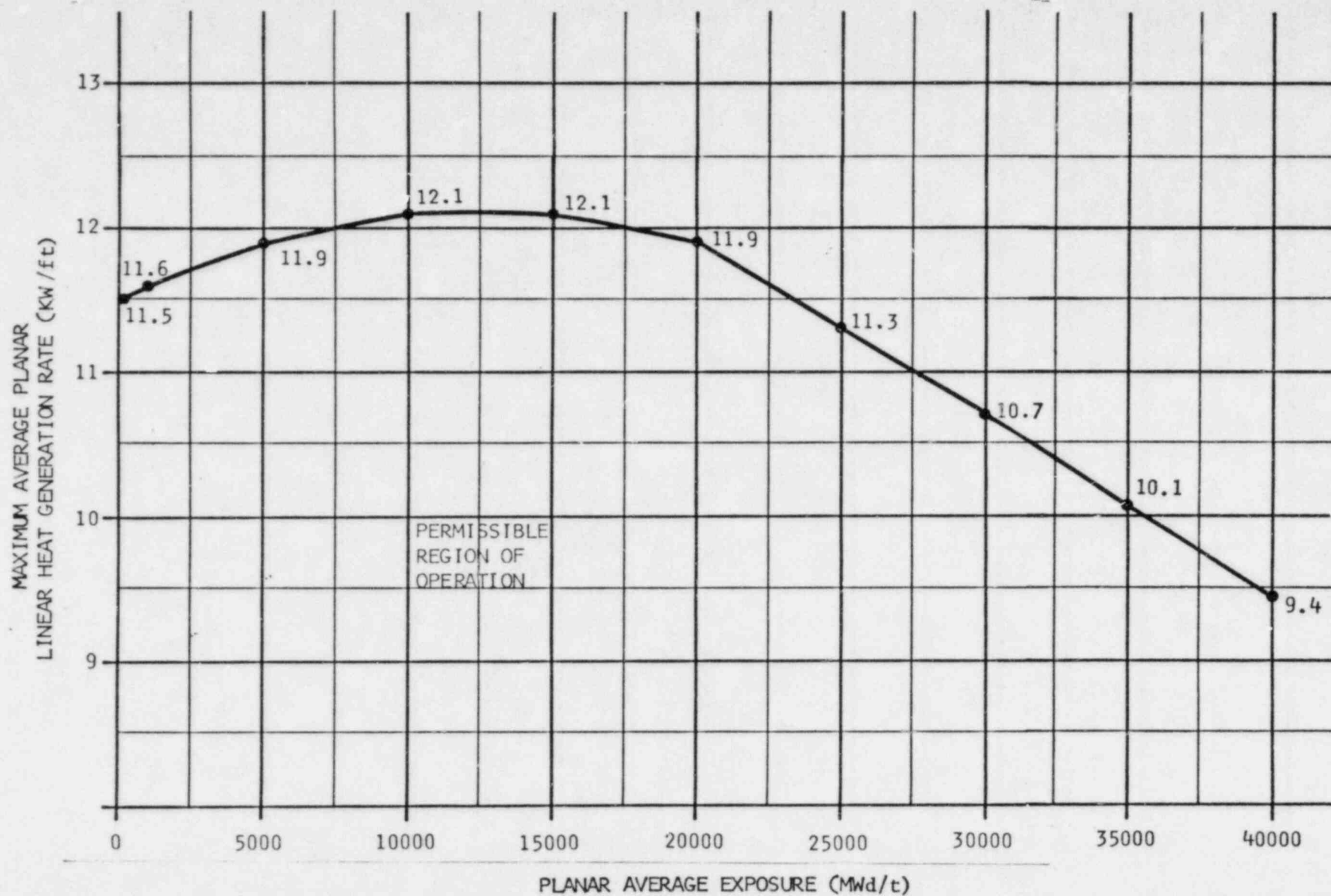
FUEL TYPE 8DRB265H (8X8R)  
MAXIMUM AVERAGE PLANAR LINEAR HEAT  
GENERATION RATE (MAPLHGR)  
VERSUS AVERAGE PLANAR EXPOSURE

FIGURE 3.2.1-2



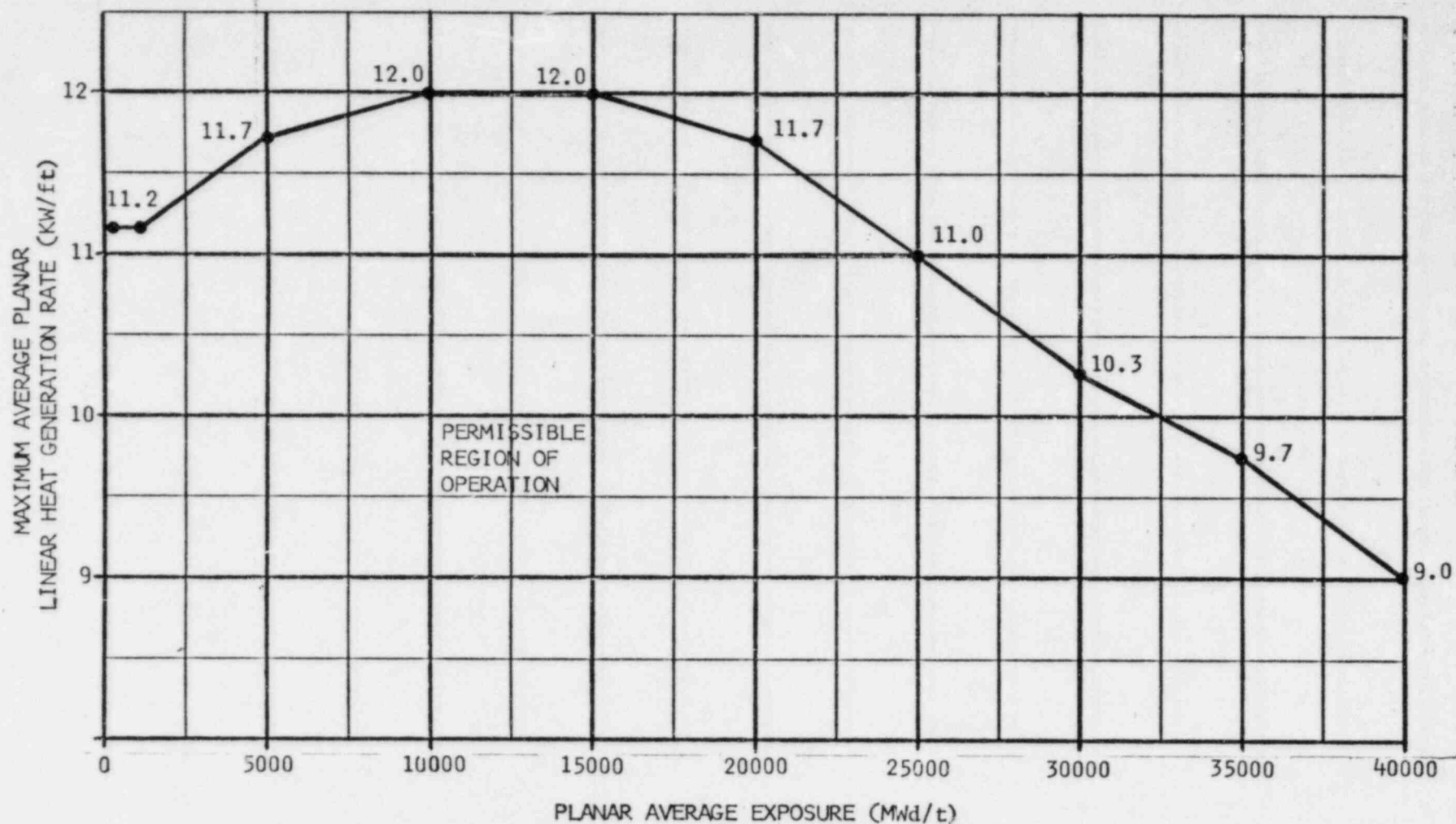
FUEL TYPE 8DRB283 (8X8R)  
MAXIMUM AVERAGE PLANAR LINEAR HEAT  
GENERATION RATE (MAPLHGR)  
VERSUS AVERAGE PLANAR EXPOSURE

FIGURE 3.2.1-3



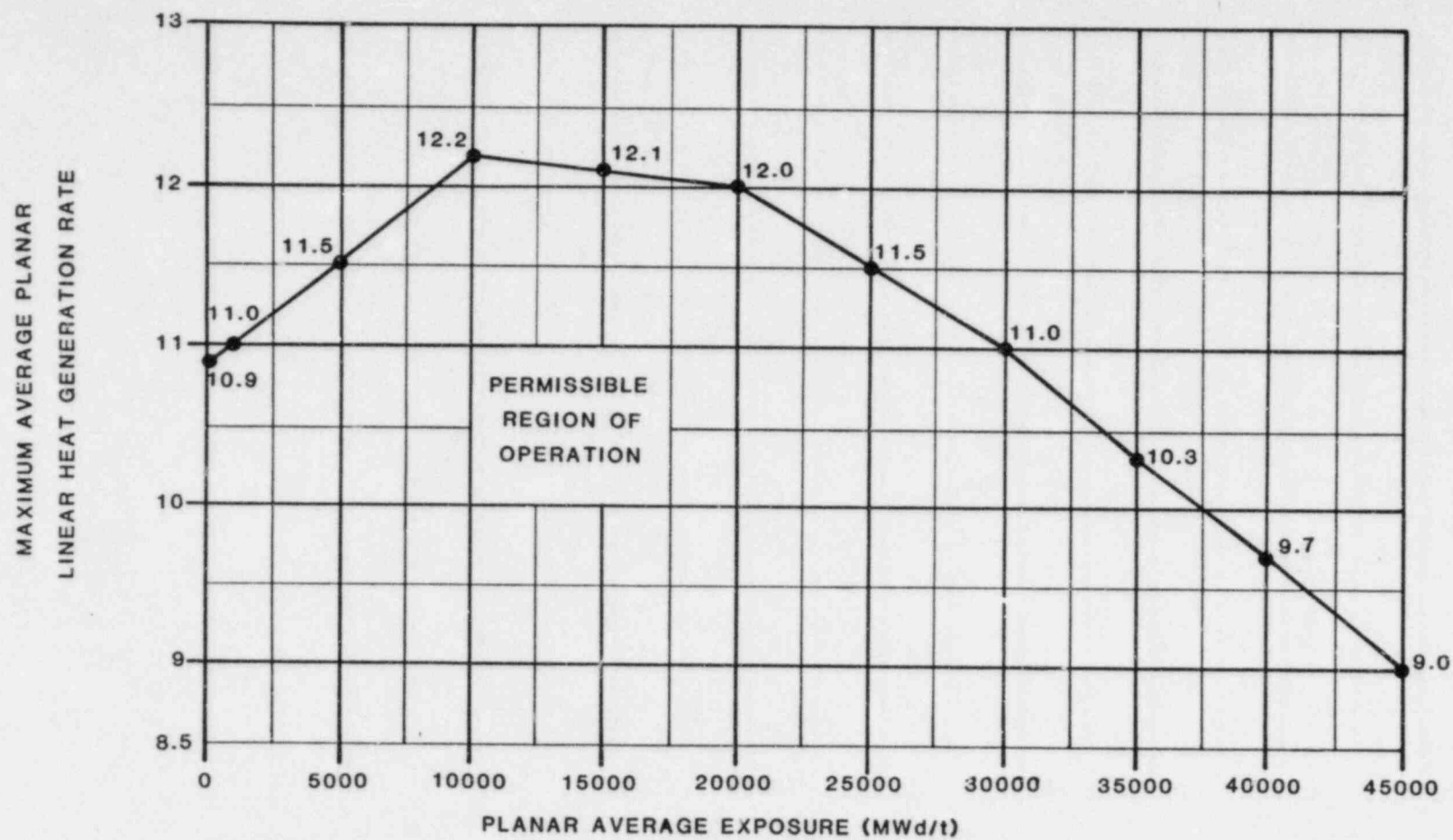
FUEL TYPE P8DRB265H (P8X8R)  
MAXIMUM AVERAGE PLANAR LINEAR HEAT  
GENERATION RATE (MAPLHGR)  
VERSUS PLANAR AVERAGE EXPOSURE

FIGURE 3.2.1-4



FUEL TYPE P8DRB284H (P8X8R)  
MAXIMUM AVERAGE PLANAR LINEAR HEAT  
GENERATION RATE (MAPLHGR)  
VERSUS AVERAGE PLANAR EXPOSURE

FIGURE 3.2.1-5



FUEL TYPE BP8DRB299 (BP8x8R)  
MAXIMUM AVERAGE PLANAR LINEAR HEAT  
GENERATION RATE (MAPLHGR)  
VERSUS AVERAGE PLANAR EXPOSURE

FIGURE 3.2.1-6

POWER DISTRIBUTION LIMITS3/4.2.2 APRM SETPOINTSLIMITING CONDITION FOR OPERATION

3.2.2 The flow-biased APRM scram trip setpoint (S) and rod block trip set point ( $S_{RB}$ ) shall be established according to the following relationship:

$$S \leq (0.66W + 54\%) T$$

$$S_{RB} \leq (0.66W + 42\%) T$$

where: S and  $S_{RB}$  are in percent of RATED THERMAL POWER.  
 W = Loop recirculation flow in percent of rated flow,  
 T = Lowest value of the ratio of design TPF divided by the MTPF obtained for any class of fuel in the core ( $T \leq 1.0$ ) and

Design TPF for: 8 x 8 fuel = 2.43  
 8 x 8R fuel = 2.39  
 P8 x 8R fuel = 2.39  
 BP8 x 8R fuel = 2.39

APPLICABILITY: OPERATIONAL CONDITION 1, when THERMAL POWER is greater than or equal to 25% of RATED THERMAL POWER.

ACTION:

With S or  $S_{RB}$  exceeding the allowable value, initiate corrective action within 15 minutes and continue corrective action so that S and  $S_{RB}$  are within the required limits within 4 hours or reduce THERMAL POWER to less than 25% of RATED THERMAL POWER within the next 4 hours.

SURVEILLANCE REQUIREMENTS

4.2.2 The MTPF for each class of fuel shall be determined, the value of T calculated, and the flow biased APRM trip setpoint adjusted, as required:

- a. At least once per 24 hours,
- b. Within 12 hours after completion of a THERMAL POWER increase of at least 15% of RATED THERMAL POWER, and
- c. Initially and at least once per 12 hours when the reactor is operating with a LIMITING CONTROL ROD PATTERN for MTPF.

POWER DISTRIBUTION LIMITS3/4.2.3 MINIMUM CRITICAL POWER RATIOLIMITING CONDITION FOR OPERATION

3.2.3.1 The MINIMUM CRITICAL POWER RATIO (MCPR), as a function of core flow, shall be equal to or greater than the MCPR limit times the  $K_f$  shown in Figure 3.2.3-1 with the following MCPR limit adjustments:

- a. Beginning-of-cycle (BOC) to end-of-cycle (EOC) minus 2000 MWD/t with ODYN OPTION A analyses in effect and the end-of-cycle recirculation pump trip system inoperable, the MCPR limits are listed below:
  1. MCPR for 8 x 8 fuel = 1.25
  2. MCPR for 8 x 8R fuel = 1.26
  3. MCPR for P8 x 8R fuel = 1.28
  4. MCPR for BP8 x 8R fuel = 1.28
- b. EOC minus 2000 MWD/t to EOC with ODYN OPTION A analyses in effect and the end-of-cycle recirculation pump trip system inoperable, the MCPR limits are listed below:
  1. MCPR for 8 x 8 fuel = 1.36
  2. MCPR for 8 x 8R fuel = 1.37
  3. MCPR for P8 x 8R fuel = 1.40
  4. MCPR for BP8 x 8R fuel = 1.40
- c. BOC to EOC minus 2000 MWD/t with ODYN OPTION B analyses in effect and the end-of-cycle recirculation pump trip system inoperable, the MCPR limits are listed below:
  1. MCPR for 8 x 8 fuel = 1.23
  2. MCPR for 8 x 8R fuel = 1.24
  3. MCPR for P8 x 8R fuel = 1.24
  4. MCPR for BP8 x 8R fuel = 1.24
- d. EOC minus 2000 MWD/t to EOC with ODYN OPTION B analyses in effect and the end-of-cycle recirculation pump trip system inoperable, the MCPR limits are listed below:
  1. MCPR for 8 x 8 fuel = 1.24
  2. MCPR for 8 x 8R fuel = 1.25
  3. MCPR for P8 x 8R fuel = 1.28
  4. MCPR for BP8 x 8R fuel = 1.28

APPLICABILITY: OPERATIONAL CONDITION 1 when THERMAL POWER is greater than or equal to 25% RATED THERMAL POWER

POWER DISTRIBUTION LIMITSLIMITING CONDITION FOR OPERATION (Continued)

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ACTION:

With MCPR, as a function of core flow, less than the applicable limit determined from Figure 3.2.3-1 initiate corrective action within 15 minutes and restore MCPR to within the applicable limit within 4 hours or reduce THERMAL POWER to less than 25% of RATED THERMAL POWER within the next 4 hours.

SURVEILLANCE REQUIREMENTS

---

4.2.3.1 MCPR, as a function of core flow, shall be determined to be equal to or greater than the applicable limit determined from Figure 3.2.3-1:

- a. At least once per 24 hours,
- b. Within 12 hours after completion of a THERMAL POWER increase of at least 15% of RATED THERMAL POWER, and
- c. Initially and at least once per 12 hours when the reactor is operating in a LIMITING CONTROL ROD PATTERN for MCPR.

TABLE 3.2.3.2-1

## TRANSIENT OPERATING LIMIT MCPR VALUES

TRANSIENT	FUEL TYPE							
	8x8		8x8R		P9x8R		BP8 x 8R	
NONPRESSURIZATION TRANSIENTS								
POC → EOC	1.23		1.24		1.24		1.24	
TUBINE TRIP/LOAD REJECT WITHOUT BYPASS								
	MCPR <sub>A</sub>	MCPR <sub>B</sub>	MCPR <sub>A</sub>	MCPR <sub>B</sub>	MCPR <sub>A</sub>	MCPR <sub>B</sub>	MCPR <sub>A</sub>	MCPR <sub>B</sub>
BOC → EOC - 2000	1.25	1.08	1.26	1.08	1.28	1.09	1.28	1.09
EOC - 2000 → EOC	1.36	1.24	1.37	1.25	1.40	1.28	1.40	1.28
FEEDWATER CONTROL FAILURE								
	MCPR <sub>A</sub>	MCPR <sub>B</sub>	MCPR <sub>A</sub>	MCPR <sub>B</sub>	MCPR <sub>A</sub>	MCPR <sub>B</sub>	MCPR <sub>A</sub>	MCPR <sub>B</sub>
BOC → EOC - 2000	1.17	1.11	1.17	1.11	1.17	1.11	1.17	1.11
EOC - 2000 → EOC	1.17	1.11	1.17	1.11	1.17	1.11	1.17	1.11

POWER DISTRIBUTION LIMITS3/4.2.4 LINEAR HEAT GENERATION RATELIMITING CONDITION FOR OPERATION

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3.2.4 The LINEAR HEAT GENERATION RATE (LHGR) shall not exceed 13.4 kw/ft for 8 X 8, 8 X 8R, P8 X 8R, and BP8 x 8R fuel assemblies.

APPLICABILITY: OPERATIONAL CONDITION 1, when THERMAL POWER is greater than or equal to 25% of RATED THERMAL POWER.

ACTION:

With the LHGR of any fuel rod exceeding the above limit, initiate corrective action within 15 minutes and continue corrective action so that the LHGR is within the limit within 4 hours, or reduce THERMAL POWER to less than 25% of RATED THERMAL POWER within the next 4 hours.

SURVEILLANCE REQUIREMENTS

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4.2.4 LHGRs shall be determined to be equal to or less than the limit:

- a. At least once per 24 hours,
- b. Within 12 hours after completion of a THERMAL POWER increase of at least 15% of RATED THERMAL POWER, and
- c. Initially and at least once per 12 hours when the reactor is operating on a LIMITING CONTROL ROD PATTERN for LHGR.

TABLE 3.3.4-2

CONTROL ROD WITHDRAWAL BLOCK INSTRUMENTATION SETPOINTS

<u>TRIP FUNCTION AND INSTRUMENT NUMBER</u>	<u>TRIP SETPOINT</u>	<u>ALLOWABLE VALUE</u>
1. <u>APRM</u> (C51-APRM-CH. A,B,C,D,E,F)		
a. Upscale (Flow Biased)	$\leq (0.66W + 42\%) \frac{T^*}{MTPF}$	$\leq (0.66W + 42\%) \frac{T^*}{MTPF}$
b. Inoperative	NA	NA
c. Downscale	$> 3/125$ of full scale	$> 3/125$ of full scale
d. Upscale (Fixed)	$\leq 12\%$ of RATED THERMAL POWER	$\leq 12\%$ of RATED THERMAL POWER
2. <u>ROD BLOCK MONITOR</u> (C51-RBM-CH.A,B)		
a. Upscale	$\leq (0.66W + 39\%) \frac{T^*}{MTPF}$	$\leq (0.66W + 39\%) \frac{T^*}{MTPF}$
b. Inoperative	NA	NA
c. Downscale	$> 3/125$ of full scale	$> 3/125$ of full scale
3. <u>SOURCE RANGE MONITORS</u> (C51-SRM-K600A,B,C,D)		
a. Detector not full in	NA	NA
b. Upscale	$\leq 1 \times 10^5$ cps	$\leq 1 \times 10^5$ cps
c. Inoperative	NA	NA
d. Downscale	$\geq 3$ cps	$\geq 3$ cps
4. <u>INTERMEDIATE RANGE MONITORS</u> (C51-IRM-K601A,B,C,D,E,F,G,H)		
a. Detector not full in	NA	NA
b. Upscale	$\leq 108/125$ of full scale	$\leq 108/125$ of full scale
c. Inoperative	NA	NA
d. Downscale	$\geq 3/125$ of full scale	$\geq 3/125$ of full scale
5. <u>SCRAM DISCHARGE VOLUME</u> (C12-LSH-N013E)		
a. Water Level High	$\leq 73$ gallons	$\leq 73$ gallons

T=2.43 for 8 x 8 fuel.

T=2.39 for 8 x 8R fuel.

T=2.39 for P8 x 8R fuel.

T=2.39 for BP8 x 8R fuel.

INSTRUMENTATIONEND-OF-CYCLE RECIRCULATION PUMP TRIP SYSTEM INSTRUMENTATIONLIMITING CONDITION FOR OPERATION

3.3.6.2 The end-of-cycle recirculation pump trip (EOC-RPT) system instrumentation channels shown in Table 3.3.6.2-1 shall be OPERABLE with their trip setpoints set consistent with the values shown in the Trip Setpoint column of Table 3.3.6.2-2 and with the END-OF-CYCLE RECIRCULATION PUMP TRIP SYSTEM RESPONSE TIME as shown in Table 3.3.6.2-3.

APPLICABILITY: OPERATIONAL CONDITION 1, when THERMAL POWER is greater than or equal to 30% of RATED THERMAL POWER.\*

ACTION:

- a. With an end-of-cycle recirculation pump trip system instrumentation channel trip setpoint less conservative than the value shown in the Allowable Values Column of Table 3.3.6.2-2, declare the channel inoperable until the channel is restored to OPERABLE status with the channel setpoint adjusted consistent with the Trip Setpoint value.
- b. With the number of OPERABLE channels one less than required by the Minimum OPERABLE Channels per Trip System requirement for one or both trip systems, place the inoperable channel(s) in the tripped condition within one hour.
- c. With the number of OPERABLE channels two or more less than required by the Minimum OPERABLE Channels per Trip System requirement for one trip system and:
  1. If the inoperable channels consist of one turbine control valve channel and one turbine stop valve channel, place both inoperable channels in the tripped condition within one hour.
  2. If the inoperable channels include two turbine control valve channels or two turbine stop valve channels, declare the trip system inoperable.
- d. With one trip system inoperable, restore the inoperable trip system to OPERABLE status within 72 hours or take the ACTION required by Specification 3.2.3.
- e. With both trip systems inoperable, restore at least one trip system to OPERABLE status within one hour or take the ACTION required by Specification 3.2.3.

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\* During Cycle 6 operation, the end-of-cycle recirculation pump trip (EOC-RPT) system will be inoperable (manually bypassed); therefore, Specification 3.3.6.2 above does not apply. The provisions of Specification 3.0.4 are not applicable.

POWER DISTRIBUTION LIMITSBASES3/4.2.2 APRM SETPOINTS

The fuel cladding integrity Safety Limits of Specification 2.1 were based on a TOTAL PEAKING FACTOR of 2.43 for 8 x 8 fuel and 2.39 for 8 x 8R, P8 x 8R, and BP8 x 8R fuel. The scram setting and rod block functions of the APRM instruments must be adjusted to ensure that the MCPR does not become less than 1.0 in the degraded situation. The scram settings and rod block settings are adjusted in accordance with the formula in this specification when the combination of THERMAL POWER and peak flux indicates a TOTAL PEAKING FACTOR greater than 2.43 for 8 x 8 fuel and 2.39 for 8 x 8R, P8 x 8R, and BP8 x 8R fuel. This adjustment may be accomplished by increasing the APRM gain and thus reducing the slope and intercept point of the flow referenced APRM high flux scram curve by the reciprocal of the APRM gain change. The method used to determine the design TPF shall be consistent with the method used to determine the MTPF.

3/4.2.3 MINIMUM CRITICAL POWER RATIO

The required operating limit MCPRs at steady state operating conditions as specified in Specification 3.2.3 are derived from the established fuel cladding integrity Safety Limit MCPR of 1.07, and an analysis of abnormal operational transients.<sup>(1)</sup> For any abnormal operating transient analysis evaluation with the initial condition of the reactor being at the steady state operating limit, it is required that the resulting MCPR does not decrease below the Safety Limit MCPR at any time during the transient, assuming an instrument trip setting as given in Specification 2.2.1.

To assure that the fuel cladding integrity Safety Limit is not exceeded during any anticipated abnormal operational transient, the most limiting transients have been analyzed to determine which result in the largest reduction in CRITICAL POWER RATIO (CPR). The type of transients evaluated were loss of flow, increase in pressure and power, positive reactivity insertion, and coolant temperature decrease.

Unless otherwise stated in cycle specific reload analyses, the limiting transient which determines the required steady state MCPR limit is the turbine trip with failure of the turbine bypass. This transient yields the largest  $\Delta$  MCPR. When added to the Safety Limit MCPR of 1.07 the required minimum operating limit MCPR of Specification 3.2.3 is obtained. Prior to the analysis of abnormal operational transients an initial fuel bundle MCPR was determined. This parameter is based on the bundle flow calculated by a GE multichannel steady state flow distribution model as described in Section 4.4 of NEDO-20360<sup>(4)</sup> and on core parameters shown in Reference 3, response to Items 2 and 9.

## 5.0 DESIGN FEATURES

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### 5.1 SITE

#### EXCLUSION AREA

5.1.1 The exclusion area shall be as shown in Figure 5.1.1-1.

#### LOW POPULATION ZONE

5.1.2 The low population zone shall be as shown in Figure 5.1.2-1.

#### SITE BOUNDARY

5.1.3 The SITE BOUNDARY shall be as shown in Figure 5.1.3-1. For the purpose of effluent release calculations, the boundary for atmospheric releases is the SITE BOUNDARY and the boundary for liquid releases is the SITE BOUNDARY prior to dilution in the Atlantic Ocean.

### 5.2 CONTAINMENT

#### CONFIGURATION

5.2.1 The PRIMARY CONTAINMENT is a steel-lined, reinforced concrete structure composed of a series of vertical right cylinders and truncated cones which form a drywell. This drywell is attached to a suppression chamber through a series of vents. The suppression chamber is a concrete, steel-lined pressure vessel in the shape of a torus. The primary containment has a minimum free air volume of 288,000 cubic feet.

#### DESIGN TEMPERATURE AND PRESSURE

5.2.2 The primary containment is designed and shall be maintained for:

- a. Maximum internal pressure 62 psig.
- b. Maximum internal temperature: drywell 300°F  
Suppression chamber 200°F
- c. Maximum external pressure 2 psig.

### 5.3 REACTOR CORE

#### FUEL ASSEMBLIES

5.3.1 The reactor core shall contain 560 fuel assemblies. The 8 x 8 fuel assemblies contain 63 fuel rods and the 8 x 8R, P8 x 8R, EP8 x 8R fuel assemblies contain 62 fuel rods. All fuel rods shall be clad with Zircaloy 2. The nominal active fuel length of each fuel rod shall be 146 inches for 8 x 8 fuel assemblies and 150 inches for 8 x 8R, P8 x 8R, and

DESIGN FEATURES

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5.3 REACTOR COREFUEL ASSEMBLIES (Continued)

BP8 x 8R fuel assemblies. The initial core loading shall have a maximum enrichment of 2.47 weight percent U-235. Reload fuel shall be similar in physical design to the initial core loading and shall have a maximum enrichment of 2.99 weight percent U-235.

CONTROL ROD ASSEMBLIES

5.3.2 The reactor core shall contain 137 control rod assemblies, each consisting of a cruciform array of stainless steel tubes containing 143 inches of boron carbide,  $B_4C$ , powder surrounded by a cruciform-shaped stainless steel sheath.

5.4 REACTOR COOLANT SYSTEMDESIGN PRESSURE AND TEMPERATURE

5.4.1 The nuclear boiler and reactor recirculation system is designed and shall be maintained:

- a. In accordance with the code requirements specified in Section 4.2 of the FSAR, with allowance for normal degradation pursuant to the applicable Surveillance Requirements,
- b. For a pressure of 1250 psig, and
- c. For a temperature of 575°F.

VOLUME

5.4.2 The total water and steam volume of the reactor vessel and recirculation system is approximately 18,670 cubic feet.

5.5 METEOROLOGICAL TOWER LOCATION

5.5.1 The meteorological tower shall be located as shown in Figure 5.1.1-1.