

# GRAND GULF NUCLEAR STATION UNITS 1 & 2

## SEISMIC QUALIFICATION REEVALUATION CLASS 1E EQUIPMENT

COMPONENT NAME: CONTROL ROOM PANELS  
MPL OR EDL ITEM NO.: AS ATTACHED  
MPL REFERENCE: H13-P601

THE SEISMIC QUALIFICATION REPORT(S) IDENTIFIED HEREIN HAVE BEEN EVALUATED AND REQUALIFIED WHERE NECESSARY TO SHOW THAT THE ABOVE-MENTIONED COMPONENT IS CAPABLE OF MEETING THE NUCLEAR REGULATORY COMMISSION SEISMIC QUALIFICATION REVIEW TEAM (SORT) REQUIREMENTS.

PREPARED BY: *L. B. Layne* L. B. LAYNE DATE MARCH 27, 1981

ORGANIZATION Science Applications, Inc.

REVIEWED BY: R. H. Hardy *R. H. Hardy* DATE 4/23/81  
SORT PROGRAM MANAGER

APPROVED BY: S. E. Hassan *S. E. Hassan* DATE 3-27-81  
RESPONSIBLE DESIGN ENGINEER

GENERAL  ELECTRIC

## Qualification Summary of Equipment

I. **Plant Name:** GRAND GULF

**Type:**

1. **Utility:** MISSISSIPPI POWER & LIGHT

**PWR**

2. **NSSS:** GE

3. **A/E:** BECHTEL

**BWR** 6 Mk III

II. **Component Name** Control Room Panel

1. **Scope:** ☒ **NSSS**

☐ **BOP**

2. **Model Number:** H13-P601

**Quantity:** one

3. **Vendor:** General Electric Co.

4. **If the component is a cabinet or panel, name and model No. of the devices included:** See attached device list

5. **Physical Description a. Appearance** Vertical/Bench Board

b. **Dimensions** 117.5" X 84" X30"

c. **Weight** NA

6. **Location: Building:** Control

**Elevation:** See attached device list

7. **Field Mounting Conditions** ☒ **Bolt (No. \*, Size 5/8")**  
☐ **Weld (Length       )**

\* On 6" centers.

8. a. **System in which located:** Reactor Core Cooling System

b. **Functional Description:** Reactor Core Cooling Bench Board

c. **Is the equipment required for** ☐ **Hot Standby** ☐ **Cold Shutdown**  
☒ **Both** ☐ **Neither**

9. **Pertinent Reference Design Specifications:** See reference 4.3.4

12/80

III. Is Equipment Available for Inspection in the Plant: ☒ Yes ☐ No

IV. Equipment Qualification Method:

☒ Test

☐ Analysis

☐ Combination of Test  
and Analysis

Qualification Report\*: Seismic Test Report H12-P870

(No., Title and Date) See Reference 4.3.1

Company that Prepared Report: General Electric Co.

Company that Reviewed Report: General Electric Co.

V. Vibration Input:

1. Loads considered: a. ☒ Seismic only b. ☐ Hydrodynamic only c. ☐ Explosive  
d. ☐ Other (Specify) \_\_\_\_\_ e. ☐ Combination of \_\_\_\_\_

f. Method of Combining RRS: ☐ Absolute Sum ☐ SRSS ☒ NA  
(other, specify) \_\_\_\_\_

2. Required Response Spectra (attach the graphs): See section 2

3. Damping Corresponding to RRS: OBE 3% SSE 3%

4. Required Acceleration in Each Direction: ☒ ZPA ☐ Other \_\_\_\_\_  
(specify)

OBE	S/S =	.254	F/B =	.254	V =	.120
SSE	S/S =	.507	F/B =	.507	V =	.239

5. Is long-term vibration load effects considered ☐ Yes ☒ No

\*Note: The H13-P601 panel is similar to the tested prototype H12-P870 panel.  
The results of the H12-P870 test were applied to the H13-P601 panel  
per the methodology described in the text.

VI. If Qualification by Test, then Complete:

1. ☐ Single Frequency ☒ Multi-Frequency: ☐ random  
☐ sine beat  
☒ In and out-of-phase
2. ☐ Single Axis ☒ Multi-Axis
3. No. of Qualification Tests: OBE 5 SSE 1 Other (specify)
4. Frequency Range: 1-33 Hz
5. Natural Frequencies in Each Direction (Side/Side, Front/Back, Vertical):  
S/S = 13 F/B = 15.5 V = None
6. Method of Determining Natural Frequencies  
☒ Lab Test ☐ Insitu Test ☐ Analysis
7. TRS enveloping RRS using Multi-Frequency Test ☒ Yes (Attach TRS & RRS graph)  
☐ No See Section 2
8. Input g-level Test: OBE S/S = 1.0 F/B = 1.0 V = 1.0  
SSE S/S = 1.5 F/B = 1.5 V = 1.5
9. Laboratory Mounting: (All mounting holes used)  
1. ☒ Bolt (No.       , Size 5/8) ☐ Weld (Length       ) ☒ clamps
10. Functional operability verified: ☒ Yes ☐ No ☐ Not Applicable
11. Test Results including modifications made: The panel maintained its  
structural integrity and the devices performed their Class 1E function.
12. Other test performed (such as aging or fragility test, including results):  
Fragility test results were applied as noted on the device list to  
establish seismic capability of certain devices.

VII. If Qualification by Analysis or by the Combination of Test and Analysis, then  
Complete:

1. Description of Test including Results: NA  
\_\_\_\_\_  
\_\_\_\_\_
2. Method of Analysis:  
☐ Static Analysis    ☐ Equipment Static Analysis  
☐ Dynamic Analysis: ☐ Time-History  
                            ☐ Response Spectrum
3. Natural Frequencies in Each Direction (Side/Side, Front/Back, Vertical):  
S/S = \_\_\_\_\_ F/B = \_\_\_\_\_ V = \_\_\_\_\_
4. Method of Determining Natural Frequencies  
☐ Lab test                      ☐ Insitu Test                      ☐ Analysis
5. Model Type: ☐ 3D                      ☐ 2D                      ☐ ID  
                    ☐ Finit Element    ☐ Beam                      ☐ Closed Form Solution
6. ☐ Computer Codes: \_\_\_\_\_  
Frequency Range and No. of modes considered: \_\_\_\_\_  
☐ Hand Calculations
7. Method of Combining Dynamic Responses: ☐ Absolute Sum    ☐ SRSS  
  ☐ Other: \_\_\_\_\_  
   (specify)
8. Damping: OBE \_\_\_\_\_ Basis for the damping used: \_\_\_\_\_  
              SSE \_\_\_\_\_
9. Support Considerations in the model: \_\_\_\_\_
10. Critical Structural Elements:

		Governing Load or Response Combination	Seismic Stress	Total Stress	Stress Allowable
A.	Identification Location				

B. Max. Critical Deflection	Location	Maximum Allowable Deflection to Assure Functional Operability
-----------------------------	----------	---

# SEISMIC QUALIFICATION REEVALUATION

117.5 INCH WIDE CONTROL ROOM PANEL CLASS 1E EQUIPMENT

Panel MPL Ref: H13-P601  
Location, Elevation: Central Floor, 166'

System: Reactor Core Cooling Bench Board  
Panel Dimension: 117.5" X 84" X 30"

EQUIPMENT MPL NO.	DESCRIPTION	IDENTIFICATION	CURRENT SEISMIC CAPABILITY/ MALFUNCTION LIMIT			MAXIMUM EXPECTED PEAK ACCELERATION			REMARKS
			f-b	s-s	v	f-b	s-s	v	
E12A-S07B	Switch	145C3040P013	20	20	20	11.7	1.7	0.3	See Note 3.1.3
- S10BC									
- S12BC									
- S16BC									
- S35B									
- S36B									
- S37B									
- S39B									
- S40B									
- S54B									
- S58B									
- S59B									
- S68B									
- S69B									
E12A-S03BC	Switch	272A7689P001	-	-	-	11.7	1.9	0.3	Insuficient Data
E12A-S04BC	Switch	145C3040P007	20	20	20	11.7	1.8	0.3	See Note 3.1.3
E12A-S04B-1	Switch	145C3040P018	20	20	20	11.7	2.0	0.3	See Note 3.1.3
- S04C-1									
E12A-S20BC	Switch	145C3040P001	20	20	20	11.7	1.9	0.3	See Note 3.1.3
E12A-S60	Switch	145C3040P004	20	20	20	7.8	2.0	0.3	See Note 3.1.3
E12A-S61	Switch	145C3040P006	20	20	20	7.8	1.6	0.3	See Note 3.1.3
E12A-S57	Switch	272A7561P002				11.7	1.9	0.3	Insuficient Data
E12A-S24B-1	Switch	145C3040P006	20	20	20	7.8	1.6	0.3	See Note 3.1.3



# SEISMIC QUALIFICATION REEVALUATION

117.5 INCH WIDE CONTROL ROOM PANEL CLASS 1E EQUIPMENT

Panel MPL Ref: H13-P601  
Location, Elevation: Central Floor, 166'

System: Reactor Core Cooling Bench Board  
Panel Dimension: 117.5" X 84" X 30"

EQUIPMENT MPL NO.	DESCRIPTION	IDENTIFICATION	CURRENT SEISMIC CAPABILITY/ MALFUNCTION LIMIT			MAXIMUM EXPECTED PEAK ACCELERATION			REMARKS
			f-b	s-s	v	f-b	s-s	v	
B21H-S76B C41A-S06B	Switch	145C3040P006	20	20	20	7.8	1.6	0.3	See Note 3.1.3
B21H-S24B - S24D-1	Switch, Contact Block	145C3040P009	20	20	20	11.7	2.0	0.3	See Note 3.1.3
B21H-S75B-1 C41A-S06B-1	Switch, Contact Block Contact Block	145C3040P010 145C3040P009	20	20	20	11.7	1.9	0.3	See Note 3.1.3 See Note 3.1.3
B21H-S33	Switch	272A8971G001	7.5	4.0	10	3.6	1.6	0.3	See Note 3.1.14
B21H-S75 C41A-S05B	Switch	145C3040P004	20	20	20	7.8	2.0	0.3	See Note 3.1.3
B21H-S76B-1 C41A-S01B	Switch, Contact Block Switch	145C3040P010 272A7561P001	20	20	20	11.7	1.9	0.3	See Note 3.1.3 Insuficient Data
B21H-S01A,D	Switch	145C3040P015	20	20	20	11.7	1.9	0.3	See Note 3.1.3
B21H-S03A,D	Switch	145C3040P017	20	20	20	11.7	1.9	0.3	See Note 3.1.3
B21H-S05 - S27	Switch	145C3040P019	20	20	20	11.7	1.9	0.3	See Note 3.1.3
B21H-S05-1 - S27-1	Switch, Contact Block	145C3040P010	20	20	20	11.7	1.9	0.3	See Note 3.1.3
B21C-S30AB - S31AB	Switch: Pushbutton	145C3230P004	10	10	10	3.6	1.6	0.3	See Note 3.1.3
B21C-S12AB - S13AB	Switch	145C3040P020	20	20	20	1.2	1.1	0.3	See Note 3.1.3
B21C-S38A,E	Switch	145C3040P002	20	20	20	1.2	1.1	0.3	See Note 3.1.3

# SEISMIC QUALIFICATION REEVALUATION

117.5 INCH WIDE CONTROL ROOM PANEL CLASS 1E EQUIPMENT

Panel MPL Ref: H13-P601  
Location, Elevation: Central Floor, 166'

System: Reactor Core Cooling Bench Board  
Panel Dimension: 117.5" X 84" X 30"

EQUIPMENT MPL NO.	DESCRIPTION	IDENTIFICATION	CURRENT SEISMIC CAPABILITY/ MALFUNCTION LIMIT			MAXIMUM EXPECTED PEAK ACCELERATION			REMARKS
			f-b	s-s	v	f-b	s-s	v	
B21H-S38B,F	Switch	145C3040P002	20	20	20	1.2	1.1	0.3	See Note 3.1.3
B21C-S37AB	Switch	145C3040P004	20	20	20	7.8	2.0	0.3	See Note 3.1.3
C41A-S05A									
B21H-S24A	Switch, Contact Block	145C3040P009	20	20	20	11.7	2.0	0.3	See Note 3.1.3
- S24C-1									
B21H-S24A,C	Switch	145C3040P006	20	20	20	7.8	1.6	0.3	See Note 3.1.3
B21H-S76A-1	Switch, Contact Block	145C3040P010	20	20	20	11.7	1.9	0.3	See Note 3.1.3
B21H-S32	Switch	272A8971P001	7.5	4.0	10	3.6	1.6	0.3	See Note 3.1.14
B21H-S74	Switch	145C3040P044	20	20	20	4.6	2.0	0.3	See Note 3.1.3
B21H-S76A	Switch	145C3040P006	20	20	20	7.8	1.6	0.3	See Note 3.1.3
C41A-S01A	Switch	272A7561P001	-	-	-	4.9	2.0	0.3	Insuficient Data
C41A-S06A-1	Switch, Contact Block	145C3040P009	20	20	20	11.7	2.0	0.3	See Note 3.1.3
E12A-S61-1	Switch, Contact Block	145C3040P010	20	20	20	11.7	1.9	0.3	See Note 3.1.3
C41A-S06A	Switch	145C3040P006	20	20	20	7.8	1.6	0.3	See Note 3.1.3
B21H-S74-1	Switch	145C3040P018	20	20	20	11.7	2.0	0.3	See Note 3.1.3
B21H-S28-1	Switch, Contact Block	145C3040P010	20	20	20	11.7	1.9	0.3	See Note 3.1.3
B21H-S29-1	Switch	145C3040P010	20	20	20	11.7	2.0	0.3	See Note 3.1.3
B21H-S18	Switch	145C3040P003	20	20	20	11.7	1.9	0.3	See Note 3.1.3
B21H-S03	Switch	145C3040P001	20	20	20	11.7	1.9	0.3	See Note 3.1.3
E51A-S17	Switch	145C3040P001	20	20	20	11.7	1.9	0.3	See Note 3.1.3



# SEISMIC QUALIFICATION REEVALUATION

117.5 INCH WIDE CONTROL ROOM PANEL CLASS 1E EQUIPMENT

Panel Dimensions: MPL Ref: H13-P601  
Location, Elevation: Central Floor, 166'

System: Reactor Core Cooling Bench Board  
Panel Dimension: 117.5 X 84" X 30"

EQUIPMENT MPL NO.	DESCRIPTION	IDENTIFICATION	CURRENT SEISMIC CAPABILITY/ MALFUNCTION LIMIT			MAXIMUM EXPECTED PEAK ACCELERATION			REMARKS
			f-b	s-s	v	f-b	s-s	v	
B21A-S20A,D	Switch	145C3040P007	20	20	20	11.7	1.8	0.3	See Note 3.1.3
B21A-S20A,D-1	Switch, Contact Block	145C3040P009	20	20	20	11.7	2.0	0.3	See Note 3.1.3
B21C-S08A	Switch	145C3040P022	20	20	20	11.7	1.8	0.3	See Note 3.1.3
- S09A									
thru S11A									
- S15A									
- S17A									
thru S29A									
- S32A									
- S33A									
B21H-S02A,D	Switch	145C3040P015	20	20	20	11.7	1.9	0.3	See Note 3.1.3
B21H-S04A,D	Switch	145C3040P017	20	20	20	11.7	1.9	0.3	See Note 3.1.3
B21H-S06	Switch	145C3040P019	20	20	20	11.7	1.9	0.3	See Note 3.1.3
B21H-S37	Switch	145C3040P019	20	20	20	11.7	1.9	0.3	See Note 3.1.3
- S38									
- S35									
- S36									
- S28									
- S29									
B21H-S06-1	Switch, Contact Block	145C3040P010	20	20	20	11.7	1.9	0.3	See Note 3.1.3
- S35-1									
thru S38-1									

# SEISMIC QUALIFICATION REEVALUATION

117.5 INCH WIDE CONTROL ROOM PANEL CLASS 1E EQUIPMENT

Panel MPL Ref: H13-P601  
Location, Elevation: Central Floor, 166'

System: Reactor Core Cooling Bench Board  
Panel Dimension: 117.5" X 84" X 30"

EQUIPMENT MPL NO.	DESCRIPTION	IDENTIFICATION	CURRENT SEISMIC CAPABILITY/ MALFUNCTION LIMIT			MAXIMUM EXPECTED PEAK ACCELERATION			REMARKS
			f-b	s-s	v	f-b	s-s	v	
B21H-S26A	Switch	145C3040P001	20	20	20	11.7	1.9	0.3	See Note 3.1.3
E12A-S64A									
E12A-S62A	Switch	145C3040P006	20	20	20	7.8	1.6	0.3	See Note 3.1.3
E12A-S62A-1	Switch, Contact Block	145C3040P010	20	20	20	11.7	1.9	0.3	See Note 3.1.3
E12A-S63A	Switch: Pushbutton	145C3230P004	10	10	10	3.6	1.6	0.3	See Note 3.1.3
E12A-S41A	Switch	145C3040P003	20	20	20	11.7	1.9	0.3	See Note 3.1.3
E12-R602A	Indicator Unit	164C5288P163026	18	18	7	4.0	1.7	0.3	See Note 3.1.3
- R603A									
B21H-S10	Switch	145C3040P019	20	20	20	11.7	1.9	0.3	See Note 3.1.3
- S12									
- S13									
B21H-S10-1	Switch, Contact Block	145C3040P010	20	20	20	11.7	1.9	0.3	See Note 3.1.3
- S12-1									
- S13-1									
B21H-S17	Switch	145C3040P003	20	20	20	11.7	1.9	0.3	See Note 3.1.3
E12A-S06A									
E12A-S34A									
E12A-S02A	Switch	145C3040P013	20	20	20	11.7	1.9	0.3	See Note 3.1.3
- S05A									
- S07A									
- S10A									
- S12A									

# SEISMIC QUALIFICATION REEVALUATION

117.5 INCH WIDE CONTROL ROOM PANEL CLASS 1E EQUIPMENT

Panel MPL Ref: H13-P601  
Location, Elevation: Central Floor, 166'

System: Reactor Core Cooling Bench Board  
Panel Dimension: 117.5" X 84" X 30"

EQUIPMENT MPL NO.	DESCRIPTION	IDENTIFICATION	CURRENT SEISMIC CAPABILITY/ MALFUNCTION LIMIT			MAXIMUM EXPECTED PEAK ACCELERATION			REMARKS
			f-b	s-s	v	f-b	s-s	v	
B21H-S26B	Switch	145C3040P001	20	20	20	11.7	1.9	0.3	See Note 3.1.3
E12A-S56									
E12A-S64B									
E12A-S21	Switch: Pushbutton	145C3230P004	10	10	10	3.6	1.6	0.3	See Note 3.1.3
E12A-S43BC	Switch	145C3040P004	20	20	20	7.8	2.0	0.3	See Note 3.1.3
E12A-S63B	Switch	145C3230P004	10	10	10	3.6	1.6	0.3	See Note 3.1.3
E12A-S62BC	Switch	145C3040P006	20	20	20	7.8	1.6	0.3	See Note 3.1.3
E12A-S62B-1	Switch, Contact Block	145C3040P010	20	20	20	11.7	1.9	0.3	See Note 3.1.3
- S62C-1									
E12A-S41B	Switch	145C3040P003	20	20	20	11.7	1.9	0.3	See Note 3.1.3
E12-R602B	Indicator Unit	164C5288P163026	18	18	7	4.0	1.7	0.3	See Note 3.1.3
- R603BC									
B21H-S09	Switch	145C3040P019	20	20	20	11.7	1.9	0.3	See Note 3.1.3
- S14									
B21H-S09-1	Switch, Contact Block	145C3040P010	20	20	20	11.7	1.9	0.3	See Note 3.1.3
- S14-1									
B21H-S69	Switch	145C3040P003	20	20	20	11.7	1.9	0.3	See Note 3.1.3
- S70									
E12A-S06B									
E12A-S34B									
E12A-S02B	Switch	145C3040P013	20	20	20	11.7	1.9	0.3	See Note 3.1.3
- S05B									

# SEISMIC QUALIFICATION REEVALUATION

117.5 INCH WIDE CONTROL ROOM PANEL CLASS 1E EQUIPMENT

Panel MPL Ref: H13-P601  
Location, Elevation: Central Floor, 166'

System: Reactor Core Cooling Bench Board  
Panel Dimension: 117.5" X 84" X 30"

EQUIPMENT MPL NO.	DESCRIPTION	IDENTIFICATION	CURRENT SEISMIC CAPABILITY/ MALFUNCTION LIMIT			MAXIMUM EXPECTED PEAK ACCELERATION			REMARKS
			f-b	s-s	v	f-b	s-s	v	
E12A-S16A	Switch	145C3040P013	20	20	20	11.7	0.9	0.3	See Note 3.1.3
- S35A									
- S36A									
- S54A									
- S58A									
- S59A									
- S68A									
- S69A									
E12A-S03A	Switch	272A7689P001	-	-	-	11.7	1.9	0.3	Insufucient Data
E12A-S04A	Switch	145C3040P007	20	20	20	11.7	1.8	0.3	See Note 3.1.3
E12A-S04A-1	Switch	145C3040P018	20	20	20	11.7	2.0	0.3	See Note 3.1.3
E21A-S08	Switch	145C3040P001	20	20	20	11.7	1.9	0.3	See Note 3.1.3
E51A-S18									
E51A-S23									
E21A-S09	Switch: Pushbutton	145C3230P004	10	10	10	3.6	1.6	0.3	See Note 3.1.3
E21A-S10	Switch	145C3040P004	20	20	20	7.8	2.0	0.3	See Note 3.1.3
E21A-S11-1	Switch	145C3040P010	20	20	20	11.7	1.9	0.3	See Note 3.1.3
E21A-S11	Switch	145C3040P006	20	20	20	7.8	1.6	0.3	See Note 3.1.3
E21-R600	Indicator Unit	164C5288P163026	18	18	7	4.0	1.7	0.3	See Note 3.1.3
E51A-S16	Switch	145C3040P006	20	20	20	7.8	1.6	0.3	See Note 3.1.3
- S25									
- S41									

# SEISMIC QUALIFICATION REEVALUATION

117.5 INCH WIDE CONTROL ROOM PANEL CLASS 1E EQUIPMENT

Panel MPL Ref: H13-P601  
Location, Elevation: Central Floor, 166'

System: Reactor Core Cooling Bench Board  
Panel Dimension: 117.5" X 84" X 30"

EQUIPMENT MPL NO.	DESCRIPTION	IDENTIFICATION	CURRENT SEISMIC CAPABILITY/ MALFUNCTION LIMIT			MAXIMUM EXPECTED PEAK ACCELERATION			REMARKS
			f-b	s-s	v	f-b	s-s	v	
E51A-S42	Switch	145C3040P006	20	20	20	7.8	1.6	0.3	See Note 3.1.3
E51A-S19	Switch	145C3040P004	20	20	20	7.8	2.0	0.3	See Note 3.1.3
- S20									
- S37									
E51A-S41-1	Switch, Contact Block	145C3040P010	20	20	20	11.7	1.9	0.3	See Note 3.1.3
- S42-1									
E51A-S16-1	Switch, Contact Block	145C3040P009	20	20	20	11.7	2.0	0.3	See Note 3.1.3
- S25-1									
E51-K601	Sq. Root Converter	159C4486P001	10	2.1	1.5	4.0	1.7	0.3	
E51-R600	Controller	163C1392P014	10	2.1	1.5	4.0	1.7	0.3	
E51-R606	Indicator Unit	164C5288P261040	18	18	7	4.0	1.7	0.3	See Note 3.1.3
E21A-S06	Switch	272A7689P001	-	-	-	11.7	1.9	0.3	Insufficient Data
E21A-S07	Switch	272A7561P002	-	-	-	11.7	1.9	0.3	Insufficient Data
E21A-S01	Switch	145C3040P007	20	20	20	11.7	1.8	0.3	See Note 3.1.3
E21A-S01-1	Switch	145C3040P018	20	20	20	11.7	2.0	0.3	See Note 3.1.3
E21A-S02	Switch	145C3040P013	20	20	20	11.7	1.9	0.3	See Note 3.1.3
- S04									
- S05									
E51A-S26									
E51A-S04									
E51A-S05									



# SEISMIC QUALIFICATION REEVALUATION

117.5 INCH WIDE CONTROL ROOM PANEL CLASS 1E EQUIPMENT

Panel MPL Ref: H13-P601  
Location, Elevation: Central Floor, 166'

System: Reactor Core Cooling Bench Board  
Panel Dimension: 117.5" X 84" X 30"

EQUIPMENT MPL NO.	DESCRIPTION	IDENTIFICATION	CURRENT SEISMIC CAPABILITY/ MALFUNCTION LIMIT			MAXIMUM EXPECTED PEAK ACCELERATION			REMARKS
			f-b	s-s	v	f-b	s-s	v	
E51A-S09	Switch	145C3040P013	20	20	20	11.7	1.9	0.3	See Note 3.1.3
E51A-S07									
E51A-S39									
E51A-S40									
E51A-S10									
E51A-S03									
E51A-S08									
E51A-S24									
E51A-S38									
E51A-S28	Switch	145C3040P003	20	20	20	11.7	1.9	0.3	
- S27									
- S11									
- S13									
E51A-S15	Switch	272A7689P001	-	-	-	11.7	1.9	0.3	Insufficient Data
E51A-S12	Switch	145C3040P003	20	20	20	11.7	1.9	0.3	See Note 3.1.3
E51A-S22	Switch	145C3040P001	20	20	20	11.7	1.9	0.3	See Note 3.1.3
E51A-S33	Switch	272A7561P002	-	-	-	11.7	1.9	0.3	Insufficient Data
E51A-S35-1	Switch, Contact Block	145C3040P018	20	20	20	11.7	2.0	0.3	See Note 3.1.3
E51A-S01	Switch	145C3040P007	20	20	20	11.7	1.8	0.3	See Note 3.1.3
- S35									
E51A-S01-1	Switch, Contact Block	145C3040P018	20	20	20	11.7	2.0	0.3	See Note 3.1.3
- S02-1									

# SEISMIC QUALIFICATION REEVALUATION

117.5 INCH WIDE CONTROL ROOM PANEL CLASS 1E EQUIPMENT

Panel MPL Ref: H13-P601  
Location, Elevation: Central Floor, 166'

System: Reactor Core Cooling Bench Board  
Panel Dimension: 117.5" X 84" X 30"

EQUIPMENT MPL NO.	DESCRIPTION	IDENTIFICATION	CURRENT SEISMIC CAPABILITY/ MALFUNCTION LIMIT			MAXIMUM EXPECTED PEAK ACCELERATION			REMARKS
			f-b	s-s	v	f-b	s-s	v	
E51A-S02	Switch	145C3040P049	20	20	20	8.2	1.4	0.3	See Note 3.1.3
C11B-S04	Switch	145C3040P017	20	20	20	11.7	1.9	0.3	See Note 3.1.3
- S06									
E12A-S37A	Switch	145C3040P013	20	20	20	11.7	1.9	0.3	See Note 3.1.3
- S39A									
- S40A									

# SEISMIC QUALIFICATION REEVALUATION

117.5 INCH WIDE CONTROL ROOM PANEL CLASS 1E EQUIPMENT

Panel MPL Ref: H13-P601

System: Reactor Core Cooling Bench Board

Location, Elevation: Central Floor, 166'

Panel Dimension: 117.5" X 84" X 30"

EQUIPMENT MPL NO.	DESCRIPTION	IDENTIFICATION	CURRENT SEISMIC CAPABILITY/ MALFUNCTION LIMIT			MAXIMUM EXPECTED PEAK ACCELERATION			REMARKS
			f-b	s-s	v	f-b	s-s	v	
E22B-S03	Switch	145C3040P013	20	20	20	11.7	1.9	0.3	See Note 3.1.3
E22B-S05									
E22B-S11									
E22A-S03	Switch	272A7561P002	-	-	-	11.7	1.9	0.3	Insuficient Data
E22A-S05	Switch	145C3040P001	20	20	20	11.7	1.9	0.3	See Note 3.1.3
E22B-S01									
E22A-S01	Switch	145C3040P013	20	20	20	11.7	1.9	0.3	See Note 3.1.3

# SEISMIC QUALIFICATION REEVALUATION

117.5 INCH WIDE CONTROL ROOM PANEL CLASS 1E EQUIPMENT

Panel MPL Ref: H13-P601  
Location, Elevation: Central Floor, 166'

System: Reactor Core Cooling Bench Board  
Panel Dimension: 117.5" X 84" X 30"

EQUIPMENT MPL NO.	DESCRIPTION	IDENTIFICATION	CURRENT SEISMIC CAPABILITY/ MALFUNCTION LIMIT			MAXIMUM EXPECTED PEAK ACCELERATION			REMARKS
			f-b	s-s	v	f-b	s-s	v	
E22B-S02	Switch	272A7689P001	-	-	-	11.7	1.9	0.3	Insufficient Data
- S07									
- S09									
- S10									
- S15									
E22B-S04	Switch	145C3040P030	20	20	20	11.7	1.6	0.3	See Note 3.1.3
- S06									
- S08									
- S12									
- S13									
- S14									
E22B-S16	Switch	272A7685P001	-	-	-	8.4	1.7	0.3	Insufficient Data
E12A-S43A	Switch	145C3040P004	20	20	20	7.8	2.0	0.3	See Note 3.1.3
E12-R607	Indicator Unit	164C5288P261041	18	18	7	3.6	1.4	0.3	See Note 3.1.2
E12A-S20A	Switch	145C3040P001	20	20	20	11.7	1.9	0.3	See Note 3.1.3
B21H-K031	Relay	164C5258P001	17	17	10	11.7	2.0	0.3	See Note 3.1.3
E12A-AT6-I	Isolator Card	204B6208AAG002	10	10	28	4.9	2.0	0.3	See Note 3.1.3
E12A-AT6-O	Isolator Card	204B6220AAG002	10	10	28	4.9	2.0	0.3	See Note 3.1.3

# SEISMIC QUALIFICATION REEVALUATION

117.5 INCH WIDE CONTROL ROOM PANEL CLASS 1E EQUIPMENT

Panel MPL Ref: H13-P601  
Location, Elevation: Central Floor, 166'

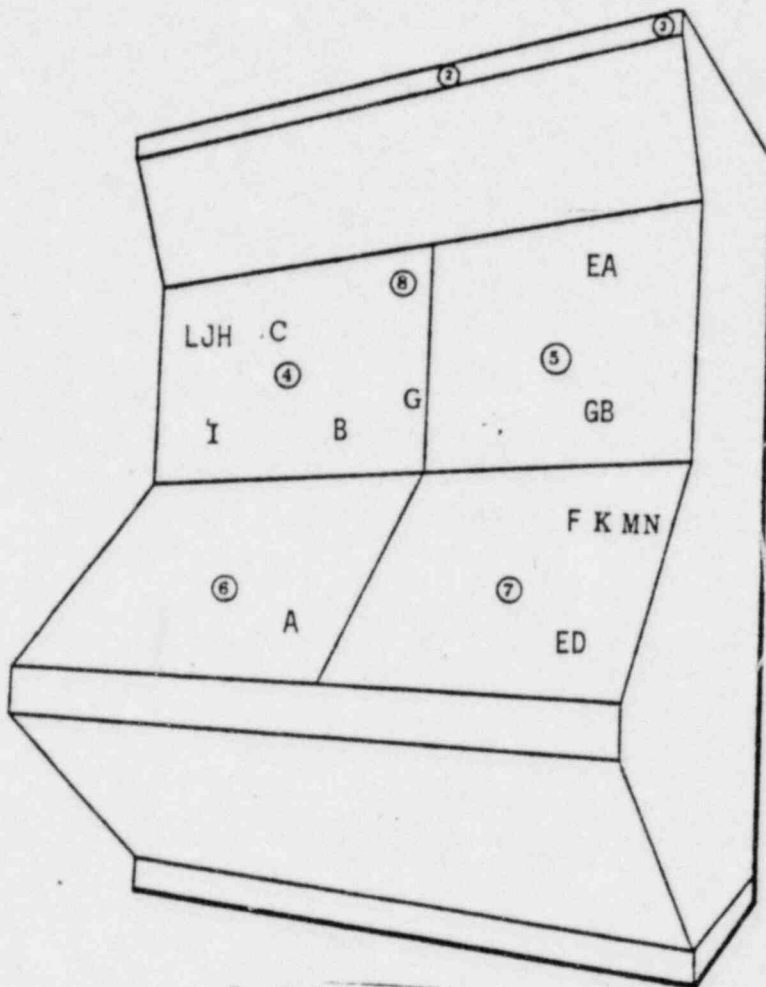
System: Reactor Core Cooling Pench Board  
Panel Dimension: 117.5" X 84" X 30"

EQUIPMENT MPL NO.	DESCRIPTION	IDENTIFICATION	CURRENT SEISMIC CAPABILITY/ MALFUNCTION LIMIT			MAXIMUM EXPECTED PEAK ACCELERATION			REMARKS
			f-b	s-s	v	f-b	s-s	v	
E12A-AT7-O	Isolator Card	204B6188AAG002	10	10	28	4.9	2.0	0.3	See Note 3.1.3
B21H-K032	Relay	164C5258P001	17	17	10	4.9	2.0	0.3	See Note 3.1.3
E12A-AT8-O	Isolator Card	204B6188AAG002	10	10	28	4.9	2.0	0.3	See Note 3.1.3
E12A-AT7-I	Isolator Card	204B6186AAG004	10	10	28	4.9	2.0	0.3	See Note 3.1.3
E12A-AT8-I	Isolator Card	204B6186AAG003	10	10	28	4.9	2.0	0.3	See Note 3.1.3
▲ E12A-PS04	Power Supply	198B6203AAG003	10	10	28	4.7	2.8	0.3	See Note 3.1.3
- PS05									
E22A-S06	Switch	145C3040P001	20	20	20	11.7	1.9	0.3	See Note 3.1.3
- S07									
E22A-S14	Switch	145C3040P006	20	20	20	7.8	1.6	0.3	See Note 3.1.3
E22A-S14-1	Switch, Contact Block	145C3040P010	20	20	20	11.7	1.9	0.3	See Note 3.1.3
E22A-S02	Switch: Pushbutton	145C3230P004	10	10	10	3.6	1.6	0.3	See Note 3.1.3
E22A-S08	Switch	145C3040P004	20	20	20	7.8	2.0	0.3	See Note 3.1.3
E22-R601	Indicator Unit	164C5288P239012	18	18	7	3.6	1.4	0.3	See Note 3.1.3
E22-R603	Indicator Unit	164C5288P162041	18	18	7	3.6	1.4	0.3	See Note 3.1.3
E22A-S01	Switch	145C3040P013	20	20	20	11.7	1.9	0.3	See Note 3.1.3
- S04									
- S10									
- S11									
- S12									
- S15									
- S23									

▲ Readings from accelerometers mounted on the power supply.



COMPONENT LOCATION AND "g" FIELD  
H13-P601 PANEL



A	3.1	5.1	7.1
	1.9	1.8	2.0
	0.3	0.3	0.3
B	4.0	4.6	4.9
	1.7	2.0	2.0
	0.3	0.3	0.3
C	1.2	3.0	3.6
	1.1	1.6	1.4
	0.3	0.3	0.3
D	7.8	8.2	8.4
	1.6	1.4	1.7
	0.3	0.3	0.3
E	11.7	11.7	11.7
	1.8	1.7	1.9
	0.3	0.3	0.3
	1	2	3

INCLINE  
TOP SECTION

VERTICAL  
MIDDLE SECTION

INCLINE  
BOTTOM SECTION

Order in each cell = f-b  
s-s  
v

H12-P870

Position Locator	Part #	Description	"g" Field Locator
A	145C3040	Switch	E-3 & B-3
B	145C3230	Switch: Pushbutton	C-2 & C-3
C	164C5288	Indicator Unit	B-1
D	272A7689	Switch	E-3
E	272A7561	Switch	B-3 & E-3
F	272A7685	Switch	D-3
G	272A8971	Switch	C-2 & C-3
H	159C4486	Sq. Root Converter	B-1
I	198B6203AA	Power Supply	* (See Note 3.1.12)
J	163C1392	Controller	B-1
K	204B6208AA	Isolator Card	* (See Note 3.1.12)
L	204B6220AA	Isolator Card	* (See Note 3.1.12)

<u>Position Locator</u>	<u>Parts #</u>	<u>Description</u>	<u>"g" Field Locator</u>
M	204B6188AA	Isolator Card	* (See Note 3.1.12)
N	164C5258	Relay	* (See Note 3.1.12)
O	204B6186AA	Isolator Card	* (See Note 3.1.12)

4.1

# RESONANCE SEARCH TEST DATA FOR VARIOUS TESTED CONTROL ROOM PANELS

Table 1

<u>Panel</u>	<u>Resonance (Hz)</u>			<u>Panel Width (inches)</u>
	<u>F/B</u>	<u>V</u>	<u>S/S</u>	
P H13P654	34	53	18	36
P H13P655	29	53	21	60
G H13P693	41	35	21	48
CL H22P028	34	60	14	36
CO H13P628	36	--	19	48
L H12P661	16	32	11.5	96
CO C61P001	22	--	22	96
L H12P601	12	--	18	158
CO H13P618	25	33	19	72
→ *CO H13P601	34	--	19	105
*CO H13P603	14	26	28	174
B H13P671	25	30	10	90

## LEGEND

CO -- Cofrentes  
 L -- Limerick  
 P -- Perry  
 G -- Grand Gulf  
 CL -- Clinton  
 B -- BWR 6 Prototype

\* = Bench Boards

Table 2

## CLASS 1E EQUIPMENT ON TESTED PANEL AND THEIR CURRENT SEISMIC CAPABILITIES

Equipment	Current Seismic Capability			Tested Panel			Accelerometer Number on Tested Panel		
	f-b	s-s	v	f-b	s-s	v	f-b	s-s	v
136B3127	3.7	3	2.3	<sup>G</sup> H13-P693	<sup>C</sup> H22-P028	<sup>C</sup> H22-P028	5	4/5	4/5
145C3040	7.5	4.0	10.0	<sup>P</sup> H13-P680	<sup>Co</sup> H13-P693	<sup>G</sup> H13-P693	7	7	7
145C3043	10.0	3.5	1.2	<sup>Co</sup> H13-P628	<sup>Co</sup> H12-P628	<sup>Co</sup> H13-P628	5	5	5
145C3230	5.0	8.8	10.0	<sup>Co</sup> H13-P603	<sup>Co</sup> H13-P603	<sup>Co</sup> H13-P603	3	3	3
159C4251	3.2	2.0	2.8	<sup>C</sup> H22-P028	<sup>C</sup> H22-P028	<sup>C</sup> H22-P028	3	3	3
159C4486	10.0	2.1	1.5	<sup>Co</sup> C61-P001	<sup>Co</sup> C61-P001	<sup>Co</sup> C61-P001	6	6	6
163C1392	10.0	2.1	1.5	<sup>Co</sup> C61-P001	<sup>Co</sup> C61-P001	<sup>Co</sup> C61-P001	6	6	6
163C1565 (same as 163C1566)	4.0	1.0	1.0	<sup>Co</sup> C61-P001	<sup>Co</sup> C61-P001	<sup>Co</sup> C61-P001	3	3	3
164C5150	5.0	2.5	2.3	<sup>Co</sup> H13-P618	<sup>Co</sup> H13-P618	<sup>Co</sup> H13-P618	2/4	4	2
164C5258	4.0	3.0	1.5	<sup>Pe</sup> H13-P628	<sup>Pe</sup> H13-P628	<sup>Pe</sup> H13-P628	4	4	4

Legend:

C: Clinton

Co: Cofrentes

G: Grand Gulf

P: BWR Prototype

Pe: Perry

4.3 REFERENCES

4.3.1 Seismic Test Reports, GE DRF A00-1138

4.3.2 GE DOCUMENT A00794-9

4.3.3 GE DRF A00-1084

4.3.4 MPL and Panel Reference for Device List:

<u>PANEL</u>	<u>EDL#</u>	<u>ASSEMBLY DRAWING #</u>
H13-P601	386X400BA	865E617G001,2
H13-P618	368X526BA	865E516G1
H13-P621	368X528BA	133D9999G1
H13-P622	368X529BA	137D7213G1
H13-P623	368X530BA	137D7214G1
H13-P625	368X531BA	865E542G1
H13-P628	368X532BA	865E278G1
H13-P629	368X533BA	865E517G1
H13-P631	368X534BA	865E279G1
H13-P632	368X535BA	865E292G1
H13-P642	368X539BA	865E280G1
H13-P654	368X416BA	865E789G1
H13-P655	368X417BA	865E897G1
H13-P669	see Assy Dwg PL	851E919AA
H13-P670	see Assy Dwg PL	851E920AA
H13-P671	see Assy Dwg PL	851E921AA
H13-P672	see Assy Dwg PL	851E922AA
H13-P680	see Assy Dwg PL	386X545G1
H13-P691	386X224BA	865E520G1
H13-P692	386X245BA	865E521G1
H13-P693	386X246BA	865E522G1
H13-P694	386X247BA	865E523G1

4.3.5 Transmittal, Bechtel to GE, GET 80/0174, dated 12/2/80, Floor Response Spectra for Control Room Building Elevations.

4.3.6 GE DRF A00-794-5-1