## Proposed Technical Specification Change

### Proposed Change

Reference is made to Pilgrim Station Operating License No. DPR-35, Sections 2.1.Al.a, 2.1.B, 2.1.1, Bases for 2.1.A, Figure 2.1.3, Table 3.2.C, and Figure 3.11-9. The following pages are affected: 6, 7, 8, 9, 15, 21, 54, and 205H.

Currently, Section 2.1.A.1.a contains the following:

$$S \leq .65W + 55\% \quad \underline{2\ \text{loop}}$$

and

$$S \leq (.65W + 55\%)\ \frac{FRP}{MFLPD} \quad \underline{2\ \text{loop}}$$

The desired revision shall state:

$$S \leq .58W + 62\% \quad \underline{2\ \text{loop}}$$

and

$$S \leq (.58W + 62\%)\ \frac{FRP}{MFLPD} \quad \underline{2\ \text{loop}}$$

Currently, Section 2.1.B contains the following:

$$S_{RB} \leq 0.65W + 42\% \quad 2\ \underline{\text{loop}}$$

and

$$S_{RB} \leq (0.65W + 42\%)\ \frac{FRP}{MFLPD} \quad \underline{2\ \text{loop}}$$

The desired revisions shall state:

$$S_{RB} \leq 0.58W + 50\% \quad \underline{2\ \text{loop}}$$

and

$$S_{RB} \leq (0.58W + 50\%)\ \frac{FRP}{MFLPD} \quad \underline{2\ \text{loop}}$$

Figure 2.1.1 is to be replaced with the revised 2.1.1 attached to this submittal.

The second sentence of paragraph 2 of the bases section contained on page 15 shall be deleted. The subject of that sentence, Figure 2.1.3 on page 21, is to be deleted because it duplicates Figure 3.11-9.

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Currently, Table 3.2.C states:

| INSTRUMENT | TRIP LEVEL SETTING | |
|---|---|---|
| APRM Upscale (Flow Biased) | $(0.65W + 42\%) \frac{FRP}{MFLPD}$ | (2) |

The revision shall state:

| INSTRUMENT | TRIP LEVEL SETTING | |
|---|---|---|
| APRM Upscale (Flow Biased) | $(0.58W + 50\%) \frac{FRP}{MFLPD}$ | (2) |

The Figure 3.11-9, which is on page 205H, shall be replaced with Figure 3.11-9 attached to this submittal.

## Reason for Change

This submittal expands the operating region of Pilgrim's power/flow map, and provides associated changes in the APRM flux scram and APRM rod block trip settings.

These proposed changes will have significant impact on the Pilgrim station operational flexibility, especially during high-power/high-flow operations. Specifically, these changes will permit a much speedier return to full power following a brief power reduction, such as condenser backwashing, without violating PCIOMRs. This improved power ascension capability will enable the Pilgrim Station to achieve higher capacity factors for the current and future cycles.

## Safety Considerations and Significant Hazards Consideration Analysis

These changes are supported by NEDO-22198, which is the Extended Load Line Limit Analysis (ELLLA) performed by General Electric for Boston Edison.

This document demonstrated that the results of the limiting transients for the limiting point in the extended operating region (100% power, 87% flow) are less severe than the same transients for the license basis point (100% power, 100% flow). The overpressure protection analysis results are also less severe for the (100,87) point. The stability results are the same as those reported in the Cycle 6 reload license submittal of September, 1982, Y1003J01A28 and the MAPLHGR results are unchanged by the extended operating region. Therefore, it is concluded that all safety bases for the extended operating region are bounded by the license basis condition and that operating in the extended operating region is justified.

Please note, however, that these proposed changes will affect the previous request for Technical Specification changes concerning Pilgrim station single loop operation, which were submitted to NRC by letter on May 12, 1981. Those affects will be provided to the NRC in the near future via an update to the Single Loop request.

We believe that this change does not present a significant hazard as defined in 10CFR50.92(c), in that it does not involve a significant increase in the probability or consequence of an accident previously evaluated, does not create an accident different from those previously evaluated, nor does it involve a significant reduction in a safety margin.

This change has been reviewed and approved by the Operations Review Committee, and reviewed by the Nuclear Safety Review and Audit Committee.

## Schedule of Change

This change will be put into effect upon Boston Edison's receipt of approval by the Commission.

## Fee Determination

Pursuant to 10CFR 170.12, Boston Edison proposes this change as a Class III.

## 1.1 SAFETY LIMIT

### 1.1 FUEL CLADDING INTEGRITY

Applicability:

Applies to the interrelated variables associated with fuel thermal behavior.

Objective:

To establish limits below which the integrity of the fuel cladding is preserved.

Specification:

A. Reactor Pressure >800 psia and Core Flow >10% of Rated

The existence of a minimum critical power ratio (MCPR) less than 1.07 shall constitute violation of the fuel cladding integrity safety limit. A MCPR of 1.07 is hereinafter referred to as the Safety Limit MCPR.

B. Core Thermal Power Limit (Reactor Pressure ≤ 800 psia and/or Core Flow ≤ 10%)

When the reactor pressure is ≤ 800 psia or core flow is less than or equal to 10% of rated, the steady state core thermal power shall not exceed 25% of design thermal power.

C. Power Transient

The safety limit shall be assumed to be exceeded when scram is known to have been accomplished by a means other than the expected scram signal unless analyses demonstrate that the fuel cladding integrity safety limits defined in Specifications 1.1A and 1.1B were not exceeded during the actual transient.

## 2.1 LIMITING SAFETY SYSTEM SETTING

### 2.1 FUEL CLADDING INTEGRITY

Applicability:

Applies to trip settings of the instruments and devices which are provided to prevent the reactor system safety limits from being exceeded.

Objective:

To define the level of the process variables at which automatic protective action is initiated to prevent the fuel cladding integrity safety limits from being exceeded.

Specification:

A. Neutron Flux Scram

The limiting safety system trip settings shall be as specified below:

1. Neutron Flux Trip Settings

   a. APRM Flux Scram Trip Setting (Run Mode)

   When the Mode Switch is in the RUN position, the APRM flux scram trip setting shall be:

   $S \leq .58W + 62\%$ 2 loop

   Where:

   S = Setting in percent of rated thermal power (1998 MWt)

   W = Percent of drive flow to produce a rated core flow of 69 M lb/hr.

| 1.1 SAFETY LIMIT | 2.1 LIMITING SAFETY SYSTEM SETTING |
|---|---|

**D.** Whenever the reactor is in the cold shutdown condition with irradiated fuel in the reactor vessel, the water level shall not be less than 12 in. above the top of the normal active fuel zone.

In the event of operation with a maximum fraction of limiting power density (MFLPD) greater than the fraction of rated power (FRP), the setting shall be modified as follows:

$$S \leq (0.58W + 62\%) \left[\frac{FRP}{MFLPD}\right] \quad \underline{2\ Loop}$$

Where,

FRP = fraction of rated thermal power (1998 MWt)

MFLPD = maximum fraction of limiting power density where the limiting power density is 13.4 KW/ft for 8x8 and P8x8R fuel.

The ratio of FRP to MFLPD shall be set equal to 1.0 unless the actual operating value is less than the design value of 1.0, in which case the actual operating value will be used.

For no combination of loop recirculation flow rate and core thermal power shall the APRM flux scram trip setting be allowed to exceed 120% of rated thermal power.

b. <u>APRM Flux Scram Trip Setting (Refuel or Start and Hot Standby Mode)</u>

When the reactor mode switch is in the REFUEL or STARTUP position, the APRM scram shall be set at less than or equal to 15% of rated power.

c. <u>IRM</u>

The IRM flux scram setting shall be ≤ 120/125 of scale.

B. <u>APRM Rod Block Trip Setting</u>

The APRM rod block trip setting shall be:

$$S_{RB} \leq 0.58W + 50\% \quad \underline{2\ Loop}$$

Where,

$S_{RB}$ = Rod block setting in percent of rated thermal power (1998 MWt)

W = Percent of drive flow required to produce a rated core flow of 69M lb/hr.

In the event of operating with a maximum fraction limiting power density (MFLPD) greater than the fraction of rated power (FRP), the setting shall be modified as follows:

$$S_{RB} \leq (0.58W + 50\%)\left[\frac{FRP}{MFLPD}\right] \quad \underline{\text{2 Loop}}$$

Where,

FRP = fraction of rated thermal power

MFLPD = maximum fraction of limiting power density where the limiting power density is 13.4 KW/ft for 8x8 and P8x8R fuel.

The ratio of FRP to MFLPD shall be set equal to 1.0 unless the actual operating value is less than the design value of 1.0, in which case the actual operating value will be used.

C. Reactor low water level scram setting shall be ≥ 9 in. on level instruments.

D. Turbine stop valve closure scram settings shall be ≤ 10 percent valve closure.

E. Turbine control valve fast closure setting shall be ≥ 150 psig control oil pressure at acceleration relay.

F. Condenser low vacuum scram setting shall be ≥ 23 in. Hg. vacuum.

G. Main steam isolation scram setting shall be ≤ 10 percent valve closure.

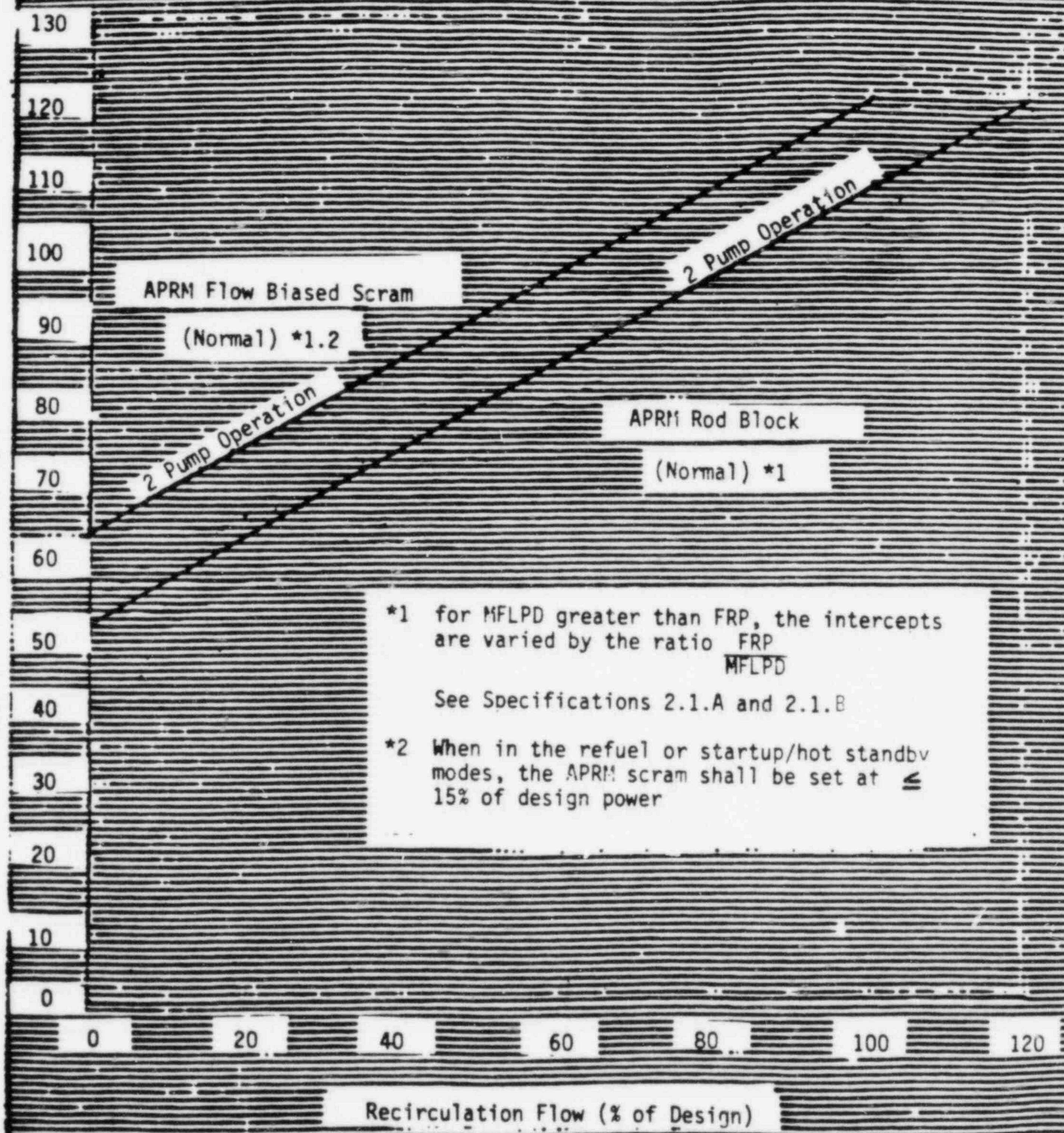


Figure 2.1.1

APRM Scram and Rod Block Trip Limiting Safety System Settings

2.1 BASES:

In summary:

i. The abnormal operational transients were analyzed to a power level of 1998 MWt.

ii. The licensed maximum power level is 1998 MWt.

iii. Analyses of transients employ adequately conservative values of the controlling reactor parameters.

iv. The analytical procedures now used result in a more logical answer than the alternative method of assuming a higher starting power in conjunction with the expected values for the parameters.

The bases for individual set points are discussed below:

A. Neutron Flux Scram Trip Settings

APRM

The average power range monitoring (APRM) system, which is calibrated using heat balance data taken during steady-state conditions, reads in percent of design power (1998 MWt). Because fission chambers provide the basic input signals, the APRM system responds directly to average neutron flux. During transients, the instantaneous rate of heat transfer from the fuel (reactor thermal power) is less than the instantaneous neutron flux due to the time constant of the fuel. Therefore, during abnormal operational transients, the thermal power of the fuel will be less than that indicated by the neutron flux at the scram setting. Analyses demonstrated that with a 120 percent scram trip setting, none of the abnormal operational transients analyzed violate the fuel safety limit and there is a substantial margin from fuel damage. Therefore, the use of flow referenced scram trip provides even additional margin.

The flow biased scram plotted on Figure 2.1.1 is based on recirculation loop flow.

An increase in the APRM scram setting would decrease the margin present before the fuel cladding integrity safety limit is reached. The APRM scram setting was determined by an analysis of margins required to provide a reasonable range for maneuvering during operation. Reducing this operating margin would increase the frequency of spurious scrams, which have an adverse effect on reactor safety because of the resulting thermal stresses. Thus, the APRM setting was selected because it provides adquate margin for the fuel cladding integrity safety limit yet allows operating margin that reduces the possibility of unnecessary scrams.

(DELETED)

TABLE 3.2.C
INSTRUMENTATION THAT INITIATES ROD BLOCKS

| Minimum # of Operable Instrument Channels Per Trip Systems (1) | Instrument | Trip Level Setting |
|---|---|---|
| 2 | APRM Upscale (Flow Biased) | $(0.58W + 50\%) \left[\frac{FRP}{MFLPD}\right]$ (2) |
| 2 | APRM Downscale | 2.5 indicated on scale |
| 1 (7) | Rod Block Monitor (Flow Biased) | $(0.65W + 42\%) \left[\frac{FRP}{MFLPD}\right]$ (2) |
| 1 (7) | Rod Block Monitor Downscale | 5/125 of full scale |
| 3 | IRM Downscale (3) | 5/125 of full scale |
| 3 | IRM Detector not in Startup Position | (8) |
| 3 | IRM Upscale | $\leq$ 108/125 of full scale |
| 2 (5) | SRM Detector not in Startup Position | (4) |
| 2 (5) (6) | SRM Upscale | $\leq 10^5$ counts/sec. |
| 1.(9) | Scram Discharge Volume Water Level-High | $\leq$ 18 gallons |

205H

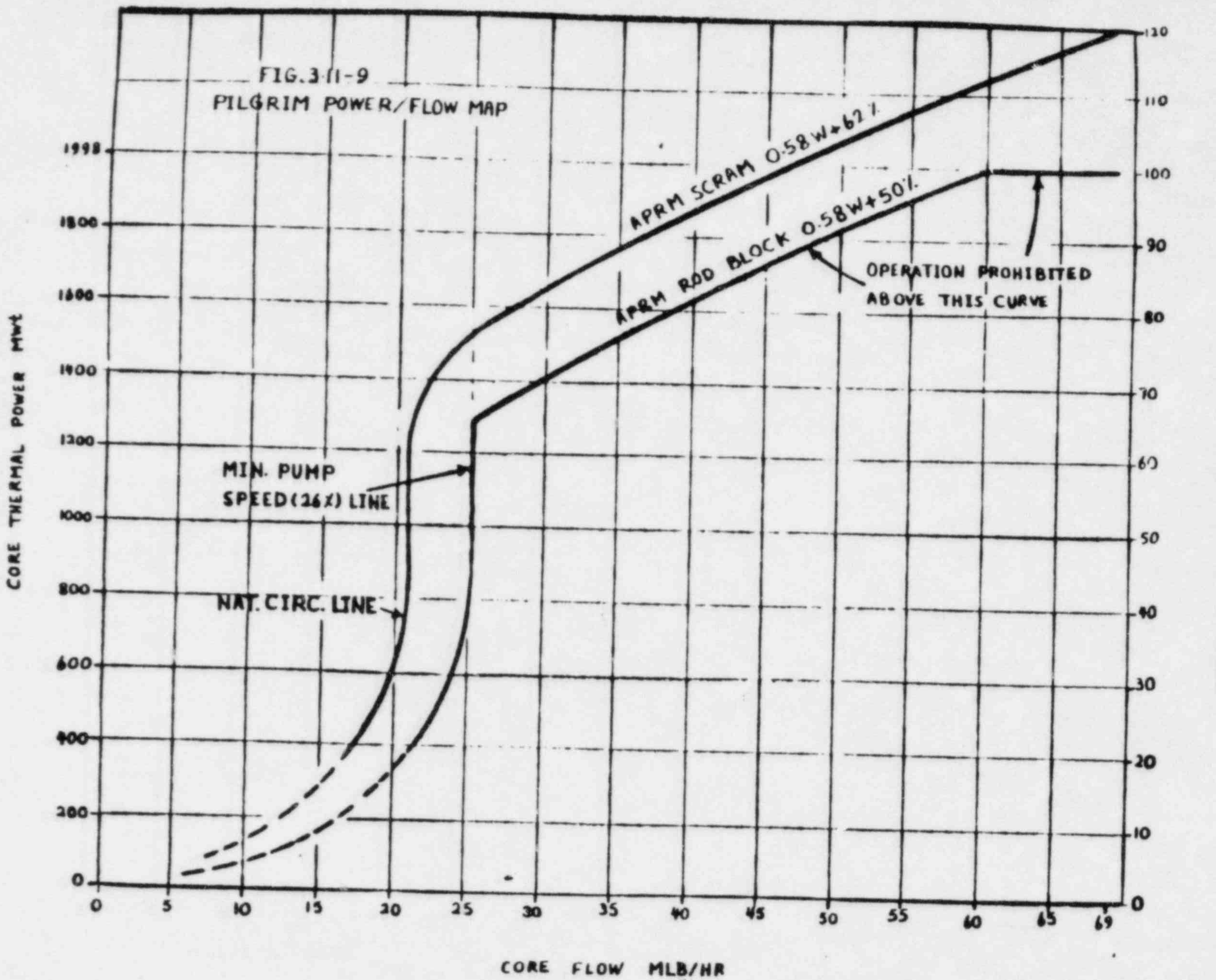


FIG. 3.11-9
PILGRIM POWER/FLOW MAP