Nuclear Operating Company
South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

November 17, 1999
NOC-AE-000695
File No.: G20.02.01
G21.02.01
10CFR50.90

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

South Texas Project
Units 1 and 2
Docket Nos. STN 50-498 and STN 50-499
Supplement to Response to Request for Additional Information -
Proposed Amendment to Add Model Δ94 Replacement Steam Generator Water Level Trip Setpoint

References:
1) Letter from T.H. Cloninger to U.S. Nuclear Regulatory Commission dated July 22, 1998, (NOC-AE-000163)
2) Letter from U. S. Nuclear Regulatory Commission to W. T. Cottle, "REQUEST FOR ADDITIONAL INFORMATION - PROPOSED AMENDMENTS ON REPLACEMENT STEAM GENERATOR WATER LEVEL TRIP SETPOINT DEFFERENCES, SOUTH TEXAS PROJECT, UNITS 1 AND 2 (STP) (TAC NOS. MA2500 AND MA2501)," dated April 15, 1999
3) Letter from S. E. Thomas to U.S. Nuclear Regulatory Commission dated June 16, 1999, (NOC-AE-000548)

STP Nuclear Operating Company (STPNOC) intends to install Westinghouse Model Δ94 steam generators to replace the original Model E2. Unit 1 replacement is scheduled to start at the beginning of March 2000, while the Unit 2 replacement will commence in the fall of 2002. For this reason, STPNOC requested (Reference 1) to amend the South Texas Project (STP) Technical Specifications (TS) to insert a low-low-level trip setpoint value in the TS for the new Westinghouse Model Δ94 steam generators. To evaluate this request, the U. S. Nuclear Regulatory Commission (NRC) made a request for additional information (RAI) (Reference 2) and STPNOC responded (Reference 3). In Attachments 1 and 2 of Reference 3 are tables and graphs, respectively, generated by Westinghouse to show pertinent results of relevant design-basis-accident analyses.

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During final design review and validation of the analyses, Westinghouse discovered and corrected an input error that affected the results of the feed-line break (FLB) analysis. This error had caused the original RETRAN code calculation to abort late in the transient, after the time then determined to be limiting. Upon correcting the error, Westinghouse observed that the actual limiting time occurs after the point in the transient at which the code previously aborted. Results of the corrected analysis continue to meet all event acceptance criteria. Westinghouse performed a review of all non-LOCA analyses associated with this project, and observed no further errors.

The input error affected Tables 4 through 8 and graphics in Figures 11 through 26 previously submitted via Attachments 1 and 2 of Reference 3. Attachment 1 to this letter contains corrected versions of the erroneous tables and graphs, which supercede those by the same title previously submitted via Reference 3.

Nothing contained in this letter is a commitment unless so specified in separate correspondence.

If questions arise, please contact Mr. M. E. Kanavos (512) 972-7181, or me (512) 972-7162.

S. E. Thomas
Manager
Design Engineering

SET/MEK/MTVN

Attachment: 1. Corrections for NOC-AE-000548, June 16, 1999, Responses to NRC Request for Additional Information (RAI) cc:

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U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-0001

ATTACHMENT 1

CORRECTIONS FOR

NOC-AE-000548, JUNE 16, 1999 RESPONSES TO NRC REQUEST FOR ADDITIONAL INFORMATION (RAI)

Table 4

**Time Sequence of Events for the FLB Event
With Maximum Reactivity Feedback and Offsite Power Available**

Event	Time (seconds)
Feedwater Pipe Rupture Occurs	20.0
Lo-Lo Steam Generator Water Level Trip Setpoint Reached	28.6
Rod Motion Begins	30.6
Turbine Trip Occurs	31.1
Low Pressurizer Pressure SI Setpoint Reached	84.8
Auxiliary Feedwater Flow of 500 GPM to One Intact Steam Generator is Initiated	88.6
Safety Injection Pumps Reach Full Flow	98.8
Minimum Margin to Hot-Leg Saturation (13.3°F) Occurs	188.5
Pressurizer Reaches Water-Solid Condition	2620
Heat Transfer Capability of the Intact Steam Generator Exceeds the NSSS Heat Generation, i.e., Transient Turnaround Occurs	~4200

Table 5

**Time Sequence of Events for the FLB Event
With Minimum Reactivity Feedback and Offsite Power Available**

Event	Time (seconds)
Feedwater Pipe Rupture Occurs	20.0
Lo-Lo Steam Generator Water Level Trip Setpoint Reached	28.6
Rod Motion Begins	30.6
Turbine Trip Occurs	31.1
Low Pressurizer Pressure SI Setpoint Reached	85.6
Auxiliary Feedwater Flow of 500 GPM to One Intact Steam Generator is Initiated	88.6
Safety Injection Pumps Reach Full Flow	99.6
Minimum Margin to Hot-Leg Saturation (36.9°F) Occurs	116.5
Heat Transfer Capability of the Intact Steam Generator Exceeds the NSSS Heat Generation, i.e., Transient Turnaround Occurs	~2100

Table 6

**Time Sequence of Events for the FLB Event
With Maximum Reactivity Feedback and Without Offsite Power**

Event	Time (seconds)
Feedwater Pipe Rupture Occurs	20.0
Lo-Lo Steam Generator Water Level Trip Setpoint Reached	28.6
Rod Motion Begins	30.6
Turbine Trip Occurs	31.1
RCPs Begin Coasting Down	32.6
Low Steam Pressure SI Setpoint Reached	65.5
Auxiliary Feedwater Flow of 500 GPM to One Intact Steam Generator is Initiated	88.6
Safety Injection Pumps Reach Full Flow	89.5
Pressurizer Reaches Water-Solid Condition	3035
Minimum Margin to Hot-Leg Saturation (9.3°F) Occurs	4195
Heat Transfer Capability of the Intact Steam Generator Exceeds the NSSS Heat Generation, i.e., Transient Turnaround Occurs	~4200

Table 7

**Time Sequence of Events for the FLB Event
With Minimum Reactivity Feedback and Without Offsite Power**

Event	Time (seconds)
Feedwater Pipe Rupture Occurs	20.0
Lo-Lo Steam Generator Water Level Trip Setpoint Reached	28.6
Rod Motion Begins	30.6
Turbine Trip Occurs	31.1
RCPs Begin Coasting Down	32.6
Low Steam Pressure SI Setpoint Reached	68.7
Auxiliary Feedwater Flow of 500 GPM to One Intact Steam Generator is Initiated	88.6
Safety Injection Pumps Reach Full Flow	92.7
Pressurizer Reaches Water-Solid Condition	2995
Minimum Margin to Hot-Leg Saturation (9.3°F) Occurs	4180
Heat Transfer Capability of the Intact Steam Generator Exceeds the NSSS Heat Generation, i.e., Transient Turnaround Occurs	~4200

Table 8

Summary of Results for the FLB Event

Reactivity Feedback Model (Min/Max)	Offsite Power Availability (With/Without)	Minimum Margin to Hot-Leg Saturation (°F)	Time to Fill the Pressurizer (Minutes)
Max	With	13.3	43.7
Min	With	36.9	(1)
Max	Without	9.3	50.6
Min	Without	9.3	49.9

(1)Fill not predicted prior to end run time of 6000 seconds (100 minutes).

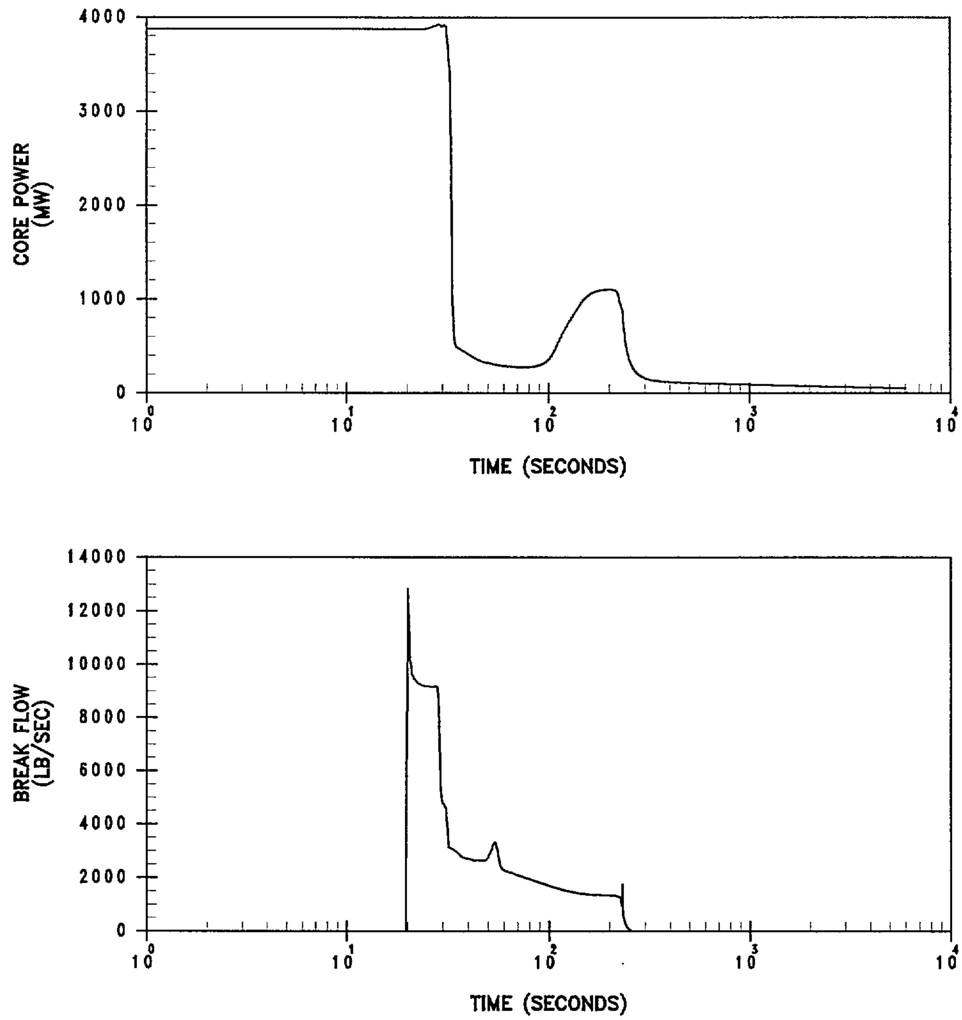


Figure 11
Feedwater Line Break Maximum Feedback With Offsite Power Available – Core Power and Break Flow

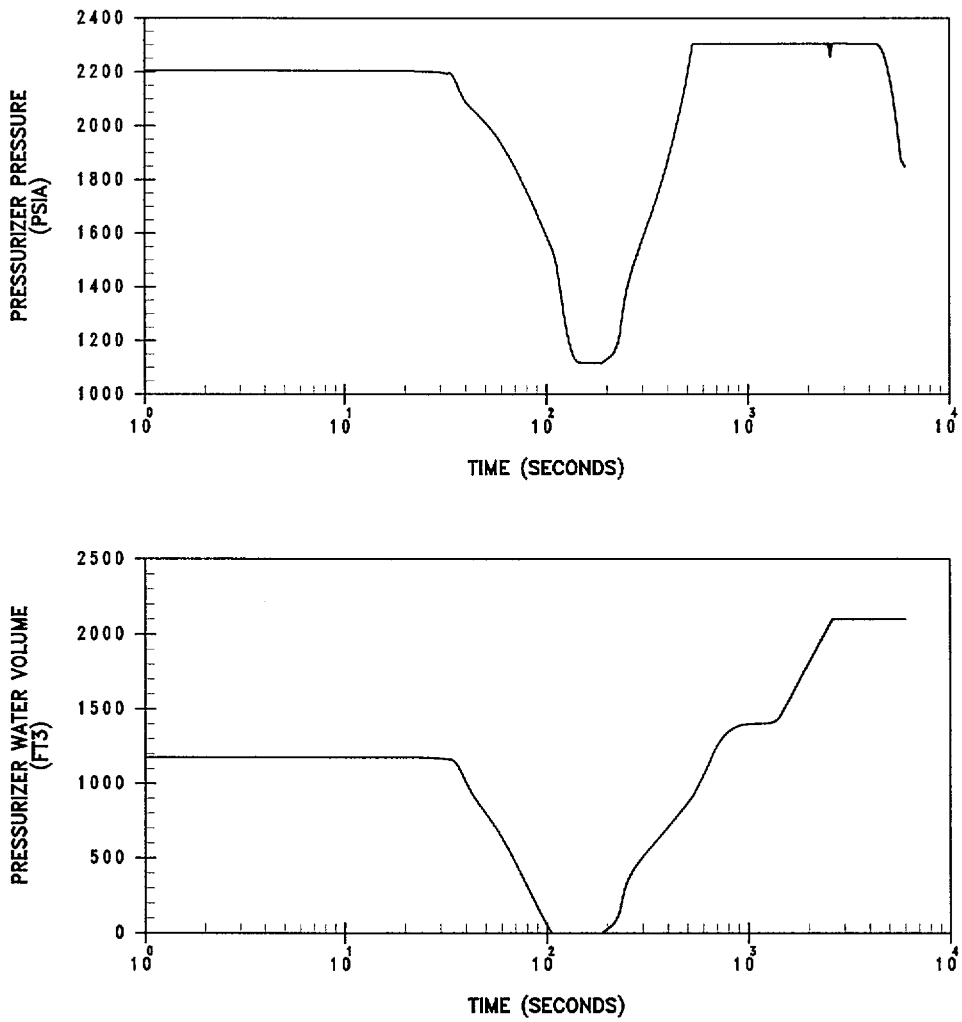


Figure 12
Feedwater Line Break Maximum Feedback With Offsite Power Available – Pressurizer Pressure and Volume

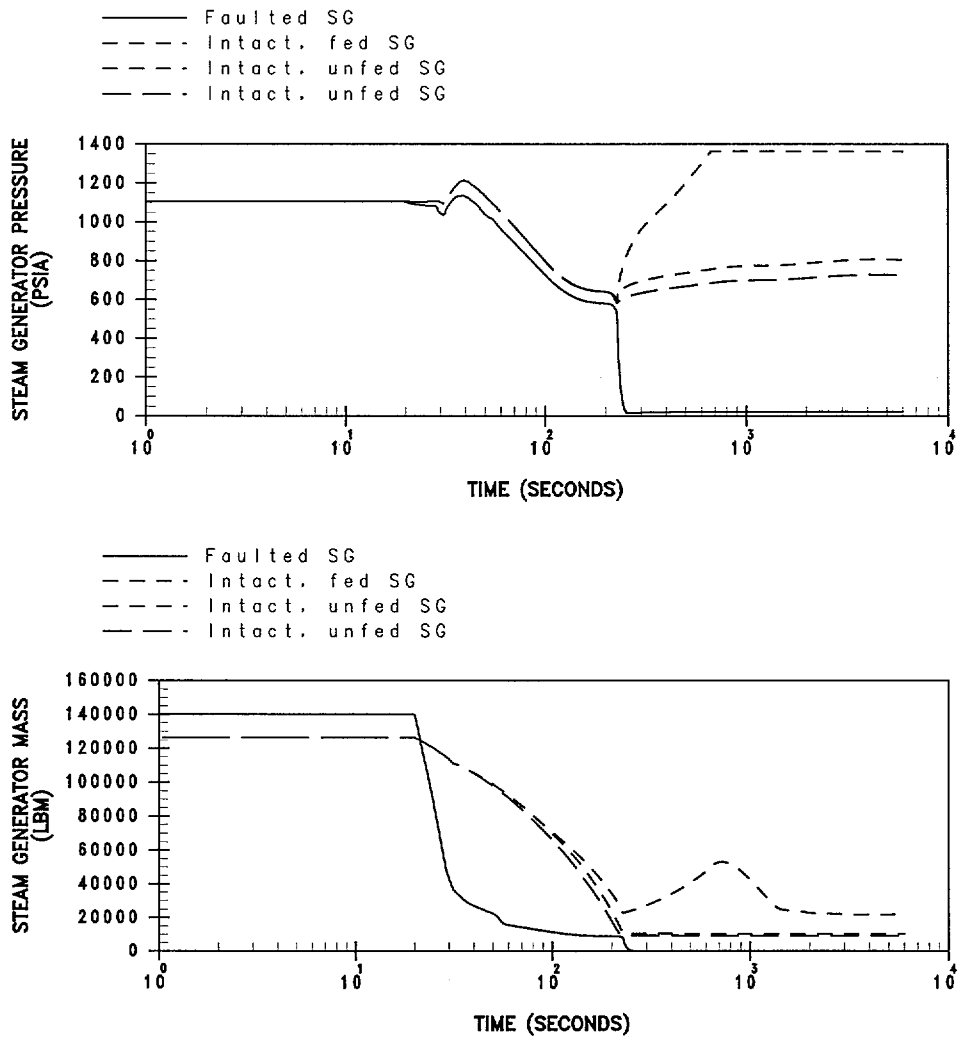


Figure 13
Feedwater Line Break Maximum Feedback With Offsite Power Available – Steam Generator Pressure and Mass

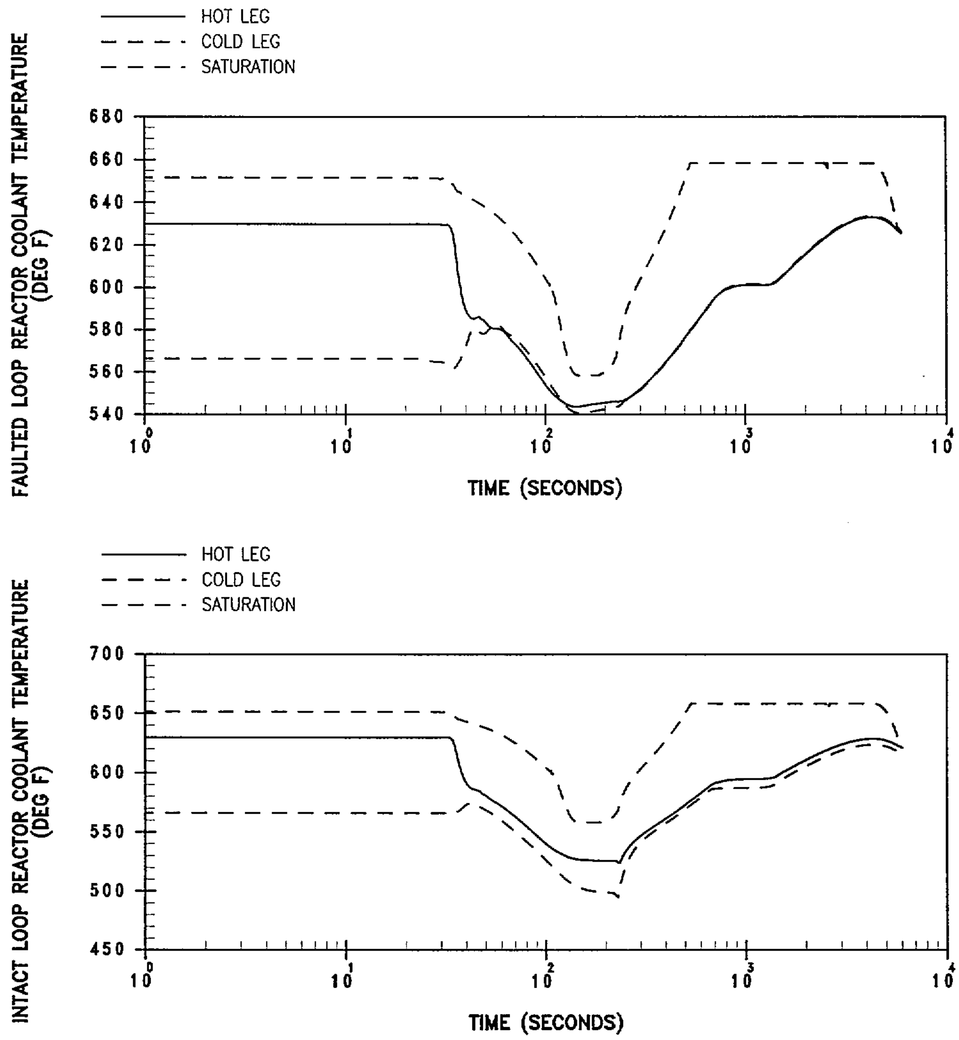


Figure 14
Feedwater Line Break Maximum Feedback With Offsite Power Available – Loop Temperatures

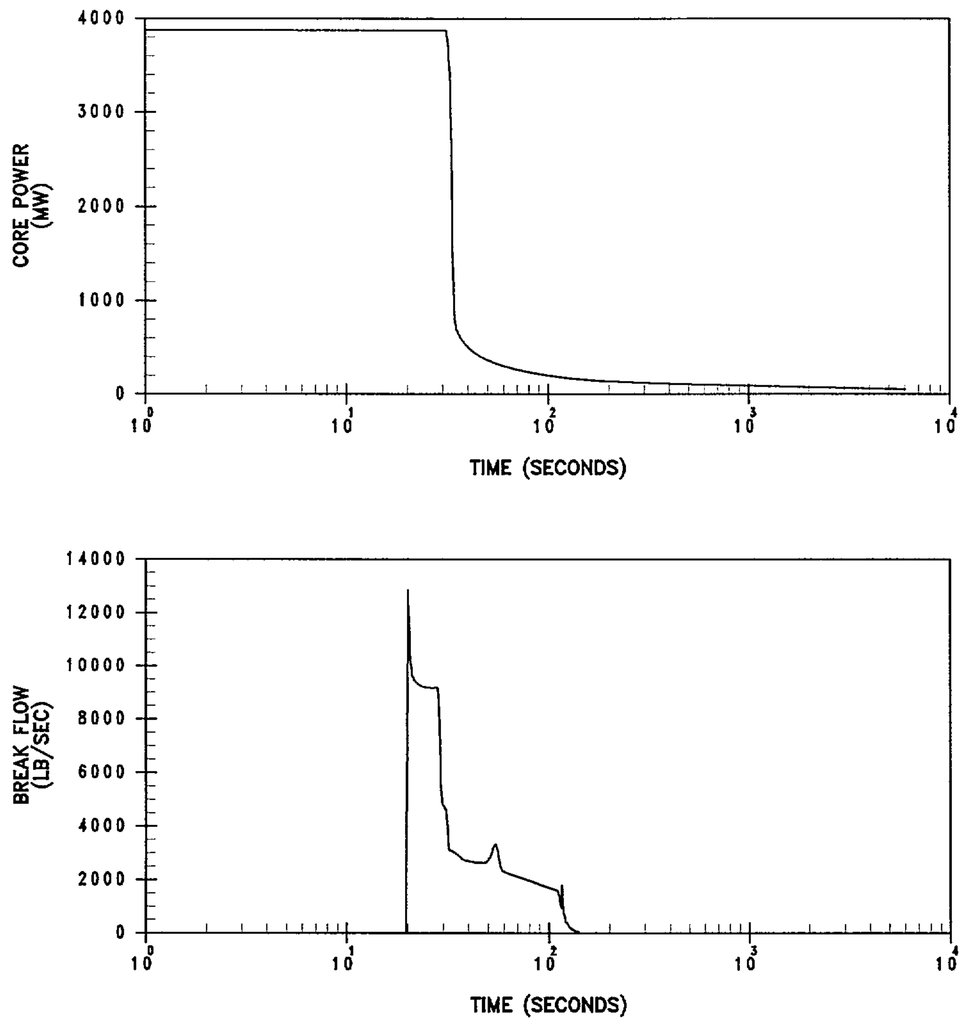


Figure 15
Feedwater Line Break Minimum Feedback With Offsite Power Available – Core Power and Break Flow

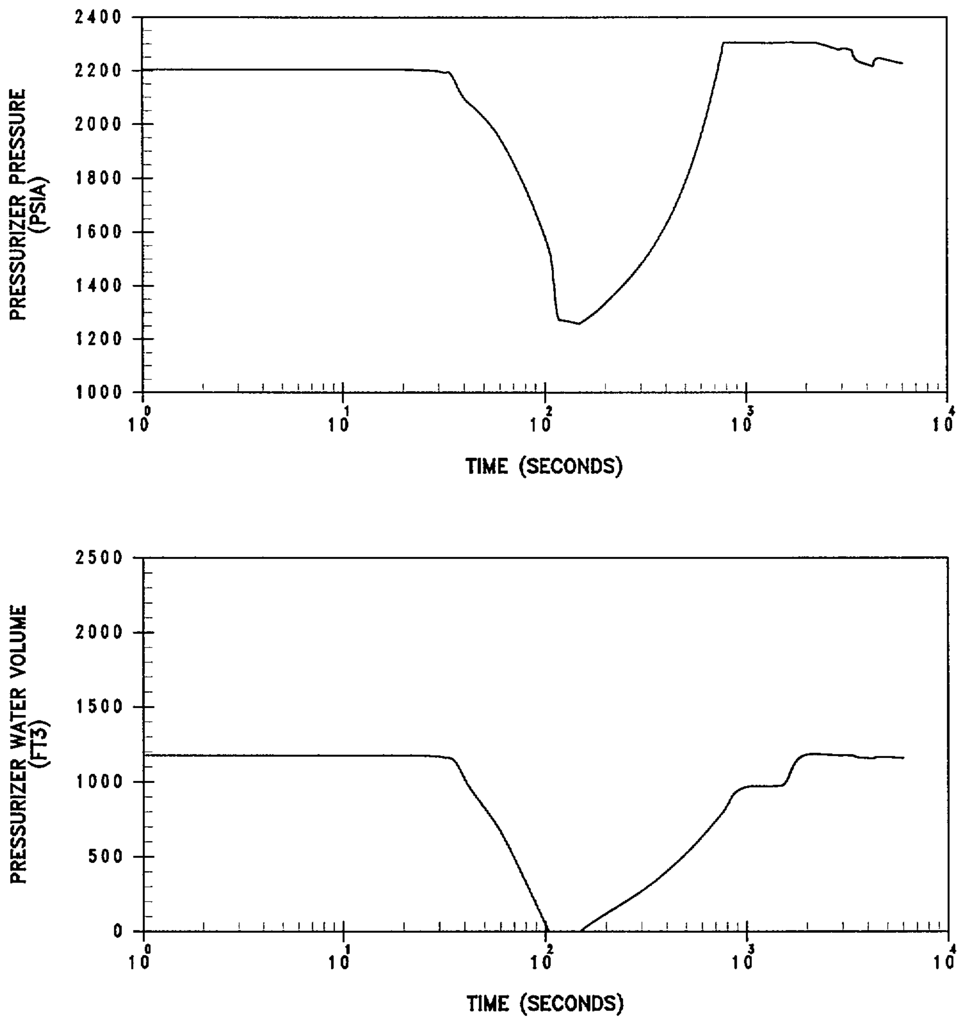
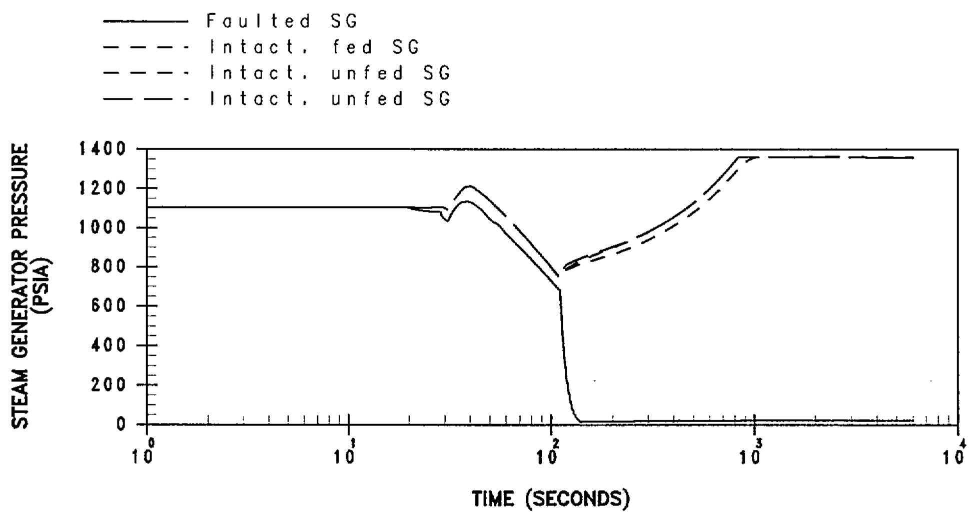


Figure 16
Feedwater Line Break Minimum Feedback With Offsite Power Available – Pressurizer Pressure and Volume



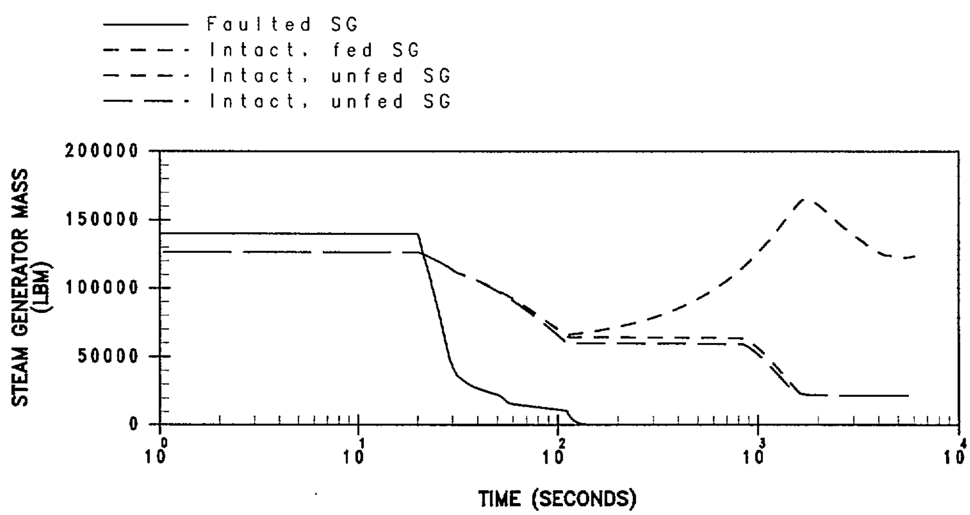


Figure 17
Feedwater Line Break Minimum Feedback With Offsite Power Available – Steam Generator Pressure and Mass

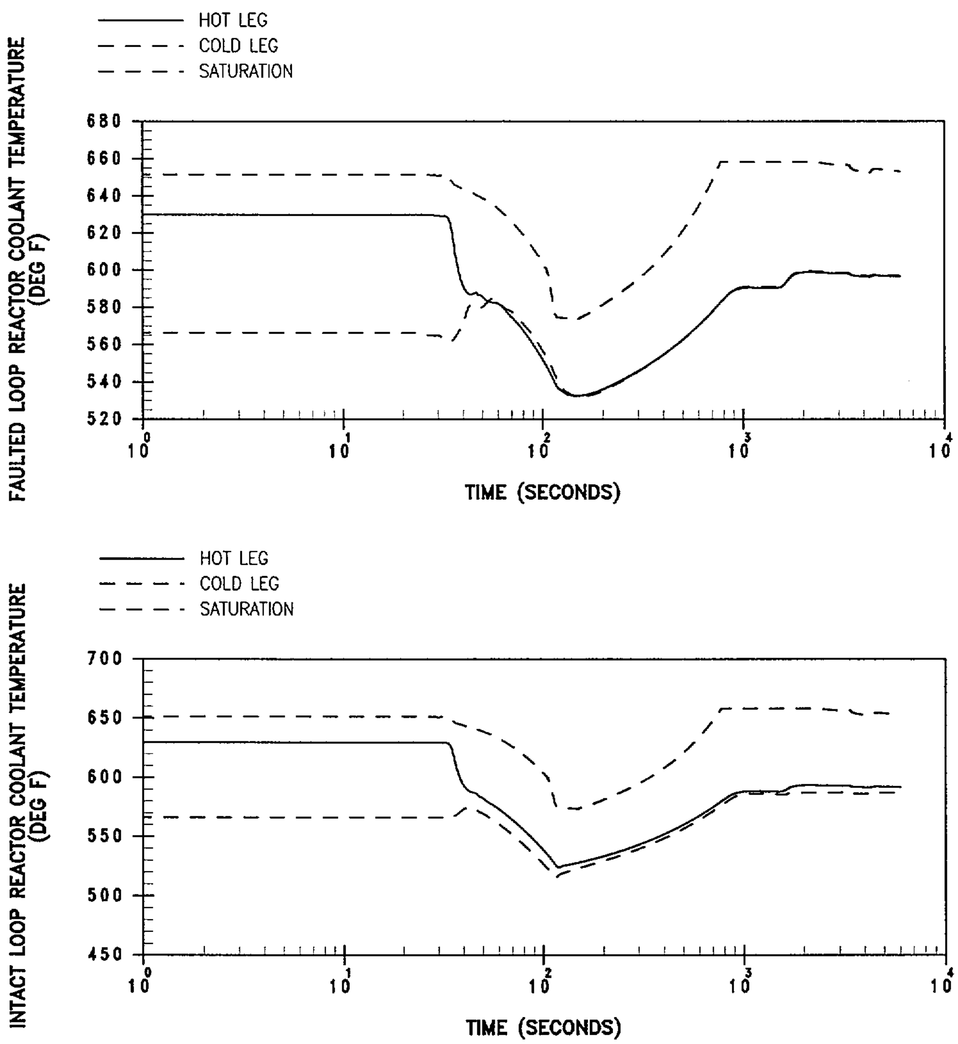
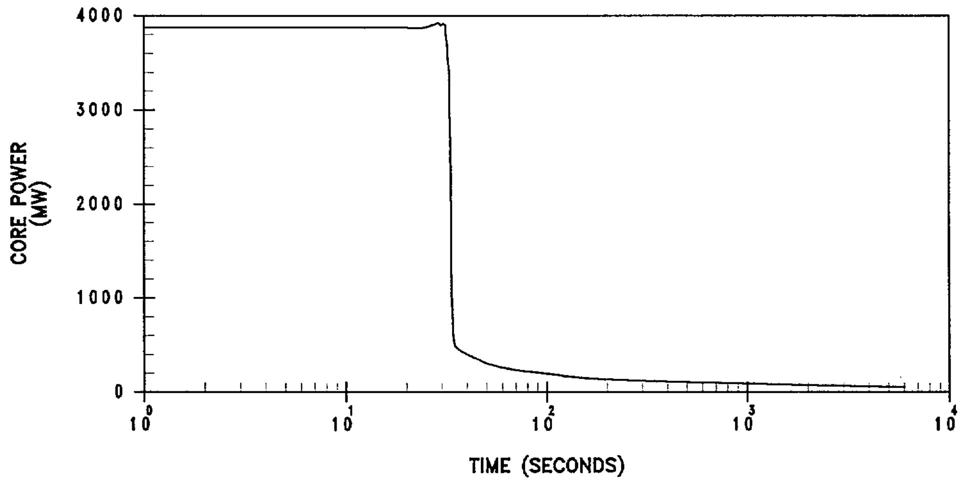


Figure 18
Feedwater Line Break Minimum Feedback With Offsite Power Available – Loop Temperatures



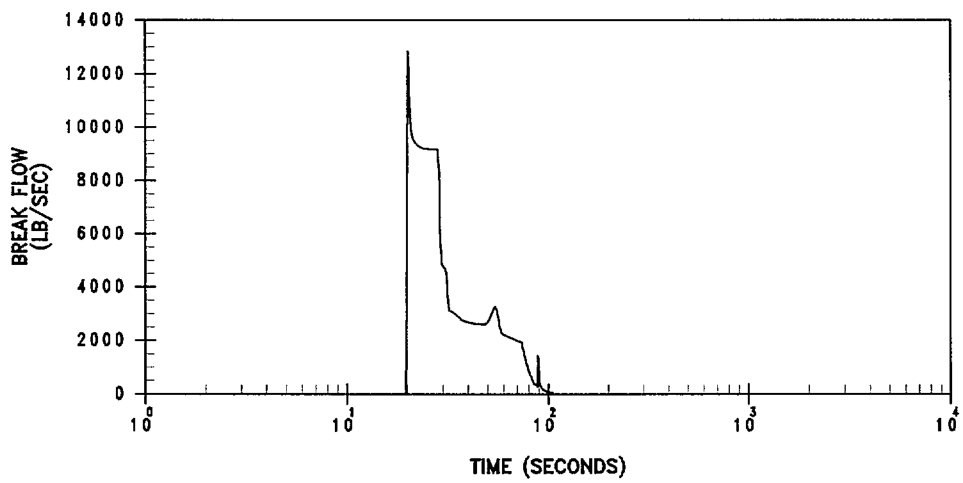


Figure 19
Feedwater Line Break Maximum Feedback With Loss-of-Offsite Power – Core Power and Break Flow

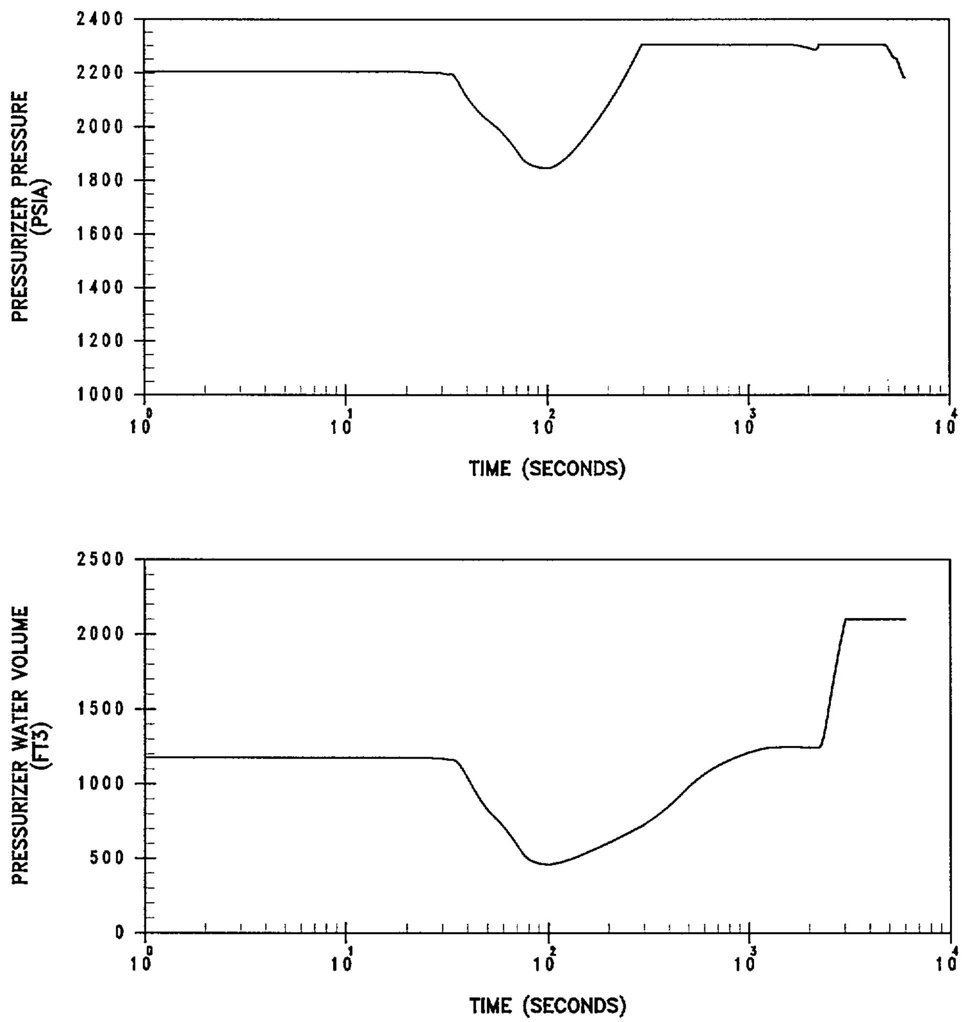
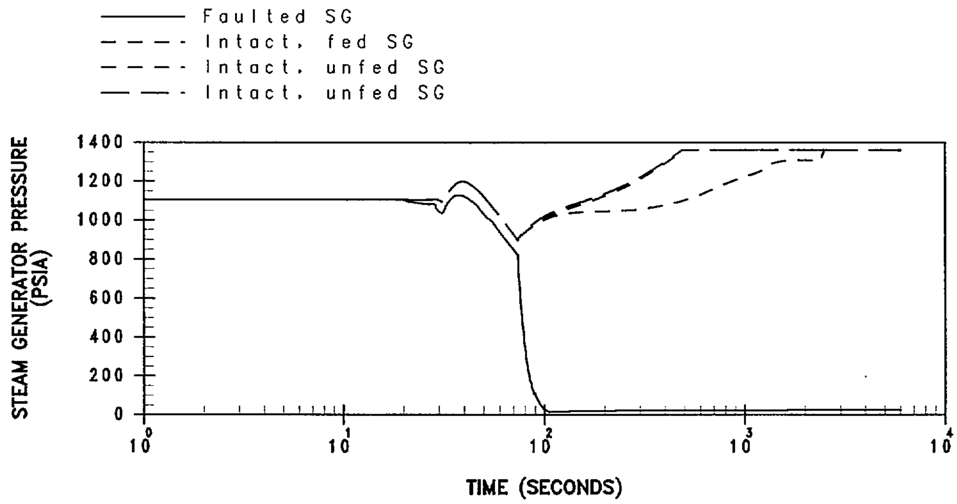


Figure 20
Feedwater Line Break Maximum Feedback With Loss-of-Offsite Power – Pressurizer Pressure and Volume



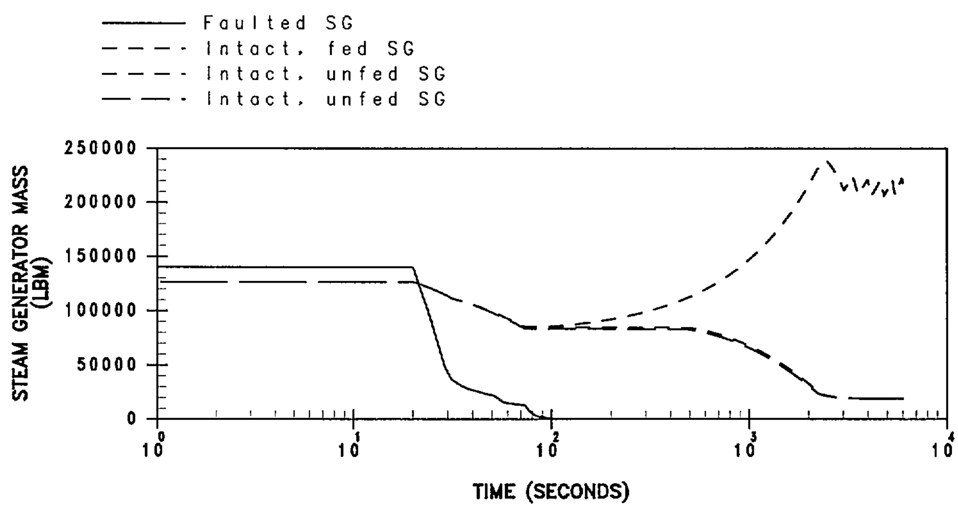


Figure 21
Feedwater Line Break Maximum Feedback With Loss-of-Offsite Power – Steam Generator Pressure and Mass

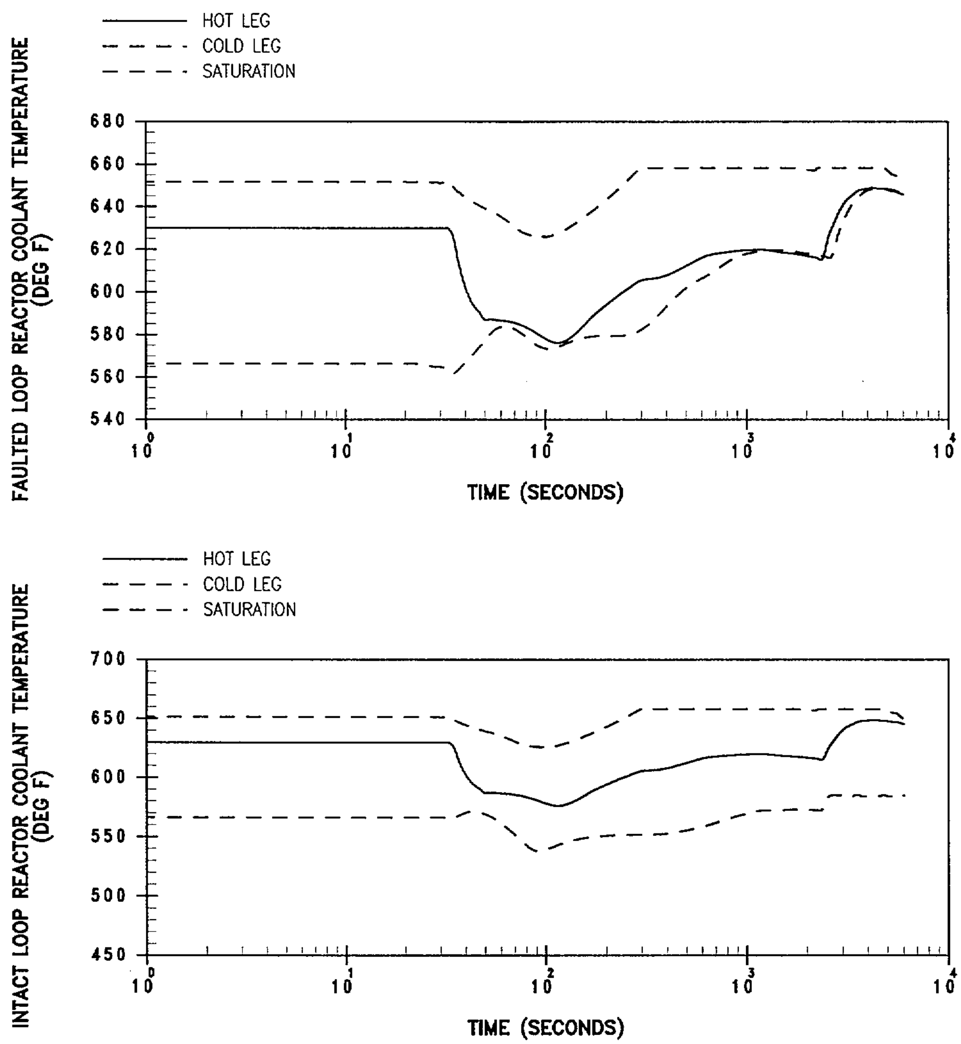
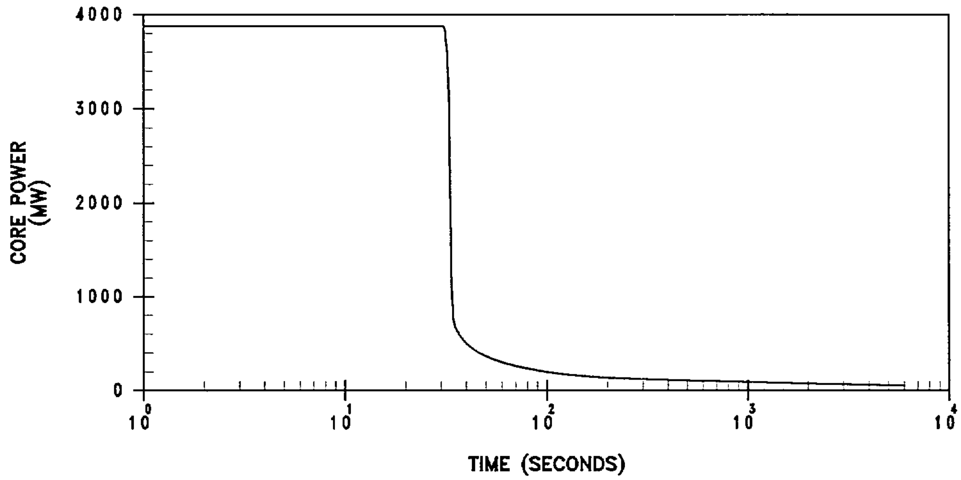


Figure 22
Feedwater Line Break Maximum Feedback With Loss-of-Offsite Power – Loop Temperatures



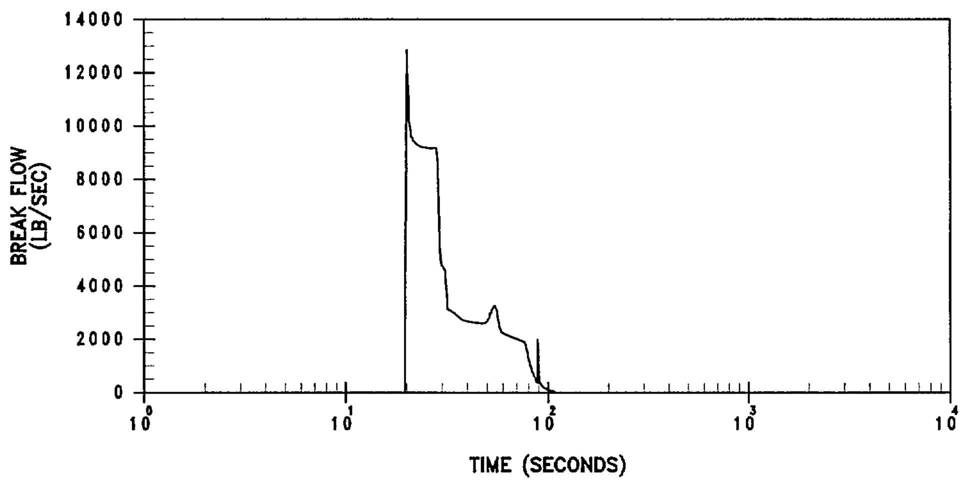


Figure 23
Feedwater Line Break Minimum Feedback With Loss-of-Offsite Power – Core Power and Break Flow

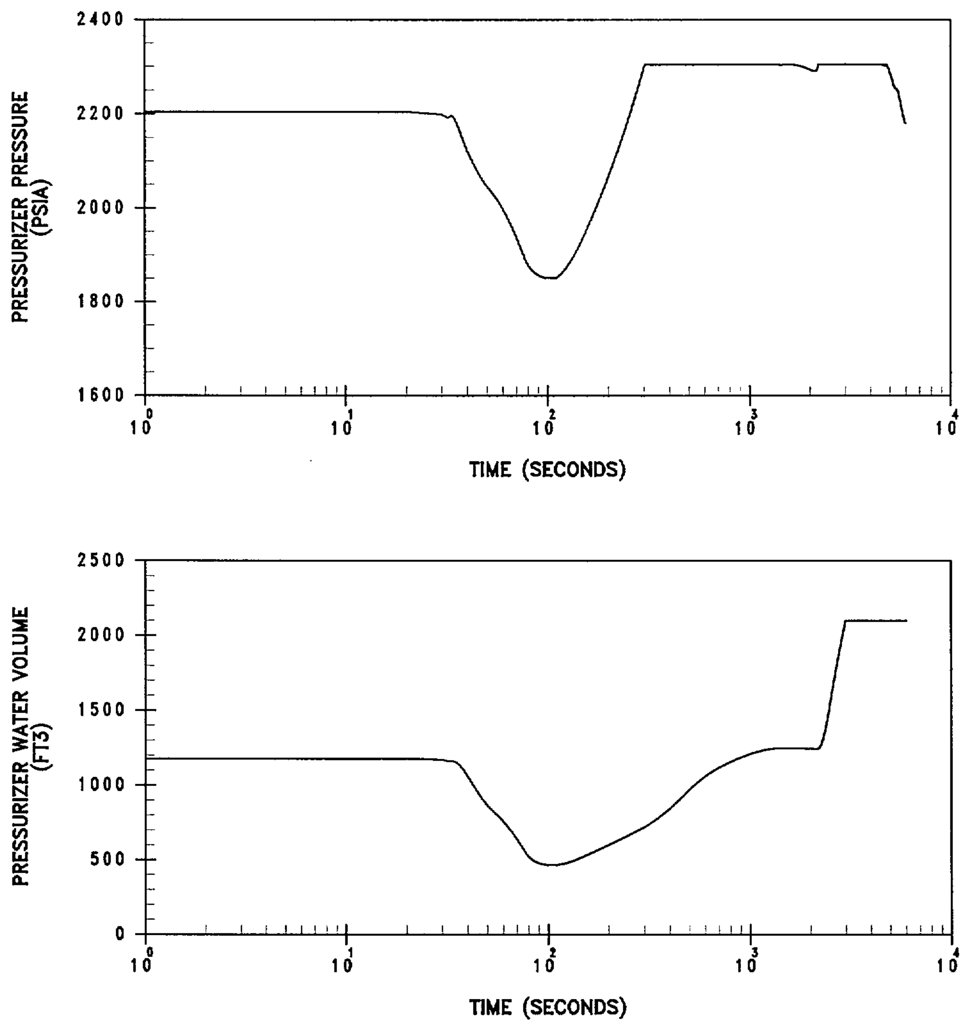


Figure 24
Feedwater Line Break Minimum Feedback With Loss-of-Offsite Power – Pressurizer Pressure and Volume

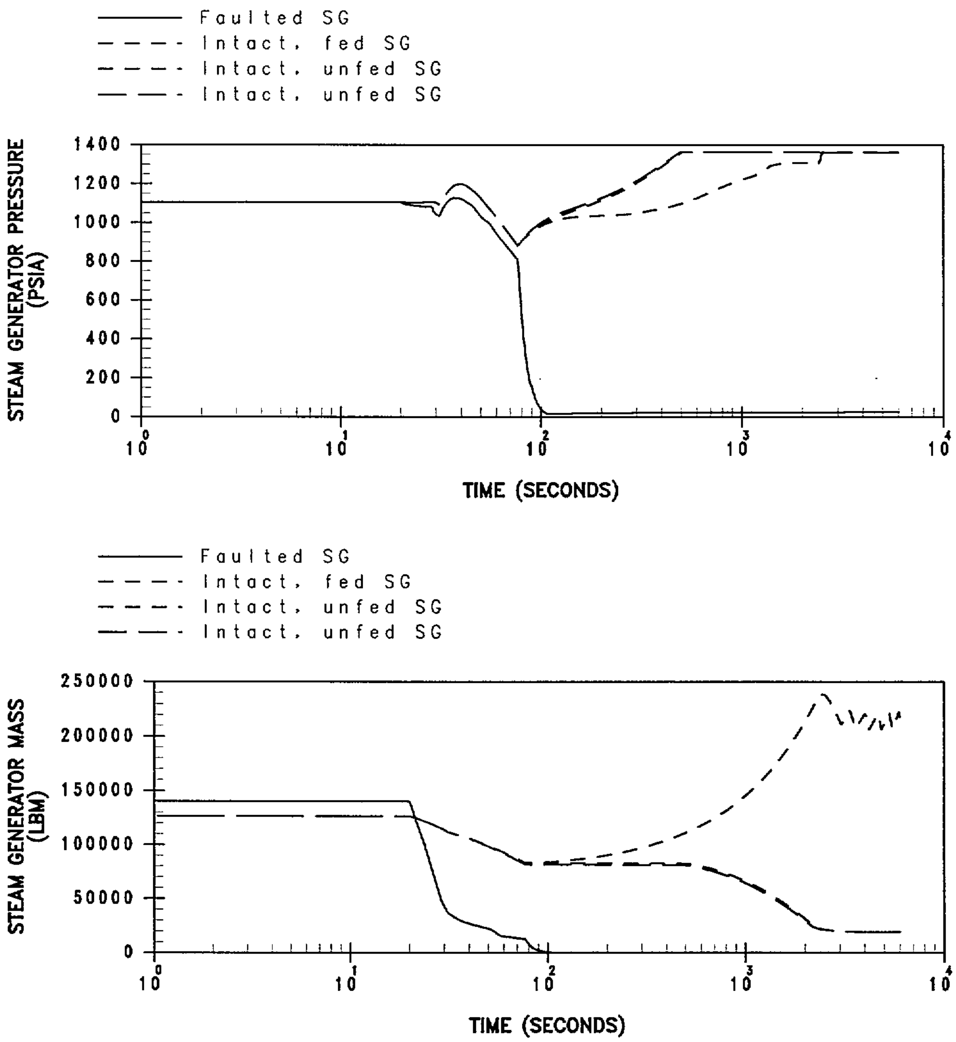


Figure 25
Feedwater Line Break Minimum Feedback With Loss-of-Offsite Power – Steam Generator Pressure and Mass

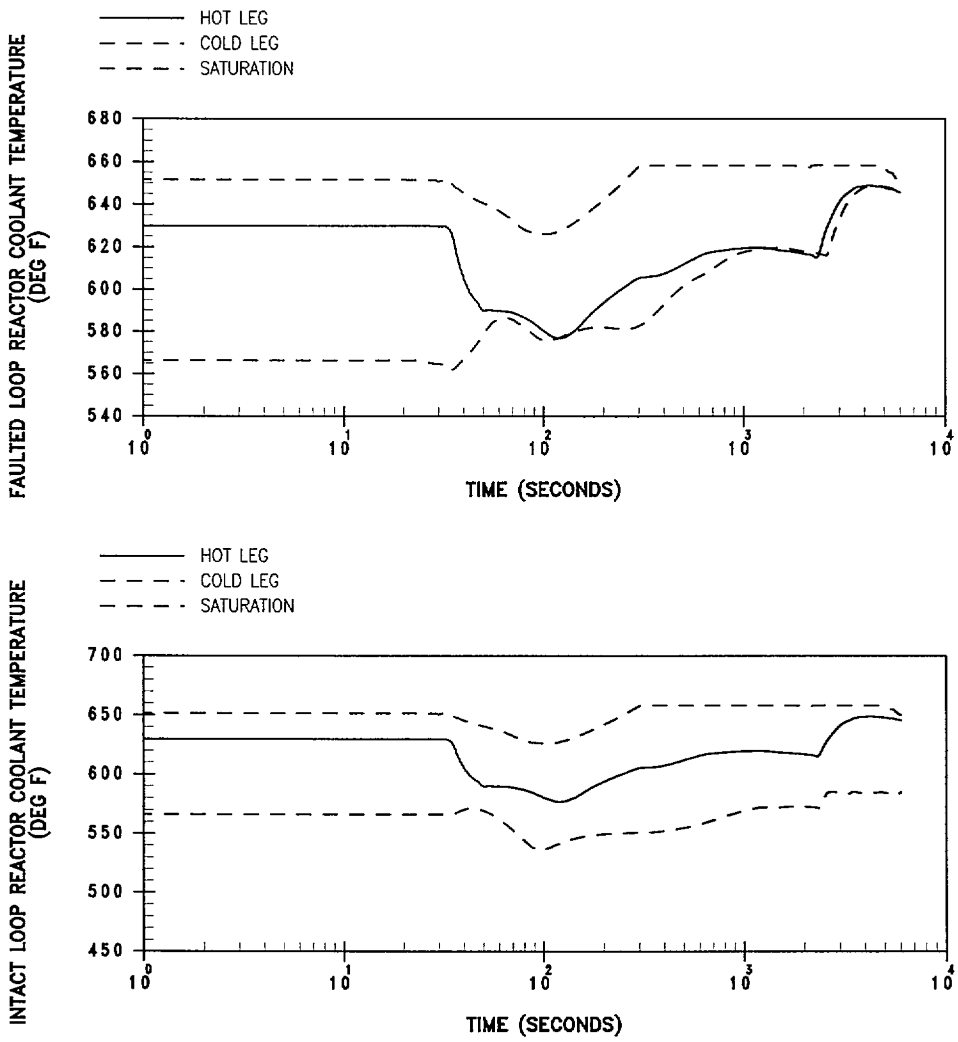


Figure 26
Feedwater Line Break Minimum Feedback With Loss-of-Offsite Power – Loop Temperatures