

ORGANIZATION: BECHTEL POWER CORPORATION
GAITHERSBURG POWER DIVISION
GAITHERSBURG, MARYLAND

REPORT NO.: 99900519/81-04 INSPECTION DATE(S): 11/2-5/81 INSPECTION ON-SITE HOURS: 28

CORRESPONDENCE ADDRESS: Bechtel Power Corporation
Gaithersburg Power Division
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PRINCIPAL PRODUCT: Architect Engineering Services

NUCLEAR INDUSTRY ACTIVITY: The Gaithersburg Power Division has a total of 2767 employees of which 2248 or 81% are assigned to nuclear projects. Major projects include Callaway Units 1 and 2, Wolf Creek Unit 1, and Grand Gulf Units 1 and 2. There are also modification/repair/service contracts on 14 additional reactor units.

ASSIGNED INSPECTOR: C. J. Hale
J. R. Costello, Reactor Systems Section (RSS)

12-4-81
Date

OTHER INSPECTOR(S):

APPROVED BY:

C. J. Hale
C. J. Hale, Chief, RSS

12-4-81
Date

INSPECTION BASES AND SCOPE:

- A. BASES: 10 CFR Part 50, Appendix B; SNUPPS PSAR, Chapter 17; and Grand Gulf PSAR, Chapter 17.
- B. SCOPE: Design input, design verification, and action on two regional requests:
- (1) incorrect beam sizes for electrical trays, Grand Gulf; and
 - (2) pipe whip restraint design discrepancies, SNUPPS.

DESIGNATED ORIGINAL
Certified By Rheanne Fouts

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PDR GA999 EECBECH
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A. VIOLATIONS:

None

B. NONCONFORMANCES:

None

C. UNRESOLVED ITEMS:

None

D. OTHER FINDINGS OR COMMENTS:

1. Design Input and Design Verification - SNUPPS PSAR Chapter 17, Grand Gulf PSAR Chapter 17, Engineering Department and Engineering Project Procedures were examined to determine quality assurance program commitments. To verify implementation of these commitments, the following documents were examined: 3 design criteria documents, 13 drawings, 3 system descriptions, 14 calculations, 1 project summary "Q" list, 1 design review notice, 2 design control check lists, 1 licensing commitment tracking system, and 6 specifications. Relative to the documents examined, all procedural commitments were being properly implemented.
2. Construction Deficiency Report - Incorrect Beam Sizes for Electrical Trays.

Mississippi Power and Light Company (Grand Gulf) reported to Region II that an Architect Engineering (AE) reevaluation had determined that incorrect beam sizes for electrical seismic Class I tray supports were purchased and installed at 76 tray locations. The purpose of this inspection was to determine if this was a generic problem and if there was a breakdown in the AE's quality program. Examination of drawing C-1415A, Revision 18, "Auxiliary Building Electrical Tray Supports Typical Standard Details," showed that the drawing had correctly stated the requirements. The error was made when Bechtel construction site personnel incorrectly translated the requirements from drawing C-1415A to their fabrication requests. The site personnel discovered the error and took appropriate corrective and preventive action. Since Grand Gulf is the only Gaithersburg Power Division (GPD) construction project, this item has no further generic potential at GPD. Management Corrective Action Request (MCAR 35) was issued August 20, 1981, to alert other Bechtel power divisions of a similar potential problem. The error appears to have been the fault of one individual onsite that failed to consider a necessary note on the design drawing (C-1415A). No further action at GPD appears warranted.
3. Pipe Whip Restraint Design Deficiencies.

The purpose of this inspection was to determine if there had been a breakdown in the Bechtel GPD design process.

During an internal design review by Bechtel GPD of the SNUPPS "Design Guide for Pipe Whip Restraints," a discrepancy was identified between this Design Guide and Bechtel's BN-TOP-2, "Design for Pipe Break Effects." The discrepancy involved the absence in the Design Guide of the requirement for an energy balance analysis in the design of pipe whip restraints in those cases where the formation of a plastic moment in the pipe could not be prevented. This discrepancy was reported as a 10 CFR 50.55(e) item by SNUPPS to Regions III and IV.

A method had been developed by SNUPPS project engineering personnel which was considered superior for those cases where a plastic hinge is developed. During the internal Bechtel design review, the consensus was that this method was not conservative enough, was in violation of BN-TOP-2, and did not provide for the increase of size of the energy absorbing material or the U-bolt diameter of the Pipe Whip Restraints (increase in size was caused by rounding off dimensions for commercial procurement).

The method developed by SNUPPS project engineering personnel had several unquantified conservatisms which, if evaluated, may have shown the restraints were adequate. However, such an analysis was not performed, instead 103 of the 242 restraints issued for construction were reanalyzed using the energy balance technique, and/or the lumped-mass dynamic model, and 44 restraints were revised. Both the FSAR and the Design Guide were revised to allow for the formation of plastic hinges within acceptable ductility ratios in pipe whip restraints and to permit the use of dynamic analysis in pipe whip restraint design as an alternate to the energy balance technique.

No nonconformances or unresolved items were identified in this area of the inspection.

1	2	TITLE/SUBJECT	3	4
1	8	Project Design Criteria Job No. 9645, section 1.1 - Nuclear Boiler System.	11/77	5
2	1	Drg. M-10838 Job No. 9645, P&I Diagram Reactor Core Isolation Cooling System Unit 1	12/19/80	14
3	8	SD-1083 Job No. 9645, System Description Reactor Core Isolation Cooling System	12/24/80	3
4	1	Isolation Cooling System	7/7/78	3
5	8	SEP-1083 Job No. 9645, System Flow Diagram Reactor Core Isolation Cooling System	9/27/77	2
6	3	Project Engineering Procedures Manual (PEPM) Job No. 9645, Section 3.4 - Project Design Criteria Manual	6/19/78	0
7	3	PEPM Job No. 9645, Section 4.3 - Drawing/Document Procedures	10/5/91	6
8	3	PEPM Job No. 9645, Section 4.4 - Calculations	4/17/78	2
9	3	PEPM Job No. 9645, Section 4.5 - Specifications	9/8/80	4
10	3	PEPM Job No. 9645, Section 4.10 - Licensing Commitment Tracking System (LCTS)	9/8/80	1

Document Types:

1. Drawing
2. Specification
3. Procedure
4. QA Manual
5. Purchas Order
6. Internal Memo
7. Letter
8. Other (Specify-if necessary)

Columns:

1. Sequential Item Number
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1	2	TITLE/SUBJECT	3	4
11	B	Chapter 17 Grand Gulf Nuclear Station Units 1 and 2 - Quality Assurance	5/2/77	1
12	B	Calculation Q1E12G015 R01 Job No. 9645 - Pipe Supports required for ISO No. M-1348F	3/14/80	B
13	B	Calculation Q1E12G015 R10 - Job No. 9645 - Pipe Supports required for ISO No. M-1348F	4/26/80	B
14	B	Calculation 1.3.1.D Job No. 9645 - Net Positive Suction Head Calculations - HPCS Pump	8/11/80	D
15	B	Calculation 1.5.5.A-Q Job No. 9645 - Standby Liquid Control Pump Discharge Pressure	2/25/77	A
16	B	Calculation C-H003.4 Job No. 9645 - Seismic Analyses of Auxiliary Building	9/15/77	0
17	B	Calculation C-G092, Job No. 9645 - Containment Heat Sink Calculations	4/16/79	1
18	B	Calculation Q-Q, Job No. 9645 - Voltage Drop Calculations HPCS Service Water Pump	12/31/73	0

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DOCUMENTS EXAMINED

1	2	TITLE/SUBJECT	3	4
10	8	Calculation 15-Q, Job No 9645 - Cable Ampacity Calculation	7/8/80	4
20	1	Drg M-1350A, System Piping Isometric LPCS Pump Discharge to CTMT Aux Bldg & CTMT Unit 1 Job No 9645	6/30/81	19
21	1	Drg C-1000 Unit Containment Civil Structural General Arrangement Plans & Section Job No 9645	1/30/80	2
22	1	Drg. C-1033 Unit 1 Containment Reinforcing - Cylinder Wall Sections & Details Job No 9645	3/17/77	13
23	8	Quality Assurance Program Project Summary Q-List Job 9645	3/25/81	11
24	8	Electrical Design Control Check List (DCCCL) Job 9645	6/18/79	9
25	1	E-1042 Diesel Logic Diagram ESF Div 1, Unit 1 Job 9645	2/3/78	3
26	2	Spec. No. 9645-E-118.0, 480-Volt Motor Control Centers	10/23/78	11
27	2	Spec. No 9645-C-151.0, Furnish and Erect Liner Plate And Accessories For Containment Drywell and Suppression Pool	1/15/79	22
28	2	Spec. No 9645-M-084.0, Horizontal Centrifugal Pump (ASME Sect. III)	6/19/80	14
29	8	Licensing Commitment Tracking System Job 9645	5/6/81	16
30	2	Spec. No 9645-E-035.0, Containment Structure Electrical Penetration Assemblies	1/29/80	12

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1	2	TITLE/SUBJECT	3	4
31	2	Spec. No 9645-E-091.1, Hydodynamic And Seismic Qualification Of Class 1E Electrical Equipment	9/26/79	0
		<u>The documents listed below pertain to the SNUPPS Project, Job No.</u> <u>10466</u>		
32	8	Standard Plant PSAR Chapter 17.0, Section 17A.0 - Bechtel Quality Assurance Program for Nuclear Power Plants	9/80	1
33	3	EDPI 4.34-01, Off-Project Design Review (Design Control Check List And Design Review Notice)	1/15/79	4
34	3	EDPI 4.37-01, Design Calculations	1/9/81	8
35	3	EDPI 4.41-01, Base Design Document Review, Approval, And Release Requirements	5/8/78	1
36	3	EDPI 4.46-01, Project Engineering Drawings	12/11/80	16
37	3	EDPI 4.49-01, Project Specifications	9/18/81	11
50	1	M-02AL01(Q) Piping & Instrumentation Diagram Auxiliary Feedwater System	5/14/81	8

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39	1	M-01AL01(Q) System Flow Diagram Auxiliary Feedwater System	12/15/77	D
40	1	M-03AL01(Q) Piping Isometric Auxiliary Feedwater Pumps Suction Piping	9/1/81	7
41	i	M-03AL02(Q) Piping Isometric Motor Driven Aux. Feedwater Pump "A" Discharge Piping	3/25/81	8
42	1	M-03AL03(Q) Piping Isometric Motor Driven Aux. Feedwater Pump "B" Discharge Piping	9/1/81	6
43	1	M-03AL04(Q) Piping Isometric Turb. Driven Aux. Feedwater Pump Discharge Piping	9/1/81	6
44	1	M-03AL05(Q) Piping Isometric Auxiliary Feedwater Pumps Recirculation Piping	3/13/81	7
45	8	M-00AL(Q) System Description Auxiliary Feedwater System	12/15/77	3
46	8	Calc. No. AL-16 Aux. Pump Feedwater Pump NPSH	7/21/77	A
47	8	Calc. No. AL-17 Aux. Feedwater Pump Suction Pressure	7/18/77	A
48	8	Calc. No. AL-18 Aux. Feedwater System - Suction Pressure	7/18/77	A
49	8	Calc. No. AL-20 Total Head For Turbine Driven Auxiliary Feedwater Pump	1/17/77	A

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DOCUMENTS EXAMINED

1	2	TITLE/SUBJECT	3	4
50	B	Calc. No. AL-21 Total Head For Motor Driven Auxiliary Feedwater Pumps	5/16/77	A
51	B	Calc. No. AL-22 Auxiliary Feedwater System - Flow Diagram Data	7/18/77	A
52	B	Design Review Notice 10466-M-02AL01 Auxiliary Feedwater System P&ID	12/16/75	-
53	2	10466-M-021(Q) Design Specification For Auxiliary Feedwater Pumps And Turbine Drives	5/28/81	13
54	B	10466-C-0(Q) Civil And Structural Design Criteria For Standardized Nuclear Unit Power Plant System	6/11/81	9
55	B	Mechanical/Nuclear Design Control Check List For The Standardized Nuclear Unit Power Plant System	5/1/79	9
56	8	10466-E-0 Electrical Design Criteria For The Standardized Nuclear Unit Power Plant System	7/2/80	10

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PERSONS CONTACTED

Company Bechtel / GPD

Dates 11/2-6/81

Docket/Report No. 99900519/81-04

Inspector J. R. Castella

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~~Bechtel Inspection Conference~~ **MC**
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