MISSISSIPPI POWER & LIGHT COMPANY
Helping Build Mississippi
P. O. BOX 1640, JACKSON, MISSISSIPPI 39205

April 26, 1982

NUCLEAR PRODUCTION DEPARTMENT

U. S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, D. C. 20555

Attention: Mr. Harold R. Denton, Director

Dear Mr. Denton:

SUBJECT: Grand Gulf Nuclear Station
Units 1 and 2
Docket Nos. 50-416 and 50-417
File: 0260/0277/L-860.0
IE Information Notice 79-22, Qualification of Control Systems; SER License Condition 1.11(9)
AECM-82/171

The April 16, 1981, NRC letter to Mississippi Power & Light requested the performance of a review to determine what, if any, design changes or operator actions will be necessary to assure that high energy line breaks (HELB) will not cause control system failures to complicate the event beyond the FSAR analysis. The attached report presents our response to this request and addresses the concerns in the GGNS Safety Evaluation Report, (SER), NUREG-0831, identified as License Condition 1.11(9). This subject was first brought to our attention by way of I&E Information Notice 79-22.

The attachment represents our complete report summarizing the results of an extensive design review, evaluation, and high energy piping/control systems walkdown conducted at the GGNS site. These results conclude that no design changes or operator actions are necessary at GGNS to assure HELB would not cause control system malfunction and complicate the event beyond FSAR analysis.

If you have any questions, please advise.

Yours truly,

John D Richardson for
L. F. Dale
Manager of Nuclear Services

DDW/SHH/JDR:rg

Attachment

cc: See next page

B001
s
1/1

8204290263

cc: Mr. N. L. Stampley (w/o)
Mr. R. B. McGehee (w/o)
Mr. T. B. Conner (w/o)
Mr. G. B. Taylor (w/o)

Mr. Richard C. DeYoung, Director (w/a)
Office of Inspection & Enforcement
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Mr. J. P. O'Reilly, Regional Administrator (w/a)
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Region II
101 Marietta St., N.W., Suite 3100
Atlanta, Georgia 30303

Dr. Franz Schauer, Chief (w/a)
Structural Engineering Branch
Nuclear Regulatory Commission
Washington, D.C. 20555

Evaluation of High Energy Line eaks and Consequential Control ' ,stems Failures (IE Information No..ce 79-22 Summary Report)

PURPOSE

This evaluation is to determine what, if any, design changes or operator actions are necessary to assure that high energy line breaks will not cause nonsafety control systems failures to instigate reactor transients beyond GGNS FSAR Chapter 15 analyses.

APPROACH

a. Establish the assumptions and resulting criteria for high energy line determination, break postulation, and consequence evaluation.

b. Identify nonsafety control systems which may impact reactor pressure, water level, or critical power ratio and which may be vulnerable to functional damage from high energy line breaks.

c. Identify the locations (elevations/areas) which contain high energy piping systems and in which instruments for the nonsafety control systems (identified in b.) are located.

d. Postulate breaks in the areas having instruments from more than one of these nonsafety control systems and determine the resultant effect on the instruments.

e. Determine resultant state of the reactor as a result of failing these nonsafety control systems.

f. Compare to events already analyzed and reported in FSAR Chapter 15, and determine if they are bounded.

g. Conduct a walkdown of the GGNS Unit 1 areas where HELB nonsafety control systems interface to corroborate design document review and to determine if HELB/instrument tubing problems exist.

h. Evaluate any HELB/nonsafety control systems events which were determined to be potentially significant based on data accumulated during the walkdown.

RESULTS

In an attempt to produce high energy line break criteria which were consistent with the intent of IE Information Notice 79-22 requirements, the assumptions included in Attachment 2 were jointly developed by MP&L, General Electric, and Bechtel. The single active failure assumed per MEB 3-1 in FSAR Chapter 3.6 was not used. Pressure and temperature limits for HELB were also modified. It was determined that the criteria established by our assumptions were consistent with the intent of the guidelines of NUREG-0800 (July 1981) and more realistic for the purpose of this evaluation.

Nonsafety control systems which may be vulnerable to functional damage or failure from high energy line breaks were initially determined to be those included in Attachment 3. Because the objective of this evaluation included HELB/nonsafety control systems effects on reactor transients, the evaluation was further restricted to those portions of systems (and events) which could have an adverse impact on GGNS FSAR Chapter 15 transient analyses (Attachment 3).

In those areas where a HELB could affect only the instruments of one system, this area and its local instruments were eliminated from the study based on previous Chapter 15 evaluation of system failures. Other than the Turbine Building, the only locations where instruments of two or more nonsafety control systems are in close proximity with one another are three widely separated locations within the Containment Building. However, the instruments of the nonsafety control systems in these areas are all designated as safety-related instruments. Because these instruments are safety-related instruments they were not further evaluated in this study. Additionally the scope was narrowed based on proximity of high energy lines.

As a result of this approach, the Turbine Building was determined to be the only area requiring additional evaluation. Essentially all nonsafety control system circuitry and many high energy lines run through the Turbine Building. Based on this the number of high energy lines present were reduced; i.e., steam lines were neglected due to safety-grade detection systems which initiate RPS signals, and feedwater lines were neglected since reactor power would be reduced if there was a failure in the feedwater line. In summary, only line failures that would maintain or increase flow/pressure/power in the reactor are considered. The revised scope is presented in Attachment 4. An evaluation of the potential consequences of HELB/nonsafety control systems failures in the Turbine Building was performed based on design document review. Results are included in Attachment 5.

To corroborate this evaluation and to assure no unevaluated or unrecognized potential HELB effects remained, a Turbine Building walkdown was performed. Participants in the walkdown included MP&L, Bechtel, and General Electric. Results of the walkdown, the high energy lines of concern, and the nonsafety control systems in common locations are included in Attachments 6, 7, and 8, respectively.

The two concerns identified in the walkdown and their subsequent evaluation are discussed in Attachments 6, 9, and 10. No concerns were identified which exceeded those previously addressed in the GGNS FSAR Chapter 15.

CONCLUSIONS

The accident analysis of high energy line break outside the containment has been included in Chapter 15 Grand Gulf FSAR. Two bounding cases, the main steam line break and the feedwater line break, were considered (Sections 15.6.4 and 15.6.6, respectively). However, the impact of a high energy line break on the nonsafety control systems adjacent to the high energy line was not included. The concern in IE Information Notice

79-22 is that the malfunction of the control system might result in severe transients, not bounded by Chapter 15 analyses, resulting in fuel rod damage and increased radioactivity release to the environment no longer bounded by Chapter 15 analyses.

The transient evaluation for each individual system failure, assuming worst direction and values, has already been analyzed in Chapter 15 of the Grand Gulf FSAR. Therefore, in this evaluation, only multiple system failures have been considered.

Based on the results of this evaluation, summarized in Attachments 6 and 9, the transients induced from a high energy line break will be bounded by Chapter 15 analyses. No fuel rod damage would occur. Therefore, Chapter 15 accident analysis, Section 15.6.4 and Section 15.6.6, would bound any high energy line break outside containment even with impact on control system considered.

PROPOSED PIPE BREAK CRITERIA

The following assumptions are to be used in establishing the criteria to be used as the basis for high energy line determination, break postulation, and consequences evaluation:

1. A high-energy pipe break is considered as the initiating event.

2. High-energy piping is defined as including those systems or portions of systems in which the maximum operating temperature exceeds 200°F and the maximum operating pressure exceeds 275 psig during normal operation.

3. Piping which exceeds 200°F and 275 psig for less than 2% of the time the <u>system</u> is in operation, or piping which exceeds 200° F and 275 psig for less than 1% of the time the <u>plant</u> is at power, is excluded from identification as high-energy piping.

4. Pipe breaks are postulated to occur during operation at power only.

5. Pipe breaks are evaluated for effects of pipe whip and jet impingement only.

6. Each break is considered separately as a single postulated initial event.

7. Pipe breaks are not considered to occur concurrently with breaks inside the containment or auxiliary building.

8. A whipping pipe is not considered capable of rupturing impacted pipes of equal or greater nominal pipe diameter and equal or greater thickness.

9. Pipe whip is assumed to occur in the plane defined by the piping geometry and to cause movement in the direction of the jet reaction.

   If unrestrained, a whipping pipe having a constant energy source is considered to form a plastic hinge and rotate about the nearest rigid restraint, anchor, or wall penetration. If unrestrained, a whipping pipe without a constant energy source is not considered capable of forming a plastic hinge and rotating provided its movement can be defined and evaluated.

10. Initial pipe break events are not assumed to occur in valve bodies due to their greater wall thickness.

11. The fluid internal energy associated with the pipe break reaction takes into account any line restrictions, including frictional effects, between the pressure source and the break location, and the presence or absence of energy reservoirs.

12. Pipe breaks are postulated to occur at worst case locations based on the locations of non-safety grade control systems as identified in MPB-82/0534 dated November 10, 1981. These control systems do not include those associated with a decrease in feedwater flow.

13. Pipe breaks are not postulated to occur in piping 1-inch NPS and smaller. Circumferential breaks only are postulated to occur in piping between 1-inch and 4-inches NPS. Circumferential and longitudinal breaks are postulated to occur in piping 4-inches NPS and larger.

14. Circumferential and longitudinal breaks are not postulated to occur concurrently.

15. The ends of a circumferentially ruptured pipe are assumed to be displaced laterally by a distance equal to one pipe diameter relative to each other.

16. The orientation of a longitudinal break is considered to cause piping movement normal to the plane of the piping system. The flow area of this break is equal to the cross-sectional flow area of the pipe.

17. Breaks will be limited to areas where control systems are within two times the Maximum Cone Length [(MCL) - the greater of 20 feet or the distance at which the fluid jet impingement load diminishes to less than 10 psig]. Pipe whip and resultant expansion of pipe break affected areas will be evaluated during a walkdown of high energy piping within the MCL distance of the control system components.

18. Effects of pipe whip and jet impingement are to include both complete loss and functional impairment of control elements or systems.

19. Breaks causing an immediate reactor trip are exempt from additional consideration.

20. Room pressurization effects will not be part of the review.

21. Reinforced concrete walls and floors are assumed to withstand fluid jet impingement loads, unless otherwise noted.

NOTE: The single active failure assumed per MEB 3-1 in FSAR Chapter 3.6 will not be used. The pressure and temperature limits for HELB were also modified. These actions were taken to produce criteria which are more realistic and consistent with the intent of IE Information Notice 79-22 (i.e., evaluate instrumentation for credible hazards).

CONTROL GRADE SYSTEMS WHICH MAY IMPACT
REACTOR PRESSURE, WATER LEVEL, OR CPR

1. Reactor Feedwater System
2. Reactor Turbine Pressure Regulator System
3. Recirculation Flow Control System
4. Feedwater Heater System (Condensate and Extraction Steam)
5. Condenser Vacuum System
6. Reactor Water Level 8 Turbine Trip
7. Bypass System Operation
8. Rod Control and Information System (RC&IS)
9. Environmental Control System (Offgas Vent and Offgas Flow Control System)
10. Instrument Air System (Isolation Actuation)

IE Information Notice 79-22

Listed below are the primary events which may have an adverse impact on GGNS FSAR Chapter 15 transient analyses, their effects, instrument numbers, reference drawings, panel or equipment numbers, and coordinates.

	Instrument Number	Reference Drawing	Panel or Equipment	Drawing Coordinates
A. FEEDWATER FLOW INCREASE				
1. Feedwater Controller Runout				
a.	C34-FT-N002A	J-1502	1H22-P043	14-F
	C34-FT-N002B	J-1502	1H22-P043	14-F
	N21-ZC-R097	J-1503	1N21-F513	15-E
	The following are safety-related instruments.			
	C34-FT-N003A	J-1507	1H22-P015	8-J
	C34-FT-N003B	J-1507	1H22-P025	10-N
	C34-FT-N003C	J-1057	1H22-P042	7.8-M
	C34-FT-N003D	J-1507	1H22-P041	11-J
	C34-LT-N004A	J-1507	1H22-P004	9-J
	C34-LT-N004B	J-1507	1H22-P027	11-N
	C34-LT-N004C	J-1507	1H22-P005	9-N
	C34-PT-N005	J-1507	1H22-P004	9-J
	C34-LT-N017	J-1507	1H22-P027	11-N
B. FEEDWATER FLOW DECREASE				
1. Feedwater Controller Failure				
a.	See A.1.a. above.			
2. Feedwater Pumps Trip				
b.	N21-SV-F612A	J-1503	N21-C004A	15-B
	N21-SV-F612B	J-1503	N21-C004B	15-C
	N21-FT-N088A	J-1503	1H22-P070	17-B
	N21-FT-N088B	J-1503	1H22-P471	17-C.9
	N21-PSL-N079A	J-1503	1H22-P070	17-B
	N21-PSL-N079B	J-1503	1H22-P471	17-C.9
	N21-PSL-N080A	J-1503	1H22-P070	17-B
	N21-PSL-N080B	J-1503	1H22-P471	17-C.9
	N21-PSHH-N104	J-1503	1H22-P471	17-C.9
	N21-PSHH-N105	J-1503	1H22-P471	17-C.9
	N21-PSHH-N106	J-1503	1H22-P471	17-C.9
	N21-PSHH-N107	J-1503	1H22-P471	17-C.9
	N21-PSH-N202A	J-1503	N21-C004A	15-B

		Instrument Number	Reference Drawing	Panel or Equipment	Drawing Coordinates
B. 2.	b.	N21-PSH-N202B	J-1503	N21-C004B	15-C
		N21-PSH-N212A	J-1503	N21-C004A	15-B
		N21-PSH-N212B	J-1503	N21-C004B	15-C
		N21-PSL-N219A	J-1503	N21-C004A	15-B
		N21-PSL-N219B	J-1503	N21-C004B	15-C
		N21-PSL-N225A	J-1503	N21-C004A	15-B
		N21-PSL-N225B	J-1503	N21-C004B	15-C
		N21-PSH-N233A	J-1503	N21-C004A	15-B
		N21-PSH-N233B	J-1503	N21-C004B	15-C
		N21-PSH-N237A	J-1503	N21-C004A	15-B
		N21-PSH-N237B	J-1503	N21-C004B	15-C
	d.	N21-PSH-N207A	J-1503	N21-C004A	15-B
		N21-PSH-N207B	J-1503	N21-C004B	15-C
		N21-PSH-N220A	J-1503	N21-C004A	15-B
		N21-PSH-N220B	J-1503	N21-C004B	15-C

3. Condensate Pumps Trip

b.	N19-FT-N021	J-1503	--	6-D
	N19-PSL-N003A	J-1501	--	9.5-E
	N19-PSL-N003B	J-1501	--	10-E
	N19-PSL-N003C	J-1501	--	11-E
	N19-LSL-N105	J-1501	--	10-D
	N19-LSL-N106	J-1501	--	10-D
	N19-LSL-N107	J-1501	--	10-D

4. Condensate Booster Pumps Trip

N19-FT-N059	J-1502	--	15-A
N19-PSL-N030A	J-1501	N19-C002A	2.9-A
N19-PSL-N030B	J-1501	N19-C002B	3.5-A
N19-PSL-N030C	J-1501	N19-C002C	4-A
N19-PSL-N053A	J-1501	--	2.9-A
N19-PSL-N053B	J-1501	--	3.5-A
N19-PSL-N053C	J-1501	--	4-A

C. RECIRC FLOW INCREASE

1. Recirc Flow Control Failure

All of the following instruments (a, c, q, & r) are safety related.

a.	B33-FT-N011A	J-1507	1H22-P025	10-N
	B33-ZT-N026A	J-1505	B33-F060A	9-M
	B33-ST-N150A	J-1505	B33-F060A	9-M
c.	B33-FT-N011B	J-1507	1H22-P041	11-J
	B33-ZT-N026B	J-1505	B33-F060B	11-K
	B33-ST-N150B	J-1505	B33-F060B	11-K

			Instrument Number	Reference Drawing	Panel or Equipment	Drawing Coordinates
C.	1.	c.	B33-TE-N028A	J-1505	--	10-M
			B33-TE-N028B	J-1505	--	11-K
			B33-PT-N040	J-1507	1H22-P027	11-N
			B33-TE-N022	J-1505	--	9-L
		q.	B21-LT-N099A	J-1507	1H22-P004	9-J
			B21-LT-N099F	J-1507	1H22-P027	11-N
			B21-PT-N058A	J-1507	1H22-P004	9-J
			B21-PT-N058F	J-1507	1H22-P027	11-N
		r.	B21-LT-N099B	J-1507	1H22-P027	11-N
			B21-LT-N099E	J-1507	1H22-P004	9-J
			B21-PT-N058B	J-1507	1H22-P027	11-N
			B21-PT-N058E	J-1507	1H22-P004	9-J

D. PRESSURE CONTROLLER

1. E/H Controller

N32-PS-N015	J-1504	1H22-P189	16-D
N32-PS-N016	J-1504	1H22-P189	16-D

E. TURBINE TRIP LVL B

1. Main Turb. & RFPT

a. Covered in A.1.a. (C34-LT-N004A, B, & C).

F. TURBINE GEN. TRIPS

1.	N30-PS-N003	J-1504	1H22-P533	11-E
	N30-PS-N004	J-1504	1H22-P533	11-E
	N32-SV-F507A	J-1504	1H22-P185/186	15-C
	N32-SV-F507B	J-1504	1H22-P185/186	15-C
	N32-PS-N011	J-1504	1H22-P187	16-B
	N32-PS-N012	J-1504	1H22-P187	16-B
	N34-PS-N013	J-1503	N34-A003	16-A.9
	N34-PS-N014	J-1503	N34-A003	16-A.9
	N35-LSH-N046A	J-1504	--	12-B
	N35-LSH-N046B	J-1504	--	12-E
	N35-LSH-N047A	J-1504	--	9-B
	N35-LSH-N047B	J-1504	--	9-E
	N35-LSH-N049A	J-1504	--	12-B
	N35-LSH-N049B	J-1504	--	12-E
	N35-LSH-N050A	J-1504	--	8-B
	N35-LSH-N050B	J-1504	--	8-E
	N43-LT-N036	J-1503	N42-D001	4.5-A
	N43-LT-N158	J-1503	N42-D001	4.5-A
	N43-LT-N051	J-1503	1H22-P148	3-C
	N43-LT-N052	J-1503	1H22-P148	3-C

	Instrument Number	Reference Drawing	Panel or Equipment	Drawing Coordinates
F. 1.	N43-FT-N058	J-1503	N43-D002	4-C
	N43-FT-N060	J-1503	N43-D002	4-C
	N43-FT-N061	J-1503	N43-D002	4-C
	N43-FT-N064	J-1503	N43-D002	4-C
	N43-FT-N062	J-1503	N43-D002	4-C
	N43-FT-N065	J-1503	N43-D002	4-C
	N43-FT-N063	J-1503	N43-D002	4-C
	N43-FT-N066	J-1503	N43-D002	4-C
	N43-FT-N067	J-1503	N43-D002	4-C
	N43-FT-N068	J-1503	N43-D002	4-C
	N43-TE-N070	J-1503	N43-D001	3.0-B
	N43-TE-N084	J-1503	N43-D001	3.0-B
	N43-YT-N077	J-1504	Exciter	4-C
	N43-YT-N078	J-1504	Exciter	4-C
	N43-YT-N079	J-1504	Exciter	4-C
	N43-YT-N080	J-1504	Exciter	4-C
	N44-AS-N014A	J-1513	1H22-P522	2.5P-A
	N44-AS-N014B	J-1513	1H22-P522	2.5P-A

G. FEEDWATER TEMP. DECREASE

1. Loss Of Feedwater Heating From Ext. Stm.

	Instrument Number	Reference Drawing	Panel or Equipment	Drawing Coordinates
a.	N36-SV-F520A	J-1503	N21-B006A	17-D.1
	N36-SV-F520B	J-1503	N21-B006B	17-E
	N36-SV-F521A	J-1503	N21-B006A	17-D.1
	N36-SV-F521B	J-1503	N21-B006B	17-E
	N36-SV-F523A	J-1503	N21-B005A	17-D.1
	N36-SV-F523B	J-1503	N21-B005B	17-E
	N36-SV-F524A	J-1503	N21-B005A	17-D.1
	N36-SV-F524B	J-1503	N21-B005B	17-E
b.	N23-LT-N059A	J-1501	1H22-P084	13-F
	N23-LT-N059B	J-1501	1H22-P084	13-F
	N23-LSHH-N062A	J-1503	--	17-E
	N23-LSHH-N062B	J-1503	--	17-F
	N23-LSHH-N074A	J-1503	--	17-D
	N23-LSHH-N074B	J-1503	--	17-E
c.	N36-SV-F525A	J-1503	--	17-F
	N36-SV-F525B	J-1503	--	17-F

4. Loss Of Condensate Inlet for Htrs. 1-4

	Instrument Number	Reference Drawing	Panel or Equipment	Drawing Coordinates
b.	N23-LSHH-N001A	J-1503	--	11-B
	N23-LSHH-N001B	J-1503	--	9.5-B
	N23-LSHH-N001C	J-1503	--	7.5-B
	N23-LT-N003A	J-1502	1H22-P081	7-A

	Instrument Number	Reference Drawing	Panel or Equipment	Drawing Coordinates
G. 4. b.	N23-LT-N003B	J-1502	1H22-P082	7-B
	N23-LT-N003C	J-1502	1H22-P083	7-B
	N23-LT-N004A	J-1502	1H22-P081	7-A
	N23-LT-N004B	J-1502	1H22-P082	7-B
	N23-LT-N004C	J-1502	1H22-P083	7-B
	N23-LSHH-N017A	J-1503	--	12-B
	N23-LSHH-N017B	J-1503	--	10.5-B
	N23-LSHH-N017C	J-1503	--	8.5-B
	N23-LT-N018A	J-1502	1H22-P081	7-A
	N23-LT-N018B	J-1502	1H22-P082	7-B
	N23-LT-N018C	J-1502	1H22-P083	7-B
	N23-LT-N020A	J-1502	1H22-P081	7-A
	N23-LT-N020B	J-1502	1H22-P082	7-B
	N23-LT-N020C	J-1502	1H22-P083	7-B
	N23-LT-N030A	J-1502	1H22-P081	7-A
	N23-LT-N030B	J-1502	1H22-P082	7-B
	N23-LT-N030C	J-1502	1H22-P083	7-B
	N23-LT-N031A	J-1502	1H22-P081	7-A
	N23-LT-N031B	J-1502	1H22-P082	7-B
	N23-LT-N031C	J-1502	1H22-P083	7-B
	N23-LSHH-N032A	J-1503	--	12-B
	N23-LSHH-N032B	J-1503	--	10.5-B
	N23-LSHH-N032C	J-1503	--	8.5-B
	N23-LSHH-N045A	J-1503	--	11-B
	N23-LSHH-N045B	J-1503	--	9.5-B
	N23-LSHH-N045C	J-1503	--	7.5-B
	N23-LT-N079	J-1501	1H22-P084	13-F
	N23-LSLL-N081	J-1502	--	14-E
	N23-LT-N082	J-1501	1H22-P084	13-F

I. TURBINE D.C. OIL PUMP

1.	N34-PS-N040	J-1503	N34-A003	16-A.9
	N34-PS-N041	J-1503	N34-A003	16-A.9

J. RADWASTE SUMP PUMPS

1. RW Floor and Equip. Drains Chem. Waste

a.	SP45-LSHL-N102	J-0503	--	0.72-D
	SP45-LSHH-N103	J-0503	--	0.72-D
	SP45-LSHL-N104	J-0503	--	0.72-C.7
	SP45-LSHH-N105	J-0503	--	0.72-C.7
	SP45-LSHH-N106	J-0503	--	0.72-A.95
	SP45-LSHL-N107	J-0503	--	0.72-A.95

	Instrument Number	Reference Drawing*	Panel or Equipment	Drawing Coordinates
K.	CONDENSER VACUUM LOSS			
1.	SJAE			
a.	N62-SV-F501A	J-1502	N62-B001A	6-B
	N62-SV-F501B	J-1502	N62-B001B	6-C
c.	1N62-FT-N013A	J-1502	1H22-P172	6-A
	1N62-FT-N013B	J-1502	1H22-P172	6-A
	1N62-FT-N013C	J-1502	1H22-P081	7-A
	1N62-FT-N013D	J-1502	1H22-P081	7-A
e.	Same as c. above.			
2.	Circulating Water System			
	N71-FIS-N041A	J-1513	--	3P-PD
	N71-FIS-N041B	J-1513	--	3P-PD
L.	RECIRCULATION PUMP TRIPS			
	Covered under C.1.q & r.			
M.	TURBINE BYPASS CONTROL			
2.	N30-PT-N018D	J-1503	--	17-F
	N30-PT-N019D	J-1503	--	17-F
3.	N30-PT-N018C	J-1502	--	14-F
	N30-PT-N019C	J-1502	--	14-F
4.	N30-PT-N018B	J-1503	--	17.5-F
	N30-PT-N019B	J-1503	--	17.5-F
	N30-PT-N018A	J-1502	--	15-F
	N30-PT-N019A	J-1502	--	15-F
	N32-SV-F505A	J-1504	1H22-P185/186	15-C
	N32-SV-F505B	J-1504	1H22-P185/186	15-C
	N32-SV-F505C	J-1504	1H22-P185/186	15-C
N.	INSTRUMENT AIR SYSTEM			
4.	P53-PSL-N030	J-0514	--	6.5W-GW
	P53-PSL-N036	J-0514	--	6.5W-GW
	P53-PDS-N037	J-0514	--	6W-GW

Instrument Number	Reference Drawing	Panel or Equipment	Drawing Coordinates
O. OFF-GAS SYSTEM CONTROLS			
D17-RE-N002	J-1502	D17-J034	5-B
D17-RE-N003A	J-1508	--	10-G
D17-RE-N003B	J-1508	--	10-G
D17-RE-N003C	J-1508	--	10-G
D17-RE-N003D	J-1508	--	10-G
D17-RE-N009A (Safety-Related)	J-1509	--	12-K
D17-RE-N009B (Safety-Related)	J-1509	--	12-K
D17-RE-N009C (Safety-Related)	J-1509	--	12-K
D17-RE-N009D (Safety-Related)	J-1509	--	12-K
D17-RE-N011	J-0504	--	0.35-A
D17-RE-N012A	J-1510	--	6-N
D17-RE-N012B	J-1510	--	6-N
D17-RE-N012C	J-1510	--	6-N
D17-RE-N012D	J-1510	--	6-N
D17-RE-N013A	J-1510	--	7.5-R
D17-RE-N013B	J-1510	--	7.5-R
D17-RE-N013C	J-1510	--	7.5-R
D17-RE-N013D	J-1510	--	7.5-R
SD17-RE-N016A	J-0502	--	20-K
SD17-RE-N016B	J-0502	--	20-K
SD17-RE-N016C	J-0502	--	20-K
SD17-RE-N016D	J-0502	--	20-K

TURBINE BUILDING EVALUATION

In response to IE Notice 79-22 an evaluation of the effects of a high-energy pipe break (as defined by the proposed criteria) within the turbine building, was performed. The results of this evaluation follow:

El. 93'-0" This elevation has but a single target, affecting 1 parameter of concern only. The target is separated from elevation 113'-0" by reinforced concrete. No further investigation is required for this elevation.

El. 113'-0" All targets on this elevation are separated from targets on elevations 93'-0" and 133'-0" by reinforced concrete. Where high-energy lines are in the vicinity of unprotected targets a pipe break would affect only a single parameter of concern. No further investigation is required for this elevation.

El. 133'-0" All targets on this elevation are separated from targets on elevations 113'-0" and 166'-0" by reinforced concrete. With the exception of the reactor feed pump room, all high-energy pipe breaks would affect only a single parameter of concern. In the reactor feed pump room, failure of line 2"-CBD-4 would affect either MCC 13B12 and 1H22-P471 or MCC 13B12 and 1H22-P070. Per GE's evaluation of MCC 13B12 in the control systems power failure review, the only possible effect (due to loss of this MCC) is a Turbine Trip. Loss of 1H22-P471 and 1H22-P070 can result in a feedwater flow decrease only.

El. 166'-0" All targets on this elevation are separated from targets on elevation 133'-0" by reinforced concrete. Where high-energy lines are in the vicinity of unprotected targets a pipe break would affect only a single parameter of concern. No further investigation is required for this elevation.

Therefore, it appears that all possible losses of nonsafety control systems due to pipe whip/jet impingement in the Turbine Building are bounded by the FSAR Chapter 15 analyses.

Results of the Turbine Building Walkdown

In response to IE Information Notice 79-22, a walkdown of the Turbine Building was performed on March 23-24, 1982. The walkdown was conducted in the following manner.

1. All nonsafety control systems identified in Attachment 4 and the associated sensing lines, were located by common area. These areas were assigned arbitrary numbers and are separated from each other by reinforced concrete walls and floors. A total of 28 separate areas were identified.

2. Each area was then evaluated for the consequences of a loss of all control systems identified in the area. If the loss of all systems in an area was identified as having the same effect (i.e., turbine trip), the areas was not reviewed further. Areas eliminated from further evaluation bound on this criteria include 1, 2, 3, 6, 13, 15, 21, 23, 26, and 27.

3. All remaining areas were then reviewed for potential high energy line breaks. If there were no high energy line breaks in an area, the area was not reviewed further. There were no high energy lines located in Areas 4, 5, 7, 8, 9, 10, 11, 12, 16, 17, 19, 20, 22, 24, 25, and 28.

4. Only two areas (areas 14 & 18) required further evaluation after the above action was complete. These areas were reviewed for pipe whip/jet impingement effects only.

   a. There is a potential for high energy line breaks to impact the sensing lines for N30-PT-N018B&D and N30-PT-N019B&D concurrently with a number of N23 and N36 instruments in Area 14. This has the potential for a turbine trip in conjunction with a loss of some feedwater heating. See Attachment 9 for resolution.

   b. In Area 18, it was determined that a circumferential break of 24"-GBD-1 could impact N21-ZCR097, but no other instrumentation. However, a longitudinal break of 24"-GBD-1 could not only impact N21-ZC-R097, but also the sensing lines for N30-PT-N018B&D and N30-PT-N019B&D. No other high energy lines in this area could impact multiple control systems.

5. An evaluation of the loss of N21-ZC-R097 concurrent with N30-PT-N018B&D and N30-PT-N019B&D has been performed. As shown in Attachment 10, N21-ZC-R097 controls the flow through N21-FV-F513, which is closed during normal operation. Additionally, this valve is designed to fail closed. Since only one parameter, turbine trip by loss of the above pressure transmitters, can possibly be affected by a break of 24"-GBD-1, the failure of any high energy lines in Area 18, results in an event which is bounded by the FSAR Chapter 15 transient analysis.

High Energy Lines
In the Turbine Building

Line No.	Elevation	Composite Dwg.
18" DBD-26	93'-0"	M-1202
2" GBD-114	93'-0"	M-1202
6" GBD-143	93'-0"	M-1202
3" GBD-1107	93'-0"	M-1202
2" GBD-1112	93'-0"	M-1202
8" GBD-116	93'-0"	M-1201
2½"GBD-1107	93'-0"	M-1201
12" GBD-62	93'-0"	M-1204
14" FBD-37	93'-0"	M-1204
18" FBD-28	93'-0"	M-1205
14" FBD-37	93'-0"	M-1205
16" FBD-19	113'-0"	M-1207
8" GBD-113	113'-0"	M-1207
24" FBD-21	113'-0"	M-1207
8" GBD-116	113'-0"	M-1207
14" DBD-65	113'-0"	M-1207
1" DBD-3	113'-0"	M-1207
3" DBD-2	113'-0"	M-1207
12" CBD-2	113'-0"	M-1208
24" FBD-24	113'-0"	M-1208
12" FBD-28	113'-0"	M-1208
30" FBD-23	113'-0"	M-1208
24" FBD-21	113'-0"	M-1208
14" DBD-65	113'-0"	M-1208
12" DBD-26	113'-0"	M-1208
2" DBD-62	113'-0"	M-1208
6" GBD-143	113'-0"	M-1208
3" DBD-2	113'-0"	M-1208
8" GBD-113	113'-0"	M-1208
8" GBD-113	113'-0"	M-1210
12" GBD-62	113'-0"	M-1210
30" DBD-58	113'-0"	M-1210
2" DBD-47	113'-0"	M-1210
18" DBD-59	113'-0"	M-1210
30" DBD-58	113'-0"	M-1210
12" DBD-61	113'-0"	M-1210
2" DBD-12	113'-0"	M-1210
3" DBD-45	113'-0"	M-1210
8" GBD-116	113'-0"	M-1210
4" DBD-47	113'-0"	M-1211
22" GBD-62	113'-0"	M-1211
12" GBD-56	113'-0"	M-1211
8" GBD-113	113'-0"	M-1211
30" DBD-58	113'-0"	M-1211
16" DBD-57	113'-0"	M-1211
NO HELB	113'-0"	M-1209

Line No.	Elevation	Composite Dwg.
NO HELB	133'-0"	M-1212
16" FBD-19	133'-0"	M-1213
18" FBD-18	133'-0"	M-1213
3" DBD-77	133'-0"	M-1213
14" DBD-65	133'-0"	M-1213
14" DBD-64	133'-0"	M-1213
6" DBD-124	133'-0"	M-1213
8" GBD-113	133'-0"	M-1213
6" GBD-134	133'-0"	M-1213
14" DBD-64	133'-0"	M-1214
6" GBD-143	133'-0"	M-1214
14" DBD-65	133'-0"	M-1214
24" GBD-2	133'-0"	M-1214
3" DBD-77	133'-0"	M-1214
28" DBD-56	133'-0"	M-1214
18" DBD-26	133'-0"	M-1214
24" GBD-1	133'-0"	M-1214
6" DBD-1	133'-0"	M-1214
24" FBD-24	133'-0"	M-1214
2" FBD-45	133'-0"	M-1214
24" DBD-14	133'-0"	M-1214
2" CBD-4	133'-0"	M-1214
24" CBD-1	133'-0"	M-1214
12" CBD-2	133'-0"	M-1214
NO HELB	133'-0"	M-1215
3" GBD-61	133'-0"	M-1216
6" DBD-124	133'-0"	M-1216
14" DBD-64	133'-0"	M-1216
18" FBD-43	133'-0"	M-1216
18" DBD-59	133'-0"	M-1216
6" GBD-134	133'-0"	M-1216
8" GBD-113	133'-0"	M-1216
28" DBB-23	133'-0"	M-1216
24" DBB-73	133'-0"	M-1216
28" DBB-56	133'-0"	M-1216
24" DBD-14	133'-0"	M-1217
24" DBD-15	133'-0"	M-1217
14" DBD-64	133'-0"	M-1217
18" DBD-20	133'-0"	M-1217
22" GBD-62	133'-0"	M-1217
12" DBD-21	133'-0"	M-1217
12" DBD-22	133'-0"	M-1217
28" DBD-16	133'-0"	M-1217
12" GBD-56	133'-0"	M-1217
3" GBD-61	133'-0"	M-1217
28" DBD-18	133'-0"	M-1217
8" DBD-60	133'-0"	M-1217
24" GBD-1	133'-0"	M-1217
16" DBD-57	133'-0"	M-1217

Line No.	Elevation	Composite Dwg.
28" DBD-56	133'-0"	M-1217
30" DBD-19	133'-0"	M-1217
24" DBD-25	133'-0"	M-1217
2" DBD-75	133'-0"	M-1217
3" DBD-77	133'-0"	M-1217
14" DBD-65	133'-0"	M-1217
18" DBD-26	133'-0"	M-1217
NO HELB	166'-0"	M-1218
24" DBD-66	166'-0"	M-1219
16" GBD-32	166'-0"	M-1219
16" DBD-67	166'-0"	M-1219
6" DBD-124	166'-0"	M-1219
6" DBD-64	166'-0"	M-1219
16" GBD-32	166'-0"	M-1219
6" GBD-35	166'-0"	M-1219
8" GBD-113	166'-0"	M-1219
6" GBD-115	166'-0"	M-1219
18" GBD-114	166'-0"	M-1219
6" GBD-134	166'-0"	M-1219
2" GBD-73	166'-0"	M-1219
28" DBD-56	166'-0"	M-1220
16" GBD-32	166'-0"	M-1220
NO HELB	166'-0"	M-1221
16" GBD-32	166'-0"	M-1222
6" DBD-113	166'-0"	M-1222
24" DBD-66	166'-0"	M-1222
6" GBD-157	166'-0"	M-1222
6" DBD-67	166'-0"	M-1222
14" DBD-64	166'-0"	M-1222
6" GBD-35	166'-0"	M-1222
6" GBD-134	166'-0"	M-1222
18" GBD-114	166'-0"	M-1222
6" GBD-115	166'-0"	M-1222
16" GBD-32	166'-0"	M-1223

Nonsafety Grade Control Systems

In Common Locations

Area	Elevation	Panel or MCC/LCC/BUS	Instrument	Associated System	Comments
1	93'0"	H22-P084	N23-LT-N059A	Feedwater Temperature	Tap in Area 14
		H22-P084	N23-LT-N059B	Feedwater Temperature	Tap in Area 14
		H22-P084	N23-LT-N079	Feedwater Temperature	Tap in Area 6
		H22-P084	N23-LT-N082	Feedwater Temperature	Tap in Area 6
2	93'0"	NA	N32-SV-F507B	Turbine Generator Trip	Electrical Solenoid Valve
3	93'-0"	NA	N23-LT-N079	Feedwater Temperature	Sensing Line, Instrument in Area 1
		NA	N23-LT-N082	Feedwater Temperature	Sensing Line, Instrument in Area 1
4	93'0"	NA	N62-FT-N013A-D	Condenser Vacuum	Sensing Lines, Instruments in Area 12
5	113'-0"	LCC 14BE2	NA	Turbine Trip/Feedwater Temperature	
		LCC13BD1	NA	Turbine Trip	
6	113'-0"	NA	N23-LSLL-N081	Feedwater Temperature	Tap in Same Area
		NA	N23-LT-N059A	Feedwater Temperature	Sensing Line, Instrument in Area 1
		NA	N23-LT-N059B	Feedwater Temperature	Sensing Line, Instrument in Area 1
		NA	N23-LT-N079	Feedwater Temperature	Tap, Instrument in Area 1
		NA	N23-LT-N082	Feedwater Temperature	Tap, Instrument in Area 1
7	113'-0"	MCC 14B22	NA	Turbine Trip	
		MCC 12B11	NA	Feedwater Temperature	
		MCC 12B12	NA	Feedwater Temperature	
		LCC 12BE1	NA	Feedwater Temperature	
		H22-P043	C34-FT-N002A	Feedwater Control	Tap in Area 23
		H22-P043	C34-FT-N002B	Feedwater Control	Tap in Area 23
		NA	N30-PT-N018A&C	Turbine Bypass Control	Taps in Area 18
		NA	N30-PT-N019A&C	Turbine Bypass Control	Taps in Area 18

Nonsafety Grade Control Systems

In Common Locations

Area	Elevation	Panel or MCC/LCC/BUS	Instrument	Associated System	Comments
8	113'-0"	BUS 12HE	NA	Turbine Trip/Condenser Vacuum/Feedwater Temperature	
		BUS 14AE	NA	Turbine Trip/Feedwater Temperature	
9	113'-0"	MCC 12B41	NA	Turbine Trip/Condenser Vacuum	
		LCC 12BE4	NA	Turbine Trip/Condenser Vacuum	
		MCC 13B21	NA	Turbine Trip/Condenser Vacuum	
		LCC 13BD2	NA	Turbine Trip/Condenser Vacuum	
		NA	N62-SV-F501A&B	Condenser Vacuum	Air Supply to Valves, Valves in Areas 10 & 11
10	113'0"	N62-B001A	N62-SV-F501A	Condenser Vacuum	Tap in Same Area
		NA	N62-FT-N013A&C	Condenser Vacuum	Taps, Instruments in Area 12
11	113'-0"	N62-B001B	N62-SV-F501B	Condenser Vacuum	Tap in Same Area
		NA	N62-FT-N013B&D	Condenser Vacuum	Taps, Instruments in Area 12
12	113'-0"	H22-P081	N23-LT-N003A	Feedwater Temperature	Tap in Area 21
		H22-P081	N23-LT-N004A	Feedwater Temperature	Tap in Area 21
		H22-P081	N23-LT-N018A	Feedwater Temperature	Tap in Area 21
		H22-P081	N23-LT-N020A	Feedwater Temperature	Tap in Area 21
		H22-P081	N23-LT-N030A	Feedwater Temperature	Tap in Area 21
		H22-P081	N23-LT-N031A	Feedwater Temperature	Tap in Area 21
		H22-P081	N62-FT-N013C	Condenser Vacuum	Tap in Area 10
		H22-P081	N62-FT-N013D	Condenser Vacuum	Tap in Area 11
		H22-P082	N23-LT-N003B	Feedwater Temperature	Tap in Area 21
		H22-P082	N23-LT-N004B	Feedwater Temperature	Tap in Area 21
		H22-P082	N23-LT-N018B	Feedwater Temperature	Tap in Area 21
		H22-P082	N23-LT-N020B	Feedwater Temperature	Tap in Area 21
		H22-P082	N23-LT-N030B	Feedwater Temperature	Tap in Area 21
		H22-P082	N23-LT-N031B	Feedwater Temperature	Tap in Area 21

Nonsafety Grade Control Systems

In Common Locations

Area	Elevation	Panel or MCC/LCC/BUS	Instrument	Associated System	Comments
12 (continued)	113'-0"	H22-P083	N23-LT-N003C	Feedwater Temperature	Tap in Area 21
		H22-P083	N23-LT-N004C	Feedwater Temperature	Tap in Area 21
		H22-P083	N23-LT-N018C	Feedwater Temperature	Tap in Area 21
		H22-P083	N23-LT-N020C	Feedwater Temperature	Tap in Area 21
		H22-P083	N23-LT-N030C	Feedwater Temperature	Tap in Area 21
		H22-P083	N23-LT-N031C	Feedwater Temperature	Tap in Area 21
		H22-P077	N62-LT-N013A	Condenser Vacuum	Tap in Area 10
		H22-P077	N62-LT-N013B	Condenser Vacuum	Tap in Area 11
		D17-J034	D17-RE-N002	Off-gas System Control	
13	133'-0"	NA	N23-LSHH-N062A	Feedwater Temperature	Tap in Same Area
		NA	N23-LSHH-N074A	Feedwater Temperature	Tap in Same Area
		N21-B005A	N36-SV-F523A	Feedwater Temperature	Tap in Same Area
		N21-B005A	N36-SV-F524A	Feedwater Temperature	Tap in Same Area
		N21-B006A	N36-SV-F520A	Feedwater Temperature	Tap in Same Area
		N21-B006A	N36-SV-F521A	Feedwater Temperature	Tap in Same Area
		NA	N36-SV-F525A	Feedwater Temperature	Tap, Valve in Area 17
14	133'-0"	NA	N23-LSHH-N062B	Feedwater Temperature	Tap in Same Area
		NA	N23-LSHH-N074B	Feedwater Temperature	Tap in Same Area
		N21-B005B	N36-SV-F523B	Feedwater Temperature	Tap in Same Area
		N21-B005B	N36-SV-F524B	Feedwater Temperature	Tap in Same Area
		N21-B006B	N36-SV-F520B	Feedwater Temperature	Tap in Same Area
		N21-B006B	N36-SV-F521B	Feedwater Temperature	Tap in Same Area
		NA	N23-LT-N059A&B	Feedwater Temperature	Taps, Instruments in Area 1
		NA	N36-SV-F525B	Feedwater Temperature	Tap, Valve in Area 17
		NA	N30-PT-N018B&D	Turbine Bypass Control	Sensing Lines, Instruments in Area 17
		NA	N30-PT-N019B&D	Turbine Bypass Control	Sensing Lines, Instruments in Area 17

Nonsafety Grade Control Systems

In Common Locations

Area	Elevation	Panel or MCC/LCC/BUS	Instrument	Associated System	Comments
15	133'-0"	MCC 13B12	NA	Turbine Trip	
16	133'-0"	N34-A003	N34-PS-N013	Turbine Generator Trip	Tap in Same Area
		N34-A003	N34-PS-N014	Turbine Generator Trip	Tap in Same Area
		N34-A003	N34-PS-N040	Turbine DC Oil Pump Control	Tap in Same Area
		N34-A003	N34-PS-N041	Turbine DC Oil Pump Control	Tap in Same Area
17	133'-0"	NA	N30-PT-N018B&D	Turbine Bypass Control	Taps in Area 18
		NA	N30-PT-N019B&D	Turbine Bypass Control	Taps in Area 18
		NA	N36-SV-F525A&B	Feedwater Temperature	Taps in Areas 13 & 14
18	133'-0"	NA	N21-ZC-R097	Feedwater Control	
		NA	N30-PT-N018A-D	Turbine Bypass Control	Taps, Instruments in Area 17
		NA	N30-PT-N019A-D	Turbine Bypass Control	Taps, Instruments in Area 17
19	133'-0"	BUS 13AD	NA	Turbine Trip/Condenser Vacuum	
20	133'-0"	N43-D001	N43-TE-N070	Turbine Generator Trip	
		N43-D001	N43-TE-N084	Turbine Generator Trip	
		N43-D002	N43-FT-N058	Turbine Generator Trip	Tap in Area 28
		N43-D002	N43-FT-N060	Turbine Generator Trip	Tap in Area 28
		N43-D002	N43-FT-N061	Turbine Generator Trip	Tap in Area 28
		N43-D002	N43-FT-N062	Turbine Generator Trip	Tap in Same Area
		N43-D002	N43-FT-N063	Turbine Generator Trip	Tap in Same Area
		N43-D002	N43-FT-N064	Turbine Generator Trip	Tap in Area 28
		N43-D002	N43-FT-N065	Turbine Generator Trip	Tap in Same Area
		N43-D002	N43-FT-N066	Turbine Generator Trip	Tap in Same Area
		N43-D002	N43-FT-N067	Turbine Generator Trip	Tap in Area 28
		N43-D002	N43-FT-N068	Turbine Generator Trip	Tap in Area 28

Nonsafety Grade Control Systems

In Common Locations

Area	Elevation	Panel or MCC/LCC/BUS	Instrument	Associated System	Comments
20 (continued)	133'-0"	N42-D001	N43-LT-N036	Turbine Generator Trip	Tap in Same Area
		N42-D001	N43-LT-N158	Turbine Generator Trip	Tap in Same Area
		H22-P148	N43-LT-N051	Turbine Generator Trip	Tap in Same Area
		H22-P148	N43-LT-N052	Turbine Generator Trip	Tap in Same Area
21	133'-0"	NA	N23-LSHH-N001A-C	Feedwater Temperature	Tap in Same Area
		NA	N23-LSHH-N017A-C	Feedwater Temperature	Tap in Same Area
		NA	N23-LSHH-N032A-C	Feedwater Temperature	Tap in Same Area
		NA	N23-LSHH-N045A-C	Feedwater Temperature	Tap in Same Area
22	133'-0"	NA	C34-FT-N002A&B	Feedwater Control	Sensing Lines, Instruments in Area 7
23	133'-0"	NA	C34-FT-N002A&B	Feedwater Control	Taps, Instruments in Area 7
24	166'-0"	H22-P189	N32-PS-N015	Pressure Controller	Tap in Same Area
		H22-P189	N32-PS-N016	Pressure Controller	Tap in Same Area
		H22-P185	N32-SV-F505A-C	Turbine Bypass Control	Electrical Solenoid Valves
		H22-P186	N32-SV-F507A	Turbine Generator Trip	Electrical Solenoid Valve
		H22-P187	N32-PS-N011	Turbine Generator Trip	Tap in Same Area
		H22-P187	N32-PS-N012	Turbine Generator Trip	Tap in Same Area
25	166'-0"	H22-P533	N30-PS-N003	Turbine Generator Trip	Tap in Same Area
		H22-P533	N30-PS-N004	Turbine Generator Trip	Tap in Same Area
26	166'-0"	NA	N35-LSH-N046B	Turbine Generator Trip	Tap in Same Area
		NA	N35-LSH-N047B	Turbine Generator Trip	Tap in Same Area
		NA	N35-LSH-N049B	Turbine Generator Trip	Tap in Same Area
		NA	N35-LSH-N050B	Turbine Generator Trip	Tap in Same Area

Nonsafety Grade Control Systems

In Common Locations

Area	Elevation	Panel or MCC/LCC/BUS	Instrument	Associated System	Comments
27	166'-0"	NA	N35-LSH-N046A	Turbine Generator Trip	Tap in Same Area
		NA	N35-LSH-N047A	Turbine Generator Trip	Tap in Same Area
		NA	N35-LSH-N049A	Turbine Generator Trip	Tap in Same Area
		NA	N35-LSH-N050A	Turbine Generator Trip	Tap in Same Area
28	166'-0"	Exciter	N43-YT-N077	Turbine Generator Trip	Tap in Same Area
		Exciter	N43-YT-N078	Turbine Generator Trip	Tap in Same Area
		Exciter	N43-YT-N079	Turbine Generator Trip	Tap in Same Area
		Exciter	N43-YT-N080	Turbine Generator Trip	Tap in Same Area
		NA	N43-FT-N058	Turbine Generator Trip	Tap, Instrument in Area 20
		NA	N43-FT-N060	Turbine Generator Trip	Tap, Instrument in Area 20
		NA	N43-FT-N061	Turbine Generator Trip	Tap, Instrument in Area 20
		NA	N43-FT-N064	Turbine Generator Trip	Tap, Instrument in Area 20
		NA	N43-FT-N067	Turbine Generator Trip	Tap, Instrument in Area 20
		NA	N43-FT-N068	Turbine Generator Trip	Tap, Instrument in Area 20

Turbine Building Walkdown
Concern for Area 14

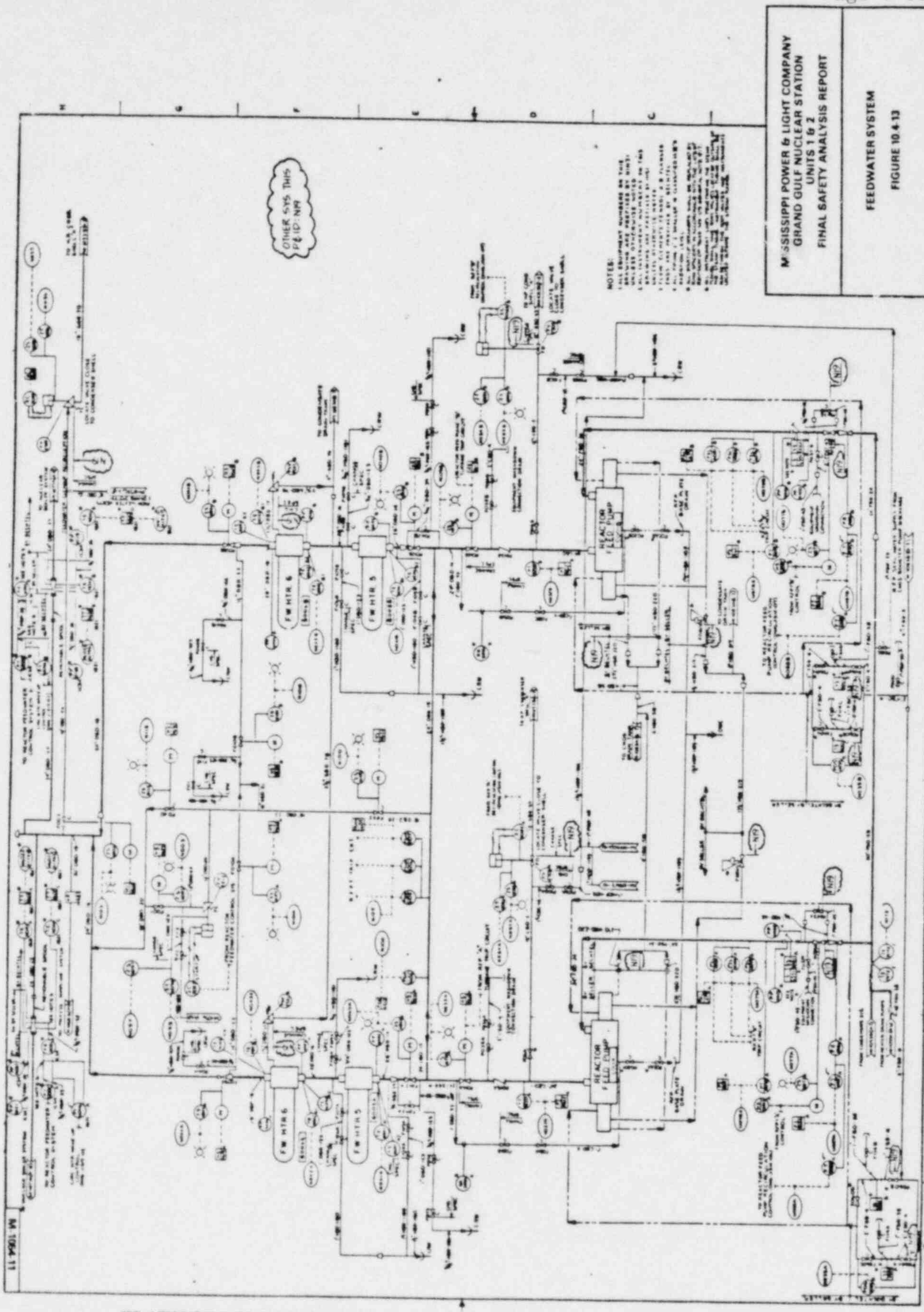
CONCERN

Attachment 6 to this report identified one remaining area of the Turbine Building to be evaluated for the effects of high energy line breaks on nonsafety grade control systems. A break of any of four separate high energy lines (28"-DBD-16, 24"-GBD-1, 22"-GBD-62, or 14"-DGD-64) can result in failure of the sensing lines to N30-PT-N018B&D, N30-PT-N019B&D, N23-LSHH-N062B, N23-LT-N059B. The simultaneous loss of the N30 pressure transmitters would result in a reading by the Pressure Controller which is 50% of the actual RPV pressure and thus could cause closure of the Turbine Control Valves. This would simulate approximately the Pressure Controller Failure-Closed transient. The worst case loss resulting from failure of the sensing lines to the N23 instruments is approximately a 68°F drop in feedwater temperature.

EVALUATION

Four separate high energy lines have been identified in the Turbine Building for which a break of any can result in simultaneous failure of a pressure controller transmitter and a feedwater heater sensing line. The worst transient resulting from this combined failure would be the turbine control valve fast closure concurrent with the partial loss of feedwater heating resulting in a maximum feedwater temperature drop of 68°F.

Since the feedwater heater has an approximate 60 second time constant and the transportation lag is on the order of 10 to 20 seconds, the loss of a feedwater heater essentially has no effect on the transient resulting from the turbine control valve fast closure. This would be terminated by a high neutron flux scram in 3 seconds. Therefore, this event, simulataneous failure of a pressure controller transmitter and a feedwater heater sensing line, would be bounded by the pressure regulator down scale failure event analyzed in Chapter 15, in which a bounding closure rate (40%/sec) and complete closure were assumed for the turbine control valve.


MISSISSIPPI POWER & LIGHT COMPANY
GRAND GULF NUCLEAR STATION
UNITS 1 & 2
FINAL SAFETY ANALYSIS REPORT
FEEDWATER SYSTEM
FIGURE 10.4-13
AMEND. 52 12/81
OTHER SYS THIS P&ID: NM
FW HTR 6
FW HTR 5
REACTOR FEED PUMP
NOTES:
M-1064