

SEP 26 1984

Docket No. 50-354

APPLICANT: Public Service Electric & Gas Company (PSE&G)  
FACILITY: Hope Creek Generating Station  
SUBJECT: SUMMARY OF SEPTEMBER 12, 1984 MEETING WITH PSE&G REGARDING  
THE PVORT AND SQRT AUDITS

On September 12, 1984, a meeting was held in the Bethesda, Maryland offices of the NRC to discuss equipment qualification issues (seismic and dynamic) with the applicant. Representatives of the staff, PSE&G, Bechtel Power Corporation and General Electric were in attendance (see Enclosure 1).

The principal purpose of the meeting was to discuss the ability of PSE&G to support the SQRT and PVORT audits. The applicant made a presentation, the highlights of which are summarized in Enclosure 2. PSE&G indicated that Hope Creek was approximately 90% complete and that 85% of the plant equipment had been tested and was in place, therefore, the applicant stated it was ready to support the subject audits.

Based on the meeting, the staff requested, and the applicant agreed to updating and submitting for staff review by mid October 1984, the master equipment summary list. The staff agreed to identify to the applicant by the end of November 1984, that equipment which would be reviewed at the audit. Currently, the staff is targeting the audits to take place sometime near the week of January 7, 1985.

After the meeting, the staff provided the applicant with a revised "Qualification Summary of Equipment" form (Enclosure 3) which is to be filled out for each piece of equipment to be audited.

Original signed by:

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Licensing Branch No. 2  
Division of Licensing

Enclosures: As stated

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9/20/84

LB#2/DL/BC  
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9/27/84

8410100467 840926  
PDR ADOCK 05000354  
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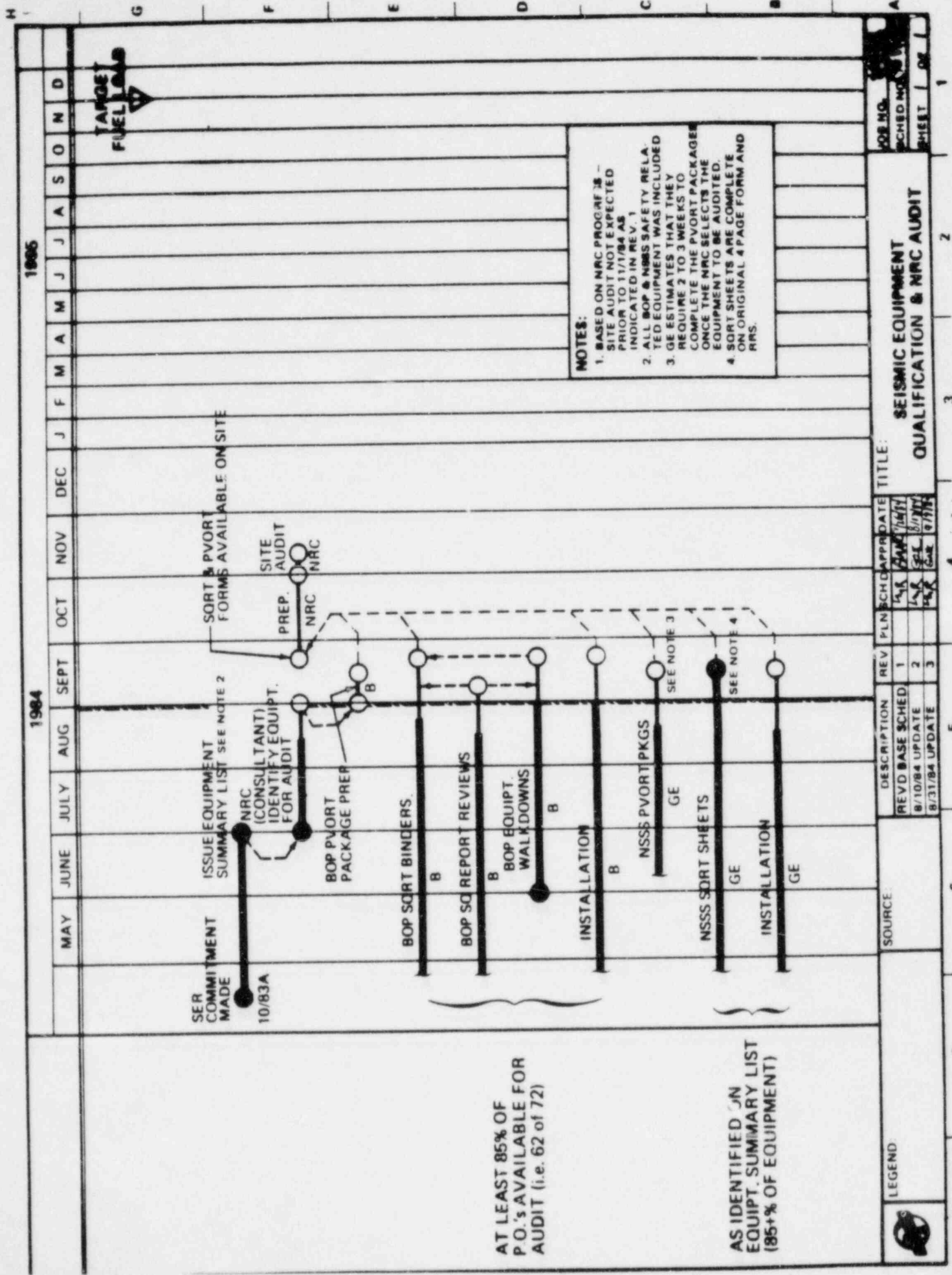
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APPLICANT : Public Service Electric & Gas Company  
 FACILITY : Hope Creek Generating Station  
 SUBJECT : Equipment Qualification Meeting  
 DATE : Wednesday, September 12, 1984

<u>NAME</u>	<u>AFFILIATION</u>
ARNOLD LEE	NRC/ERB
Anthony Bournia	NRC/LB-2
Goutam Bagchi	NRC/ERB
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Charles F. Miller	EG & G Idaho, Inc.
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NORVILLE GRIFFIN	BECHTEL
DEAN CONSTANTINE	PSEG
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<del>DAVE WAGNER</del>	NRC/LB-2
Gus Kapandritis	Bechtel
Dave Sullivan	Bechtel

HOPE CREEK GENERATING STATION  
EQUIPMENT QUALIFICATION PROGRAM

- . ENVIRONMENTAL QUALIFICATION OF SAFETY RELATED ELECTRICAL AND MECHANICAL EQUIPMENT (PROGRAM WAS PRESENTED AT NOVEMBER 29, 1983 NRC MEETING, DOCKET NO. 50-354)
- . DYNAMIC/SEISMIC QUALIFICATION OF SAFETY RELATED ELECTRICAL AND MECHANICAL EQUIPMENT (SRP 3.10, 3.9.2)
  - . NSSS AND NON-NSSS
- . DYNAMIC QUALIFICATION OF ACTIVE PUMPS AND VALVES (SRP 3.9.3) (PVORT)
  - . NSSS AND NON-NSSS



1985

1984

MAY JUNE JULY AUG SEPT OCT NOV DEC J F M A M J J A S O N D

TARGET FUEL LOAD

SER COMMITMENT MADE 10/83A

ISSUE EQUIPMENT SUMMARY LIST SEE NOTE 2

NRC (CONSULTANT) IDENTIFY EQUIPT. FOR AUDIT

BOP PVORT PACKAGE PREP

BOP SORT BINDERS

BOP SQ REPORT REVIEWS

BOP EQUIPT. WALKDOWNS

INSTALLATION

NSSS PVORT PKGS

NSSS SORT SHEETS

INSTALLATION

SORT & PVORT FORMS AVAILABLE ON SITE

PREP. NRC

SITE AUDIT NRC

SEE NOTE 3

SEE NOTE 4

NOTES:

1. BASED ON NRC PROGRF 18 - SITE AUDIT NOT EXPECTED PRIOR TO 11/1/84 AS INDICATED IN REV. 1

2. ALL BOP & NSSS SAFETY RELATED EQUIPMENT WAS INCLUDED

3. GE ESTIMATES THAT THEY REQUIRE 2 TO 3 WEEKS TO COMPLETE THE PVORT PACKAGE ONCE THE NRC SELECTS THE EQUIPMENT TO BE AUDITED.

4. SORT SHEETS ARE COMPLETE ON ORIGINAL 4 PAGE FORM AND RRS.

AT LEAST 85% OF P.O.'s AVAILABLE FOR AUDIT (i.e. 62 of 72)

AS IDENTIFIED ON EQUIPT. SUMMARY LIST (85+% OF EQUIPMENT)

REV	PLN	SCHD	APPR	DATE
1	1	1	1	1/1/84
2	1	1	1	8/10/84
3	1	1	1	8/31/84

SOURCE

TITLE:

SEISMIC EQUIPMENT QUALIFICATION & NRC AUDIT

JOB NO. SCHED NO. SHEET 1 OF 1

LEGEND



## INSTALLATION CRITERIA

- . BULK QUANTITY ITEMS
  - . REPRESENTATIVE SAMPLE OF EACH ITEM TYPE INSTALLED
  - . COMPLETE FOR AUDIT PURPOSES
  
- . NON-BULK QUANTITY ITEMS
  - . EQUIPMENT SET AND ANCHORED
  - . MOUNTED IN-LINE
  - . PROCESS CONNECTIONS PIPED AND WELDED
  - . FINAL PUMP-MOTOR ALIGNMENT MAY NOT BE COMPLETE
  
- . PANELS
  - . ANCHORAGE COMPLETE
  - . CONDUIT MASS EFFECTS INCLUDED
  - . NO SIGNIFICANT CONDUIT RIGIDITY EFFECTS

CONFIRMATORY SEISMIC WALKDOWN

- . AS-BUILT VERIFICATION  
MOUNTING DURING QUALIFICATION TESTING EQUIVALENT  
TO ACTUAL IN-SITU CONDITION
- . LOCATION
- . CONFIGURATION
- . CLEARANCE FROM ADJACENT EQUIPMENT/WALLS  
CLASS 1E PANELS

SEISMIC QUALIFICATION BINDER ORGANIZATION  
(NON-NSSS)

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- . SUMMARY OF ACCEPTANCE CRITERIA
- . SQRT FORMS
- . REPORTS AND SUPPORTING DOCUMENTS
- . COMMENTS AND RESOLUTIONS
- . RELATED CORRESPONDENCE
- . FIELD WALKDOWN SUMMARY



KIPE CREEK GENERATING STATION  
JUN 1985

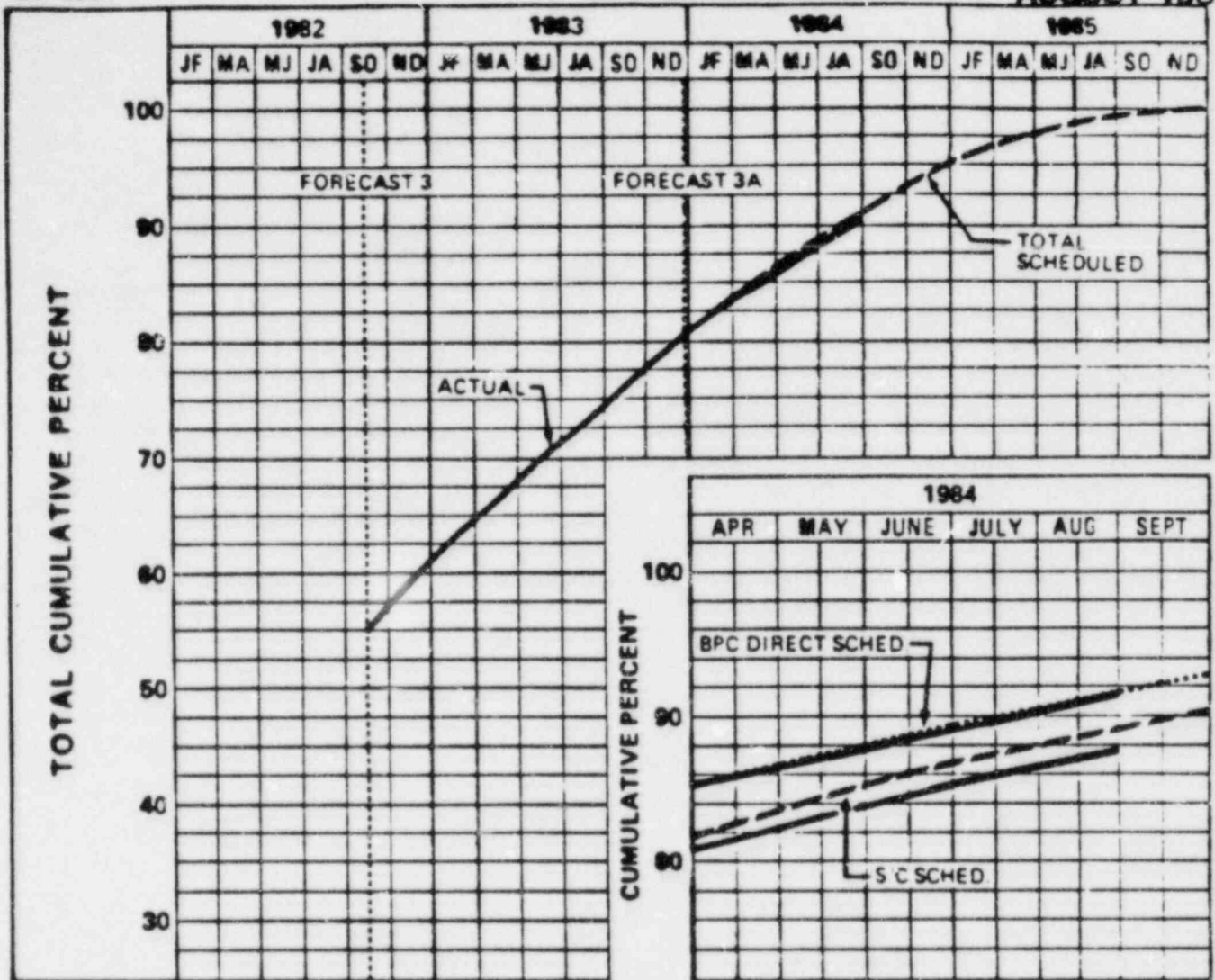
TARGET TURNS:  
SEP-85, 400  
MAY 24, 1984

S/U SYSTEM DESCRIPTION	TARGET DATE	S/U SYSTEM DESCRIPTION	TARGET DATE
ASB Main Steam	12/13/84	KFA-3 Noists	01/01/85
ACA Turb. steam Supp & Moist Sup.	11/30/84	KFA-4 Elev. & Noists	04/01/85
ADA Cond. & Primary Condensate	09/04/84	KFA-5 Elev. and Noists	07/01/85
AJA Recirculator Steam to Turbine	01/10/85	KGA Breathing Air	08/15/85
AEB F.W. Pumps & Lube Oil & Turb	01/28/85	KJA Emergency Diesel Gen. "GP"	10/31/84
AEC F.W. Pumps & Heaters	09/26/84	KJB Emergency Diesel Gen. "CP"	08/28/84
AFA Extraction Steam, V&D	05/13/85	KJC Emergency Diesel Gen. "AP"	11/14/84
AGA Condensate Train, Process	09/13/84	KJD Emergency Diesel Gen. "AA"	12/12/84
AHA Fresh Water Supply	Actual	KJA Prim. Contain. Instr. Gas	04/09/85
ANA Demin. Water P/Up & Storage	02/04/85	LAA Vacuum Drains	07/23/85
AVA Demin. Water Transfer	Actual	LDA Chemical Waste (Acid Waste)	07/02/85
APA Condensate Storage & Transfer	<del>09/29/84</del> ACTUAL	LDA Oily Waste	03/05/85
BAH Recirculation RG Sets	12/31/84	LFA Normal Drains	06/03/85
BAB Reactor Recirc. System	01/16/85	MAA Main Generator	Actual
BAC RG Set Ventilation	11/27/84	NCA 13.8KV stat. Power Transformer	Actual
BCA RH Outside Containment	11/28/84	NDA Switchyard Busbar (Gp. 1)	Actual
BCR RH Inside Containment	01/18/85	NDA Switchyard Busbar (Gp. 2)	Actual
BDA Reactor Core Iso. Cooling	01/14/85	NEA Switchyard 125V DC Power (PSE&G)	Actual
BEA Heav. Core Spray Outside	12/26/84	NEA Switchyard Lt. Aux. Power (PSE&G)	Actual
BFB Avac. Core Spray Inside	01/23/85	NEA Outgoing EDV Lines (PSE&G)	Actual
BFA Old Water, Pumps, & Pipe	11/26/84	NEB Outgoing EDV Lines (PSE&G)	10/21/85
BFB Old Control Installed Eqpt.	02/25/85	NHA 7.2KV Station Power	Actual
BFC Control Rod Drive Units	03/07/85	NBA 4.16KV Station Power Yard	Actual
BGA Reactor Water Clean-up	12/12/84	NBB 4.16KV Station Power	Actual
BHA Standby Liquid Control	01/23/85	NCA-1 480V Substation Power (GP1)	Actual
BJA High Pressure Cool Inject	01/17/85	NCA-2 480V Unit Substation (GP1)	Actual
BVA Refueling Water Transfer	Actual	NBB 480V Substation Power (GP2)	Actual
CAA Turbine Sealing Steam	02/22/85	NBA-1 480V MCC Power (GP 1)	Actual
CBA Main Turb. & Gen. Lube Oil	09/21/84	NBA-2 480V MCC Power (GP-1)	Actual
CO Generator Gas Control	05/20/85	NBB-1 480V MCC Power (GP-2)	Actual
CQA Stator Cooling	05/06/85	NBB-2 Partial T/U 480V LBS Power (GP 2)	Actual
CFA Lube Oil	07/01/84	NJA 250V DC Power	<del>09/29/84</del> ACTUAL
CGA Condenser Air Removal	12/13/84	NKA Supply Power to 125V DC	Actual
CHA Main Turbine Control Oil	11/30/84	NKB 125V DC Power Distribution	Actual
DAA Circulating Water	11/15/84	NLA 24V DC Power	11/23/84
DGA Circ. Water Hypochlorination	11/29/84	NKA Supply Power to 120V AC	Actual
DEA Circ. Water Acid Injection	10/25/84	NKB 120V AC Power Distribution	Actual
EAA Station Service Water	10/12/84	PHA 4.16KV IE Station Power	Actual
ECA Fuel Pools & Pool Cooling	12/17/84	PGA 480V IE Substation Power (GP 1)	Actual
EDA Reactor Auxiliaries Cooling	11/29/84	PGA 480V IE Substation Power (GP 2)	Actual
EEA Racs to Radwaste Extractor	07/11/85	PHB 480V IE MCC Power (GP 1)	Actual
EFA Torus & Torus Penetration	11/26/84	PHB 480V IE MCC Power (GP 2)	Actual
EBB Torus Water Clean-up	11/26/84	RJA 250V Class IE Power	Actual
EJA Safety & Turb. Aux. Cooling	12/04/84	PHA Supply Power to IE 120V DC	Actual
EKA Service Water Hypochlorine	11/08/84	PHB 125V DC Class IE Power Distrib.	Actual
FAA Auxiliary Boilers	Actual	PHB Supply Power to IE 120V AC	Actual
FAE-1 Auxiliary Steam Piping	Actual	PHB Class IE 120V AC Power Distrib.	Actual
FAE-2 Partial Aux. Steam Gen.	<del>09/29/84</del> ACTUAL	QAA Normal Lighting (GP 1)	07/23/85
GAA Plant Heating	<del>09/29/84</del> ACTUAL	QAB Normal Lighting (GP 2)	09/03/85
GAB Plant Heat - Core, E/W/RS	<del>09/29/84</del> ACTUAL	QAC Normal Lighting (GP 3)	09/03/85
GAC Pt - Aux. Diesel & Chtrl	<del>09/29/84</del> ACTUAL	QDA Standby DC Lighting	08/27/85
GAH Chilled Water (Plant)	<del>09/29/84</del> ACTUAL	QDB Essential Lighting	08/27/85
GIA Admin. Facility HVAC	01/01/85	QCC Yard Lighting	09/13/85
GJA Fire Pump House HVAC	Actual	QEA Public Offsite Communication	09/12/85
GKA T/B Supply & Exhaust	06/03/85	QFA-1 In-Plant Comm.-Cont. & Dal	As Req'd
GKB T/B HVAC (TBC & TDC)	03/20/85	QFD In-Plant Comm.-Radwaste	As Req'd
GKC T/B HVAC (TBE & TCE)	03/07/85	QFC In-Plant Comm.-Aux. & D.W.	As Req'd
GKA Asphalt Storage Bldg. HVAC	10/12/84	QFE In-Plant Comm.-Turbine	As Req'd
GCB Circ. Water Pump House HVAC	Actual	QFF In-Plant Comm.-Admin.	As Req'd
GCC Guardhouse HVAC	07/25/85	QGA Grounding (site Ground)	06/06/85
GDA R/W Area Supply & Exhaust	05/07/85	QHA Cathodic Protection	06/13/85
GDB Radwaste Tank Vent Filter	08/20/85	QKA Fire/Smoke Detect. C.W.S.	11/23/84
GDC Control Area Chilled Water	06/18/85	QKB Fire/Smoke Detect. Chtrl & Dal	05/22/85
GDE Control Room Supply & Exhaust	05/22/85	QKC Fire/Smoke Detect. Serv. & R/W	07/18/85
GDF Control Equip. Room Supply	04/10/85	QKD Fire/Smoke Detect. Turbine	04/17/85
GEG Control Area Battery Exhaust	03/19/85	QKE Fire/Smoke Detect. Reactor	04/10/85
GEH W/R Area Supply & Exhaust	05/08/85	QLA Private Offsite Communication	09/19/85
GIA Serv. Area Supply & Exhaust	06/20/85	QMA Motor Operated Doors	06/01/85
GIB Chemistry Lab Exhaust	07/16/85	QMB Lab and Shop Equipment	06/01/85
GIC Dis. Area Supply & Exhaust	02/18/85	QPC Welding & Power Receptacle	08/01/85
GID Switchgear & Gen. Room Cool	04/17/85	QCA Auxiliary Bldg. Sampling	07/30/85
GIE Diesel Area Battery Exhaust	03/27/85	QCB Turbine building sampling	07/30/85
GJA Leakage Rate Testing Eqpt.	09/10/85	QCC Reactor building sampling	07/30/85
GJB Intake Structure HVAC	10/31/84	QCD Cont. Post Accident Sampling	07/06/85
GJC Reactor Building HVAC	06/13/85	QEA Meteorological Instrumentation	09/26/85
GJD Containment Atmosphere Chtrl.	05/29/85	QEA Security Computer	02/21/85
GJE Containment Inerting	04/24/85	QEB Intrusion & Access Security	06/03/85
GJF Containment Purge Clean-up	02/04/85	QEC Security TV Monitoring	03/29/85
GJA Filtr. Recirc. & Vent. (FRVs)	05/14/85	QED Security Communications	05/20/85
GKB Gaseous Radwaste	06/27/85	QEE Guardhouse Non-IE Dal. Gen.	06/10/85
GKB Liquid Radwaste Collection	05/28/85	QEF Closed Circuit TV	10/07/85
GBC Liquid Radwaste Processing	05/28/85	QFA Plant Computer	Actual
GBC Radwaste Demin. Regen. Sys	05/28/85	QFB Plant Computer Field	Actual
GBD Chemical Radwaste	05/28/85	QFC Emergency Response Facility	09/02/85
GCA SW Collect. & Phase Proc.	06/11/85	QFA-1 Control Room Complex (Panels/Cable)	Actual
GCB SW Volume Reduction	06/11/85	QFA-2 Remote shutdown Panel	Actual
GCA Decontamination Facilities	09/26/85	QBA Reactor Protection	04/18/85
GCA Bldg. & Equip. R/W Drains	09/09/85	QCA Reactor Instrumentation	06/06/85
GCB Oily Radwaste Drains	08/04/85	QCA Area Radiation Monitoring	07/15/85
GCB Radioactive Laundry	06/08/85	QBA S/U & Inerm. Range Mds	07/23/85
JAA Auxiliary Boiler Fuel Oil	Actual	QBB Power Range Mds Monitoring	07/09/85
JBA Diesel Fuel Oil Transfer	10/24/84	QBC Tip. Calibration System	05/09/85
JBA Service Compressed Air	Actual	QBD React. Drive Con. Neut. Monitor	05/02/85
JBA Instrument Compressed Air	Actual	QFA Reactor Manual Control	04/10/85
KCA Fire Protection	Actual	QKA seismic Instrumentation	08/20/85
KCB Wet Sprinkler System	10/19/84	QKA Plant (Steam) Leak Detect.	06/17/85
KCC Fire Protection-Deluge Sys	Actual	QBA Nuc. steam supply shutoff	07/02/85
KCD FPs Auto Pre-Action W/R. Sp	11/09/84	QBA Automatic Depressurization	05/13/85
KCE FPs Pre-Action Sprinkler	Actual	QBA Process Radiation Monitor	05/13/85
KCF-1 FPs Carbon Dioxide Fire Pr.	Actual	QBA Process Radiation (Safety)	
KCF-2 17 Ton CO <sub>2</sub> Unit	<del>09/29/84</del> ACTUAL		
KCG FPs Fuel Oil Foam Protect.	Actual		
KCA Domestic Water	06/20/84		
KEA Fuel Handling & RVV Service	03/21/85		
KFA-1 Noists	Actual		
KFA-2 Radwaste Elev. & Noists	10/01/84		



### CONSTRUCTION % COMPLETE

AUGUST 1984



### CUMULATIVE % COMPLETE

1984		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
TOTAL	SCHED.	82.11	83.63	84.94	86.30	87.56	89.06	90.03	91.29	92.36	93.45	94.23	95.02
	ACTUAL	82.07	83.52	84.69	85.88	87.06	88.35	89.43	90.71				

### INCREMENTAL % COMPLETE

1984		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
BECHTEL DIRECT	SCHED.	1.00	1.44	1.21	1.25	1.26	1.49	.91	1.23	1.03	1.07	.75	.80
	ACTUAL	.98	1.41	1.14	1.13	1.14	1.22	1.09	1.36				
SUB-CONTRACT	SCHED.	1.56	1.95	1.81	1.97	1.29	1.53	1.29	1.41	1.29	1.22	.94	.76
	ACTUAL	1.45	1.70	1.38	1.38	1.34	1.59	0.99	1.47				
TOTAL	SCHED.	1.08	1.52	1.31	1.36	1.26	1.50	.97	1.26	1.07	1.09	.78	.79
	ACTUAL	1.05	1.45	1.17	1.19	1.18	1.29	1.08	1.28				

## QUALIFICATION SUMMARY OF EQUIPMENT

- ° To be completed to stand on its own (do not refer to any document)
- ° All questions are to be answered (if not applicable; mark "N/A")

I. Plant Name: \_\_\_\_\_

1. Utility: \_\_\_\_\_

2. Location: \_\_\_\_\_

3. Type: \_\_\_\_\_ 4. Capacity (MWe Net): \_\_\_\_\_

5. Containment Type: \_\_\_\_\_ 6. Cooling Source: \_\_\_\_\_

7. NRC Docket No.: \_\_\_\_\_ 8. CP Docket Date: \_\_\_\_\_

9. NSSS Vendor: \_\_\_\_\_ 10. A/E: \_\_\_\_\_

II. Component Name: \_\_\_\_\_

1. Scope:  NSSS  BOP

2. Vendor: \_\_\_\_\_ 3. Vendor Model No.: \_\_\_\_\_

4. Manufacturer: \_\_\_\_\_ 5. Manufacturer Model No.: \_\_\_\_\_

6. Purchase Spec. No.: \_\_\_\_\_ 7. Total No. in Safety Systems: \_\_\_\_\_

8. Location (Choose the worst one with respect to seismic)

a. Building: \_\_\_\_\_ b. Elevation and Area: \_\_\_\_\_

c. Environment:  Harsh  Mild

9. Field Mounting:

a.  Floor  Wall  Pipe  Panel

Other (describe) \_\_\_\_\_

b.  Bolted; description: \_\_\_\_\_  
(no. size, grade, etc.)

Welded; description: \_\_\_\_\_  
(size, length, electrode type, etc.)

Other; description: \_\_\_\_\_

c. Mounting restriction from the manufacturer, if any: (horizontal vertical, etc.) \_\_\_\_\_

10. Functional Description of the Equipment:

a. System in which located: \_\_\_\_\_  
(for item 8 in II, above)

b. Type:  Active  Passive

c. Equipment required for:  Hot standby  Cold shutdown

Both  Neither

d. Intended safety function: \_\_\_\_\_

\_\_\_\_\_

e. Direct consequences of its failure (brief description of the effect on the system): \_\_\_\_\_  
\_\_\_\_\_

f. Redundancies, if any: \_\_\_\_\_

III. Equipment Qualification Method:

Test     Analysis

Combination of test & analysis     Other (describe) \_\_\_\_\_

IV. Loads and Load Combinations:

1. Loads:

a.  Seismic                      b.  Hydrodynamic

c.  Flow induced vib.    d.  Normal operation vib.

e.  Other dynamic loads: (specify) \_\_\_\_\_

2. Combination technique: \_\_\_\_\_

3. Required acceleration in each direction:

a.  ZPA     Other; specify: \_\_\_\_\_

b. OBE: s/s \_\_\_\_\_; f/b: \_\_\_\_\_; v: \_\_\_\_\_

SSE: s/s \_\_\_\_\_; f/b: \_\_\_\_\_; v: \_\_\_\_\_

V. Qualification by Test (complete this section for each report including partial test:

1. Test report: (Company) \_\_\_\_\_

a. Title: \_\_\_\_\_

no.: \_\_\_\_\_; revision: \_\_\_\_\_; date: \_\_\_\_\_

b. Reviewed by: \_\_\_\_\_

2. Qualification report: (Company) \_\_\_\_\_

a. Title: \_\_\_\_\_

no.: \_\_\_\_\_; revision: \_\_\_\_\_; date: \_\_\_\_\_

b. Reviewed by: \_\_\_\_\_

3. Laboratory mounting:

a. Describe [from shaker table to the equipment; include orientation, bolt (size, no., gr., etc.), weld (type, size, length, electrode type, etc.)]: \_\_\_\_\_  
\_\_\_\_\_

b. If different from field mounting include equivalency justification:

\_\_\_\_\_  
\_\_\_\_\_

4. Resonance search:  yes  no

a. Technique: \_\_\_\_\_

b. Excitation magnitude & frequency interval (or sweep rate): \_\_\_\_\_

c. Resonances found: (up to: \_\_\_\_\_)

s/s: \_\_\_\_\_; f/b: \_\_\_\_\_; v: \_\_\_\_\_

5. Test Description:

a. Input:

(a)  single axis;  biaxial;  pseudo biaxial;

tri-axial  random;  sine beat;

other: \_\_\_\_\_

phase coherent;  phase incoherent

(b) Frequency range: \_\_\_\_\_

(c) Input level (g-level & frequency)

OBE: s/s: \_\_\_\_\_; f/b: \_\_\_\_\_; v: \_\_\_\_\_

SSE: s/s: \_\_\_\_\_; f/b: \_\_\_\_\_; v: \_\_\_\_\_

(d) Number of tests performed: OBE: \_\_\_; SSE: \_\_\_; other: \_\_\_\_\_

(e) Sequential test, including fatigue & vibration aging

conducted:  yes  no

Justification, if not performed: \_\_\_\_\_

b. Output:

(a) TRS generated:  yes  no

(b) Percent damping in TRS generation: \_\_\_\_\_

(c) Percent damping used in RRS: \_\_\_\_\_

(d) Margin included in RRS: \_\_\_\_\_

by test lab.  by others: (specify) \_\_\_\_\_

(e) Attach sets of TRS and RRS comparison plots (if not provided, explain): \_\_\_\_\_

\_\_\_\_\_

c. Results:

(a) Basis of qualification:

[ ] structural integrity verified; [ ] operability verified

(b) Failures detected during qualification tests: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(c) Anomalies (with disposition) if any: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(d) Modifications made (in the equipment or mounting) during the qualification phase; describe, if any: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(e) How (modifications) implemented in the field: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

d. Other tests performed (such as fragility test; include results)  
\_\_\_\_\_

VI. Qualification by Analysis (complete this section for each report )

1. Analysis Report: (Company) \_\_\_\_\_

a. Title: \_\_\_\_\_  
\_\_\_\_\_

no.: \_\_\_\_\_; revision: \_\_\_\_\_; date: \_\_\_\_\_

b. Reviewed by: \_\_\_\_\_

2. Qualification Report: (Company) \_\_\_\_\_

a. Title: \_\_\_\_\_  
\_\_\_\_\_

no.: \_\_\_\_\_; revision: \_\_\_\_\_; date: \_\_\_\_\_

3. Failure modes: \_\_\_\_\_  
\_\_\_\_\_

4. Method of Analysis:

[ ] static [ ] static coefficient [ ] dynamic

[ ] time history [ ] response spectrum

5. Natural frequencies (up to cut off frequency of: \_\_\_\_\_):

s/s: \_\_\_\_\_; f/b: \_\_\_\_\_; v: \_\_\_\_\_

6. Model type:  
 1D;     2D;     3D  
 finite element: (kinds of elements used) \_\_\_\_\_  
 other: (specify) \_\_\_\_\_
7. Support & Boundary conditions in the model:  
 \_\_\_\_\_  
 \_\_\_\_\_
8. Computer codes used: \_\_\_\_\_  
 Method of verification: \_\_\_\_\_
9. Damping: OBE: \_\_\_\_\_; SSE: \_\_\_\_\_; Basis: \_\_\_\_\_
10. Fatigue & aging consideration:  yes     no
11. Responses:  
 a. Method of combination:  ABS;  SRSS;  
     algebraic,  other, specify: \_\_\_\_\_  
 b. For critical elements:

Identification	Location	Loads	Total calculated stresses	Allowable stresses	Source of allowables

Identification	Location	Loads	Total defl.	Allow. defl.	Source of allow. defl.

VII. Surveillance and Maintenance Program:

1. Qualified life: \_\_\_\_\_  
 (based on weakest link or appendage in the equip.)
2. Basis: \_\_\_\_\_
3. Procedure of assuring operability of the equipment under seismic and dynamic condition throughout the plant life: \_\_\_\_\_