NUCLEAR ENERGY BUSINESS OPERATIONS • GENERAL ELECTRIC COMPANY
SAN JOSE, CALIFORNIA 95125

GENERAL ELECTRIC

APPLICABLE TO:
PUBLICATION NO. NEDO-22128
T. I. E. NO. 82NED051
TITLE GE BWR Extended Load Line Limit Analysis for Susquehanna Steam Electric Station Unit 1
ISSUE DATE May 1982

ERRATA And ADDENDA SHEET

NO. 2
DATE June 1983

NOTE: Correct all copies of the applicable publication as specified below.

ITEM	REFERENCES (SECTION, PAGE PARAGRAPH, LINE)	INSTRUCTIONS (CORRECTIONS AND ADDITIONS)
1.	Pages 3-2 and 3-3	Replace with revised pages 3-2 and 3-3.

1. For those transients and accidents that are sensitive to variations in power and flow, the 105% power/100% flow (licensing basis) point must be shown to be a more limiting condition than any condition within the expanded operating region (i.e., the shaded region of Figure 2-1).

2. In no instance shall the ratio of power to flow intentionally exceed the ratio defined by the APRM rod block line.

3. The slope of the APRM rod block line must be such that flow increases are capable of compensating for xenon buildup while increasing reactor power.

4. The consequences of all accidents and transients analyzed in the FSAR and subsequent amendments and the license submittals must remain within the limits normally specified for such events.

5. Reactor power ascension from minimum recirculation pump speed to full power shall be directly attainable through combined control rod movement and recirculation flow increase without violation of either the power/flow line or PCIOMRs.

To meet these objectives, analyses were performed for typical BWRs and conclusions were drawn concerning the safety consequences of operation in the extended operating region (shaded area of Figure 1-1). It was shown by specific analyses for the SSES-1 equilibrium cycle of the current GE fuel type that these conclusions were applicable to SSES-1, Cycle 1.

3.3 ANALYSIS AND RESULTS

3.3.1 Stability

3.3.1.1 Channel Hydrodynamic Conformance to the Ultimate Performance Criterion

The channel performance calculation for SSES-1, Cycle 1, was performed for the most limiting load line limit case at the point of intersection of the extrapolated rod block line and natural circulation power. The results are given below.

Channel Hydrodynamic Performance	Extrapolated Rod Block Line* - Natural Circulation Power
Channel Type	Decay Ratio
P8x8R Channel	0.81

At this most responsive condition, the most responsive channels are clearly within the bounds of the ultimate performance criteria of $\leq$1.0 decay ratio at all attainable operating conditions.

3.3.1.2 Reactor Conformance to Ultimate Performance Criterion

The limiting reactor core stability condition for this analysis is the extrapolated rod block line* - natural circulation condition. The results of the calculation are shown below.

Reactor Core Stability	Extrapolated Rod Block Line* - Natural Circulation Power
Decay Ratio, X_2/X_o	0.96

These calculations show the reactor to be in compliance with the ultimate performance criteria, including the most responsive condition.

3.3.2 Loss-of-Coolant Accident

A discussion of low-flow effects on LOCA analyses for all operating plants (Reference 2) has been presented to and was approved by the NRC (Reference 3). The LOCA analysis for SSES-1 (contained in Reference 1) is applicable in the power flow domain discussed in this report.

3.3.3 Pressurization Transients

As shown in Reference 1, the most limiting transient for SSES-1 equilibrium cycle is the Load Rejection without bypass. The results of numerous transient

*RB $\leq$ 0.58 W + 50%, where W is recirculation flow in % of rated.