



# MISSISSIPPI POWER & LIGHT COMPANY

*Helping Build Mississippi*

P. O. BOX 1640, JACKSON, MISSISSIPPI 39205

May 11, 1984

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  
License No. NPF-13  
File 0260/L-860.0/L-952.0/M-189.0  
Inservice Inspection to ASME  
Section XI  
AECM-84/0257

This letter transmits the sample plan for the selection of Grand Gulf Nuclear Station (GGNS) Unit 1 pipe supports that shall be subject to the ten-year inservice inspection plan to comply with the ASME Boiler and Pressure Vessel Code, Section XI, 1977 Edition with Addenda through and including Summer of 1979.

The attachment delineates the criteria which shall be used for the selection of ASME Section III Class 1, 2 and 3 pipe supports requiring inservice inspection.

This sample plan, however, does not encompass snubbers since the safety related snubbers on ASME Class 1, 2 and 3 piping shall be subject to examination and operability testing in accordance with surveillance requirements described in GGNS Unit 1 Technical Specifications, Section 3/4.7.4.

Please review the attached information by June 1, 1984, so that the ten-year inservice inspection plan can be submitted to you by August 1, 1984.

If you have any questions or require further information, please contact this office.

Yours truly,

L. F. Dale  
Manager of Nuclear Services

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Attachment: Sample Plan for Pipe Supports

cc: (See Next Page)

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Member Middle South Utilities System

MISSISSIPPI POWER & LIGHT COMPANY

AECM-84/0257

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SAMPLE PLAN FOR PIPE SUPPORTS

1.0 SCOPE

This document describes the sample plan that shall be used in selecting pipe supports that shall be subject to ISI.

This sample plan is limited to pipe supports as defined in the Subsection IWF of the ASME Boiler and Pressure Vessel Code Section XI, 1977 Edition through and including 1979 Summer Addenda. This sample plan does not cover snubbers, as all safety related snubbers on ASME Class 1, Class 2, and Class 3 piping are subject to examination and operability testing as per surveillance procedures described in GGNS Unit 1 Operating License Manual Section 3/4.7.4.

2.0 EXEMPTION CRITERIA

The sample plan for pipe supports shall exclude following supports:

- 2.1 Pipe supports on ASME Section III Class 1 piping 1" nps and smaller. Also, pipe supports on piping 2" nps and smaller inaccessible due to control rod drive penetrations.
- 2.2 Pipe supports on ASME Section III Class 2 and 3 piping 2" nps and smaller.
- 2.3 Pipe supports buried or encased in concrete or within guard pipes.

3.0 PERFORMANCE CRITERIA FOR THE SAMPLE PLAN

The performance criteria for the sampling plan is that it shall provide 95 percent confidence that a support population which contains 10 percent or more defective supports will be rejected (i.e. 95/90). This criteria will be satisfied over the ten-year interval of this plan

4.0 SUPPORT CATEGORIES

The pipe supports to be inspected as per this sample plan shall be grouped by the support types such as spring, anchor or rigid. Where a support is constructed from more than one support type, each type shall be listed with its respective category. Rigid supports shall be further divided into standard components and frame type supports, based on their assembly details. Further, all groups shall be subdivided into Class 1, and Class 2 or 3, based on the piping code class. The supports on pipe Class 2 and 3 shall be placed into the same category since their design, fabrication and installation requirements are similar.

5.0 SAMPLING PLAN

A single stage sampling plan shall be selected. The size of the sample for such a plan depends upon the population size and the maximum number of rejects permitted in the sample. The sample size is based on hypergeometric population distribution. For large populations, the sample size shall

## SAMPLE PLAN FOR PIPE SUPPORTS

permit 1 or more defective supports, while for small population (less than approximately 50) a zero defective support shall be allowed within the sample selected. A typical example of such a sampling plan is shown in Attachment #1.

#### 6.0 SELECTION OF SUPPORT SAMPLES

The selection of supports for each sample shall be based on a random basis. The population in each support category shall be assigned random indices. From each population category, the required number of samples shall be drawn randomly. This sample selection shall be performed using a subroutine from the International Mathematical and Statistical Library, which generates the specified number of sample indices (equal to the sample size) from a given population size. These sample indices shall be then matched with the indices in the corresponding population to arrive at the supports to be inspected.

Attachment #2 is an example of the selection of random sample indices and sample supports.

#### 7.0 EXAMINATION

The pipe support samples selected shall be examined once during the ten year interval. The sample size in each support category shall be scheduled over three inspection periods, in accordance with ASME Section XI Tables IWB-2412-1 and IWC-2412-1. The results of the examination shall be evaluated in accordance with ASME Section XI.

#### 8.0 ADDITIONAL EXAMINATIONS

- 8.1 In the event that the number of unacceptable supports exceeds the permissible reject level, additional examinations shall be made. The additional examinations shall be conducted in accordance with a sampling appropriate for the population size of the original sample.
- 8.2 For small populations (less than approximately 100), when the number of cumulative defectives exceeds the acceptance number, the entire population shall be examined.
- 8.3 For large populations, upon completion of the inspection of the initial sample and their evaluation, additional samples shall be generated for ISI. The size of these additional samples will be determined based on the evaluation of the defects recorded in the samples examined. If the nature and origin of the defect can be established, all pipe supports with similar possible defects shall be examined. For the case when such trend cannot be established, the additional samples will be determined by the initial acceptance number and the total number of defective supports recorded in the samples examined. The equation that shall be used to generate the additional sample size is provided in Attachment #3. The use of the equation with a typical example is also explained.

SAMPLE PLAN FOR PIPE SUPPORTS

9.0 ATTACHMENTS

- 9.1 Attachment #1 - Sampling Plan for Pipe Supports Subject to ISI
- 9.2 Attachment #2 - Selection Process for Pipe Supports
- 9.3 Attachment #3 - Equations for Additional Samples

GRAND GULF NUCLEAR STATION  
UNIT 1

SAMPLE PLAN FOR PIPE SUPPORTS

TABLE #1

SAMPLING PLAN FOR PIPE SUPPORTS SUBJECT TO ISI

No.	Support Category	Population Size	Sample Size	No of Defects	
				Accept	Reject
<u>ASME Class 1</u>					
1	Spring	69	40	0 or 1	2
2	Rigid (Std. Comp)	40	21	0	1
3	Rigid (Frame)	85	40	0 or 1	2
<u>ASME Class 2 &amp; 3</u>					
4	Spring	74	40	0 or 1	2
5	Anchor	66	40	0 or 1	2
6	Rigid (Std. Comp)	712	100	5 or less	6
7	Rigid (Frame)	638	100	5 or less	6



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 CALCULATION BY SHYAM KUMAR-----VERIFIED BY -----

GRAND GULF NUCLEAR STATION-UNIT 1  
 POPULATION OF PIPE SUPPORTS FOR ISI

TABLE 1A SPRING SUPPORTS (PIPE-CLASS 1)

SHU.	RANDOM INDICES	SYS.	HL Dwg.NO.	PIPE SUPPORT NO	PIPE SIZE INCH	PIPE CLASS	LINE NO.	STRESS PROR	REMARKS
1	45	B21	G002-769E453	Q1021G006H101A	28	--A	A	NA	MAIN STR-GE FIURN.
2	55	B21	G002-769E453	Q1021G006H101B	28	--A	B	NA	MAIN STR-GE FIURN.
3	19	B21	G002-769E453	Q1021G006H102A	28	--A	B	NA	MAIN STR-GE FIURN.
4	35	B21	G002-769E453	Q1021G006H101C	28	--A	B	NA	MAIN STR-GE FIURN.
5	34	B21	G002-769E453	Q1021G006H102C	28	--A	C	NA	MAIN STR-GE FIURN.
6	57	B21	G002-769E453	Q1021G006H101D	28	--A	D	NA	MAIN STR-GE FIURN.
7	1	B21	1328J/6	Q1021G026H04	12	DBA	17	75	
8	54	B21	1328J/6	Q1021G026H02	12	DBA	17	74	
9	32	B21	1328J/6	Q1021G026H03	18	DBA	13	75	
10	7	B21	1328J/6	Q1021G026H01	18	DBA	13	74	
11	60	B21	1077A-023-C/3	Q1021G153C02	2	DBA	19	2081	COMB. W/PICIN, SHUR.
12	38	B21	1077A-023-C/3	Q1021G153C03	2	DBA	21	2081	COMB. W/SHUR.
13	68	B21	1077A-022-C/2	Q1021G152H01	2	DBA	19	2081	
14	69	B21	1328J/6	Q1021G026C02	24	DBA	13	75	COMB W/SHUR
15	17	B21	1328J/6	Q1021G026C01	24	DBA	13	74	COMB. W/SHUR
16	21	B33	G002-768E317	Q1033G006H351A	16	--A	A	NA	RECTRC-GE FIURN.
17	6	B33	G002-768E317	Q1033G006H352A	16	--A	A	NA	RECTRC-GE FIURN.
18	39	B33	G002-768E317	Q1033G006H353A	16	--A	A	NA	RECTRC-GE FIURN.
19	26	B33	G002-768E317	Q1033G006H354A	16	--A	A	NA	RECTRC-GE FIURN.
20	30	B33	G002-768E317	Q1033G006H351B	16	--A	B	NA	RECTRC-GE FIURN.
21	64	B33	G002-768E317	Q1033G006H352B	16	--A	B	NA	RECTRC-GE FIURN.
22	3	B33	G002-768E317	Q1033G006H353B	16	--A	B	NA	RECTRC-GE FIURN.
23	52	B33	G002-768E317	Q1033G006H354B	16	--A	B	NA	RECTRC-GE FIURN.
24	50	B33	G002-768E317	Q1033G006H301A	24	--A	A	NA	RECTRC-GE FIURN.
25	2	B33	G002-768E317	Q1033G006H302A	24	--A	A	NA	RECTRC-GE FIURN.
26	53	B33	G002-768E317	Q1033G006H303A	24	--A	A	NA	RECTRC-GE FIURN.
27	20	B33	G002-768E317	Q1033G006H304A	24	--A	A	NA	RECTRC-GE FIURN.
28	16	B33	G002-768E317	Q1033G006H305A	24	--A	A	NA	RECTRC-GE FIURN.
29	5	B33	G002-768E317	Q1033G006H306A	24	--A	A	NA	RECTRC-GE FIURN.
30	47	B33	G002-768E317	Q1033G006H355A	24	--A	A	NA	RECTRC-GE FIURN.
31	13	B33	G002-768E317	Q1033G006H356A	24	--A	A	NA	RECTRC-GE FIURN.
32	24	B33	G002-768E317	Q1033G006H301B	24	--A	B	NA	RECTRC-GE FIURN.
33	33	B33	G002-768E317	Q1033G006H302B	24	--A	B	NA	RECTRC-GE FIURN.
34	4	B33	G002-768E317	Q1033G006H303B	24	--A	B	NA	RECTRC-GE FIURN.
35	56	B33	G002-768E317	Q1033G006H304B	24	--A	B	NA	RECTRC-GE FIURN.
36	48	B33	G002-768E317	Q1033G006H305B	24	--A	B	NA	RECTRC-GE FIURN.
37	66	B33	G002-768E317	Q1033G006H306B	24	--A	B	NA	RECTRC-GE FIURN.
38	65	B33	G002-768E317	Q1033G006H355B	24	--A	B	NA	RECTRC-GE FIURN.
39	23	B33	G002-768E317	Q1033G006H356B	24	--A	B	NA	RECTRC-GE FIURN.

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GRAND GULF NUCLEAR STATION-UNIT 1  
 POPULATION OF PIPE SUPPORTS FOR ISI

TABLE 1A SPRING SUPPORTS (PIPE=CLASS 1)

SNO.	RANDOM INDICES	SYS.	HL DWG.NO.	PIPE SUPPORT NO	PIPE SIZE INCH	PIPE CLASS	LINE NO.	STRESS PROB	REMARKS
40	36	B33	1078A-028C/1	Q1B33G128C01	2	DBA	40	13A	COMB. W/SNIIBER
41	8	B33	1078A-005C/2	Q1B33G105C01	2	DCA	24	13A	COMB. W/SNIIBER
42	18	B33	1078A-088C/4	Q1B33G108C01	2	DCA	24	13A	COMB. W/SNIIBER
43	28	B33	1078A-029-C/1	Q1B33G129C01	2	DBA	41	13A	COMB. W/SNIIBER
44	14	B33	1342A	Q1B33G024H01	4	DCA	1	13A	COMB. W/SPRING, RTGTD
45	31	C41	1082-013C	Q1C41G113H01	1.5	DCA	3	204A	
46	59	C41	1082-019C	Q1C41G119H02	1.5	DCA	3	2047	
47	9	E12	1348T/4	Q1E12G016H01	12	DBA	38	67	
48	49	E12	1348F/15	Q1E12G015H12	14	DBA	28	102	
49	37	E12	1348F/15	Q1E12G015H04	14	DBA	29	101	
50	41	E12	1348A/17	Q1E12G012H19	20	DBA	64	123	
51	10	E12	1348E/20	Q1E12G014H01	6	DBA	32	365	
52	62	E21	1350B/7	Q1E21G002H04	14	DBA	1	56	
53	61	E21	1350B/7	Q1E21G002H01	14	DBA	1	55	
54	27	E22	1349B/7	Q1E22G003H04	4	DBA	5	60	
55	42	E22	1349B/7	Q1E22G003H03	4	DBA	5	61	
56	63	E51	1347A/10	Q1E51G004H07	10	DBA	24	229	
57	58	E51	1346A/12	Q1E51G001H09	6	DBA	30	7A	
58	46	E51	1346A/12	Q1E51G001H08	6	DBA	30	7A	
59	51	E51	1346A/12	Q1E51G001H07	6	DBA	30	7A	
60	44	E51	1346A/12	Q1E51G001H05	6	DBA	30	7A	
61	43	G33	1079-005C/1	Q1G33G105H01	2	DBA	12	13A	
62	25	G33	1342A/16	Q1G33G002H12	4	DBA	9	13A	
63	29	G33	1342A/16	Q1G33G002H15	4	DBA	9	13A	
64	15	G33	1342A/16	Q1G33G002H09	4	DBA	10	13A	
65	12	G33	1342A/16	Q1G33G002H17	4	DBA	10	13A	
66	11	G33	1342A/16	Q1G33G002C03	4	DBA	11	13A	COMB. W/SNIIB
67	22	G33	1342B/5	Q1G33G011H01	6	DBA	29	13A	
68	40	G33	1342A/16	Q1G33G002H14	6	DBA	9	13A	
69	67	G33	1342A/16	Q1G33G002H13	6	DBA	9	13A	



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GRAND GULF NUCLEAR STATION-UNIT 1: PIPE SUPPORT ISI SAMPLING

TABLE 18 SPRING SUPPORTS (PIPE-CLASS 1)

PIPE SUPPORT SAMPLE NO. 1  
TYPE OF SUPPORT SPRING SUPPORTS (PIPE-CLASS 1)

POPULATION 69  
SAMPLE SIZE 40  
NO. OF DEFECTIVE 1 OR LESS-ACCEPT  
NO. OF DEFECTIVE 2 OR MORE-REJECT  
SAMPLING PLAN SINGLE  
ASSUMED DISTRIBUTION HYPERGEOMETRIC

RANDOM SAMPLE INDICES ARE

2	5	6	7	13	14	15	16	19	20
21	22	26	27	29	32	33	34	35	36
37	38	40	43	44	47	48	49	51	52
53	55	56	57	58	59	60	63	67	68

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## LIST OF SUPPORTS TO BE EXAMINED

TABLE 1C SPRING SUPPORTS (PIPE-CLASS 1)

MANDUM SNU. INDICES	SYS.	HL DWG.NO.	PIPE SUPPORT NO	PIPE SIZE INCH	PIPE CLASS	LINE NO.	STRESS PROB	REMARKS	
2	25	B33	G002-768E317	Q1B33G006H302A	24	--A	A	NA	RECTRC-GE FIURN.
5	29	B33	G002-768E317	Q1B33G006H306A	24	--A	A	NA	RECTRC-GE FIURN.
6	17	B33	G002-768E317	Q1B33G006H352A	16	--A	A	NA	RECTRC-GE FIURN.
7	10	B21	1328J/6	Q1B21G026H01	18	DBA	13	74	
13	31	B33	G002-768E317	Q1B33G006H356A	24	--A	A	NA	RECTRC-GE FIURN.
14	44	B33	1342A	Q1B33G024H01	4	DCA	1	13A	
15	64	B33	1342A/16	Q1B33G002H09	4	DBA	10	13A	
16	26	B33	G002-768E317	Q1B33G006H305A	24	--A	A	NA	RECTRC-GE FIURN.
19	3	B21	G002-769E453	Q1B21G006H102B	28	--A	B	NA	MAIN STH-GE FIURN.
20	27	B33	G002-768E317	Q1B33G006H304A	24	--A	A	NA	RECTRC-GE FIURN.
21	16	B33	G002-768E317	Q1B33G006H351A	16	--A	A	NA	RECTRC-GE FIURN.
22	67	G33	1342B/5	Q1G33G011H01	6	DBA	89	13A	
26	19	B33	G002-768E317	Q1B33G006H354A	16	--A	A	NA	RECTRC-GE FIURN.
27	54	E22	1349B/7	Q1E22G003H04	14	DBA	5	60	
29	63	G33	1342A/16	Q1G33G002H15	4	DBA	9	13A	
32	9	B21	1328J/6	Q1B21G026H03	18	DBA	13	75	
33	33	B33	G002-768E317	Q1B33G006H302B	24	--A	B	NA	RECTRC-GE FIURN.
34	5	B21	G002-769E453	Q1B21G006H102C	28	--A	C	NA	MAIN STH-GE FIURN.
35	4	B21	G002-769E453	Q1B21G006H101C	28	--A	B	NA	MAIN STH-GE FIURN.
36	40	B33	1078A-028C/1	Q1B33G128C01	2	DBA	40	13A	COMB. W/SHUTTER
37	49	E12	1348F/15	Q1E12G015H04	14	DBA	29	101	
38	12	B21	1077A-023-C/3	Q1B21G153C03	2	DBA	21	2081	COMB. W/SHUT.
40	68	G33	1342A/16	Q1G33G002H14	6	DBA	9	13A	
43	61	G33	1079-005C/1	Q1G33G105H01	2	DBA	12	13A	
44	60	E51	1346A/12	Q1E51G001H05	6	DBA	30	7A	
47	30	B33	G002-768E317	Q1B33G006H355A	24	--A	A	NA	RECTRC-GE FIURN.
48	36	B33	G002-768E317	Q1B33G006H305B	24	--A	B	NA	RECTRC-GE FIURN.
49	48	E12	1348F/15	Q1E12G015H12	14	DBA	28	102	
51	59	E51	1346A/12	Q1E51G001H07	6	DBA	30	7A	
52	23	B33	G002-768E317	Q1B33G006H354B	16	--A	B	NA	RECTRC-GE FIURN.
53	26	B33	G002-768E317	Q1B33G006H303A	24	--A	A	NA	RECTRC-GE FIURN.
55	2	B21	G002-769E453	Q1B21G006H101B	28	--A	B	NA	MAIN STH-GE FIURN.
56	35	B33	G002-768E317	Q1B33G006H304B	24	--A	B	NA	RECTRC-GE FIURN.
57	6	B21	G002-769E453	Q1B21G006H101D	28	--A	D	NA	MAIN STH-GE FIURN.
58	57	E51	1346A/12	Q1E51G001H09	6	DBA	30	7A	
59	46	C41	1082-019C	Q1C41G119-02	1.5	DCA	3	2047	
60	11	B21	1077A-023-C/3	Q1B21G153C02	2	DBA	19	2081	COMB. W/RIGID, SHUT.
63	56	E51	1347A/10	Q1E51G004H07	10	DBA	24	229	
67	69	G33	1342A/16	Q1G33G002H13	6	DBA	9	13A	
68	13	B21	1077A-022-C/2	Q1B21G152H01	2	DBA	19	2081	

GRAND GULF NUCLEAR STATION  
UNIT 1

SAMPLE PLAN FOR PIPE SUPPORTS

CALCULATION FOR ADDITIONAL SAMPLES SIZES

The following equation will be used to determine the size of the additional sample sizes.

$$N = S \frac{2}{c + 1}^2 (a - c)$$

where,

S = Initial sample size

c = Allowable number of defective supports

a = Total number of defective supports in the total sample

For c = 5 and S = 100, the first re-sample size will be

$$N_1 = 11.11 (a - c)$$

Further additional sample sizes will be determined by the following equation

$$N_2 = (b) (S) \frac{2}{c + 1}^2$$

where, b = No of defective supports in the previous re-sample

$$N_2 = 11.11 (b)$$

The process will continue until no additional defective supports are found.