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 AUTH. NAME AUTHOR AFFILIATION
 VAN BRUNT, E. E. Arizona Public Service Co.
 RECIP. NAME RECIPIENT AFFILIATION
 KNIGHTON, G. Licensing Branch 3

SUBJECT: Forwards Amend 1 to environ qualification rept, per 830314 request & NUREG-0588 requirements.

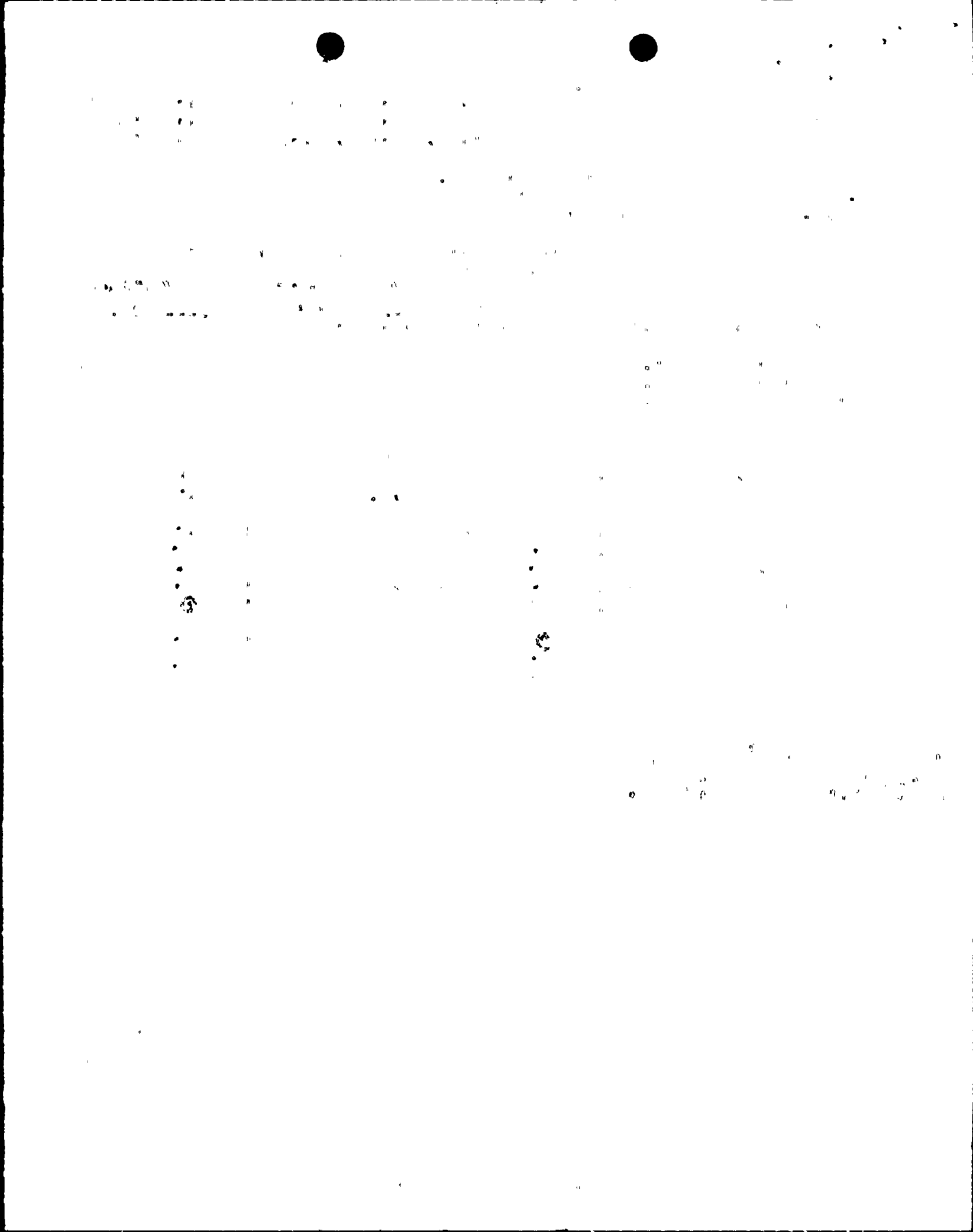
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	NRR/DL/GRAB	06	1	1	NRR/DSI/AEB		1 1
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Arizona Public Service Company

P.O. BOX 21666 • PHOENIX, ARIZONA 85036

June 24, 1983
ANPP-24107 - WFQ/TFQ

Director of Nuclear Reactor Regulation
Attention: Mr. George Knighton, Chief
Licensing Branch No. 3
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

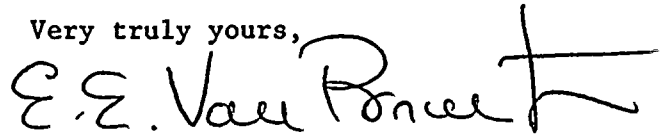
Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2 and 3
Docket Nos. STN-50-528/529/530
File: 83-056-026; G.1.01.10

Reference: Letter from G. W. Knighton, NRC to E. E. Van Brunt, Jr., APS,
dated March 14, 1983. Subject: Request for Additional
Information Concerning the PVNGS Environmental Qualification
Report.

Dear Mr. Knighton:

Arizona Public Service Company (APS), as Project Manager and Operating Agent for Palo Verde Nuclear Generating Station (PVNGS) Units 1, 2 and 3, is submitting herewith fifteen (15) copies of Amendment 1 to the PVNGS Environmental Qualification Report (EQR). The EQR provides a summary of the progress of the PVNGS Equipment Qualification Team (EQT) on environmental qualification of nuclear safety-related equipment. Amendment 1 to the EQR is submitted in response to your request for information stated in the referenced letter, and to support the Audit of the Environmental Qualification Program tentatively scheduled for the week of June 27, 1983.

Very truly yours,



E. E. Van Brunt, Jr.
APS Vice President
Nuclear Projects Management
ANPP Project Director

EEVB/TFQ/sp
Attachment

cc: E. A. Licitra
A. C. Gehr


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1/15 Limited
Post*

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PDR ADOCK 05000528
A PDR

June 24, 1983
ANPP-24107 - WFQ/TFQ

STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

I, Edwin E. Van Brunt, Jr., represent that I am Vice President, Nuclear Projects of Arizona Public Service Company, that the foregoing document has been signed by me on behalf of Arizona Public Service Company with full authority to do so, that I have read such document and know its contents, and that to the best of my knowledge and belief, the statements made therein are true.


Edwin E. Van Brunt, Jr.

Sworn to before me this 17th day of June, 1983.


Notary Public

My Commission Expires:

My Commission Expires April 6, 1987



Arizona Public Service Company

P.O. BOX 21666 • PHOENIX, ARIZONA 85036

June 24, 1983
ANPP-24107 - WFQ/TFQ

Director of Nuclear Reactor Regulation
Attention: Mr. George Knighton, Chief
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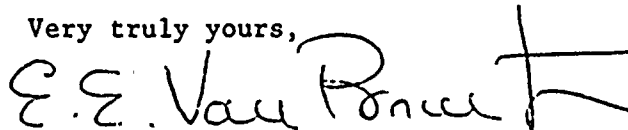
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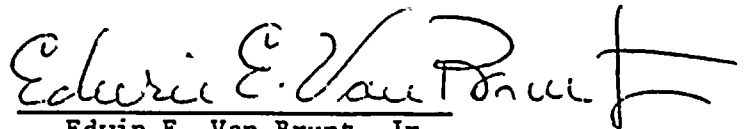
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June 24, 1983
ANPP-24107 - WFQ/TFQ

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COUNTY OF MARICOPA)

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Edwin E. Van Brunt, Jr.

Sworn to before me this 17th day of June, 1983.


Notary Public

My Commission Expires:

My Commission Expires April 6, 1987

ENVIRONMENTAL QUALIFICATION REPORT
PER REQUIREMENTS OF NUREG-0588

Revised 7/13/83

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ENVIRONMENTAL QUALIFICATION REPORT
PER REQUIREMENTS OF NUREG-0588

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Qualification Rpt. dtd 6/24/83 #8306280436*

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1. INTRODUCTION

1.1 INTRODUCTION

As part of the environmental qualification program for Class IE equipment for the Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2 and 3, Arizona Public Service Company (APS) has organized an Equipment Qualification Team (EQT) to coordinate and review qualification of nuclear safety-related equipment. The equipment covered in this effort includes all Class IE equipment, both inside and outside containment, and in harsh and non-harsh environments. However, since this report is intended to meet the requirements of NUREG-0588, its scope is limited to Class IE equipment inside containment and in harsh environment areas outside containment. Harsh environment is defined as the environment in any area where there is a significant change in one or more of the environmental parameters due to a Design Basis Accident (DBA). The harsh environments result from the following DBA's:

1. Loss of Coolant Accident (LOCA)/Main Steam Line Break (MSLB)/High Energy Line Break (HELB) inside containment
2. MSLB outside containment
3. HELB outside containment

The EQT review includes the effects of radiation on equipment outside the containment during post-LOCA recirculation of containment sump fluids. Review of supporting documentation is made to determine that the equipment necessary to protect the public health and safety will perform its function when subjected to DBA's up to and including its end-of-life condition.

This qualification coordination and review, ongoing since approximately 1976 (commencing with preparation of specifications), was originally based on IEEE 323-1974 and was oriented toward the preferred use of type testing and analysis based on type testing, in lieu of the other techniques offered by

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INTRODUCTION

that document. Since the issuance of NUREG-0588, "Interim Staff Position on Environmental Qualification of Safety Related Electrical Equipment", this effort has been adjusted to meet the requirements outlined for Category I plants of that document. This effort is being performed by a team composed of personnel experienced in reactor systems safety analysis and design, plant operations, emergency operating procedures, nuclear safety and licensing, and environmental qualification.

This report is supported by an auditable record of documentation. The documentation identifies the specific equipment and its function, the criteria used in preparation and review of the qualification reports (starting with the project initial procurement activities and proceeding through report approval), the preparers and reviewers of the documents, and the report references.

The purpose of the EQT review is to evaluate specific safety-related equipment for the worst environment that it would experience and to demonstrate its qualification. Class IE equipment subject to harsh environments is documented in this report on summary sheets, with requirements and results included in accordance with Nuclear Regulatory Commission (NRC) guidelines. Additional documentation is available for NRC audit for further comparison and demonstration that the environmental qualification data and reports conform to the requirements of NUREG-0588. These data are included in APS and Bechtel Power Corporation review sheets which accompany the qualification reports and document their compliance with NUREG-0588, Regulatory Guide 1.89 (Rev. 0), IEEE Standard 323-1974, and other industry standards and regulatory guides. Tables 4.1-1 and 4.1-2 provide the summary sheets for Balance-of-Plant (BOP) and Nuclear Steam Supply System (NSSS) Class IE equipment considered in this report, including demonstration of qualification to NUREG-0588 Category I requirements. The last column of these

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tables identifies the status of the qualification effort. All equipment in tables 4.1-1 and 4.1-2 will be qualified prior to fuel load unless otherwise indicated. It is recognized that even with APS's best efforts, certain items may not be qualified prior to commercial operation. Items described in IE Information Notice 82-52 are being qualified in programs outside the control of APS. As such, failure to demonstrate qualification for these particular items should not be held against the APS program inasmuch as qualification for these items is an industry wide problem. APS, however, commits to provide a letter to the commission prior to exceeding 5% power on PVNGS Unit 1 describing the current status of qualification efforts. This letter will assess the safety implications of full power operation without completion of qualification and will provide justification for interim full power operation if considered desired by APS. In addition programs of equipment qualification, described in appendix A, assure that equipment will remain qualified throughout the life of the plant.

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2. SAFETY-RELATED SYSTEMS REQUIRED TO FUNCTION FOR
LOCA/MSLB/HELB SAFE SHUTDOWN

2.1 SAFE SHUTDOWN AND ACCIDENT MITIGATION

APS has evaluated the environmental qualification of the Class 1E equipment which experiences a harsh environment due to LOCA, MSLB, and HELB accidents. This report includes equipment required to bring the reactor to a safe shutdown condition. PVNGS has been designed to achieve both the hot and cold safe shutdown conditions relying only upon safety related equipment. Although APS is aware of recent changes to 10CFR 50.49 (commissioner vote of January 7, 1983) that would delete cold shutdown qualification from the scope of this report, APS has identified in appendix E, the list of equipment required for cold shutdown pursuant to the NRC staff request made in the meeting held in Bethesda, Maryland, on March 25, 1982.

Class 1E equipment required to reach safe shutdown is qualified to assure operability in the accident environment for the time required to mitigate a postulated accident. The LOCA accident evaluation also includes areas where equipment will be exposed to high radiation from piping systems containing recirculated containment sump fluids.

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Table 2.2-1

LIST OF SYSTEMS CONTAINING CLASS IE
EQUIPMENT (Sheet 2 of 2)

Services

Instrument and Service Air System^(a)
Fire Protection System^(a)
Service Gas System (N₂ and H₂)^(a)
Diesel Generator Systems

2. ELECTRICAL SYSTEMS

Class IE Power Systems

Class IE 4.16-kV Power System
Class IE Standby Generation System
Class IE 480-V Power Switchgear System
Class IE 480-V Power MCC System^(a)
Class IE 125-V DC Power System
Class IE Instrument AC Power System^(a)

3. INSTRUMENTATION AND CONTROL SYSTEMS

Engineered Safety Features Actuation System^(a)
Reactor Protection System^(a)
Ex-Core Neutron Monitoring System^(a)
Radiation Monitoring System^(a)

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Table 2.2-2
SAFETY SYSTEMS REQUIRED TO PERFORM SAFETY FUNCTIONS (Sheet 1 of 4)

Safety System Identification		Function						
Name	System Designator	Reactivity Control (a)	Reactor Core Cooling (b)	Heat Removal From the RCS (a)	RCS Integrity (d)	Radio-activity Control (e)	Containment Integrity (f)	Support System (g)
Main Steam System	SG			X			X	
Auxiliary Feedwater System	AF			X			X	
Condensate Transfer and Storage System	CT			X				
Reactor Coolant System	RC		X	X	X	X		
Safety Injection and Shutdown Cooling System	SI	X	X	X	X	X	X	
Chemical and Volume Control System	CH	X			X		X	
Nuclear Sampling System	SS				X		X	
Essential Spray Pond System	SP			X				X
Essential Cooling Water System	EW			X				X

a. Instrumentation or systems for reactivity control.
b. Instrumentation to detect or systems to mitigate inadequate core cooling.
c. Systems involved in transferring primary heat to ultimate heat sinks.
d. Systems part of reactor coolant pressure boundary.
e. Barrier or filter for radioactivity and instrumentation to detect breach.
f. Containment pressure boundary.
g. Supports other ESF systems.

Table 2.2-2

SAFETY SYSTEMS REQUIRED TO PERFORM SAFETY FUNCTIONS (Sheet 2 of 4)

Safety System Identification		Function						
Name	System Designator	Reactivity Control ^(a)	Reactor Core Cooling ^(b)	Heat Removal From the RCS ^(a)	RCS Integrity ^(d)	Radio-activity Control ^(e)	Containment Integrity ^(f)	Support System ^(g)
Essential Chilled Water System	EC							X
HVAC - Fuel Building	HF					X		X
HVAC - Control Building	HJ					X		
HVAC - Diesel Generator Building	HD							X
Containment Hydrogen Control System	HP					X	X	
Diesel Fuel Oil and Transfer System	DF							X
Diesel Generator System	DG							X
Class IE 4.16 kV Power System	PB							X
Class IE Standby Generation System	PE							X
Class IE 480V Power Switchgear System	PG							X
Class IE 480V Power MCC System	PH							X
Class IE 125V dc Power System	PK							X
Class IE Instrument ac Power System	PN							X

Table 2.2-2

SAFETY SYSTEMS REQUIRED TO PERFORM SAFETY FUNCTIONS (Sheet 3 of 4)

Safety System Identification		Function						
Name	System Designator	Reactivity Control (a)	Reactor Core Cooling (b)	Heat Removal From the RCS (a)	RCS Integrity (d)	Radio-activity Control (e)	Containment Integrity (f)	Support System (g)
Engineered Safety Features Actuation System	SA							X
Reactor Protection System	SB	X						X
Ex-Core Neutron Monitoring System	SE	X						X
Radiation Monitoring System	SQ						X	X
Demineralized Water System	DW							X
Fuel Pool Cooling System	DC		X					X
Nuclear Cooling System	NC							X
Chilled Water	WC							X
Chemical and Volume Control System	CH	X			X			
HVAC - Auxiliary Building	HA							X
HVAC - Containment	HC							X
Gaseous Radwaste System	GR						X	X

2.2-6

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 ENVIRONMENTAL QUALIFICATION REPORT
 PER REQUIREMENTS OF NUREG-0588

Table 2.2-2

SAFETY SYSTEMS REQUIRED TO PERFORM SAFETY FUNCTIONS (Sheet 4 of 4)

Safety System Identification		Function						
Name	System Designator	Reactivity Control ^(a)	Reactor Core Cooling ^(b)	Heat Removal From the RCS ^(a)	RCS Integrity ^(d)	Radio-activity Control ^(e)	Containment Integrity ^(f)	Support System ^(g)
Radioactive Waste Drains System	RD						X	X
Instrument & Service Air System	IA							X
Fire Protection	FP							X
Service Gas System	GA							X
Containment Purif.	CP					X		

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PER REQUIREMENTS OF NUREG-0588
SAFETY RELATED DISPLAY INDICATION AND
POST-ACCIDENT MONITORING INSTRUMENTATION

Table 2.5-1

SAFETY-RELATED DISPLAY INDICATION/POST-ACCIDENT
MONITORING INSTRUMENTATION (PAMI) (Sheet 5 of 6)

Bechtel Tag No.	Description	Required For Cold Shutdown	PAMI	Accident Mitigation
J-SIN-TI-712	Emergency Sump Water Temperature		X	
J-CHN-LI-226	Volume Control Tank Level		X	X
J-EWN-FI-13	Essential Cooling Water System Flow		X	X
J-EWN-TI-51	Essential Cooling Water System Temperature		X	
J-SQA-RU-150 J-SQB-RU-151	High Range In-(a) Containment Area Radiation Monitor		X	X
J-SQA-RU-152 J-SQB-RU-153	Primary Coolant (a) Monitor		X	X
J-SQN-RU-141 J-SQN-RU-142 J-SQN-RU-143 J-SQN-RU-144 J-SQN-RU-145 J-SQN-RU-146	High Range Effluent (a) Monitors		X	
J-SQN-RU-139 J-SQN-RU-140	Main Steam Line Monitor (a)		X	X
J-SQN-RU- 152A, B, C, D through J-SQN-RU- 158A, B, C, D	Intermediate Range Area Radiation (a) Monitors		X	

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ENVIRONMENTAL QUALIFICATION REPORT
PER REQUIREMENTS OF NUREG-0588
SAFETY RELATED DISPLAY INDICATION AND
POST-ACCIDENT MONITORING INSTRUMENTATION

Table 2.5-1

SAFETY-RELATED DISPLAY INDICATION/POST-ACCIDENT
MONITORING INSTRUMENTATION (PAMI) (Sheet 6 of 6)

Bechtel Tag No.	Description	Required For Cold Shutdown	PAMI	Accident Mitigation
J-SQA-RI-31	Fuel Building Area Monitor ^(b)			X
J-SQA-RU-37 J-SQA-RU-38	Power Access Purge Area Monitors			X
<p>a. Sensitive electronics are located in a benign environment and are not included in this report.</p> <p>b. Trip monitors - long term qualification not required.</p>				

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PER REQUIREMENTS OF NUREG-0588

3. ENVIRONMENTAL CONDITIONS

3.1 ACCIDENT PROFILE

The normal/abnormal and DBA environmental conditions for equipment used at PVNGS are described in table 4.1-3. IEEE Standard 323-1974 and NUREG-0588 Category I have been used to establish requirements for qualification tests and analyses performed on the Class 1E equipment exposed to these environmental conditions.

3.1.1 ENVIRONMENTAL CONDITIONS INSIDE CONTAINMENT

3.1.1.1 LOCA

The environmental qualification and design condition envelope is based on an analysis of the containment response to various hot leg and cold leg LOCA's. The analyses were performed using Bechtel's COPATTA containment response analysis program. The COPATTA program predicts pressures and temperatures within the containment building atmosphere and sump regions and the temperature profiles in various modeled structures. A condensed description of the COPATTA code appears in FSAR Paragraph 6.2.1.1.3 and a complete description can be found in Bechtel Topical Report BN-TOP-3'. The methodology used in the COPATTA program is consistent with that provided in NUREG-0588 as applied to LOCA analyses. The analyses used to define the qualification envelope (table 4.1-3) were developed from break mass/energy flow data provided by CE and are presented in FSAR Section 6.2. For temperature considerations, the worst case LOCA is a double-ended suction leg slot break (9.82 ft^2) at 102% power with loss of off-site power and failure of one emergency core cooling system (ECCS) train. This postulated LOCA generates a calculated peak containment pressure of 46.5 psig and a peak containment vapor temperature of 300F. This temperature profile is bounded by the MSLB

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profile shown in figure 3.1-1. For pressure considerations, the worst case LOCA is a double-ended discharge leg slot break (9.82 ft^2) at 102% power with loss of off-site power and maximum ECCS flow. This postulated LOCA generates a calculated peak containment pressure of 49.2 psig and a peak containment vapor temperature of 293F. The post-accident design envelope for safety-related equipment is shown in figures 3.1-1 and 3.1-2.

3.1.1.2 MSLB

The evaluation of environmental conditions associated with a MSLB in containment was performed utilizing the Bechtel COPATTA code modified to incorporate the modeling set forth in the NRC Containment Systems Branch Interim Evaluation Model (CSB-IEM) and is consistent with the methodology presented in NUREG-0588, Appendix B. The most severe MSLB accident, 102% power with failure of one cooling train and off-site power available, has been analyzed.

Previously reported MSLB containment response analyses in FSAR Table 6.2-9 are conservative compared to the CSB-IEM and remain valid for the purpose of identifying the worst case MSLB to be used for the environmental qualification analysis. On the basis of peak containment pressure and temperature, the 102% power MSLB with cooling train failure is most severe. This MSLB exhibits peak containment conditions of 41.1 psig and 369.8F.

3.1.1.3 HELB

A listing of the lines within safety-related structures that are considered capable of failure is given in FSAR Tables 3.6-1 and 3.6-2. For each line break postulated, a zone of influence was generated and any safety-related equipment in that zone of influence was identified. Design

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MARGINS

4. The margin applied to the minimum operability time when combined with the other test margins will account for the uncertainties associated with the design, production tolerances, testing techniques, and the number of units tested.

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3.3 HIGH RADIATION

3.3.1 LEVELS INSIDE CONTAINMENT

A review of safety-related equipment which may be degraded by radiation during post-accident operation has been conducted. The guidance provided by NUREG-0588 has been used in determining radiation exposures.

A LOCA results in depressurization of the primary system and large release of radioactive material to the containment atmosphere. The PVNGS qualification effort is also considering an intact primary degraded core event in accordance with NUREG-0737. Source term changes derived from the guidance of NUREG-0737 are consistent with NUREG-0588.

3.3.1.1 Core Inventory

Table 3.3-1 presents the core inventory of radionuclides. These sources are based on 108% of full power core conditions or 4100 MWt. Note that the full power identified in the application for the operating license (dated October 1, 1979) is 3800 MWt. Thus, all values identified in the table include 8% margin.

3.3.1.2 Containment Airborne Activity

The following fractions of core inventory are diluted in the containment volume of $2.6 \times 10^6 \text{ ft}^3$.

- A. 100% Noble Gas
- B. 25% Halogens

Table 3.3-2 presents containment airborne concentrations at the start of a postulated accident.

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Table 3.3-1
TOTAL CORE INVENTORY

Nuclide Activity ^(a) (Curies)		Nuclide Activity ^(a) (Curies)		Nuclide Activity ^(a) (Curies)	
Se-84	2.55(+7)	Sn-129	1.08(+7)	Cs-140	2.00(+8)
Br-84	2.55(+7)	Sb-129	2.08(+7)	Ba-140	2.11(+8)
As-85	5.52(+6)	Te-129m	3.68(+6)	La-140	2.11(+8)
Se-85	3.02(+7)	Te-129	2.03(+7)	Xe-143	2.75(+6)
Br-85	3.21(+7)	I-129	1.61(+0)	Cs-143	4.52(+7)
Kr-85m	3.48(+7)	Sn-131	3.50(+7)	Ba-143	1.47(+8)
Kr-85	1.21(+6)	Sb-131	9.30(+7)	La-143	1.81(+8)
Se-87	3.29(+7)	Te-131m	1.72(+7)	Ce-143	1.83(+8)
Br-87	5.73(+7)	Te-131	1.00(+8)	Pr-143	1.84(+8)
Kr-87	5.91(+7)	I-131	1.13(+8)	Xe-144	4.03(+5)
Br-88	7.74(+7)	Xe-131m	6.17(+5)	Cs-144	1.25(+7)
Kr-88	8.59(+7)	Sn-132	3.08(+7)	Ba-144	8.75(+7)
Rb-88	8.61(+7)	Sb-132	8.24(+7)	La-144	1.61(+8)
Br-89	7.92(+7)	Te-132	1.15(+8)	Ce-144	1.25(+8)
Kr-89	1.08(+8)	I-132	1.16(+8)	Pr-144	1.25(+8)
Rb-89	1.12(+8)	Sn-133	5.37(+6)		
Sr-89	1.13(+8)	Sb-133	1.10(+8)		
Br-90	7.78(+7)	Te-133m	1.42(+8)		
Kr-90	1.16(+8)	Te-133	1.01(+8)		
Rb-90	1.31(+8)	I-133	2.32(+8)		
Sr-90	6.60(+6)	Xe-133	2.26(+8)		
Y-90	6.57(+6)	Cs-134	1.28(+6)		
Kr-91	8.95(+7)	Sb-134	5.69(+7)		
Rb-91	1.45(+8)	Te-134	2.14(+8)		
Sr-91	1.49(+8)	I-134	2.54(+8)		
Y-91m	8.80(+7)	Sb-135	1.80(+7)		
Y-91	1.49(+8)	Te-135	1.09(+8)		
Sr-95	1.64(+8)	I-135	2.21(+8)		
Y-95	2.02(+8)	Xe-135m	6.38(+7)		
Zr-95	1.99(+8)	Xe-135	5.31(+7)		
Nb-95	1.95(+8)	Cs-135	2.50(+1)		
Zr-99	2.61(+8)	Cs-136	1.32(+6)		
Nb-99	2.61(+8)	I-137	1.44(+8)		
Mo-99	2.69(+8)	Xe-137	2.09(+8)		
Tc-99m	3.23(+7)	Cs-137	4.84(+6)		
Mo-103	1.46(+8)	Ba-137m	4.52(+6)		
Tc-103	1.53(+8)	I-138	8.77(+7)		
Ru-103	1.53(+8)	Xe-138	2.05(+8)		
Tc-106	6.72(+7)	Cs-138	2.07(+8)		
Ru-106	5.27(+7)	Xe-140	1.16(+8)		
a. Numbers in parentheses denote powers of ten					

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Table 3.3-2

CONTAINMENT AIRBORNE ACTIVITY AT START OF ACCIDENT

Nuclide	Activity ^(a) ^(b) (Curies)
Kr-85m	3.48(+7)
Kr-85	1.21(+6)
Kr-87	5.91(+7)
Kr-88	8.59(+7)
Kr-89	1.08(+8)
Kr-90	1.16(+8)
Kr-91	8.95(+7)
I-129	4.03(-1)
I-131	2.83(+7)
Xe-131m	6.17(+5)
I-132	2.90(+7)
I-133	5.80(+7)
Xe-133	2.26(+8)
I-134	6.35(+7)
I-135	5.53(+7)
Xe-135m	6.38(+7)
Xe-135	5.31(+7)
I-137	3.60(+7)
Xe-137	2.09(+8)
I-138	2.19(+7)
Xe-138	2.05(+8)
Xe-140	1.16(+8)
Xe-143	2.75(+6)
Xe-144	4.03(+5)
<p>a. Numbers in parentheses denote powers of ten.</p> <p>b. Containment free volume is 2.6×10^6 ft³.</p>	

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3.3.1.3 Reactor Coolant Activity

The following fractions of core inventory are diluted in the reactor coolant volume of $9.15 \times 10^3 \text{ ft}^3$ for a degraded core intact primary event (NUREG 0737).

- A. 100% Noble Gas
- B. 50% Halogens
- C. 1% Solids

Table 3.3-3 presents reactor coolant concentrations at the start of a postulated accident.

3.3.1.4 Plateout Source Terms

Iodine released from the core will plateout on surfaces within containment. The amount of iodine which is available for plateout is 25% of the core iodine inventory. Conservatively, no time dependency was assumed for the mechanism of plateout. The entire 25% of the core iodine inventory was assumed to plateout immediately following a postulated accident with the activity the same as the airborne iodine activity throughout the accident.

The total available iodine plateout surface area taken into consideration was the concrete, stainless, galvanized, and carbon steel surfaces within containment. The total surface area available is $5.6 \times 10^5 \text{ ft}^2$.

3.3.1.5 Sump Sources

For the purpose of qualifying equipment which is located near the containment sumps, a sump source was determined. The following fractions of core inventory are assumed to be diluted in the sump volume of approximately 600,000 gallons immediately following the postulated accident.

- A. 50% Halogens
- B. 1% Solids

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Table 3.3-3

REACTOR COOLANT ACTIVITY AT START OF ACCIDENT

Nuclide Activ- ity ^{(a)(b)} (Curies)		Nuclide Activ- ity ^{(a)(b)} (Curies)		Nuclide Activ- ity ^{(a)(b)} (Curies)	
Se-84	2.55(+5)	Sn-129	1.08(+5)	Cs-140	2.00(+6)
Br-84	1.28(+7)	Sb-129	2.08(+5)	Ba-140	2.11(+6)
As-85	5.52(+4)	Te-129m	3.68(+4)	La-140	2.11(+6)
Se-85	3.02(+5)	Te-129	2.03(+5)	Xe-143	2.75(+6)
Br-85	1.61(+7)	I-129	8.05(-1)	Cs-143	4.52(+5)
Kr-85m	3.48(+7)	Sn-131	3.50(+5)	Ba-143	1.47(+6)
Kr-85	1.21(+6)	Sb-131	9.30(+5)	La-143	1.81(+6)
Se-87	3.29(+5)	Te-131m	1.72(+5)	Ce-143	1.83(+6)
Br-87	2.87(+7)	Te-131	1.00(+6)	Pr-143	1.84(+6)
Kr-87	5.91(+7)	I-131	5.65(+7)	Xe-144	4.03(+5)
Br-88	3.87(+7)	Xe-131m	6.17(+5)	Cs-144	1.25(+5)
Kr-88	3.59(+7)	Sn-132	3.08(+5)	Ba-144	8.75(+5)
Rb-88	8.61(+5)	Sb-132	8.24(+5)	La-144	1.61(+6)
Br-89	3.96(+7)	Te-132	1.15(+6)	Ce-144	1.25(+6)
Kr-89	1.08(+8)	I-132	5.80(+7)	Pr-144	1.25(+6)
Rb-89	1.12(+6)	Sn-133	5.37(+4)		
Sr-89	1.13(+6)	Sb-133	1.10(+6)		
Br-90	3.89(+7)	Te-133m	1.42(+6)		
Kr-90	1.16(+8)	Te-133	1.01(+6)		
Rb-90	1.31(+6)	I-133	1.16(+8)		
Sr-90	6.60(+4)	Xe-133	2.26(+8)		
Y-90	6.57(+4)	Cs-134	1.28(+4)		
Kr-91	8.95(+7)	Sb-134	5.69(+5)		
Rb-91	1.45(+6)	Te-134	2.14(+6)		
Sr-91	1.49(+6)	I-134	1.27(+8)		
Y-91m	8.80(+5)	Sb-135	1.80(+5)		
Y-91	1.49(+6)	Te-135	1.09(+6)		
Sr-95	1.64(+6)	I-135	1.10(+8)		
Y-95	2.02(+6)	Xe-135m	6.38(+7)		
Zr-95	1.99(+6)	Xe-135	5.31(+7)		
Nb-95	1.95(+6)	Cs-135	2.50(-1)		
Zr-99	2.61(+6)	Cs-136	1.32(+4)		
Nb-99	2.61(+6)	I-137	7.20(+7)		
Mo-99	2.69(+6)	Xe-137	2.09(+8)		
Tc-99m	3.23(+5)	Cs-137	4.84(+4)		
Mo-103	1.46(+6)	Ba-137m	4.52(+4)		
Tc-103	1.53(+6)	I-138	4.39(+7)		
Ru-103	1.53(+6)	Xe-138	2.05(+8)		
Tc-106	6.72(+5)	Cs-138	2.07(+6)		
Ru-106	5.27(+5)	Xe-140	1.16(+8)		

a. Numbers in parentheses denote powers of ten.

b. Reactor coolant system volume is $9.15 \times 10^3 \text{ ft}^3$.

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Table 3.3-4 presents the isotopic inventory in the sump immediately following the postulated accident.

3.3.1.6 Methodology

The following calculation methodology is utilized. Gamma and beta doses are determined for three types of radioactive source distributions: nuclides suspended in the containment atmosphere, plated-out on containment surfaces, or mixed in the containment sump water. A given piece of equipment may receive a dose contribution from any or all of these sources. The amount of dose contributed by each of these sources is determined by the location of the equipment and the effects of shielding as follows:

A. Gamma Radiation

1. Containment Airborne

The finite cloud model is used to calculate the gamma dose to equipment from airborne sources. This model uses a sphere with the same volume as that of the containment.

2. Plateout

The contribution to the gamma dose from iodine plateout is calculated using a cylindrical shell source of the same height and volume as that of the containment. No internal structures are modeled. Air attenuation is not considered.

3. Sump

The gamma dose from the sump is calculated by modeling the sump as a cylinder with a radius equal to that of the containment. To conserve the volume of the source, the height of the cylinder is set at about 4.5 feet. Figure 3.3-1

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Table 3.3-4

CONTAINMENT SUMP ACTIVITY AT START OF ACCIDENT

Nuclide Activity ^{(a)(b)} (Curies)		Nuclide Activity ^{(a)(b)} (Curies)		Nuclide Activity ^{(a)(b)} (Curies)	
Se-84	2.55(+5)	Sn-129	1.08(+5)	Cs-140	2.00(+6)
Br-84	1.28(+7)	Sb-129	2.08(+5)	Ba-140	2.11(+6)
As-85	5.52(+4)	Te-129m	3.68(+4)	La-140	2.11(+6)
Se-85	3.02(+5)	Te-129	2.03(+5)	Cs-143	4.52(+5)
Br-85	1.61(+7)	I-129	8.05(-1)	Ba-143	1.47(+6)
Se-87	3.29(+5)	Sn-131	3.50(+5)	La-143	1.81(+6)
Br-87	2.87(+7)	Sb-131	9.30(+5)	Ce-143	1.83(+6)
Br-88	3.87(+7)	Te-131m	1.72(+5)	Pr-143	1.84(+6)
Rb-88	8.61(+5)	Te-131	1.00(+6)	Cs-144	1.25(+5)
Br-89	3.96(+7)	I-131	5.65(+7)	Ba-144	8.75(+5)
Rb-89	1.12(+6)	Sn-132	3.08(+5)	La-144	1.61(+6)
Sr-89	1.13(+6)	Sb-132	8.24(+5)	Ce-144	1.25(+6)
Br-90	3.89(+7)	Te-132	1.15(+6)	Pr-144	1.25(+6)
Rb-90	1.31(+6)	I-132	5.80(+7)		
Sr-90	6.60(+4)	Sn-133	5.37(+4)		
Y-90	6.57(+4)	Sb-133	1.10(+6)		
Rb-91	1.45(+6)	Te-133m	1.42(+6)		
Sr-91	1.49(+6)	Te-133	1.01(+6)		
Y-91m	8.80(+5)	I-133	1.16(+8)		
Y-91	1.49(+6)	Cs-134	1.28(+4)		
Sr-95	1.64(+6)	Sb-134	5.69(+5)		
Y-95	2.02(+6)	Te-134	2.14(+6)		
Zr-95	1.99(+6)	I-134	1.27(+8)		
Nb-95	1.95(+6)	Sb-135	1.80(+5)		
Zr-99	2.61(+6)	Te-135	1.09(+6)		
Nb-99	2.61(+6)	I-135	1.10(+8)		
Mo-99	2.69(+6)	Cs-135	2.50(-1)		
Tc-99m	3.23(+5)	Cs-136	1.32(+4)		
Mo-103	1.46(+6)	I-137	7.20(+7)		
Tc-103	1.53(+6)	Cs-137	4.84(+4)		
Ru-103	1.53(+6)	Ba-137m	4.52(+4)		
Tc-106	6.72(+5)	I-138	4.39(+7)		
Ru-106	5.27(+5)	Cs-138	2.07(+6)		

a. Numbers in parentheses denote powers of ten.

b. Containment sump volume is minimum of $7.76 \times 10^4 \text{ ft}^3$.

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shows the gamma dose above the sump as a function of distance.

B. Beta Radiation

1. Containment Airborne

The beta doses to equipment from airborne sources following a postulated accident are calculated using a semi-infinite cloud model. All the beta energy is assumed to be absorbed by the equipment.

2. Plateout

Beta doses to equipment due to plateout assume that the iodine plates out uniformly on all the plateout surfaces. An infinite plane source model is used to calculate the equipment dose.

3. Sump

The contribution to the beta dose from the sump can be ignored as beta contribution at air distances greater than 1 inch will be less than 10% of gamma dose rates.

In addition to gamma and beta radiation from accident sources, doses due to normal operation over a 40-year plant life are also considered. Contributions from neutrons and Nitrogen-16 in reactor coolant with 1% failed fuel were included.

Table 3.3-5 presents the 0-30 day integrated accident doses. For each specific component, the appropriate normal operational dose is included along with the pertinent accident contributors. Credit for equipment and internal containment shielding is taken for various components.

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Table 3.3-5

INTEGRATED 0-30 DAY POST-ACCIDENT DOSES INSIDE CONTAINMENT

Source Contributor	Gamma (Rads)	Beta (Rads)
Airborne	9.5(+6)	8.7(+7)
Plateout	3.7(+5)	9.0(+6)
Sump	(a)	(b)
a. Refer to figure 3.3-1. b. Negligible - refer to section 3.3.1.6.B.3.		

3.3.2 LEVELS OUTSIDE CONTAINMENT

Radiation levels outside the containment are noted in FSAR Appendix 3E based upon the assumptions specified in FSAR Section 3.11.5.2. A review has been conducted to consider the effects of noble gases in recirculation piping in accordance with NUREG-0737 Item II.B.2.2.4.b. The results are summarized in table 3.3-6.

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Table 3.3-6
INTEGRATED POST-ACCIDENT AUXILIARY BUILDING DOSES^{(a)(b)}
(INTACT PRIMARY, DEGRADED CORE)

Dose Point	0-30 Days Dose (Rads)
Contact dose, on recirculation piping	2.1×10^8
Area field in room containing recircula- tion fluids	6.4×10^6
Areas not containing recirculation fluids	$<10^6$

- a. Calculated in accordance with NUREG 0737.
- b. NUREG 0588 doses are presented in Table 4.1-3.

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3.7 FLOODING AND SUBMERGENCE

Flooding is considered to be part of the design basis event for equipment located in the lower levels of the containment building. Flooding outside containment is not part of the design basis for qualification for the reasons described in FSAR section 9.3.3.2. The water surface elevation in containment after a LOCA will be a maximum of 90'-6" (or 10-1/2' above the floor level at 80'-0"). All safety related equipment that may become submerged as a result of this LOCA are evaluated to determine the respective accident mitigation or post accident functionability requirements. Verification of as-installed equipment locations are performed by means of actual in-plant inspections. Where the devices must remain operable and are located below the maximum flood elevation, the equipment will either be relocated above the 90'-6" elevation or will be qualified for submergence.

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3.8 CHEMICAL SPRAY

The chemical spray is applicable only to the containment building post-LOCA/MSLB environment. Applicable parameters are summarized in table 4.1-3 and were established on the basis of containment spray system operation.

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4. MASTER EQUIPMENT LIST AND QUALIFICATION REVIEW

4.1 REVIEW TECHNIQUE

4.1.1 BOP

A master list was compiled using the instrument, valve and equipment indices and separating the systems into Class IE and non-Class IE. The equipment associated with the Class IE systems, noted in table 2.2-1, were then categorized into harsh and non-harsh environments. In addition, a review of other project documents, such as specifications, P&ID's, electrical single line and elementary diagrams, was conducted as a check for Class IE equipment. Lastly, the FSAR was used to determine that all safety-related equipment had been identified. Table 4.1-1 presents the BOP Class IE equipment in a harsh environment requiring qualification.

To facilitate a uniform review of the environmental qualification of equipment, review forms entitled "Equipment Environmental Qualification Check Lists" and "Seismic Check Lists" were prepared. A copy of these forms is included as Appendix B. The review forms were prepared based upon the requirements of NUREG-0588 Category I and emphasize the requirements to be addressed on a case by case basis. The review forms are designed to guide the reviewer in obtaining information from vendors which is in an auditable form.

4.1.2 NSSS

The safety-related Class IE equipment within the NSSS scope of supply was identified from a review of CESSAR Sections 3.9, 3.11, and Chapters 6, 7, and 15, procurement specifications,

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System Design Requirements, electrical drawings, and P&IDs. The safety-related systems listed in section 2.2 have been systematically analyzed in accordance with NUREG-0588 to determine if components required to mitigate or monitor the consequence of an accident or place the plant in a hot standby/cold shutdown condition are located in a harsh environment. Component locations were defined using a list provided by C-E, in conjunction with a review of physical drawings. Table 4.1-2 presents the NSSS Class IE equipment located in a harsh environment.

Once the Class IE equipment was identified for the NSSS scope of supply, a systematic review on a component-level basis was performed to determine the extent to which the component environmental qualification program complied with the requirements of NUREG-0588.

4.1.3. INDEPENDENT APS REVIEW

In addition to the review activities described in sections 4.1.1 and 4.1.2, APS performs a detailed independent review of each qualification program, both environmentally and seismically, utilizing the Equipment Qualification Program Check List, included as Appendix C.

The review procedure for qualification plans and reports between the Bechtel and APS is intended to insure compliance to IEEE-323, 344, and NUREG-0588.

The following procedure requires that, when the qualification document is received at Bechtel a copy is formally transmitted to APS requesting a review by a specific date. The transmittal letter and the qualification document are routed to the electrical section, upon its arrival in-house, where it is logged

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in and a review request form is filled out and routed to the appropriate engineering discipline, requesting that the qualification document be reviewed and comments provided by the specified date on the form. The discipline supervising engineer or his designee retrieves the qualification document from the Central File and reviews it against the Equipment Qualification Program Checklist.

The checklist is designed to insure that the qualification test information required by IEEE-323 and 344 is incorporated into the documents. Section 6.3.1.1 of IEEE-323 specifies the recommended content of test plans and reports and is incorporated as indicated on the checklist under the item "Documentation". It is the reviewers responsibility to insure that this area is covered sufficiently throughout the qualification test submittal to meet the intent of the requirements. The qualification review document does provide for specific entries that are required to meet the Section 6.3.1.1 documentation requirements which are considered significant to be separated out to insure their entry into the qualification submittal by the supplier such as:

1. Life Limiting Components required by item 5 of Section 6.2, IEEE-323.
2. Preventive Maintenance as required by item 4 of Section 6.2, IEEE-323.
3. Environmental Service Conditions as required by item 7 of Section 6.2, IEEE-323.

The review of the seismic test report, to insure that all applicable areas are covered as required by IEEE-344, is patterned after Section 8.2.1 of this standard, with each item requiring a specific review check to insure its incorporation.

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Upon completion of the Equipment Qualification Program Checklist, the review request form is signed and dated as well as the applicable section within the qualification checklist. If the review was conducted by someone other than the discipline supervising engineer, then they review the content of the qualification review document and also provides their signature and date in the appropriate section. The completed review forms are then submitted to the electrical section where copies of the qualification review document form are made, the transmittal letter is drafted and all required data is entered into the log to indicate review has been completed and documented. Copies of all documentation are placed within a single package and filed in the Central File.

The Equipment Qualification Program Checklist is then transmitted, in its entirety, to the Bechtel where it is reviewed along with their generated comments. The APS comments are incorporated as appropriate in transmittals to the supplier for resolution or incorporation into the qualification test documentation and the supplier resubmits a subsequent report. This cycle continues until all requirements are satisfied upon which time the qualification document receives a Status 1. Final qualification documentation submitted to APS is reviewed and signed off by the reviewer, the Electrical Engineering Supervisor, the Nuclear Engineering Manager and Quality Assurance.

4.1.4 QUALIFICATION STATUS

Upon completion of the review discussed in sections 4.1.1 through 4.1.3, the qualification status of each component was placed into one of the following categories and entered in the Qualification Status column of table 4.1-1 and 4.1-2. Status categories are described in sections 4.1.4.1, 4.1.4.2, and 4.1.4.3.

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 1 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identi- fication	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
480V Class IE Motor Control Centers	General Electric (P.O. No. 13-EM-018)	Prototype IC7700	Temperature 50-104F	Temperature 104F peak	30 days	Post Seismic Stress Test Test sample subjected to: 131F and 90-99% humidity for 96 hr with con- tactors cycled Post-func- tional tests included 1. Operation 2. Dielec- tric Strength 3. Insula- tion resis- tance 4. Pickup voltage 5. Drop out voltage	N/A	N/A	Type Test	Qualified for 40 years except for life limit- ing compo- nents: Agastat Relays: 10 years Contactors: 50,000 cycles Aux. Relays: 100,000 cycles Circuit breakers: 22 years
Auxiliary Bldg		System: Class IE 480V Power MCC Tag No. E-PHA-M33 E-PHB-M34 E-PHA-M35 E-PHB-M36 E-PHA-M37 E-PHB-M38	Pressure 0 psig	Pressure 0 psig					Breakers cycled per UL489 and NEMA AB1	
			Relative Humidity 20-90%	Relative Humidity 90%					Contactors cycled per UL 508	
			Radiation 1 x 10 ⁶ rads	Radiation 1 x 10 ⁶ rads					General purpose control relays cycled per UL 508	
			Chemical Spray N/A	Chemical Spray N/A					Selector switches and push buttons cycled per UL 508	
			Submergence N/A	Submergence N/A					Thermal aging 81 days at 115C	
			Env. Desig. III						G.E. Quali- fication Report 80GPC004 Feb 25, 1982 (cont)	
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 2 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
480V Class IE Motor Control Centers									BPC Log No. 13-10407- E018- 2802-2, 2803-2, 2770-2 2804-2 March 22, 1982	
Auxiliary Bldg (cont)									Wyle Reports 43757-2 Sept. 27, 1978, and 44380-1, Feb. 7, 1979	
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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Table 4.1-1

**ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 3 of 100)**

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Auxiliary Relay Cabinets	Harlo Corp. (P.O. No. 13-EM-022)	Prototype	Temperature 50-104F	Temperature 119F	30 days	16 hr Post-aging functional test 50F for 8 hrs followed by 135F for 8 hrs at 90 ±10% humidity	N/A	N/A	Type Test	In progress (pending)
Auxiliary Bldg.		System: ESFAS	Pressure 0 psig	Pressure 0 psig					Aging analysis performed on all materials	
		Tag No.	Relative Humidity 20-90%	Relative Humidity 20-90%					Major com- ponent aging: 1. Westing- house FTI test switch 69 days at 110C 2. Westing- house ARD relay 441 days at 110C 3. Agastat timing relay 62 days at 110C BPC Log No. 13-10407- E600-1-3 May 26, 1982 Wyle Quali- fication Plan NES26331, May 7, 1982	
		E-ZAA-C01	Radiation 1 x 10 ⁶ rads	Radiation 1.1 x 10 ⁶ rads						
		E-ZAA-C02								
		E-ZAA-C03	Chemical Spray N/A	Chemical Spray N/A						
		E-ZAA-C04								
		E-ZAA-C05								
		E-ZAB-C01	Submergence N/A	Submergence N/A						
		E-ZAB-C02								
		E-ZAB-C03								
		E-ZAB-C04	Env. Desig. III							
		E-ZAB-C05								
		E-ZAB-C06								

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 4 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
5kV Power Cables	Anaconda (PO No. 13-EM-029)	Insulation FR-EP jacket hypalon	Temperature 300F	Temperature 346F peak	30 days	30 days Cable energized throughout test	N/A	N/A	Type Test - in contain- ment 168 hrs at 150C	Qualified for 40 years
MSSS Auxiliary Bldg			Pressure 21 psig	Pressure 113 psig peak		Cables sub- jected to post-LOCA mandrel bend/high potential withstand test (passed)				
			Relative Humidity Steam/air mixture	Relative Humidity 100%						
			Radiation 1 x 10 ⁶ rads	Radiation 2 x 10 ⁸ rads						
			Chemical Spray N/A	Chemical Spray 3000 ppm H ₃ BO ₃ 0.064 molar Na ₂ S ₂ O ₃ pH 9-11, with NaOH						
			Submergence N/A	Submergence N/A						
			Env. Desig. II, III							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 5 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Low Voltage Elec- trical Pene- tration Assem- blies	Conax Corp. (PO No. 13-EM- 035A)	Prototype for low voltage power and control	Temperature 370F peak See fig. 3.1-1	Temperature 370F peak	30 days	13.5 days	N/A	N/A	Type Test	Qualified for 40 years
Contain- ment Wall		System: Non-Class IE 480V Power Switch- gear Tag No. E-NGN-201 E-NGN-203 E-NGN-205 E-NGN-207 E-NGN-211 E-NGN-213 E-NGN-232 E-NGN-254 E-NGN-260 E-NGN-271 E-NGN-288 E-NGN-290	Pressure 60 psig peak see fig. 3.1-2	Pressure 74.5 psig peak		Post LOCA/ MSLB dielectric strength test at 660V-ac for 5 minutes; insulation resistance test range			Qualified per IEEE- 317-1976 as modified by NRC Reg. Guide 1.63, July 1978	
			Relative Humidity Steam/air mixture	Relative Humidity 100%		4 x 10 ⁸ - 1 x 10 ¹⁰ Ω			104 hours at 303F	
			Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta	Radiation 1.28 x 10 ⁸ rads		Passed gas leak rate test			Conax Corp. Report No. IPS 585.3, Jan. 26, 1981	
			Chemical Spray Yes See table 4.1-3	Chemical Spray ^(b) 6200 ppm H ₃ BO ₃ 50 ppm N ₂ H ₄ pH = 8.6 with Na ₃ PO ₄ for 13.5 days		Rated short circuit test conducted			BPC Log No. 13-10407- E035A- 320-1, Feb. 6, 1981	
									Conax Corp. Report No. IPS 447.1 July 28, 1981	
							BPC Log No. E-035A- 313-2 Sept. 9, 1981			
		(cont)	(cont)	(cont)						

- a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.
b. Results of prior tests demonstrated no significant impact of chemical spray; no chemicals were used in qualification test.

Table 4.1-1

**ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 6 of 100)**

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Low Voltage Elec- trical Pene- tration Assem- blies		E-NHN-212 E-NHN-215 E-NHN-217 E-NHN-219 E-NHN-261 E-NHN-267	Submergence N/A	Submergence N/A						
Contain- ment Wall (cont)		System: Class IE 480V Power MCC and Control Tag No. E-PHC-229 E-PHB-241 E-PHN-243 E-PHA-246 E-PHN-286 System: Reactor Control Tag No. E-RIB-235 System: CEDM Control Power Tag Nos. E-SFN-256 E-SFN-258 E-SFN-264 E-SFN-266 E-NHN-267 E-SFN-276 E-SFD-278 E-SFN-282 E-SFN-284	Env. Desig. I							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 7 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status			
Medium Voltage Elec- trical Pene- tration Assem- bly	Conax Corp. (P.O. No. 13-EM- 035A)	Prototype for medium voltage	Temperature 370F peak see fig. 3.1-1	Temperature 400 peak	30 days	13 days Conductors energized throughout test with leakage current monitored	N/A	N/A	Type Test	Qualified for 40 years			
Contain- ment Wall		System: Non-Class IE 13.8kV power Tag Nos. E-NAN-231 E-NAN-244 E-NAN-245 E-NAN-270	Pressure 60 psig peak see fig. 3.1-2	Pressure 70 psig peak		Post LOCA/ MSLB test of gas leak rate, conti- nuity, dielectric strength, and insula- tion resis- tance			Qualified per IEEE- 317-1976 as modified by NRC Reg. Guide 1.63, July 1978				
			Relative Humidity Steam/air mixture	Relative Humidity 100%							Aged for 168 hours at 250F		
			Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta	Radiation 1.05 x 10 ⁸ rads								Conax Corp. test report No. IPS- 447.2 Aug 24, 1981	
			Chemical Spray Yes See table 4.1-3	Chemical Spray (b) 6200 ppm H ₃ BO ₃ , 50 ppm N ₂ H ₄ and Na ₃ PO ₄ pH = 8.7 for 48 hrs									BPC Log No. E-035A- 426-1
			Submergence N/A	Submergence N/A									
			Env. Desig. I										

- a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.
b. Results of prior tests demonstrated no significant impact of chemical spray; no chemicals were used in qualification test.

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 8 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Instrumentation Electrical Penetration Assemblies	Conax Corp. (P.O. No. 13-EM- 035A)	Prototypes for instru- menta- tion	Temperature 370F peak See fig. 3.1-1	Temperature 396F peak	30 day	16 days Cables energized through- out test Post LOCA/ MSLB test of gas leak rate test, con- tinuity test dielec- tric strength test. Supple- mental MSLB/ LOCA con- ducted peak temp: 510F, peak pressure: 80 psig duration: 8 days passed post supple- mental MSLB/ LOCA tests	N/A	N/A	Type test Qualified per IEEE- 317-1976 as modi- fied per NRC Reg. Guide 1.63, July 1978 Aged for 100 hours at 302F. Conax Corp. Report No. IPS-585.2 Jan. 12, 1981 BPC Log No. E-035A- 420-1 Sept. 9, 1981 Conax Corp. Report No. IPS-447.3 Aug. 5, 1981 BPC Log No. E-035A- 421-1 Sept. 9, 1981	In progress (pending)
		System: HVAC - Contain- ment	Pressure 60 psig peak See fig. 3.1-2	Pressure 80 psig peak						
		Tag No. E-HCN-253	Relative Humidity Steam/air mixture	Relative Humidity 100%						
		System: Non-IE Power 480V MCC	Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta	Radiation 1.8 x 10 ⁸ rads						
		Tag Nos. E-NHN-216 E-NHN-220	Chemical Spray Yes See table 4.1-3	Chemical Spray 6200 ppm H ₃ BO ₃ 50 ppm H ₂ H ₄ and Na ₃ PO ₄ pH = 8.7						
		System: In-plant communi- cation	Submergence N/A	Submergence N/A						
		Tag Nos. E-QFN-214 E-QFN-257	Env. Desig. I							
		(cont)								
Containment Wall										

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 9 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Instru- menta- tion Elec- trical Pene- tration Assem- blies		System: ESF Actuation Tag Nos. E-SAA-247 E-SAB-237 E-SAC-228 E-SAD-281								
Contain- ment Wall		System: Ex-Core Neutron Monitor- ing Tag Nos. E-SEA-251 E-SEB-236 E-SEN-275								
(cont)		System: Reactor Control Tag No. E-SFA-250 E-SFB-238 E-SFC-222 E-SFC-225 E-SFC-226 E-SFC-227 E-SFD-277 E-SFD-283 E-SFN-202 E-SFN-204 E-SFN-287 E-SFN-289 E-SFN-291								
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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Table 4.1-1

**ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 10 of 100)**

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
600V Control Cable	Brand-Rex Co. (P.O. No. 13-EM- 057)	XLPE Insu- lation Neoprene jacket	Temperature 370F peak. See fig. 3.1-1	Temperature 385F peak	30 days	16 days	N/A	N/A	Type Test	Qualified for 40 years
Contain- ment			Pressure 60 psig peak See fig. 3.1-2	Pressure 66 psig peak		Cables energized throughout LOCA/MSLB test			168 hours at 136C	
MSSS			Relative Humidity Steam/air mixture	Relative Humidity 100%		Cables sub- jected to post-LOCA/ MSLB mandrel bend and high- potential withstand test (passed)			Brand-Rex Report No. F-C4771, Nov. 1977	
Auxiliary Bldg			Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta	Radiation 2 x 10 ⁸ rads					BPC Log No. 13-10407- E057-24-7, Sept. 11, 1981	
			Chemical Spray Yes See table 4.1-3	Chemical Spray 6200 ppm H ₃ BO ₃ 50 ppm N ₂ H ₄ pH 8.6-10 with Na ₃ PO ₄						
			Submergence N/A	Submergence N/A						
			Env. Desig. I, II, III							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 11 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
600V Power Cable	Rockbestos (P.O. No. 13-EM-058)	XLPE Insula- tion Neoprene jacket	Temperature 370F peak See fig. 3.1-1	Temperature 440F peak	30 days	30 days Cables energized at rated voltage and current throughout MSLB/LOCA test Post-LOCA test environ- ment 200F Humidity 100% Duration 100 days Passed voltage withstand test of 80V-ac/mil for 5 minutes	N/A	N/A	Type Test Aged 1300 hours at 150C prior to LOCA Rockbestos Report June 30, 1981 BPC Log No. 13-10407- E058-40-3 June 9, 1982	Qualified for 40 years
Contain- ment			Pressure 60 psig peak See fig. 3.1-2	Pressure 31 psig peak						
MSSS			Relative Humidity Steam/air mixture	Relative Humidity 100%						
Auxiliary Bldg			Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta	Radiation 2 x 10 ⁸ rads						
			Chemical Spray Yes See table 4.1-3	Chemical Spray 3000 ppm H ₃ BO ₃ 0.064 molar H ₂ S ₂ O ₃ pH = 9 to 11 with NaOH for 30 days						
			Submergence N/A	Submergence N/A						
			Env. Desig. I, II, III							

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

Table 4.1-1

**ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 12 of 100)**

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
600V Power Cable	Brand Rex (P.O. No. 13-EM-058A)	XLPE Insula- tion Hypalon jacket	Temperature 370F peak See fig. 3.1-1	Temperature 385F peak	30 days	Cables ener- gized with 600V- and 300V-ac throughout LOCA/MSLB test Passed post LOCA/MSLB 40 x mandrel bend test and 5 minute 80V per mil high poten- tial with- stand test	N/A	N/A	Type Test Brand Rex Report No. F-C-5120-1, Aug. 19, 1980 BPC Log No. 13-10407- E058 1-2 April 22, 1982 Samples aged 168 hrs at 136C or 168 hrs at 158C	Qualified for 40 years (pending)
Contain- ment MSSS			Pressure 60 psig peak See fig. 3.1-2	Pressure 66 psig						
Auxiliary Bldg.			Relative Humidity Steam/air mixture	Relative Humidity 100%						
			Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta	Radiation 2 x 10 ⁸						
			Chemical Spray Yes See table 4.1-3	Chemical Spray 6200 ppm H ₃ BO ₃						
			Submergence N/A	Submergence N/A						
			Env. Desig. I, II, III	50 ppm hydrazine pH=8.5 to 10 with sodium triphos- phate and sodium hydroxide						
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 13 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Coaxial Cables	Brand-Rex (P.O. No. 13-EM-060)	XLPE insula- tion Hypalon jacket	Temperature 370F peak See fig. 3.1-1	Temperature 385F	30 days	30 days Cables energized with 600V-ac throughout simulated LOCA/MSLB test Cables sub- jected to a final 40 x mandrel bend and high potential withstand test of 80V per mil (passed)	N/A	N/A	Type Test Aged 168 hours at 136C Brand-Rex Report No. F-C5120-2, Sept. 2, 1980 BPC Log No. 13-10407- E060-7-4 Jan. 18, 1982	Qualified for 40 years
Contain- ment Auxiliary Bldg			Pressure 60 psig peak See fig. 3.1-2	Pressure 66 psig						
			Relative Humidity Steam/air mixture	Relative Humidity 100%						
			Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta	Radiation 2 x 10 ⁸ rads						
			Chemical Spray Yes See table 4.1-3	Chemical Spray 6200 ppm H ₃ BO ₃ 50 ppm N ₂ H ₄ pH 8.5-10 with Na ₃ PO ₄ to pH 8.5 and NaOH to pH 10						
			Submergence N/A	Submergence N/A						
Env. Desig. I, III										
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 14 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Shielded Instru- ment/ Thermo- couple Exten- sion Cables	Anaconda Ericcson (P.O. No. 13-EM-061)	FR-EP insula- tion Hypalon (CPE) jacket	Temperature 370F peak See fig. 3.1-1	Temperature 385F	30 days	16 days Cables energized throughout test Cables sub- jected to a mandrel bend/high potential withstand test of 80V per mil for 5 min. (passed)	N/A	N/A	Type Test 168 hours at 150C Franklin Institute Research Labora- tories Report No. F-C4836-2, January, 1978 BPC Log No. 13-10407- E061-14-6 January 15, 1982	Qualified for 40 years
Contain- ment MSSS Auxiliary Bldg			Pressure 60 psig peak See fig. 3.1-2	Pressure 66 psig						
			Relative Humidity Steam/air mixture	Relative Humidity 100%						
			Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta	Radiation 2 x 10 ⁸						
			Chemical Spray Yes See table 4.1-3	Chemical Spray 6200 ppm H ₃ BO ₃ 50 ppm N ₂ H ₄ pH 8.6-10 with Na ₃ PO ₄ for 16 days						
			Submergence N/A	Submergence N/A						
			Env. Desig. I, II, III							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

PVNGS 1,2&3
 ENVIRONMENTAL QUALIFICATION REPORT
 PER REQUIREMENTS OF NUREG-0588

REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 15 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Shielded Instru- menta- tion Cable	The Anoconda Company (P.O. No. 13-EM-062)	FR-EP Insula- tion CPE jacket	Temperature 370F peak See fig. 3.1-1	Temperature 385F peak	30 days	16 days Cables energized throughout test Cables sub- jected to a mandrel bend/high potential withstand test of 80V per mil (passed)	N/A	N/A	Type Test 168 hours at 150C	Qualified for 40 years
Contain- ment			Pressure 60 psig peak See fig. 3.1-2	Pressure 66 psig peak		Franklin Institute Research Labora- tories Report F-C4836-2, January 1978				
MSSS Auxiliary Bldg			Relative Humidity Steam/air mixture	Relative Humidity 100%					BPC Log No. 13-10407- E062 14-7, January 1982	
			Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta	Radiation 2 x 10 ⁸ rads						
			Chemical Spray Yes See table 4.1-3	Chemical Spray 6200 ppm H ₃ BO ₃ 50 ppm N ₂ H ₄ pH = 8.6 to 10.0 with Na ₃ PO ₄ for 16 days						
			Submergence N/A	Submergence N/A						
			Env. Desig. I, II, III							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

PVNGS 1,2&3
 ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 16 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Outside Contain- ment Prefab Cables	Bendix/ Anaconda Ericson (P.O. No. 13-EM-064)	FR-EP Insula- tion CPE Jacket	Temperature 50-104F	Temperature 385F peak	30 days	16 days All cables energized throughout 16 day simu- lated LOCA/ MSLB Post MSLB/ LOCA man- drel bend and high potential withstand tests. 80V/ mil for 5 minutes (passed)	N/A	N/A	Type Test 168 hours at 150C Franklin Institute F-C4836-2 Jan. 1978 BPC Log No. 13-10407- E064-22-2. Sept. 1, 1981 and BPC Log No. 13-10407- E064-23-8	Qualified for 40 years
Auxiliary Bldg			Pressure 0 psig	Pressure 60 psig						
			Relative Humidity 20-90%	Relative Humidity 100%						
			Radiation 1 x 10 ⁶ rads	Radiation 2 x 10 ⁸ rads						
			Chemical Spray N/A	Chemical Spray 6200 ppm H ₃ BO ₃ 50 ppm N ₂ H ₄ pH=8.6-10 with Na ₃ PO ₄						
			Submergence N/A	Submergence N/A						
			Env. Desig. III							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

ENVIRONMENTAL QUALIFICATION REPORT
PER REQUIREMENTS OF NUREG-0588
PVNGS 1,2&3

REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 17 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Inside Contain- ment Prefab Cables	BIW Cable Systems (P.O. No. 13-EM- 064A)	Silicone Insula- tion silicone jacket RSPT cable from CEDM to dis- connect panel. RSPT I 3/C #16 AWG shielded triad RSPT II 6/C, #16 AWG twisted shielded triplet CEDM power cable	Temperature 370F peak See fig. 3.1-1	Temperature 370F	30 days	30 days Cables energized throughout LOCA/MSLB Subjected to post LOCA/MSLB test of 50 x mandrel bend and 750V ac for 5 min- utes	N/A	N/A	<u>Silicone Rubber</u>	In progress
Contain- ment			Pressure 60 psig peak See fig 3.1-2	Pressure 155 psig					Type Test	
			Relative Humidity Steam/air mixture	Relative Humidity 90%					750 hours at 160C	
			Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta	Radiation 5 x 10 ⁷ rads					BIW Report No. 82E080 Sept. 9, 1982	
			Chemical Spray Yes See table 4.1-3	Chemical Spray 6200 ppm H ₃ BO ₃ 50 ppm N ₂ H ₄ pH 8.6 to 10 with Na ₃ PO ₄					BPC Log No. 13-10407- E064-77-2, Oct. 1, 1982	
			Submergence N/A	Submergence N/A						
			Env. Desig. I							

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 18 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Inside Contain- ment Prefab Cables	BIW Cable Systems (P.O. No. 13-EM- 064A)	FREP insula- tion CPE jacket	Temperature 370F peak See fig. 3.1-1	Temperature 370F	30 days	30 days Cables energized throughout LOCA/MSLB with 60V ac passed Post LOCA/ MSLB 40 x mandrel bend test and 70V ac for 5 minutes immersed in water	N/A	N/A	Type Test Aged 126 hrs at 150C BIW Report No. 82C033C Nov. 24, 1982 BPC Log No. B-10407- E064A-66-5 Dec. 9, 1982	Qualified for 30 years (pending)
Contain- ment		RSPT cable from dis- connect panel to EPA	Pressure 60 psig peak See fig. 3.1-2	Pressure 155 psig						
		RSPT I 3C, #16 AWG shielded twisted triplex	Relative Humidity Steam/air mixture	Relative Humidity 90%						
		RSPT II 6/C, #14 AWG twisted shielded triplex CEDM power cable	Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta	Radiation 5 x 10 ⁷ rads						
			Chemical Spray Yes See table 4.1-3	Chemical Spray 6200 ppm H ₃ BO ₃ 50 ppm N ₂ H ₄ pH 8.6 to 10 with Na ₃ PO ₄						
			Submergence N/A	Submergence N/A						
			Env. Desig. I							

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

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ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 19 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Inside Contain- ment Prefab Cables	BIW Cable Systems (P.O. No. 13-EM- 064A)	Tefzel Insula- tion CSPE Jacket RG-71B/U Coaxial & Triaxial Cables for Fixed Incore Instru- menta- tion used from Bulkhead to Elec- trical Penetra- tion Assembly	Temperature 370F peak See fig. 3.1-1	Temperature 340F	30 days	100 days Cable energized throughout LOCA/MSLB with 2300V ac between conductor and shield. Cable sub- jected to post LOCA/ MSLB 40 x mandrel bend and passed 6000V ac for 5 minutes Simulated environment of 167F and 0 psig con- tinued for an addi- tional 59 days. Cable remained functional throughout 159 day test	N/A	N/A	Type Test Aged for 168 hrs at 150C BIW Report No. B913-PV Oct. 12, 1982 BPC Log No. 13-10407- E064A-74-4	Qualified for 40 years (pending)
Contain- ment			Pressure 60 psig peak See fig. 3.1-2	Pressure 105 psig						
			Relative Humidity Steam/air mixture	Relative Humidity 90%						
			Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta	Radiation 2 x 10 ⁸ rads						
			Chemical Spray Yes See table 4.1-3	Chemical Spray .28 molar H ₃ BO ₃ pH=10.5 with NaOH for 24 hours						
			Submergence N/A	Submergence N/A						
			Env. Desig. I							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 20 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identi- fication	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Ring Tongue Termi- nals	AMP Incorpo- rated (P.O. No. 13-EM- 106A)	N/A Kynar Insu- lating Sleeves Radiation resistant PIDG and Plasti- grip Terminals	Temperature 370F peak See fig. 3.1-1	Temperature 370F	30 days	16 days Representa- tive number of samples energized to 600V-ac and current of 5 amp throughout MSLB/LOCA test Samples passed post LOCA/ MSLB tensile strength test	N/A	N/A	Type Test	Qualified for for 40 years
Contain- ment			Pressure 60 psig peak See fig. 3.1-2	Pressure 60 psig		Separate samples aged for: 168 hours at 150C 400 hours at 150C				
MSSS			Relative Humidity Steam/air mixture	Relative Humidity 100%		750 hours at 150C 1000 hours at 150C 1500 hours at 150C				
Auxiliary Bldg			Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta	Radiation 2.05 x 10 ⁸ rads		AMP Report No. 302940016 July 18, 1980				
			Chemical Spray Yes See table 4.1-3	Chemical Spray 6200 ppm H ₃ BO ₃ 50 ppm N ₂ H ₄ pH=9.0 to 9.5 with Na ₃ PO ₄ for 16 days		BPC Log No. 13-10407- E106A-52-3, August 7, 1980				
			Submergence N/A	Submergence N/A						
			Env. Desig. I, II, III							

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

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PVNGS 1,2&3

REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 21 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
High Voltage Termina- tions 5 & 15 kV	Raychem (P.O. No. 13-EM- 106B)	NHVT (formerly identi- fied as HVT) HVMC	Temperature 28-120F	Temperature 360F peak	30 days	113 days Cables energized throughout LOCA test at rated voltage (passed)	N/A	N/A	Type Test 168 hours at 121C Raychem Test Report No. 71100 Rev. 1 BPC Log No. 13-10407- E106B-7-4, Jan. 22, 1981	In Progress
MSSS Elev. 80' Auxiliary Bldg			Pressure 0 psig	Pressure 70 psig peak						
			Relative Humidity 20-90%	Relative Humidity 100%						
			Radiation 1 x 10 ⁵	Radiation 2 x 10 ⁶ rads						
			Chemical Spray N/A	Chemical Spray 0.2% H ₃ BO ₃ pH=10						
			Submergence N/A	Submergence N/A						
			Env. Desig. II, III							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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 ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 22 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Heat Shrinkable Motor Connection Kits, Molded Cable Breakout Kits, Cable and Sealing Kits, and Heat Shrinkable Tubing	Raychem (P.O. No. 13-EM-106B)	NHCK NCBK NESK WCSF-N	Temperature 370F peak See fig. 3.1-1	Temperature 390F peak	30 days	30 days Samples energized throughout LOCA/MSLB test Samples passed post LOCA/MSLB IR Test and 3.6 kV withstand test	N/A	N/A	Type Test 1500 hours at 150C Raychem Report No. QP-PV123 Apr. 23, 1981 BPC Log No. 13-10407-E106B-10-5 Sept. 14, 1981	Qualified for 40 years (pending)
			Pressure 60 psig peak See fig. 3.1-2	Pressure 66 psig peak						
			Relative Humidity Steam/air mixture	Relative Humidity 100%						
			Radiation 3.3×10^7 rads-gamma 2×10^8 rads-beta	Radiation 2.9×10^8 rads						
MSSS Auxiliary Bldg			Chemical Spray Yes See table 4.1-3	Chemical Spray 6200 ppm H_2BO_3 50 ppm N_2H_4 pH=10.5 with NA_3PO_4						
Containment			Submergence N/A	Submergence N/A						
			Env. Desig. I, II, III							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 23 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Heat Shrink- able Motor Conne- ction Kits	Raychem (P.O. No. 13-EM- 106B)	NMCK8	Temperature 120F peak	Temperature 348F peak	30 days	4 hours	N/A	N/A	Type Test	Qualified for 40 years (pending)
MSSS, Elev. 80' Auxiliary Bldg			Pressure 0 psig	Pressure 28 psig peak		Samples energized throughout MSLB test at 5 kV ac.			Aging performed: 504 hours at 150C	
			Relative Humidity 20-90%	Relative Humidity 100% Steam/air mixture		Samples passed post MSLB IR test and 5.5 kV ac withstand test			Raychem Report No. EDR-5037 Sept. 10, 1982	
			Radiation 10 ³ rads	Radiation 5.0 x 10 ⁷ rads					BPC Log No. 13-10407- E-1068-62-3 Sept. 20, 1982	
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. II, III							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 24 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identi- fication	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
4.16 kV Transfer Switch	ITE Golden Gate Swbd Co. (P.O. No. 13-EM-117)	HPL-C Switch	Temperature 50-104F	Temperature 104F	30 days	Passed post aging and seismic testing	N/A	N/A	Type Test 1716 hours at 134C and ambient relative humidity Golden Gate Report No. QR-2141 Rev. 5 May 18, 1982 BPC Log No. 13-10407- E-117-10-6 June 18, 1982	Qualified for 40 years
Auxiliary Bldg		480V Power Switch- gear Tag No. E-PGE-036	Pressure 0 psig	Pressure 0 psig						
			Relative Humidity 20-90%	Relative Humidity 0-100%						
			Radiation 1 x 10 ⁶ rads	Radiation 1 x 10 ⁶ rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. III							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 25 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Hydrogen Recom- biner Damper Panel Hand Switches	Comsip Custom Line (P.O. No. 13-JM-200)	Micro- switch Model No. PTSB-C2- 12-C	Temperature 50-104F	Later	30 days	Later	N/A	N/A	Later	In progress
Auxiliary Bldg			Pressure 0 psig							
Fuel Pool Cooling Pump Panel Hand Switches		System: HP Tag Nos. J-HPA-HS61 J-HPB-HS62 Panel No. J-HPA-E03 J-HPB-E03	Relative Humidity 20-90%							
Fuel Bldg			Radiation 1 x 10 ⁶ rads							
		Env. Desig. III	Chemical Spray N/A							
		GE SBM Switch Model 10CG211	Submergence N/A							
		System: PC Tag Nos. J-PCA-HS7 J-PCB-HS8 Panel No. J-PCA-E01 J-PCB-E01								
		Env. Desig. VI								
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

PVNGS 1,2&3
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REVIEW TECHNIQUE

Table 4.1-1

**ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 26 of 100)**

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Pressure Trans- mitter	Rosemount (P.O. No. 13-JM-311)	Model No. 1153GB7	Temperature 50-104F	Temperature 318F	30 days	30 days	Accu- racy: 10.25% of cali- brated span Re- sponse Time: N/A	Accu- racy: -.77% of cali- brated span Re- sponse Time: 63% of final value in .01 sec- onds at 100F (100% FS to 36.8% FS)	Type Test	Qualified for 4 years
Auxiliary Bldg		System: HVAC-Con Bldg	Pressure 0 psig	Pressure 72 psig					Each unit aged for 1110 hours at 95C and cycled from 0 to 100% FR 8,030 times	
		Tag Nos. J-HCA-PT- 353A	Relative Humidity 20-90%	Relative Humidity 0-100%						
		J-HCB-PT- 353B	Radiation 1 x 10 ⁶ rads	Radiation 2.44 x 10 ⁷ rads						
		Model No. 1153GB6	Chemical Spray N/A	Chemical Spray N/A						
		System: HVAC-Con Bldg	Submergence N/A	Submergence N/A						
		Tag Nos. J-HCA-PT- 351A	Env. Desig. III							
		J-HCB-PT- 351B								
		J-HCC-PT- 351C								
		J-HCD-PT- 351D								
		J-HCA-PT- 352A								
		J-HCB-PT- 352B								
		J-HCC-PT- 352C								
		J-HCD-PT- 352D								
		Rosemount Report No. 108026 Vol I & II Feb. 12, 1981								
Qualification Report No. 18025, Rev. A Feb. 4, 1981										
Analysis Report No. 57820, Rev. D Aug. 18, 1978										
BPC Log No. 13-10407- J311-44-1, 46-2, 19-4										
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 27 of 100)

Type of Equipment/Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Level Transmitter	Rosemount (P.O. No. 13-JM-311)	Model No. 1153DB4	Temperature 50-104F	Temperature 318F	30 days	30 days	Accuracy: ±0.25% of calibrated span Response Time: N/A	Accuracy: -3.19% of calibrated span Response Time: 63% of final value in 2.46 seconds at 100F (100% FS to 36.8% FS)	Type Test Each unit aged for 1110 hours at 95C and cycled from 0 to 100% FR 8,030 times Rosemount Report No. 108026, Vol. I & II Feb. 12, 1981 Qualification Report No. 18025, Rev. A Feb. 1, 1981 Analysis Report No. 57820, Rev. D Aug. 18, 1978 BPC Log No. 13-10407-J311-44-1, 46-2, 19-4	Qualified for 4 years
Auxiliary Bldg		System: ECWS Tag Nos. J-EWA-LT-91 J-EWB-LT-92	Pressure 0 psig	Pressure 72 psig						
			Relative Humidity 20-90%	Relative Humidity 0-100%						
			Radiation 1 x 10 ⁶ rads	Radiation 2.44 x 10 ⁷ rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. III							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

PVNGS 1,2&3
 ENVIRONMENTAL QUALIFICATION REPORT
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Table 4.1-1

**ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 28 of 100)**

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Flow Trans- mitter	Rosemount (P.O. No. 13-JM-311)	Model No. 1153DB5	Temperature 28-120F	Temperature 318F	30 days	30 days	Accu- racy: ±0.25% of cali- brated span Re- sponse Time: N/A	Accu- racy: ±0.20% of cali- brated span Re- sponse Time: 63% of final value in .09 sec- onds at 100F (100% FS to 36.8% FS)	Type Test	Qualified for 4 years
MSSS		System: AFS Tag Nos. J-AFA-FT- 40B J-AFB-FT- 41B J-AFA-FT- 40A J-AFB-FT- 41A	Pressure 0 psig	Pressure 72 psig					Each unit aged for 1110 hours at 95C and cycled from 0 to 100% FR 8,030 times	
			Relative Humidity 20-90%	Relative Humidity 0-100%						
			Radiation 1 x 10 ⁵ rads	Radiation 2.44 x 10 ⁷ rads						
			Chemical Spray N/A	Chemical Spray N/A					Rosemount No. 108026 Vol I & II	
			Submergence N/A	Submergence N/A					Qualification Report No. 18025, Rev. A	
			Env. Desig. II						Analysis Report No. 57820, Rev D	
									BPC Log No. 13-10407- J311-44-1, 46-2, 19-4	
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

PVNGS 1,2&3
ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 29 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Pressure Trans- mitter	Rosemount (P.O. No. 13-JM-311)	Model No. 1153GB9	Temperature 28-120F	Temperature 318F	30 days	30 days	Accu- racy: ±0.25% of cali- brated span Re- sponse Time: N/A	Accu- racy: ±0.25% of cali- brated span Re- sponse Time: 63% of final value in 0.1 sec- onds at 100F (100% FS to 36.8% FS)	Type Test	Qualified for 4 years
MSSS		System: AFS Tag Nos. J-AFB-PT- 17 J-AFA-PT- 18	Pressure 0 psig	Pressure 72 psig					Each unit aged for 1110 hours at 95C and cycled from 0 to 100% FR 8,030 times	
		Model No. 1153GB6	Relative Humidity 20-90%	Relative Humidity 0-100%					Rosemount Report No. 108026 Vol I & II Feb. 12, 1981	
		System: MSS Tag Nos. J-SGB-PT- 306 J-SGA-PT- 313	Radiation 1 x 10 ⁵ rads	Radiation 2.44 x 10 ⁷ rads					Qualification Report No. 18025, Rev. A Feb. 4, 1981	
		Model No. 1153GB8	Chemical Spray N/A	Chemical Spray N/A					Analysis Report No. 57820, Rev. D Aug. 18, 1978	
		System: MSS Tag Nos. J-SGB-PT- 301 J-SGA-PT- 308 J-SGB-PT- 315 J-SGB-PT- 321	Submergence N/A	Submergence N/A					Qualification Report No. 88114, Rev. B Sept. 4, 1982	
			Env. Desig. II						(cont)	
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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PVNGS 1,2&3
 ENVIRONMENTAL QUALIFICATION REPORT
 PER REQUIREMENTS OF NUREG-0588

REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 30 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Pressure Transmitter									BPC Log No. B-10407- J311-44-1, 46-2, 19-4, 51-2	
MSSS (cont)										

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

PVNGS 1,2&3
ENVIRONMENTAL QUALIFICATION REPORT
PER REQUIREMENTS OF NUREG-0588

REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 31 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
I/P Con- vertor	Masoneilan (P.O. No. 13-JM-312)	Model No. 8005A	Temperature 28 to 120	Temperature 160F	30 days	Transducers operated at 160F 95 to 100% RH for 10 days. Also subjected to 335F and 23.2 psig within 8 minutes dur- ing 0.30 minute SLB test.	Response Time: N/A Accuracy: ±0.5% of oper- ating span	Response and Accuracy No anoma- lies were found after MSLB test	Type Test Aged 1080 hours at 100C. Unit cycled 0 to 100% 2000 times during aging. Masoneilan Report No. 1129 Jan. 18, 1982 BPC Log No. 13-10407- J-312-7-1 March 16, 1982	Qualified for 5.4 years
MSSS (El. 81'-0")		System: MSS Tag Nos. J-SGB- HY-178C J-SGA- HY-179C J-SGA- HY-184C J-SGB- HY-185C	Pressure 0 psig	Pressure 0 psig						
			Relative Humidity 20 to 90%	Relative Humidity 95 to 100%						
			Radiation 1 x 10 ⁵ rads	Radiation 1.016 x 10 ⁷ rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. II							

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.
** Not yet awarded.

PVNGS 1, 2&3
 ENVIRONMENTAL QUALIFICATION REPORT
 PER REQUIREMENTS OF NUREG-0588

REVIEW TECHNIQUE

Table 4.1-1

**ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 32 of 100)**

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Containment Post- LOCA Hydro- gen Monitor	Comsip Delphi (P.O. No. 13-JM-359)	Model No. System KIII per P.O. No. 13-JM-359	Temperature 50-104F	Temperature 150F peak	30 days	100 days Simulated LOCA at sample points for 100 days at 300F and 70 psig	Response Time: 30 min	Not Speci- fied by sup- plier	Type Test Engineering Analysis and Test Co. 1035-1, Rev. 1 Sept. 1981 Engineering Analysis and Test Co. Report No. 1035-8 Sept. 1982 BPC Log No. 10407-J359- 29-2, 42-1 March 1, 1982, Oct. 28, 1982	Qualified life for misc. parts is 5 and 10 years (pending)
Auxiliary Bldg			Pressure 0 psig	Pressure 0 psig peak						
		System: CHCS Panel Nos. JHPAE02 JHPBE02	Relative Humidity 20-90%	Relative Humidity 90%						
			Radiation 1 x 10 ⁶ rads	Radiation 1 x 10 ⁶ rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. III							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

PVNGS 1, 2&3
ENVIRONMENTAL QUALIFICATION REPORT
PER REQUIREMENTS OF NUREG-0588

REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 33 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Acoustic Monitors	Technology for Energy Corp. (P.O. No. 13-JM-366)	Model No. BBN424ISO	Temperature 300F	Temperature 510F peak	30 days	33 days	Change sensi- tivity 20pc/g ±15% at 500F Voltage sensi- tivity 90mV/g Trans- verse sensi- tivity 5%	Passed	Type Test	Qualified for 4 years (pending) Note: These tag numbers are the result of TMI plant modifica- tion
MSSS		System: Main Steam Tag Nos. J-SGE-ZE- 696 J-SGE-ZE- 697 J-SGE-ZE- 698 J-SGE-ZE- 699 J-SGE-ZE- 700 J-SGE-ZE- 701 J-SGE-ZE- 702 J-SGE-ZE- 703 J-SGE-ZE- 704 J-SGE-ZE- 705 J-SGE-ZE- 706 J-SGE-ZE- 707 J-SGE-ZE- 708 J-SGE-ZE- 709 J-SGE-ZE- 710 J-SGE-ZE- 711 (cont)	Pressure 21 psig	Pressure 92 psig peak					Aging per- formed 100C for 1488 hrs	
			Relative Humidity Steam/air mixture	Relative Humidity 100%					TEC Report No. 517-TR-03 April 1982	
			Radiation 1 x 10 ⁶ rads	Radiation 2.2 x 10 ⁸ rads					BPC Log No. 13-10407- J366-292-1 Sept. 17, 1982	
			Chemical Spray N/A	Chemical Spray 13,000- 14,000 ppm H ₃ BO ₃ 50-70 ppm N ₂ H ₄ pH = 4.5 to 7.5 with NaPO ₄						
			Submergence N/A	Submergence N/A						
			Env. Desig. II							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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PVNGS 1,2&3
ENVIRONMENTAL QUALIFICATION REPORT
PER REQUIREMENTS OF NUREG-0588

REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 34 of 100)

Type of Equipment/Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Acoustic Monitors	Technology for Energy Corp. (P.O. No. 13-JM-366)	Model No. BBN424ISO	Temperature 300F							In progress
MSSS (cont)		System: Main Steam Tag Nos. J-SGE-ZE-712 J-SGE-ZE-713 J-SGE-ZE-714 J-SGE-ZE-715	Pressure 21 psig							
			Relative Humidity Steam/air mixture							
			Radiation 1 x 10 ⁶ rads							
			Chemical Spray N/A							
			Submergence N/A							
			Env. Desig. II							

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

PVNGS 1,2&3
 ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 35 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Acoustic Monitors	Technology for Energy Corp. (P.O. No. 13-JM-366)	Model No. 424-C2	Temperature 300F	Temperature 510 peak	30 days	33 days	N/A	N/A	Type Test	Qualified for 4 years (pending) Note: These tag numbers are the result of TMI plant modifica- tion
MSSS		System: RCS Tag No. N/A 20 cables approx- imately 150 feet each in length	Pressure 21 psig	Pressure 92 psig peak					Aging per- formed: 100C for 1988 hrs	
			Relative Humidity Steam/air mixture	Relative Humidity 100%					TEC Report No. 517-TR-03 April, 1982	
			Radiation 1 x 10 ⁶ rads	Radiation 2.2 x 10 ⁸ rads					BPC Log No. 13-10407- J366-292-1 Sept. 17, 1982	
			Chemical Spray N/A	Chemical Spray 13,000- 14,000 ppm H ₃ BO ₃ 50-70 ppm N ₂ H ₄ pH = 4.5 to 7.5 with NaPO ₄						
			Submergence N/A	Submergence N/A						
			Env. Desig. II							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 36 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Acoustic Monitors	Technology for Energy Corp. (P.O. No. 13-JM-366)	Model No. 2273AMI	Temperature 370F peak See fig. 3.1-1	Temperature 510F peak	30 days	33 days	Charge sensi- tivity 10.0 ±1pC/g Voltage sensi- tivity 12mV/g Trans- verse sensi- tivity 3% maxi- mum	Passed	Type Test Aging performed: 100C for 1488 hrs TEC Report No. 517-TR-03 April 1982 BPC Log No. 13-10407- J366-292-1 Sept. 17, 1982	Qualified for 4 years (pending) Note: These tag numbers are the result of TMI plant modifica- tion
Containment		System: RCS								
		Tag Nos. J-RCE-ZE- 726	Pressure 60 psig peak See fig. 3.1-2	Pressure 92 psig peak						
		J-RCE-ZE- 727								
		J-RCE-ZE- 728	Relative Humidity Steam/air mixture	Relative Humidity 100%						
		J-RCE-ZE- 729								
			Radiation 3.3×10^7 rads-gamma 2×10^8 rads-beta	Radiation 2.2×10^8 rads						
			Chemical Spray Yes See table 4.1-3	Chemical Spray 13,000- 14,000 ppm H_3BO_3 50-70 ppm N_2H_4 pH = 4.5 to 7.5 with $NaPO_3$						
			Submergence N/A	Submergence N/A						
			Env. Desig. I							

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

PVNGS 1,2&3
ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 37 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identi- fication	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Preampli- fier	Technology for Energy Corp. (P.O. No. 13-JM-366)	Model No. TEC-504A	Temperature 370F peak See fig. 3.1-1	Temperature 510F peak	30 days	33 days	Bias Volt- age 18V ±1V	Bias Volt- age 17.83V	Type Test Aging Performed: 100C for 1488 hrs TEC Report No. 517-TR-03 April, 1982 BPC Log No. 13-10407- J366-292-1 Sept. 17, 1982	Qualified for 4 years (pending) Note: These tag numbers are the result of TMI plant modifica- tion
Contain- ment		System: RCS J-RCE-ZY- 726 J-RCE-ZY- 727 J-RCE-ZY- 728 J-RCE-ZY- 729	Pressure 60 psig peak See fig. 3.1-2	Pressure 92 psig peak			Gain 2mV/pC ±5%	Gain 2.02 mV/pC		
			Relative Humidity Steam/air mixture	Relative Humidity 100%			Dynamic Range 10V pp-min	Dynamic Range 13.0 pp-min		
			Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta	Radiation 2.2 x 10 ⁸ rads			Low Fre- quency 130- 390 Hz	Low Fre- quency 385 Hz		
			Chemical Spray Yes See table 4.1-3	Chemical Spray 13,000- 14,000 ppm H ₃ BO ₃ 50-70 ppm N ₂ H ₄ pH = 4.5 to 7.5 with NaPO ₄			High Fre- quency 1 MHz/ min	High Fre- quency >1MHz/ min		
			Submergence N/A	Submergence N/A						
			Env. Desig. I							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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ENVIRONMENTAL QUALIFICATION REPORT
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PVNGS 1,2&3

REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 38 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Transient Shield	Technology for Energy Corp. (P.O. No. 13-JM-366)	Model No. TEC-160-2	Temperature 370F peak See fig. 3.1-1	Temperature 510F peak	30 days	33 days	N/A	N/A	Type Test qualified similarity to TEC-160 Aging performed: 100C for 672 hrs TEC Report No. 517-TR-03 April, 1982 BPC Log No. 13-10407- J366-292-1 Sept. 17, 1982	Qualified for 4 years (pending) Note: These tag numbers are the result of TMI plant modifica- tion
Contain- ment		System: RCS Tag Nos. J-RCN-E03 J-RCN-E06	Pressure 60 psig peak See fig. 3.1-2	Pressure 92 psig peak						
			Relative Humidity Steam/air mixture	Relative Humidity 100%						
			Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta	Radiation 2.2 x 10 ⁸ rads						
			Chemical Spray Yes See table 4.1-3	Chemical Spray 13,000- 14,000 ppm H ₃ BO ₃ 50-70 ppm N ₂ H ₄ pH = 4.5 to 7.5 with NaPO ₄						
			Submergence N/A	Submergence N/A						
			Env. Desig. I							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

PVNGS 1,2&3
ENVIRONMENTAL QUALIFICATION REPORT
PER REQUIREMENTS OF NUREG-0588

REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 39 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Radiation Resistant Cable	Technology for Energy Corp. (P.O. No. 13-JM-366)	Model No. 2273-C2	Temperature 370F peak See fig. 3.1-1	Temperature 510F peak	30 days	33 days	N/A	N/A	Type Test	Qualified for 4 years (pending) Note: This material is the result of TMI plant modi- fications.
		System: RCS Tag Nos. N/A	Pressure 60 psig peak See fig. 3.1-2	Pressure 92 psig peak					Aging performed: 100C for 1488 hrs	
		Four cables approx- imately 75 feet each in length	Relative Humidity Steam/air mixture	Relative Humidity 100%					TEC Report No. 517-TR-03 April, 1982	
		XLPE insu- lation hypalon jacket	Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta	Radiation 2.2 x 10 ⁸ rads					BPC Log No. 13-10407- J366-292-1 Sept. 17, 1982	
			Chemical Spray Yes See table 4.1-3	Chemical Spray 13,000- 14,000 ppm H ₃ BO ₃ 50-70 ppm N ₂ H ₄ pH = 4.7- 7.5 with NaPO ₄						
			Submergence N/A	Submergence N/A						
			Env. Desig. I							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

PVNGS 1,2&3
 ENVIRONMENTAL QUALIFICATION REPORT
 PER REQUIREMENTS OF NUREG-0588

REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 40 of 100)

Type of Equipment/Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Level Transmitter	Transamerica Delaval Gems Sensors (P.O. No. 13-JM-475)	Model No. Later	Temperature 370F peak See fig. 3.1-1	Later	30 days	Later	Accuracy: 10.5"	Later	Later	In progress
Containment		System: RWDS								
		Tag Nos. J-RDE-LE-410	Pressure 60 psig peak See fig. 3.1-2							
		J-RDE-LE-411								
		XM-54854								
		System: SIS	Relative Humidity Steam/air mixture							
		Tag Nos. J-SIA-LE-706A	Radiation 3.3 x 10 ⁷ rads-gamma							
		J-SIB-LE-707A	2 x 10 ⁶ rads-beta							
		J-SIA-LE-706B								
		J-SIB-LE-707B								
		XM-54852	Chemical Spray Yes See table 4.1-3							
		XM-54853								
			Submergence Yes							
			Env. Desig. I							

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

PVNGS 1,2&3
 ENVIRONMENTAL QUALIFICATION REPORT
 PER REQUIREMENTS OF NUREG-0588

REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 41 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Level Switch	Magnetrol (P.O. No. 13-JM-481)	Model No. FLS-X- MPX- SIMD4DC System: RWDS Tag Nos. J-RDA- LSH-147 J-RDB- LSH-148 J-RDA- LSH-149 J-RDB- LSH-150 J-RDA- LSH-151 J-RDB- LSH-152 System: MSSS HVAC Bldg Tag Nos. J-HAA- LSH-125A J-HAA- LSH-125B J-HAA- LSH-126A J-HAA- LSH-126B	Temperature 28 to 120F	Temperature 120F peak	30 days	Post- Functional Tests: Switch insulation resistance Switch contact resistance Switch operation verified at operating temperatures and pressures as indicated on Magnetrol Dwg. No. SKC-3013 sheets 1-5	N/A	N/A	Type Test	Qualified for 40 years except for micro- switch, qualified for 5 years
Auxiliary Bldg MSSS Elev. 80'			Pressure 0 psig	Pressure 0 psig					Qualified by similarity to model BCS-751- EP/VPX- SIMD4DC Thermal aging 160 hours at 300F 480 hours at 100F and 95%- 100% RH Mechanical cycling 10,000 cycles Magnetrol Report No. M131830- 102/202 Sept. 8, 1981 Wyle Report No. 43235-1, May 2, 1977 BPC Log No. 13-10407- J481-10-2 Sept. 18, 1981 13-10407- J481-13-2 Aug. 11, 1982	
			Relative Humidity 20 to 90%	Relative Humidity 100%						
			Radiation 10 ⁶ rads	Radiation 1.0 x 10 ⁷ min rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence Switch placed in pressure vessel, submerged in water and pres- surized for 180 min at 104 psig.						
			Env. Desig. II, III	Leakage was 4.2 milli- liters of water						
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 42 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- fication	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
RTD's and Thermo- couples	Weed Inst. Company (P.O. No. 13-JM-556)	Model Nos. RTD's 611-18- C4-C-2- A2-0 TC's K28250G System: Safety Injection Tag Nos. J-S1A-TE- 712 J-S1B-TE- 713 System: Essential Cooling Water Tag Nos. J-EWA-TE- 083 J-EWB-TE- 084	Temperature 370F peak See fig. 3.1-1	Temperature 485F peak	30 days	30 days minimum temperature used throughout LOCA was 300F continuous	RTD's Resis- tance at 0C 99.780- 100.228 ohms Resis- tance at 100C 138.590 - 139.450 ohms Thermo- couples Voltage at 0C -0.130 to 0.131mV Voltage at 100C +6.167 to +6.467 mV	Post- Quali- fica- tion re- sults Resis- tances at 0C 99.88 to 100.82 ohms Resis- tances at 100C 138.20 to 139.15 ohms Voltage at 0C 0.003 to 0.010 mV Voltage at 100C 6.350 to 6.391 mV	Type Test Aging performed at 304F for 724 hrs NTS Report No. 548-8854-2 March 1, 1982 BPC Log No. 13-10407- J556-89-1 March 25, 1982	Qualified for 40 years (pending)
Contain- ment Bldg			Pressure 60 psig peak See fig. 3.1-2	Pressure 70 psig						
Auxiliary Bldg			Relative Humidity Steam/air mixture	Relative Humidity Steam/air mixture						
			Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta	Radiation 3.03 x 10 ⁸ rads						
			Chemical Spray Yes, see table 4.1-3	Chemical Spray 80-110 ppm N ₂ H ₄ 11,000- 13,000 ppm H ₃ BO ₃ pH = 4.0- 11.0 Na ₂ PO ₃						
			Submergence Yes	Submergence Qualified						
			Env. Desig. I, III							

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

PVNGS 1,2&3
 ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 43 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
D.C. Motor- Operated Valve Actuator	Control Components Inc. (P.O. No. 13-JM- 601A)	Limatorque Model No. SB-00-10	Temperature 28-120F	Temperature 340F peak	30 days	33 days cycled 70 times throughout 25 hrs LOCA/MSLB test. Cycled once post LOCA	None	N/A Open times: 31.0- 32.5 secs Close times 31.0- 37.7 secs Post LOCA/ MSLB Open: 33 sec- onds Close 33 sec- onds	Type Test and Analysis Aged for 100 hours at 180C unit cycled 2004 times Prequalified per Limatorque Report No. B-0058	Qualified for 8 yrs with maintenance
MSSS below 100'		System: AFS Tag Nos. J-AFA- HV-32 J-AFC- HV-33	Pressure 0 psig	Pressure 105 psig peak						
			Relative Humidity 20-90%	Relative Humidity 100%						
			Radiation 1 x 10 ⁵ rads	Radiation 1 x 10 ⁷ rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. II							

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

PVNGS 1,2&3
 ENVIRONMENTAL QUALIFICATION REPORT
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Table 4.1-1

**ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 44 of 100)**

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
AC Motor- Operated Valve Actuator	Control Components Inc. (P.O. No. 13-JM- 601A)	Limitorque Model No. SB-00-10	Temperature 28-120F	Temperature 250F peak	30 days	33 days Cycled 9 times throughout LOCA/MSLB Post-LOCA load cycling test: 794 cycles	None Not speci- fied by sup- plier	N/A	Type Test	Qualified for 8 yrs with maintenance
MSSS below 100'		System: AFS Tag Nos. J-AFB- HV-30 J-AFB- HV-31	Pressure 0 psig	Pressure 25 psig peak					Thermal aging: 100 hrs at 180C	
			Relative Humidity 20-90%	Relative Humidity 100%					Mechanical aging: 1028 cycles	
			Radiation 1 x 10 ⁵ rads	Radiation 2 x 10 ⁷ rads					Limitorque Report No. B0058 Jan. 11, 1981	
			Chemical Spray N/A	Chemical Spray N/A					BPC Log No. 13-10407- P221B- 349-1 March 4, 1981	
			Submergence N/A	Submergence N/A						
			Env. Desig. II							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

PVNGS 1, 2&3
ENVIRONMENTAL QUALIFICATION REPORT
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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 45 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status	
Position Trans- mitters	Control Components Inc. (P.O. No. 13-JM- 601A)	CCI Valve Model No. EXG9-X3- X6P6- X6P6- 13MH31	Temperature 28-120F	Temperature 315F peak	30 days	Later	N/A	Later	Type Test and Analysis	In progress (pending)	
MSSS			Pressure 0 psig	Pressure 21 psig peak					Thermal aging (later)		
		System: AFS Tag Nos. J-AFB-ZT- 30 J-AFB-ZT- 31 J-AFA-ZT- 32 J-AFC-ZT- 33	Relative Humidity 20-90%	Relative Humidity 100%					Wyle Lab- oratories Qualifica- tion Plan NES 57555, June 9, 1981		
			Radiation 1 x 10 ⁵ rads	Radiation 1 x 10 ⁶ rads							BPC Log No. 13-10407- J601A-115 -4, June 22, 1981
			Chemical Spray N/A	Chemical Spray N/A							
			Submergence N/A	Submergence N/A							

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

PVNGS 1,2&3
 ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 46 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Position Trans- mitters	Control Components Inc. (P.O. No. 13-JM- 601A)	Schaevitz Model No. HPA-10000	Temperature 300F	Temperature 315F peak	30 days	Later	N/A	N/A	Type Test and Analysis	In progress (pending)
MSSS		System: MSS Tag Nos. J-SCB-ZT- 178 J-SGA-ZT- 179 J-SGA-ZT- 184 J-SCB-ZT- 185	Pressure 21 psig	Pressure 21 psig peak					To be thermally aged at 130C for 100 hours Wyle Lab- oratories Qualifica- tion Plan BPC Log No. 13-10407- J601A	
			Relative Humidity Steam/air mixture	Relative Humidity 100%						
			Radiation 1 x 10 ⁶ rads	Radiation 1 x 10 ⁶ rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. II							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

PVNGS 1,2&3
ENVIRONMENTAL QUALIFICATION REPORT
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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 47 of 100)

Type of Equipment/Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Limit Switch	Control Components Inc. (P.O. No. 13-JM-601A)	Namco Model No. EA 180	Temperature 300F	Temperature 340F peak	30 days	33 days Functional throughout LOCA/MSLB at 5 M open contact resistance	N/A	N/A	Type Test and Analysis	Qualified for 40 years with maintenance parts
MSSS		System: MSS Valve Tag No. J-SGB-HV-178 J-SGA-HV-179 J-SGA-HV-184 J-SGB-HV-185 2/Valve	Pressure 21 psig	Pressure 70 psig peak					Prequalified per qualification.	
			Relative Humidity Steam/air mixture	Relative Humidity 100%					Namco Report No. QTR 105 April 3, 1980	
			Radiation 1 x 10 ⁶ rads	Radiation 2 x 10 ⁶ rads					Wyle Laboratories Qualification Plan NES 57555, Rev. 0 June 9, 1981	
			Chemical Spray N/A	Chemical Spray H ₃ BO ₃ , Na ₂ S ₂ O ₃ , NaOH with pH 10-11					BPC Log No. 13-10407-J601A-134-1, 115-4 July 13, 1981 Sept. 25, 1981	
			Submergence N/A	Submergence N/A					Aged 400 hrs at 120C switch actuated 100, 200 times at a rate 0	
			Env. Desig. 11						(cont)	
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

PVNGS 1,2&3
 ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 48 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Limit Switch									70 cycles 1 min while loaded at .54 and 100V DC Qualified by CE Namco program.	
MSSS (cont)										
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

PVNGS 1,2&3
ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 49 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Solenoid Valves	Control Components Inc. (P.O. No. 13-JM- 601A)	ASCO Model No. 206-381- 44	Temperature 300F	Temperature 450 peak	30 days	33 days Valves cycled throughout LOCA test with base- line func- tional tests con- ducted following LOCA Passed all tests	N/A	N/A	Type Test and Analysis Prequalified per quali- fication. ASCO Report No. AQS- 216 78/TR & AQR- 67368 Rev. 0 & C-E Program PE 5734 & C-E letter V-PAK-250 BPC Log No. 13-10407- J601A-137- -1, 115-4 Dec. 9, 1981, Sept. 25, 1981	Qualified for 40 yrs with maintenance.
MSSS		System: MSS	Pressure 21 psig	Pressure 78 psig peak						
		Tag Nos. J-SGB-HY- 178A	Relative Humidity Steam/air mixture	Relative Humidity 100%						
		J-SGD-HY- 178B	Radiation 1 x 10 ⁶ rads	Radiation 1.82 x 10 ⁸ λ 1.1 x 10 ⁸ β						
		J-SGB-HY- 178H								
		J-SGD-HY- 178I								
		J-SGA-HY- 179A	Chemical Spray N/A	Chemical Spray 6626 ppm 196 ppm N ₂ H ₄ pH 7.0- 8.5						
		J-SGC-HY- 179B								
		J-SGA-HY- 179H								
		J-SGC-HY- 179I	Submergence N/A	Submergence N/A						
		J-SGA-HY- 184A								
		J-SGC-HY- 184B	Env. Desig. II							
		J-SFA-HY- 184H								
		J-SGC-HY- 184I								
		J-SGB-HY- 185A								
		J-SGD-HY- 185B								
		J-SGB-HY- 185H								
		J-SGD-HY- 185I								

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

PVNGS 1,2&3
ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 50 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status				
Solenoid Valve	Target Rock Corp. (P.O. No. 13-JM-603)	Model No. 76HH-002	Temperature 370F peak See fig. 3.1-1	Temperature 385F peak	30 days	14 days Operational and seat leakage tests post MSLB/LOCA operation: 6 cycles, 60 psig pressure 120V-dc and 6 cycles, 60 psig, 70V-dc Seat leakage 60 psig pressure for 6 min. with no leakage	N/A	N/A	Type Test	Qualified for 40 years except for "O" rings - 5 years Coil - 20 years; elect. sub- assembly parts - 20 years (pending)				
Contain- ment		System: HVAC- Cont. Tag Nos. J-HCB-UV- 44 J-HCB-UV- 47	Pressure 60 psig See fig. 3.1-2	Pressure 66 psig peak					Relative Humidity Steam/air mixture		Relative Humidity 100%	Units cycled 18,000 times with 75 psig inlet pressure while at 122 ± 5F and 90 ± 5% RH	Additional testing in progress under C-E program PE-5733	
			Model No. 76HH-008											
		System: RCS Tag No. J-RCA-HV- 101 J-RCB-HV- 102 J-RCA-HV- 103 J-RCB-HV- 105 J-RCA-HV- 106	Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta	Radiation 3.53 x 10 ⁷ rads					Chemical Spray Yes See table 4.1-3 H ₃ BO ₃ 50 ppm N ₂ H ₄ pH = 8.6 to 10.0 with Na ₃ PO ₄		Submergence No	Submergence N/A		Target Rock Corporation Report No. 2302, Feb. 2, 1982 BPC Log No. 13-10407- J603-95-8 March 5, 1982
			Submergence No	Submergence N/A										
			Env. Desig. I											

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

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 PVNGS 1,2&3

REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 51 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Solenoid Valve	Target Rock Corp. (P.O. No. 13-JM-603)	Model No. 76HH-009-010	Temperature 50 to 104F	Temperature 385F peak	30 days	Operation and seat leakage tests post MSLB/LOCA operation: 6 cycles, 60 psig pressure, 120V-dc and 6 cycles, 60 psig, 70V-dc Seat leakage: 60 psig pressure for 6 minutes with no leakage	N/A	N/A	Type Test	Qualified for 40 years except for: "O" rings - 5 years; coil - 20 years; elec. sub-assembly parts - 20 years (pending)
Auxiliary Bldg		System: SIS Tag No. J-SIB-UV-710 J-SIA-UV-709 J-SIA-UV-708	Pressure 0 psig	Pressure 66 psig peak					792 hrs at 350F ± 5F with humidity at 55 ± 5% and N ₂ at 75 psig supplied to valve inlet port	
		System: CVCS Tag No. J-CHB-UV-924	Relative Humidity 20 to 90%	Relative Humidity 100%					Units cycled 18,000 times with 75 psig inlet pressure while at 122 ± 5F and 90 ± 5% relative humidity	
		Model No. 76HH-020, 76HH-021 76HH-023	Radiation 10 ⁶ rads	Radiation 3.53 x 10 ⁷ rads					Target Rock Corporation Report No. 2302 dated May 9, 1979	
		System: SCS Tag No. J-GAA-UV-1 J-GAA-UV-2	Chemical Spray N/A	Chemical Spray 6200 ppm H ₃ BO ₃ 50 ppm N ₂ H ₄ pH = 8.6 to 10.0 with Na ₃ PO ₄ for 14 days					BPC Log No. 13-10407-J603-95-6 dated Nov. 21, 1980	
		System: SIAS Tag No. J-IAA-UV-2	Submergence N/A	Submergence N/A						
			Env. Desig. III							
		(cont)								
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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PVNGS 1,2&3
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 52 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Solenoid Valve	Target Rock Corp. (P.O. No. 13-JM-603)	Model No. 76HH-005	Temperature 50 to 104F	Temperature 385F peak	30 days	14 days Operational and seat leakage tests post MSLB/LOCA operation: 6 cycles, 60 psig pressure 120V-dc and 6 cycles, 60 psig, 70V-dc Seat leakage: 60 psig pressure for 6 min. with no leakage	N/A	N/A	Type Test	Qualified for 40 years except for: "O" rings - 5 years; coil - 20 years; elect, sub- assembly parts - 20 years (pending) Additional testing in progress under C-E program PE-5733
Auxiliary Bldg (cont)		System: CHCS Tag No. J-HPB-HV- 8B	Pressure 0 psig	Pressure 66 psig peak					792 hrs at 350F ± 5F with humid- ity 55 ± 5% and N ₂ at 75 psig supplied to valve inlet port	
		Model No. 76HH-005	Relative Humidity 20 to 90%	Relative Humidity 100%					Units cycled 18,000 times with 75 psig inlet pres- sure while at 122 ± 5F and 90 ± 5% relative humidity	
		System: CHCS Tag Nos. J-HPA-HV- 7A J-HPB-HV- 8A	Radiation 10 ⁶ rads	Radiation 3.53 x 10 ⁷ rads					Target Rock Corporation Report No. 2302, May 9, 1979	
		Model No. 76HH-003	Chemical Spray N/A	Chemical Spray 6200 ppm H ₃ BO ₃ 50 ppm N ₂ H ₄ pH = 8.6 to 10.0 with Na ₃ PO ₄					BPC Log No. 13-10407- J603-95-6, Nov. 21, 1980	
		System: HVAC-Cont Bldg J-HCA-HV- 74 J-HCC-HV- 76 J-HCB-HV- 75 J-HCD-HV- 77	Submergence N/A	Submergence N/A						
			Env. Desig. III							
		Model No. 76HH-005								
		System: CHCS Tag No. J-HPA-HV- 703								

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

ENVIRONMENTAL QUALIFICATION REPORT
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 PVNGS 1,2&3

REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 53 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Solenoid Valve (cont)	Target Rock Corp. (P.O. No. 13-JM-603)	Model No. 76-HH-009	Temperature 50-104F	Temperature 385F peak	30 days	14 days Operational and seat leakage tests post MSLB/LOCA Operation: 6 cycles, 60 psig pressure 120V-dc and 6 cycles 60 psig pressure 120V-dc and 6 cycles, 60 psig, 70V-dc Seat leakage: 60 psig pressure for 6 min. with no leakage	N/A	N/A	Type Test	Qualified for 40 years except for: "O" rings - 5 years; coil - 20 years; elect. sub-assembly parts - 20 years (pending) Additional testing in progress under C-E program PE-5733
Auxiliary Bldg		76-HH-011	Pressure 0 psig	Pressure 66 psig peak					792 hrs at 350F ± 5F with humidity at 55 ± 5% and N ₂ at 75 psig supplied to valve inlet port	
		76-HH-013								
		System: RWDS								
		Tag No. J-RDB-UV-407	Relative Humidity 20-90%	Relative Humidity 100%						
		System: CHCS								
		Tag Nos. J-HPA-UV-23 J-HPA-UV-24	Radiation 10 ⁶ rads	Radiation 3.53 x 10 ⁷ rads					Units cycled 18,000 time with 75 psig inlet pressure while at 122 ± 5F and 90 ± 5% relative humidity	
		System: CRS J-CRB-UV-2	Chemical Spray N/A	Chemical Spray 6200 ppm H ₃ BO ₃ 50 ppm N ₂ H ₄ pH = 8.6 to 10.0 with Na ₃ PO ₆					Target Rock Corporation Report No. 2302, May 9, 1979	
Model No. 76HH-002										
		System: HVAC-Cont Bldg								
		Tag Nos. J-HCA-UV-46 J-HCA-UV-45							BPC Log No. 13-10407-J603-95-6, Nov. 21, 1980	
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

PVNGS 1,2&3
 ENVIRONMENTAL QUALIFICATION REPORT
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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 54 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Solenoid Valve (cont)	Target Rock Corp. (P.O. No. 13-JM-603)	Model No. 76HH-001								
Auxiliary Bldg		System: ECWS Tag Nos. J-EWA-LV- 91 J-EWB-LV- 92								
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

PVNGS 1,2&3
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 55 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Solenoid Valve	Target Rock Corp. (P.O. No. 13-JM-603)	Model No. 76HH-007	Temperature 300F	Temperature 385F peak	30 days	Operation and seat leakage tests post MSLB/LOCA operation: 6 cycles, 60 psig pressure, 120V-dc and 6 cycles, 60 psig, 70V-dc Seat leakage: 60 psig pressure for 6 minutes with no leakage	N/A	N/A	Type Test 792 hrs at 350F \pm 5F with humidity at 55 \pm 5% and N ₂ at 75 psig supplied to valve inlet port Target Rock Corporation Report No. 2302 dated May 9, 1979 BPC Log No. 13-10407-J603-95-6 dated Nov. 21, 1980	Qualified for 40 years except for: "O" rings - 5 years; coil - 20 years elect. sub-assembly parts - 20 years (pending)
MSSS		System: SG Tag No. JSGB-PV-306A JSGB-PV-306B JSGA-PV-313A JSGA-PV-313B	Pressure 21 psig	Pressure 66 psig peak						
			Relative Humidity Steam/air mix	Relative Humidity 100%						
			Radiation 10 ⁶ rads	Radiation 2.38 x 10 ⁷ rads						
			Chemical Spray N/A	Chemical Spray 6200 ppm H ₃ BO ₃ 50 ppm N ₂ H ₄ pH = 8.6 to 10.0 with Na ₃ PO ₄ for 14 days						
			Submergence N/A	Submergence N/A						
			Env. Desig. II							

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

PVNGS 1,2&3
ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 56 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Solenoid Valve	Target Rock Corp. (P.O. No. 13-JM-603)	Model No. T6HH-008	Temperature 300F	Temperature 385F peak	30 days	Operation and seat leakage tests post MSLB/LOCA operation: 6 cycles, 60 psig pressure, 120V-dc and 6 cycles, 60 psig, 70V-dc	N/A	N/A	Type Test	Qualified for 40 years except for: "O" rings - 5 years; coil - 20 years; elect. sub-assembly parts - 20 years (pending)
MSSS		System: SG Tag No. J-SGA-UV-1133 J-SGA-UV-1134 J-SGB-UV-1135A J-SGB-UV-1135B J-SGB-UV-1136A J-SGB-UV-1136B	Pressure 21 psig	Pressure 66 psig peak		Seat leakage: 60 psig pressure for 6 minutes with no leakage			792 hrs at 350F ± 5F with humidity at 55 ± 5% and N ₂ at 75 psig supplied to valve inlet port	
			Relative Humidity Steam/air mix	Relative Humidity 100%					Target Rock Corporation Report No. 2302 dated May 9, 1979	
			Radiation 10 ⁶ rads	Radiation 2.38 x 10 ⁷ rads					BPC Log No. 13-10407-J603-95-6 dated Nov. 21, 1980	
			Chemical Spray N/A	Chemical Spray 6200 ppm H ₃ BO ₃ 50 ppm N ₂ H ₄ pH = 8.6 to 10.0 with Na ₃ PO ₄ for 14 days						
			Submergence N/A	Submergence N/A						
			Env. Desig. II							

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

PVNGS 1,2&3
 ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 57 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
AC Motor Operator	Henry Pratt (P.O. No. 13-JM-605)	Limiterque Motor: SMB-00-2 Actuator: H1BC System: ECWS Tag Nos. J-EWA-UV- 145 J-EWA-UV- 65 System: NCWS Tag Nos. J-NCB-UV- 401 J-NCA-UV- 402	Temperature 50 to 104F	Temperature 250 peak	30 days	33 days	None	None	Type Test & Analysis Limiterque test report B-0058	Qualified for 8 years with maintenance
Auxiliary Bldg			Pressure 0 psig	Pressure 25 psig peak						
			Relative Humidity 20 to 90%	Relative Humidity 100%						
			Radiation 10 ⁶ rads	Radiation 2 x 10 ⁷ rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. III							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

PVNGS 1,2&3
ENVIRONMENTAL QUALIFICATION REPORT
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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 58 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status					
AC Motor Operator	Henry Pratt (P.O. No. 13-JM-605)	Limitorque Motor: SMB-00-40 Actuator: H3BC	Temperature 370F peak See fig. 3.1-1	Temperature 315 peak	30 days	30 days Test unit subjected to 794 cycles post LOCA/MSLB	None	N/A	Type Test Motor Stator aged for 100 hrs at 180C. Actuator mechani- cally cycled 1208 times prior to LOCA/MSLB Limitorque test report 600456 Dec. 9, 1975 BPC Log No. 13-10407- J-605-164-1	Qualified for 40 years (pending)					
Contain- ment		System: CPS Valve Tag No. J-CPA- UV-2B J-CPB- UV-3A J-CPA- UV-2A J-CPB- UV-3B Limitorque Motor: SMB-005 Actuator: H1BC System: CPS Valve Tag No. J-CPA- UV-4B J-CPB- UV-5A J-CPA- UV-4A J-CPB- UV-5B Limitorque Motor: SMB-00-2 Actuator H1BC System: NCWS Tag No. J-NCB-UV-403	Pressure 60 psig peak See fig. 3.1-2	Pressure 70 psig peak							Relative Humidity Steam/air mixture 100%	Radiation 2.0 x 10 ⁸	Chemical Spray Yes See table 4.1-3 Submergence N/A Env. Desig. I	Chemical Spray 3000 ppm H ₂ BO ₃ 0.064 molar Na ₂ S ₂ O ₃ pH = 10.5 with NaOH	Submergence N/A
			Relative Humidity Steam/air mixture												
			Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta												
			Chemical Spray Yes See table 4.1-3												
			Submergence N/A												
			Env. Desig. I												
			Submergence N/A												
			Submergence N/A												
			Submergence N/A												
			Submergence N/A												
Submergence N/A															

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

PVNGS 1,2&3
 ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

**ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 59 of 100)**

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Auxiliary Feed- water Pump Motor	Bingham- Willamette (P.O. No. 13-MM-021)	Westing- house Model No. 4x6x10½B MSD-8 STG Tag No. M-AFB-P01	Temperature 28-120F	Temperature 120F peak	30 days	33 days Stator was cycled -30C to 150C to 25C 4 times, then sub- merged in water. Insulation resistance was then measured and found to be unchanged.	N/A	N/A	Type Test Thermally aged per IEEE-275- 1966. Westinghouse Report No. WCAP-8754 Rev. 1 BPC Log No. 13-10407- M021-M001- 11.05-14-2. June 3, 1982	Qualified for 40 years
MSSS			Pressure 0 psig	Pressure 0 psig						
			Relative Humidity 20-90%	Humidity 20-100%						
			Radiation 1 x 10 ⁵ rads	Radiation 2 x 10 ⁴ rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. II							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

PVNGS 1,2&3
ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 60 of 100)

Type of Equipment/Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Auxiliary Feed-water Pumps GS-type Turbine Electronic Control Systems	Bingham-Willamette Company (P.O. No. 13-MM-021)	Panel and Auxiliaries Custom-Built Tag No. M-AFA-E01	Temperature 28 to 120F	Temperature 137F	30 days	Equipment to be operated at 137F and 95% RH for 8 hours. Voltage frequency current and pressure to be varied first at minimum levels then at maximum levels.	Later	Later	Type Test Non-metallic components to be aged to 40 year life except for GPD Relay (10 years) and Limitorque valve operator (5 year) Wyle Qualification Test Plan No. 57595. Oct. 1, 1982. BPC Log No. 13-10407-M021-185-2 Nov. 12, 1982	In progress To be qualified for 40 years except GPDNQ relays (10 years) and Limitorque valve operators (5 years)
MSSS			Pressure 0 psig	Pressure 0 psig						
			Relative Humidity 20-90%	Humidity 95%						
			Radiation 1×10^5 rads	Radiation 1.1×10^5 rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. II							

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

ENVIRONMENTAL QUALIFICATION REPORT
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PVNGS 1, 2&3

REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 61 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identi- fication	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Auxiliary Feed- water Pumps		Limatorque Model No. SMB-000 System AF Tag No. AFA-HV-54	Temperature 28 to 120F	Temperature 340F peak	30 days	33 days	None	N/A	Type Test Limatorque test report B-0058	Qualified for 8 years with maintenance
			Pressure 0 psig	Pressure 105 psig peak						
			Relative Humidity 20-90%	Relative Humidity 100%						
			Radiation 1 x 10 ⁵ rads	Radiation 1 x 10 ⁷ rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. II							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

PVNGS 1,2&3
ENVIRONMENTAL QUALIFICATION REPORT
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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 62 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Essential Cooling Water System Motor	Westinghouse Elect. Corp. (P.O. No. 13-MM-093)	Motor: HSWF Frame 6808L	Temperature 50-104F	Temperature 104F	30 days	33 days Thermalastic Epoxy Insulation remained intact for varying degrees of thermal/ mechanical aging	N/A	N/A	Type Test	Qualified for 40 years
Auxiliary Building		System: ECWS Tag Nos. MEWAP01 MEWBP01	Pressure 0 psig	Pressure 0 psig					Stator cycled from -30C to 150C to 25C, 4 times. Insulation resistance while sub- merged in water, before and after cycling, stayed 300 kΩ or better. Mechanical cycling: Motor stator at full line voltage and received when at speed, then allowed to coast for 1.5 min- utes. Repeated 500 times. No degrada- tion is noticed in megger tests. (cont)	
Fuel Pool Cooling Pumps			Relative Humidity 20-90%	Relative Humidity 100%						
Fuel Bldg		System: Fuel Pool Cooling Tag Nos. MPCAP01 MPCBP01	Radiation 1 x 10 ⁶ rads	Radiation 2 x 10 ⁸ rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. III, VI							

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

PVNGS 1, 2&3
 ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 63 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Essential Cooling Water System Motor (cont)									Westinghouse Electric Corporation Report No. WCAP-8754, Rev. 1 Sept. 21, 1982 BPC Log No. 13-10407- MM-093- 235-2 Oct. 7, 1981	
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 64 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
MSIV Pressure Trans- mitter	Anchor/ Darling (P.O. No. 13-MM- 234A)	Rosemount 1152GP-0- A-92-PB	Temperature 300F	Temperature 350F peak	30 days	Functional test during accident Post functional test	N/A	Accuracy post func- tional test 0.5% of full scale	Type Test 2 cycles of 100F, 1 hour; 0F, 1 hour; 200F, 1 hour; 100F, 1 hour Anchor Darling Report No. E9023-QR-2 Rev. A, April 15, 1980 RMT Report No. 117415 Sept. 24, 1975 Bechtel Log No. 13- 10407- M234A-68-2, April 24, 1980	Qualified for 40 years except for non-metallic parts (pending)
MSSS		System: MSS Tag Nos. J-SGA- PT-229 J-SGB- PT-230 J-SGA- PT-231 J-SGB- PT-232 J-SGA- PT-233 J-SGB- PT-234 J-SGA- PT-235 J-SGB- PT-236	Pressure 21 psig	Pressure 70 psig peak						
			Relative Humidity Steam/air mixture	Relative Humidity Steam/air mixture						
			Radiation 1 x 10 ⁶ rads	Radiation 5.0 x 10 ⁶ rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. II							

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

PVNGS 1,2&3
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 65 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
MSIV Limit Switch	Anchor/ Darling (P.O. No. 13-MM- 234A)	Namco EA180	Temperature 300F	Temperature 340F peak	30 days	33 days	N/A	N/A	Type Test	Qualified for 40 years with maintenance
MSSS		System: MSS Valve Tag Nos. J-SGE-UV- 170 J-SGE-UV- 171 J-SGE-UV- 180 J-SGE-UV- 181 (6/valve)	Pressure 21 psig	Pressure 70 psig peak					Mechanically aged for 100, 200 actuation cycles	
			Relative Humidity Steam/Air mixture	Relative Humidity 100%					Thermal aging 400 hours at 120F	
			Radiation 1 x 10 ⁶ rads	Radiation 2.04 x 10 ⁴ rads					Anchor/ Darling Report No. E9023-QR-2 Rev. A, April 15, 1980	
			Chemical Spray N/A	Chemical Spray H ₃ BO ₃ N ₂ S ₂ O ₃ and NaOH to pH 10- 11					Wyle test Report 43847-2, May 23, 1978	
			Submergence N/A	Submergence N/A					BPC Log No. 13-10407- M234A-68-2, April 24, 1980	
			Env. Desig. II						Reference: Namco Report No. QTR 105 April 13, 1980 (cont)	
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 66 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
MSIV Limit Switch									BPC Log No. 13-10407- J601A-134-1	
MSSS (cont)									Qualified by C-E Namco Program	
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 67 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
FWIV Pressure Switch	Anchor/ Darling (P.O. No. B-MM- 234A)	Barksdale BIT-A48SS	Temperature 300F	Temperature 450F peak	30 days	Functional tests during accident Post func- tional test	N/A	N/A	Type Test	Qualified for 40 years except for non-metallic parts
MSSS		System: MSS Tag Nos. J-SGA- PSH-245 J-SGA- PSH-246 J-SGB- PSH-247 J-SGB- PSH-248	Pressure 21 psig	Pressure 0 psig					Cyclic aging full stroke 100 cycles	
			Relative Humidity Steam/Air mixture	Relative Humidity Saturated steam					Exercise 150 cycles	
			Radiation 1 x 10 ⁶ rads	Radiation 2.5 x 10 ⁶ rads					Thermal aging 317.6 hours at 121C	
			Barksdale BIT-A12SS	Chemical Spray N/A					Chemical Spray None	
		System: MSS Tag Nos. J-SGA- PSL-268 J-SGA- PSL-269 J-SGB- PSL-270 J-SGB- PSL-271	Submergence N/A	Submergence N/A					Wyle Test Report 43847-2, May 23, 1978	
			Env. Desig. II						BPC Log No. 13-10407 M234A-68-3 Oct. 28, 1980	

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 68 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
FWIV Pressure Trans- mitter	Anchor/ Darling (P.O. No. 13-MM- 234A)	Rosemount 1152GP-0 -A-92-PB	Temperature 300F	Temperature 350F peak	30 days	Functional test during accident Post func- tional test.	Accuracy 2.0% of full scale Response time N/A	Accuracy Post func- tional test 0.5% of full scale Response time N/A	Type Test 2 cycles of 100F, 1 hour; 0F, 1 hour; 200F, 1 hour; 100F, 1 hour Anchor/ Darling Report No. E9023-QR-2 Rev. A, April 15, 1980 RMT Report No. 117415, September 24, 1975 BPC Log No. 13-10407- M234A-68-2, April 24, 1980	Qualified for 40 years except for non-metallic parts (pending)
MSSS		System: MSS Tag Nos. J-SGA- PT-237A J-SGA- PT-237B J-SGA- PT-238A J-SGA- PT-238B J-SGA- PT-239A J-SGA- PT-239B J-SGA- PT-240A J-SGA- PT-240B	Pressure 21 psig	Pressure 70 psig						
			Relative Humidity Steam/Air mixture	Relative Humidity Steam/Air mixture						
			Radiation 1 x 10 ⁶ rads	Radiation 5.0 x 10 ⁶ rads						
			Chemical Spray N/A	Chemical Spray Not Addressed						
			Submergence N/A	Submergence N/A						
			Env. Desig. II							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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 ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 69 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
FWIV Solenoid Valve	Anchor/ Darling (P.O. No. 13-MM- 234A)	Skinner V5H65590 -125VDC	Temperature 300F	Temperature 450F peak	30 days	Functional test during accident Post func- tional test	N/A	N/A	Type Test	Qualified for 40 years except for non-metallic parts (pending)
MSSS		System: MSS Tag Nos. J-SGB- UY-132B J-SGB- UY-132D J-SGB- UY-137B J-SGB- UY-137D J-SGA- UY-174B J-SGA- UY-174D J-SGA- UY-177B J-SGA- UY-177D	Pressure 21 psig	Pressure 0 psig					Cyclic aging full stroke 100 cycles	
			Relative Humidity Steam/air mixture	Relative Humidity Steam/air mixture					Exercise 150 cycles	
			Radiation 1 x 10 ⁶ rads	Radiation 2.5 x 10 ⁶ rads					Thermal aging 121C for 317.6 hours	
			Chemical Spray N/A	Chemical Spray Not Addressed					Anchor/ Darling Report No. E9023-QR-2, Rev. A, April 15, 1980	
			Submergence N/A	Submergence N/A					Wyle Test Report 43847-2, May 23, 1978	
			Env. Desig. II						BPC Log No. 13-10407- M234A-68-3 Oct. 28, 1980	

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 70 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
FWIV Solenoid Valve (cont)		Skinner V5H65600 -125VDC								
		System: MSS Tag Nos. J-SGB-UY-132A J-SGB-UY-132C J-SGB-UY-137A J-SGB-UY-137C J-SGA-UY-174A J-SGA-UY-174C J-SGA-UY-177A J-SGA-UY-177C								
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 71 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
FWIV Limit Switch	Anchor/ Darling (P.O. No. 13-MM- 234A)	Namco EA180	Temperature 300F	Temperature 340F peak	30 days	33 days	N/A	N/A	Type Test	Qualified for 40 years with maintenance
MSSS		System: MSS Tag Nos. J-SGA- UV-174 J-SGA- UV-177 J-SGB- UV-132 UV-SGB- UV-137 (3/valve)	Pressure 21 psig	Pressure 70 psig peak					Thermally aged 400 hours at 120F	
			Relative Humidity Steam/air mixture	Relative Humidity 100%					Mechanically aged for 100,200 actuation cycles	
			Radiation 1 x 10 ⁶ rads	Radiation 2.04 x 10 ⁶ rads					Anchor/ Darling Report No. E9023-QR-2, Rev. A, April 15, 1980	
			Chemical Spray N/A	Chemical Spray H ₃ BO ₃ , Na ₂ S ₂ O ₃ and NaOH to pH = 10-11					Acme- Cleveland Development Company, September 5 1978	
			Submergence N/A	Submergence N/A					BPC Log No. 13-10407- M234A-68-2, April 24, 1980	
			Env. Desig. II						Reference: Namco Report No. QTR-105 April 13, 1980	
									(cont)	

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 72 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
FWIV Limit Switch									BPC Log No. 13-10407-J601A-134-1	
MSSS (cont)									Qualified by C-E Namco program	
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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Table 4.1-1

**ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 73 of 100)**

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
MSIV Solenoid Valve	Anchor/ Darling (P.O. No. 13-MM- 234A)	Skinner V5H65590 -125 VDC	Temperature 300F	Temperature 450F peak	30 days	Functional test during accident Post func- tional test	N/A	N/A	Type Test	Qualified for 40 years except for non- metallic (pending)
MSSS		System: MSS Tag Nos. J-SGB-UY -170B J-SGB-UY -170D J-SGB-UY -170F J-SGB-UY -170H J-SGA-UY -171B J-SGA-UY -171D J-SGA-UY -171F J-SGA-UY -171H J-SGA-UY -180B J-SGA-UY -180D	Pressure 21 psig	Pressure 0 psig					Cyclic aging full stroke 100 cycles	
			Relative Humidity Steam/air mixture	Relative Humidity Saturated steam/air mixture					Exercise 150 cycles	
			Radiation 10 ⁶ rads	Radiation 2.5 x 10 ⁶ rads					Thermal aging 317.6 hours at 121C	
			Chemical Spray N/A	Chemical Spray N/A					Anchor/ Darling Report No. E9023-QR-2, Rev. A, April 15, 1980	
			Submergence N/A	Submergence N/A					Wyle Test Report No. 43847-2, May 23, 1978	
			Env. Desig. II						BPC Log No. 13-1040-7- M234A-68-2, April 24, 1980	
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)-
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 74 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
MSIV Solenoid Valve (cont)		J-SGA-UY -180F J-SGA-UY -180H J-SGB-UY -181B J-SGB-UY -181D J-SGB-UY -181F J-SGB-UY -181H								
		Skinner V5H65600 125 VDC								
		System: MSS Tag Nos. J-SGB-UY -170A J-SGB-UY -170C J-SGB-UY -170E J-SGB-UY -170G								
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

PVNGS 1,2&3
ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 75 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
MSIV Solenoid Valve (cont)		J-SGA-UY -171A J-SGA-UY -171C J-SGA-UY -171E J-SGA-UY -171G J-SGA-UY -180A J-SGA-UY -180C J-SGA-UY -180E J-SGA-UY -180G J-SGB-UY -181A J-SGB-UY -181C J-SGB-UY -181E J-SGB-UY -181G								
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

PVNGS 1,2&3
ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 76 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
MSIV Pressure Switch	Anchor/ Darling (P.O. No. 13-MM- 234A)	Barksdale BIT-A48SS	Temperature 300F	Temperature 450F peak	30 days	Functional test during accident Post func- tional test	N/A	N/A	Type Test	Qualified for 40 years except for non- metallic parts (pending)
MSSS		System: MSS Tag Nos. J-SGE-PSH -241 J-SGE-PSH -242 J-SGE-PSH -243 J-SGE-PSH -244	Pressure 21 psig	Pressure 0 psig					Cyclic aging full stroke 100 cycles	
			Relative Humidity Steam/air mixture	Relative Humidity Steam/air mixture					Exercise 150 cycles	
			Radiation 10 ⁶ rads	Radiation 2.5 x 10 ⁶ rads					Thermal aging 121C for 317.6 hours	
			Barksdale BIT-A12SS	Chemical Spray N/A					Chemical Spray N/A	
		System: MSS Tag Nos. J-SGA-PSL -260 J-SGB-PSL -261 J-SGA-PSL -262 J-SGB-PSL -263 J-SGA-PSL -264 J-SGB-PSL -265 J-SGA-PSL -266 J-SGB-PSL -267	Submergence N/A	Submergence N/A					Wyle Test Report 43847-2, May 23, 1978 BPC Log No. 13-10407- M234A-68-2, April 24, 1980	
			Env. Desig. II							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

PVNGS 1,2&3
 ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 77 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Electric Low- Leakage Damper Actu- ator	Wal- dinger Corp. (P.O. No. 13-MM- 598)	Model No. ITT NH95	Temperature 28-120F	Temperature 135F peak	30 days	Post Seis- mic Extreme Environ- mental Test: 8 hrs at 40F and 8 hrs at 135F specimens cycled six times at each specified temperature	Close Re- sponse time not re- ported	Report States that test units passed ex- treme en- viron- mental func- tion- als	Type Test Aging Per- for- med: 648 hrs at 212F Total mech- anical cyclic aging: 2800 cycles Wyle Report No. 58551 Sept. 22, 1982 BPC Log No. 13- 10-407- M598- 1712-2 M598- 1715-3 Oct. 5, 1982	Qualified for 40 yrs (pending)
Auxiliary Bldg. MSSS Elev. 80' Fuel Bldg.		System: CHCS	Pressure 0 psig	Pressure 0 psig						
		Tag Nos. MHPAM02 MHPBM01 MHPBM02 MHPAM01	Humidity 20-90%	Humidity 100% RH						
		System: HVAC MSSS Bldg	Radiation 1' x 10 ⁶ rads	Radiation 1.16 x 10 ⁶ rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Tag Nos. MHAAM214 MHABM215 MHAAM216 MHABM217	Submergence N/A						
		System HVAC Fuel Bldg	Env. Desig. II,III,VI							
			Tag Nos. MHFAM05 MHFBM05 MHFAM06 MHFBM06							

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

PVNGS 1,2&3
 ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 78 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Pneumatic Low- Leakage Damper Motor	Wal- dinger Corp. (P.O. No. 13-MM- 598)	Model No. Fisher 656	Temperature 50-104F	Temperature 135F peak	30 days	Post Seis- mic Extreme Environ- mental Test: 8 hrs at 40F and 8 hrs at 135F. Specimens cycled 6 times at each specified tempera- ature.	Fisher 656-30 Re- ceiv- ing Test. Open: 5.8 to 7.2 sec. Close: 1.5 to 2 sec.	Fisher 656-30 Re- ported Re- sults Open: pass Close: pass	Type Test Aging per- formed 648 hrs at 212F. Total mech- anical cyclic aging: 2800 cycles	Qualified for 40 yrs (pending)
Auxiliary Bldg. Fuel Bldg.		System: HVAC - Auxiliary Bldg. Tag Nos. M-HAA-M01 M-HAA-M02 M-HAA-M03 M-HAA-M04 M-HAA-M05 M-HAB-M01 M-HAB-M02 M-HAB-M03 M-HAB-M04 M-HAB-M05 M-HAB-M06	Pressure 0 psig	Pressure 0 psig						
			Humidity 20-90%	Humidity 100% RH						
			Radiation 1 x 10 ⁶	Radiation 1.27 x 10 ⁶ rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. III,VI							
					Fisher 656-40 Re- ceiv- ing Test. Open: 13.5 to 15 sec. Close: 4 sec.	Fisher 656-40 Re- ported Re- sults Open: pass Close: pass	Wyle Report No. 58551 Sept. 22, 1982 BPC Log No. 13- 10407- M598- 1712-2 M598- 1715-3 Oct. 5, 1982			

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 79 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Solenoid Valves	Wal- dinger (P.O. No. 13-MM- 598)	Automatic Switch Company Model No. NP8320	Temperature 50 to 104F	Temperature 450 peak	30 days	33 days	N/A	N/A	Type Test ASCO Report No. AQS 787R Rev. A & AQS- 67368 Rev. 0 & C-E Letter V-PAK-250	Qualified 40 yrs with mainte- nance
Auxiliary Bldg.			Pressure 0 psig	Pressure 78 psig						
Fuel Bldg.		System: HVAC-Aux. Bldg. Tag Nos. J-HAA-UY- 114 J-HAB-UY- 115 J-HAA-UY- 112 J-HAB-UY- 113 J-HAA-UY- 125 J-HAB-UY- 126 Fuel Bldg. Tag Nos. J-HFA-UY- 26 J-HFA-UY- 27 J-HFB-UY- 25 J-HFB-UY- 28	Relative Humidity 20 to 90%	Humidity 100%						
			Radiation 10 ⁶ rads	Radiation 1.8 x 10 ⁸ γ 1.1 x 10 ⁸ β						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. III, VI							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 80 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Limit Switches	Waldinger (P.O. No. 13-MM-598)	Namco Controls EA-170	Temperature 50 to 104F	Temperature 135F peak	30 days	33 days	N/A	N/A	Type Test	Qualified for 40 years with mainte- nance Replace with qualified Model EA-180
Auxiliary Bldg Fuel Bldg		System: HVAC-Aux. Bldg Tag Nos. M-HAA-M01 M-HAA-M02 M-HAA-M03 M-HAA-M04 M-HAA-M05 M-HAA-M06 M-HAB-M01 M-HAB-M02 M-HAB-M03 M-HAB-M04 M-HAB-M05 M-HAB-M06 System: HVAC Fuel Bldg M-HFA-M01 M-HFB-M01 M-HFA-M02 M-HFB-M02 M-HFA-M03 M-HFB-M03 M-HFA-M04 M-HFB-M04	Pressure 0 psig	Pressure 0 psig					Aging per- formed: 312 hrs at 212F	
			Relative Humidity 20 to 90%	Humidity 100%					Cycled 2800 times	
			Radiation 10 ⁶ rads	Radiation 1.27 x 10 ⁶ rads					Coyle Report No. 58551 Sept. 22, 1982	
			Chemical N/A	Chemical N/A					BPC Log No. 13-10407- M598-1712-2 M598-1715-3 Oct. 5, 1982	
			Submergence N/A	Submergence N/A						
			Env. Desig. III, VI							
			a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.							

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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 81 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Essential/ Air Handling Unit Motors	Reliance Motors (P.O. No. 13-MM- 721A)	System: HVAC- Aux. Bldg Tag Nos. MHAAZ01 MHAAZ02 MHAAZ03 MHAAZ05 MHAAZ06 MHABZ01 MHABZ02 MHABZ03 MHABZ05 MHABZ06 MSSS MHAAZ04 MHABZ04	Temperature 28-120F	Temperature 122F	30 days	33 days Motors cycled under load with total time per cycle equal to 40 seconds and 794 cycles after radiation testing and aging	N/A	N/A	Combination analysis and Motorette test to IEEE-117 with tempera- ture to 220C Reliance Electric Co. Report No. NUC-9 July 1, 1978 and Supplement BPC Log No. . 13-10407- M721A-94-6 March 31, 1982	Qualified for 40 years
Auxiliary Bldg MSSS			Pressure 0 psig	Pressure 0 psig						
			Relative Humidity 20-90%	Relative Humidity 100%						
			Radiation 1 x 10 ⁶ rads	Radiation 2.04 x 10 ⁸ rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. II, III							

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

PVNGS 1,2&3
 ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

**ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 82 of 100)**

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Essential Air Handling Unit Motors	Reliance Motors (P.O. No. 13-MM- 721B)	System: HVAC- Fuel Bldg Tag Nos. M-HFA-J01 M-HFB-J01	Temperature 50-104F	Temperature 122F	30 days	Motors cycled under load with total time per cycle equal to 40 seconds and 794 cycles after radiation testing	N/A	N/A	NUC 9 Report Combination analysis and Motor- ette test to IEEE-117 with temperature to 130C Mechanical Cycling: 1208 cycles post thermal aging Thermal aging: 2112 hours at 255C Reliance Electric Co. Report No. NUC-9 July 1, 1978 Reliance Electric Co. Report No. NUC-9 Supplement (NUC 18) September 29, 1981 BPC Log No. 13-10407- M721B-123-1 June 22, 1978	Qualified for 40 years (pending)
Fuel Bldg			Pressure 0 psig	Pressure 0 psig						
			Relative Humidity 20-90%	Relative Humidity 100%						
			Radiation 1 x 10 ⁵ rads	Radiation 2.04 x 10 ⁸ rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. VI			NUC 9 Supplement motor sub- jected to postaging tests including: load per- formance no load, locked, torque current vs. speed at 80% & 100% rated motor voltage				
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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PVNGS 1, 2&3

REVIEW TECHNIQUE

Table 4.1-1

**ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 83 of 100)**

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Essential Air Handling Unit Heaters	Nutherm (P.O. No. 13-MM- 721B)	System: HVAC-Fuel Bldg Tag Nos. M-HFA-J01 M-HFB-J01	Temperature 50-104F	Temperature 104F	30 days	Functional tests to be performed 4 times during aging. Inspection to follow DBE.	N/A	N/A	Type Test To be thermally aged 31, 36 days at 293F, 50 to 90% RH _o to mechani- cally cycled 4000 times Nutherm Intr. Qualifica- tion Plan No. 51117P Rev. 1 September 14, 1982 BPC Log No. 13-10407- M900-1-2 September 20, 1982	In Progress
Fuel Bldg			Pressure 0 psig	Pressure 16.5 psig						
			Relative Humidity 20-90%	Relative Humidity 100%						
			Radiation 1 x 10 ⁵ rads	Radiation 1.1 x 10 ⁵ rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. VI							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 84 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identi- fication	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Hydrogen Recom- biner Fan Motor with Class H Insula- tion System	Westinghouse Electric Corpora- tion (P.O. No. 13-NM-993)	N/A	Temperature 50-104F	Temperature 130C	30 days	33 days Aged for an additional 38 hours at 210C prior to moisture and voltage tests: 120V, 60 Hz between con- ductors, 10 minutes 600V, 60 Hz phase to phase, 10 minutes 600V, 60 Hz to ground, 10 minutes	N/A	N/A	Combination analysis and Motor- ette tests as per IEEE-117. Motorettes aged for 1369 hours at 210C Westinghouse Report No. WCAP-9112, May 12, 1977. BPC Log No. 13-10407- N993-114-2, March 6, 1980	Qualified for 40 years (pending)
Auxiliary Bldg			Pressure 0 psig	Pressure 0 psig						
			Relative Humidity 20-90%	Relative Humidity 100%						
			Radiation 1 x 10 ⁶ rads	Radiation 2 x 10 ⁸ rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. II							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 85 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Hydrogen Recom- biner Blower Motor with Class H Insula- tion System	Rockwell Energy System Group (Atoms Internat- ional) (P.O. No. 13-NM-993		Temperature 50-104F	Temperature 245F Inlet	30 days	402 days system operated 1 week at 245F, 35.8 psia, 3 weeks at 190F, 24.1 psia, 48 weeks at 170F, 21.4 psia winding resistance remained at 50 mΩ or better.	N/A	N/A	Type Test	Qualified for 40 years (pending)
			Pressure 0 psig	Pressure 35.8 psia					Thermal Aging: 125 hours at 170C. Mechanical aging 0.008 in peak to peak at 60 Hz, for 1 hour cycled 277 times.	
			Relative Humidity 20-90%	Relative Humidity 100%						
			Radiation 1 x 10 ⁶ rads	Radiation 1.1 x 10 ⁸ rads						
Auxiliary Bldg	Blower motor by Reliance Electric		Chemical Spray N/A	Chemical Spray Inlet Air sprayed with the following mixture: 108 gal- lons H ₂ O, 31.3 lbs of boric acid, 18.2 lbs N ₂ S ₂ O ₃ , 4.8 oz of hydrazine pH to 10.5 with sodi- um tri- phosphate and sodium hydroxide, also added 0.2 cc acetone (cont)					Rockwell Internat- ional Report No. N139QR 120001 Sept. 19, 1982. BPC Log No. 13-10407- NM-993-134- 1 Nov. 9, 1982.	
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 86 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Hydrogen Recom- biner Blower Motor with Class H Insula- tion System				0.1 cc paint thinner, 0.1 cc lube oil, 0.1 cc detergent						
			Submergence N/A	Submergence N/A						
Auxiliary Bldg			Env. Desig. II							
(cont)										
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 87 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Containment Atmosphere Monitor	Kaman Science Corp. (P.O. No. 13-NM-997)	Model 51497	Temperature 50-104F	Temperature 104F	30 days	Passed postaging functional tests	None specified by supplier	N/A	Type Test Aging per Major Components P.C. Boards 1200 hrs at 100C Field Unit Chassis 1200 hrs at 100C Power Supply 648 hrs at 100C Magnecraft Relays 800 hrs at 100C Motor Starter 1500 hrs at 100C Ledex Solenoid 500 hrs at 85C Moving Step Filter 412 hrs at 100C Mechanical Aging: Motor Starter 7280 cycles Magnecraft Relays 4500 cycles Moving Step Filter (cont)	Qualified for 15 yrs maximum except terminal blocks which are qualified for 40 years (pending)
Auxiliary Bldg		System: RMS Tag No. SQB-RU-01	Pressure 0 psig	Pressure 0 psig						
Containment Bldg Purge Exhaust "B" Monitor		SQB-RU-34	Relative Humidity 20-90%	Relative Humidity Not addressed						
Auxiliary Bldg			Radiation 1×10^6 rads	Radiation 1×10^3 rads						
Fuel Bldg Atmosphere Monitor			Chemical Spray N/A	Chemical Spray N/A						
Fuel Bldg		SQA-RU-32	Submergence N/A	Submergence N/A						
			Env. Desig. III, VI							

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

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PVNGS 1,2&3
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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 88 of 100)

Type of Equipment/Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Containment Atmosphere Monitor									48,048 cycles Ledex Solenoid 12,012 cycles	
Auxiliary Bldg									Kamen Report No. K-80-63U(R) May 27, 1982	
Containment Purge Exhaust "B" Monitor									BPC Log No. 13-10407-N997-164-2 June 3, 1982	
Auxiliary Bldg										
Fuel Bldg Atmosphere Monitor										
Fuel Bldg (cont)										
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 89 of 100)

Type of Equipment/Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Refueling Machine Area "A" Monitor	Kaman Sciences Corp. (P.O. No. 13-NM-997)	Model No. N117	Temperature 50-120F	Temperature 120F	30 days	Passed postaging functional tests	None specified by supplier	N/A	Type Test Aging Performed: Major Components PIC/LIC/RIC Display 768 hrs at 85C Motherboard 648 hrs at 100C Power Supply 648 hrs at 80C HV Board 800 hrs at 100C Pre-Amp Area monitor 1200 hrs at 100C Magneecraft Relays 800 hrs at 100C Mechanical Aging Magneecraft Relays 4500 cycles Kaman Report No. K-80-63U(R) May 27, 1982 BPC Log No. 13-10407-N-997-164-2	Qualified for a maximum of 40 years with life limiting components (pending)
Containment		System: RMS Tag No. SQA-RE-033(c)	Pressure 0 psig	Pressure 0 psig						
			Relative Humidity 20-90%	Relative Humidity						
Power Access Purge Area "A" and "B" Monitors		SQA-RU-37 SQB-RU-38	Radiation 1 x 10 ⁷ rads	Radiation 1 x 10 ³ rads						
Auxiliary Bldg			Chemical Spray N/A	Chemical Spray N/A						
Fuel Bldg Area Monitor		SQA-RU-31	Submergence N/A	Submergence N/A						
Fuel Bldg			Env. Desig. I, III, VI							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown. c. Not required to function post-accident.										

PVNGS 1,2&3
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 90 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability, Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Alter- nating Current Electric Motor Opera- tors	Dresser Industries Rotork Controls Inc. (P.O. No. 13-PM- 221A)	Model No. 7NAB1-43	Temperature 370F peak See fig. 3.1-1	Temperature 385F peak	30 days	30 days Valves cycled 15 times during the pres- surization test LOCA Post Function 5 complete cycles	N/A	N/A	Type Test	Qualified for 40 years
Contain- ment Auxiliary Bldg		System: GRS Tag No. JGRA-UV-1 JHPA-UV-1 JHPB-UV-2	Pressure 60 psig peak. See fig. 3.1-2	Pressure 75 psig					Environmental and Mechan- ical Wear Aging Test: 200F for 400 hours in live steam. Cycled once per hour during environ- mental phase plus 1600 addi- tional tests.	
		System: CHCS JHPA-UV-3 JHPB-UV-4 JHPA-UV-5 JHPB-UV-6	Relative Humidity Steam/Air mixture	Relative Humidity 100%					Wyle Labs Report No. 43979-1, 43979-3, Rev. A, 58364, December 19, 1978	
			Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta	Radiation 2.04 x 10 ⁸ rads					BPC Log No. 13-10407- P221A-165-6, P-221A-188, P-221A-200, P-221A-201 May 21, 1979	
			Chemical Spray Yes See table 4.1-3	Chemical Spray 6200 ppm H ₃ BO ₃ , NaOH to pH of 9.5					(cont)	
			Submergence N/A	Submergence N/A						
			Env. Desig. I, III							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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 ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 91 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Alter- nating Current Electric Motor Opera- tors									Rotork Reports TR-3029 TR-3030 Jan. 18, 1982	
Contain- ment Auxiliary Bldg (cont)										
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

PVNGS 1,2&3
ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 92 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Alter- nating Current Electric Motor Opera- tors (For Cont. Isola- tion Valves)	Limatorque Corpora- tion (P.O. No. 13-PM- 221B) Anchor/ Darling Valve Company	Model No. SB-00-7.5	Temperature 370F peak See fig. 3.1-1	Temperature 315F peak	30 days	30 days Cycled 9 times throughout 30 day test Post-LOCA Load Cycl- ing Test: 794 full cycles Models tested: Inside Containment: SMB-0-40 Outside Con- tainment: SMB-0	Open: 40 second Close: 40 second	9 cycles run during LOCA Open low 41 second High 42 second Close: low 42 second high 43.5 second	Type Test (SMB-0) Generic Test (SMB, SB, SBD and SMB HBC) Thermal Aging (motor only) 180C for 100 hours Mechanical Aging 1028 full cycles prior to LOCA test Limatorque Report No. B0058, Jan. 11, 1980 BPC Log No. 13-10407- P221B-349- 1, March 4, 1981	Qualified for 40 years (pending)
Contain- ment		System: CWS Tag No. JWCB-UV- 61	Pressure 60 psig peak. See fig. 3.1-2	Pressure 70 psig						
		Model No. SMB-000-2	Relative Humidity Steam/Air mixture	Relative Humidity 100%						
		System: RWDS Tag No. JRDA-UV- 23	Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta	Radiation 2.04 x 10 ⁸ rads						
			Chemical Spray Yes See table 4.1-3	Chemical Spray 3000 ppm H ₃ BO ₃ , 0.064 molar Na ₂ S ₂ O ₃ , NaOH added for pH of 10.5						
			Submergence N/A	Submergence N/A						
			Env. Desig. I							

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 93 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Limit Switch (For Pneu- matic Operated Main Steam Blowdown Isola- tion Valves)	Namco Controls - Acme Cleveland Company (P.O. No. 13-PM- 221B) Anchor/ Darling Valve Co.	Model No. EA-740	Temperature 370F peak See fig. 3.1-1	(Later)	30 days	(Later)	N/A	N/A	Type Test (Later)	To be replaced with quali- fied model EA-180
Contain- ment		System: MSS Tag Nos. JSGA-UV- 500P JSGA-UV- 500R	Pressure 60 psig peak. See fig. 3.1-2							
			Relative Humidity Steam/Air mixture							
			Radiation 3.3 x 10 ⁷ gamma 2 x 10 ⁶ beta							
			Chemical Spray Yes See table 4.1-3							
			Submergence N/A							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 94 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Alternating and Direct Current Electric Motor Opera- tors (For Main Steam and Feed- water Isola- tion Valves)	Limitorque Corpora- tion (P.O. No. 13-PM- 221B) Anchor/ Darling Valve Co.	Model No. SB-0-40	Temperature 300F (above 100 ft)	Temperature 315F peak	30 days	33 days	None	N/A	Type Test	Qualified for 8 years with maintenance
		System: MSSS				Cycled 9 times throughout test				
		Tag No. JSCA-UV- 134	Pressure 21 psig (above 100 ft)	Pressure 25 psig peak		Post LOCA load cycling test: 794 cycles				
		JSCA-UV- 138								
		Model No. SMB-00-25	Relative Humidity 100% (above 100 ft)	Relative Humidity 100%		Limitorque Report No. B0058, January 11, 1981 BPC Log No. 13-10407- P221B-349- 1, March 4, 1981				
		System: AFS								
		Tag No. JAFB-UV- 34	Radiation 1 x 10 ⁶ rads	Radiation 2 x 10 ⁷ rads						
		JAFB-UV- 35								
JAJA-UV- 36	Chemical Spray N/A	Chemical Spray N/A								
MSSS		JAJA-UV- 37	Submergence N/A	Submergence N/A						
			Env. Desig. II							

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

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 ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 95 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Limit Switch (For Pneu- matic Operated Main Steam & Feed- water Isola- tion Gate Valves)	Namco Controls - Acme Cleveland Company (P.O. No. 13-PM- 221B) Anchor/ Darling Valve Co.	Model No. EA-740	Temperature 300F	Temperature 340F	30 days	33 days	N/A	N/A	Type Test Thermal aging 200 hrs at 200F	Qualified for 40 years with mainte- nance Replace with qualified model EA 180
		System: MSS	Pressure 21 psig	Pressure 63 psig						
		Tag No. JSGE-UV- 169, JSGE-UV- 183	Relative Humidity 100%	Relative Humidity 100%						
		JSGB-UV- 500Q JSGA-UV- 500S	Radiation 1.x 10 ⁶ rads	Radiation 2.04 x 10 ⁸ rads						
		JSGA-UV- 172 JSCB-UV- 130	Chemical Spray N/A	Chemical Spray N/A						
		JSCB-UV- 135 JSGA-UV- 175	Submergence N/A	Submergence N/A						
			Env. Desig. II							
MSSS Bldg										
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 96 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Solenoid Valves (For Pneu- matic Operated Main Steam & Feed- water Isola- tion Gate Valves)	Automatic Switch Co. (ASCO) (P.O. No. 13-PM- 221B) Anchor/ Darling Valve Co.	Model No. NP831654E	Temperature 300F (above 100 ft)	Temperature 450F peak	30 days	33 days	N/A	N/A	Type Test Thermal aging 12 days at 268F Mechanical aging 40,000 cycles ASCO Report No. AQS 78TR Rev. A and AQS 67368 Rev. 0 and CE letter V-PAK-250	Qualified for 40 years with mainte- nance
MSSS		System: MSS								
		Tag No. JSGA-UY- 169A	Pressure 21 psig (above 100 ft)	Pressure 78 psig peak						
		JSCB-UY- 169B								
		JSGA-UY- 183A	Relative Humidity 100% (above 100 ft)	Relative Humidity 100%						
		JSCB-UY- 183B								
		JSCB-UY- 500Q								
		JSGA-UY- 500S	Radiation 1 x 10 ⁶ rads	Radiation 1.8 x 10 ⁸ γ 1.1 x 10 ⁸ β						
		Model No. NP831665E	Chemical Spray N/A	Chemical Spray N/A						
		System: MSS								
Tag No. JSGA-UY- 172A	Submergence N/A	Submergence N/A								
JSGA-UY- 172B	Env. Desig. II									
JSCB-UY- 130A										
JSCB-UY- 130B										
JSGA-UY- 175A										
JSGA-UY- 175B										
JSCB-UY- 135A										
JSCB-UY- 135B										

a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.

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 ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 97 of 100)

Type of Equipment/ Location	Manufacturer	Model No. of Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Alter- nating Current Electric Motor Opera- tors	Limatorque Corpora- tion (P.O. No. 13-PM- 221B) Anchor/ Darling Valve Co.	Model No. SB-00-7.5	Temperature 50-104F	Temperature 250F peak	30 days	33 days Cycled 9 times throughout test Post LOCA load cycl- ing test: 794 cycles	N/A	N/A	Type Test and Analysis	Qualified for 8 years with maintenance
Auxiliary Bldg		System: CWS Tag Nos. JWCB-UV- 63 JWCA-UV- 62	Pressure 0 psig	Pressure 25 psig peak					Thermal aging 100 hrs at 180C	
			Relative Humidity 90%	Relative Humidity 100%					Mechanical aging 1028 cycles	
			Radiation 1 x 10 ⁶ rads	Radiation 2 x 10 ⁷ rads					Limatorque Report No. B0058, January 11, 1981	
			Chemical Spray N/A	Chemical Spray 3000 ppm H ₃ BO ₃ , 0.064 molar Na ₂ S ₂ O ₃ , pH = 10.5 with NaOH					BPC Log No. 13-10407- P221B-349- 1, March 4, 1981	
			Submergence N/A	Submergence N/A						
			Env. Desig. III							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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PVNGS 1,2&3

REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 98 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Limit Switch (For Pneu- matic Operated Cont. Radwaste Sump Pump Dis- charge Valve)	Namco Controls - Acme Cleveland Company (P.O. No. 13-PM- 221B) Anchor/ Darling Valve Co.	Model No. EA-740	Temperature 50-104F	Temperature 340F peak	30 days	Switch was cycled 8 times during LOCA test. Open Circuit resistance maintained 40 KΩ or better throughout	N/A	N/A	Type Test Thermal aging 200 hrs at 200F	Qualified for 40 years with mainte- nance Replace with qualified model EA-180
Auxiliary Bldg		System: RWDS Tag No. JRDB-UV- 24	Pressure 0 psig	Pressure 63 psig						
			Relative Humidity 20-90%	Relative Humidity 100%						
			Radiation 1 x 10 ⁶ rads	Radiation 2.04 x 10 ⁸ rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. III							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 99 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Solenoid Valves (For Pneu- matic Operated Cont Radwaste Sump Pump Dis- charge Valve)	Automatic Switch Company (ASCO) (P.O. No. 13-PM- 221B) Anchor/ Darling Valve Co.	Model No. NP831654E	Temperature 50-104F	Temperature 450F peak	30 days	33 days	N/A	N/A	Type Test ASCO Report No. AQS-78- TR Rev. A & AQS-67368 Rev. 0 & C-E letter V-PAK-250	Qualified for 40 years with maintenance
		System: RWDS Tag No. JRDB-UY- 24	Pressure 0 psig	Pressure 78 psig						
			Relative Humidity 20-90%	Relative Humidity 100%						
			Radiation 1×10^6 rads	Radiation $1.8 \times 10^8 \gamma$ $1.1 \times 10^8 \beta$						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. III							
Auxiliary Bldg										
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

PVNGS 1,2&3
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 100 of 100)

Type of Equipment/ Location	Manufacturer	Model No. or Identi- fication	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Solenoid Valves (For Pneu- matic Operated Main Steam Blowdown Isola- tion Valves)	Valcor Engineer- ing Cor- poration (P.O. No. 13-PM- 221B)	Model No. V70900- 37-4	Temperature 370F peak See fig. 3.1-1		30 days	33 days	N/A	N/A	Type Test	Replace with qualified ASCO NP-1 Series
Contain- ment	Anchor Darling	System: MSS Tag No. JSGA-UY- 500P JSGB-UY- 500R	Pressure 60 psig See fig. 3.1-2							
			Relative Humidity 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta							
			Chemical Spray Yes See table 4.1-3							
			Submergence N/A							
			Env. Desig. I							
a. Where equipment is involved with more than one harsh environment, only the worst case environment is shown.										

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REVIEW TECHNIQUE

Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 1 of 35)

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status
Motor Operated Valve Actuator	Limi- torque	System: SIS	Temperature 104F	Temperature 250F	Remain operable for 30 days fol- lowing DBE after 40 years of normal operation	Remain operable for 33 days fol- lowing DBE after simulated 40 years of normal operation including 2000 cycles by type test and anal- ysis	None	Not Appli- cable	Type test and anal- ysis per Limi- torque Report B0058, CE Pro- gram 14273- PE- 5731	Qualified for 8 years with preventative maintenance note a
Auxiliary Building		Model/Tag No:	Pressure Atmo- spheric	Pressure 25 psig						
		SB-0-25 SI-671, SI-672	Radiation 1 x 10 ⁶ rads γ	Radiation 2 x 10 ⁷ rads γ						
		SB-3-150 SI-615, SI-628 SI-635, SI-645								
		SMB-000-5 SI-657, SI-658 SI-678, SI-679	Humidity 90% RH	Humidity 100% RH						
		SMB-00-10 SI-604, SI-609 SI-674, SI-676	Chemical Spray None	Chemical Spray Not Applicable						
		SMB-0-10 SI-698, SI-699	Submergence None	Submergence Not Applicable						
		SMB-0-25 SI-684, SI-685 SI-687, SI-688 SI-689, SI-693 SI-694, SI-695								
		SMB-1-40 SI-306, SI-307 SI-655, SI-656 SI-690, SI-691								
		SMB-1-60 SI-683, SI-686 SI-692, SI-696								

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REVIEW TECHNIQUE

Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 2 of 35)

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status
Motor Operated Valve Actuator	Limi- torque	System: CVCS	Temperature 104F	Temperature 250F	Remain operable for 30 days (except CH-530 and CH-531 which must remain operable for 36 hours) following DBE after 40 years of normal operation	Remain operable for 33 days fol- lowing DBE after simulated 40 years of normal operation including 2000 cycles by type test and analysis	None	Not Appli- cable	Type test and anal- ysis per Limi- torque Report B0058, CE Pro- gram 14273- PE- 5731	Qualified for 8 years with preventative maintenance note a
Auxiliary Building		Model/Tag No:	Pressure Atmo- spheric	Pressure 25 psig						
		SB-1-60 CH-530,CH-531	Radiation 1 x 10 ⁶ rads γ	Radiation 2 x 10 ⁷ rads γ						
		SMB-00-15 CH-524,CH-255								
			Humidity 90% RH	Humidity 100% RH						
			Chemical Spray None	Chemical Spray Not Applicable						
			Submergence None	Submergence Not Applicable						

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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 3 of 35)

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status
Motor Operated Valve Actuator	Limi- torque	System: SIS	Temperature 104F	Temperature 340F (max)	Remain operable for 30 days fol- lowing DBE after 40 years of normal operation	Remain operable for 33 days fol- lowing DBE after simulated 40 years of normal operation including 2000 cycles by type test and analysis	None	Not Appli- cable	Type test and anal- ysis per Limi- torque Report B0058, CE Pro- gram 14273- PE- 5731	Qualified for 8 years with preventative maintenance note a
Auxiliary Building		Model/Tag No:	Pressure Atmo- spheric	Pressure 105 psig (max)						
		SMB-0-25(DC) SI-321, SI-331	Radiation 1 x 10 ⁶ rads γ	Radiation 1 x 10 ⁷ rads γ						
			Humidity 90% RH	Humidity 100% RH						
			Chemical Spray None	Chemical Spray Not Applicable						
			Submergence None	Submergence Not Applicable						

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Table 4.1-2

**ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 4 of 35)**

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status
Motor Operated Valve Actuator	Limi- torque	System: SIS	Temperature 104F	Temperature 250F	Remain operable for 30 days fol- lowing DBE after 40 years of normal operation	Remain operable for 33 days fol- lowing DBE after simulated 40 years of normal operation including 2010 cycles by type test and analysis	None	Not Appli- cable	Type test and anal- ysis per Limi- torque Report B0058, CE Pro- gram 14273- PE- 5731	Qualified on interim basis for 1 year with preven- tative main- tenance. Complete type test is scheduled. Note a
Auxiliary Building		Model/Tag No:	Pressure Atmo- spheric	Pressure 25 psig						
		SMC-04-5 SI-664, SI-665 SI-668, SI-669	Radiation 1 x 10 ⁶ rads γ	Radiation 4.2 x 10 ⁷ rads γ						
		SMC-04-7-1/2 SI-616, SI-617 SI-626, SI-627 SI-636, SI-637 SI-646, SI-647 SI-666, SI-667	Humidity 90% RH	Humidity 100% RH						
			Chemical Spray None	Chemical Spray Not Applicable						
			Submergence None	Submergence Not Applicable						

PVNGS 1,2&3
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REVIEW TECHNIQUE

Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 5 of 35)

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status
Motor Operated Valve Actuator	Limi- torque	System: SIS	Temperature 370F peak	Testing in Progress	Remain operable for 30 days fol- lowing DBE after 40 years of normal operation	Testing in progress	None	Not Appli- cable	Type test and anal- ysis per Limi- torque Report B0058 and future amend- ments	Testing in progress. To be com- pleted June 1983.
Contain- ment Building		Model/Tag No:	Pressure 60 psig peak							
		SMB-00-10 SI-673, SI-675	Humidity Steam/Air Mixture							
		SMB-1-40 SI-653, SI-654								
		SMB-1-60 SI-614, SI-624 SI-634, SI-644								
		SMB-3-100 SI-651, SI-652								
					Chemical Spray 4400 ppm boron as H ₃ BO ₃ , 50 ppm hydrazine, pH 7.0-8.5					
		Submergence None								

PVNGS 1, 2&3
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REVIEW TECHNIQUE

Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 6 of 35)

Type of Equipment/Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demonstrated	Accuracy or Response Time Requirements	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Valve Limit Switch for Position Indication of Pneumatic Operated Valve (2 per valve)	Namco Controls	Model: EA180-11302	Temperature 370F peak	Temperature 415F peak	Provide position indication for 36 hours following DBE (CH-240 30 day position indication) after 40 years of normal operation	Position indication maintained for 33 days following DBE after simulated 40 years of normal operation including 50,025 cycles by type test and analysis	None	Not Applicable	Type test and analysis per CE Program 14273-PE-5732	Qualified for 11 years with preventative maintenance note b
		System: SIS	Pressure 60 psig peak	Pressure 70 psig peak						
		Valve Tag Nos: SI-322, SI-332 SI-611, SI-618 SI-621, SI-628 SI-631, SI-638 SI-641, SI-648 SI-682	Radiation 3.3×10^7 rads γ 1×10^8 rads β	Radiation 8.8×10^7 rads γ 1.1×10^8 rads β						
		System: CVCS	Humidity Steam/Air Mixture	Humidity Steam/Air Mixture						
		Valve Tag Nos: CH-506, CH-515 CH-516, CH-560 CH-240	Chemical Spray 4400 ppm boron as H_2BO_3 , 50 ppm hydrazine, pH 7.0-8.5	Chemical Spray 4400 ppm boron as H_2BO_3 , 110 ppm NH_3 , pH 7.0-9.0						
			Submergence if below plant elevation 90'6"	Submergence None						
Containment Building										

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PVNGS 1,2&3

4.1-1114

Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 7 of 35)

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status
Valve Limit Switch for Position Indica- tion of Pneuma- tic Operated Valve (2 per valve)	Namco Con- trols	Model: EA180-11302	Temperature 104F	Temperature 415F peak	Provide posi- tion indica- tion for 36 hours follow- ing DBE after 40 years of normal operation	Position indica- tion main- tained for 33 days fol- lowing DBE after simulated 40 years of normal operation including 50,025 cycles by type test and analysis	None	Not Appli- cable	Type test and anal- ysis per CE Pro- gram 14273- PE- 5732	Qualified for 26 years with preventative maintenance note b
		System: CVCS	Pressure Atmo- spheric	Pressure 70 psig peak						
		Valve Tag Nos: CH-505, CH-523 CH-561, CH-580	Radiation 1×10^6 rads γ	Radiation 8.8×10^7 rads γ 1.1×10^8 rads β						
			Humidity 90% RH	Humidity Steam/Air Mixture						
			Chemical Spray None	Chemical Spray 4400 ppm boron as H_3BO_3 , 110 ppm NH_3 , pH 7.0-9.0						
			Submergence None	Submergence None						
Auxiliary Building										

PVNGS 1,2&3
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REVIEW TECHNIQUE

Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 8 of 35)

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status
Electric Solenoid Valve	Valcor Engi- neer- ing	Valcor Model V526-5683-6	Temperature 370F	Temperature 385F peak	36 hours Post DBE and main- tenance of pressure boundary	Valve cycling and posi- tion indica- tion main- tained for 33 days fol- lowing DBE after simulated 40 years of normal operation including 50,000 cycles	None	Not Appli- cable	Type test per 14273- PE- 5733	Qualified to 10 years with maintenance note c
Contain- ment Building		CE Tag Nos:	Pressure 65 psig	Pressure 66 psig						
		SS-203, SS-204 SS-205	Radiation 3.3 x 10 ⁷ rads γ 1 x 10 ⁸ rads β	Radiation 3.5 x 10 ⁷ rads γ 1.1 x 10 ³ rads β						
		Sampling System	Humidity Steam/Air Mixture	Humidity Steam/Air Mixture						
			Chemical Spray 4400 ppm boron 50 ppm hydrazine pH Adjus- ted to 7.0-8.5 using Na ₃ PO ₄	Chemical Spray 4400 ppm boron as H ₃ BO ₃ , 50 ppm hydrazine pH 7.0-8.5						
			Submergence If below plant ele- vation 90'6"	Submergence None						

PVNGS 1,2&3
ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 9 of 35)

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status
Electric Solenoid Valve	Valcor Engi- neer- ing	Valcor Model VS26-5683-5	Temperature 370F peak	Temperature 385F peak	36 hours post DBE and main- tenance of pressure boundary	Valve cycling and posi- tion indica- tion main- tained for 33 days fol- lowing DBE after simulated 40 years of normal operation including 50,000 cycles	None	Not Appli- cable	Type test per 14273- PE- 5733	Qualified to 10 years with maintenance note c
Contain- ment Building		C-E Tag Nos:	Pressure 60 psig	Pressure 66 psig						
		SC-204, SC-211 SC-220, SC-222 SC-224, SC-226	Radiation 3.3 x 10 ⁷ rads γ 1.1 x 10 ⁸ rads β	Radiation 3.5 x 10 ⁷ rads γ 1.1 x 10 ⁸ rads β						
		Secondary Chemistry System	Humidity Steam/Air Mixture	Humidity Steam/Air Mixture						
			Chemical Spray 4400 ppm boron 50 ppm hydrazine pH Adjust- ed to 7.0-8.5 using Na ₃ PO ₄	Chemical Spray 4400 ppm boron as H ₃ BO ₃ , 50 ppm hydrazine pH 7.0-8.5						
			Submergence If below plant ele- vation 90'6"	Submergence None						

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REVIEW TECHNIQUE

Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 10 of 35)

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status
Solenoid Process System Valve	Target Rock Corp.	System: SIS	Temperature 370F peak	Testing in progress	Remain operable for 30 days following DBE (CH-203 and CH-205 36 hours) after 40 years of normal operation	Testing in progress	None	Not Appli- cable	Type test per CE Pro- gram 14273- PE- 5733	Testing in progress. To be comple- ted March 1983 Note d
Contain- ment Building		Model/Tag Nos: 77L-001 SI-605,SI-606 SI-607,SI-608 SI-613,SI-623 SI-633,SI-643	Pressure 60 psig peak							
		System: CVCS	Radiation 3.3 x 10 ⁷ rads γ 1 x 10 ⁸ rads β							
			Model/Tag Nos: 77L-003 CH-203,CH-205		Humidity Steam/Air Mixture					
					Chemical Spray 4400 ppm boron as H ₃ BO ₃ , 50 ppm hydrazine pH 7.0-8.5					
					Submergence None					

PVNGS 1, 2&3
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REVIEW TECHNIQUE

Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 11 of 35)

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status
Solenoid Process System Valve	Target Rock Corp.	System: SIS	Temperature 104F	Testing in progress	Remain operable for 30 days following DBE after 40 years of normal operation	Testing in progress	None	Not Appli- cable	Type test per CE Pro- gram 14273- PE- 5733	Testing in progress. To be comple- ted March 1983. Note d
Auxiliary Building		Model/Tag Nos: 77L-002 SI-659, SI-660	Pressure Atmo- spheric							
			Radiation 1 x 10 ⁶ rads γ							
			Humidity 90% RH							
			Chemical Spray None							
		Submergence None								

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PVNGS 1,2&3

REVIEW TECHNIQUE

Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 12 of 35)

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status
Air Solenoid Valve for Pilot Control of Pneu- matic Operated Valve Contain- ment Building	Automa- tic Switch Co.	Model: NP8320A187E	Temperature 370F peak	Temperature 450F peak	Operate for 36 hours follow- ing DBE after 40 years of normal oper- ation	Close and remain closed or operate for 33 days (792 hours) following DBE after simulated 40 years of normal operation including 47,460 cycles by type test and analysis	None	Not Appli- cable	Type test and anal- ysis per ASCO Re- ports AQS- 21678/ TR, Rev A; AGR- 67368, Rev 0; CE Pro- gram 14273- PE- 5734, Rev 0; CE letter V-PAK- 250	Qualified for 40 years with preventative maintenance note c
		System: SIS	Pressure 60 psig peak	Pressure 78 psig peak						
		Valve Tag Nos: SI-322,SI-332 SI-611,SI-618 SI-621,SI-628 SI-631,SI-638 SI-641,SI-648 SI-682	Radiation 3.3×10^7 rads γ 1×10^8 rads β	Radiation 1.82×10^8 rads γ 1.1×10^8 rads β						
			Humidity Steam/Air Mixture	Humidity Steam/Air Mixture						
			Chemical Spray 4400 ppm boron as H_2BO_3 , 50 ppm hydrazine pH 7.0-8.5	Chemical Spray 6626 ppm boron as H_2BO_3 , 196 ppm hydrazine, pH 7.0-8.5						
			Submergence If below plant ele- vation 90'6"	Submergence None						

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Table 4.1-2

**ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 13 of 35)**

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status
Air Solenoid Valve for Pilot Control of Pneuma- tic Operated Valve	Automa- tic Switch Co.	Model: NP8320A1B7E	Temperature 370F peak	Temperature 450F peak	Close and remain closed for 36 hours or be oper- able for 30 days (CH-240 only) follow- ing DBE after 40 years of normal operation	Close and remain closed or oper- ate for 33 days (792 hours) following DBE after simulated 40 years of normal operation including 47,460 cycles by type test and analysis	None	Not Appli- cable	Type test and anal- ysis per ASCO Re- ports AQS- 21678/ TR, Rev A; AGR- 67368, Rev 0; CE Pro- gram 14273- PE- 5734, Rev 0; CE letter V-PAK- 250	Qualified for 40 years with preventative maintenance note c
		System: CVCS	Pressure 60 psig peak	Pressure 78 psig peak						
		Valve Tag Nos: CH-506, CH-515 CH-516, CH-560 CH-240	Radiation 3.3×10^7 rads γ 1×10^8 rads β	Radiation 1.82×10^8 rads γ 1.1×10^8 rads β						
			Humidity Steam/Air Mixture	Humidity Steam/Air Mixture						
			Chemical Spray 4400 ppm boron as H_3BO_3 , 50 ppm hydrazine, pH 7.0-8.5	Chemical Spray 6626 ppm boron as H_3BO_3 , 196 ppm hydrazine pH 7.0-8.5						
Contain- ment Building			Submergence If below plant ele- vation 90'6"	Submergence None						

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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 14 of 35)

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status
Air Solenoid Valve for Pilot Control of Pneuma- tic Operated Valve Auxiliary Building	Automa- tic Switch Co.	Model: NP8320A187E	Temperature 104F	Temperature 450F peak	Close and remain closed for 36 hours following DBE after 40 years of normal operation	Close and remain closed or operate for 33 days (792 hours) following DBE after simulated 40 years of normal operation including 47,460 cycles by test and analysis	None	Not Appli- cable	Type test and anal- ysis per ASCO Re- ports AQS- 21678/ TR, Rev A; AGR- 67368, Rev 0; CE Pro- gram 14273- PE- 5734, Rev 0; CE letter V-PAK- 250	Qualified for 40 years with preventative maintenance note c
		System: CVCS	Pressure Atmo- spheric	Pressure 78 psig peak						
		Valve Tag Nos: CH-505, CH-523 CH-561	Radiation 1×10^6 rads γ	Radiation 1.82×10^8 rads γ 1.1×10^8 rads β						
			Humidity 90% RH	Humidity Steam/Air Mixture						
			Chemical Spray None	Chemical Spray 6626 ppm boron as H_2BO_3 , 196 ppm hydrazine, pH 7.0-8.5						
			Submergence None	Submergence None						

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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 15 of 35)

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status
Air Solenoid Valve for Pilot Control of Pneuma- tic Operated Valve Auxiliary Building	Automa- tic Switch Co.	Model: NP8321A1E	Temperature 104F	Temperature 450F peak	Close and remain closed for 36 hours following DBE after 40 years of normal operation	Close and remain closed or operate for 33 days (792 hours) following DBE after simulated 40 years of normal operation and including 40,000 cycles by type test and analysis	None	Not Appli- cable	Type test and anal- ysis per ASCO Re- ports AQS- 21678/ TR, Rev A; AGR- 67368, Rev 0; CE Pro- gram 14273- PE- 5734, Rev 0; CE letter V-PAK- 250	Qualified for 40 years with preventative maintenance note c
		System: CVCS	Pressure Atmo- spheric	Pressure 78 psig peak						
		Valve Tag No: CH-580	Radiation 1×10^6 rads γ	Radiation 1.82×10^8 rads γ 1.1×10^8 rads β						
			Humidity 90% RH	Humidity Steam/Air Mixture						
			Chemical Spray None	Chemical Spray 6626 ppm boron as H_3BO_3 , 196 ppm hydrazine, pH 7.0-8.5						
			Submergence None	Submergence None						

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Table 4.1-2

**ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 16 of 35)**

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status
Motor for High Pressure Safety Injec- tion Pump	Westing- house Large AC Motor Divi- sion	Model: 5810H WP2	Temperature 104F	Temperature 161F	Continuous operation for up to 30 days following DBE after 40 years of nor- mal operation	160,778 hours by test and analysis	None	Not Appli- cable	Westing- house Report WCAP- 8754, Rev 1 with Bib- liog- raphy by test and anal- ysis	Qualified for 40 years with preventative maintenance
Auxiliary Building		System: SIS	Pressure Atmo- spheric	Pressure Atmo- spheric						
		Motor S/N: 76F60561-1 76F60563-1 76F60564-1 77F14115-1 77F14116-1 77F14117-1	Radiation 1 x 10 ⁶ rads	Radiation 2 x 10 ⁸ rads						
			Humidity 90% RH	Humidity 100% RH						
		Bechtel Tag No: 1MS1AP02 1MS1BP02 2MS1AP02 2MS1BP02 3MS1AP02 3MS1BP02	Chemical Spray None	Chemical Spray Not Applicable						
		Submergence None	Submergence Not Applicable							
									Seismic by anal- ysis West- ing- house Report 76F- 60562	
									Environ- mental Quali- fica- tion Pro- gram 14273- PE- 5400 Rev 02	

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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 17 of 35)

Type of Equipment/ Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status
Motor for Low Pressure Safety Injec- tion Pump	Westing- house Large AC Motor Divi- sion	Model: 5010P39 WP2	Temperature 104F	Temperature 123F	Continuous operation for up to 30 days following DBE after 40 years of nor- mal operation	135,487 hours by test and analysis	None	Not Appli- cable	Westing- house Report WCAP- 8754, Rev 1 with Bib- liog- raphy by test and anal- ysis	Qualified for 40 years with preventative maintenance
Auxiliary Building		System: SIS	Pressure Atmo- spheric	Pressure Atmo- spheric						
		Motor S/N: 76F60574-1 76F60574-2 76F60576-1 76F60576-2 76F60578-1 76F60578-2	Radiation 1 x 10 ⁶ rads	Radiation 2 x 10 ⁸ rads						
			Humidity 90% RH	Humidity 100% RH						
			Bechtel Tag No: 1MS1AP01 1MS1BP01 2MS1AP01 2MS1BP01 3MS1AP01 3MS1BP01	Chemical Spray None					Chemical Spray Not Applicable	
		Submergence None		Submergence Not Applicable						
								Seismic per West- ing house Report 76F- 60575		
								Environ- mental Quali- fica- tion Pro- gram 14273- PE- 5401 Rev 02		

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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 18 of 35)

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status
Motor for Contain- ment Spray Pump	Westing- house Large AC Motor Divi- sion	Model: 5808P39 WP2	Temperature 104F	Temperature 159F	Continuous operation for up to 30 days following DBE after 40 years of nor- mal operation	147,559 hours by test and analysis	None	Not Appli- cable	Westing- house Report WCAP- 8754, Rev 1 with bib- liog- raphy by test and anal- ysis	Qualified for 40 years with preventative maintenance
Auxiliary Building		System: CSS	Pressure Atmo- spheric	Pressure Atmo- spheric						
		Motor S/N: 76F60580-1 76F60580-2 76F60582-1 76F60582-2 76F60583-1 76F60583-2	Radiation 1 x 10 ⁶ rads	Radiation 2 x 10 ⁸ rads						
			Humidity 90% RH	Humidity 100% RH						
			Bechtel Tag No: 1MS1AP03 1MS1BP03 2MS1AP03 2MS1BP03 3MS1AP03 3MS1BP03	Chemical Spray None						
		Submergence None		Submergence Not Applicable						

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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 19 of 35)

Type of Equipment/ Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status
Motor for Charging Pump	Westing- house Medium Motor and Gear- ing Divi- sion	Model: 404TS DP	Temperature 104F	Temperature 181F	Continuous operation for up to 30 days following DBE after 40 years of nor- mal operation	350,400 hours by test and analysis	None	Not Appli- cable	Westing- house Report MM- 9112 and appen- dices C and E of West- ing- house Report WCAP- 9112 by test and anal- ysis	Qualified for 40 years with preventative maintenance
Auxiliary Building		System: CVCS	Pressure Atmo- spheric	Pressure Atmo- spheric						
		Motor S/N: SO 76C62115 7703-01-001 7703-01-002 7703-01-003 7707-02-001 7707-02-002 7707-02-003 7708-03-001 7708-03-002 7708-03-003	Radiation 1 x 10 ⁶ rads	Radiation 2 x 10 ⁸ rads						
			Humidity 90% RH	Humidity 100% RH						
			Chemical Spray None	Chemical Spray Not Applicable						
		Bechtel Tag No: 1MCHAP01 1MCHBP01 1MCHEP01 2MCHAP01 2MCHBP01 2MCHEP01 3MCHAP01 3MCHBP01 3MCHEP01	Submergence None	Submergence Not Applicable						
								Environ- mental Quali- fica- tion Pro- gram 14273- PE- 5403 Rev 03		

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Table 4.1-2

**ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 20 of 35)**

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status
Motor for Spray Chemical Addition Pump	Reliance Elec- tric Co.	Model: 18FTC TEFC-XT	Temperature 104F	Temperature 471F	Continuous operation for up to 30 days following DBE after 40 years of nor- mal operation	350,000 hours by test and analysis	None	Not Appli- cable	Reliance Report NUC-9 with Sup- ple- ment by test and anal- ysis	Qualified for 40 years with preventative maintenance
Auxiliary Building		System: IRS	Pressure Atmo- spheric	Pressure Atmo- spheric						
		Motor S/N: YM209071A1 YM209071A3 YM209071A4 YM209071A5 YM209071A8 YM209071A12	Radiation 1 x 10 ⁶ rads	Radiation 2 x 10 ⁸ rads						
			Humidity 90% RH	Humidity 100% RH						
		Bechtel Tag No: 1MS1AP05 1MS1BP05 2MS1AP05 2MS1BP05 3MS1AP05 3MS1BP05	Chemical Spray None	Chemical Spray Not Applicable					Seismic per Action Report 13831	
Submergence None	Submergence Not Applicable		Environ- mental Quali- fica- tion Pro- gram 14273- PE- 5404 Rev 3							

PVNGS 1,2&3
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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 21 of 35)

Type of Equipment/Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demonstrated	Accuracy or Response Time Requirements	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status	
Level Transmitter	ITT Barton	Model: 764	Temperature 370F	(Later)	Accident mitigation not applicable	(Later)	Accident accuracy not applicable	(Later)	(Later)	Qualified life: (Later)	
C-E Summary Sheet No. 1		System: PAMS	Pressure 60 psig		Post accident monitoring 30 days				Post accident accuracy (later)	E.Q. Program Document 14273-1CE-3535	Status: Qual. Report note e
Containment Building		CE Tag No: LT-110X,Y	Relative Humidity Sat. Steam/Air Mixture								
			Radiation 3.3 x 10 ⁷ rads γ 1.0 x 10 ⁸ rads β								
			Chemical Spray 4400 ppm boron H ₃ BO ₃ 50 ppm hydrazine pH adjusted to 7.0-8.5 after 4 hrs using trisodium phosphate								
			Submergence None								

Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 22 of 35)

Type of Equipment/Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demonstrated	Accuracy or Response Time Requirements	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Diff. Pressure Transmitter	ITT Barton	Model: 764	Temperature 370F	(Later)	Accident mitigation 30 min.	(Later)	Accident accuracy $\pm 2.9\%$	(Later)	(Later)	Qualified life: (Later)
C-E Summary Sheet No. 2		System: PPS	Pressure 60 psig		Post accident monitoring not applicable		Post accident accuracy not applicable			Status: Qual. Report note e
Containment Building		CE Tag No: PDT-115A-D PDT-125A-D	Relative Humidity Sat. Steam/Air Mixture							
			Radiation 3.3×10^7 rads γ 1.0×10^8 rads β							
			Chemical Spray 4400 ppm boron H_2BO_3 50 ppm hydrazine pH adjusted to 7.0-8.5 after 4 hrs using trisodium phosphate							
			Submergence None							

PVNGS 1,2&3
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Table 4.1-2

**ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 23 of 35)**

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status			
Pressure Trans- mitter	ITT Barton	Model: 763	Temperature 370F	(Later)	Accident mitigation PT-101A-D 30 min. PT-102A-D 60 min.	(Later)	Accident accu- racy PT- 101A-D PT- 102A-D ±12.8%	(Later)	(Later)	Qualified life: (Later)			
C-E Summary Sheet No. 3		System(s): PPS LTOP PAMS CE Tag No: PT-101A-D PT-102A-D PT-103 PT-104	Pressure 60 psig		Post accident monitoring PT-102A-D 30 days PT-103, 104 36 hrs.		Post accident accu- racy PT- 102A-D (la- ter) PT- 103, 104 (la- ter)		E.Q. Pro- gram Docu- ment 14273- 1CE- 3535	Status: Qual. Report note e			
Contain- ment Building			Relative Humidity Sat. Steam/Air Mixture										
			Radiation 3.3 x 10 ⁷ rads γ 1.0 x 10 ⁸ rads β										
			Chemical Spray 4400 ppm boron H ₂ BO ₃ 50 ppm hydrazine pH adjus- ted to 7.0-8.5 after 4 hrs using trisodium phosphate										
			Submergence None										

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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 24 of 35)

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status
Pressure Trans- mitter	Rose- mount	Model: 1153AD8	Temperature 370F	(Later)	Accident Mitigation	(Later)	Accident Accu- racy		(Later)	Qualified Life:
C-E Summary Sheet No. 4		System: SDCS	Pressure 60 psig		Not Applicable		Not Appli- cable			(Later)
Contain- ment		CE Tag No: PT-105, 106	Relative Humidity Sat-Stm/ Air Mix- ture		Post Accident Monitoring		Post AC- cident Accu- racy			Status: Testing Complete Qual. Report Due 2/83
			Radiation 3.3 x 10 ⁷ rads γ 1.0 x 10 ⁸ rads β				(Later)			
			Chemical Spray 4400 ppm Boron H ₃ BO ₃ 50 ppm hydrazine pH ad- justed to 7.0-8.5 after 4 hrs using trisodium phosphate							
			Submergence None							

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ENVIRONMENTAL QUALIFICATION REPORT
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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 25 of 35)

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status
Pressure Trans- mitter	ITT Barton	Model: 763	Temperature 370F	(Later)	Accident Mitigation	(Later)	Accident Accu- racy	(Later)	(Later)	Qualified Life:
C-E Summary Sheet No. 5		Systems: PAMS	Pressure 60 psig		Not Applicable		Not Appli- cable		E.Q. Pro- gram Docu- ment 14273- ICE- 3535	(Later)
Contain- ment		CE Tag No: PT-311, 321 PT-331, 341	Relative Humidity Sat-Stm/ Air mix- ture		Post Accident Monitoring		Post Ac- cident Accu- racy			Status: Qual. Report Note e
			Radiation 3.3×10^7 rads γ 1.0×10^8 rads β		30 days		(Later)			
			Chemical Spray 4400 PPM Boron H_3BO_3 50 PPM hydrazine pH ad- justed to 7.0-8.5 after 4 hrs using trisodium phosphate							
			Submergence None							

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PVNGS 1,2&3
ENVIRONMENTAL QUALIFICATION REPORT
PER REQUIREMENTS OF NUREG-0588

REVIEW TECHNIQUE

Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 26 of 35)

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status
Level Trans- mitter	ITT Barton	Model: 763	Temperature 370F	(Later)	Accident Mitigation	(Later)	Accident Accu- racy	(Later)	(Later)	Qualified Life:
C-E Summary Sheet No. 6		Systems: PAMS	Pressure 60 psig		Not Applicable		Not Appli- cable		E.Q. Pro- gram Docu- ment 14273- ICE- 3535	(Later)
Contain- ment		CE Tag No: LT-311, 321 LT-331, 341	Relative Humidity Sat-Stm/ Air mix- ture		Post Accident Monitoring		Post Ac- cident Accu- racy			Status: Qual. Report Note e
			Radiation 3.3×10^7 rads γ 1.0×10^8 rads β		30 days		(Later)			
			Chemical Spray 4400 PPM Boron H_2BO_3 50 PPM hydrazine pH ad- justed to 7.0-8.5 after 4 hrs using trisodium phosphate							
			Submergence None							

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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 27 of 35)

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status	
Level Trans- mitter	ITT Barton	Model: 763	Temperature 370F	(Later)	Accident Mitigation LT-1113 A-D LT-1123 A-D LT-1114 A-D LT-1124 A-D 30 min	(Later)	Accident Accu- racy LT-1113 A-D LT-1123 A-D LT-1114 A-D LT-1124 A-D ±12.8%	(Later)	(Later)	Qualified Life:	
C-E Summary Sheet No.7		Systems: PPS PAMS	Pressure 60 psig							(Later)	Post Accident Monitoring LT-1113 AB LT-1123 AB 30 days
Contain- ment		CE Tag No: LT-1113 A-D LT-1123 A-D LT-1114 A-D LT-1124 A-D	Relative Humidity Sat-Stm/ Air mix- ture		Status: Note e						
			Radiation 3.3-10 ⁷ rads γ 1.0-10 ⁸ rads β								
			Chemical Spray 4400 PPM Boron H ₃ BO ₃ 50 PPM Hydrazine pH ad- justed to 7.0-8.5 after 4 hrs using Trisodium Phosphate								
		Submergence None									

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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 28 of 35)

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status	
Level Trans- mitter	ITT Barton	Model: 763	Temperature 370F	(Later)	Accident Mitigation PT-1013 A-D PT-1023 A-D 30 min	(Later)	Accident Accu- racy PT-1013 A-D PT-1023 A-D ±12.8%	(Later)	(Later)	Qualified Life:	
C-E Summary Sheet No. 8		Systems: PAMS, PPS	Pressure 60 psig						E.Q. Pro- gram Docu- ment 14273- ICE- 3535	(Later)	
Contain- ment		CE Tag No: PT-1013 A-D PT-1023 A-D	Relative Humidity Sat-Stm/ Air mix- ture		Post Accident Monitoring PT-1013 A-B PT-1023 A-B 30 days		Post Ac- cident Accu- racy PT-1013 A-B PT-1023 A-B (Later)			Status: Qual. Report Note e	
			Radiation 3.3-10 ⁷ rads γ 1.0-10 ⁸ rads β								
			Chemical Spray 4400 PPM Boron H ₃ BO ₃ 50 PPM Hydrazine pH ad- justed to 7.0-8.5 after 4 hrs using Trisodium Phosphate								
			Submergence None								

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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 29 of 35)

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status
Excore Safety Channel Detector Assembly	Westing- house	Model: WL-24036	Temperature 370F	0-2 min Temperature 385F		0-10 min by test 2 min to 1 hr and 2 min by analysis	Not Appli- cable Note h	Note h	Quali- fied by test West- ing- house Test Report No. NC-TR- 21-15 Program docu- ment No. 14273- ICE- 3512	Qualified Life: 10 years Status: Qualified to NUREG 0588
Contain- ment Building		System: RPS	Pressure 60 psig	Pressure 65 psig						
C-E Summary Sheet No. 9		CE Tag No: RW-001-A RW-001-B RW-001-C RW-001-D	Relative Humidity Steam/Air Mixture	Relative Humidity Saturated Steam						
				2-10 min Temperature 400F Pressure 74 psig Relative Humidity Saturated Steam						
			Radiation 2.5×10^6 rads note f	Radiation Detector Not Appli- cable note g Transi- tion Joint 4.8×10^6 rads						
			Chemical Spray None	Chemical Spray Not Applicable						
			Submergence None	Submergence Not Applicable						

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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 30 of 35)

Type of Equipment/Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demonstrated	Accuracy or Response Time Requirements	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Excore Safety Channel Preamp-lifier/Filter Assembly	Westing-house	Model: WL-24037	Preamplifier	Preamplifier 0-2 min	Preamplifier Not Applicable note i Filter 2 min	0-10 min by test 2 min to 1 hr and 2 min by analysis	Preamp-lifier Not Applicable Filter Insulation Resistance remain greater than 1×10^8 ohms	Preamp-lifier None Filter Insulation Resistance exceeded 2.0×10^{10} ohms	Quali-fied by test West-ing house Test Report No. NC-TR-81-15 Program Docu-ment: 14273-ICE 3511	Qualified Life: 10 Years
Containment Building		System: RPS	Temperature 120F	Temperature 390F						Status: Qualified to NUREG 0588
C-E Summary Sheet No. 10		CE Tag No: RT-001-A RT-001-B RT-001-C RT-001-D	Pressure 0 psig	Pressure 76 psig						
			Relative Humidity 90%	Relative Humidity Saturated Steam						
			Filter	Filter 0-2 min						
			Temperature 370F	Temperature 376F						
			Pressure 60 psig	Pressure 62 psig						
			Relative Humidity Steam/Air Mixture	Relative Humidity Saturated Steam						
			Radiation 3×10^4 rads	Radiation 6×10^4 rads (γ) 7×10^3 rads (neutron)						
			Chemical Spray None	Chemical Spray Not Applicable						
			Submergence None	Submergence Not Applicable						

PVNGS 1,2&3
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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 31 of 35)

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status		
Trans- mitter Rack	C-E	None	Temperature 370F	(Later)	Accident Mitigation (Later)	(Later)	Accident Miti- gation (Later)	(Later)	Test Report No. (Later)	Qualified Life: (Later)		
Contain- ment Build- ing			Pressure 60 psig		Post Accident Monitoring (Later)		Post Acci- dent Moni- toring (Later)		Program Docu- ment No. 14273- ICE- 3504	Status: Note j		
Summary Sheet No. 11			Relative Humidity Steam/Air Mixture									
			Radiation 3.3 x 10 ⁷ rads γ 1 x 10 ⁸ rads α									
			Chemical Spray 4400 PPM Boron, 50 PPM Hydrazine pH ad- justed to 7.0-8.5 after 4 hrs using Trisodium Phosphate									
			Submergence None									

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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 32 of 35)

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status	
Pressure Trans- mitter and Flow Trans- mitter	Rose- mount	Model: 1153 B	Temperature 50-104F	Temperature 303F	Accident Mitigation	37 days thermal aging + 80 hrs Accident Environ- ment	Accident Accu- racy	Post Acci- dent <1%	Rose- mount Re- ports 108025 Rev. A 108026 E.Q. Pro- gram , Docu- ment 14273- ICE- 3538	Qualified Life:	
Auxiliary Building		System: CVCS	Pressure 0 psig	Pressure 55 psig	None		Post Accident Monitoring 30 days			None	Status: Qualified to NUREG 0588
		CE Tag No: PT-212 FT-212	Relative Humidity 20-90%	Relative Humidity Sat-Stm/ Air Mix- ture						Post Acci- dent Accu- racy	
			Radiation 1-10 ⁶ rads	Radiation 2.44-10 ⁷ rads						(Later)	
			Chemical Spray None	Chemical Spray Not Applicable							
			Submergence None	Submergence Not Applicable							
C-E Summary Sheet No. 12											

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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 33 of 35)

Type of Equipment/Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demonstrated	Accuracy or Response Time Requirements	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Flow Transmitter and Level Transmitter	Rose-mount	Model: 1153 B	Temperature 50-104F	Temperature 303F	Accident Mitigation Not Applicable	37 days thermal aging + 80 hrs Accident Environment	Accident Accuracy None	Post Accident <1%	Rose-mount Reports 108025 Rev. A 108026	Qualified Life: 10 Years
Auxiliary Building		System: PAMS	Pressure 0 psig	Pressure 55 psig	Post Accident Monitoring 30 days		Post Accident Accuracy 2.5%			E.Q. Program Document 14273-ICE-3538
C-E Summary Sheet No. 13		CE Tag No: FT-306, 307 FT-308, 309 FT-311, 321 FT-331, 341 FT-338, 348 FT-390, 391 LT-344, 345 LT-348, 349	Relative Humidity 20-90%	Relative Humidity Sat-Stm/Air Mixture						
			Radiation 1-10 ⁶ rads	Radiation 2.44-10 ⁷ rads						
			Chemical Spray None	Chemical Spray Not Applicable						
			Submergence None	Submergence Not Applicable						

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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 34 of 35)

Type of Equipment/Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demonstrated	Accuracy or Response Time Requirements	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status	
RTD (Temp. Detectors)	RDF Corp.	Model: 21245	Temperature 50-104F	(Later)	Accident Mitigation None	(Later)	Accident Accuracy None	(Later)	(Later)	Qualified Life: (Later)	
Auxiliary Building		System: PAMS SDCS	Pressure 0 psig		Post Accident Monitoring 30 days		Post Accident Accuracy		E.Q. Program Document 14273-ICE-3538	note k	
C-E Summary Sheet No. 14		CE Tag No: TE-303X, Y TE-351X, Y TE-352X, Y	Relative Humidity 20-90%				(Later)				
			Radiation 1.10 ⁶ rads								
			Chemical Spray None								
			Submergence None								

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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 35 of 35)

NOTES

- Note a) May require replacement of electrical auxiliaries pending verification of parts supplied.
- Note b) Replacing NAMCO Model EA-170 with NAMCO Model EA-180. See Appendix (X) for listing of Tag Nos. of affected limit switches.
- Note c) Refer to Appendix (X) for equipment retrofits required as a result of lessons learned during the Qualification Process.
- Note d) Valves may require refurbishment/modification as determined on basis of Qualification Testing.
- Note e) Barton Test Report under review. Awaiting resolution of potential 10 CFR Part 21 issued by Barton on these devices.
- Note f) The operability time is 2 minutes. The radiation levels "seen" during steam line or feed line break events in this time frame do not significantly increase above the normal total integrated dose (TID) for the 10 year Qualified Life of this equipment. This 10 year TID is 2.5×10^6 Rad.
- Note g) Based on previous operating experience, the fission Camber assembly does not require thermal aging nor irradiation for qualification. Inorganic materials have been shown to not be significantly affected by irradiation flux (see Westinghouse Test Report No. NC-TR-81-15).
- Note h) A neutron detector is an uncalibrated instrument. Sensitivity is based on things such as: distance from Core, neutron attenuation due to intervening materials, etc.
- The accuracy of the ex-core flux measurement system is established by in-plant calibration by comparison to primary heat balance calculations. The response time of the Ex-core Neutron Detector is basically the detector collection time which is in the order of 2.0×10^{-7} seconds.
- Note i) The Ex-core Safety Channel Preamplifier is required to provide only low power trips, and has no required function during LOCA or MSLB.
- Note j) Qualification program for termination of instruments on transmitter racks is in progress.
- Note k) Qualification of these devices to be demonstrated based upon type testing of incontainment service RTD's (similar models). Test report presently being prepared.

Table 4.1-3

ENVIRONMENTAL QUALIFICATION PARAMETERS (Sheet 1 of 8)
CONTAINMENT BUILDING - ENVIRONMENTAL DESIGNATOR I (1 of 2)

Condition Parameter	Normal/Abnormal (N)	Design Basis Accident (A) (Includes 40 Year Integrated)		
		LOCA	MSLB	TIME DURATION
Temperature (F)	50 - 120	350 350 302 302-270 270-200	370 350 302 302-270 270-200	4 Min 8 Min 8 Hr 42 Hr 2 Wk
Pressure (psig)	ATM. (a)	60 55 25 10		12 Min 8 Hr 42 Hr 2 Wk
Relative Humidity (%)	20 - 90%	Steam/Air Mixture		
Radiation (Rads) (40 Year Integrated Dose)	1×10^7	3.3×10^7 Gamma 2×10^8 Beta (non-sprayed enclosures) 1×10^8 Beta (all other areas)		
Chemicals	None	<ul style="list-style-type: none"> • 4400 ppm Boron • 50 ppm Hydrazine • pH adjusted to 7.0-8.5 after 4 hours using Trisodium phosphate 		

a. Structural Integrity Test Pressure = 69 psig.

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Table 4.1-3

ENVIRONMENTAL QUALIFICATION PARAMETERS (Sheet 2 of 8)
CONTAINMENT BUILDING - ENVIRONMENTAL DESIGNATOR I (2 of 2)

Condition Parameter	Normal/Abnormal	Design Basis Accident
		LOCA/MSLB
Submergence	None	Below Plant El. 91'
Dust	1.52 $\mu\text{G}/\text{M}^3$	650 $\mu\text{G}/\text{M}^3$
Seismic	2 OBE's (Refer to Seismic Response Spectra)	1 SSE (Refer to Seismic Response Spectra)
Dynamic	Refer to Equipment Specifications for requirements	Refer to Equipment Specifications for requirements
Aging.	Equipment must be qualified for 40 year life for environmental parameters	Equipment must be qualified for 40 year life plus DBA for environmental parameters

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Table 4.1-3

ENVIRONMENTAL QUALIFICATION PARAMETERS (Sheet 3 of 8)
 MAIN STEAM SUPPORT STRUCTURE - ENVIRONMENTAL DESIGNATOR II (1 of 2)

Condition Parameter	Normal/Abnormal (N)	Design Basis Accident (A) (Includes 40 Year Integrated)	
		LOCA/MSLB	Time Duration
Temperature (F)	28 - 120	300 (above El. 100')	15 minutes
		28-120 (below El. 100')	not appli- cable(b)
Pressure (psig)	ATM	21 (above El. 100')	15 minutes
		ATM (below El. 100')	not appli- cable(b)
Relative Humidity (%)	20 - 90%	Steam/Air Mixture (above El. 100') 20-90% (below El. 100')	
Radiation (Rads) (40 Year Integrated Dose)	$<10^3$	10^6 (above El. 100') 10^5 (below El. 100')	
Chemicals	None	None	

- b. The subcompartments below elevation 100' are unaffected by the MSSS design basis pipe break.

Table 4.1-3

ENVIRONMENTAL QUALIFICATION PARAMETERS (Sheet 4 of 8)
 MAIN STEAM SUPPORT STRUCTURE - ENVIRONMENTAL DESIGNATOR II (2 of 2)

Condition Parameter	Normal/Abnormal	Design Basis Accident
		LOCA/MSLB
Submergence	None	None
Dust	1.52 $\mu\text{G}/\text{M}^3$ (Below El. 100') 61.3 $\mu\text{G}/\text{M}^3$ (Above El. 100')	650 $\mu\text{G}/\text{M}^3$ (Below El. 100') 131 mG/M^3 (Above El. 100')
Seismic	2 OBE's (Refer to Seismic Response Spectra)	1 SSE (Refer to Seismic Response Spectra)
Dynamic	Refer to Equipment Specifications for requirements	Refer to Equipment Specifications for requirements
Aging	Equipment must be qualified for 40 year life for environmental parameters	Equipment must be qualified for 40 year life plus DBA for environmental parameters

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Table 4.1-3

ENVIRONMENTAL QUALIFICATION PARAMETERS (Sheet 5 of 8)
 AUXILIARY BUILDING - ENVIRONMENTAL DESIGNATOR III (1 of 2)

Condition Parameter	Normal/Abnormal (N)	Design Basis Accident (A) (Includes 40 Year Integrated)	
		LOCA/MSLB	Aux Steam Break
Temperature (F)	50 - 104	50 - 104	50 - 318F ^(c)
Pressure (psig)	ATM	ATM	1.5 ^(d)
Relative Humidity (%)	20 - 90%	20 - 90%	20 - 100%
Radiation (Rads) (40 Year Integrated Dose)	3.5 x 10 ⁴ (accessible areas) 1.25 x 10 ⁷ (Volume Control Tank) 2.7 x 10 ⁹ (Purification Ion Exch.)	1 x 10 ⁶ (accessible areas) 1.25 x 10 ⁷ (Volume Control Tank) 2.7 x 10 ⁹ (Purification Ion Exch.)	
Chemicals	None	None	

c. Applicable to Class 1E electrical cable only (Class 1E cable satisfies qualification envelope for containment)

d. Pressure is a transient effect (i.e., several seconds duration)

Table 4.1-3

ENVIRONMENTAL QUALIFICATION PARAMETERS (Sheet 6 of 8)
 AUXILIARY BUILDING - ENVIRONMENTAL DESIGNATOR III (2 of 2)

Condition Parameter	Normal/Abnormal	Design Basis Accident
		LOCA/MSLB
Submergence	None	None
Dust	1.52 $\mu\text{G}/\text{M}^3$	650 $\mu\text{G}/\text{M}^3$
Seismic	2 OBE's (Refer to Seismic Response Spectra)	1 SSE (Refer to Seismic Response Spectra)
Dynamic	Refer to Equipment Specifications for requirements	Refer to Equipment Specifications for requirements
Aging	Equipment must be qualified for 40 year life for environmental parameters	Equipment must be qualified for 40 year life plus DBA for environmental parameters

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REVIEW TECHNIQUE

Table 4.1-3

ENVIRONMENTAL QUALIFICATION PARAMETERS (Sheet 7 of 8)
 FUEL BUILDING - ENVIRONMENTAL DESIGNATOR VI (1 of 2)

Condition Parameter	Normal/Abnormal (N)	Design Basis Accident (A) (Includes 40 Year Integrated)
		LOCA/MSLB
Temperature (F)	50 - 104	50 - 104
Pressure (psig)	ATM	ATM
Relative Humidity (%)	20 - 90%	20 - 90%
Radiation (Rads) (40 Year Integrated Dose)	$<10^3$	10^5
Chemicals	None	None

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REVIEW TECHNIQUE

Table 4.1-3

ENVIRONMENTAL QUALIFICATION PARAMETERS (Sheet 8 of 8)
 FUEL BUILDING - ENVIRONMENTAL DESIGNATOR VI (2 of 2)

Condition Parameter	Normal/Abnormal	Design Basis Accident
		LOCA/MSLB
Submergence	None	None
Dust	1.52 $\mu\text{G}/\text{M}^3$	650 $\mu\text{G}/\text{M}^3$
Seismic	2 OBE's (Refer to Seismic Response Spectra)	1 SSE (Refer to Seismic Response Spectra)
Dynamic	Refer to Equipment Specifications for requirements	Refer to Equipment Specifications for requirements
Aging	Equipment must be qualified for 40 year life for environmental parameters	Equipment must be qualified for 40 year life plus DBA for environmental parameters

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4.1.6 PERMANENT FILES

The Qualification Report Permanent Files are presently organized into an auditable form to insure that all information may be readily retrieved. The first and subsequent individual plan and report submittals (except the final report) for each specification are arranged in folders in a manner which indicates sequence in which were received. Each folder will identify the specification, the Bechtel log number, the supplier report number and the transmittal letter number. The contents of the folders will be:

- A copy of the transmittal letter
- The qualification report
- FAP-1 review request form
- APS review check sheet (FAP-15) (if applicable)
- A copy of the letter transmitting comments to Bechtel (if applicable).

The following information will also be available, for audit:

- Environmental Requirements as identified in the FSAR
- Applicable Required Response Curves
- SQRT Master Lists
- Harsh Environmental Qualification Summary Report
- PVNGS Checklists

Once a qualification report is judged to be satisfactory, a final qualification package is developed and identified separately from the previous report submittals. In addition to the qualification folder contents as listed in the first paragraph

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the following information will be placed in the final qualification package as applicable or available for audit.

- Title and Table of Contents Form (FAP-14) containing
 - Supplier Report Number, Revision and Date
 - Title
 - Appropriate review sign off
- Equipment Qualification Document Certifications
- PVNGS Environmental and Seismic Checklists
- Annotated APS Checklist (FAP-15)
- Qualification Maintenance Spare Parts Form
- Other miscellaneous applicable documentation

In addition the NSSS Environmental Qualification (EQ) Files are also organized in an auditable form as EQ Program Audit Folders. The EQ Program Audit Folders contain EQ Program Documents and Generic Files. The combination of the EQ Program Documents and Generic Files present an overall view of the equipment specific qualification effort.

The EQ Program Documents provide the test plans, test procedures, test reports, equipment specifications, environmental requirements, and analyses to support qualification. The Generic Files contain documents required to verify information presented on the Summary Sheets and in the EQ Program Documents.

For Instrumentation and Control Engineering supplied EQ Program Audit Folders, the Generic Files are provided as a supplementary section to the EQ Program Documents.

For Plant Engineering supplied EQ Program Audit Folders, the Generic Files are provided as separate Audit Folders with specific references made to the Generic Files in the appendices of the EQ Program Documents.



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APPENDIX A

If duplicate original parts cannot be purchased, alternate components will be analyzed for form, fit, and function and supporting qualification documentation will be obtained to insure that they are qualified for their installed location and service conditions.

Maintenance procedures will require that all documentation relating to periodic and preventative maintenance, spare, and replacement part procurement including certification of compliance and component replacement will be placed within the Qualification Central Files.

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APPENDIX B

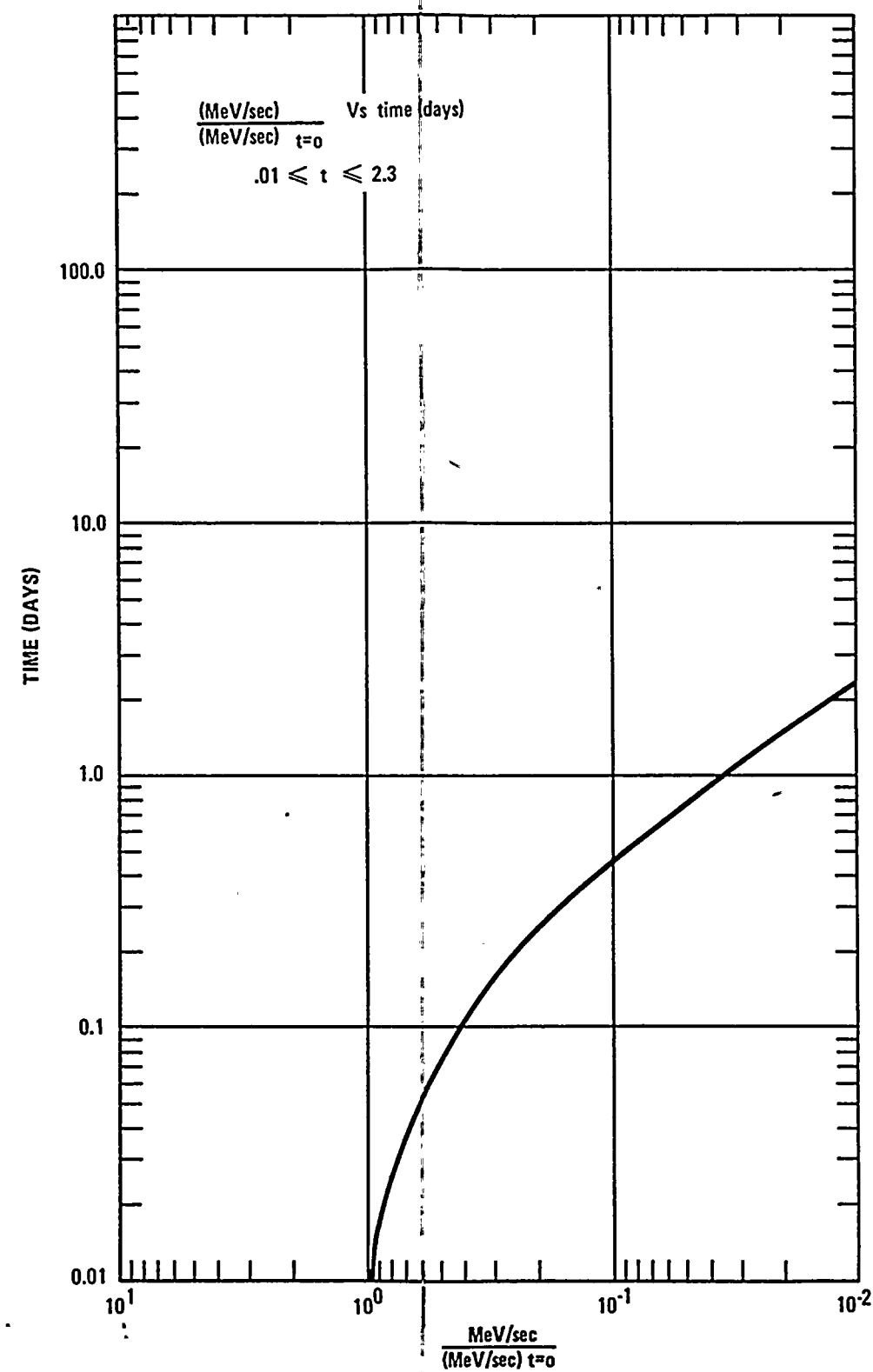
PVNGS EQUIPMENT ENVIRONMENTAL AND
SEISMIC QUALIFICATION CHECK LISTS (BOP)



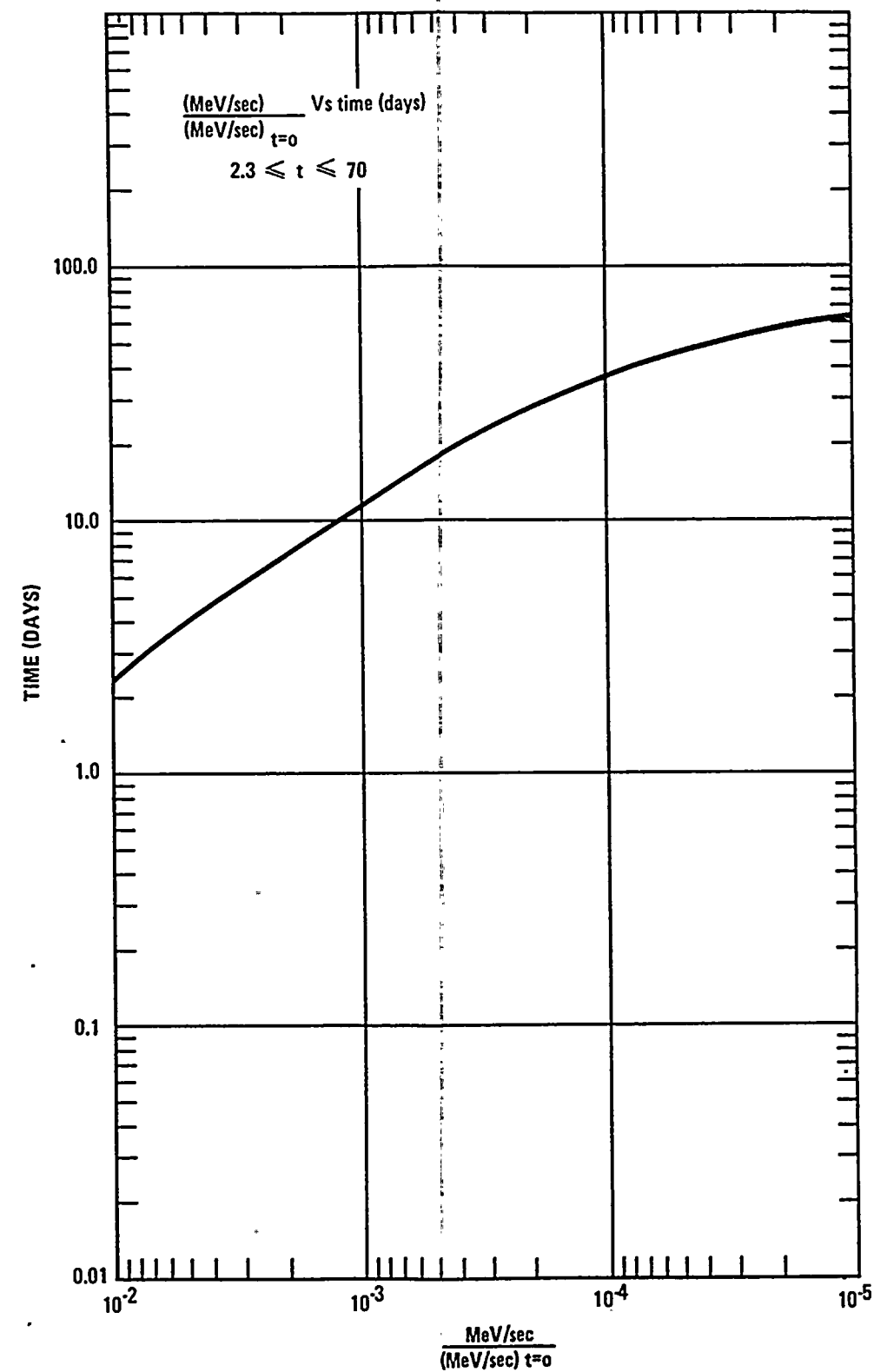
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Environmental Qualification

DECAY CURVE - SOURCE A
(Sheet 2 of 2)

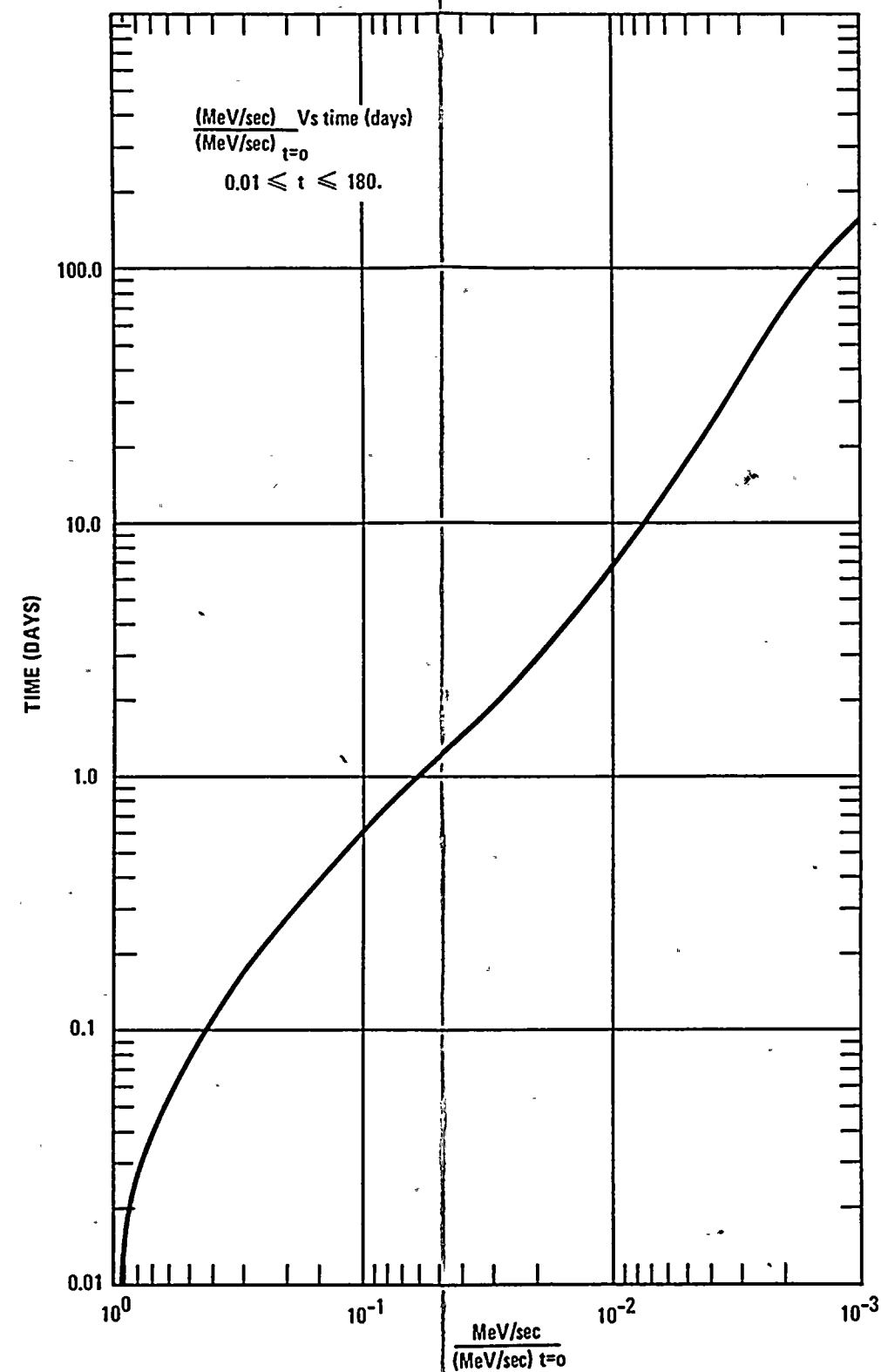
Figure 3.3-2

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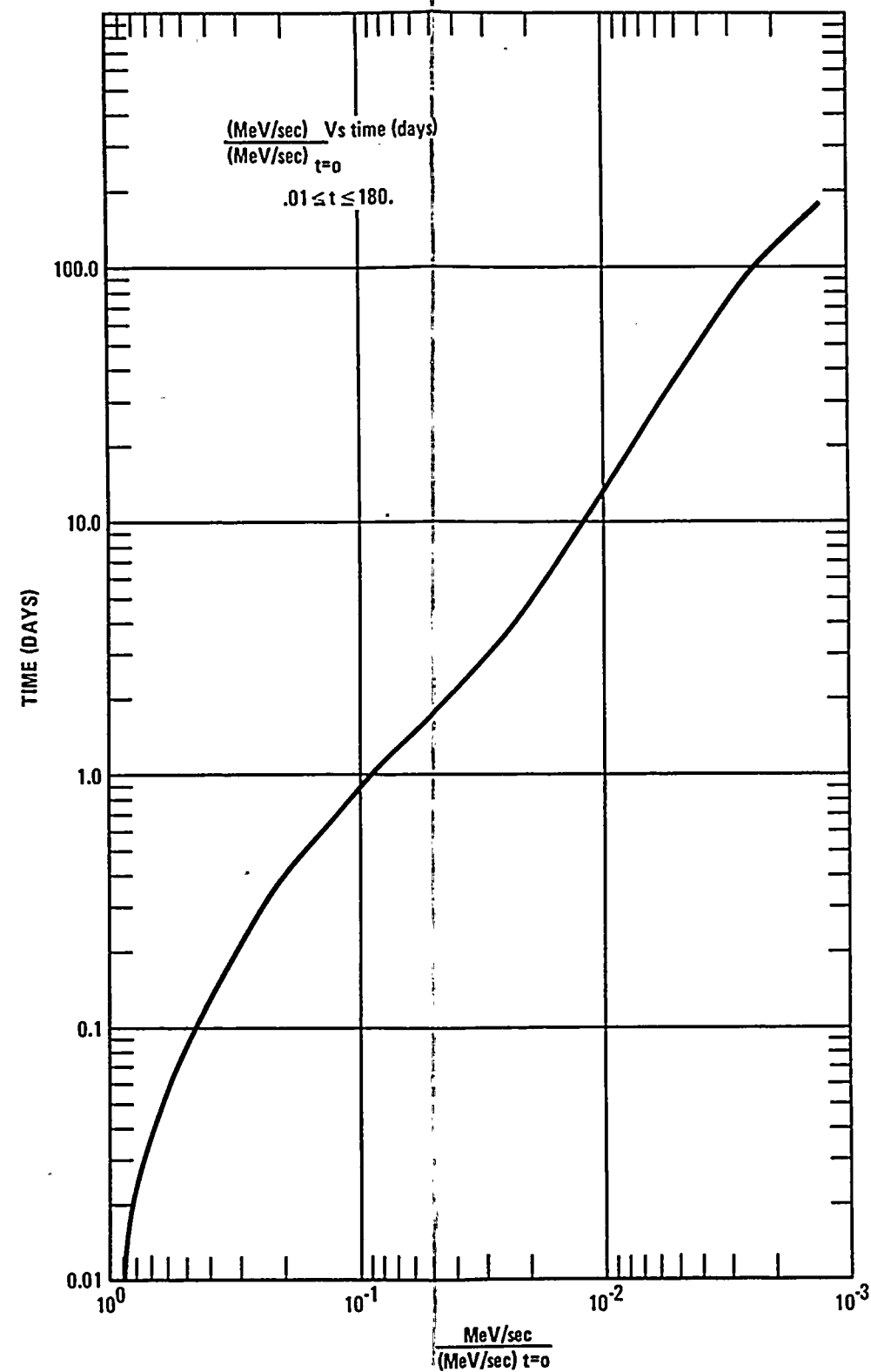
DECAY CURVE - SOURCE B
Figure 3.3-3


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DECAY CURVE - SOURCE C
Figure 3.3-4

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3.4 VOLTAGE AND FREQUENCY FLUCTUATIONS

3.4.1 VOLTAGE

Sustained voltage variations at rated frequency specified for Class IE equipment operation are as follows:

4.16 kV Power	4160 volts ac +5%, -10%
Standby Generation:	4160 volts ac \pm 5%
480-V Power, Switchgear:	480 volts ac +9%, -6%
480-V Power, MCC:	480 volts ac, +9%, -6%
125-V Power:	125 volts dc (range 105 to 140V dc)
Instrument ac Power:	120 volt ac vital bus system \pm 2%

Voltage qualification of motors is not required because electrical motors are designed in accordance with NEMA Standard MG-1, which allows sustained fluctuations of \pm 10% in supply voltage. Motors procured for this station can also function during voltage dips to 75% of normal for 15 seconds.

Control devices are specified to withstand voltage deviations in accordance with NEMA Standard ICS. All control components will operate satisfactorily within the applicable voltage ranges except for dc relays. During 125V dc battery equalizing, the voltage is 140V dc which exceeds the +10% (137.5V dc) upper limit allowed by ICS. Due to the small (2.5V dc) deviation and the fact that equalizing is done infrequently, operation or life of the control devices will not be significantly affected.

For equipment powered by the vital buses, voltage variations are not a common mode concern. Each of the four protective channels is electrically isolated (IEEE Standard 279-1971) from the others and is separately powered by a similarly isolated vital bus, with each bus having its own inverter, battery and battery charger. The qualification of these power sources establishes that they have no common mode failure

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VOLTAGE AND FREQUENCY FLUCTUATIONS

mechanisms and they are designed specifically to provide stable, regulated power. In addition, the equipment powered from the vital buses are designed for voltage variations of $\pm 10\%$, whereas the vital buses are designed to regulate voltage to within $\pm 2\%$. Therefore, voltage variations will not affect the ability of these systems to perform their required safety functions.

3.4.2 FREQUENCY

Sustained frequency variations at rated voltage specified for Class IE equipment operation are as follows:

4.16 kV Power:	60 ± 3 Hz
Standby Generation:	60 ± 2 Hz
480V Power, Switchgear:	60 ± 3 Hz
480V Power, MCC:	60 ± 3 Hz
Instrument ac Power:	60 ± 0.5 Hz

Frequency fluctuations which take place on the auxiliary power system are considered minor and will not affect equipment qualification. Transmission system stability studies outlined in FSAR Section 8.2.2 indicate that a trip of the most critical fully-loaded generating unit would not result in underfrequency load shedding.

The diesel generator frequency is limited to 60 ± 2 Hz steady state and 57 Hz during transients.

The frequency deviations described above will have only extremely limited consequences on the performance of induction motors and control components which have been specified to operate at 60 Hz $\pm 5\%$ with rated voltage.

For equipment powered by the vital buses, frequency variations are not a common mode concern for the same reasons as previously described in the discussion of voltage variations.

The equipment is designed for frequency variations of ± 3 Hz, frequency qualification of motors is not required because electrical motors are designed in accordance with NEMA Standard MG-1, which allows sustained fluctuations of $\pm 5\%$ in supply frequency,

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VOLTAGE AND FREQUENCY FLUCTUATIONS

except standby generation which is designed for frequency variations of ± 2 Hz, and the vital buses are designed to regulate frequency to within ± 0.5 Hz. Therefore, frequency variations will not affect the ability of these systems to perform their required functions.

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3.5 DUST

Site specific dust loading quantity, size distribution and composition were established by test and analysis. This information was used to size outside air filters for all buildings. Using the filter efficiencies, dust loadings were established for each building.

The diesel generator unit combustion air intake filter was sized by the manufacturer for the dust loadings established and information was provided by the manufacturer for units in similar applications.

Most manufacturers have recommended maintenance intervals. When intervals not available, an engineering analysis was performed to recommend maintenance intervals for all susceptible equipment. Periodic maintenance will be performed in accordance with these recommendations.



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3.6 AGING

An aging analysis, accelerated aging and design basis event (DBE) testing was performed for items of equipment covered by this report to evaluate the stresses which degrade performance. The objective of the program was to determine a time period for which acceptable equipment performance is anticipated.

The results of the program, including qualified life of the equipment and, where applicable, replacement intervals for life limiting components are listed on tables 4.1-1 and 4.1-2.

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3.7 FLOODING AND SUBMERGENCE

Internal flooding is considered to be part of the design basis event for the lower levels of the containment building. Flooding outside containment is not part of the design basis for qualification for the reasons described in FSAR Section 9.3.3.2. The water surface elevation in containment after a LOCA will be a maximum of 90'-6" (or 10-1/2' above the floor level at 80'-0"). All safety related equipment that may become submerged as a result of this LOCA has been evaluated to determine the respective accident mitigation or post accident functionability requirements. As-installed equipment locations were verified by in-plant inspections.

The containment water level instrumentation (Tag nos. J-RDE-LE-410, 411) is the only equipment important to safety that would be submerged that requires continued operability post flooding. These items are being qualified for submergence. Refer to table 4.1-1 (sheet 39). The signal cables from these level transmitters have been qualified for an environment of 100% relative humidity and a peak pressure of 66 psig. The submergence qualification is demonstrated by the spray environment with LOCA pressure. In addition, as part of the test of these cables there is an immersion test. Therefore, these signal cables are qualified for submergence. (See table 4.1-1 sheet 15 for cable qualification data.) All safety-related cables inside containment are qualified for similar environment parameters as those cables to the level transmitters (See table 4.1-1 sheets 4, 10, 11, 12, 13, 14, 17, and 18). All other necessary equipment completes its function prior to submergence and does not have a failure mode when submerged that would compromise safety (e.g., an air operated containment isolation valve).

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3.8 CHEMICAL SPRAY

The chemical spray is applicable only to the containment building post-LOCA/MSLB environment. Applicable parameters are summarized in table 4.1-3 and were established on the basis of normal containment spray system operation.

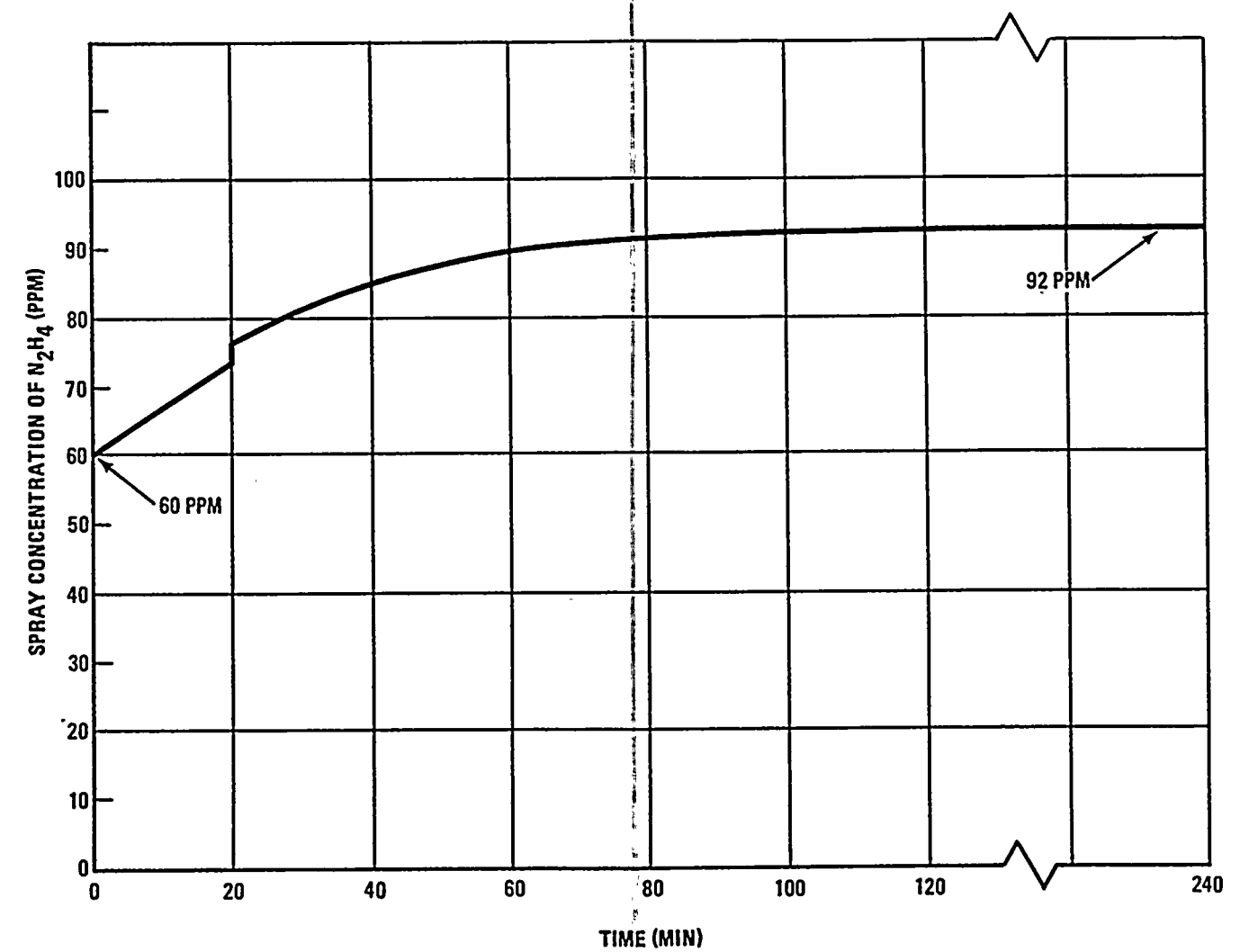
Figure 3.8-1 presents the estimate of hydrazine concentration under the most limiting single failure. The limiting failure would be closure of the containment isolation valve on one train of the containment spray system. The chemical addition portion of the isolated train would discharge to the refueling water tank (RWT), resulting in a more concentrated spray through the non isolated train. Operator action to terminate the discharge to the RWT is assumed at 30 minutes.

The use of 50 ppm hydrazine for qualification purposes is consistent with the range of hydrazine concentrations stipulated in CESSAR. Additionally, no significant difference in the various materials' performances should occur due to an increase in the hydrazine concentration of up to 200 ppm. This statement assumes that the related safety equipment consist of materials' normally found in these items, including but not limited to stainless steels, nickel-based alloys, copper-based alloys, EPDM, silicon rubber, phenolics, epoxy materials, low-carbon and mild steels, cast irons, and low alloyed steels. Possible concerns with brass, bronze and other copper-based alloys with the decomposition of hydrazine to ammonia (ammonia readily attacks copper-alloys) have been alleviated based on qualification tests on valve materials. Type testing to demonstrate material capability was conducted by C-E with 200 ppm hydrazine and showed no appreciable corrosion-related attack. The test procedure and the analysis are included in the following reports: ASCO reports AQS-21678/TR Rev. A, AGR-67368 Rev. 0; C-E program report 14273-PE-5734 Rev. 1, and C-E letter V-PAK-250. Therefore, no attack of copper-based alloys is expected to occur in a 50 ppm hydrazine environment.


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CHEMICAL SPRAY

1 | Accordingly, the single failure does not result in conditions more severe than the 50 ppm specified in table 4.1-3.



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CONTAINMENT SPRAY HYDRAZINE
CONCENTRATION VS TIME
LIMITING SINGLE FAILURE

Figure 3.8-1

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4. MASTER EQUIPMENT LIST AND QUALIFICATION REVIEW

4.1 REVIEW TECHNIQUE

4.1.1 BOP

A master list was compiled using the instrument, valve and equipment indices and separating the systems into Class IE and non-Class IE. The equipment associated with the Class IE systems, noted in table 2.2-1, were then categorized into harsh and non-harsh environments. In addition, a review of other project documents, such as specifications, P&ID's, electrical single line and elementary diagrams, was conducted as a check for Class IE equipment. Lastly, the FSAR was used to determine that all safety-related equipment had been identified. Table 4.1-1 presents the BOP Class IE equipment in a harsh environment requiring qualification.

To facilitate a uniform review of the environmental qualification of equipment, review forms entitled "Equipment Environmental Qualification Check Lists" and "Seismic Check Lists" were prepared. A copy of these forms is included as Appendix B. The review forms were prepared based upon the requirements of NUREG-0588 Category I and emphasize the requirements to be addressed on a case by case basis. The review forms are designed to guide the reviewer in obtaining information from vendors which is in an auditable form.

4.1.2 NSSS

The safety-related Class IE equipment within the NSSS scope of supply was identified from a review of CESSAR Sections 3.9, 3.11, and Chapters 6, 7, and 15, procurement specifications,

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System Design Requirements, electrical drawings, and P&IDs. The safety-related systems listed in section 2.2 have been systematically analyzed in accordance with NUREG-0588, Category I to determine if components required to mitigate or monitor the consequence of an accident or place the plant in a hot standby/cold shutdown condition are located in a harsh environment. Component locations were defined using a list provided by C-E, in conjunction with a review of physical drawings. Table 4.1-2 presents the NSSS Class IE equipment located in a harsh environment.

Once the Class IE equipment was identified for the NSSS scope of supply, a systematic review on a component-level basis was performed to determine the extent to which the component environmental qualification program complied with the requirements of NUREG-0588, Category I.

4.1.3. INDEPENDENT APS REVIEW

In addition to the review activities described in sections 4.1.1 and 4.1.2, APS performs a detailed independent review of each qualification program, both environmentally and seismically, utilizing the Equipment Qualification Program Check List, included as Appendix C.

The review procedure for qualification plans and reports between the Bechtel and APS is intended to insure compliance to IEEE-323-74, 344-75, and NUREG-0588, Category I.

The following procedure requires that, when the qualification document is received at Bechtel a copy is formally transmitted to APS requesting a review by a specific date. The transmittal letter and the qualification document are routed to the electrical section, upon its arrival in-house, where it is logged

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in and a review request form is filled out and routed to the appropriate engineering discipline, requesting that the qualification document be reviewed and comments provided by the specified date on the form. The discipline supervising engineer or his designee retrieves the qualification document from the Central File and reviews it against the Equipment Qualification Program Checklist.

The checklist is designed to insure that the qualification test information required by IEEE-323-74 and 344-75 is incorporated into the documents. Section 6.3.1.1 of IEEE-323-74 specifies the recommended content of test plans and reports and is incorporated as indicated on the checklist under the item "Documentation". It is the reviewers responsibility to insure that this area is covered sufficiently throughout the qualification test submittal to meet the intent of the requirements. The qualification review document does provide for specific entries that are required to meet the Section 6.3.1.1 documentation requirements which are considered significant to be separated out to insure their entry into the qualification submittal by the supplier such as:

1. Life Limiting Components required by item 5 of Section 6.2, IEEE-323-74.
2. Preventive Maintenance as required by item 4 of Section 6.2, IEEE-323-74.
3. Environmental Service Conditions as required by item 7 of Section 6.2, IEEE-323-74.

The review of the seismic test report, to insure that all applicable areas are covered as required by IEEE-344-75 is patterned after Section 8.2.1 of this standard, with each item requiring a specific review check to insure its incorporation.

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Upon completion of the Equipment Qualification Program Checklist, the review request form is signed and dated as well as the applicable section within the qualification checklist. If the review was conducted by someone other than the discipline supervising engineer, then they review the content of the qualification review document and also provides their signature and date in the appropriate section. The completed review forms are then submitted to the electrical section where copies of the qualification review document form are made, the transmittal letter is drafted and all required data is entered into the log to indicate review has been completed and documented. Copies of all documentation are placed within a single package and filed in the Central File.

The Equipment Qualification Program Checklist is then transmitted, in its entirety, to the Bechtel where it is reviewed along with their generated comments. The APS comments are incorporated as appropriate in transmittals to the supplier for resolution or incorporation into the qualification test documentation and the supplier resubmits a subsequent report. This cycle continues until all requirements are satisfied upon which time the qualification document receives a Status 1. Final qualification documentation submitted to APS is reviewed and signed off by the reviewer, the Electrical Engineering Supervisor, the Nuclear Engineering Manager and Quality Assurance.

4.1.4 QUALIFICATION STATUS

Upon completion of the review discussed in sections 4.1.1 through 4.1.3, the qualification status of each component was placed into one of the following categories and entered in the Qualification Status column of table 4.1-1 and 4.1-2. Status categories are described in sections 4.1.4.1, 4.1.4.2, and 4.1.4.3.

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4.1.4.1 Qualified

The qualification documentation is complete. The qualified life is identified, along with the life limiting component, if applicable.

4.1.4.2 Qualified (Pending)

The qualification documentation is not complete, but documentation is in the review process and the equipment is considered qualified. A brief explanation of the outstanding items and forecasted completion date are also included.

4.1.4.3 In Progress

The qualification documentation is not complete enough to establish a qualified life. The usual case for placing components in this category would be when testing is not complete or retesting or additional testing is required. A brief statement of status and forecasted completion date is included.

4.1.5 QUALITY ASSURANCE

All equipment and information listed in this report is controlled by the APS, Bechtel and C-E QA programs. This includes such actions as requiring establishment of a QA program by the equipment manufacturers and testing facilities. Periodic QA audits of the manufacturers and testing facilities have been performed by APS, C-E (for NSSS equipment) and Bechtel (for BOP equipment). In addition, APS carries out periodic audits of the C-E and Bechtel QA programs.

APS initiated and organized the environmental qualification program and has maintained a direct involvement in the program, including review of the environmental qualification documents and monitoring of the qualification status of each

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REVIEW TECHNIQUE

piece of equipment. As a result of these activities and the application of the C-E and Bechtel QA programs to the data files and check lists, APS has a high degree of confidence that the qualification status shown in tables 4.1-1 and 4.1-2 are correct. APS Quality Assurance regularly conducts audits of Design Control, Procurement Document Control, Control of Purchased Material, Equipment and Services, and other applicable criteria at APS, Bechtel, and C-E.

In conjunction with APS Quality Assurance Department audits and surveillances, APS Nuclear Engineering personnel perform quality assurance functions by detailed review of equipment qualification documentation, and coordination with Bechtel, C-E and other Suppliers. An Equipment Qualification Team consisting of APS, Bechtel, and C-E personnel has been designated to coordinate, review, and monitor the completion of equipment qualification for PVNGS.

<u>Company</u>	<u>Position</u>	<u>Equipment Qualification Responsibility</u>
APS	Supervising Electrical Engineer	Overall Equipment Qualification Responsibility
APS	Electrical Engineer	Balance of Plant Coordinator
APS	Electrical Engineer	Combustion Engineering Coordinator
APS	Quality Systems Engineer	Quality Assurance Support
Bechtel	Assistant Project Engineer	Project Overall Equipment Qualification Responsibility

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<u>Company</u>	<u>Position</u>	<u>Equipment Qualification Responsibility</u>
Bechtel	Senior Engineer	Project Equipment Qualification Coordinator
Bechtel	Staff Environmental Group Supervisor	Technical Qualification Consultant
Bechtel	Staff Seismic Group Supervisor	Technical Seismic Consultant
C-E	Assistant Project Manager	Qualification Interface Coordinator
C-E	Product Manager	Equipment Qualification Manager

APS Nuclear Engineering personnel use the Nuclear Projects Department Procedures Manual, Procedure NS-15, "Class IE Equipment Qualification Procedures IEEE-323 (1974), IEEE-344 (1975)," for review, approval, and revision of programs, procedures and data for equipment qualification. Upon completion of an equipment qualification package, it is reviewed and approved by APS Nuclear Engineering Management for transmittal to the NRC. APS Nuclear Engineering compliance with Procedure NS-15 and other applicable criteria is verified by regularly scheduled audits conducted by APS Quality Assurance.

Bechtel uses their Internal Procedures Manual, No. IP-5.22, "Qualification of Safety-Related Plant Equipment", for review of equipment environmental and seismic qualification plans, procedures, reports, and Bechtel/Supplier interfaces. Bechtel transmits a monthly summary to APS Nuclear Engineering and Quality Assurance, updating the Equipment Qualification Program schedule, status report, and action item list. APS Quality Assurance conducts regularly scheduled audits of Bechtel's QA Program, Internal Procedures including IP-5.22, and other applicable criteria.

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C-E qualification criteria for Nuclear Steam Supply System equipment contained in CESSAR, and C-E Topical Report CENPD 255 Rev 3. APS Quality Assurance, in conjunction with Bechtel Quality Assurance, conducts annual audits of CE's quality assurance program at their three principal work locations in Windsor, CT, Avery, NH, and Chattanooga, TN.

APS Bechtel and CE Quality Assurance and Engineering also conduct surveillance of equipment suppliers and test laboratories. Documentation of these reviews and audits, including findings and corrective actions, are on file, along with current status lists and schedules of future audits.

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 1 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
480V Class IE Motor Control Centers	General Electric (P.O. No. 13-EM-018)	Prototype IC7700	Temperature 50-104F	Temperature 104F peak	30 days	30 days (h)	N/A	N/A	Type Test	Review Complete (k) expected to be qual- ified for 40 years except for life limit- ing compo- nents: Agastat Relays: 10 years Contactors: 50,000 cycles Aux.Relays: 100,000 cycles Circuit breakers: 22 years Scheduled Completion Date June 30, 1983
Auxiliary Bldg		System: Class IE 480V Power MCC Tag No. E-PHA-M33 E-PHB-M34 E-PHA-M35 E-PHB-M36 E-PHA-M37 E-PHB-M38	Pressure 0 psig	Pressure 0 psig		Post Seismic Stress Test Test sample subjected to: 131F and 90-99% humidity for 96 hr with con- tactors cycled	Breakers cycled per UL489 and NEMA AB1			
			Relative Humidity 20-90%	Relative Humidity 90% (f)			Contactors cycled per UL 508			
			Radiation 1 x 10 ⁶ rads	Radiation 1 x 10 ⁶ rads			General purpose control relays cycled per UL 508			
			Chemical Spray N/A	Chemical Spray N/A			Selector switches and push buttons cycled per UL 508			
			Submergence N/A	Submergence N/A			Thermal aging 81 days at 115C			
			Env. Desig. III				G.E. Quali- fication Report 80GPC004 Feb 25, 1982 (cont)			

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 2 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
480V Class IE Motor Control Centers									BPC Log No. 13-10407- E018- 2802-2, 2803-2 2770-2 2804-2 March 22, 1982 Wyle Reports 43757-2 Sept. 27, 1978, and 44380-1, Feb. 7, 1979	
Auxiliary Bldg (cont)										

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 3 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status	
Auxiliary Relay Cabinets	Harlo Corp. (P.O. No. 13-EM-022)	Prototype System: ESFAS Tag No. E-ZAA-C01 E-ZAA-C02 E-ZAA-C03 E-ZAA-C04 E-ZAA-C05 E-ZAA-C06 E-ZAB-C01 E-ZAB-C02 E-ZAB-C03 E-ZAB-C04 E-ZAB-C05 E-ZAB-C06	Temperature 50-104F	Temperature 119F	30 days	Testing in progress	N/A	N/A	Type Test	Not quali- fied Aging in progress Scheduled Completion Date July 30, 1983	
Auxiliary Bldg.			Pressure 0 psig	Pressure 0 psig					Aging analysis performed on all materials		
			Relative Humidity 20-90%	Relative Humidity 20-90%					Major com- ponent aging: 1. Westing- house FTI test switch 69 days at 110C 2. Westing- house ARD relay 441 days at 110C 3. Agastat timing relay 62 days at 110C		
			Radiation 1 x 10 ⁶ rads	Radiation 1.1 x 10 ⁶ rads							
			Chemical Spray N/A	Chemical Spray N/A							
			Submergence N/A	Submergence N/A							
			Env. Desig. III								
									BPC Log No. 13-10407- E600-1-3 May 26, 1982 Wyle Quali- fication Plan NES26331, May 7, 1982		

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 4 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
5kV Power Cables	Anaconda (PO No. 13-EM-029)	Insulation FR-EP jacket hypalon	Temperature 300F	Temperature 346F peak	30 days	30 days Cable energized throughout test	N/A	N/A	Type Test - in contain- ment 168 hrs at 150C	Qualified for 40 years
MSSS Auxiliary Bldg			Pressure 21 psig	Pressure 113 psig peak		Cables sub- jected to post-LOCA mandrel bend/high potential withstand test (passed)			Anaconda Report F-C4350-3, July, 1976	
			Relative Humidity Steam/air mixture	Relative Humidity 100% (b)					BPC Log 13-10407- EO29-II-6	
			Radiation 1 x 10 ⁶ rads	Radiation 2 x 10 ⁸ rads					July 20, 1982	
			Chemical Spray N/A	Chemical Spray 3000 ppm H ₃ BO ₃ 0.064 molar Na ₂ S ₂ O ₃ pH 9-11, with NaOH					Type Test out of contain- ment and MSSS 350 hrs at 150C	
			Submergence N/A	Submergence N/A					BPC Log No. EO29-41-1 Oct. 26, 1982	
			Env. Desig. II, III							

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 5 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Low Voltage Elec- trical Pene- tration Assem- blies	Conax Corp. (PO No. 13-EM- 035A)	Prototype for low voltage power and control	Temperature 370F peak See fig. 3.1-1	Temperature 370F peak	30 days	30 days (h)	N/A	N/A	Type Test	Qualified for 40 years
Contain- ment Wall		System: Non-Class IE 480V Power Switch- gear Tag No. E-NGN-201 E-NGN-203 E-NGN-205 E-NGN-207 E-NGN-211 E-NGN-213 E-NGN-232 E-NGN-254 E-NGN-260 E-NGN-271 E-NGN-288 E-NGN-290 System: Non-Class IE 480V Power MCC and Control Tag No. E-NHN-209 E-NHN-210	Pressure 60 psig peak see fig. 3.1-2	Pressure 74.5 psig peak		Post LOCA/ MSLB dielectric strength test at 660V-ac for 5 minutes	104 hours at 303F Conax Corp. Report No. IPS 585.3, Jan. 26, 1981 BPC Log No. 13-10407- E035A- 320-1, Feb. 6, 1981 Conax Corp. Report No. IPS 447.1 July 28, 1981 BPC Log No. E-035A- 313-2 Sept. 9, 1981			
			Relative Humidity Steam/air mixture	Relative Humidity 100% (b)		Passed gas leak rate test				
			Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta	Radiation 1.28 x 10 ⁸ rads (g)		Rated short circuit test conducted				
			Chemical Spray Yes See table 4.1-3	Chemical Spray (note c) 6200 ppm H ₃ BO ₃ 50 ppm N ₂ H ₄ pH = 8.6 with Na ₃ PO ₄ for 13.5 days						
			Submergence N/A	Submergence N/A						
			Env. Desig. I							

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 6 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Low Voltage Elec- trical Pene- tration Assem- blies		E-NHN-212 E-NHN-215 E-NHN-217 E-NHN-219 E-NHN-261 E-NHN-267							BPC Log No. E-035A- 314-3 March 4, 1982	
Contain- ment Wall (cont)		System: Class IE 480V Power MCC and Control Tag No. E-PHC-229 E-PHB-241 E-PHN-243 E-PHA-246 E-PHN-286 System: Reactor Control Tag No. E-RIB-235 System: CEDM Control Power Tag Nos. E-SFN-256 E-SFN-258 E-SFN-264 E-SFN-266 E-NHN-267 E-SFN-276 E-SFD-278 E-SFN-282 E-SFN-284							BPC Log No. E-035A- 428-2 October 4, 1982	

Table 4.1-1

**ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 7 of 92)**

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Medium Voltage Elec- trical Pene- tration Assem- bly	Conax Corp. (P.O. No. 13-EM- 035A)	Prototype for medium voltage	Temperature 370F peak see fig. 3.1-1	Temperature 400 peak	30 days	30 days (h) Conductors energized throughout test with leakage current monitored	N/A	N/A	Type Test	Qualified for 40 years
Contain- ment Wall		System: Non-Class IE 13.8kV power Tag Nos. E-NAN-231 E-NAN-244 E-NAN-245 E-NAN-270	Pressure 60 psig peak see fig. 3.1-2	Pressure 70 psig peak		Post LOCA/ MSLB test of gas leak rate, conti- nuity, dielectric strength, and insula- tion resis- tance			Qualified per IEEE- 317-1976 as modified by NRC Reg. Guide 1.63, July 1978	
			Relative Humidity Steam/air mixture	Relative Humidity 100% (b)					Aged for 168 hours at 250F	
			Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta	Radiation 1.05 x 10 ⁸ rads (g)					Conax Corp. test report No. IPS- 447.2 Aug 24, 1981	
			Chemical Spray Yes See table 4.1-3	Chemical Spray 6200 ppm H ₃ BO ₃ 50 ppm N ₂ H ₄ and Na ₃ PO ₄ pH = 8.7 (d)					BPC Log No. E-035A- 426-1	
			Submergence N/A	Submergence N/A					BPC Log No. E-035A- 314-3 March 4, 1982	
			Env. Desig. I						BPC Log No. E-035A- 428-2 October 4, 1982	

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 8 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Instrumentation Electrical Penetration Assemblies	Conax Corp. (P.O. No. 13-EM- 035A)	Prototypes for instru- menta- tion	Temperature 370F peak See fig. 3.1-1	Temperature 396F peak	30 day	30 days (h) Cables energized through- out test Post LOCA/ MSLB test of gas leak rate test, con- tinuity test dielec- tric strength test. Supple- mental MSLB/ LOCA con- ducted peak temp: 510F, peak pressure: 80 psig duration: 8 days passed post supple- mental MSLB/ LOCA tests	N/A	N/A	Type test Qualified per IEEE- 317-1976 as modi- fied per NRC Reg. Guide 1.63, July 1978 Aged for 100 hours at 302F. Conax Corp. Report No. IPS-585.2 Jan. 12, 1981 BPC Log No. E-035A- 420-1 Sept. 9, 1981 Conax Corp. Report No. IPS-447.3 Aug. 5, 1981 BPC Log No. E-035A- 421-1 Sept. 9, 1981	Review complete (1) Scheduled Completion Date June 30, 1983
		System: HVAC - Contain- ment	Pressure 60 psig peak See fig. 3.1-2	Pressure 80 psig peak						
		Tag No. E-HCN-253	Relative Humidity Steam/air mixture	Relative Humidity 100% (b)						
		System: Non-IE Power 480V MCC	Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta	Radiation 1.8 x 10 ⁸ rads (g)						
		Tag Nos. E-NHN-216 E-NHN-220	Chemical Spray Yes See table 4.1-3	Chemical Spray 6200 ppm H ₃ BO ₃ 50 ppm H ₂ H ₄ and Na ₃ PO ₄ pH = 8.7						
		System: In-plant communi- cation	Submergence N/A	Submergence N/A						
		Tag Nos. E-QFN-214 E-QFN-257	Env. Desig. I							
		System: In-core Reactor Instru- mentation								
		Tag Nos. E-RIA-249 E-RIC-230 E-RID-279								
		(cont)								
Containment Wall										

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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 9 of 92)

Type of Equipment/Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Instrumentation Electrical Penetration Assemblies		System: ESF Actuation Tag Nos. E-SAA-Z47 E-SAB-Z37 E-SAC-Z28 E-SAD-Z81							BPC Log No. E-035A-314-3 March 4, 1982	
Containment Wall		System: Ex-Core Neutron Monitoring Tag Nos. E-SEA-251 E-SEB-236 E-SEN-275							BPC Log No. E-035A-428-2 October 4, 1982	
(cont)		System: Reactor Control Tag No. E-SFA-250 E-SFB-238 E-SFC-222 E-SFC-225 E-SFC-226 E-SFC-227 E-SFD-277 E-SFD-283 E-SFN-202 E-SFN-204 E-SFN-287 E-SFN-289 E-SFN-291								

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 10 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
600V Control Cable	Brand-Rex Co. (P.O. No. 13-EM- 057)	XLPE Insu- lation Neoprene jacket	Temperature 370F peak. See fig. 3.1-1	Temperature 385F peak	30 days	30 days (h) Cables energized throughout LOCA/MSLB test Cables sub- jected to post-LOCA/ MSLB mandrel bend and high- potential withstand test (passed)	N/A	N/A	Type Test 168 hours at 136C Brand-Rex Report No. F-C4771, Nov. 1977 BPC Log No. 13-10407- E057-24-7, Sept. 11, 1981	Qualified for 40 years
Contain- ment			Pressure 60 psig peak See fig. 3.1-2	Pressure 66 psig peak						
MSSS			Relative Humidity Steam/air mixture	Relative Humidity 100% (b)						
Auxiliary Bldg			Radiation 3.3×10^7 rads-gamma 1×10^8 rads-beta	Radiation 2×10^8 rads						
			Chemical Spray Yes See table 4.1-3	Chemical Spray 6200 ppm H_3BO_3 50 ppm N_2H_4 pH 8.6-10 with Na_3PO_4 (d)						
			Submergence N/A	Submergence N/A						
			Env. Desig. I, II, III							

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 11 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
600V Power Cable	Rockbestos (P.O. No. 13-EM-058)	XLPE Insulation Neoprene jacket	Temperature 370F peak See fig. 3.1-1	Temperature 376F peak	30 days	30 days (h) Cables energized at rated voltage and current throughout MSLB/LOCA test Post-LOCA test environment 200F Humidity 100% Passed voltage withstand test of 80V-ac/mil for 5 minutes	N/A	N/A	Type Test Aged 1300 hours at 150C prior to LOCA Rockbestos Report June 22, 1978 BPC Log No. 13-10407-E058-13-4 May 3, 1979	Qualified for 40 years
Containment			Pressure 60 psig peak See fig. 3.1-2	Pressure 62 psig peak						
MSSS			Relative Humidity Steam/air mixture	Relative Humidity 100% (b)						
Auxiliary Bldg			Radiation 3.3 x 10 ⁷ rads-gamma 1 x 10 ⁸ rads-beta	Radiation 2 x 10 ⁸ rads						
			Chemical Spray Yes See table 4.1-3	Chemical Spray 6200 ppm Boron 50 ppm Hydrazine pH = 8.6 to 10 with Trisodium Phosphate (d)						
			Submergence N/A	Submergence N/A						
			Env. Desig. I, II, III							

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 12 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identi- fication	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
600V Power Cable	Brand Rex (P.O. No. 13-EM-058A)	XLPE Insula- tion Hypalon jacket	Temperature 370F peak See fig. 3.1-1	Temperature 385F peak	30 days	30 days Cables ener- gized with 600V- and 300V-ac throughout LOCA/MSLB test Passed post LOCA/MSLB 40 x mandrel bend test and 5 minute 80V per mil high poten- tial with- stand test	N/A	N/A	Type Test Brand Rex Report No. F-C-5120-1, Aug. 19, 1980 BPC Log No. 13-10407- E058 1-2 April 22, 1982 Samples aged 168 hrs at 136C or 168 hrs at 158C	Review Complete(m) Scheduled Completion Date July 30, 1983
Contain- ment MSSS Auxiliary Bldg.			Pressure 60 psig peak See fig. 3.1-2	Pressure 66 psig						
			Relative Humidity Steam/air mixture	Relative Humidity 100% (b)						
			Radiation 3.3 x 10 ⁷ rads-gamma 1 x 10 ⁸ rads-beta	Radiation 2 x 10 ⁸						
			Chemical Spray Yes See table 4.1-3	Chemical Spray 6200 ppm H ₃ BO ₃ 50 ppm hydrazine pH=8.5 to 10 with sodium triphos- phate and sodium hydroxide (d)						
			Submergence N/A	Submergence N/A						
	Env. Desig. I, II, III									

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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 13 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Coaxial Cables	Brand-Rex (P.O. No. 13-EM-060)	XLPE insulation Hypalon jacket	Temperature 370F peak See fig. 3.1-1	Temperature 385F	30 days	30 days Cables energized with 600V-ac throughout simulated LOCA/MSLB test Cables sub- jected to a final 40 x mandrel bend and high potential withstand test of 80V per mil (passed)	N/A	N/A	Type Test Aged 168 hours. at 136C Brand-Rex Report No. F-C5120-2, Sept. 2, 1980 BPC Log No. 13-10407- E060-7-4 Jan. 18, 1982	Qualified for 40 years
Contain- ment			Pressure 60 psig peak See fig. 3.1-2	Pressure 66 psig						
Auxiliary Bldg			Relative Humidity Steam/air mixture	Relative Humidity 100% (b)						
			Radiation 3.3 x 10 ⁷ rads-gamma 1 x 10 ⁸ rads-beta	Radiation 2 x 10 ⁸ rads						
			Chemical Spray Yes See table 4.1-3	Chemical Spray 6200 ppm H ₃ BO ₃ 50 ppm N ₂ H ₄ pH 8.5-10 with Na ₃ PO ₄ to pH 8.5 and NaOH to pH 10 (d)						
			Submergence N/A	Submergence N/A						
			Env. Desig. I, III							

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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 14 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Shielded Instru- ment/ Thermo- couple Extension Cables	Anaconda Ericcson (P.O. No. 13-EM-061)	FR-EP insulation Hypalon (CPE) jacket	Temperature 370F peak See fig. 3.1-1	Temperature 385F	30 days	30 days (h) Cables energized throughout test Cables sub- jected to a mandrel bend/high potential withstand test of 80V per mil for 5 min.	N/A	N/A	Type Test 168 hours at 150C Franklin Institute Research Labora- tories Report No. F-C4836-2, January, 1978 BPC Log No. 13-10407- E061-14-6 January 15, 1982	Qualified for 40 years
Containment MSSS Auxiliary Bldg			Pressure 60 psig peak See fig. 3.1-2	Pressure 66 psig						
			Relative Humidity Steam/air mixture	Relative Humidity 100% (b)						
			Radiation 3.3 x 10 ⁷ rads-gamma 1 x 10 ⁸ rads-beta	Radiation 2 x 10 ⁸						
			Chemical Spray Yes See table 4.1-3	Chemical Spray 6200 ppm H ₃ BO ₃ 50 ppm N ₂ H ₄ pH 8.6-10 with Na ₃ PO ₄ (d)						
			Submergence N/A	Submergence N/A						
			Env. Desig. I, II, III							

Table 4.1-1
ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 15 of 92)

Type of Equipment/Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Shielded Instrumentation Cable	The Anaconda Company (P.O. No. 13-EM-062)	FR-EP Insulation CPE jacket	Temperature 370F peak See fig. 3.1-1	Temperature 385F peak	30 days	30 days (h) Cables energized throughout test Cables subjected to a mandrel bend/high potential withstand test of 80V per mil (passed)	N/A	N/A	Type Test 168 hours at 150C Franklin Institute Research Laboratories Report F-C4836-2, January 1978 BPC Log No. 13-10407-E062 14-7, January 1982	Qualified for 40 years
Containment			Pressure 60 psig peak See fig. 3.1-2	Pressure 66 psig peak						
MSSS Auxiliary Bldg			Relative Humidity Steam/air mixture	Relative Humidity 100% (b)						
			Radiation 3.3 x 10 ⁷ rads-gamma 1 x 10 ⁸ rads-beta	Radiation 2 x 10 ⁸ rads						
			Chemical Spray Yes See table 4.1-3	Chemical Spray 6200 ppm H ₃ BO ₃ 50 ppm N ₂ H ₄ pH = 8.6 to 10.0 with Na ₃ PO ₄ (d)						
			Submergence N/A	Submergence N/A						
			Env. Desig. I, II, III							

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June 1983

4.1-23

Amendment 1

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 16 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Outside Contain- ment Prefab Cables	Bendix/ Anaconda Ericson (P.O. No. 13-EM-064)	FR-EP Insula- tion CPE Jacket	Temperature 50-104F	Temperature 385F peak	30 days	30 days (h)	N/A	N/A	Type Test	Qualified for 40 years
Auxiliary Bldg			Pressure 0 psig	Pressure 60 psig		All cables energized throughout 16 day simu- lated LOCA/ MSLB			168 hours at 150C	
			Relative Humidity 20-90%	Relative Humidity 100% (f)		Post MSLB/ LOCA man- drel bend and high potential withstand tests. 80V/ mil for 5 minutes (passed)			Franklin Institute F-C4836-2 Jan. 1978	
			Radiation 1 x 10 ⁶ rads	Radiation 2 x 10 ⁸ rads					BPC Log No. 13-10407- E064-22-2. Sept. 1, 1981 and BPC Log No. 13-10407- E064-23-8	
			Chemical Spray N/A	Chemical Spray 6200 ppm H ₃ BO ₃ 50 ppm N ₂ H ₄ pH=8.6-10 with Na ₃ PO ₄ (d)						
			Submergence N/A	Submergence N/A						
			Env. Desig. III							

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 17 of 92)

Type of Equipment/Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Inside Containment Containment Prefab Cable Assemblies in Conduit	BIW Cable Systems (P.O. No. 13-EM-064A)	Silicone Insulation silicone jacket RSPT cable from CEDM to disconnect panel. RSPT I 3/C #16 AWG shielded triad RSPT II 6/C, #16 AWG twisted shielded triplet	Temperature 370F peak See fig. 3.1-1	Temperature 370F	30 days	30 days (h) Cables energized throughout LOCA/MSLB Subjected to post LOCA/MSLB test of 50 x mandrel bend and 750V ac for 5 minutes	N/A	N/A	<u>Silicone Rubber</u> Type Test 750 hours at 160C BIW Report No. 82E080 Sept. 9, 1982 BPC Log No. 13-10407-E064-77-3, Jan. 10, 1983	Review Complete (n) Scheduled Completion Date July 30, 1983
			Pressure 60 psig peak See fig 3.1-2	Pressure 155 psig						
			Relative Humidity Steam/air mixture	Relative Humidity Steam/air mixture						
			Radiation 3.3×10^7 rads-gamma 2×10^8 rads-beta	Radiation 5×10^7 rads (i)						
			Chemical Spray Yes See table 4.1-3	Chemical Spray 6200 ppm H_3BO_3 50 ppm N_2H_4 pH 8.6 to 10 with Na_3PO_4 (d)						
			Submergence N/A	Submergence N/A						
			Env. Desig. I							

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June 1983

4.1-25

Amendment 1

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 18 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Inside Contain- ment Prefab Cable Assem- blies	BIW Cable Systems (P.O. No. 13-EM- 064A)	FRFP insula- tion CPE jacket RSPT cable from dis- connect panel to EPA RSPT I 3C, #16 AWG shielded twisted triplex RSPT II 6/C, #14 AWG, #16 twisted shielded triplex FID 6 STP #18 AWG 1 STP #18 AWG CH-AL from bulkhead to EPA	Temperature 370F peak See fig. 3.1-1	Temperature 370F	30 days	Cables energized throughout LOCA/MSLB with 60V ac passed Post LOCA/ MSLB 40 x mandrel bend test and 70V ac for 5 minutes immersed in water	N/A	N/A	Type Test Aged 126 hrs at 150C BIW Report No. 82C033C Nov. 24, 1982 BPC Log No. B-10407- E064A-66-5 Dec. 9, 1982 Anaconda F-C4836-2 BPC Log No. E062-14-7 March 3, 1982	Qualified for 30 years
Contain- ment			Pressure 60 psig peak See fig. 3.1-2	Pressure 155 psig						
			Relative Humidity Steam/air mixture	Relative Humidity Steam/air mixture						
			Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta	Radiation 2 x 10 ⁸ rads						
			Chemical Spray Yes See table 4.1-3	Chemical Spray 6200 ppm H ₃ BO ₃ 50 ppm N ₂ H ₄ pH 8.6 to 10 with Na ₃ PO ₄ (d)						
			Submergence N/A	Submergence N/A						
			Env. Desig. I							

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 19 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Ring Tongue Termi- nals	AMP Incorpo- rated (P.O. No. 13-EM- 106A)	N/A Kynar Insu- lating Sleeves Radiation resistant PIDG and Plasti- grip Terminals	Temperature 370F peak See fig. 3.1-1	Temperature 370F	30 days	30 days (h) Representa- tive number of samples energized to 600V-ac and current of 5 amp throughout MSLB/LOCA test Samples passed post LOCA/ MSLB tensile strength test	N/A	N/A	Type Test	Qualified for for 40 years
Contain- ment			Pressure 60 psig peak See fig. 3.1-2	Pressure 60 psig		Separate samples aged for: 168 hours at 150C 400 hours at 150C				
MSSS			Relative Humidity Steam/air mixture	Relative Humidity 100% (b)		750 hours at 150C 1000 hours at 150C 1500 hours at 150C				
Auxiliary Bldg			Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta	Radiation 2.05 x 10 ⁸ rads		AMP Report No. 302940016 July 18, 1980				
			Chemical Spray Yes See table 4.1-3	Chemical Spray 6200 ppm H ₂ BO ₃ 50 ppm N ₂ H ₄ pH=9.0 to 9.5 with Na ₃ PO ₄ (d)		BPC Log No. 13-10407- E106A-52-3, August 7, 1980				
			Submergence N/A	Submergence N/A						
			Env. Desig. I, II, III							

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Table 4.1-1

**ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 20 of 92)**

1

Type of Equipment/ Location	Manufacturer	Model No. or Identi- fication	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
High Voltage Termina- tions 5 & 15 kV	Raychem (P.O. No. 13-EM- 106B)	NHVT (formerly identi- fied as HVT) HVMC	Temperature 28-120F	Temperature 360F peak	30 days	113 days Cables energized throughout LOCA test at rated voltage	N/A	N/A	Type Test	Review Complete (o) Scheduled Completion Date June 30, 1983
MSSS Elev. 80'			Pressure 0 psig	Pressure 70 psig peak					168 hours at 121C .	
			Relative Humidity 20-90%	Relative Humidity 100% (f)					Raychem Test Report No. 71100 Rev. 1	
			Radiation 1 x 10 ⁶	Radiation 2 x 10 ⁸ rads					BPC Log No. 13-10407- E106B-7-4, Jan. 22, 1981	
			Chemical Spray N/A	Chemical Spray 0.2% H ₃ BO ₃ pH=10						
			Submergence N/A	Submergence N/A						
Auxiliary Bldg			Env. Desig. II, III							

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Table 4.1-1

**ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 21 of 92)**

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Heat Shrinkable Motor Connection Kits, Molded Cable Breakout Kits, Cable and Sealing Kits, and Heat Shrinkable Tubing	Raychem (P.O. No. 13-EM-106B)	NHCK NCBK NESK WCSF-N	Temperature 370F peak See fig. 3.1-1	Temperature 390F peak	30 days	30 days Samples energized throughout LOCA/MSLB test Samples passed post LOCA/MSLB IR Test and 3.6 kV withstand test	N/A	N/A	Type Test 1500 hours at 150C Raychem Report No. QP-PV123 Apr. 23, 1981 BPC Log No. 13-10407-E106B-10-5 Sept. 14, 1981	Qualified for 40 years
			Pressure 60 psig peak See fig. 3.1-2	Pressure 66 psig peak						
			Relative Humidity Steam/air mixture	Relative Humidity 100% (b)						
			Radiation 3.3×10^7 rads-gamma 2×10^8 rads-beta	Radiation 2.0×10^8 rads						
			Chemical Spray Yes See table 4.1-3	Chemical Spray 6200 ppm H_3BO_3 50 ppm N_2H_4 pH=10.5 with NA_3PO_4 (d)						
MSSS Auxiliary Bldg Containment			Submergence N/A	Submergence N/A						
			Env. Desig. I, II, III							

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 22 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Heat Shrink- able Motor Conne- ction Kits	Raychem (P.O. No. 13-EM- 106B)	NMCK8	Temperature 120F peak	Temperature 348F peak	30 days	30 days (h) Samples energized throughout MSLB test at 5 kV ac. Samples passed post MSLB IR test and 5.5 kV ac withstand test	N/A	N/A	Type Test	Review Complete ^(o) Scheduled Completion Date June 30, 1983
MSSS, Elev. 80' Auxiliary Bldg			Pressure 0 psig	Pressure 28 psig peak					Aging performed: 504 hours at 150C	
			Relative Humidity 20-90%	Relative Humidity 100% Steam/air mixture (note f)					Raychem Report No. EDR-5037 Sept. 10, 1982	
			Radiation 1 x 10 ⁶	Radiation 5.0 x 10 ⁷ rads					BPC Log No. 13-10407- E-1068-62-3 Sept. 20, 1982	
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. II, III							

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 23 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identi- fication	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
4.16 kV Transfer Switch	ITE Golden Gate Swbd Co. (P.O. No. 13-EM-117)	HPL-C Switch	Temperature 50-104F	Temperature 104F	30 days	30 days (h) Passed post aging and seismic testing	N/A	N/A	Type Test 1716 hours at 134C and ambient relative humidity Golden Gate Report No. QR-2141 Rev. 5 May 18, 1982 BPC Log No. 13-10407- E-117-10-6 June 18, 1982	Qualified for 40 years
Auxiliary Bldg		480V Power Switch- gear Tag No. E-PGE-036	Pressure 0 psig	Pressure 0 psig						
			Relative Humidity 20-90%	Relative Humidity 0-100%						
			Radiation 1 x 10 ⁶ rads	Radiation 1 x 10 ⁶ rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. III							

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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 24 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Hydrogen Recom- biner Damper Panel Hand Switches	Comsip Custom Line (P.O. No. 13-JM-200)	Micro- switch Model No. PTSB-C2- 12-C	Temperature 50-104F	Later	30 days	Later	N/A	N/A	Later	Not qualified (P) Scheduled Completion Date Dec. 30, 1983
Auxiliary Bldg			Pressure 0 psig							
		System: HP Tag Nos. J-HPA-HS61 J-HPB-HS62 Panel No. J-HPA-E03 J-HPB-E03	Relative Humidity 20-90%							
			Radiation 1 x 10 ⁶ rads							
Fuel Pool Cooling Pump Panel Hand Switches		Env. Desig. III	Chemical Spray N/A							
Fuel Bldg		GE SBM Switch Model 10CG211	Submergence N/A							
		System: PC Tag Nos. J-PCA-HS7 J-PCB-HS8 Panel No. J-PCA-E01 J-PCB-E01								
			Env. Desig. VI							

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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 25 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Pressure Trans- mitter	Rosemount (P.O. No. 13-JM-311)	Model No. 1153GB7	Temperature 50-104F	Temperature 318F	30 days	30 days	Accu- racy: ±0.25% of cali- brated span	Accuracy was main- tained within speci- fica- tion limits after aging and seis- mic test- ing.	Type Test Each unit aged for 1110 hours at 95C and cycled from 0 to 100% FR 8,030 times Rosemount Report No. 108026 Vol I & II Feb. 12, 1981 Qualification Report No. 18025, Rev. A Feb. 4, 1981 Analysis Report No. 57820, Rev. D Aug. 18, 1978 BPC Log No. 13-10407- J311-44-1, 46-2, 19-4	Qualified for 4 years
Auxiliary Bldg		System: HVAC-Con Bldg	Pressure 0 psig	Pressure 72 psig						
		Tag Nos. J-HCA-PT- 353A J-HCB-PT- 353B	Relative Humidity 20-90%	Relative Humidity 0-100%						
		Model No. 1153GB6	Radiation 1 x 10 ⁶ rads	Radiation 2.44 x 10 ⁷ rads						
		System: HVAC-Con Bldg	Chemical Spray N/A	Chemical Spray N/A						
		Tag Nos. J-HCA-PT- 351A J-HCB-PT- 351B J-HCC-PT- 351C J-HCD-PT- 351D J-HCA-PT- 352A J-HCB-PT 352B J-HCC-PT- 352C J-HCD-PT- 352D	Submergence N/A	Submergence N/A						
			Env. Desig. III							

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 26 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Level Transmitter	Rosemount (P.O. No. 13-JM-311)	Model No. 1153DB4	Temperature 50-104F	Temperature 318F	30 days	30 days	Accuracy: $\pm 0.25\%$ of calibrated span	Accuracy was maintained within specification limits after aging and seismic testing.	Type Test	Qualified for 4 years
Auxiliary Bldg		System: ECWS Tag Nos. J-EWA-LT-91 J-EWB-LT-92	Pressure 0 psig	Pressure 72 psig					Each unit aged for 1110 hours at 95C and cycled from 0 to 100% FR 8,030 times	
			Relative Humidity 20-90%	Relative Humidity 0-100%					Rosemount Report No. 108026, Vol. I & II Feb. 12, 1981	
			Radiation 1×10^6 rads	Radiation 2.44×10^7 rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. III							
		Analysis Report No. 57820, Rev. D Aug. 18, 1978								
								BPC Log No. 13-10407-J311-44-1, 46-2, 19-4		

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 27 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Flow Trans- mitter	Rosemount (P.O. No. 13-JM-311)	Model No. 1153DB5	Temperature 28-120F	Temperature 318F	30 days	30 days	Accu- racy: ±0.25% of cali- brated span	Accuracy was main- tained within speci- fica- tion limits after aging and seis- mic test- ing.	Type Test Each unit aged for 1110 hours at 95C and cycled from 0 to 100% FR 8,030 times Rosemount No. 108026 Vol I & II Qualification Report No. 18025, Rev. A Analysis Report No. 57820, Rev D BPC Log No. 13-10407- J311-44-1, 46-2, 19-4	Qualified for 4 years
MSSS		System: AFS Tag Nos. J-AFA-FT- 40B J-AFB-FT- 41B J-AFA-FT- 40A J-AFB-FT- 41A	Pressure 0 psig	Pressure 72 psig						
			Relative Humidity 20-90%	Relative Humidity 0-100%						
			Radiation 1 x 10 ⁵ rads	Radiation 2.44 x 10 ⁷ rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. II							

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 28 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	EnVironment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status	
Pressure Trans- mitter	Rosemount (P.O. No. 13-JM-311)	Model No. 1153GB9	Temperature 28-120F	Temperature 318F	30 days	30 days	Accu- racy: ±0.25% of cali- brated span	Accuracy was main- tained within speci- fica- tion limits after aging and seis- mic test- ing.	Type Test	Qualified for 4 years	
MSSS		System: AFS Tag Nos. J-AFB-PT- 17 J-AFA-PT- 18	Pressure 0 psig	Pressure 72 psig					Each unit aged for 1110 hours at 95C and cycled from 0 to 100% FR 8,030 times		
			Relative Humidity 20-90%	Relative Humidity 0-100%							
			Radiation 1 x 10 ⁵ rads	Radiation 2.44 x 10 ⁷ rads							
		Model No. 1153GB6	System: MSS Tag Nos. J-SGB-PT- 306 J-SGA-PT- 313	Chemical Spray N/A					Chemical Spray N/A		Rosemount Report No. 108026 Vol I & II Feb. 12, 1981
				Submergence N/A					Submergence N/A		Qualification Report No. 18025, Rev. A Feb. 4, 1981
				Env. Desig. II							Analysis Report No. 57820, Rev. D Aug. 18, 1978
		Model No. 1153GB8							Qualification Report No. 88114, Rev. B Sept. 4, 1982 (cont)		
System: MSS Tag Nos. J-SGB-PT- 301 J-SGA-PT- 308 J-SGB-PT- 315 J-SGB-PT- 321											

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 29 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Pressure Trans- mitter									BPC Log No. B-10407- J311-44-1, 46-2, 19-4, 51-2	
MSSS (cont)										

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 30 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- fication	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
I/P Con- vertor	Masoneilan (P.O. No. 13-JM-312)	Model No. 8005A	Temperature 28 to 120	Temperature 160F	30 days	30 days (h) Transucers operated at 160F 95 to 100% RH for 10 days. Also subjected to 335F psig 23.2 psig within 8 minutes during 0.30 minute SLB test.	Response Time: N/A Accuracy: ±0.5% of oper- ating span	Response and Accuracy No abnor- mality or degra- dation was found	Type Test Aged 1080 hours at 100C. Unit cycled 0 to 100% 2000 times during aging. Masoneilan Report No. 1129 Jan. 18, 1982 BPC Log No. 13-10407- J-312-7-1 March 16, 1982	Qualified for 5.4 years
MSSS (El. 81'-0")		System: MSS Tag Nos. J-SGB- HY-178C J-SGA- HY-179C J-SGA- HY-184C J-SGB- HY-185C	Pressure 0 psig	Pressure 0 psig						
			Relative Humidity 20 to 90%	Relative Humidity 95 to 100% (f)						
			Radiation 1 x 10 ⁵ rads	Radiation 1.016 x 10 ⁷ rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. II							

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 31 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Containment Post- LOCA Hydro- gen Monitor	Comsip Delphi (P.O. No. 13-JM-359)	Model No. System KIII per P.O. No. 13-JM-359 System: CHCS Panel Nos. JHPAE02 JHPBE02	Temperature 50-104F	Temperature 150F peak	30 days	100 days Simulated LOCA at sample points for 100 days at 300F and 70 psig	Accu- racy: ±2.5% of full scale	No abnor- malities were re- ported	Type Test	Review Complete(q) Scheduled Completion Date Aug. 30, 1983
Auxiliary Bldg			Pressure 0 psig	Pressure 0 psig peak					Engineering Analysis and Test Co. 1035-1, Rev. 1 Sept. 1981	
			Relative Humidity 20-90%	Relative Humidity 90% (f)					Engineering Analysis and Test Co. Report No. 1035-8 Sept. 1982	
			Radiation 1 x 10 ⁶ rads	Radiation 1 x 10 ⁶ rads					BPC Log No. 10407-J359- 29-2, 42-1 March 1, 1982, Oct. 28, 1982	
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. III							

PVNGS 1,2&3
 ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 32 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Acoustic Monitors	Technology for Energy Corp. (P.O. No. 13-JM-366)	Model No. BBN424ISO	Temperature 300F	Temperature 510F peak	30 days	33 days	Change sensi- tivity 20pc/g ±15% at 500F	Passed	Type Test	Review complete ^(r)
MSSS		System: Main Steam	Pressure 21 psig	Pressure 92 psig peak					Aging per- formed 100C for 1488 hrs	Note: These tag numbers are the result of TMI plant modifica- tion
		Tag Nos. J-SGE-ZE- 696	Relative Humidity	Relative Humidity 100% (b)					TEC Report No. 517-TR-03 April 1982	
		J-SGE-ZE- 697	Steam/air mixture							
		J-SGE-ZE- 698								
		J-SGE-ZE- 699	Radiation 1 x 10 ⁶ rads	Radiation 2.2 x 10 ⁶ rads			Voltage sensi- tivity 90mV/g		BPC Log No. 13-10407- J366-292-1 Sept. 17, 1982	Scheduled Completion Date July 30, 1983
		J-SGE-ZE- 700								
		J-SGE-ZE- 701	Chemical Spray N/A	Chemical Spray 13,000- 14,000 ppm			Trans- verse sensi- tivity 5%			
		J-SGE-ZE- 702		H ₃ BO ₃ 50-70 ppm						
		J-SGE-ZE- 703		N ₂ H ₄ pH = 4.5 to 7.5						
		J-SGE-ZE- 704		with NaPO ₄						
		J-SGE-ZE- 705								
		J-SGE-ZE- 706	Submergence N/A	Submergence N/A						
		J-SGE-ZE- 707								
		J-SGE-ZE- 708	Env. Desig. II							
		J-SGE-ZE- 709								
		J-SGE-ZE- 710								
		J-SGE-ZE- 711								
		(cont)								

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PVNGS 1,2&3

REVIEW TECHNIQUE

June 1983

4.1-41

Amendment 1

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 33 of 92)

1

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Acoustic Monitors	Technology for Energy Corp. (P.O. No. 13-JM-366)	Model No. BBN424ISO								Review complete(r)
MSSS (cont)		System: Main Steam Tag Nos. J-SGE-2E- 712 J-SGE-2E- 713 J-SGE-2E- 714 J-SGE-2E- 715								Scheduled Completion Date July 30, 1983

PVNGS 1,2&3
ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

**ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 34 of 92)**

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Acoustic Monitors	Technology for Energy Corp. (P.O. No. 13-JM-366)	Model No. 424-C2	Temperature 300F	Temperature 510 peak	30 days	33 days	N/A	N/A	Type Test	Review complete (r)
MSSS		System: SG Tag No. N/A 20 cables approx- imately 150 feet each in length	Pressure 21 psig	Pressure 92 psig peak					Aging per- formed: 100C for 1988 hrs	Note: This material added as the result of TMI plant mod- ification Scheduled Completion Date July 30, 1983
			Relative Humidity Steam/air mixture	Relative Humidity 100% (b)					TEC Report No. 517-TR-03 April, 1982	
			Radiation 1×10^6 rads	Radiation 2.2×10^8 rads					BPC Log No. 13-10407- J366-292-1 Sept. 17, 1982	
			Chemical Spray N/A	Chemical Spray 13,000- 14,000 ppm H_2BO_3 50-70 ppm N_2H_4 pH = 4.5 to 7.5 with $NaPO_4$						
			Submergence N/A	Submergence N/A						
			Env. Desig. II							

PVNGS 1,2&3
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 35 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Acoustic Monitors	Technology for Energy Corp. (P.O. No. 13-JM-366)	Model No. 2273AMI	Temperature 370F peak See fig. 3.1-1	Temperature 510F peak	30 days	33 days	Charge sensi- tivity 10.0 ±1pC/g Voltage sensi- tivity 12mV/g Trans- verse sensi- tivity 3% maxi- mum	Passed	Type Test Aging performed: 100C for 1488 hrs TEC Report No. 517-TR-03 April 1982 BPC Log No. 13-10407- J366-292-1 Sept. 17, 1982	Review complete(r) Note: These tag numbers are the result of TMI plant modifica- tion Scheduled Completion Date July 30, 1983
Contain- ment		System: RCS Tag Nos. J-RCE-ZE- 726 J-RCE-ZE- 727 J-RCE-ZE- 728 J-RCE-ZE- 729	Pressure 60 psig peak See fig. 3.1-2	Pressure 92 psig peak						
			Relative Humidity Steam/air mixture	Relative Humidity 100% (b)						
			Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta	Radiation 2.2 x 10 ⁸ rads						
			Chemical Spray Yes See table 4.1-3	Chemical Spray 13,000- 14,000 ppm H ₃ BO ₃ 50-70 ppm N ₂ H ₄ pH = 4.5 to 7.5 with NaPO ₃ (j)						
			Submergence N/A	Submergence N/A						
			Env. Desig. I							

PVNGS 1,2&3
ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 36 of 92)

Type of Equipment/Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Preamplifier	Technology for Energy Corp. (P.O. No. 13-JM-366)	Model No. TEC-504A	Temperature 370F peak See fig. 3.1-1	Temperature 510F peak	30 days	33 days	Bias Voltage 18V \pm 1V	Bias Voltage 17.83V	Type Test Aging Performed: 100C for 1488 hrs TEC Report No. 517-TR-03 April, 1982 BPC Log No. 13-10407-J366-292-1 Sept. 17, 1982	Review complete (r) Note: These tag numbers are the result of TMI plant modification Scheduled Completion Date July 30, 1983
Containment		System: RCS					Gain 2mV/pC \pm 5%	Gain 2.02 mV/pC		
		J-RCE-ZY-726	Pressure 60 psig peak See fig. 3.1-2	Pressure 92 psig peak			Dynamic Range 10V pp-min	Dynamic Range 13.0 pp-min		
		J-RCE-ZY-727					Low Frequency 130-390 Hz	Low Frequency 385 Hz		
		J-RCE-ZY-728	Relative Humidity Steam/air mixture	Relative Humidity 100% (b)			High Frequency 1 MHz/min	High Frequency >1MHz/min		
		J-RCE-ZY-729	Radiation 3.3×10^7 rads-gamma 2×10^8 rads-beta	Radiation 2.2×10^8 rads						
			Chemical Spray Yes See table 4.1-3	Chemical Spray 13,000-14,000 ppm H_2BO_3 50-70 ppm N_2H_4 pH = 4.5 to 7.5 with $NaPO_4$ (j)						
			Submergence N/A	Submergence N/A						
			Env. Desig. I							

ENVIRONMENTAL QUALIFICATION REPORT
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PVNGS 1,2&3

REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 37 of 92)

Type of Equipment/Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Transient Shield	Technology for Energy Corp. (P.O. No. 13-JM-366)	Model No. TEC-160-2	Temperature 370F peak See fig. 3.1-1	Temperature 510F peak	30 days	33 days	N/A	N/A	Type Test qualified similarity to TEC-160	Review complete(r)
Containment		System: RCS Tag Nos. J-RCN-E03 J-RCN-E06	Pressure 60 psig peak See fig. 3.1-2	Pressure 92 psig peak					Aging performed: 100C for 672 hrs	Note: These tag numbers are the result of TMI plant modifications.
			Relative Humidity Steam/air mixture	Relative Humidity 100% (b)					TEC Report No. 517-TR-03 April, 1982	Scheduled Completion Date
			Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta	Radiation 2.2 x 10 ⁸ rads					BPC Log No. 13-10407-J366-292-1 Sept. 17, 1982	July 30, 1983
			Chemical Spray Yes See table 4.1-3	Chemical Spray 13,000-14,000 ppm H ₃ BO ₃ 50-70 ppm N ₂ H ₄ pH = 4.5 to 7.5 with NaPO ₄ (j)						
			Submergence N/A	Submergence N/A						
			Env. Desig. I							

PVNGS 1,2&3
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 38 of 92)

1

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status		
Radiation Resis- tant Cable	Technology for Energy Corp. (P.O. No. 13-JM-366)	Model No. 2273-C2	Temperature 370F peak See fig. 3.1-1	Temperature 510F peak	30 days	33 days	N/A	N/A	Type Test	Review complete(r)		
Contain- ment		System: RCS Tag Nos. N/A	Pressure 60 psig peak See fig. 3.1-2	Pressure 92 psig peak					Aging performed: 100C for 1488 hrs	Note: This material is the result of TMI plant modi- fications.		
		Four cables approxi- mately 75 feet each in length	Relative Humidity Steam/air mixture	Relative Humidity 100% (b)					TEC Report No. 517-TR-03 April, 1982		Scheduled Completion Date	
			Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta	Radiation 2.2 x 10 ⁸ rads					BPC Log No. 13-10407- J366-292-1 Sept. 17, 1982			July 30, 1983
			Chemical Spray Yes See table 4.1-3	Chemical Spray 13,000- 14,000 ppm H ₃ BO ₃ 50-70 ppm N ₂ H ₄ pH = 4.7- 7.5 with NaPO ₄ (j)								
			Submergence N/A	Submergence N/A								
			Env. Desig. I									

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ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 39 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Level Trans- mitter	Transamerica Delaval Gems Sensors (P.O. No. 13-JM-475)	Model No. XM-54854	Temperature 370F peak See fig. 3.1-1	Temperature 450F peak	30 days	30 days subjected to simulated LOCA/MSLB with Chemi- cal Spray Comp. Boric Acid Sodium Thiosulfate Sodium Hydroxide	3% of full scale	3% of full scale	Wyle Test Report 45700-1 Dec. 8,, 1982 BPC Log No. JM-475- 16-1 May 6, 1983	Review complete(o) Note: These tag numbers are the result of TMI plant modifi- cations. Scheduled Completion Date June 30, 1983
Contain- ment		System: RWDS Tag Nos. J-RDE-LE- 410 J-RDE-LE- 411	Pressure 60 psig peak See fig. 3.1-2	Pressure 65 psig peak						
		System: SIS Model No. XM-54852 Tag Nos. J-SIA-LE- 706A J-SIB-LE- 707A	Relative Humidity Steam/air mixture	Relative Humidity Steam/air mixture						
		Model No. XM-54853 Tag Nos. J-SIA-LE- 706B J-SIB-LE- 707B	Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta	Radiation 1.16 x 10 ⁸ rads T.I.D						
		Chemical Spray Yes See table 4.1-3	Submergence Test Cham- ber filled with Chem. Solution and pres- surized to 6.5-7.0 psig and maintained for 30 minutes							
		Submergence Yes								
		Env. Desig. I								

ENVIRONMENTAL QUALIFICATION REPORT
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ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 40 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Level Switch	Magnetrol (P.O. No. 13-JM-481)	Model No. FLS-X- MPX- SIMD4DC	Temperature 28 to 120F	Temperature 120F peak	30 days	30 days (h)	N/A	N/A	Type Test	Qualified for 40 years except for micro- switch, qualified for 5 years
Auxiliary Bldg			Pressure 0 psig	Pressure 0 psig		Post- Functional Tests:			Qualified by similarity to model BCS-751- EP/VPX- SIMD4DC	
MSSS Elev. 80'		System: RWDS Tag Nos. J-RDA- LSH-147 J-RDB- LSH-148 J-RDA- LSH-149 J-RDB- LSH-150 J-RDA- LSH-151 J-RDB- LSH-152 System: MSSS HVAC Bldg Tag Nos. J-HAA- LSH-125A J-HAA- LSH-125B J-HAA- LSH-126A J-HAA- LSH-126B	Relative Humidity 20 to 90%	Relative Humidity 100% (f)		Switch insulation resistance			Thermal aging 160 hours at 300F 480 hours at 100F and 95%- 100% RH	
			Radiation 10 ⁶ rads	Radiation 1.0 x 10 ⁷ min rads		Switch contact resistance			Mechanical cycling 10,000 cycles	
			Chemical Spray N/A	Chemical Spray N/A		Switch veri- fied at operation verified at operating temperatures and pres- sures as indicated on Magnetrol Dwg. No. SKC-3013 sheets 1-5			Magnetrol Report No. M131830- 102/202 Sept. 8, 1981	
			Submergence N/A N/A	Submergence Switch placed in pressure vessel, submerged in water and pres- surized for 180 min at 104 psig.					Wyle Report No. 43235-1,	
				Leakage was 4.2 milli- liters of water					BPC Log No. 13-10407- J481-10-2 Sept. 18, 1981	
			Env. Desig. II, III						13-10407- J481-13-2 Aug. 11, 1982	

May 2, 1977

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June 1983

4.1-49

Amendment 1

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 41 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status		
RTD's and Thermo- couples	Weed Inst. Company (P.O. No. 13-JM-556)	Model Nos. RTD's 611-18- C4-C-2- A2-0 TC's K28250G System: Safety Injection Tag Nos. J-S1A-TE- 712 J-S1B-TE- 713 System: Essential Cooling Water Tag Nos. J-EWA-TE- 083 J-EWB-TE- 084	Temperature 370F peak See fig. 3.1-1	Temperature 485F peak	30 days	30 days minimum temperature used throughout LOCA was 300F continuous	Accuracy of the RTD shall be ±0.30C (+0.50F) or ±1/2 percent of the reading, which- ever is greater. Time con- stant based upon a 63 per- cent response to a step tempera- ture change	Passed	Type Test Aging performed at 304F for 724 hrs NTS Report No. 548-8854-2 March 1, 1982 BPC Log No. 13-10407- J556-89-1 March 25, 1982	Review complete(s) TMI related tag numbers Scheduled Completion Date July 30, 1983		
Contain- ment Bldg Auxiliary Bldg			Pressure 60 psig peak See fig. 3.1-2	Pressure 70 psig							Relative Humidity Steam/air mixture	Relative Humidity Steam/air mixture
			Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta	Radiation 3.03 x 10 ⁸ rads							Chemical Spray Yes, see table 4.1-3	Chemical Spray 80-110 ppm N ₂ H ₄ 11,000- 13,000 ppm H ₃ BO ₃ pH = 4.0 11.0 Na ₂ PO ₃ (d)
			Submergence N/A	Submergence N/A							Env. Desig. I, III	

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PVNGS 1,2&3

REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 42 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
D.C. Motor- Operated Valve Actuator	Control Components Inc. (P.O. No. 13-JM- 601A)	Limatorque Model No SB-00-10 System: AFS Tag Nos. J-AFA- HV-32 J-AFC- HV-33	Temperature 28-120F	Temperature 340F peak	30 days	33 days	None	N/A	Type Test and Analysis Qualified per Limatorque Report No. B-0058	Qualified for 40 yrs with maintenance
MSSS below 100'			Pressure 0 psig	Pressure 105 psig peak						
			Relative Humidity 20-90%	Relative Humidity 100% (f)						
			Radiation 1 x 10 ⁵ rads	Radiation 1 x 10 ⁷ rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. II							

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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 43 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
AC Motor- Operated Valve Actuator	Control Components Inc. (P.O. No. 13-JM- 601A)	Limatorque Model No. SB-00-10 System: AFS Tag Nos. J-AFB- HV-30 J-AFB- HV-31	Temperature 28-120F	Temperature 250F peak	30 days	33 days	None	N/A	Type Test Limatorque Report.No. B0058 Jan. 11, 1981 BPC Log No. 13-10407- P221B- 349-1 March 4, 1981	Qualified for 40 yrs with maintenance
MSSS below 100'			Pressure 0 psig	Pressure 25 psig peak						
			Relative Humidity 20-90%	Relative Humidity 100% (f)						
			Radiation 1 x 10 ⁵ rads	Radiation 2 x 10 ⁷ rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. II							

PVNGS 1,2&3
 ENVIRONMENTAL QUALIFICATION REPORT
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June 1983

4.1-52

Amendment 1

Table 4.1-1

**ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 44 of 92)**

Type of Equipment/Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Position Transmitters	Control Components Inc. (P.O. No. 13-JM-601A)	Schaevitz Model No. HPA-10000	Temperature 300F	Temperature 315F peak	30 days	Later	N/A	N/A	Type Test and Analysis To be thermally aged at 130C for 100 hours Wyle Laboratories Qualification Plan BPC Log No. 13-10407-J601A	Not qualified (t) Scheduled Completion Date Aug. 30, 1983
MSSS		System: MSS Tag Nos. J-SGB-ZT-178 J-SGA-ZT-179 J-SGA-ZT-184 J-SGB-ZT-185	Pressure 21 psig	Pressure 21 psig peak						
			Relative Humidity Steam/air mixture	Relative Humidity 100% (b)						
			Radiation 1 x 10 ⁶ rads	Radiation 1 x 10 ⁶ rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. II							

PVNGS 1,2&3
ENVIRONMENTAL QUALIFICATION REPORT
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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 45 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Limit Switch	Control Components Inc. (P.O. No. 13-JM- 601A)	Namco Model No. EA 180 System: MSS Valve Tag No. J-SGB-HV- 178 J-SGA-HV 179 J-SGA-HV 184 J-SGB-HV- 185 2/Valve	Temperature 300F	Temperature 415F peak	30 days	33 days	None	N/A	Type Test and Analysis BPC Log No. 13-10407- J601A- 134-1, 115-4 July 13, 1981 Sept. 25, 1981 Qualified by CE Namco program. 14273-ICE- 5732	Qualified for 1.4 years with main- tenance parts Replacement of cam-lok connector thread sealant every 1.4 years and limit switch terminal block every 8 years will provide for qual- ification to 40 years
MSSS			Pressure 21 psig	Pressure 70 psig peak						
			Relative Humidity Steam/air mixture	Relative Humidity 100% (b)						
			Radiation 1 x 10 ⁶ rads	Radiation 8.8 x 10 ⁷ rads γ 1.1 x 10 ⁸ rads β						
			Chemical Spray N/A	Chemical Spray 4400 ppm boron as H ₃ BO ₃ , 110 ppm NH ₃ , pH 2.0-9.0						
			Submergence N/A	Submergence N/A						
			Env. Desig. II							

ENVIRONMENTAL QUALIFICATION REPORT
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PVNGS 1,2&3

REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 46 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Solenoid Valves	Control Components Inc. (P.O. No. 13-JM- 601A)	ASCO Model No. 206-381- 44	Temperature 300F	Temperature 450 peak	30 days	33 days Valves cycled throughout LOCA test with base- line func- tional tests con- ducted following LOCA Passed all tests	N/A	N/A	Type Test and Analysis ASCO Report No. AQS- 216 78/TR & AQR- 67368 Rev. 0 & C-E letter V-PAK-250 BPC Log No. 13-10407- J601A-137- -1, 115-4 Dec. 9, 1981, Sept. 25, 1981	Qualified for 40 yrs with maintenance.
MSSS		System: MSS	Pressure 21 psig	Pressure 78 psig peak						
		Tag Nos. J-SGB-HY- 178A J-SGD-HY- 178B J-SGB-HY- 178H J-SGD-HY- 178I J-SGA-HY- 179A J-SGC-HY- 179B J-SGA-HY- 179H J-SGC-HY- 179I J-SGA-HY- 184A J-SGC-HY- 184B J-SFA-HY- 184H J-SGC-HY- 184I J-SGB-HY- 185A J-SGD-HY- 185B J-SGB-HY- 185H J-SGD-HY- 185I	Relative Humidity Steam/air mixture	Relative Humidity 100% (b)						
			Radiation 1 x 10 ⁶ rads	Radiation 1.82 x 10 ⁸ λ 1.1 x 10 ⁸ β						
			Chemical Spray N/A	Chemical Spray 6626 ppm 196 ppm N ₂ H ₄ pH 7.0- 8.5						
			Submergence N/A	Submergence N/A						
			Env. Desig. II							

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 47 of 92)

1

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status			
Solenoid Valve	Target Rock Corp. (P.O. No. 13-JM-603)	Model No. 76HH-002	Temperature 370F peak See fig. 3.1-1	Temperature 385F peak	30 days	30 days (h)	N/A	N/A	Type Test	Review complete ^(u) Scheduled Completion Date June 30, 1983			
Contain- ment		System: HVAC- Cont. Tag Nos. J-HCB-UV- 44 J-HCB-UV- 47	Pressure 60 psig See fig. 3.1-2	Pressure 66 psig peak					Aged for 792 hours at 350F				
			Model No. 76HH-008	Relative Humidity Steam/air mixture					Relative Humidity Steam/air mixture		Valves cycled 18,000 times		
				System: RCS Tag No. J-RCA-HV- 101 J-RCB-HV- 102 J-RCA-HV- 103 J-RCB-HV- 105 J-RCA-HV- 106					Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta		Radiation 3.53 x 10 ⁷ rads	BPC Log No. 13-10407- J603-95-9 Oct. 6, 1982	
		Chemical Spray Yes See table 4.1-3	Chemical Spray 6200 ppm boric acid 50 ppm N ₂ H ₄ pH = 8.6 to 10 with Na ₃ PO ₄ (d)						Submergence No		Submergence N/A	BPC Log No. 13-10407- 174-2 Jan. 25, 1983	
													Env. Desig. I

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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 48 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status	
Solenoid Valve	Target Rock Corp. (P.O. No. 13-JM-603)	Model No. 76HH-009- 010	Temperature 50 to 104F	Temperature 385F peak	30 days	30 days (h)	N/A	N/A	Type Test	Review complete (u)	
Auxiliary Bldg		System: SIS Tag No. J-SIB-UV- 710 J-SIA-UV- 709 J-SIA-UV- 708	Pressure 0 psig	Pressure 66 psig peak					Aged for 792 hours at 350F	Scheduled Completion Date June 30, 1983	
			Relative Humidity 20 to 90%	Relative Humidity Steam/air mixture					Valves cycled 18,000 times		
			Radiation 10 ⁶ rads	Radiation 3.53 x 10 ⁷ rads					BPC Log No. 13-10407- J603-95-9 dated Oct. 6, 1982		
			Chemical Spray N/A	Chemical Spray 6200 ppm boric acid 50 ppm N ₂ H ₄ pH = 8.6 to 10 with Na ₃ PO ₄ (d)					BPC Log No. 13-10407- 174-2 Jan. 25, 1983		
		System: CVCS Tag No. J-CHB-UV- 924							Submergence N/A		Submergence N/A
		Model No. 76HH-020, 76HH-021 76HH-023									
		System: SCS Tag No. J-GAA- UV-1 J-GAA- UV-2									
			Env. Desig. III								
		System: SIAS Tag No. J-IAA- UV-2									
(cont)											

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Amendment 1

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 49 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status		
Solenoid Valve	Target Rock Corp. (P.O. No. 13-JM-603)	Model No. 76HH-005	Temperature 50 to 104F	Temperature 385F peak	30 days	30 days (h)	N/A	N/A	Type Test	Review complete (u) Scheduled Completion Date June 30, 1983		
Auxiliary Bldg (cont)		System: CHCS Tag No. J-HPB-HV- 8B	Pressure 0 psig	Pressure 66 psig peak					Relative Humidity 20 to 90%		Relative Humidity Steam/air mixture	Aged for 792 hours at 350F
			Model No. 76HH-005	Radiation 10 ⁶ rads								Radiation 3.53 x 10 ⁷ rads
		System: CHCS Tag Nos. J-HPA-HV- 7A J-HPB-HV- 8A	Chemical Spray N/A	Chemical Spray 6200 ppm boric acid 50 ppm N ₂ H ₄ pH = 8.6 to 10 with Na ₃ PO ₄ (d)					BPC Log No. 13-10407- J603-95-9, Oct. 6, 1982			
											Model No. 76HH-003	Submergence N/A
		System: HVAC-Cont Bldg J-HCA-HV- 74 J-HCC-HV- 76 J-HCB-HV- 75 J-HCD-HV- 77	Env. Desig. III									
									Model No. 76HH-005			
											System: CHCS Tag No. J-HPA-HV- 703	

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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 50 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Solenoid Valve (cont)	Target Rock Corp. (P.O. No. 13-JM-603)	Model No. 76-HH-009	Temperature 50-104F	Temperature 385F peak	30 days	30 days (h)	N/A	N/A	Type Test Aged for 792 hours at 350F Valves cycled 18,000 times BPC Log No. 13-10407- J603-95-9, Oct. 6, 1982 BPC Log No. 13-10407- 174-2 Jan. 25, 1983	Review complete ^(u) Scheduled Completion Date June 30, 1983
Auxiliary Bldg		76-HH-011	Pressure 0 psig	Pressure 66 psig peak						
		76-HH-013	Relative Humidity 20-90%	Relative Humidity Steam/air mixture						
		System: RWDS Tag No. J-RDB- UV-407	Radiation 10 ⁶ rads	Radiation 3.53 x 10 ⁷ rads						
		System: CHCS Tag Nos. J-HPA- UV-23 J-HPA- UV-24	Chemical Spray N/A	Chemical Spray 6200 ppm boric acid 50 ppm N ₂ H ₄ pH = 8.6 to 10 with Na ₃ PO ₄ (d)						
		System: GRS J-CRB- UV-2	Submergence N/A	Submergence N/A						
		Model No. 76HH-002								
	System: HVAC-Cont Bldg Tag Nos. J-HCA- UV-46 J-HCA- UV-45									

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 51 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Solenoid Valve (cont)	Target Rock Corp. (P.O. No. 13-JM-603)	Model No. 76HH-001								
Auxiliary Bldg		System: ECWS Tag Nos. J-EWA-LV-91 J-EWB-LV-92								

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 52 of 92)

1

Type of Equipment/ Location	Manufacturer	Model No. or Identi- fication	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Solenoid Valve	Target Rock Corp. (P.O. No. 13-JM-603)	Model No. 76HH-007	Temperature 300F	Temperature 385F peak	30 days	30 days (h)	N/A	N/A	Type Test	Review complete(u)
MSSS		System: SG Tag No. JSGB-PV- -306A JSGB-PV- -306B JSGA-PV- 313A JSGA-PV- 313B	Pressure 21 psig	Pressure 66 psig peak					Aged for 792 hours at 350F	Scheduled Completion Date
			Relative Humidity Steam/air mix	Relative Humidity Steam/air mixture					Valves cycled 18,000 times	June 30, 1983
			Radiation 10 ⁶ rads	Radiation 3.53 x 10 ⁷ rads					BPC Log No. . 13-10407- J603-95-9 dated Oct. 6, 1982	
			Chemical Spray N/A	Chemical Spray 6200 ppm boric acid 50 ppm N ₂ H ₄ pH = 8.6 to 10 with Na ₃ PO ₄ (d)					BPC Log No. 13-10407- 174-2 Jan 25, 1983	
			Submergence N/A	Submergence N/A						
			Env. Desig. II							

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 53 of 92)

1

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Solenoid Valve	Target Rock Corp. (P.O. No. 13-JM-603)	Model No. 76HH-008	Temperature 300F	Temperature 385F peak	30 days	30 days (h)	N/A	N/A	Type Test	Review complete (u)
MSSS		System: SG Tag No. J-SGA-UV- 1133 J-SGA-UV- 1134 J-SGB-UV- 1135A J-SGB-UV- 1135B J-SGB-UV- 1136A J-SGB-UV- 1136B	Pressure 21 psig	Pressure 66 psig peak					Aged for 792 hours at 350F	Scheduled Completion Date
			Relative Humidity Steam/air mix	Relative Humidity Steam/air mixture					Valves cycled 18,000 times	June 30, 1983
			Radiation 10 ⁶ rads	Radiation 3.53 x 10 ⁷ rads					BPC Log No. 13-10407- J603-95-9 dated Oct. 6, 1982	
			Chemical Spray N/A	Chemical Spray 6200 ppm boric acid 50 ppm N ₂ H ₄ pH = 8.6 to 10 with Na ₃ PO ₄ (d)					BPC Log No. 13-10407- 174-2 Jan. 25, 1983	
			Submergence N/A	Submergence N/A						
			Env. Desig. II							

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 54 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identi- fication	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Valve AC Motor Operator	Henry Pratt (P.O. No. 13-JM-605)	Limitorque Motor: SMB-00-2	Temperature 50 to 104F	Temperature 250 peak	30 days	33 days	None	None	Type Test & Analysis Limitorque test report B-0058	Qualified for 40 years with maintenance
Auxiliary Bldg		Actuator: HIBC	Pressure 0 psig	Pressure 25 psig peak						
		System: ECWS Tag Nos. J-EWA-UV- 145 J-EWA-UV- 65	Relative Humidity 20 to 90%	Relative Humidity 100% (f)						
			Radiation 10 ⁶ rads	Radiation 2 x 10 ⁷ rads						
			System: NCWS Tag Nos. J-NCB-UV- 401 J-NCA-UV- 402	Chemical Spray N/A						
		Submergence N/A		Submergence N/A						
		System: CPS Valve Tag No. J-CPA-UV -2A J-CPB-UV -3B J-CPA-UV -4A J-CPB-UV -5B	Env. Desig. III							

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 55 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Valve AC Motor Operator	Henry Pratt (P.O. No. 13-JM-605)	Limitorque Motor: SMB-00-40 Actuator: H3BC	Temperature 370F peak See fig. 3.1-1	Type test- ing in progress	30 days	Type testing in progress	None	N/A	Type Test and analy- sis per Limitorque Report B0058 and future amendments	Not qualified (v) Scheduled Completion Date Sept. 30, 1983
Contain- ment		System: CPS Valve Tag No. J-CPA- UV-2B J-CPB- UV-3A	Pressure 60 psig peak See fig. 3.1-2							
		Limitorque: Motor: SMB-005 Actuator: H1BC	Relative Humidity Steam/air mixture							
		System: CPS Valve Tag No. J-CPA- UV-4B J-CPB- UV-5A	Radiation 3.3 x 10 ⁷ rads-gamma 1 x 10 ⁸ rads-beta							
			Chemical Spray Yes See table 4.1-3							
			Submergence N/A							
		Limitorque Motor: SMB-00-2 Actuator H1BC:	Env. Desig. I							

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 56 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Auxiliary Feed- water Pump Motor	Bingham- Willamette (P.O. No. 13-MM-021)	Westing- house Model No. 4x6x10½B MSD-8 STG Tag No. M-AFB-P01	Temperature 28-120F	Temperature 120F peak	30 days	33 days	N/A	N/A	Type Test and analy- sis	Qualified for 40 years
MSSS			Pressure 0 psig	Pressure 0 psig					Westinghouse Report No. WCAP-8754 Rev. 1 BPC Log No. 13-10407- M021-N001- 11.05-14-2. June 3, 1982	
			Relative Humidity 20-90%	Humidity 20-100%						
			Radiation 1 x 10 ⁵ rads	Radiation 2 x 10 ⁸ rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. II							

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 57 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Auxiliary Feed- water Pumps GS-type Turbine Elec- tronic Control Systems MSSS	Bingham- Willamette Company (P.O. No. 13-MM-021)	Panel and Auxil- iaries Custom- Built Tag No. M-AFA-E01	Temperature 28 to 120F	Temperature 137F	30 days	In progress	Later	Later	Type Test Non-metallic components to be aged to 40 year life except for GPD Relay (10 years) and Limitorque valve operator (5 year) Wyle Qualifi- cation Test Plan No. 57595. Oct. 1, 1982. BPC Log No. 13-10407- M021-185-2 Nov. 12, 1982	Not qualified (w) To be quali- fied for 40 years except GPDNQ relays (10 years) and Limitorque valve operators (5 years) Scheduled Completion Date December 30, 1983
			Pressure 0 psig	Pressure 0 psig						
			Relative Humidity 20-90%	Humidity 95% (note f)						
			Radiation 1×10^5 rads	Radiation 1.1×10^5 rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. II							

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Table 4.1-1

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PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 58 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Auxiliary Feed-water Pumps		Limitorque Model No. SMB-000	Temperature 28 to 120F	Temperature 340F peak	30 days	33 days	None	N/A	Type Test Limitorque test report B-0058	Qualified for 40 years with maintenance
		System AF Tag No. AFA-HV-54	Pressure 0 psig	Pressure 105 psig peak						
			Relative Humidity 20-90%	Relative Humidity 100% (f)						
			Radiation 1×10^5 rads	Radiation 1×10^7 rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. II							

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 59 of 92)

1

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Essential Cooling Water System Motor	Westinghouse Elect. Corp. (P.O. No. 13-MM-093)	Motor: HSWF Frame 6808L System: ECWS Tag Nos. MEWAP01 MEWBP01 System: Fuel Pool Cooling Tag Nos. MPCAP01 MPCBP01	Temperature 50-104F	Temperature 104F	30 days	33 days	N/A	N/A	Type Test and analysis Westinghouse Electric Corporation Report No. WCAP-8754, Rev. 1 Sept. 21, 1982 BPC Log No. 13-10407- MM-093- 235-2 Oct. 7, 1981	Qualified for 40 years
Auxiliary Building			Pressure 0 psig	Pressure 0 psig						
Fuel Pool Cooling Pumps			Relative Humidity 20-90%	Relative Humidity 100% (f)						
Fuel Bldg			Radiation 1 x 10 ⁶ rads	Radiation 2 x 10 ⁶ rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. III, VI							

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Table 4.1-1

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Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status	
MSIV Pressure Trans- mitter	Anchor/ Darling (P.O. No. 13-MM- 234A)	Rosemount 1152GP-0- A-92-PB	Temperature 300F	Temperature 350F peak	30 days	30 days (h) Functional test during accident Post functional test	N/A	Accuracy post func- tional test 0.5% of full scale	Type Test	Review complete(x)	
MSSS		System: MSS Tag Nos. J-SGA- PT-229 J-SGB- PT-230 J-SGA- PT-231 J-SGB- PT-232 J-SGA- PT-233 J-SGB- PT-234 J-SGA- PT-235 J-SGB- PT-236	Pressure 21 psig	Pressure 70 psig peak					2 cycles of 100F, .1 hour; 0F, 1 hour; 200F, 1 hour; 100F, 1 hour	Anchor Darling Report No. E9023-QR-2 Rev. A, April 15, 1980 RMT Report No. 117415 Sept. 24, 1975 Bechtel Log No. 13- 10407- M234A-68-2, April 24, 1980	Scheduled Completion Date June 30, 1983
			Relative Humidity Steam/air mixture	Relative Humidity Steam/air mixture							
			Radiation 1 x 10 ⁶ rads	Radiation 5.0 x 10 ⁶ rads							
			Chemical Spray N/A	Chemical Spray N/A							
			Submergence N/A	Submergence N/A							
			Env. Desig. II								

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Table 4.1-1

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PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 61 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
MSIV Limit Switch	Anchor/ Darling (P.O. No. 13-MM- 234A)	Namco EA180	Temperature 300F	Temperature 415F peak	30 days	33 days	None	N/A	Type Test	Qualified for 1.4 years with maintenance
MSSS		System: MSS Valve Tag Nos. J-SGE-UV- 170 J-SGE-UV- 171 J-SGE-UV- 180 J-SGE-UV- 181 (6/valve)	Pressure 21 psig	Pressure 70 psig peak					BPC Log No. 13-10407- J601A-134-1 Qualified by C-E Namco Program 14273-PE- 5732	Replacement of cam-lok connector thread sealant every 1.4 years and limit switch terminal block every 8 years will provide for quali- fication to 40 years
			Relative Humidity Steam/Air mixture	Relative Humidity 100% (b)						
			Radiation 1 x 10 ⁶ rads	Radiation 8.8 x 10 ⁷ rads γ 1.1 x 10 ⁸ rads β						
			Chemical Spray N/A	Chemical Spray 4400 ppm boron as H ₃ BO ₃ , 110 ppm NH ₃ , pH 7.0-9.0						
			Submergence N/A	Submergence N/A						
			Env. Desig. II							

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 62 of 92)

Type of Equipment/Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
FWIV Pressure Transmitter	Anchor/Darling (P.O. No. 13-MM-234A)	Rosemount 1152GP-0 -A-92-PB	Temperature 300F	Temperature 350F peak	30 days	30 days (h) Functional test during accident Post functional test	N/A	Accuracy Post functional test 0.5% of full scale	Type Test 2 cycles of 100F, 1 hour; OF, 1 hour; 200F, 1 hour; 100F, 1 hour	Review complete(x) Scheduled Completion Date June 30, 1983
MSSS		System: MSS	Pressure 21 psig	Pressure 70 psig						
		Tag Nos. J-SGA-PT-237A	Relative Humidity Steam/Air mixture	Relative Humidity Steam/Air mixture						
		J-SGA-PT-237B	Radiation 1 x 10 ⁶ rads	Radiation 5.0 x 10 ⁶ rads						
		J-SGA-PT-238A	Chemical Spray N/A	Chemical Spray N/A						
		J-SGA-PT-238B	Submergence N/A	Submergence N/A						
		J-SGB-PT-239A	Env. Desig. II							
		J-SGB-PT-239B								
		J-SGB-PT-240A								
		J-SGB-PT-240B								
									Anchor/Darling Report No. E9023-QR-2 Rev. A, April 15, 1980	
									RMT Report No. 117415, September 24, 1975	
									BPC Log No. 13-10407-M234A-68-2, April 24, 1980	

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Amendment 1

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 63 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
FWIV Solenoid Valve	Anchor/ Darling (P.O. No. 13-MM- 234A)	Skinner V5H65590 -125VDC	Temperature 300F	Temperature 328F peak	30 days	30 days (h) Functional test during accident Post func- tional test	N/A	N/A	Type Test	Review completed(y) Scheduled Completion Date June 30, 1983
MSSS		System: MSS	Pressure 21 psig	Pressure 21 psig					Cyclic aging full stroke 100 cycles	
		Tag Nos. J-SGB- UY-132B J-SGB- UY-132D J-SGB- UY-137B J-SGB- UY-137D J-SGA- UY-174B J-SGA- UY-174D J-SGA- UY-177B J-SGA- UY-177D	Relative Humidity Steam/air mixture	Relative Humidity Steam/air mixture					Exercise 150 cycles	
			Radiation 1 x 10 ⁶ rads	Radiation 2.5 x 10 ⁶ rads					Thermal aging 121C for 317.6 hours	
			Chemical Spray N/A	Chemical Spray N/A					Anchor/ Darling Report No. E9023-QR-2, Rev. A, April 15, 1980	
			Submergence N/A	Submergence N/A					Wyle Test Report 43847-2, May 23, 1978	
			Env. Desig. II						BPC Log No. 13-10407- M234A-68-3 Oct. 28, 1980	

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 64 of 92)

Type of Equipment/Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
FWIV Solenoid Valve (cont)		Skinner V5H65600 -125VDC System: MSS Tag Nos. J-SGB- UY-132A J-SGB- UY-132C J-SGB- UY-137A J-SGB- UY-137C J-SGA- UY-174A J-SGA- UY-174C J-SGA- UY-177A J-SGA- UY-177C								

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 65 of 92)

1

Type of Equipment/ Location	Manufacturer	Model No. or Identi- fication	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
FWIV Limit Switch	Anchor/ Darling (P.O. No. 13-MM- 234A)	Namco EA180	Temperature 300F	Temperature 415F Peak	30 days	33 days	N/A	N/A	Type Test	Qualified for 1.4 years with maintenance
MSSS		System: MSS Tag Nos. J-SGA- UV-174 J-SGA- UV-177 J-SGB- UV-132 J-SGB- UV-137 (3/valve)	Pressure 21 psig	Pressure 70 psig peak					BPC Log No. 13-10407- J601A-134-1 Qualified by C-E Namco program 14273-ICE- 5732	Replacement of cam-lok connector thread sealant every 1.4 years and limit switch terminal block every 8 years will provide for quali- fication to 40 years
			Relative Humidity Steam/air mixture	Relative Humidity 100% (b)						
			Radiation 1 x 10 ⁶ rads	Radiation 8.8 x 10 ⁷ rads γ 1.1 x 10 ⁸ rads β						
			Chemical Spray N/A	Chemical Spray 4400 ppm boron as H ₃ BO ₃ , 110 ppm NH ₃ , pH 7.0-9.0						
			Submergence N/A	Submergence N/A						
			Env. Desig. II							

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 66 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
MSIV Solenoid Valve	Anchor/ Darling (P.O. No. 13-MM- 234A)	Skinner VSH65590 -125 VDC	Temperature 300F	Temperature 328F peak	30 days	30 days (h)	N/A	N/A	Type Test	Review complete (y)
MSSS		System: MSS Tag Nos. J-SGB-UY -170B J-SGB-UY -170D J-SGB-UY -170F J-SGB-UY -170H J-SGA-UY -171B J-SGA-UY -171D J-SGA-UY -171F J-SGA-UY -171H J-SGA-UY -180B J-SGA-UY -180D	Pressure 21 psig	Pressure 21 psig		Functional test during accident	N/A	N/A	Cyclic aging full stroke 100 cycles	Scheduled Completion Date
			Relative Humidity Steam/air mixture	Relative Humidity Saturated steam/air mixture		Post func- tional test			Exercise 150 cycles	June 30, 1983
			Radiation 10 ⁶ rads	Radiation 2.5 x 10 ⁶ rads		N/A			Thermal aging 317.6 hours at 121C	Anchor/ Darling Report No. E9023-QR-2, Rev. A, April 15, 1980
			Chemical Spray N/A	Chemical Spray N/A					Wyle Test Report No. 43847-2, May 23, 1978 BPC Log No. 13-1040-7- M234A-68-2, April 24, 1980	
			Submergence N/A	Submergence N/A						
			Env. Desig. II							

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 67 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
MSIV Solenoid Valve (cont)		J-SGA-UY -180F J-SGA-UY -180H J-SGB-UY -181B J-SGB-UY -181D J-SGB-UY -181F J-SGB-UY -181H Skinner V5H65600 125 VDC System: MSS Tag Nos. J-SGB-UY -170A J-SGB-UY -170C J-SGB-UY -170E J-SGB-UY -170G								

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 68 of 92)

Type of Equipment/Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
MSIV Solenoid Valve (cont)		J-SGA-UY -171A J-SGA-UY -171C J-SGA-UY -171E J-SGA-UY -171G J-SGA-UY -180A J-SGA-UY -180C J-SGA-UY -180E J-SGA-UY -180G J-SGB-UY -181A J-SGB-UY -181C J-SGB-UY -181E J-SGB-UY -181G								

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 69 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Electric Low- Leakage Damper Actu- ator	Wal- dinger Corp. (P.O. No. 13-MM- 598)	Model No. ITT NH95	Temperature 28-120F	Temperature 135F peak	30 days	30 days (h) Post Seismic Extreme Environ- mental Test: 8 hrs at 40F and 8 hrs at 135F specimens cycled six times at each specified temperature	Close Re- sponse time not re- ported (ab)	Report States that test units passed ex- treme en- viron- mental func- tion- als	Type Test Aging Per- for- med: 648 hrs at 212F Total mech- anical cyclic aging: 2800 cycles Wyle Report No. 58551 Sept. 22, - 1982 BPC Log No. 13- 10-407- M598- 1712-2 M598- 1715-3 Oct. 5, 1982	Review complete ^(r) Scheduled Completion Date June 30, 1983
Auxiliary Bldg. MSSS Elev. 80' Fuel Bldg.		System: CHCS Tag Nos. MHPAM02 MHPBM01 MHPBM02 MHPAM01	Pressure 0 psig	Pressure 0 psig						
			Humidity 20-90%	Humidity 100% RH (f)						
			Radiation 1 x 10 ⁶ rads	Radiation 1.16 x 10 ⁶ rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. II, III, IV							

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 70 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status		
Pneumatic Low- Leakage Damper Motor	Wal- dinger Corp. (P.O. No. 13-MM- 598)	Model No. Fisher 656	Temperature 50-104F	Temperature 135F peak	30 days	30 days (h) Post Seismic Extreme Environ- mental Test: 8 hrs at 40F and 8 hrs at 135F Specimens cycled 6 times at each specified tempera- ture.	Fisher 656-30 Re- ceiv- ing Test. Open: 5.8 to 7.2 sec. Close: 1.5 to 2 sec. Fisher 656-40 Re- ceiv- ing Test. BPC Open: 13.5 to 15 sec. Close: 4 sec. (ab)	Fisher 656-30 Re- ported Re- sults Open: pass Close: pass Fisher 656-40 Re- ported Re- sults Open: pass Close: pass	Type Test Aging per- formed 648 hrs at 212F. Total mech- anical cyclic aging: 2800 cycles Wyle Report No. 58551 Sept. 22, 1982 Log No. 13- 10407- M598- 1712-2 M598- 1715-3 Oct. 5, 1982	Review complete(r) Scheduled Completion Date June 30, 1983		
Auxiliary Bldg.		System: HVAC - Auxiliary Bldg. Tag Nos. M-HAA-M01 M-HAA-M02 M-HAA-M03 M-HAA-M04 M-HAA-M05 M-HAA-M06 M-HAB-M01 M-HAB-M02 M-HAB-M03 M-HAB-M04 M-HAB-M05 M-HAB-M06 System: HVAC Fuel Bldg. Tag Nos. M-HFA-M01 M-HFB-M01 M-HFA-M02 M-HFB-M02 M-HFA-M03 M-HFB-M03 M-HFA-M04 M-HFB-M04	Pressure 0 psig	Pressure 0 psig								
Fuel Bldg.			Humidity 20-90%	Humidity 100% RH (f)								
			Radiation 1 x 10 ⁶	Radiation 1.27 x 10 ⁶ rads								
			Chemical Spray N/A	Chemical Spray N/A								
			Submergence N/A	Submergence N/A								
			Env. Desig. III, VI									

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Table 4.1-1

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PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 71 of 92)

1

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Solenoid Valves Auxiliary Bldg. Fuel Bldg.	Wal-dinger (P.O. No. 13-MM-598)	Automatic Switch Company Model No. NP8320	Temperature 50 to 104F	Temperature 450 peak	30 days	33 days	N/A	N/A	Type Test ASCO Report No. AQS-21678/TR Rev. A & AQR 67368 Rev. 0 C-E Program 14273-KE-5734 & C-E Letter V-PAK-250	Review complete(r) Scheduled Completion Date June 30, 1983
			Pressure 0 psig	Pressure 78 psig						
			Relative Humidity 20 to 90%	Humidity 100% (f)						
		System: HVAC-Aux. Bldg. Tag Nos. J-HAA-UY-114 J-HAB-UY-115 J-HAA-UY-112 J-HAB-UY-113 J-HAA-UY-125 J-HAB-UY-126 Fuel Bldg. Tag Nos. J-HFA-UY-26 J-HFA-UY-27 J-HFB-UY-25 J-HFB-UY-28	Radiation 10 ⁶ rads	Radiation 1.8 x 10 ⁸ γ 1.1 x 10 ⁸ β						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. III, VI							

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 72 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Limit Switches Auxiliary Bldg Fuel Bldg	Waldinger (P.O. No. 13-MM-598)	Namco Controls EA-170	Temperature 50 to 104F	Temperature 415F peak	30 days	33 days	None	N/A	Type Test BPC Log No. 13-10407- M598-1712 -2 M598- 1715-3 Oct. 5, 1982 Qualified by C-E Namco Program 14273-ICE- 5732	Review complete(r) Scheduled Completion Date June 30, 1983
		System: HVAC-Aux. Bldg Tag Nos. M-HAA-M01 M-HAA-M02 M-HAA-M03 M-HAA-M04 M-HAA-M05 M-HAA-M06 M-HAB-M01 M-HAB-M02 M-HAB-M03 M-HAB-M04 M-HAB-M05 M-HAB-M06 System: HVAC Fuel Bldg M-HFA-M01 M-HFB-M01 M-HFA-M02 M-HFB-M02 M-HFA-M03 M-HFB-M03 M-HFA-M04 M-HFB-M04	Pressure 0 psig	Pressure 70 psig						
			Relative Humidity 20 to 90%	Humidity Steam/air mix (f)						
			Radiation 10 ⁶ rads	Radiation 8.6 x 10 ⁶ rads γ 1.1 x 10 ⁶ rads β						
			Chemical N/A	Chemical N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. III, VI							

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Table 4.1-1

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Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Essential/ Air Handling Unit Motors Auxiliary Bldg MSSS	Reliance Motors (P.O. No. 13-MM- 721A)	System: HVAC- Aux. Bldg Tag Nos. MHAAZ01 MHAAZ02 MHAAZ03 MHAAZ05 MHAAZ06 MHABZ01 MHABZ02 MHABZ03 MHABZ05 MHABZ06 MSSS MHAAZ04 MHABZ04	Temperature 28-120F	Temperature 122F	30 days	33 days	N/A	N/A	Type testing and analysis Reliance Electric Co. Report No. NUC-9 July 1, 1978 Reliance Electric Co. Report No. NUC-9 Supplement (NUC-18) September 29, 1981 BPC Log No. 13-10407- M721A-94-6 March 31, 1982	Qualified for 40 years
			Pressure 0 psig	Pressure 0 psig						
			Relative Humidity 20-90%	Relative Humidity 100% (f)						
			Radiation 1 x 10 ⁶ rads	Radiation 2.04 x 10 ⁸ rads						
			For Motors MHAAZ02 MHABZ02 6.4x10 ⁶ rads							
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. II, III							

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 74 of 92)

1

Type of Equipment/ Location	Manufacturer	Model No. or Identi- fication	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Essential Air Handling Unit Motors	Reliance Motors (P.O. No. 13-MM- 721B)	System: HVAC- Fuel Bldg Tag Nos. M-HFA-J01 M-HFB-J01	Temperature 50-104F	Temperature 122F	30 days	33 days	N/A	N/A	Type test and analysis Reliance Electric Co. Report No. NUC-9 July 1, 1978 Reliance Electric Co. Report No. NUC-9 Supplement (NUC 18) September 29, 1981 BPC Log No. 13-10407- M721B-123-1 June 22, 1978	Qualified for 40 years
Fuel Bldg			Pressure 0 psig	Pressure 0 psig						
			Relative Humidity 20-90%	Relative Humidity 100% (f)						
			Radiation 1 x 10 ⁵ rads	Radiation 2.04 x 10 ⁶ rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. VI							

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Table 4.1-1

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1

Type of Equipment/Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Essential Air Handling Unit Heaters	Nutherm (P.O. No. 13-MM-721B)	System: HVAC-Fuel Bldg Tag Nos. M-HFA-J01 M-HFB-J01	Temperature 50-104F	Temperature 104F	30 days	In progress	N/A	N/A	Type Test To be thermally aged 31, 36 days at 293F, 50 to 90% RH ₀ to mechanically cycled 4000 times Nutherm Intr. Qualification Plan No. 51117P Rev. 1 September 14, 1982 BPC Log No. 13-10407-M900-1-2 September 20, 1982	Not qualified (2) Scheduled Completion Date July 30, 1983
Fuel Bldg			Pressure 0 psig	Pressure 16.5 psig						
			Relative Humidity 20-90%	Relative Humidity 100% (f)						
			Radiation 1×10^5 rads	Radiation 1.1×10^5 rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. VI							

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 76 of 92)

1

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Hydrogen Recom- biner Fan Motor with Class H Insula- tion System Auxiliary Bldg	Westinghouse Electric Corpora- tion (P.O. No. 13-NM-993)	N/A	Temperature 50-104F	Temperature 130C	30 days	33 days	N/A	N/A	Type Test and analysis Westinghouse Report No. MM-9112 BPC Log No. 13-10407- N993-114-2, March 6, 1980	Qualified for 40 years
			Pressure 0 psig	Pressure 0 psig						
			Relative Humidity 20-90%	Relative Humidity 100% (f)						
			Radiation 1 x 10 ⁶ rads	Radiation 2 x 10 ⁶ rads						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. II							

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Table 4.1-1

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PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 77 of 92)

Type of Equipment/Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Hydrogen Recombiner Blower Motor with Class H Insulation System	Rockwell Energy System Group (Atomics International) (P.O. No. 13-NM-993)		Temperature 50-104F	Temperature 245F Inlet	30 days	402 days system operated 1 week at 245F, 35.8 psia, 3 weeks at 190F, 24.1 psia, 48 weeks at 170F, 21.4 psia winding resistance remained at 50 mΩ or better.	N/A	N/A	Type Test Thermal Aging: 125 hours at 170C. Mechanical aging 0.008 in peak to peak at 60 Hz, for 1 hour cycled 277 times. Rockwell International Report No. N139QR 120001 Sept. 19, 1982. BPC Log No. 13-10407-NM-993-134-1 Nov. 9, 1982.	Review complete ^(aa) Scheduled Completion Date Nov. 30, 1983
			Pressure 0 psig	Pressure 35.8 psia						
			Relative Humidity 20-90%	Relative Humidity 100% (f)						
			Radiation 1 x 10 ⁶ rads	Radiation 1.1 x 10 ⁸ rads						
			Chemical Spray, N/A	Chemical Spray Inlet Air sprayed with the following mixture: 108 gallons H ₂ O, 31.3 lbs of boric acid, 18.2 lbs N ₂ S ₂ O ₂ , 4.8 oz of hydrazine pH to 10.5 with sodium triphosphate and sodium hydroxide, also added 0.2 cc acetone (cont)						
Auxiliary Bldg	Blower motor by Reliance Electric									

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ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 78 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Hydrogen Recom- biner Blower Motor with Class H Insula- tion System				0.1 cc paint thinner, 0.1 cc lube oil, 0.1 cc detergent						
			Submergence N/A	Submergence N/A						
Auxiliary Bldg (cont)			Env. Desig. II							

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Amendment .1

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 79 of 92)

1

Type of Equipment/ Location	Manufacturer	Model No. or Identi- fication	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status		
Hydrogen Recom- biner	Rockwell Energy System Group (Atoms Interna- national) (P.O. No. 13-NM-993)	Later	Temperature 50-104F	Later	30 days	Later	N/A	N/A		Not qualified (aa)		
Package except blower motor			Pressure 0 psig								Scheduled completion date Nov. 30, 1983	
Auxiliary Bldg			Relative Humidity 20-90%									
			Radiation 1 x 10 ⁶ rads									
			Chemical Spray N/A									

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 80 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Alter- nating Current Electric Motor Opera- tors	Dresser Industries Rotork Controls Inc. (P.O. No. 13-PM- 221A)	Model No. 7NAB1-43	Temperature 370F peak See fig. 3.1-1	Temperature 385F peak	30 days	30 days Valves cycled 15 times during the pres- surization test LOCA Post Function 5 complete cycles	N/A	N/A	Type Test	Qualified for 40 years
Contain- ment Auxiliary Bldg		System: GRS Tag No. JGRA-UV-1 JHPA-UV-1 JHPB-UV-2	Pressure 60 psig peak. See fig. 3.1-2	Pressure 75 psig					Environmental and Mechan- ical Wear Aging Test: 200F for 400 hours in live steam. Cycled once per hour during environ- mental phase plus 1600 addi- tional tests.	
		System: CHCS JHPA-UV-3 JHPB-UV-4 JHPA-UV-5 JHPB-UV-6	Relative Humidity Steam/Air mixture	Relative Humidity 100% (b)					Wyle Labs Report No., 43979-1, 43979-3, Rev. A, 58364, December 19, 1978	
			Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta	Radiation 2.04 x 10 ⁸ rads					BPC Log No. 13-10407- P221A-165-6, P-221A-188, P-221A-200, P-221A-201 May 21, 1979	
			Chemical Spray Yes See table 4.1-3	Chemical Spray 6200 ppm H ₃ BO ₃ , NaOH to pH of 9.5 (e)					(cont)	
			Submergence N/A	Submergence N/A						
			Env. Desig. I, III							

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 81 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Alternating Current Electric Motor Operators									Rotork Reports TR-3029 TR-3030 Jan. 18, 1982	
Containment Auxiliary Bldg (cont)										

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 82 of 92)

1

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Alter- nating Current Electric Motor Opera- tors (For Cont. Isola- tion Valves)	Limatorque Corpora- tion (P.O. No. 13-PM- 221B) Anchor/ Darling Valve Company	Model No. SB-00-7.5	Temperature 370F peak See fig. 3.1-1	Type test- ing in progress	30 days	Type testing in progress	None	N/A	Type Test and analy- sis per Limatorque Report B0058 and future amendments	Motor not qualified(v) Scheduled Completion Date Aug. 30, 1983
Contain- ment		System: CWS Tag No. JWCB-UV- 61	Pressure 60 psig peak. See fig. 3.1-2							
		Model No. SMB-000-2	Relative Humidity Steam/Air mixture							
		System: RWDS Tag No. JRDA-UV- 23	Radiation 3.3 x 10 ⁷ rads-gamma 2 x 10 ⁸ rads-beta							
			Chemical Spray Yes See table 4.1-3							
			Submergence N/A							
			Env. Desig. I							

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 83 of 92)

1

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Limit Switch (For Pneu- matic Operated Main Steam Blowdown Isola- tion Valves)	Namco Controls - Acme Cleveland Company (P.O. No. 13-PM- 221B) Anchor/ Darling Valve Co.	Model No. EA-180	Temperature 370F peak	Temperature 415F peak	30 days	33 days	None	N/A	Type Test Qualified by C-E Namco program 14273-1CE- 5732	Qualified for 1.4 years with main- tenance. Replacement of cam-lok connector thread sealant every 1.4 years and limit switch terminal block every 8 years will provide qualifi- cation to 40 years
Contain- ment		System: MSS Tag Nos. JSGA-UV- 500P JSGA-UV- 500R	Pressure 60 psig peak. See fig. 3.1-2	Pressure 70 psig peak						
			Relative Humidity Steam/Air mixture	Relative Humidity Steam/Air mixture						
			Radiation 3.3 x 10 ⁷ gamma 2 x 10 ⁸ beta	Radiation 6.6 x 10 ⁷ rads γ 2.2 x 10 ⁸ rads β						
			Chemical Spray 4400 ppm boron as H ₃ BO ₃ , 50 ppm hydrazine, pH 7.0-8.5	Chemical Spray 4400 ppm boron as H ₃ BO ₃ , 110 ppm NH ₃ , pH 7.0-9.0						
			Submergence N/A							
			Env. Desig. I							

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 84 of 92)

1

Type of Equipment/Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Requirement	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Alternating and Direct Current Electric Motor Operators (For Main Steam and Feed-water Isolation Valves)	Limitorque Corporation (P.O. No. 13-PM-221B) Anchor/Darling Valve Co.	Model No. SB-0-40	Temperature 300F	Temperature 340F peak (dc) 250F peak (ac)	30 days	33 days	None	N/A	Type Test Limitorque Report No. B0058, January 11, 1981 BPC Log No. 13-10407-P221B-349-1, March 4, 1981	Qualified for 40 years with maintenance
		System: MSSS								
		Tag No. JSGA-UV-134	Pressure 21 psig	Pressure 105 psig peak (dc) 25 psig peak (ac)						
		Tag No. JSGA-UV-138								
		Model No. SMB-00-25	Relative Humidity 100%	Relative Humidity 100%						
		System: AFS								
		Tag No. JAFB-UV-34	Radiation 1×10^6 rads	Radiation 1×10^7 rads (dc) 2×10^7 rads (ac)						
		Tag No. JAFB-UV-35								
MSSS above el. 100 ft		Tag No. JAFA-UV-36	Chemical Spray N/A	Chemical Spray N/A						
		Tag No. JAFA-UV-37	Submergence N/A	Submergence N/A						
			Env. Desig. II							

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REVIEW TECHNIQUE

Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 85 of 92)

1

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Limit Switch (For Pneu- matic Operated Main Steam & Feed- water Isola- tion Gate Valves)	Namco Controls - Acme Cleveland Company (P.O. No. 13-PM- 221B) Anchor/ Darling Valve Co.	Model No. EA-180	Temperature 300F	Temperature 415F	30 days	33 days	None	N/A	Type Test Qualified by C-E Namco Program 14273-PE- 5732	Qualified for 1.4 years with maintenance Replacement of cam-lok connector thread sealant every 1.4 years and limit switch terminal block every 8 years will provide qualifi- cation to 40 years
MSSS		System: MSS	Pressure 21 psig	Pressure 78 psig						
		Tag No. JSGE-UV- 169	Relative Humidity 100%	Relative Humidity Stm/Air Mix (b)						
		JSGE-UV- 183	Radiation 1 x 10 ⁶ rads	Radiation 8.8 x 10 ⁷ rads γ 1.1 x 10 ⁸ rads β						
		JSGB-UV- 500Q								
		JSCA-UV- 500S	Chemical Spray N/A	Chemical Spray N/A						
		JSCA-UV- 172								
		JSGB-UV- 130	Submergence N/A	Submergence N/A						
		JSGB-UV- 135								
		JSGB-UV- 175	Env. Desig. II							

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 86 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Solenoid Valves (For Pneu- matic Operated Main Steam & Feed- water Isola- tion Gate Valves)	Automatic Switch Co. (ASCO) (P.O. No. 13-PM- 221B) Anchor/ Darling Valve Co.	Model No. NP831654E	Temperature 300F	Temperature 450F peak	30 days	33 days	N/A	N/A	Type Test ASCO Report No. AQS 21678/TR Rev. A and AQR 67368 Rev. 0 and CE letter V-PAK-250	Qualified for 40 years with maintenance
MSSS above el. 100 ft		System: MSS	Pressure 21 psig	Pressure 78 psig peak						
		Tag No. JSGA-UY- 169A	Relative Humidity 100%	Relative Humidity 100%						
		JSGB-UY- 169B	Radiation 1 x 10 ⁶ rads	Radiation 1.8 x 10 ⁸ γ 1.1 x 10 ⁸ β						
		JSGA-UY- 183A								
		JSGB-UY- 183B	Chemical Spray N/A	Chemical Spray N/A						
		JSGB-UY- 500Q								
		JSGA-UY- 500S	Submergence N/A	Submergence N/A						
		Model No. NP831665E	Env. Desig. II							
		System: MSS								
	Tag No. JSGA-UY- 172A									
JSGA-UY- 172B										
JSGB-UY- 130A										
JSGB-UY- 130B										
JSGA-UY- 175A										
JSGA-UY- 175B										
JSGB-UY- 135A										
JSGB-UY- 135B										

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 87 of 92)

1

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Alter- nating Current Electric Motor Opera- tors	Limatorque Corpora- tion (P.O. No. 13-PM- 221B) Anchor/ Darling Valve Co.	Model No. SB-00-7.5	Temperature 50-104F	Temperature 250F peak	30 days	33 days	N/A	N/A	Type Test and Analysis Limatorque Report No. B0058, January 11, 1981 BPC Log No. 13-10407- P221B-349- 1, March 4, 1981	Qualified for 40 years with maintenance
Auxiliary Bldg		System: CWS Tag Nos. JWCB-UV- 63 JWCA-UV- 62	Pressure 0 psig	Pressure 25 psig peak						
			Relative Humidity 90%	Relative Humidity 100%						
			Radiation 1 x 10 ⁶ rads	Radiation 2 x 10 ⁷ rads						
			Chemical Spray N/A	N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. III							

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Table 4.1-1

**ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 88 of 92)**

Type of Equipment/ Location	Manufacturer	Model No. or Identi- fication	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Limit Switch (For Pneu- matic Operated Cont. Radwaste Sump Pump Dis- charge Valve)	Namco Controls - Acme Cleveland Company (P.O. No. 13-PM- 221B) Anchor/ Darling Valve Co.	Model No. EA-180	Temperature 50-104F	Temperature 415F peak	30 days	30 days	None	N/A	Type Test Qualified by C-E Namco Program 14273-PE- 5732	Qualified for 2.3 years with maintenance Replacement of cam-lok connector thread sealant every 2.3 years and limit switch terminal block every 18 years will provide qualifi- cation to 40 years .
Auxiliary Bldg		System: RWDS Tag No. JRDB-UV- 24	Pressure 0 psig	Pressure 78 psig						
			Relative Humidity 20-90%	Relative Humidity Stm/Air Mix (f)						
			Radiation 1 x 10 ⁶ rads	Radiation 8.8 x 10 ⁷ rads γ 1.1 x 10 ⁸ rads β						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. III							

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 89 of 92)

Type of Equipment/ Location	Manufacturer	Model No. or Identifi- cation	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Solenoid Valves (For Pneu- matic Operated Cont Radwaste Sump Pump Dis- charge Valve) Auxiliary Bldg	Automatic Switch Company (ASCO) (P.O. No. 13-PM- 221B) Anchor/ Darling Valve Co.	Model No. NP831654E	Temperature 50-104F	Temperature 450F peak	30 days	33 days	N/A	N/A	Type Test ASCO Report AQS-21678/ TR Rev. A & AQR-67368 Rev. 0 & C-E letter V-PAK-250	Qualified for 40 years with maintenance
		System: RWDS Tag No. JRDB-UY- 24	Pressure 0 psig	Pressure 78 psig						
			Relative Humidity 20-90%	Relative Humidity 100% (f)						
			Radiation 1 x 10 ⁶ rads	Radiation 1.8 x 10 ⁶ _y 1.1 x 10 ⁶ _g						
			Chemical Spray N/A	Chemical Spray N/A						
			Submergence N/A	Submergence N/A						
			Env. Desig. III							

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1,2&3 (Sheet 90 of 92)

1

Type of Equipment/ Location	Manufacturer	Model No. or Identification	Abnormal or Accident Environment (a)	Environment to Which Qualified	Operability Requirement	Operability Demonstrated	Accuracy or Response Time Require- ment	Accuracy or Response Time Demon- strated	Qualification Report & Method	Qualification Status
Solenoid Valves (For Pneu- matic Operated Main Steam Blowdown Isola- tion Valves) Contain- ment	Automatic Switch Co. (ASCO) (P.O. No. 13-PM- 221B), Anchor Darling	Model No. NP831664E	Temperature 370F peak See fig. 3.1-1	Temperature 420F	30 days	30 days (h)	N/A	N/A	Type Test Asco Report No. . AQS-67368 rev. 0 & C-E letter V-PAK-250	Qualified for 40 years EPDM seat for 20 years
		System: MSS								
		Tag No. JSCA-UV- 500P JSCB-UV- 500R	Pressure 60 psig See fig. 3.1-2	Pressure 62 psig						
			Relative Humidity Steam/air mixture	Relative Humidity Steam/air mixture						
			Radiation 3.3×10^7 rads-gamma 2×10^8 rads-beta	Radiation 2.02×10^8 rads						
			Chemical Spray Yes See table 4.1-3	Chemical Spray 3000 ppm Boric Acid 0.064 Molar Sodium Thiosul- fate Add NaOH to pH = 10.5						
			Submergence N/A							
			Env. Desig. I							
				Submergence N/A						

PVNGS 1,2&3
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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1, 2 & 3 (Sheet 91 of 92)

1

NOTES:

- a. Where equipment is subjected to more than one harsh environment, only the worst case environment is indicated.
- b. The qualification environment of 100% relative humidity is equivalent to the steam/air mixture relative humidity environment.
- c. Results of prior tests demonstrated no significant impact of chemical spray; no chemicals were used in the qualification test.
- d. The environment to which this equipment is qualified is of a higher pH range. This higher pH results in a more caustic and corrosive environment than that postulated by the abnormal/accident environment conditions of table 4.1-3.
- e. In section 3.8 it is stated that no significant difference in the various materials' performance should occur due to the change in the hydrazine concentration of up to 200 ppm. Therefore, the omission of hydrazine in the qualification environment does not invalidate the qualification of this piece of environment.
- f. Qualifying the equipment only to the high end of the humidity range is acceptable since electrical equipment experiences no adverse dry-out effect, at the 20% RH point or above.
- g. The component materials and terminal blocks that constitute these assemblies were exposed to a radiation level of 2×10^8 rads and remained functional. Other items were tested to 1×10^8 rads.
- h. Refer to qualification package located in the central file.
- i. Conduit attenuates beta radiation.
- j. Awaiting vendor confirmation of PH ≥ 8.5 .
- k. Awaiting documentation for the resolution of open items pertaining to the justification of aging time and temperature.

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Table 4.1-1

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (BOP)
PALO VERDE NUCLEAR GENERATING STATION UNITS 1, 2 & 3 (Sheet 92 of 92)

1

- l. Awaiting results of terminal block testing for influence on instrument loop accuracy.
- m. Awaiting the results of the flame test report.
- n. Awaiting resolution of open items discovered in testing.
- o. Preparing the final qualification package.
- p. Commercial negotiations in process with vendor.
- q. Awaiting reception of certification of qualification for Reliance motors.
- r. Justification of aging time and temperature required.
- s. Awaiting documentation of submergence test results.
- t. Awaiting completion of test program and submission of qualification package.
- u. Analysis presently being performed to establish similarity between tested and supplied models.
- v. In-containment motors are not qualified. Motors will be changed upon completion of testing.
- w. Testing not yet started.
- x. Awaiting qualification of hydraulic pressure transmitters - safety equipment status only.
- y. Awaiting resolution of temperature profile MSLB test and justification of the 10 degree rule.
- z. Awaiting receipt of test report.
- aa. Supplier re-evaluating generic qualification program.
- ab. The required response times were established by the vendor. The project does not have a requirement for response time.

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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS (1,2&3 (Sheet 1 of 34))

1

Type of Equipment/Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demonstrated	Accuracy or Response Time Requirements	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Motor Operated Valve Actuator	Limi-torque	System: SIS	Temperature 104F	Temperature 250F	30 days	33 days	None	Not Applicable	Type test and analysis per Limi-torque Report B0058, CE Program 14273-PE-5731	Qualified for 40 years with preventative maintenance (a)
Auxiliary Building		Model/Tag No:	Pressure Atmo-spheric	Pressure 25 psig						
		SB-0-25 SI-671, SI-672	Radiation 1 x 10 ⁶ rads y Radiation for motors to valves SI-615, SI-625, SI-635, SI-645, SI-657, SI-658, SI-685, SI-694, SI-306, SI-307, SI-655, SI-656, SI-686, SI-696	Radiation 2 x 10 ⁷ rads y						
		SB-3-150 SI-615, SI-625 SI-635, SI-645								
		SMB-000-5 SI-657, SI-658 SI-678, SI-679								
		SMB-00-10 SI-604, SI-609 SI-674, SI-676								
		SMB-0-10 SI-698, SI-699								
		SMB-0-25 SI-684, SI-685 SI-687, SI-688 SI-689, SI-693 SI-694, SI-695								
		SMB-1-40 SI-306, SI-307 SI-655, SI-656 SI-690, SI-691			6.4 x 10 ⁶ rads y					
		SMB-1-60 SI-683, SI-686 SI-692, SI-696			Humidity 90% RH	Humidity 100% RH				
	Chemical Spray None	Chemical Spray Not Applicable								
		Submergence None	Submergence Not Applicable							

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PVNGS 1,2&3

Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS. (1,2&3 (Sheet 2 of 34)

1

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status
Motor Operated Valve Actuator	Limi- torque	System: CVCS	Temperature 104F	Temperature 250F	30 days	33 days	None	Not Appli- cable	Type test and anal- ysis per Limi- torque Report B0058, CE Pro- gram 14273- PE- 5731	Qualified for 40 years with preventative maintenance (a)
Auxiliary Building		Model/Tag No:	Pressure Atmo- spheric	Pressure 25 psig						
		SB-1-60 CH-530, CH-531	Radiation 1 x 10 ⁶ rads y	Radiation 2 x 10 ⁷ rads y						
		SMB-00-15 CH-524, CH-255								
			Humidity 90% RH	Humidity 100% RH						
			Chemical Spray None	Chemical Spray Not Applicable						
		Submergence None	Submergence Not Applicable							

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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS (1,2&3 (Sheet 3 of 34)

1

Type of Equipment/Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demonstrated	Accuracy or Response Time Requirements	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status	
Motor Operated Valve Actuator	Limi-torque	System: SIS	Temperature 104F	Temperature 340F (max)	30 days	33 days	None	Not Appli-cable	Type test and analysis per Limi-torque Report B0058, CE Program 14273-PE-5731	Qualified for 40 years with preventative maintenance (a)	
Auxiliary Building		Model/Tag No:	Pressure Atmo-spheric	Pressure 105 psig (max)							
		SMB-0-25(DC) SI-321,SI-331	Radiation 1 x 10 ⁶ rads γ	Radiation 1 x 10 ⁷ rads γ							
			Humidity 90% RH	Humidity 100% RH							
			Chemical Spray None	Chemical Spray Not Applicable							
			Submergence None	Submergence Not Applicable							

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PVNGS 1,2&3

Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS (1,2&3 (Sheet 4 of 34)

1

Type of Equipment/Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demonstrated	Accuracy or Response Time Requirements	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Motor Operated Valve Actuator	Limi-torque	System: SIS	Temperature 104F	Temperature 250F	30 days	33 days	None	Not Applicable	Type test and analysis per Limi-torque Report B0058, CE Program 14273-PE-5731	Qualified for 6 years with preventive maintenance. (a)
Auxiliary Building		Model/Tag No:	Pressure Atmospheric	Pressure 25 psig						
		SMC-04-5 SI-664, SI-665 SI-668, SI-669	Radiation 1 x 10 ⁶ rads γ	Radiation 4.2 x 10 ⁷ rads γ						
		SMC-04-7-1/2 SI-616, SI-617 SI-626, SI-627 SI-636, SI-637 SI-646, SI-647 SI-666, SI-667	Radiation for motors to valves SI-668 SI-669							
			6.4 x 10 ⁶ rads γ							
			Humidity 90% RH	Humidity 100% RH						
			Chemical Spray None	Chemical Spray Not Applicable						
			Submergence None	Submergence Not Applicable						

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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS (1,2&3 (Sheet 5 of 34))

1

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status
Motor Operated Valve Actuator	Limi- torque	System: SIS	Temperature 370F peak	Testing in Progress	Remain operable for 30 days fol- lowing DBE after 40 years of normal operation	Testing in progress	None	Not Appli- cable	Type test and anal- ysis per Limi- torque Report B0058 and future amend- ments	Motor not qualified
Contain- ment Building		Model/Tag No:	Pressure 60 psig peak							Testing in progress
		SMB-00-10 SI-673,SI-675	Radiation 3.3 x 10 ⁷ rads γ 1 x 10 ⁸ rads β							
		SMB-1-40 SI-653,SI-654								
		SMB-1-60 SI-614,SI-624 SI-634,SI-644	Humidity Steam/Air Mixture							
		SMB-3-100 SI-651,SI-652	Chemical Spray 4400 ppm boron as H ₃ BO ₃ , 50 ppm hydrazine, pH 7.0-8.5							
										Submergence None

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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS (1,2&3 (Sheet 6 of 34))

Type of Equipment/Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demonstrated	Accuracy or Response Time Requirements	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Valve Limit Switch for Position Indication of Pneumatic Operated Valve (2 per valve)	Namco Controls	Model: EA180-11302	Temperature 370F peak	Temperature 415F peak	30 days	33 days	None	Not Applicable	Type test and analysis per CE Program 14273-PE-5732	Qualified for 1.4 years with preventative maintenance
		System: SIS	Pressure 60 psig peak	Pressure 70 psig peak						
		Valve Tag Nos: SI-322, SI-332 SI-611, SI-618 SI-621, SI-628 SI-631, SI-638 SI-641, SI-648 SI-682	Radiation 3.3 x 10 ⁷ rads γ 1 x 10 ⁸ rads β	Radiation 8.8 x 10 ⁷ rads γ 1.1 x 10 ⁸ rads β						
		System: CVCS	Humidity Steam/Air Mixture	Humidity Steam/Air Mixture						
		Valve Tag Nos: CH-506, CH-515 CH-516, CH-560 CH-240	Chemical Spray 4400 ppm boron as H ₃ BO ₃ , 50 ppm hydrazine, pH 7.0-8.5	Chemical Spray 4400 ppm boron as H ₃ BO ₃ , 110 ppm NH ₃ , pH 7.0-9.0						
			Submergence if below plant elevation 90'6"	Submergence None						
Containment Building										Replacement of cam-lok connector thread sealant every 1.4 years and limit switch terminal block every 8 years will provide qualification to 40 years.

Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS (1,2&3 (Sheet 7 of 34))

11

Type of Equipment/ Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status
Valve Limit Switch for Position Indica- tion of Pneuma- tic Operated Valve (2 per valve)	Namco Con- trols	Model: EA180-11302	Temperature 104F	Temperature 415F peak	Operate for 30 days following DBE after 40 years of normal operation	Position indica- tion main- tained for 33 days fol- lowing DBE after simulated 40 years of normal operation including 50,025 cycles by type test and analysis	None	Not Appli- cable	Type test and anal- ysis per CE Pro- gram 14273- PE- 5732	Qualified for 2.3 years with preven- tative maintenance
		System: CVCS	Pressure Atmo- spheric	Pressure 70 psig peak						
		Valve Tag Nos: CH-505,CH-523 CH-561,CH-580	Radiation 1×10^6 rads γ	Radiation 8.8×10^7 rads γ 1.1×10^8 rads β						
			Humidity 90% RH	Humidity Steam/Air Mixture						
			Chemical Spray None	Chemical Spray 4400 ppm boron as H_3BO_3 , 110 ppm NH_3 , pH 7.0-9.0						
			Submergence None	Submergence None						
Auxiliary Building										Replacement of cam-lok connector thread sealant every 2.3 years and limit switch terminal block every 18 years will provide qualifi- cation to 40 years.

Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS (1,2&3 (Sheet 8 of 34)

1

Type of Equipment/Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demonstrated	Accuracy or Response Time Requirements	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Electric Solenoid Valve	Valcor Engineering	System: SS	Temperature 370F	Temperature 385F peak	Operate for 30 days following DBE after 40 years of normal operation	Valve cycling and position indication maintained for 33 days following DBE after simulated 40 years of normal operation including 50,000 cycles	None	Not Applicable	Type test per 14273-PE-5733	Qualified to 10 years with maintenance (c)
Containment Building		Model/Tag No.	Pressure 65 psig	Pressure 66 psig						
		V-526-5683-45 SS-203, SS-204, SS-205	Radiation 3.3 x 10 ⁷ rads γ 1 x 10 ⁸ rads β	Radiation 3.5 x 10 ⁷ rads γ 1.1 x 10 ³ rads β						
		System: SCCS	Humidity Steam/Air Mixture	Humidity Steam/Air Mixture						
		Model/Tag No.	Chemical Spray 4400 ppm boron as H ₃ BO ₃ , 50 ppm hydrazine pH Adjusted to 7.0-8.5 using Na ₃ PO ₄	Chemical Spray 4400 ppm boron as H ₃ BO ₃ , 50 ppm hydrazine pH 7.0-8.5						
			Submergence If below plant elevation 90'6"	Submergence None						

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Amendment 1

Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS (1,2&3 (Sheet 9 of 34))

1

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status	
Electric Solenoid Valve	Valcor Engi- neering	System: SS	Temperature 104F peak	Temperature 385F peak	Operate for 30 years following DBE after 40 years of normal operation	Valve cycling and posi- tion indica- tion main- tained for 33 days fol- lowing DBE after simulated 40 years of normal operation including 50,000 cycles	None	Not Appli- cable	Type test per 14273- PE- 5733	Qualified to 10 years with maintenance (c)	
Auxiliary Building		Model/Tag No.	V-526-5683-6 SS-200, SS-201, SS-202	Pressure Atmos- pheric							Pressure 66 psig
		System: SCCS		Radiation 3.5 x 10 ⁷ rads γ 1.1 x 10 ⁸ rads β							
			Model/Tag No.	V-526-5683-6 SC-200, SC-201							Radiation 1 x 10 ⁶ rads
		V-526-5683-5 SC-219, SC-221, SC-223, SC-225, SC-227, SC-228	Humidity 90% RH								Chemical Spray 4400 ppm boron as H ₃ BO ₃ , 50 ppm hydrazine pH 7.0-8.5
			System: IRS	Chemical None							
				Model/Tag No.							
		V-526-5292- 17-1 IR-680, IR-681									

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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS (1,2&3 (Sheet 10 of 34))

1

Type of Equipment/Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demonstrated	Accuracy or Response Time Requirements	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Solenoid Process System Valve	Target Rock Corp.	System: SIS	Temperature 370F peak	Testing in progress	Remain operable for 30 days following DBE after 40 years of normal operation	Testing in progress	None	Not Applicable	Type test per CE Program 14273-PE-5733	Not qualified (m)
Containment Building		Model/Tag Nos: 77L-001 SI-605,SI-606 SI-607,SI-608 SI-613,SI-623 SI-633,SI-643	Pressure 60 psig peak							Scheduled Completion Date Dec 30, 1983
		System: CVCS	Radiation 3.3 x 10 ⁷ rads γ 1 x 10 ⁸ rads β							
			Model/Tag Nos: 77L-003 CH-203,CH-205		Humidity Steam/Air Mixture					
			Chemical Spray 4400 ppm boron as H ₃ BO ₃ , 50 ppm hydrazine pH 7.0-8.5							
			Submergence None							

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Amendment 1

Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS (1,2&3 (Sheet 11 of 34))

1

Type of Equipment/Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demonstrated	Accuracy or Response Time Requirements	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Air Solenoid Valve for Pilot Control of Pneumatic Operated Valve Containment Building	Automatic Switch Co.	Model: NP8320A187E	Temperature 370F peak	Temperature 450F peak	Operate for 30 days following DBE after 40 years of normal operation	Close and remain closed or operate for 33 days (792 hours) following DBE after simulated 40 years of normal operation including 47,460 cycles by type test and analysis	None	Not Applicable	Type test and analysis per ASCO Reports AQS-21678/TR, Rev A; AGR-67368, Rev 0; CE Program 14273-PE-5734, Rev 1; CE letter V-PAK-250	Qualified for 40 years with preventative maintenance (c)
		System: SIS	Pressure 60 psig peak	Pressure 78 psig peak						
		Valve Tag Nos: SI-322, SI-332 SI-611, SI-618 SI-621, SI-628 SI-631, SI-638 SI-641, SI-648 SI-682	Radiation 3.3×10^7 rads γ 1×10^8 rads β	Radiation 1.82×10^8 rads γ 1.1×10^8 rads β						
			Humidity Steam/Air Mixture	Humidity Steam/Air Mixture						
			Chemical Spray 4400 ppm boron as H_3BO_3 , 50 ppm hydrazine, pH 7.0-8.5	Chemical Spray 6626 ppm boron as H_3BO_3 , 196 ppm hydrazine, pH 7.0-8.5						
			Submergence If below plant elevation 90'6"	Submergence None						

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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS (1,2&3 (Sheet 12 of 34))

11

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status
Air Solenoid Valve for Pilot Control of Pneuma- tic Operated Valve Contain- ment Building	Automa- tic Switch Co.	Model: NP8320A1B7E	Temperature 370F peak	Temperature 450F peak	Following DBE remain operable for 30 days after 40 years of normal operation	Close and remain closed or oper- ate for 33 days (792 hours) following DBE after simulated 40 years of normal operation including 47,460 cycles by type test and analysis	None	Not Appli- cable	Type test and anal- ysis per ASCO Re- ports AQS- 21678/ TR, Rev A; AGR- 67368, Rev 0; CE Pro- gram 14273- PE- 5734, Rev 0; CE letter V-PAK- 250	Qualified for 40 years with preventative maintenance (c)
		System: CVCS	Pressure 60 psig peak	Pressure 78 psig peak						
		Valve Tag Nos: CH-506,CH-515 CH-516,CH-560 CH-240	Radiation 3.3 x 10 ⁷ rads γ 1 x 10 ⁸ rads β	Radiation 1.82 x 10 ⁸ rads γ 1.1 x 10 ⁸ rads β						
			Humidity Steam/Air Mixture	Humidity Steam/Air Mixture						
			Chemical Spray 4400 ppm boron as H ₃ BO ₃ , 50 ppm hydrazine, pH 7.0-8.5	Chemical Spray 6626 ppm boron as H ₃ BO ₃ , 196 ppm hydrazine pH 7.0-8.5						
			Submergence If below plant ele- vation 90'6"	Submergence None						

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Amendment 1

Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS (1,2&3 (Sheet 13 of 34))

1

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status
Air Solenoid Valve for Pilot Control of Pneuma- tic Operated Valve Auxiliary Building	Automa- tic Switch Co.	Model: NP8320A187E	Temperature 104F	Temperature 450F peak	Remain operable for 30 days following DBE after 40 years of normal operation	Close and remain closed or operate for 33 days (792 hours) following DBE after simulated 40 years of normal operation including 47,460 cycles by test and analysis	None	Not Appli- cable	Type test and anal- ysis per ASCO Re- ports AQS- 21678/ TR, Rev A; AGR- 67368, Rev 0; CE Pro- gram 14273- PE- 5734, Rev 0; CE letter V-PAK- 250	Qualified for 40 years with preventative maintenance (c)
		System: CVCS	Pressure Atmo- spheric	Pressure 78 psig peak						
		Valve Tag Nos: CH-505, CH-523 CH-561	Radiation 1×10^6 rads γ	Radiation 1.82×10^8 rads γ 1.1×10^8 rads β						
			Humidity 90% RH	Humidity Steam/Air Mixture						
			Chemical Spray None	Chemical Spray 6626 ppm boron as H_3BO_3 , 196 ppm hydrazine, pH 7.0-8.5						
			Submergence None	Submergence None						

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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS (1,2&3 (Sheet 14 of 34))

1

Type of Equipment/Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demonstrated	Accuracy or Response Time Requirements	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Air Solenoid Valve for Pilot Control of Pneumatic Operated Valve	Automatic Switch Co.	Model: NP8321A1E	Temperature 104F	Temperature 450F peak	Remain operable for 30 days following DBE after 40 years of normal operation	Close and remain closed or operate for 33 days (792 hours) following DBE after simulated 40 years of normal operation and including 40,000 cycles by type test and analysis	None	Not Applicable	Type test and analysis per ASCO Reports AQS-21678/TR, Rev A; AGR-67368, Rev 0; CE Program 14273-PE-5734, Rev 0; CE letter V-PAK-250	Qualified for 40 years with preventative maintenance (c)
		System: CVCS	Pressure Atmospheric	Pressure 78 psig peak						
		Valve Tag No: CH-580	Radiation 1×10^6 rads γ	Radiation 1.82×10^8 rads γ 1.1×10^8 rads β						
			Humidity 90% RH	Humidity Steam/Air Mixture						
			Chemical Spray None	Chemical Spray 6626 ppm boron as H_3BO_3 , 196 ppm hydrazine, pH 7.0-8.5						
			Submergence None	Submergence None						
Auxiliary Building										

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Table 4.1-2

**ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS (1,2&3 (Sheet 15 of 34))**

1

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified.	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status
Motor for High Pressure Safety Injec- tion Pump	Westing- house Large AC Motor Divi- sion	Model: 5810H WP2-	Temperature 104F	Temperature 161F	30 days	160,778 hours	None	Not Appli- cable	Westing- house Report WCAP- 8754, Rev 1 with Bib- liog- raphy by test and anal- ysis	Qualified for 40 years with preventative maintenance
Auxiliary Building		System: SIS	Pressure Atmo- spheric	Pressure Atmo- spheric						
		Motor S/N: 76F60561-1 76F60563-1 76F60564-1 77F14115-1 77F14116-1 77F14117-1	Radiation 1 x 10 ⁶ rads	Radiation 2 x 10 ⁸ rads						
			Humidity 90% RH	Humidity 100% RH						
			Chemical Spray None	Chemical Spray Not Applicable						
		Submergence None	Submergence Not Applicable							
									Seismic by anal- ysis West- ing- house Report 76F- 60562	
									Environ- mental Quali- fica- tion Pro- gram 14273- PE- 5400 Rev 02	

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PVNGS 1,2&3

Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS (1,2&3 (Sheet 16 of 34))

1

Type of Equipment/Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demonstrated	Accuracy or Response Time Requirements	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status	
Motor for Low Pressure Safety Injection Pump	Westinghouse Large AC Motor Division	Model: 5010P39 WP2	Temperature 104F	Temperature 123F	30 days	135,487 hours	None	Not Applicable	Westinghouse Report WCAP-8754, Rev 1 with Bibliography by test and analysis	Qualified for 40 years with preventative maintenance	
Auxiliary Building		System: SIS	Pressure Atmospheric	Pressure Atmospheric							
		Motor S/N: 76F60574-1 76F60574-2 76F60576-1 76F60576-2 76F60578-1 76F60578-2	Radiation 6.4 x 10 ⁶ rads	Radiation 2 x 10 ⁸ rads							
			Humidity 90% RH	Humidity 100% RH							
			Chemical Spray None	Chemical Spray Not Applicable							
		Submergence None	Submergence Not Applicable								
								Seismic per Westinghouse Report 76F-60575			
								Environmental Qualification Program 14273-PE-5401 Rev 02			

Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS (1,2&3 (Sheet 17 of 34)

1

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Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status
Motor for Contain- ment Spray Pump	Westing- house Large AC Motor Divi- sion	Model: 5808P39 WP2	Temperature 104F	Temperature 159F	30 days	147,559 hours	None	Not Appli- cable	Westing- house Report WCAP- 8754, Rev 1 with bib- liog- raphy by test and anal- ysis	Qualified for 40 years with preventative maintenance
Auxiliary Building		System: CSS	Pressure Atmo- spheric	Pressure Atmo- spheric						
		Motor S/N: 76F60580-1 76F60580-2 76F60582-1 76F60582-2 76F60583-1 76F60583-2	Radiation 1 x 10 ⁶ rads	Radiation 2 x 10 ⁸ rads						
			Humidity 90% RH	Humidity 100% RH						
			Chemical Spray None	Chemical Spray Not Applicable						
		Submergence None	Submergence Not Applicable							
									Seismic per West- ing house Report- 76F- 60581	
									Environ- mental Quali- fica- tion Pro- gram 14273- PE- 5402 Rev 02	

Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS (1,2&3 (Sheet 18 of 34))

1

Type of Equipment/Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demonstrated	Accuracy or Response Time Requirements	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Motor for Charging Pump	Westinghouse Medium Motor and Gearing Division	Model: 404TS DP	Temperature 104F	Temperature 181F	30 days	350,400 hours by test and analysis	None	Not Applicable	Westinghouse Report MM-9112 and appendices C and E of Westinghouse Report WCAP-9112 by test and analysis	Qualified for 40 years with preventative maintenance
Auxiliary Building		System: CVCS	Pressure Atmospheric	Pressure Atmospheric						
		Motor S/N: SO 76C62115 7703-01-001 7703-01-002 7703-01-003 7707-02-001 7707-02-002 7707-02-003 7708-03-001 7708-03-002 7708-03-003	Radiation 1 x 10 ⁶ rads	Radiation 2 x 10 ⁸ rads						
			Humidity 90% RH	Humidity 100% RH						
			Chemical Spray None	Chemical Spray Not Applicable						
			Submergence None	Submergence Not Applicable						
								Seismic per Westinghouse Report BS25411-MG		
								Environmental Qualification Program 14273-PE-5403 Rev 03		

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PVNGS 1,2&3

Table 4.1-2

**ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS (1,2&3 (Sheet 19 of 34))**

1

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status
Motor for Spray Chemical Addition Pump	Reliance Elec- tric Co.	Model: 18FTC TEFC-XT	Temperature 104F	Temperature 471F	30 days	350,000 hours	None	Not Appli- cable	Reliance Report NUC-9 with Sup- ple- ment by test and anal- ysis	Qualified for 40 years with preventative maintenance
Auxiliary Building		System: IRS	Pressure Atmo- spheric	Pressure Atmo- spheric						
		Motor S/N: YM209071A1 YM209071A3 YM209071A4 YM209071A5 YM209071A8 YM209071A12	Radiation 1 x 10 ⁶ rads	Radiation 2 x 10 ⁶ rads						
			Humidity 90% RH	Humidity 100% RH						
			Chemical Spray None	Chemical Spray Not Applicable						
		Submergence None	Submergence Not Applicable							
								Seismic per Action Report 13831		
									Environ- mental Quali- fica- tion Pro- gram 14273- PE- 5404 Rev 3	

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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS (1,2&3 (Sheet 20 of 34)

1

Type of Equipment/Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demonstrated	Accuracy or Response Time Requirements	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Level Transmitter	ITT Barton	Model: 764	Temperature 370F	Temperature 420F	Accident mitigation not applicable	100 days	(1)	(e)	E.Q. Program Document 14273-1CE-3535	Review complete (e) expect qualification for 40 years
Containment Building		System: PAMS	Pressure 60 psig	Pressure 75 psig						Scheduled Completion Date Oct 30, 1983
		CE Tag No: LT-110X,Y	Relative Humidity Sat. Steam/Air Mixture	Relative Humidity Sat. Steam/Air Mixture	Post accident monitoring 30 days				Barton report R3-764 -9	
			Radiation 3.3×10^7 rads γ and 1.0×10^8 rads β	Radiation 5×10^7 rads γ and 2×10^8 rads γ diff. samples						
			Chemical Spray 4400 ppm boron H_2BO_3 50 ppm hydrazine pH adjusted to 7.0-8.5 after 4 hrs using trisodium phosphate	Chemical Spray 2700 ppm boron H_2BO_3 .064 moles NaOH to achieve pH of 10.5						
			Submergence None	Submergence N/A						

Table 4.1-2

**ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS (1,2&3 (Sheet 21 of 34))**

1

Type of Equipment/Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demonstrated	Accuracy or Response Time Requirements	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Diff. Pressure Transmitter	ITT Barton	Model: 764	Temperature 370F	Temperature 420F	Accident mitigation 30 min.	100 days	(1)	(e)	E.Q. Program Document 14273-1CE-3535	Review complete (e) expect qualification for 40 years
Containment Building		System: PPS	Pressure 60 psig	Pressure 75 psig	Post accident monitoring not applicable					Scheduled Completion Date Oct 30, 1983
		CE Tag No: PDT-115A-D PDT-125A-D	Relative Humidity Sat. Steam/Air Mixture	Relative Humidity Sat. Steam/Air Mixture						
			Radiation 3.3 x 10 ⁷ rads γ 1.0 x 10 ⁸ rads β	Radiation 5 x 10 ⁷ rads γ and 2 x 10 ⁸ rads γ diff. samples						
			Chemical Spray 4400 ppm boron H ₃ BO ₃ 50 ppm hydrazine pH adjusted to 7.0-8.5 after 4 hrs using trisodium phosphate	Chemical Spray 2700 ppm boron H ₃ BO ₃ .064 moles NaOH to achieve pH of 10.5						
			Submergence None	Submergence N/A						
									Barton report R3-764-9	

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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS (1,2&3 (Sheet 22 of 34))

1

Type of Equipment/Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demonstrated	Accuracy or Response Time Requirements	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Pressure Transmitter	ITT Barton	Model: 763	Temperature 370F	Temperature 420F	Accident mitigation PT-101A-D 30 min. PT-102A-D 60 min.	100 days	(1)	(e)	E.Q. Program Document 14273-1CE-3535	Review complete (e) expect qualification for 40 years
Containment Building		System(s): PPS LTOP PAMS CE Tag No: PT-101A-D PT-102A-D PT-103 PT-104	Pressure 60 psig	Pressure 75 psig	Post accident monitoring PT-102A-D 30 days PT-103, 104 36 hrs.				Barton report R3-763 -6	Scheduled Completion Date Oct 30, 1983
			Relative Humidity Sat. Steam/Air Mixture	Relative Humidity Sat. Steam/Air Mixture						
			Radiation 3.3 x 10 ⁷ rads γ 1.0 x 10 ⁸ rads β	Radiation 5 x 10 ⁷ rads γ and 2 x 10 ⁸ rads γ diff. samples						
			Chemical Spray 4400 ppm boron H ₃ BO ₃ 50 ppm hydrazine pH adjusted to 7.0-8.5 after 4 hrs using trisodium phosphate	Chemical Spray 2700 ppm boron H ₃ BO ₃ .064 moles NaOH to achieve pH of 10.5						
			Submergence None	Submergence N/A						

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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS (1,2&3 (Sheet 23 of 34))

1

Type of Equipment/Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demonstrated	Accuracy or Response Time Requirements	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Pressure Transmitter	Rose-mount	Model: 1153AD8	Temperature 370F	Temperature 420F	Accident Mitigation	1 year	(1)	±8%	E.Q. Program Document 14273-ICE-3535	Review complete (n) expect qualification for 10 years
Containment		System: SDCS	Pressure 60 psig	Pressure 85 psig	Not Applicable					
		CE Tag No: PT-105, 106	Relative Humidity Sat-Stm/Air Mixture	Relative Humidity Sat-Stm/Air Mixture	Post Accident Monitoring 36 hrs					
			Radiation 3.3 x 10 ⁷ rads γ 1.0 x 10 ⁸ rads β	Radiation 5 x 10 ⁷ rads γ						
			Chemical Spray 4400 ppm Boron H ₃ BO ₃ 50 ppm hydrazine pH adjusted to 7.0-8.5 after 4 hrs using trisodium phosphate	Chemical Spray 3000 ppm Boron HBO ₂ .64 moles Na ₂ S ₂ O ₃ pH 8.5 to 11 by addition of NaOH						
			Submergence None	Submergence N/A						
									Type test report "Preliminary Qualification Report for 1153D Series"	Scheduled Completion Date Dec 30, 1983
									RMT Report 48223C Rev. A	
										RMT report 108220A Rev. A

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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS (1,2&3 (Sheet 24 of 34))

1

Type of Equipment/Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demonstrated	Accuracy or Response Time Requirements	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Pressure Transmitter	ITT Barton	Model: 763	Temperature 370F	Temperature 420F	Accident Mitigation	100 days	(1)	(e)	E.Q. Program Document 14273-ICE-3535 Barton report R3-763-6	Review complete (e) expect qualification for 40 years
Containment		Systems: PAMS	Pressure 60 psig	Pressure 75 psig	Not Applicable					Scheduled Completion Date Oct 30, 1983
		CE Tag No: PT-311, 321 PT-331, 341	Relative Humidity Sat-Stm/Air mixture	Relative Humidity Sat-Stm/Air mixture	Post Accident Monitoring 30 days					
			Radiation 3.3 x 10 ⁷ rads γ 1.0 x 10 ⁸ rads β	Radiation 5 x 10 ⁷ rads γ and 2 x 10 ⁸ rads γ diff. samples						
			Chemical Spray 4400 PPM Boron H ₃ BO ₃ 50 PPM hydrazine pH adjusted to 7.0-8.5 after 4 hrs using trisodium phosphate	Chemical Spray 2700 ppm Boron H ₃ BO ₃ .064 moles NaOH to achieve pH of 10.5						
			Submergence None	Submergence N/A						

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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS (1,2&3 (Sheet 25 of 34))

1

Type of Equipment/Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demonstrated	Accuracy or Response Time Requirements	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status	
Level Transmitter	ITT Barton	Model: 763	Temperature 370F	Temperature 420F	Accident Mitigation	100 days	(1)	(e)	E.Q. Program Document 14273 ICE-3535	Review complete (e) expect qualification for 40 years	
Containment		Systems: PAMS	Pressure 60 psig	Pressure 75 psig	Not Applicable						
		CE Tag No: LT-311, 321 LT-331, 341	Relative Humidity Sat-Stm/Air mixture	Relative Humidity Sat-Stm/Air mixture	Post Accident Monitoring						
					30 days						
			Radiation 3.3 x 10 ⁷ rads γ and 1.0 x 10 ⁸ rads β	Radiation 5 x 10 ⁷ rads γ and 2 x 10 ⁸ rads γ diff. samples							
			Chemical Spray 4400 PPM Boron H ₃ BO ₃ 50 PPM hydrazine pH adjusted to 7.0-8.5 after 4 hrs using trisodium phosphate	Chemical Spray 2700 ppm Boron H ₃ BO ₃ .064 moles NaOH to achieve pH of 10.5							
		Submergence None	Submergence N/A								

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PVNGS 1,2&3

Table 4.1-2

**ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS (1,2&3 (Sheet 26 of 34))**

1

Type of Equipment/Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demonstrated	Accuracy or Response Time Requirements	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Level Transmitter	ITT Barton	Model: 763	Temperature 370F	Temperature 420F	Accident Mitigation LT-1113 A-D LT-1123 A-D LT-1114 A-D LT-1124 A-D 30 min	100 days	(1)	(e)	E.Q. Program Document 14273-ICE-3535	Review complete (e) expect qualification for 40 years
Containment		Systems: PPS PAMS	Pressure 60 psig	Pressure 75 psig						
		CE Tag No: LT-1113 A-D LT-1123 A-D LT-1114 A-D LT-1124 A-D	Relative Humidity Sat-Stm/Air mixture	Relative Humidity Sat-Stm/Air mixture						
			Radiation 3.3×10^7 rads γ 1.0×10^8 rads β	Radiation 5×10^7 rads γ and 2×10^8 rads γ diff. samples	Post Accident Monitoring LT-1113 AB LT-1123 AB				Barton report R3-763 -6	Scheduled Completion Date Oct 30, 1983
			Chemical Spray 4400 PPM Boron H_2BO_3 50 PPM Hydrazine pH adjusted to 7.0-8.5 after 4 hrs using Trisodium Phosphate	Chemical Spray 2700 ppm Boron H_2BO_3 .064 moles NaOH to achieve pH of 10.5	30 days					
			Submergence None	Submergence N/A						

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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS (1,2&3 (Sheet 27 of 34))

1

Type of Equipment/Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demonstrated	Accuracy or Response Time Requirements	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Level Transmitter	ITT Barton	Model: 763	Temperature 370F	Temperature 420F	Accident Mitigation PT-1013 A-D PT-1023 A-D	100 days	(1)	(e)	E.Q. Program Document 14273-ICE-3535	Review complete (e) expect qualification for 40 years
Containment		Systems: PAMS, PPS	Pressure 60 psig	Pressure 75 psig	30 min				Barton report R3-763 -6	Scheduled Completion Date Oct 30, 1983
		CE Tag No: PT-1013 A-D PT-1023 A-D	Relative Humidity Sat-Stm/Air mixture	Relative Humidity Sat-Stm/Air mixture	Post Accident Monitoring PT-1013,A,B PT-1023,A,B					
			Radiation 3.3 x 10 ⁷ rads γ 1.0 x 10 ⁸ rads β	Radiation 5 x 10 ⁷ rads γ and 2 x 10 ⁸ rads γ diff. samples	30 days					
			Chemical Spray 4400 PPM Boron H ₃ BO ₃ 50 PPM Hydrazine pH adjusted to 7.0-8.5 after 4 hrs using Trisodium Phosphate	Chemical Spray 2700 ppm Boron H ₃ BO ₃ .064 moles NaOH to achieve pH of 10.5						
			Submergence None	Submergence N/A						

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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS (1,2&3 (Sheet 28 of 34))

1

Type of Equipment/Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demonstrated	Accuracy or Response Time Requirements	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Excore Safety Channel Detector Assembly	Westinghouse	Model: WL-24036	Temperature 370F	0-2 min Temperature 385F	2 min	0-10 min by test 2 min to 1 hr and 2 min by analysis	Not Applicable (h)	(h)	Qualified by test Westinghouse Test Report No. NC-TR-21-15 Program document No. 14273-ICE-3512	Qualified for 10 Years
Containment Building		System: RPS	Pressure 60 psig	Pressure 65 psig						
		CE Tag No: RW-001-A RW-001-B RW-001-C RW-001-D	Relative Humidity Steam/Air Mixture	Relative Humidity Saturated Steam						
				2-10 min Temperature 400F Pressure 74 psig Relative Humidity Saturated Steam						
			Radiation 2.5×10^6 rads note f	Radiation Detector Not Applicable note g Transition Joint 4.8×10^6 rads						
			Chemical Spray None	Chemical Spray Not Applicable						
			Submergence None	Submergence Not Applicable						

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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS (1,2&3 (Sheet 29 of 34))

11

Type of Equipment/Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demonstrated	Accuracy or Response Time Requirements	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Excore Safety Channel Preamplifier/Filter Assembly	Westinghouse	Model: WL-24037	Preamplifier	Preamplifier 0-2 min	Preamplifier Not Applicable note i	0-10 min by test 2 min to 1 hr and 2 min by analysis	Filter Insulation Resistance remain greater than 1×10^8 ohms	Filter Insulation Resistance exceeded 2.0×10^{10} ohms	Qualified by test Westinghouse Test Report No. NC-TR-81-15	Qualified for 10 Years
		System: RPS	Temperature 120F	Temperature 390F	Filter 2 min					
Containment Building		CE Tag No: RT-001-A RT-001-B RT-001-C RT-001-D	Pressure 0 psig	Pressure 76 psig						
			Relative Humidity 90%	Relative Humidity Saturated Steam						
			Filter	Filter 0-2 min						
			Temperature 370F	Temperature 376F						
			Pressure 60 psig	Pressure 62 psig						
			Relative Humidity Steam/Air Mixture	Relative Humidity Saturated Steam						
			Radiation $<3 \times 10^4$ rads γ negligible neutron	Radiation 6×10^4 rads (γ) 7×10^3 rads (neutron)						
			Chemical Spray None	Chemical Spray Not Applicable						
			Submergence None	Submergence Not Applicable						

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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS (1,2&3 (Sheet 30 of 34))

1

Type of Equipment/Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demonstrated	Accuracy or Response Time Requirements	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Transmitter Rack	C-E	None	Temperature 370F	(Later)	Accident Mitigation (Later)	(Later)	Accident Mitigation (Later)	(Later)	Test Report No. (Later)	Not Qualified (j)
Containment Building			Pressure 60 psig		Post Accident Monitoring (Later)		Post Accident Monitoring (Later)		Program Document No. 14273-ICE-3504	Scheduled Completion Date Aug 30, 1983
			Radiation 3.3 x 10 ⁷ rads γ 1 x 10 ⁸ rads α							
			Chemical Spray 4400 PPM Boron, 50 PPM Hydrazine pH adjusted to 7.0-8.5 after 4 hrs using Trisodium Phosphate							
			Submergence None							

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Amendment 1

Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS (1,2&3 (Sheet 31 of 34)

1

Type of Equipment/Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demonstrated	Accuracy or Response Time Requirements	Accuracy or Response Time Demonstrated	Qualification Report & Method	Qualification Status
Pressure Transmitter and Flow Transmitter	Rose-mount	Model: 1153 B	Temperature 50-104F	Temperature 303F	Accident Mitigation	37 days thermal aging + 80 hrs Accident Environment	Post Accident Accuracy ±10%	Post Accident <1%	Rose-mount Reports 108025 Rev. A and 108026	Qualified for 10 Years
Auxiliary Building		System: CVCS	Pressure 0 psig	Pressure 55 psig	None					
		CE Tag No: PT-212 FT-212	Relative Humidity 20-90%	Relative Humidity Sat-Stm/Air Mixture	Post Accident Monitoring					
			Radiation 1 x 10 ⁶ rads	Radiation 2.44 x 10 ⁷ rads	30 days					
			Chemical Spray None	Chemical Spray Not Applicable						
Submergence None			Submergence Not Applicable							

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ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS (1,2&3 (Sheet 32 of 34)

Type of Equipment/ Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status
Flow Transmitter and Level Transmitter	Rose-mount	Model: 1153 B	Temperature 50-104F	Temperature 303F	30 days	37 days thermal aging + 80 hrs Accident Environment	Post Acci- dent Accu- racy ±10%	Post Acci- dent <1%	Rose-mount Reports 108025 Rev. A and 108026	Qualified for 10 Years
Auxiliary Building		System: PAMS	Pressure 0 psig	Pressure 55 psig					E.Q. Program Document 14273-ICE-3538	
		CE Tag No: FT-306, 307 FT-308, 309 FT-311, 321 FT-331, 341 FT-338, 348 FT-390, 391 LT-344, 345 LT-348, 349	Relative Humidity 20-90%	Relative Humidity Sat-Stm/ Air Mix-ture						
			Radiation 1×10^6 rads	Radiation 2.44×10^7 rads						
			Chemical Spray None	Chemical Spray Not Applicable						
			Submergence None	Submergence Not Applicable						

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Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS (1,2&3 (Sheet 33 of 34))

1

Type of Equipment/ Location	Manufac- turer	Model No. or Identification No.	Abnormal or Accident Environment	Environment to Which Qualified	Operability Requirements	Operability Demon- strated	Accuracy or Response Time Require- ments	Accuracy or Response Time Demon- strated	Qualifi- cation Report & Method	Qualification Status	
RTD (Temp. Detec- tors)	RDF Corp.	Model: 21245	Temperature 50-104F	Temperature 385F	Accident Mitigation	30 days	Accident Accu- racy None	Accuracy < ± 1% Response Time <8 secs	E.Q. Pro- gram Docu- ment 14273- ICE- 3538	Review complete (k) expect to be qualified for 40 years	
Auxiliary Building		System: PAMS SDCS	Pressure 0 psig	Pressure 66 psig	Post Accident Monitoring		(Later)				
		CE Tag No: TE-303X, Y TE-351X, Y TE-352X, Y	Relative Humidity 20-90%	Relative Humidity	30 days						
			Radiation 1.10 ⁶ rads	Steam/Air Mixture							
			Chemical Spray None	Radiation 2 x 10 ⁸ rads							
			Submergence None	Chemical Spray N/A							
				Submergence N/A							

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PVNGS 1,2&3

Table 4.1-2

ENVIRONMENTAL QUALIFICATION OF IE ELECTRICAL EQUIPMENT (NSSS)
PALO VERDE NUCLEAR GENERATING STATION UNITS (1,2&3 (Sheet 34 of 34)

1

NOTES

- a. May require replacement of electrical auxiliaries pending verification of parts supplied.
- b. Replacing NAMCO Model EA-170 with NAMCO Model EA-180. See Appendix (X) for listing of Tag Nos. of affected limit switches.
- c. Refer to Appendix (X) for equipment retrofits required as a result of lessons learned during the Qualification Process.
- d. Valves may require refurbishment/modification as determined on basis of Qualification Testing.
- e. Barton Test Report review complete. Awaiting resolution of potential 10 CFR Part 21 issued by Barton on these devices.
- f. The operability time requirement is 2 minutes. The radiation levels "seen" during steam line or feed line break events in this time frame do not significantly increase above the normal total integrated dose (TID) for the 10 year Qualified Life of this equipment. This 10 year TID is 2.5×10^6 Rad.
- g. Based on previous operating experience, the fission chamber assembly does not require thermal aging nor irradiation for qualification. Inorganic materials have been shown to not be significantly affected by irradiation flux (see Westinghouse Test Report No. NC-TR-81-15).
- h. A neutron detector is an uncalibrated instrument. Sensitivity is based on things such as: distance from Core, neutron attenuation due to intervening materials, etc.

The accuracy of the ex-core flux measurement system is established by in-plant calibration by comparison to primary heat balance calculations. The response time of the Ex-core Neutron Detector is basically the detector collection time which is in the order of 2.0×10^{-7} seconds.
- i. The Ex-core Safety Channel Preamplifier is required to provide only low power trips, and has no required function during LOCA, MSLB or FWLB.
- j. Qualification program for termination of instruments on transmitter racks is in progress.
- k. Qualification of these devices to be demonstrated based upon type testing of incontainment service RTD's (similar models). Test report presently being prepared.
- l. A re-evaluation of DBE and post-DBE instrument accuracy requirements, on a case-by-case circuit basis, is currently under way.
- m. The worst case accident for which these valves (-001) are required is presently being redefined - For valves (-003) the test failure is presently under review, replacement is probable.
- n. Awaiting the final test report.

Table 4.1-3

ENVIRONMENTAL QUALIFICATION PARAMETERS (Sheet 1 of 8)
CONTAINMENT BUILDING - ENVIRONMENTAL DESIGNATOR I (1 of 2)

Condition Parameter	Normal/Abnormal (N)	Design Basis Accident (A) (Includes 40 Year Integrated)		
		LOCA	MSLB	TIME DURATION
Temperature (F)	50 - 120	350 350 302 302-270 270-200	370 350 302 302-270 270-200	4 Min 8 Min 8 Hr 42 Hr 2 Wk
Pressure (psig)	ATM. (a)	60 55 25 10		12 Min 8 Hr 42 Hr 2 Wk
Relative Humidity (%)	20 - 90%	Steam/Air Mixture		
Radiation (Rads) (40 Year Integrated Dose)	1×10^7	3.3×10^7 Gamma 2×10^8 Beta (non-sprayed enclosures) 1×10^8 Beta (all other areas)		
Chemicals	None	<ul style="list-style-type: none"> • 4400 ppm Boron • 50 ppm Hydrazine • pH adjusted to 7.0-8.5 after 4 hours using Trisodium phosphate 		

a. Structural Integrity Test Pressure = 69 psig.

Table 4.1-3

ENVIRONMENTAL QUALIFICATION PARAMETERS (Sheet 2 of 8)
 CONTAINMENT BUILDING - ENVIRONMENTAL DESIGNATOR I (2 of 2)

Condition Parameter	Normal/Abnormal	Design Basis Accident
		LOCA/MSLB
Submergence	None	Below Plant El. 91'
Dust	1.52 $\mu\text{G}/\text{M}^3$	650 $\mu\text{G}/\text{M}^3$
Seismic	2 OBE's (Refer to Seismic Response Spectra)	1 SSE (Refer to Seismic Response Spectra)
Dynamic	Refer to Equipment Specifications for requirements	Refer to Equipment Specifications for requirements
Aging	Equipment must be qualified for 40 year life for environmental parameters	Equipment must be qualified for 40 year life plus DBA for environmental parameters

Table 4.1-3

ENVIRONMENTAL QUALIFICATION PARAMETERS (Sheet 3 of 8)
 MAIN STEAM SUPPORT STRUCTURE - ENVIRONMENTAL DESIGNATOR II (1 of 2)

Condition Parameter	Normal/Abnormal (N)	Design Basis Accident (A) (Includes 40 Year Integrated)	
		LOCA/MSLB	Time Duration
Temperature (F)	28 - 120	300 (above El. 100')	15 minutes
		28-120 (below El. 100')	not appli- cable(b)
Pressure (psig)	ATM	21 (above El. 100')	15 minutes
		ATM (below El. 100')	not appli- cable(b)
Relative Humidity (%)	20 - 90%	Steam/Air Mixture (above El. 100') 20-90% (below El. 100')	
Radiation (Rads) (40 Year Integrated Dose)	<10 ³	10 ⁶ (above El. 100') 10 ⁵ (below El. 100')	
Chemicals	None	None	

- b. The subcompartments below elevation 100' are unaffected by the MSSS design basis pipe break.

Table 4.1-3

ENVIRONMENTAL QUALIFICATION PARAMETERS (Sheet 4 of 8)
 MAIN STEAM SUPPORT STRUCTURE - ENVIRONMENTAL DESIGNATOR II (2 of 2)

Condition Parameter	Normal/Abnormal	Design Basis Accident	
		LOCA/MSLB	
Submergence	None	None	
Dust	1.52 $\mu\text{G}/\text{M}^3$ (Below El. 100') 61.3 $\mu\text{G}/\text{M}^3$ (Above El. 100')	650 $\mu\text{G}/\text{M}^3$ (Below El. 100') 131 mG/M^3 (Above El. 100')	
Seismic	2 OBE's (Refer to Seismic Response Spectra)	1 SSE (Refer to Seismic Response Spectra)	
Dynamic	Refer to Equipment Specifications for requirements	Refer to Equipment Specifications for requirements	
Aging	Equipment must be qualified for 40 year life for environmental parameters	Equipment must be qualified for 40 year life plus DBA for environmental parameters	

Table 4.1-3
ENVIRONMENTAL QUALIFICATION PARAMETERS (Sheet 5 of 8)
AUXILIARY BUILDING - ENVIRONMENTAL DESIGNATOR III (1 of 2)

Condition Parameter	Normal/Abnormal (N)	Design Basis Accident (A) (Includes 40 Year Integrated)	
		LOCA/MSLB	Aux Steam Break
Temperature (F)	50 - 104	50 - 104	50 - 318F ^(c)
Pressure (psig)	ATM	ATM	1.5 ^(d)
Relative Humidity (%)	20 - 90%	20 - 90%	20 - 100%
Radiation (Rads) (40 Year Integrated Dose)	3.5 x 10 ⁴ (accessible areas) 1.25 x 10 ⁷ (Volume Control Tank) 2.7 x 10 ⁹ (Purification Ion Exch.)	1 x 10 ⁶ (accessible areas) ^(e) 1.25 x 10 ⁷ (Volume Control Tank) 2.7 x 10 ⁹ (Purification Ion Exch.)	
Chemicals	None	None	

- c. Applicable to Class 1E electrical cable only (Class 1E cable satisfies qualification envelope for containment)
- d. Pressure is a transient effect (i.e., several seconds duration)
- e. For an intact primary degraded core event, rooms containing LPSI recirculation fluids will have integrated radiation levels of 6.4×10^6 Rads. Equipment subject to this dose is identified in table 3.3-7.

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REVIEW TECHNIQUE

June 1983

4.1-139

Amendment 1

Table 4.1-3
 ENVIRONMENTAL QUALIFICATION PARAMETERS (Sheet 6 of 8)
 AUXILIARY BUILDING - ENVIRONMENTAL DESIGNATOR III (2 of 2)

Condition Parameter	Normal/Abnormal	Design Basis Accident
		LOCA/MSLB
Submergence	None	None
Dust	1.52 $\mu\text{G}/\text{M}^3$	650 $\mu\text{G}/\text{M}^3$
Seismic	2 OBE's (Refer to Seismic Response Spectra)	1 SSE (Refer to Seismic Response Spectra)
Dynamic	Refer to Equipment Specifications for requirements	Refer to Equipment Specifications for requirements
Aging	Equipment must be qualified for 40 year life for environmental parameters	Equipment must be qualified for 40 year life plus DBA for environmental parameters

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REVIEW TECHNIQUE

June 1983

4.1-141

Amendment 1

Table 4.1-3

ENVIRONMENTAL QUALIFICATION PARAMETERS (Sheet 7 of 8)
FUEL BUILDING - ENVIRONMENTAL DESIGNATOR VI (1 of 2)

Condition Parameter	Normal/Abnormal (N)	Design Basis Accident (A) (Includes 40 Year Integrated)
		LOCA/MSLB
Temperature (F)	50 - 104	50 - 104
Pressure (psig)	ATM	ATM
Relative Humidity (%)	20 - 90%	20 - 90%
Radiation (Rads) (40 Year Integrated Dose)	<10 ³	10 ⁵
Chemicals	None	None

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Table 4.1-3

ENVIRONMENTAL QUALIFICATION PARAMETERS (Sheet 8 of 8)
 FUEL BUILDING - ENVIRONMENTAL DESIGNATOR VI (2 of 2)

Condition Parameter	Normal/Abnormal	Design Basis Accident
		LOCA/MSLB
Submergence	None	None
Dust	1.52 $\mu\text{G}/\text{M}^3$	650 $\mu\text{G}/\text{M}^3$
Seismic	2 OBE's (Refer to Seismic Response Spectra)	1 SSE (Refer to Seismic Response Spectra)
Dynamic	Refer to Equipment Specifications for requirements	Refer to Equipment Specifications for requirements
Aging	Equipment must be qualified for 40 year life for environmental parameters	Equipment must be qualified for 40 year life plus DBA for environmental parameters

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4.1.6 PERMANENT FILES

The Qualification Report Permanent Files are presently organized into an auditable form to insure that all information may be readily retrieved. The first and subsequent individual plan and report submittals (except the final report) for each specification are arranged in folders in a manner which indicates sequence in which were received. Each folder will identify the specification, the Bechtel log number, the supplier report number and the transmittal letter number. The contents of the folders will be:

- A copy of the transmittal letter
- The qualification report
- FAP-1 review request form
- APS review check sheet (FAP-15) (if applicable)
- A copy of the letter transmitting comments to Bechtel (if applicable).

The following information will also be available, for audit:

- Environmental Requirements as identified in the FSAR
- Applicable Required Response Curves
- SQRT Master Lists
- Harsh Environmental Qualification Summary Report
- PVNGS Checklists

Once a qualification report is judged to be satisfactory, a final qualification package is developed and identified separately from the previous report submittals. In addition to the qualification folder contents as listed in the first paragraph

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the following information will be placed in the final qualification package as applicable or available for audit.

- Title and Table of Contents Form (FAP-14) containing
 - Supplier Report Number, Revision and Date
 - Title
 - Appropriate review sign off
- Equipment Qualification Document Certifications
- PVNGS Environmental and Seismic Checklists
- Annotated APS Checklist (FAP-15)
- Qualification Maintenance Spare Parts Form
- Other miscellaneous applicable documentation

In addition the NSSS Environmental Qualification (EQ) Files are also organized in an auditable form as EQ Program Audit Folders. The EQ Program Audit Folders contain EQ Program Documents and Generic Files. The combination of the EQ Program Documents and Generic Files present an overall view of the equipment specific qualification effort.

The EQ Program Documents provide the test plans, test procedures, test reports, equipment specifications, environmental requirements, and analyses to support qualification. The Generic Files contain documents required to verify information presented on the Summary Sheets and in the EQ Program Documents.

For Instrumentation and Control Engineering supplied EQ Program Audit Folders, the Generic Files are provided as a supplementary section to the EQ Program Documents.

For Plant Engineering supplied EQ Program Audit Folders, the Generic Files are provided as separate Audit Folders with specific references made to the Generic Files in the appendices of the EQ Program Documents.

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5. MILD ENVIRONMENT EQUIPMENT QUALIFICATION

5.1 MILD ENVIRONMENT EQUIPMENT QUALIFICATION

Non-harsh environment, Class 1E equipment will be qualified for the normal and abnormal local environment and a seismic event. An aging analysis will be performed to determine whether or not known significant aging mechanisms exist for that equipment. The aging analysis will focus on the identification of known aging mechanisms that significantly increase the equipments susceptibility to its design basis event (seismic only for non-harsh environments). Using the results of the aging analysis, the equipment may require an accelerated age conditioning program. The results of the aging analysis and/or age conditioning are used to establish qualified life and equipment component replacement interval.

Appendix A "Procedures for Maintaining Equipment Qualification" is also applicable to mild environment equipment.

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APPENDIX A

PROCEDURES FOR MAINTAINING EQUIPMENT QUALIFICATION



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APPENDIX A

PROCEDURES FOR MAINTAINING EQUIPMENT QUALIFICATION

A Qualification Maintenance Program is presently under development for safety related equipment to insure that such equipment remains qualified throughout the life of the plant.

Since many categories of equipment have life limiting components and forty year consumables, it is necessary to collect and classify equipment component data and store this information in a retrievable data base for immediate access. The data base to be employed at PVNGS is integrated into the (Station Information Management System/Maintenance Management Information System) SIMS/MMIS program. The objectives of the SIMS/MMIS program is to assure a streamlined information flow with auditable record keeping and to provide for resource planning and station work management.

To support a Qualification Maintenance Program, all Class IE specifications are reviewed to extract and classify equipment components so that life limiting components and forty year consumables are identified. Collection of this data is obtained by reviewing:

- qualification reports
- bills of material
- instruction manuals
- maintenance manuals
- supplier recommended spare parts

For each specification, equipment model numbers are identified along with all equipment tag numbers. For each specific model number the following information is listed for each component, as applicable, but not limited to:

- equipment tag number(s) and purchase order number
- part nomenclature or description

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APPENDIX A

- manufacture/supplier
- alternate sources
- part number/manufacture model number
- part safety classification
- qualified life
- unique preventative maintenance requirements
- consumable or required for regular maintenance/repair
- shelf life
- parts list identification by log number(s)
- quantity on hand
- inventory location
- lead time for placing orders

This information will be placed into the SIMS/MMIS random access data base which may be sorted in any desired fashion. Hard copies of this data will be placed in the Qualification Central Files.

The major functional area of the SIMS/MMIS data base, which supports this effort, is called Station Work Management, which performs work initiation and control, work planning and scheduling, work execution and closing with supporting documentation. Additional functions performed by SIMS/MMIS is preventative maintenance flagging and providing stock status information to inform the user when purchases are required at reorder levels.

Procedures are presently being developed to aid in the procurement of Class IE spare and replacement parts. This is to ensure that proper procurement activities are performed in obtaining fully qualified parts, to the installed environment that they will experience. All Class IE parts will be specified and purchased with proper documentation to demonstrate that qualification has been obtained for both the environmental and seismic requirements of its installed location.

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APPENDIX A

If duplicate original parts cannot be purchased, alternate components will be analyzed for form, fit, and function and supporting qualification documentation will be obtained to insure that they are qualified for their installed location and service conditions.

Maintenance procedures will require that all documentation relating to periodic and preventative maintenance, spare, and replacement part procurement including certification of compliance and component replacement will be placed within the Qualification Central Files.

The quality assurance requirements of Regulatory Guide 1.33, Revision 2 and ANS-3.2/ANSI N18.7-1976 will be met as described in FSAR Section 1.8. These requirements will be implemented in the qualification maintenance program.

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APPENDIX B

PVNGS EQUIPMENT ENVIRONMENTAL AND
SEISMIC QUALIFICATION CHECK LISTS

1

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PER REQUIREMENTS OF NUREG-0588

APPENDIX B

PALO VERDE NUCLEAR GENERATING STATION
EQUIPMENT ENVIRONMENTAL QUALIFICATION
CHECK LIST (SHEET 1 OF 10)

***I General**

This checklist is designed as an aid for reviewing safety-related equipment qualification reports and to assure that all requirements have been met. Complete one checklist sheet for each safety-related component. Like components with the same environmental designator can be listed on the same sheet.

System Description	System Components (General Description)	Equipment Location		Manufacturer	Model Number	PVNGS Spec.	PVNGS Tag Number
		Bldg.	Elev.				

Additional Information _____

***II. Operability Requirements**

Environmental Designator	Design(1) Basis Accident	Time Requirements for Operation(a)	Nature of Operation	Equipment Function

(1) Defines requirements for operation, not environment. If required to operate during seismic, state and define under additional information (include unacceptable function).

(2) If required during DBA, state duration from onset of DBA

Additional Information _____

*To be completed by responsible engineer (RE)

ENVIRONMENTAL QUALIFICATION REPORT
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APPENDIX B

PALO VERDE NUCLEAR GENERATING STATION
EQUIPMENT ENVIRONMENTAL QUALIFICATION
CHECK LIST (SHEET 2 OF 10)***III** Designated Environment

Append copy of FSAR Table 3E-1 Environmental Designator Service condition characterization

IV Qualified Environment

Complete Table 1. Compare Table 1 to FSAR designated service condition. Does supplier's qualified service meet or exceed the FSAR requirements:

- ☐ Yes - Proceed to item V
- ☐ No - Describe the differences. Indicate whether differences will impair the equipment function. Justify any conclusions that qualification to less than full service conditions is acceptable. (Attach additional sheets as required.)
-
-
-
-

V Margin

Identify margins, if any, provided by qualification on Table 2. Compare the listed margins to IEEE-323-1974 requirements. Are margins acceptable?

- ☐ Yes - Proceed to item VI
- ☐ No - Describe differences and indicate whether or not differences are significant
- ☐ Significant ☐ Not Significant

Justification: _____

*To be completed by RE.

ENVIRONMENTAL QUALIFICATION REPORT
PER REQUIREMENTS OF NUREG-0588

APPENDIX B

PALO VERDE NUCLEAR GENERATING STATION
EQUIPMENT ENVIRONMENTAL QUALIFICATION
CHECK LIST (SHEET 3 OF 10)VI Equipment Mounting and Orientation

- A. Was equipment qualification for a unique installed orientation (horizontal, vertical, upside down, etc.)? Specify orientation of required installation (check all that are permissible).

- ☐ Horizontal (e.g., floor)
- ☐ Vertical (e.g., wall)
- ☐ Canted at _____ degrees from vertical (e.g., piping)
- ☐ No orientation requirement
- ☐ Other - Clarify: _____

- *B. Mounting method (welding, bolts, rivets, etc.)

Was test mount same as intended site installation?

- ☐ Yes - Proceed to item VII
- ☐ No - Explain: _____

*VIII Qualification Method

- A. Identify qualification method:

- ☐ Type Test - Report # _____
- ☐ Analysis - Report # _____
- ☐ Operating Experience Report # _____
- ☐ On-Going Qualification - Report # _____
- ☐ Combination of Methods (check all that apply)

*To be completed by RE.

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PALO VERDE NUCLEAR GENERATING STATION
EQUIPMENT ENVIRONMENTAL QUALIFICATION
CHECK LIST (SHEET 4 OF 10)

- B. Describe qualification method. What codes and standards were utilized? Discuss all extrapolations from test data that supplier claims qualify different items by a prototype/modulator test. If on-going qualification is used, describe program and identify scope and schedule of required re-testing, re-analysis, or inspection.
-
-
-
-

- C. Were tests conducted in the following sequence? (Steps may be omitted if not applicable.) Sequence specified in IEEE 323-1974.

- | | |
|-------------------------|---|
| 1. Inspection | |
| 2. Operation (baseline) | <input type="checkbox"/> Yes - Proceed to D |
| 3. Operation (extremes) | |
| 4. Aging | <input type="checkbox"/> No - Explain test sequence |
| 5. Seismic | |
| 6. DBA Operation | |
| 7. Post DBA Operation | |
| 8. Inspection | |

Was actual test sequence equal to or more severe than this sequence?

- ☐ Yes - Explain
- ☐ No - Equipment is not qualified

- D. Provide additional test data as noted:

1. Seismic testing consisting of _____ OBEs before/after _____ SSEs using the required response spectra/required input motion noted in FSAR Section _____.*

*To be completed and provided by RE.

ENVIRONMENTAL QUALIFICATION REPORT
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APPENDIX B

PALO VERDE NUCLEAR GENERATING STATION
EQUIPMENT ENVIRONMENTAL QUALIFICATION
CHECK LIST (SHEET 5 OF 10)

2. Specimen tested in identical to permanent plant equipment:

☐ Yes - Proceed to 3☐ No - Explain: _____

3. Test temperatures were measured by:

☐ Direct Mounted Thermocouple - Proceed to 4☐ Other - Explain and Justify: _____

4. Heat aging was conducted by:

☐ Arrhenius Methods - Satisfactory, Proceed to 5☐ Arrhenius Methods - Unsatisfactory, Explain: _____

_____☐ Other - Explain and Justify: _____

_____5. Humidity testing was conducted by: _____

_____6. Were heat, humidity, and radiation aging performed
simultaneously?☐ Yes☐ No - Justify: _____

ENVIRONMENTAL QUALIFICATION REPORT
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APPENDIX B

PALO VERDE NUCLEAR GENERATING STATION
EQUIPMENT ENVIRONMENTAL QUALIFICATION
CHECK LIST (SHEET 6 OF 10)

7. The performance characteristics required to be monitored were:

8. Functional operability verified: Operational modes monitored

Before During After

☐☐☐

Acceptable

☐☐☐

Unacceptable

☐☐☐

Not Applicable

9. Performance characteristics during testing were monitored

☐

Continuously

☐

Intermittently at _____ intervals

☐

Not applicable - Justify: _____

10. Does test report identify that instrumentation was in current calibration and traceable to the National Bureau of standards?

☐

Yes

☐

No - Justify: _____

- *11. Does qualification test interfaces (electrical connections, piping supports, etc.) simulate installed condition?

☐

Yes

☐

No - Justify: _____

*To be completed by RE.

ENVIRONMENTAL QUALIFICATION REPORT
PER REQUIREMENTS OF NUREG-0588

APPENDIX B

PALO VERDE NUCLEAR GENERATING STATION
EQUIPMENT ENVIRONMENTAL QUALIFICATION
CHECK LIST (SHEET 7 OF 10)VIII Evaluation

Qualified lifetime is:

☐ 40 years☐ Other - Specify times(s) and replacement schedule(s): _____

Is preventative maintenance required to maintain qualified life?

☐ Yes - Maintenance instruction reference: _____☐ No

*Identify documentation that supports qualification evaluation:

Bechtel Log No.	Report No.	Subject	Proprietary (Yes/No) (If proprietary, identify location of report)

IX Qualification DeficienciesThe following is a list of qualification deficiencies requiring corrections
and/or work orders:

1. _____
2. _____
3. _____
4. _____
5. _____

*To be completed by the responsible engineer

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PALO VERDE NUCLEAR GENERATING STATION
EQUIPMENT ENVIRONMENTAL QUALIFICATION
CHECK LIST (SHEET 8 OF 10)

Work orders written:

Method of analysis, calculation, and/or testing is:

☐ Acceptable

☐ Not Acceptable

Reviewed by _____ Date _____

Group Supervisor _____ Date _____

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PALO VERDE NUCLEAR GENERATING STATION
EQUIPMENT ENVIRONMENTAL QUALIFICATION
CHECK LIST (SHEET 9 OF 10)

Table 1
ENVIRONMENTAL SERVICE CONDITION AS QUALIFIED
(TEST, ANALYSIS, ETC) BY SUPPLIER

CONDITION PARAMETER	NORMAL/ABNORMAL	DESIGN BASIS ACCIDENT (INCLUDES 40 YEAR INTEGRATED)
TEMPERATURE (F)		
PRESSURE (PSIG)		
RELATIVE HUMIDITY (%)		
RADIATION (RADS) (40 YEAR INTEGRATED DOSE)		
CHEMICALS		
SUBMERGENCE		
DUST		
SEISMIC		
DYNAMIC		
AGING		

Table 2
QUALIFICATION MARGIN

CONDITION PARAMETER	NORMAL/ABNORMAL	DESIGN BASIS ACCIDENT (INCLUDES 40 YEAR INTEGRATED)
TEMPERATURE (F)		
PRESSURE (PSIG)		
RELATIVE HUMIDITY (%)		
RADIATION (RADS) (40 YEAR INTEGRATED DOSE)		
CHEMICALS		
SUBMERGENCE		
DUST		
SEISMIC		
DYNAMIC		
AGING		

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PALO VERDE NUCLEAR GENERATING STATION
SEISMIC QUALIFICATION
CHECK LIST (Sheet 1 of 7)

I. Component Name:*1. Scope: ☐ NSSS☐ BOP

System Description	System Components (General Description)	Equipment Location	Manufacturer	Model Number	PVNGS Spec.	PVNGS Tag Number
		Bldg. Elev.				

Additional Information _____

Identify documentation that supports qualification evaluation:

Bechtel Log No.	Report No.	Subject	Proprietary (Yes/No)
			(If proprietary, identify location of report)

*2. Physical Description

a. Appearance _____

b. Dimensions _____

c. Weight _____

*To be completed by the responsible engineer (RE).

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APPENDIX B

PALO VERDE NUCLEAR GENERATING STATION
SEISMIC QUALIFICATION
CHECK LIST (Sheet 2 of 7)

- *3. Field Mounting Conditions ☐ Bolt (No. _____, Size _____)
☐ Weld (Length _____)
☐ _____

Is field mounting the same as qualification mounting?
☐ Yes ☐ No

Are field connections other than mounting the same as the
qualification connections?
☐ Yes ☐ No

- *4. Natural Frequencies in each direction (Side/Side, Front/Back,
Vertical):

S/S: _____ F/B: _____ V: _____

- *5. a. Functional Description: _____

- b. Is the equipment required for

☐ Hot Standby ☐ Cold Shutdown

☐ Both _____

- *6. Pertinent reference Design Specification: _____

- *7. Equipment function during seismic event (include unacceptable
function): _____

*II Is equipment available for inspection in the plant: ☐ Yes ☐ No

III Equipment Qualification Method:

Test: _____

Analysis: _____

Combination of Test and Analysis: _____

Test and/or Analysis by _____
(Name of Company or Laboratory & Report No.)

*To be completed by RE.

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APPENDIX B

PALO VERDE NUCLEAR GENERATING STATION
SEISMIC QUALIFICATION
CHECK LIST (Sheet 3 of 7)

IV Vibration Input:

1. Loads considered:

- a. ☐ Seismic only
- b. ☐ Hydrodynamic only
- c. ☐ Explosive only
- d. ☐ Other (Specify) _____
- e. ☐ Combination of _____
- f. Method of combining RRS: ☐ Absolute Sum
☐ SRSS
☐ _____
(other, specify)

*2. Required Response Spectra (attach the graphs): _____
(ZPA for RRS and/or max. of rim)

3. Required Acceleration in each direction: (Req'd by specification)

S/S = _____ F/B = _____ V = _____

V If Qualification by test, then Complete:

- 1. ☐ Single Frequency ☐ Multi-Frequency: ☐ random
☐ sine beat
☐ _____
- 2. ☐ Single Axis ☐ Multi-Axis
- 3. No. of Qualification Tests: OBE _____ SSE _____ Other _____
(specify)
- 4. Frequency Range: _____

*To be completed by RE.

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APPENDIX B

PALO VERDE NUCLEAR GENERATING STATION
SEISMIC QUALIFICATION
CHECK LIST (Sheet 4 of 7)

5. TRS enveloping RRS using Multi-Frequency Test

- ☐ Yes (plot TRS on RRS graphs)
☐ No

6. Input g-level Test at S/S = _____ F/B = _____ V = _____

7. Laboratory Mounting: _____

- a. ☐ Bolt (No. _____, Size _____)
☐ Weld (Length _____)
☐ _____

8. Functional operability verified: _____ Operational modes monitored

Before	During	After	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Acceptable
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Unacceptable
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Not Applicable

9. Test Results including modifications made: _____

10. Other tests performed (such as fragility test, including results): _____

VI If Qualification by analysis or by the combination of test and analysis, then complete:

1. Description of Test including Results: _____

2. Method of Analysis: _____

- | | |
|---|---|
| <input type="checkbox"/> Static Analysis | <input type="checkbox"/> Equivalent Static Analysis |
| <input type="checkbox"/> Dynamic Analysis | <input type="checkbox"/> Time-History |
| | <input type="checkbox"/> Response Spectrum |

3. Model Type: ☐ 3D ☐ 2D ☐ 1D
☐ Finite Element ☐ Beam ☐ Closed Form Solution

*To be completed by RE and Staff

ENVIRONMENTAL QUALIFICATION REPORT
PER REQUIREMENTS OF NUREG-0588

APPENDIX B

PALO VERDE NUCLEAR GENERATING STATION
SEISMIC QUALIFICATION
CHECK LIST (Sheet 5 of 7)

4. ☐ Computer Codes: _____
Frequency Range and No. of modes considered: _____
☐ Hand Calculations
5. Method of Combining Dynamic Responses: ☐ Absolute Sum
☐ SRSS
☐ Other: _____
(specify)
6. Damping: _____ Basis for the damping used: _____
7. Support Considerations in the model: _____

8. Critical Structural Elements: _____

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

B.	Maximum Deflection	Location	Effect Upon Functional Operability			Parameter Measured
			Before Test	During Test	After Test	

VII Aging Requirements

- *A. Is aging required prior to seismic qualification: ☐ Yes
☐ No
- B. Was equipment aged prior to seismic qualification: ☐ Yes
☐ No

*To be completed by the RE

ENVIRONMENTAL QUALIFICATION REPORT
PER REQUIREMENTS OF NUREG-0588

APPENDIX B

• PALO VERDE NUCLEAR GENERATING STATION
SEISMIC QUALIFICATION
CHECK LIST (Sheet 6 of 7)

VIII Qualification Deficiencies

The following is a list of qualification deficiencies requiring work orders:

Work orders written:

Method of analysis, calculation, and/or testing is:

☐ Acceptable

☐ Not Acceptable

Reviewed by _____ Date _____

Group Supervisor _____ Date _____



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APPENDIX C

EQUIPMENT QUALIFICATION PROGRAM CHECK LIST



ENVIRONMENTAL QUALIFICATION REPORT
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APPENDIX C

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NUCLEAR PROJECTS ENGINEERING DEPARTMENT
IEEE-323-1974, 344-1975
EQUIPMENT QUALIFICATION PROGRAM CHECKLIST

BECHTEL PACKAGE # _____ LOG # _____

TEST PLAN # _____ REV. # _____

Specification _____ Manufacturer _____

Equipment Identification in accordance with specification data sheets

_____ YES _____ NO

Proprietary _____ YES _____ NO

Applicable Specification Appendix:

BOP Environmental 4V _____ 4Y _____

Seismic 4E _____ 4F _____ 4G _____ 4H _____

4I _____ 4J _____ 4K _____ 4U _____

NSSS CE Specification _____

Environmental Service Conditions:

I-A _____ I-B _____ I-C _____ I-D _____ I-E _____ I-F _____

Equipment Description:

Equipment Life: _____ (year)

Life Limiting Components:

<u>Item</u>	<u>Part Number</u>	<u>Life (Cycles or years)</u>
-------------	--------------------	-------------------------------

ENVIRONMENTAL QUALIFICATION REPORT
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APPENDIX C

F-AP-15
PAGE 2 OF 8

IEEE-323-1974 Qualification Type (Mark exhibits B,C,D,&E as appropriate
or mark "Not Applicable")

_____ Type Testing
_____ Operating Experience
_____ Analysis
_____ On-Going
_____ Combination of the above

Note Any Exceptions Taken

IEEE-344-1975 Qualification Type

_____ Testing _____ Analysis _____ N/A

_____ RRS: The RRS for the surface on which equipment will be mounted should contain the data for the principal horizontal axis and the vertical axis as a minimum. The RRS should include critical damping values at which the RRS was made and should indicate artificially broadened areas (see Sections 3.5 and 6.6.1.1). Equipment location relative to the location for the RRS should be included as should any unusual mounting plans.

_____ Floor Motion: If an RRS is not furnished, either surface (floor or structure) motion maximum accelerations at all significant frequencies or a time history should be provided.

_____ Functional Requirements: A listing or description of the functional requirements and malfunction criteria should be provided.

_____ Operations Settings: Typical operational settings (or ranges) for adjustable devices should be provided.

_____ Class IE: Identification of Class IE devices and circuitry, and the functions of related Class IE equipment should be provided.

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ENVIRONMENTAL QUALIFICATION REPORT
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APPENDIX C

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PAGE 3 OF 8

- _____ Duration: The earthquake's strong motion time duration should be specified.
- _____ Loading: Loading requirements to be applied during the test, if any, should be specified.
- _____ Acceptance: Special acceptance criteria, if any, should be specified.
- _____ Tests versus Analysis: Special requirements for tests or analysis on specific equipment should be provided.
- _____ Margin: All margins included in this document shall be identified (see IEEE Std 323-1974).

Special Maintenance Procedure

Any special maintenance or surveillance procedure required to maintain equipment qualifications.

_____ Yes _____ No

Will qualification need updated or ongoing data to requalify or maintain present qualification?

_____ Yes _____ No

(If yes, by whom & when will data be provided.)

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APPENDIX C

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IEEE-323-1974, 344-1975
TYPE TEST PROGRAM/PLAN
CHECKLIST

IEEE-323-1974, 344-1975 Type Test

The test plan must contain the following information:

- ☐ (1) Equipment descriptions
- ☐ (2) Number (quantity) of units to be tested
- ☐ (3) Mounting and connection requirements
- ☐ (4) Aging simulation procedure
- ☐ (5) The service conditions to be simulated
- ☐ (6) Performance and environmental variables to be measured
- ☐ (7) Test equipment requirements including accuracies
- ☐ (8) Environmental, operating, and measurement sequence in step-by-step detail
- ☐ (9) Performance limits or failure definition
- ☐ (10) Documentation (See Section 8.3 IEEE-323)
- ☐ (11) Statement of nonapplicable portions of the specification
- ☐ (12) A description of any conditions peculiar to the equipment which are not covered above, but which would probably affect said equipment during testing

Additional qualification methods required

☐ Yes ☐ No

(If yes, give details below)

Comments:

ENVIRONMENTAL QUALIFICATION REPORT
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APPENDIX C

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IEEE-323-1974
OPERATING EXPERIENCE PROGRAM/PLAN
CHECK LIST

IEEE-323-1974 Operating Experience

Note: This method is usually of limited use as a sole means of qualifications

_____ Identification of specific features to be demonstrated by operating experience

_____ Past history of performance and service conditions of equipment identified

_____ Equipment whose operating history is being demonstrated is shown to be typical of equipment to be qualified

_____ Equipment to be qualified is within envelope of operating experience equipment

Additional operating experience to be provided to qualify or keep equipment qualified:

_____ Yes _____ No

(If yes, give details below)

Comments:

ENVIRONMENTAL QUALIFICATION REPORT
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IEEE-323-1974, 344-1975
ANALYSIS TEST PROGRAM/PLAN
CHECKLIST

Note: This method of limited value as a sole means of qualification

IEEE-323-1974, 344-1975 Analysis

- ☐ Interface or boundary conditions of equipment
- ☐ What is to be analyzed
- ☐ Assumptions, empirically derived values, and mathematical models used and justifications
- ☐ Descriptions of analytical methods and/or computer programs used
- ☐ Environmental compatibility
- ☐ Similarity of equipment
- ☐ Basis for any extrapolation
- ☐ Failure modes and effects identified

Additional analysis needed to qualify equipment - keep equipment qualified

☐ Yes ☐ No

(If yes, give details below)

Comments:

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IEEE-323-1974
ON-GOING QUALIFICATION PROGRAM/PLAN
CHECKLIST

Note: This method of qualification should be minimized due to its adverse effect on maintenance and surveillance at PVNGS during operation.

IEEE-323-1974 On-Going Qualification

On-Going Method Proposed

- _____ Aging and testing of identical equipment or components continuing during the qualified period of installed equipment (spare program)
- _____ Additional equipment to be installed under similar conditions to be removed before end of life of installed equipment and type tested to determine additional qualified life (pacing program)
- _____ Periodic replacement plan. (can be components or total equipment)
- _____ Combined scheduled and unscheduled maintenance with periodic testing
- _____ Reliability predictions based on similar equipment or other accepted techniques
- _____ Maintainability predictions based on experience with supplied equipment or similar equipment
- _____ Use of continuous on-line testing

Has Vendor Provided:

- _____ Proposed Testing Plans
- _____ Proposed Maintenance Plans
- _____ Equipment Replacement Plans

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APPENDIX C

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APPROVAL & SIGNATURES

Designated Representative: _____ Date _____

Other Review: _____ Date _____

Responsible Supervisor/Supervising Engineer:

_____ Date _____

Nuclear Engineering Manager: _____ Date _____

Corporate Quality Assurance: _____ Date _____

PVNGS 1,2&3
ENVIRONMENTAL QUALIFICATION REPORT
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APPENDIX D

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 1 of 202)

ENVIRONMENTAL QUALIFICATION REPORT
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APPENDIX D

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 2 of 202)

12/17/82 02:28:02

Q INSTRUMENTS BY SYSTEM

PAGE 1
(AF-2)

TAG NUMBER

DESCRIPTION

BECHTEL
SPEC/PO

1JAFBHS 0010	AF PP B
1JAFHS 0011	AF PP N
1JAFBFO 0012	AF PP B RECIRC
1JAFFO 0013	AF PP A RECIRC
1JAFBFE 0015	AF PP B TEST/EXERCISE
1JAFBXC 0016	EXC FLOW CHK VLV FOR PI-16
1JAFBPT 0017	AF PP B DISCH
1JAFBPT 0017	I/E CONVERTOR
1JAFBPI 0017A	AF PP B DISCH
1JAFAPT 0018	AF PP A DISCH
1JAFAPY 0018	I/E CONVERTOR
1JAFAPY 0018A	AF PP A DISCH
1JAFAXCV 0020	EXC FLOW CHK VLV FOR PI-20
1JAFAPY 0026	AF PP A TEST/EXERCISE
1JAFBHV 0030	AF REG VLV PP B TO SG 1
1JAFBZT 0030	AF REG VLV PP B TO SG 1
1JAFBHS 0030A	AF REG VLV PP B TO SG 1-CR
1JAFBZI 0030A	AF REG VLV PP B TO SG 1-CR
1JAFBHS 0030B	AF REG VLV PP B TO SG 1-RS
1JAFBZI 0030B	AF REG VLV PP B TO SG 1-RS
1JAFBHS 0030C	AF REG VLV PP B TO SG 1-CR OR
1JAFBHS 0030D	AF REG VLV PP B TO SG 1-RS OR
1JAFBHS 0030E	AF REG VLV PP B TO SG 1 DISC
1JAFBHV 0031	AF REG VLV PP B TO SG 2
1JAFBZT 0031	AF REG VLV PP B TO SG 2
1JAFBHS 0031A	AF REG VLV PP B TO SG 2-CR
1JAFBZI 0031A	AF REG VLV PP B TO SG 2-CR
1JAFBHS 0031B	AF REG VLV PP B TO SG 2-RS
1JAFBZI 0031B	AF REG VLV PP B TO SG 2-RS
1JAFBHS 0031C	AF REG VLV PP B TO SG 2-CR OR
1JAFBHS 0031D	AF REG VLV PP B TO SG 2-RS OR
1JAFBHS 0031E	AF REG VLV PP B TO SG 2 DISC
1JAFAHV 0032	AF REG VLV PP A TO SG 1
1JAFAZT 0032	AF REG VLV PP A TO SG 1
1JAFHS 0032A	AF REG VLV PP A TO SG 1-CR
1JAFAZI 0032A	AF REG VLV PP A TO SG 1-CR
1JAFHS 0032B	AF REG VLV PP A TO SG 1-RS
1JAFAZI 0032B	AF REG VLV PP A TO SG 1-RS
1JAFHS 0032C	AF REG VLV PP A TO SG 1-CR OR
1JAFHS 0032D	AF REG VLV PP A TO SG 1-RS OR
1JAFCHV 0033	AF REG VLV PP A TO SG 2
1JAFCTZ 0033	AF REG VLV PP A TO SG 2
1JAFCHS 0033A	AF REG VLV PP A TO SG 2-CR
1JAFCTZ 0033A	AF REG VLV PP A TO SG 2-CR
1JAFCHS 0033B	AF REG VLV PP A TO SG 2-RS
1JAFCTZ 0033B	AF REG VLV PP A TO SG 2-RS
1JAFCHS 0033C	AF REG VLV PP A TO SG 2-CR OR
1JAFCTZ 0033D	AF REG VLV PP A TO SG 2-RS OR
1JAFBUV 0034	AF ISOL VLV PP B TO SG 1
1JAFBHS 0034A	AF ISOL VLV PP B TO SG 1-CR
1JAFBHS 0034B	AF ISOL VLV PP B TO SG 1-RS
1JAFBHS 0034C	AF ISOL VLV PP B TO SG 1-CR OR
1JAFBHS 0034D	AF ISOL VLV PP B TO SG 1-RS OR
1JAFBHS 0034E	AF ISOL VLV PP B TO SG 1 DISC

J-200
J-200
M-021
M-021
J-425
J-705
J-311
J-111
J-111
J-311
J-111
J-111
J-705
J-425
J-601A
J-601A
J-200
J-200
N-001
N-001
J-200
N-001
N-001
J-601A
J-601A
J-200
J-200
N-001
N-001
J-200
N-001
N-001
J-601A
J-601A
J-200
J-200
N-001
N-001
J-200
N-001
N-001
J-200
N-001
N-001
P-221B
J-200
N-001
J-200
N-001
N-001

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ENVIRONMENTAL QUALIFICATION REPORT
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APPENDIX D

PVNGS 1, 2&3

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 3 of 202)

12/17/82 02:28:02	Q INSTRUMENTS BY SYSTEM	PAGE 2 (AF-3)
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO
1JAFBUY 0035	AF ISOL VLV PP B TU SG 2	P=221B
1JAFBHS 0035A	AF ISOL VLV PP B TU SG 2-CR	J=200
1JAFBHS 0035B	AF ISOL VLV PP B TU SG 2-RS	N=001
1JAFBHS 0035C	AF ISOL VLV PP B TU SG 2-CR OR	J=200
1JAFBHS 0035D	AF ISOL VLV PP B TU SG 2-RS OR	N=001
1JAFBHS 0035E	AF ISOL VLV PP B TU SG 2 DISC	N=001
1JAFCUV 0036	AF ISOL VLV PP A TU SG 1	P=221B
1JAFCHS 0036A	AF ISOL VLV PP A TU SG 1-CR	J=200
1JAFCHS 0036B	AF ISOL VLV PP A TU SG 1-RS	N=001
1JAFCHS 0036C	AF ISOL VLV PP A TU SG 1-CR OR	J=200
1JAFCHS 0036D	AF ISOL VLV PP A TU SG 1-RS OR	N=001
1JAFUUV 0037	AF ISOL VLV PP A TU SG 2	P=221B
1JAFAMS 0037A	AF ISOL VLV PP A TU SG 2-CR	J=200
1JAFAMS 0037B	AF ISOL VLV PP A TU SG 2-RS	N=001
1JAFAMS 0037C	AF ISOL VLV PP A TU SG 2-CR OR	J=200
1JAFAMS 0037D	AF ISOL VLV PP A TU SG 2-RS OR	N=001
1JAFEFE 0040	AF FLOW TO SG 1 DOWNCOMER	J=425
1JAFAFI 0040A	AFM FLOW TO SG 1/2	J=111
1JAFAFI 0040A	AFM FLOW TO SG 1	J=311
1JAFAFY 0040A	I/E CONVERTOR	J=111
1JAFAFI 0040B	AFM FLOW TO SG 1/2-RS	J=111
1JAFAFI 0040B	AFM FLOW TO SG 2	J=311
1JAFAFY 0040B	SQ ROOT CONVERTOR	J=111
1JAFAFY 0040C	I/E CONVERTOR	J=111
1JAFAFY 0040D	SQ ROOT CONVERTOR	J=111
1JAFEFE 0041	AF FLOW TO SG 2 DOWNCOMER	J=425
1JAFBFI 0041A	AFM FLOW TO SG 1/2	J=111
1JAFBFI 0041A	AFM FLOW TO SG 1	J=311
1JAFBFI 0041A	I/E CONVERTOR	J=111
1JAFBFI 0041B	AFM FLOW TO SG 1/2-RS	J=111
1JAFBFI 0041B	AFM FLOW TO SG 2	J=311
1JAFBFI 0041B	SQ ROOT CONVERTOR	J=111
1JAFBFI 0041C	I/E CONVERTOR	J=111
1JAFBFI 0041D	SQ ROOT CONVERTOR	J=111
1JAFAST 0052	AF TURB SPEED	M=021
1JAFASV 0052	AF TURB GOVERNOR VALVE	M=021
1JAFASY 0052	I/E CONVERTOR	J=111
1JAFAMS 0052A	AF TURB SPEED CONTROL XFER--RS	N=001
1JAFASI 0052A	AF TURB SPEED--CR	J=111
1JAFASK 0052A	AF TURB CONTROL--CR	M=021
1JAFAMS 0052B	AF TURB O.S. TEST--LP	M=021
1JAFASI 0052B	AF TURB SPEED--RS	J=111
1JAFASK 0052B	AF TURB CONTROL--RS	M=021
1JAFAMS 0052C	AF TURB SPEED CONTROL XFER--LP	M=021
1JAFASI 0052C	AF TURB SPEED--LP	M=021
1JAFASK 0052C	AF TURB CONTROL--LP	M=021
1JAFAHV 0054	AF TURB TRIP VLV	M=021
1JAFAHY 0054	AF TURB TRIP VLV MAN TRIP	M=021
1JAFAMS 0054A	AF TURB TRIP--CR	J=200
1JAFAMS 0054B	AF TURB TRIP--RS	N=001
1JAFAMS 0054C	AF TURB TRIP--LP	M=021
1JAFAMS 0054D	AF TURB TRIP VLV JOG--CR	J=200
1JAFAMS 0054E	AF TURB TRIP VLV JOG--LP	M=021
1JAFAMS 0054F	AF TURB TRIP VLV JOG--RS	N=001

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CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 4 of 202)

ENVIRONMENTAL QUALIFICATION REPORT
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APPENDIX D

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 5 of 202)

04/19/82 15150139	VALVE="NO" CLASS	PAGE 1	(AF-5)
TAG NUMBER	R/SPFC/		
1PAFAV002	13PM221B		
1PAFAV004	13PM221A		
1PAFAV005	13PM221B		
1PAFAV006	13PM221B		
1PAFAV007	13PM221B		
1PAFAV010	13PM221A		
1PAFAV014	13PM221A		
1PAFAV015	13PM221B		
1PAFAV016	13PM221B		
1PAFAV017	13PM221B		
1PAFAV018	13PM221B		
1PAFAV019	13PM221A		
1PAFAV020	13PM221A		
1PAFAV041	13PM221A		
1PAFAV042	13PM221A		
1PAFAV047	13PM221A		
1PAFAV056	13PM221A		
1PAFAV058	13PM221B		
1PAFAV059	13PM221A		
1PAFAV062	13PM221A		
1PAFAV067	13PM221A		
1PAFAV069	13PM221A		
1PAFAV070	13PM221A		
1PAFAV075	13PM221A		
1PAFAV076	13PM221A		
1PAFAV077	13PM221B		
1PAFAV079	13PM221B		
1PAFAV081	13PM221A		
1PAFAV084	13PM221A		
1PAFAV087	13PM221A		
1PAFAV090	13PM221A		
1PAFAV091	13PM221A		
1PAFAV096	13PM221B		
1PAFAV097	13PM221A		
1PAFAV099	13PM221A		
1PAFAV107	13PM221A		
1PAFAV108	13PM221A		
1PAFAV115	13PM221C		
1PAFAV119	13PM221A		
1PAFAV122	13PM221A		
1PAFAV125	13PM221A		
1PAFAV126	13PM221A		
1PAFAV127	13PM221C		
1PAFAV128	13PM221C		
1PAFAV132	13PM221C0		
1PAFAV137	13PM221B		
1PAFAV139	13PM221C0		
1PAFAV140	13PM221C0		
1PAFAV141	13PM221C		
1PAFAV142	13PM221C		
1PAFAV144	13PM221C		
1PAFAV504			
1PAFAV505			
1PAFAV506			
1PAFAV009	13PM221B		

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Table D-1
CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 6 of 202)

04/19/82 15:50:39	VALVE="M" CLASS	PAGE 2	(AF-6)
TAG NUMBER	R/SPEC/		
1PAFRV021	13PH221B		
1PAFRV022	13PH221B		
1PAFRV023	13PH221A		
1PAFRV024	13PH221B		
1PAFRV025	13PH221B		
1PAFRV026	13PH221B		
1PAFRV027	13PH221B		
1PAFRV028	13PH221B		
1PAFRV029	13PH221A		
1PAFRV030	13PH221A		
1PAFRV039	13PH221A		
1PAFRV040	13PH221A		
1PAFRV048	13PH221A		
1PAFRV049	13PH221A		
1PAFRV050	13PH221A		
1PAFRV061	13PH221A		
1PAFRV063	13PH221A		
1PAFRV065	13PH221A		
1PAFRV066	13PH221A		
1PAFRV068	13PH221A		
1PAFRV071	13PH221A		
1PAFRV072	13PH221A		
1PAFRV073	13PH221A		
1PAFRV074	13PH221A		
1PAFRV078	13PH221B		
1PAFRV080	13PH221B		
1PAFRV082	13PH221A		
1PAFRV083	13PH221A		
1PAFRV093	13PH221A		
1PAFRV094	13PH221A		
1PAFRV129	13PH221C		
1PAFRV130	13PH221C		
1PAFRV138	13PH221B		
1PAFFV080	13PH221B		
1PAFMV047	13PH221A		

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PVNGS 1,2&3

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 7 of 202)

[illegible]

ENVIRONMENTAL QUALIFICATION REPORT
PER REQUIREMENTS OF NUREG-0588
APPENDIX D

PVNGS 1, 2&3

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 8 of 202)

04/19/82 15:38:46		EQUIPMENT-NOM CLASS	PAGE 5	CHEMICAL AND VOLUME CONTROL	(CH-1)
TAG NUMBER	DESCRIPTION	RECHIFL SPEC/PO			
1JCHNE02	CNTL PNL-CVCS GAS STRIPPER	13NM001			
1JCHNE03	INSTR PACK-CVCS GAS STRIPPER	13NM001			
1MCHAP01	CHARGING PUMP (1)	13NM001			
1MCHAX05	SUCTION STABILIZER CHG PP A	13NM001			
1MCHAX07	PULSATION DAMPENER CHG PP A	13NM001			
1MCHBP01	CHARGING PUMP (2)	13NM001			
1MCHBX05	SUCTION STABILIZER CHG PP B	13NM001			
1MCHBX07	PULSATION DAMPENER CHG PP B	13NM001			
1MCHEF01	REGENERATIVE HEAT EXCHANGER	13NM001			
1MCHEP01	CHARGING PUMP (3)	13NM001			
1MCHET01	REFUFLING WATER TANK	13CM220			
1MCHEU40	PENETRATION-LETDOWN	13NM500			
1MCHEU41	PENETRATION-CHARGING	13NM500			
1MCHEU43	PENETRATION-RC PUMP BLFENDOFF	13NM500			
1MCHEU45	PENETRATION-RDT MAKE UP	13NM500			
1MCHEX05	SUCTION STABILIZER CHG PP F	13NM001			
1MCHEX07	PULSATION DAMPENER CHG PP E	13NM001			
1MCHND01A	PURIFICATION ION EXCHANGER (1)	13NM001			
1MCHND01B	PURIFICATION ION EXCHANGER (2)	13NM001			
1MCHND01R	ION EXCHANGER RESIN	13NM001			
1MCHND02	DEORATING ION EXCHANGER	13NM001			
1MCHND03	PRF-HOLD UP ION EXCHANGER	13NM001			
1MCHNF02	LETDOWN HEAT EXCHANGER	13NM001			
1MCHNE03	GAS STRIPPER PACKAGE	13NM001			
1MCHNE05	SEAL INJECTION HEAT EXCHANGER	13NM001			
1MCHNE11	HEAT REC.H-E IN PKG 1MCHNE03	13NM001			
1MCHNE12	PREHEATER IN PKG 1MCHNE03	13NM001			
1MCHNE13	STRIPPER CLMN IN PKG 1MCHNE03	13NM001			
1MCHNE14	REBOILER IN PKG 1MCHNE03	13NM001			
1MCHNE15	AFTERCOOLER IN PKG 1MCHNE03	13NM001			
1MCHNE16	PI-HEAD COND. IN PKG 1MCHNE03	13NM001			
1MCHNF01	BACKFLUSHABLE PURIF FILTER	13NM001			
1MCHNF02A	SEAL INJECTION FILTER	13NM001			
1MCHNF02B	SEAL INJECTION FILTER	13NM001			
1MCHNF03	BORIC ACID FILTER	13NM001			
1MCHNF04	REACTOR DRAIN FILTER	13NM001			
1MCHNF07	PRE HOLDUP STRAINER	13NM001			
1MCHNF08	LET DOWN STRAINER	13NM001			
1MCHNF19	PURIFICATION FILTER	13NM001			
1MCHNF30	RE-BLR COND STRAINER- 1MCHNE03	13NM001			
1MCHNF31	PREHTR COND STRNR IN 1MCHNE03	13NM001			
1MCHNM13	RE-BLR STEAM TRAP IN 1MCHNE03	13NM001			
1MCHNM14	PREHTR STEAM TRAP IN 1MCHNE03	13NM001			
1MCHNP02A	BORIC ACID MAKEUP PUMP (1)	13NM001			
1MCHNP02B	BORIC ACID MAKEUP PUMP (2)	13NM001			
1MCHNP04A	REACTOR DRAIN PUMP	13NM001			
1MCHNP04B	REACTOR DRAIN PUMP	13NM001			
1MCHNP10B	DISCH. PUMP IN PKG 1MCHNE03	13NM001			
1MCHNX01	VOLUME CONTROL TANK	13NM001			
1MCHNX04	EQUIPMENT DRAIN TANK	13NM001			
1MCHNX06	N2 SUPPLY TANK	13NM001			

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APPENDIX D

PVNGS 1, 2&3

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 9 of 202)

12/17/82 02128102

U INSTRUMENTS BY SYSTEM

PAGE 5
(CH-2)

TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO
1JCHNFO 0023	LETDOWN CONTROL VLVS BYPASS	J-425
1JCHNPSV 0053	CHG PP 1 OIL	N-001
1JCHNPSV 0054	CHG PP 2 OIL	N-001
1JCHNPSV 0055	CHG PP 3 OIL	N-001
1JCHNPI 0056	CHG PP 1 OIL	N-001
1JCHNPI 0057	CHG PP 2 OIL	N-001
1JCHNPI 0058	CHG PP 3 OIL	N-001
1JCHNTW 0064	REFUELING WATER TANK HEATER	J-556
1JCHNTW 0065	REFUELING WATER TANK HEATER	J-556
1JCHNTW 0071	REFUELING WATER TANK HEATER	J-556
1JCHNTW 0072	REFUELING WATER TANK HEATER	J-556
1JCHEFO 0077	RESTRICTION ORIFICE FOR POT240	J-425
1JCHELV 0110P	REGEN HX TO LETDOWN HX	N-001
1JCHELV 0110Q	REGEN HX TO LETDOWN HX	N-001
1JCHNPSV 0115	VOLUME CONTROL TANK OUTLET	N-001
1JCHNPSV 0199	KCP CONT BLEED-OFF TO RUT	N-001
1JCHALT 0200	REFUELING WATER TANK	J-311
1JCHALY 0200	17E CONVERTOR	N-001
1JCHETH 0200	REFUELING WATER TANK	N-001
1JCHALI 0200-1	REFUELING WATER TANK--RS	N-001
1JCHALY 0200-1	17E CONVERTOR (ISOL)	N-001
1JCHBLI 0201	REFUELING WATER TANK	N-001
1JCHBLSHL 0201	REFUELING WATER TANK	N-001
1JCHBLT 0201	REFUELING WATER TANK	N-001
1JCHBLY 0201	17E CONVERTOR	N-001
1JCHETH 0201	REFUELING WATER TANK	N-001
1JCHBLI 0201-1	REFUELING WATER TANK--RS	N-001
1JCHEPV 0201P	LETDOWN BACK PRESS VLV	N-001
1JCHEPV 0201Q	LETDOWN BACK PRESS VLV	N-001
1JCHNFE 0202	LETDOWN FROM PUR FILTER	N-001
1JCHNXC 0202A	EXC FLOW CHK VLV FOR PDIS-202	J-705
1JCHNXC 0202B	EXC FLOW CHK VLV FOR PDIS-202	J-705
1JCHBHS 0203	REGEN HX TO AUX SPRAY--CR	J-200
1JCHBHV 0203	REGEN HX TO AUX SPRAY	N-001
1JCHBHS 0203-1	REGEN HX TO AUX SPRAY--RS	N-001
1JCHBHS 0203-2	REGEN HX TO AUX SPRAY DISC	N-001
1JCHALI 0203A	REFUELING WATER TANK	N-001
1JCHALT 0203A	REFUELING WATER TANK	J-311
1JCHALY 0203A	17E CONVERTOR	N-001
1JCHNXC 0203A	EXC FLOW CHK VLV FOR PDIS-203	J-705
1JCHBLI 0203B	REFUELING WATER TANK	N-001
1JCHBLT 0203B	REFUELING WATER TANK	J-311
1JCHBLY 0203B	17E CONVERTOR	N-001
1JCHNXC 0203B	EXC FLOW CHK VLV FOR PDIS-203	J-705
1JCHCLI 0203C	REFUELING WATER TANK	N-001
1JCHCLY 0203C	REFUELING WATER TANK	J-311
1JCHCLY 0203C	17E CONVERTOR	N-001
1JCHOLI 0203D	REFUELING WATER TANK	N-001
1JCHOLY 0203D	REFUELING WATER TANK	J-311
1JCHOLY 0203D	17E CONVERTOR	N-001
1JCHOLY 0203D	LETDOWN RAD MONITOR	N-001
1JCHAFV 0204	REGEN HX TO AUX SPRAY--CR	J-200
1JCHAHV 0205	REGEN HX TO AUX SPRAY	N-001
1JCHAHV 0205-1	REGEN HX TO AUX SPRAY--RS	N-001

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PVNGS 1, 2&3

ENVIRONMENTAL QUALIFICATION REPORT
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APPENDIX D

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 10 of 202)

12/17/82 02128102		Q INSTRUMENTS BY SYSTEM		PAGE 5
TAG NUMBER		DESCRIPTION	BECHTEL SPEC/PO	(CH-3)
1JCHNFV 0210X		REACTOR MU WATER PP TO VCI	N=001	
1JCHNFV 0210Y		BORIC ACID MU PP TO VCI	N=001	
1JCHAPI 0212		CHARGING PUMPS TO REGEN HX	N=001	
1JCHAPSL 0212		CHARGING PUMPS TO REGEN HX	N=001	
1JCHAPT 0212		CHARGING PUMPS TO REGEN HX	N=001	
1JCHAPY 0212		17E CONVERTER	N=001	
1JCHBPE 0212		CHARGING PUMPS TO REGEN HX	N=001	
1JCHBPI 0212		CHARGING PUMPS TO REGEN HX	N=001	
1JCHBPSL 0212		CHARGING PUMPS TO REGEN HX	N=001	
1JCHBPT 0212		CHARGING PUMPS TO REGEN HX	N=001	
1JCHBPFY 0212		17E CONVERTER	N=001	
1JCHAPI 0212-1		CHARGING PUMPS TO REGEN HX--RS	N=001	
1JCHBPI 0212-1		CHARGING PUMPS TO REGEN HX--RS	N=001	
1JCHBPFY 0212-1		SO MOUNT CONVERTER	N=001	
1JCHBPFY 0212-2		17E CONVERTER	N=001	
1JCHAHV 0216		CHARGING PP NO. 1	J=200	
1JCHAPSL 0216		CHARGING PP NO. 1 SUCTION	N=001	
1JCHBHS 0217		CHARGING PP NO. 2	J=200	
1JCHBPSL 0217		CHARGING PP NO. 2 SUCTION	N=001	
1JCHBHS 0218		CHARGING PP NO. 3	J=200	
1JCHBPSL 0218		CHARGING PP NO. 3 SUCTION	N=001	
1JCHAHV 0218A		CHARGING PP NO. 3	J=200	
1JCHAPSL 0218A		CHARGING PP NO. 3 SUCTION	N=001	
1JCHBTE 0221		REGEN HX TUBE OUTLET	N=001	
1JCHBTY 0221		REGEN HX TUBE OUTLET	N=001	
1JCHBTW 0221		REGEN HX TO LETDOWN HX	N=001	
1JCHBTSHH0221-1		REGEN HX TUBE OUTLET	N=001	
1JCHBTY 0221-1		17E CONVERTER (ISOL)	N=001	
1JCHNTW 0223		LETDOWN HX OUTLET	N=001	
1JCHNTW 0224		LD HX TO LD BACK PRESS VLV	N=001	
1JCHNTW 0223		VOLUME CONTROL TANK	N=001	
1JCHETW 0229		REGEN HX CHARGING OUTLET	N=001	
1JCHNTW 0231		SEAL INJECTION TO AC PPS	N=001	
1JCHREOV 0231P		CHARGING PPS TO SEAL INJECT HX	N=001	
1JCHEPOT 0240		REGEN HX TO CHARGING LINE	N=001	
1JCHEPOV 0240		REGEN HX TO CHARGING LINE	N=001	
1JCHEFE 0241		SEAL INJECTION TO RCP 1A	N=001	
1JCHEFV 0241		SEAL INJECTION TO RCP 1A	N=001	
1JCHNXCVC 0241A		EXC FLOW CRK VLV FOR POIS-241	J=705	
1JCHNXCVC 0241B		EXC FLOW CRK VLV FOR POIS-241	J=705	
1JCHEFE 0242		SEAL INJECTION TO RCP 1B	N=001	
1JCHEFV 0242		SEAL INJECTION TO RCP 1B	N=001	
1JCHEFE 0243		SEAL INJECTION TO RCP 2A	N=001	
1JCHEFV 0243		SEAL INJECTION TO RCP 2A	N=001	
1JCHEFE 0244		SEAL INJECTION TO RCP 2B	N=001	
1JCHEFV 0244		SEAL INJECTION TO RCP 2B	N=001	
1JCHEHV 0250		N2 TO PUR FILTER	N=001	
1JCHBHS 0255		SEAL INJECTION ISOL	J=200	
1JCHBHV 0255		SEAL INJECTION ISOL	N=001	
1JCHNXCVC 0258A		EXC FLOW CRK VLV FOR POIS-258	J=705	
1JCHNXCVC 0258B		EXC FLOW CRK VLV FOR POIS-258	J=705	
1JCHNXCVC 0260A		EXC FLOW CRK VLV FOR POIS-260	J=705	
1JCHNXCVC 0260B		EXC FLOW CRK VLV FOR POIS-260	J=705	
1JCHNTW 0264		PRE-HOLDUP IX INLET	N=001	

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ENVIRONMENTAL QUALIFICATION REPORT
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APPENDIX D

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 11 of 202)

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Q INSTRUMENTS BY SYSTEM

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(CH-4)

TAG NUMBER

DESCRIPTION

BECHTEL
SPEC/PO

1JCHNXC	0265A	EXC FLOW CHK VLV FOR PUIS-265	J-705
1JCHNXC	0265B	EXC FLOW CHK VLV FOR PUIS-265	J-705
1JCHAPT	0268	REACTOR DRAIN TANK	N-001
1JCHAPY	0268	17E CONVERTUM	N-001
1JCHNLT	0268	REACTOR DRAIN TANK	N-001
1JCHAPSHH	0268-2	REACTOR DRAIN TANK	N-001
1JCHAPY	0268-1	17E CONVERTUM ISOL	N-001
1JCHNTW	0269	EQUI DRAIN TANK	N-001
1JCHAPSV	0315	CHARGING PP NO. 1 SUCTION	N-001
1JCHBPSV	0318	CHARGING PP NO. 2 SUCTION	N-001
1JCHEPSV	0321	CHARGING PP NO. 3 SUCTION	N-001
1JCHEPSV	0324	CHARGING PP NO. 3 RECYC	N-001
1JCHBPSV	0325	CHARGING PP NO. 2 RECYC	N-001
1JCHAPSV	0326	CHARGING PP NO. 1 RECYC	N-001
1JCHNPSV	0345	REGEN AX TO LETDOWN AX	N-001
1JCHNPSV	0354	PURIFICATION FICTER INLET	N-001
1JCHEUV	0500	VOLUME CONTROL TANK INLET	N-001
1JCHNUV	0501	VOLUME CONTROL TANK OUTLET	N-001
1JCHBHS	0505	RCP BLEED-OFF TO VCT ISOL	J-200
1JCHBUV	0505	RCP BLEED-OFF TO VCT ISOL	N-001
1JCHBUV	0505	RCP BLEED-OFF TO VCT ISOL	N-001
1JCHBHS	0505-1	RCP BLEED-OFF TO VCT ISOL--RS	N-001
1JCHBHS	0505-2	RCP BLEED-OFF TO VCT DISC	N-001
1JCHAHS	0506	RCP BLEED-OFF TO VCT ISOL	J-200
1JCHAUU	0506	RCP BLEED-OFF TO VCT ISOL	N-001
1JCHAUU	0506	RCP BLEED-OFF TO VCT ISOL	N-001
1JCHAHS	0506-1	RCP BLEED-OFF TO VCT ISOL--RS	N-001
1JCHAHS	0507	RCP BLEED-OFF TO ROT	J-200
1JCHAHV	0507	RCP BLEED-OFF TO ROT	N-001
1JCHAHV	0507	RCP BLEED-OFF TO ROT	N-001
1JCHAHS	0507-1	RCP BLEED-OFF TO ROT--RS	N-001
1JCHRUU	0510	HA MO PUMPS TO RWT	N-001
1JCHNUV	0512	HAKEP TO VCT	N-001
1JCHNHV	0513	VCT TO GXS SORGE HEADER	N-001
1JCHNUV	0514	BORIC ACID RU TO CHRG PUMPS	N-001
1JCHBHS	0515	LETDOWN TO REGEN AX CNTMT ISOL	J-200
1JCHBUU	0515	LETDOWN TO REGEN AX CNTMT ISOL	N-001
1JCHBUU	0515	LETDOWN TO REGEN AX CNTMT ISOL	N-001
1JCHBHS	0515-1	LD TO REGEN AX CNTMT ISOL--RS	N-001
1JCHBHS	0515-2	LD TO REGEN AX DISCONNECT	N-001
1JCHAHS	0516	LETDOWN TO REGEN AX CNTMT ISOL	J-200
1JCHAUU	0516	LETDOWN TO REGEN AX CNTMT ISOL	N-001
1JCHAUU	0516	LETDOWN TO REGEN AX CNTMT ISOL	N-001
1JCHARS	0516-1	LD TO REGEN AX CNTMT ISOL--RS	N-001
1JCHEUV	0520	ION EXCHANGER BYPASS	N-001
1JCHEUV	0521	RAW WATER BOROMETER WP	N-001
1JCHBHS	0523	REGEN AX TO LETDOWN AX ISOL	J-200
1JCHBUU	0523	REGEN AX TO LETDOWN AX ISOL	N-001
1JCHBUU	0523	REGEN AX TO LETDOWN AX ISOL	N-001
1JCHARS	0524	CHARGING PUMPS TO REGEN AX	J-200
1JCHAHV	0524	CHARGING PUMPS TO REGEN AX	N-001
1JCHNHV	0526	LETDOWN CONTROL VLV BYPASS	N-001
1JCHNUV	0527	RHW TO CHRG PPS--BP VCT	N-001
1JCHBHS	0530	RHW TO TAIN B SI	J-200

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 12 of 202)

12/17/82 02128102		Q INSTRUMENTS BY SYSTEM		PAGE 8
TAG NUMBER		DESCRIPTION	BECHTEL SPEC7PD	(CH-5)
1JCH8HV	0530	RWT TO TRAIN B SI	N=001	
1JCH8HS	0531	RWT TO TRAIN A SI	J=200	
1JCH8HV	0531	RWT TO TRAIN A SI	N=001	
1JCHEHV	0532	RWT TO BOMIC ACID HU PUMPS	N=001	
1JCHEHV	0536	RWT GRAVITY FEED TO CRAIG PPS	N=001	
1JCH8HS	0560	REACTOR DRAIN TANK OUTLET ISOL	J=200	
1JCHAUV	0560	REACTOR DRAIN TANK OUTLET ISOL	N=001	
1JCHAUV	0560	REACTOR DRAIN TANK OUTLET ISOL	N=001	
1JCH8HS	0561	REACTOR DRAIN TANK OUTLET ISOL	J=200	
1JCH8UV	0561	REACTOR DRAIN TANK OUTLET ISOL	N=001	
1JCH8UV	0561	REACTOR DRAIN TANK OUTLET ISOL	N=001	
1JCH8UV	0562	RECYCLE DRAIN FOR TO EDT	N=001	
1JCH8UV	0563	RDP SUCTION FROM EDT	N=001	
1JCH8UV	0564	EQPT DRAIN TANK GAS ANAL	N=001	
1JCHEUV	0565	CO TO PRE-HOCOP IX BYPASS	N=001	
1JCHEUV	0566	PRE-HOCOP IX DISCHARGE	N=001	
1JCH8UV	0567	GAS SKIPPER OSCH	N=001	
1JCH8HS	0580	MAKE UP TO REACTOR DRAIN TK	J=200	
1JCHAUV	0580	MAKE UP TO REACTOR DRAIN TK	N=001	
1JCHAUV	0580	MAKE UP TO REACTOR DRAIN TK	N=001	
1JCHNPSV	0657	EQPT DRAIN TANK	N=001	
1JCH8HS	0713	PASS RETURN TO RDT	J=200	
1JCHAUV	0713	PASS RETURN TO RDT	J=603	
1JCHAUV	0713A	SPARE	J=603	
1JCHNPSV	0831	N2 TO EQPT DRAIN TANK	N=001	
1JCHNPSV	0865	SEAL INJECTION HX	N=001	
1JCH8HS	0924	PASS LETOORN SAMPLE	J=200	
1JCH8HV	0924	TAG # REVISED TO 09-924	J=603	
1JCH8UV	0924	PASS LETOORN SAMPLE	J=603	

ENVIRONMENTAL QUALIFICATION REPORT
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APPENDIX D

PVNGS 1,2&3

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 13 of 202)

04/19/82 15:50:39	VALVE="ON" CLASS	PAGE 4	(CH-6)
TAG NUMBER	R/SPEC/		
1PCHAVM41	13PM221A		
1PCHAVX79	13PM221A		
1PCHAVX80	13PM221A		
1PCHAVX81	13PM221A		
1PCHAVX82	13PM221A		
1PCHAVX85	13PM221A		
1PCHAV069	13PM221A		
1PCHAV070	13PM221A		
1PCHAV11A	13NM001		
1PCHAV135	13NM001		
1PCHAV141			
1PCHAV15A	13NM001		
1PCHAV177	13NM001		
1PCHAV179	13NM001		
1PCHAV190	13NM001		
1PCHAV306	13NM001		
1PCHAV314	13NM001		
1PCHAV316	13NM001		
1PCHAV317	13NM001		
1PCHAV328	13NM001		
1PCHAV329	13NM001 C		
1PCHAV339	13NM001		
1PCHAV437	13NM001		
1PCHAV755	13NM001		
1PCHRV50R	13PM221A		
1PCHRV067	13PM221A		
1PCHRV06R	13PM221A		
1PCHRV13A	13NM001		
1PCHRV157	13NM001		
1PCHRV305	13NM001		
1PCHRV319	13NM001		
1PCHRV320	13NM001		
1PCHRV327	13NM001		
1PCHRV331	13NM001		
1PCHRV332	13NM001		
1PCHRV337	13NM001		
1PCHRV43A	13NM001		
1PCHRV756	13NM001		
1PCHRV943	13PM221A		
1PCHRV960	13PM221A		
1PCHCV137	13NM001		
1PCHCV15R	13NM001		
1PCHDV13R	13NM001		
1PCHDV159	13NM001		
1PCHVEM3A	13PM221A		
1PCHVEM42	13PM221A		
1PCHVEM47	13PM221C		
1PCHFVS07	13PM221A		
1PCHVVS09	13PM221A		
1PCHVVS10	13PM221A		
1PCHVEX01	13PM231		
1PCHVEX02	13PM231		
1PCHVEX11	13PM221A		
1PCHVEX12	13PM221A		
1PCHVEX13	13PM221A		

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 14 of 202)

04/19/82 15:50:39		VALVE="M" CLASS	PAGE 5	(CH-7)
TAG NUMBER	R/SPEC/			
1PCHEVX47	13PM221B			
1PCHEV011	13PM221B			
1PCHEV021	13PM221A			
1PCHEV022	13PM221A			
1PCHEV023	13PM221A			
1PCHEV024	13PM221A			
1PCHEV043	13PM221A			
1PCHEV044	13PM221A			
1PCHEV045	13PM221A			
1PCHEV065	13PM221A			
1PCHEV066	13PM221A			
1PCHEV088	13PM221A			
1PCHEV096	13PM221A			
1PCHEV097	13PM221A			
1PCHEV098	13PM221A			
1PCHEV128	13NM001			
1PCHEV129	13NM001			
1PCHEV322	13NM001			
1PCHEV323	13NM001			
1PCHEV334	13NM001			
1PCHEV335	13NM001			
1PCHEV336	13NM001			
1PCHEV393	13NM001			
1PCHEV405	13NM001			
1PCHEV406	13NM001			
1PCHEV425	13NM001			
1PCHEV427	13NM001			
1PCHEV428	13NM001			
1PCHEV429	13NM001			
1PCHEV431	13NM001			
1PCHEV433	13NM001			
1PCHEV434	13NM001			
1PCHEV435	13NM001			
1PCHEV436	13NM001			
1PCHEV439	13NM001			
1PCHEV440	13NM001			
1PCHEV494	13NM001			
1PCHEV642	13NM001			
1PCHEV757	13NM001			
1PCHEV796	13NM001			
1PCHEV797	13NM001			
1PCHEV798	13NM001			
1PCHEV843	13NM001			
1PCHEV853	13NM001			
1PCHEV854	13NM001			
1PCHEV920	13PM221A			
1PCHEV930	13PM221A			
1PCHEV939	13PM221A			
1PCHEV940	13PM221A			
1PCHEV961	13PM221A			
1PCHEV962	13PM221A			
1PCHEV994	13PM221A			
1PCHEV919	13PM221A			
1PCHEV922	13PM221A			
1PCHEV923	13PM221A			

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 15 of 202)

04/19/R2 15150139	VALVE="0" CLASS	PAGE 6	(CH-8)
TAG NUMBER	R/SPFC/		
1PCHNVM24	13PM221A		
1PCHNVM25	13PM221A		
1PCHNVM26	13PM221A		
1PCHNVM27	13PM221A		
1PCHNVM28	13PM221A		
1PCHNVM33	13PM221A		
1PCHNVM34	13PM221A		
1PCHNVM35	13PM221A		
1PCHNVM37	13PM221A		
1PCHNVM43	13PM221C		
1PCHNVR02	13PM221A		
1PCHNVR04	13PM221A		
1PCHNVR13	13PM221A		
1PCHNVR16	13PM221A		
1PCHNVR17	13PM221A		
1PCHNVR18	13PM221A		
1PCHNVR20	13PM221A		
1PCHNVR21	13PM221A		
1PCHNVR22	13PM221A		
1PCHNVR23	13PM221A		
1PCHNVR24	13PM221A		
1PCHNVR25	13PM221A		
1PCHNVR26	13PM221A		
1PCHNVR27	13PM221A		
1PCHNVR28	13PM221A		
1PCHNVR29	13PM221A		
1PCHNVR30	13PM221A		
1PCHNVR41	13PM221A		
1PCHNVR42	13PM221A		
1PCHNVR43	13PM221A		
1PCHNVR44	13PM221A		
1PCHNVR60	13PM221A		
1PCHNVR61	13PM221A		
1PCHNVR63	13PM221A		
1PCHNVR64	13PM221A		
1PCHNVR68	13PM221A		
1PCHNVR70	13PM221A		
1PCHNVR71	13PM221A		
1PCHNVR72	13PM221A		
1PCHNVR73	13PM221A		
1PCHNVR74	13PM221A		
1PCHNVR75	13PM221A		
1PCHNVR76	13PM221A		
1PCHNVR77	13PM221A		
1PCHNVR78	13PM221A		
1PCHNVR79	13PM221A		
1PCHNVR80	13PM221A		
1PCHNVR81	13PM221A		
1PCHNVR82	13PM221A		
1PCHNVR83	13PM221A		
1PCHNVR84	13PM221A		
1PCHNVR85	13PM221A		
1PCHNVR86	13PM221A		
1PCHNVR87	13PM221A		
1PCHNVR88	13PM221A		

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ENVIRONMENTAL QUALIFICATION REPORT
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APPENDIX D

PVNGS 1,2&3

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 16 of 202)

04/19/82 15:50:30	VALVE-"0" CLASS	PAGE 7	(CH-9)
TAG NUMBER	R/SPFC/		
1PCNNVP89	13PM221A		
1PCNNVR90	13PM221A		
1PCNNVR91	13PM221A		
1PCNNVR92	13PM221A		
1PCNNVR94	13PM221A		
1PCNNVR95	13PM221A		
1PCNNVR96	13PM221A		
1PCNNVS02	13PM221A		
1PCNNVS06	13PM221A		
1PCNNVS14	13PM221A		
1PCNNVS15	13PM221A		
1PCNNVS29	13PM221C		
1PCNNVX03	13PM221A		
1PCNNVX04	13PM221A		
1PCNNVX05	13PM221A		
1PCNNVX06	13PM221A		
1PCNNVX07	13PM221A		
1PCNNVX08	13PM221A		
1PCNNVX09	13PM221A		
1PCNNVX10	13PM221A		
1PCNNVX23	13PM221A		
1PCNNVX24	13PM221A		
1PCNNVX39	13PM221A		
1PCNNVX40	13PM221A		
1PCNNVX41	13PM221A		
1PCNNVX53	13PM221A		
1PCNNVX59	13PM221A		
1PCNNVX60	13PM221A		
1PCNNVX61	13PM221A		
1PCNNVX62	13PM221A		
1PCNNVX63	13PM221A		
1PCNNVX64	13PM221A		
1PCNNVX66	13PM221A		
1PCNNVX67	13PM221A		
1PCNNVX68	13PM221A		
1PCNNVX70	13PM221A		
1PCNNVX71	13PM221A		
1PCNNVX77	13PM221A		
1PCNNVX84	13PM221A		
1PCNNVX88	13PM221A		
1PCNNVX89	13PM221A		
1PCNNVX90	13PM221A		
1PCNNVX96	13PM221A		
1PCNNV001	13PM231		
1PCNNV003	13PM221A		
1PCNNV004	13PM221A		
1PCNNV006	13PM221A		
1PCNNV010	13PM221A		
1PCNNV012	13PM221A		
1PCNNV013	13PM221A		
1PCNNV014	13PM221A		
1PCNNV020	13PM221A		
1PCNNV025	13PM221A		
1PCNNV026	13PM221A		
1PCNNV027	13PM221A		

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ENVIRONMENTAL QUALIFICATION REPORT
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APPENDIX D

PVNGS 1,2&3

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 17 of 202)

04/19/82 15:50:39	VALVE="0" CLASS	PAGE 8	(CH-10)
TAG NUMBER	R/SPEC/		
1PCHNV028	13PM221A		
1PCHNV047	13PM221A		
1PCHNV048	13PM221A		
1PCHNV049	13PM221A		
1PCHNV050	13PM221A		
1PCHNV051	13PM221A		
1PCHNV052	13PM221A		
1PCHNV053	13PM221A		
1PCHNV055	13PM221A		
1PCHNV056	13PM221A		
1PCHNV063	13PM221A		
1PCHNV064	13PM221A		
1PCHNV074	13PM221A		
1PCHNV075	13PM221A		
1PCHNV076	13PM221A		
1PCHNV077	13PM221A		
1PCHNV085	13PM221A		
1PCHNV086	13PM221A		
1PCHNV087	13PM221A		
1PCHNV089	13PM221A		
1PCHNV090	13PM221A		
1PCHNV091	13PM221A		
1PCHNV093	13PM231		
1PCHNV094	13PM231		
1PCHNV095	13PM231		
1PCHNV101	13NM001 C		
1PCHNV103	13NM001 C		
1PCHNV104	13NM001 C		
1PCHNV112	13NM001 C		
1PCHNV113	13NM001 C		
1PCHNV114	13NM001 C		
1PCHNV116	13NM001 C		
1PCHNV117	13NM001 C		
1PCHNV124	13NM001 C		
1PCHNV126	13NM001 C		
1PCHNV127	13NM001 C		
1PCHNV130	13NM001		
1PCHNV131	13NM001 C		
1PCHNV132	13NM001 C		
1PCHNV134	13NM001 C		
1PCHNV139	13NM001 C		
1PCHNV143	13NM001		
1PCHNV144	13NM001		
1PCHNV145	13NM001		
1PCHNV146	13NM001 C		
1PCHNV147	13NM001 C		
1PCHNV152	13NM001 C		
1PCHNV153	13NM001 C		
1PCHNV154	13NM001 C		
1PCHNV155	13NM001 C		
1PCHNV161	13NM001 C		
1PCHNV162	13NM001		
1PCHNV164	13NM001 C		
1PCHNV165	13NM001 C		
1PCHNV166	13NM001 C		

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 18 of 202)

04/19/82 15:50:39	VALVE-NO CLASS	PAGE 9	(CH-11)
TAG NUMBER	B/SPEC/		
1PCHNV172	13NM001 C		
1PCHNV174	13NM001 C		
1PCHNV176	13NM001 C		
1PCHNV184	13NM001 C		
1PCHNV185	13NM001 C		
1PCHNV188	13NM001 C		
1PCHNV192	13NM001 C		
1PCHNV197	13NM001 C		
1PCHNV198	13NM001 C		
1PCHNV296	13PM221C		
1PCHNV300	13NM001 C		
1PCHNV330	13NM001 C		
1PCHNV340	13NM001 C		
1PCHNV341	13NM001 C		
1PCHNV342	13NM001 C		
1PCHNV343	13NM001 C		
1PCHNV344	13NM001 C		
1PCHNV346	13NM001		
1PCHNV347	13NM001 C		
1PCHNV348	13NM001 C		
1PCHNV349	13NM001 C		
1PCHNV350	13NM001 C		
1PCHNV351	13NM001 C		
1PCHNV352	13NM001 C		
1PCHNV353	13NM001 C		
1PCHNV354	13NM001 C		
1PCHNV356	13NM001 C		
1PCHNV357	13NM001 C		
1PCHNV358	13NM001 C		
1PCHNV359	13NM001		
1PCHNV360	13NM001 C		
1PCHNV362	13NM001 C		
1PCHNV363	13NM001 C		
1PCHNV364	13NM001 C		
1PCHNV364	13NM001		
1PCHNV367	13NM001 C		
1PCHNV368	13NM001 C		
1PCHNV369	13NM001 C		
1PCHNV370	13NM001 C		
1PCHNV371	13NM001 C		
1PCHNV372	13NM001 C		
1PCHNV373	13NM001 C		
1PCHNV374	13NM001 C		
1PCHNV375	13NM001 C		
1PCHNV376	13NM001 C		
1PCHNV378	13NM001 C		
1PCHNV379	13NM001 C		
1PCHNV380	13NM001 C		
1PCHNV381	13NM001 C		
1PCHNV382	13NM001 C		
1PCHNV383	13NM001 C		
1PCHNV384	13NM001 C		
1PCHNV385	13NM001		
1PCHNV386	13NM001 C		
1PCHNV387	13NM001 C		

ENVIRONMENTAL QUALIFICATION REPORT
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APPENDIX D

PVNGS 1, 2&3

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 19 of 202)

04/19/82 15:50:39	VALVE-NOM CLASS	PAGE 10	(CH-12)
TAG NUMBER	R/SPEC/		
1PCHNV389	13NM001 C		
1PCHNV390	13NM001 C		
1PCHNV391	13NM001 C		
1PCHNV392	13NM001 C		
1PCHNV394	13NM001 C		
1PCHNV395	13NM001 C		
1PCHNV396	13NM001 C		
1PCHNV397	13NM001 C		
1PCHNV398	13NM001		
1PCHNV399	13NM001		
1PCHNV400	13NM001		
1PCHNV401	13NM001		
1PCHNV402	13NM001		
1PCHNV403	13NM001		
1PCHNV404	13NM001		
1PCHNV407	13NM001		
1PCHNV408	13NM001		
1PCHNV413	13NM001		
1PCHNV414	13NM001		
1PCHNV415	13NM001		
1PCHNV418	13NM001		
1PCHNV419	13NM001		
1PCHNV420	13NM001		
1PCHNV421	13NM001		
1PCHNV422	13NM001		
1PCHNV423	13NM001		
1PCHNV424	13NM001 C		
1PCHNV426	13NM001 C		
1PCHNV445	13NM001		
1PCHNV449	13NM001		
1PCHNV450	13NM001 C		
1PCHNV459	13NM001 C		
1PCHNV460	13NM001 C		
1PCHNV461	13NM001 C		
1PCHNV462	13NM001 C		
1PCHNV464	13NM001 C		
1PCHNV465	13NM001		
1PCHNV466	13NM001		
1PCHNV468	13NM001		
1PCHNV469	13NM001		
1PCHNV470			
1PCHNV471			
1PCHNV472	13NM001		
1PCHNV473	13NM001		
1PCHNV474	13NM001 C		
1PCHNV475	13NM001 C		
1PCHNV476	13NM001 C		
1PCHNV477	13NM001		
1PCHNV478	13NM001 C		
1PCHNV479	13NM001		
1PCHNV480	13NM001 C		
1PCHNV485	13NM001 C		
1PCHNV486	13NM001 C		
1PCHNV488	13NM001 C		
1PCHNV489	13NM001 C		

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 20 of 202)

04/19/82 15:50:39

VALVE="Q" CLASS

PAGE 11

(CH-13)

TAG NUMBER	R/SPEC/
1PCHNV490	13NM001 C
1PCHNV491	13NM001 C
1PCHNV492	13NM001 C
1PCHNV493	13NM001 C
1PCHNV494	13NM001 C
1PCHNV495	13NM001 C
1PCHNV496	13NM001 C
1PCHNV612	13NM001
1PCHNV613	13NM001
1PCHNV614	13NM001
1PCHNV645	13NM001 C
1PCHNV646	13NM001 C
1PCHNV647	13NM001 C
1PCHNV648	13NM001 C
1PCHNV649	13NM001 C
1PCHNV653	13NM001 C
1PCHNV654	13NM001 C
1PCHNV655	13NM001 C
1PCHNV656	13NM001 C
1PCHNV660	13NM001 C
1PCHNV662	13NM001 C
1PCHNV663	13NM001 C
1PCHNV665	13NM001
1PCHNV66A	13NM001 C
1PCHNV686	13NM001 C
1PCHNV709	13NM001 C
1PCHNV721	13NM001 C
1PCHNV722	13NM001 C
1PCHNV723	13NM001 C
1PCHNV724	13NM001 C
1PCHNV725	13NM001 C
1PCHNV726	13NM001 C
1PCHNV727	13NM001 C
1PCHNV72R	13NM001 C
1PCHNV730	13NM001 C
1PCHNV740	13NM001A
1PCHNV753	13NM001 C
1PCHNV787	13NM001 C
1PCHNV78R	13NM001 C
1PCHNV789	13NM001 C
1PCHNV800	13NM001 C
1PCHNV802	13NM001 C
1PCHNV803	13NM001 C
1PCHNV804	13NM001 C
1PCHNV805	13NM001 C
1PCHNV807	13NM001 C
1PCHNV80R	13NM001 C
1PCHNV809	13NM001 C
1PCHNV810	13NM001 C
1PCHNV812	13NM001 C
1PCHNV813	13NM001 C
1PCHNV814	13NM001 C
1PCHNV815	13NM001 C
1PCHNV816	13NM001 C
1PCHNV81R	13NM001 C

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APPENDIX D

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 21 of 202)

04/19/82 15:50:39	VALVE-NOM CLASS	PAGE 12	(CH-14)
TAG NUMBER	R/SPEC/		
1PCHNV819	13NM001 C		
1PCHNV821	13NM001 C		
1PCHNV822	13NM001 C		
1PCHNV823	13NM001 C		
1PCHNV825	13NM001 C		
1PCHNV826	13NM001 C		
1PCHNV830	13NM001 C		
1PCHNV833	13NM001		
1PCHNV834	13NM001		
1PCHNV835	13NM001		
1PCHNV836	13NM001		
1PCHNV839	13NM001		
1PCHNV841	13NM001 C		
1PCHNV842	13NM001 C		
1PCHNV844	13NM001		
1PCHNV845	13NM001		
1PCHNV848	13NM001 C		
1PCHNV849	13NM001 C		
1PCHNV855	13NM001		
1PCHNV856	13NM001 C		
1PCHNV858	13NM001		
1PCHNV859	13NM001 C		
1PCHNV860	13NM001 C		
1PCHNV861	13NM001 C		
1PCHNV866	13NM001		
1PCHNV867	13NM001		
1PCHNV868	13NM001		
1PCHNV869	13NM001		
1PCHNV900	13PH221A		
1PCHNV909	13PH221A		
1PCHNV911	13PH221A		
1PCHNV915	13PH221A		
1PCHNV917	13PH221A		
1PCHNV925	13PH221A		
1PCHNV928	13PH221A		
1PCHNV934	13PH221A		
1PCHNV936	13PH221A		
1PCHNV946	13PH221A		
1PCHNV948	13PH221A		
1PCHNV952	13PH221A		
1PCHNV953	13PH221A		
1PCHNV963	13PH221A		
1PCHNV964	13PH221A		
1PCHNV965	13PH221A		
1PCHNV969	13PH221A		
1PCHNV976	13PH231		
1PCHNV993	13PH221A		
1PCHNV994	13PH221A		
1PCHNV997	13PH221A		

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 22 of 202)

04/19/82 1513814A		EQUIPMENT-NO CLASS	PAGE 7	CONTAINMENT LEAK TEST	(CL-1)
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PU			
1MCLEU5R	PENETRATION-TEST COHN	13MH500			
1MCLEU62B	FLOW VERIFICATION PENETRATION	13MH500			
1MCLEU62C	PRESSURE SENSING PENETRATION	13MH500			

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 23 of 202)

04/19/82 15:50:39	VALVE-NOM CLASS	PAGE 14	(CL-2)
TAG NUMBER	R/SPEC/		
1PCLEV002	13PH221C0		
1PCLEV003	13PH221C		

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 24 of 202)

04/19/82 15:38:46		EQUIPMENT="00" CLASS	PAGE 9	CONTAINMENT PURGE	(CP-1)
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO			
1MCPEN25	PENETRATION-AIR SAMPLING	13MH500			
1MCPEN56	MECH PENETRATION, CP SUPPLY	13CH152			
1MCPEN57	MECH PENETRATION, CP EXHAUST	13CH152			
1MCPEN78	MECH PENETRATION, CP SUPPLY	13CH152			
1MCPEN79	MECH PENETRATION, CP EXHAUST	13CH152			

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 25 of 202)

12/17/82 02:28:02

U INSTRUMENTS BY SYSTEM

PAGE 10
(CP-2)

TAG NUMBER

DESCRIPTION

HECTEL
SPEC7PD

1JCPAHS 0002
 1JCPAUV 0002A
 1JCPAUV 0002B
 1JCPBHS 0003
 1JCPBUV 0003A
 1JCPBUV 0003B
 1JCPAHS 0004
 1JCPAUV 0004A
 1JCPAUV 0004B
 1JCPBHS 0005
 1JCPBUV 0005A
 1JCPBUV 0005B

CUNTH PRG RFL MODE IV
 CUNTH PRG RFL MODE IV
 CUNTH PRG RFL MODE IV
 CUNTH PRG RFL MODE IV
 CUNTH PRG RFL MODE IV
 CUNTH PRG RFL MODE IV
 CUNTH PRG PHA-ACCESS MODE IV
 CUNTH PRG PHA-ACCESS MODE IV
 CUNTH PRG PHA-ACCESS MODE IV
 CUNTH PRG PHA-ACCESS MODE IV
 CUNTH PRG PHA-ACCESS MODE IV
 CUNTH PRG PHA-ACCESS MODE IV

J=200
 J=805
 J=805
 J=200
 J=805
 J=805
 J=200
 J=805
 J=805
 J=200
 J=805
 J=805

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 26 of 202)

04/19/82 15:50:39		VALVE="0" CLASS	PAGE 16	(CP-3)
TAG NUMBER		B/SPEC/		
1PCPNV001		13PM221A		
1PCPNV002		13PM221A		
1PCPNV003		13PM221A		
1PCPNV004		13PM221A		

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APPENDIX D

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 27 of 202)

04/19/82 15:38:46		EQUIPMENT-WQM CLASS	PAGE 11	CONDENSATE TRANSFER AND STORAGE
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO	(CT-1)	
1MCTAF01	TEMPORARY-STARTUP-STRAINER	13PM407		
1MCTAP01	CONDENSATE TRANSFER PUMP	13MM093		
1MCTRF01	TEMPORARY-STARTUP-STRAINER	13PM407		
1MCTRP01	CONDENSATE TRANSFER PUMP	13MM093		
1MCTET01	CONDENSATE STORAGE TANK	13CM220		

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 28 of 202)

12/17/82 02128102		U INSTRUMENTS BY SYSTEM		PAGE 12
TAG NUMBER		DESCRIPTION	BECHTEL SPEC/PO	(CT-2)
1JCTAHS 0001		CNDS TK TO AUX FW PP IV CONT	J-200	
1JCTAHV 0001		CNDS TK TO AOX FW PP IV	J-803	
1JCTAHS 0004		CNDS TK TO AOX FW PP IV CONT	J-200	
1JCTAHV 0004		CNDS TK TO AOX FW PP IV	J-200	
1JCTETH 0014		CNDS TK TEMP	J-356	
1JCTAHS 0015		CNDS TRANSFER PP-A CUNT	J-200	
1JCTBHS 0016		CNDS TRANSFER PP-B CUNT	J-200	
1JCTAXCV 0017		EXC FLOW CRR VCV FOR PI-17	J-703	
1JCTAXCV 0018		EXC FLOW CRR VLV FOR PY-18	J-703	
1JCTINFO 0019		CNDS TRANSFER PP-A RECYRC	M-093	
1JCTINFO 0020		CNDS TRANSFER PP-B RECYRC	M-093	
1JCTAFE 0028		CNDS TRANSFER PP-A TEST	J-425	
1JCTBFE 0029		CNDS TRANSFER PP-B TEST	J-425	
1JCTALR 0033		CNDS TK LEVEEC 7"MIN LEVEL	J-111	
1JCTALSHLO033		CNDS TK NORM OVER LEVELS	J-111	
1JCTALT 0033		CNDS TK LEVEL	J-311	
1JCTALY 0033		17E CONVERTOR	J-111	
1JCTALI 0033A		CNDS TK LEVEEC	J-111	
1JCTALI 0033B		CNDS TK LEVEEC	J-111	
1JCTBLSHMO036		CNDS TK MAX OVER LEVEL	J-111	
1JCTBLT 0036		CNDS TK LEVEL	J-311	
1JCTBLV 0036		17E CONVERTOR	J-111	
1JCTBLV 0036A		CNDS TK LEVEEC	J-111	
1JCTBLSLLO036A		CNDS TK MIN OVER LEVEL	J-111	
1JCTBLT 0036B		CNDS TK LEVEL	J-111	
1JCTBLSLLO036B		CNDS TK EMPTY	J-111	

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 29 of 202)

04/19/82 15:50:39

VALVE="ON" CLASS

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(CT-3)

TAG NUMBER	R/SPFC/
1PCTAV015	13PM221B
1PCTAV016	13PM221B
1PCTAV017	13PM221B
1PCTAV018	13PM221B
1PCTAV023	13PM221B
1PCTAV028	13PM221A
1PCTAV030	13PM221A
1PCTAV033	13PM221B
1PCTAV037	13PM221B
1PCTAV043	13PM221A
1PCTAV044	13PM221A
1PCTAV050	13PM221A
1PCTAV051	13PM221A
1PCTAV053	13PM221A
1PCTAV056	13PM221A
1PCTAV059	13PM221A
1PCTAV060	13PM221A
1PCTAV061	13PM221A
1PCTAV062	13PM221A
1PCTAV063	13PM221A
1PCTAV068	13PM221A
1PCTAV070	13PM221A
1PCTAV071	13PM221A
1PCTAV080	13PM221A
1PCTAV086	13PM221A
1PCTAV090	13PM221A
1PCTAV091	13PM221A
1PCTAV092	13PM221A
1PCTAV093	13PM221 A
1PCTAV014	13PM221B
1PCTAV019	13PM221B
1PCTRV020	13PM221B
1PCTRV021	13PM221B
1PCTRV022	13PM221B
1PCTRV024	13PM221B
1PCTRV029	13PM221A
1PCTRV031	13PM221A
1PCTRV032	13PM221A
1PCTRV034	13PM221B
1PCTRV038	13PM221B
1PCTRV042	13PM221B
1PCTRV045	13PM221A
1PCTRV046	13PM221A
1PCTRV048	13PM221A
1PCTRV049	13PM221A
1PCTRV054	13PM221A
1PCTRV057	13PM221A
1PCTRV058	13PM221A
1PCTRV064	13PM221A
1PCTRV065	13PM221A
1PCTRV066	13PM221A
1PCTRV072	13PM221A
1PCTRV081	13PM221A
1PCTRV088	13PM221A
1PCTRV095	13PM221A

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 30 of 202)

04/19/R2 15:50:39		VALVE-NOM CLASS	PAGE 19	(CT-4)
TAG NUMBER		R/SPEC/		
1PCTEV009		13PH221B		
1PCTEV013		13PH221A		
1PCTEV025		13PH221A		
1PCTEV035		13PH221A		
1PCTEV036		13PH221A		
1PCTEV055		13PH221B		
1PCTEV111		13PH221C		

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 31 of 202)

04/19/82 15:38:46		EQUIPMENT="00" CLASS	PAGE 13	DIESEL FUEL OIL AND TRANSFER (DF-1)
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO		
AMDPE01	SPARE OL GEN FL OIL XFER PUMP	13MM098		
1MDFAF01	DSL GEN A FUEL OIL BSKT STRNR	13MM210		
1MDFAF01A	DSL GEN A FUEL OIL BSKY STRNR	13MM210		
1MDFAF01B	DSL GEN A FUEL OIL BSKT STRNR	13MM210		
1MDFAP01	DIESEL GEN FUEL OIL XFER PUMP	13MM098		
1MDFAT01	DIESEL GEN FUEL OIL STG TANK	13MM105		
1MDFAT02	DSL GEN A FUEL OIL DAY TNK	13MM018		
1MDFBF01A	DSL GEN A FUEL OIL BSKT STRNR	13MM210		
1MDFBF01B	DSL GEN A FUEL OIL BSKY STRNR	13MM210		
1MDFBP01	DIESEL GEN FUEL OIL XFER PUMP	13MM098		
1MDFBT01	DIESEL GEN FUEL OIL STG TANK	13MM105		
1MDFBT02	DSL GEN A FUEL OIL DAY TNK	13MM018		

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 32 of 202)

PAGE 14
(DF-2)

12/17/82 02128102	INSIKUMENIS BY SYSTEM	BECHTEL SPEC7PO
IAG NUMBER	DESCRIPTION	
1JDFAFB 000Y	UG A FU FLOW TO DAY TANK	J-425
1JDFBFE 0010	UG B FU FLOW TO DAY TANK	J-425
1JDFAXCV 0013A	EXC FLOW CHK VLV FOR P01S-13	J-705
1JDFAXCV 0013B	EXC FLOW CHK VLV FOR P01S-13	J-705
1JDFBXC 0014A	EXC FLOW CHK VLV FOR P01S-14	J-705
1JDFBXC 0014B	EXC FLOW CHK VLV FOR P01S-14	J-705
1JDFAXCV 0017	EXC FLOW CHK VLV FOR P01S-17	J-705
1JDFBXC 0018	EXC FLOW CHK VLV FOR P01S-18	J-705
1JDFBHS 0021A	UG A FU PUMP P01(CURTRUC"HA)	M-016
1JDFBHS 0021B	UG A FU PUMP P01(CURTRUC"HA)	J-200
1JDFBHS 0022A	UG B FU PUMP P01(CURTRUC"HA)	M-016
1JDFBHS 0022B	UG B FU PUMP P01(CURTRUC"HA)	J-200
1JDFBHS 0022C	UG B FU PUMP P01(CURTRUC"HA)	J-200

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Table D-1
CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 33 of 202)

04/19/82 15:50:39	VALVE="0" CLASS	PAGE 21	(DF-3)
TAG NUMBER	R/SPEC/		
1P0FAV003	13PM221A		
1P0FAV007	13PM221A		
1P0FAV008	13PM221A		
1P0FAV009	13PM221A		
1P0FAV012	13PM221A		
1P0FAV013	13PM221A		
1P0FAV014	13PM221A		
1P0FAV015	13PM221A		
1P0FAV041	13PM221A		
1P0FAV042	13PM221A		
1P0FAV044	13PM221A		
1P0FAV045	13PM221A		
1P0FAV062	13PM221A		
1P0FAV067	13PM221A		
1P0FAV078	13PM221B		
1P0FAV081	13PM221A		
1P0FAV082	13PM221A		
1P0FAV083	13PM221A		
1P0FAV084	13PM221A		
1P0FAV089	13PM221A		
1P0FAV093	13PM221A		
1P0FAV094	13PM221A		
1P0FAV095	13PM221A		
1P0FAV096	13PM221A		
1P0FAV097	13PM221A		
1P0FAV098	13PM221A		
1P0FAV103	13PM221A		
1P0FRV018	13PM221A		
1P0FRV019	13PM221A		
1P0FRV020	13PM221A		
1P0FRV021	13PM221A		
1P0FRV028	13PM221A		
1P0FRV029	13PM221A		
1P0FRV030	13PM221A		
1P0FRV032	13PM221A		
1P0FRV051	13PM221A		
1P0FRV052	13PM221A		
1P0FRV054	13PM221B		
1P0FRV058	13PM221A		
1P0FRV059	13PM221A		
1P0FRV064	13PM221A		
1P0FRV068	13PM221A		
1P0FRV069	13PM221A		
1P0FRV077	13PM221A		
1P0FRV079	13PM221B		
1P0FRV085	13PM221A		
1P0FRV086	13PM221A		
1P0FRV087	13PM221A		
1P0FRV088	13PM221A		
1P0FRV090	13PM221A		
1P0FRV091	13PM221A		
1P0FRV092	13PM221A		
1P0FRV099	13PM221A		
1P0FRV100	13PM221A		
1P0FRV101	13PM221A		

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ENVIRONMENTAL QUALIFICATION REPORT
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APPENDIX D

PVNGS 1, 2&3

Table D-1
 CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 34 of 202)

04/19/82 15:50:39	VALVE="0" CLASS	PAGE 22	(DF-4)
TAG NUMBER	B/SPEC/		
1P0FRV102	13PH221A		

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APPENDIX D

PVNGS 1,2&3

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 35 of 202)

04/19/82 15:38:46		EQUIPMENT-"Q" CLASS	PAGE 15	DIESEL GENERATOR SYSTEM	(DG-1)
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO			
1JDGAR01	ENG CNTL PNL-DSL GEN A	13MM018			
1JDGA802	GEN CNTL PNL-DSL GEN A	13MM018			
1JDGA803	HIGH VLTG CNTL PNL-DSL GEN-A	13MM018			
1JDGAR04	RATIO/RELAY PANEL-DSL GEN A	13MM018			
1JDGB801	ENG CNTL PNL-DSL GEN B	13MM018			
1JDGB802	GEN CNTL PNL-DSL GEN B	13MM018			
1JDGB803	HIGH VLTG CNTL PNL-DSL GEN B	13MM018			
1JDGB804	RATIO/RELAY PANEL-DSL GEN B	13MM018			
1MDGAC03	TURBOCHARGER	13MM018			
1MDGAE01A	AIR INTERCOOLERS/HEATERS	13MM018			
1MDGAE01B	AIR INTERCOOLERS/HEATERS	13MM018			
1MDGAE02	GOVERNOR OIL COOLER	13MM018			
1MDGAE03	FUEL OIL COOLER	13MM018			
1MDGAE04	LUBE OIL COOLER	13MM018			
1MDGAE05	JACKET WATER COOLER	13MM018			
1MDGAF03	DSL GEN A AIR INTAKE FILTER	13MM018			
1MDGAF04	DSL GEN A AIR INTAKE SILENCER	13MM018			
1MDGAF05	DSL GEN A EXHAUST SILENCER	13MM018			
1MDGAF06A	DSL GEN A STARTING AIR FLTR A	13MM018			
1MDGAF06B	DSL GEN A STARTING AIR FLTR B	13MM018			
1MDGAF07	DSL GEN A L.O. SUMP STRAINER	13MM018			
1MDGAF08	DEL GEN A LO FILTER	13MM018			
1MDGAF09A	DEL GEN A LO STRAINER A	13MM018			
1MDGAF09B	DEL GEN A LO STRAINER B	13MM018			
1MDGAF10A	DEL GEN A TURBO BRGS LO FLTR A	13MM018			
1MDGAF10B	DEL GEN A TURBO BRGS LO FLTR B	13MM018			
1MDGAF11A	DEL GEN A FO SUCT STRAINER A	13MM018			
1MDGAF11B	DEL GEN A FO SUCT STRAINER B	13MM018			
1MDGAF12A	DEL GEN A FO DISCH FILTER A	13MM018			
1MDGAF12B	DEL GEN A FO DISCH FILTER B	13MM018			
1MDGAH01	DIESEL GENERATOR A	13MM018			
1MDGAM01	DSL GEN A JACKET WTR CIRC HTR	13MM018			
1MDGAM02	DSL GEN A LO CIRC HEATER	13MM018			
1MDGAP01	DSL GEN A JACKET WTR CIRC PUMP	13MM018			
1MDGAP02	DEL GEN ENG DR JACKET WTR PUMP	13MM018			
1MDGAP03	DEL GEN ENG DR LO PUMP	13MM018			
1MDGAP04	DSL GEN A LO CIRC PUMP	13MM018			
1MDGAP05	DEL GEN ENG DR FO BOOSTER PUMP	13MM018			
1MDGAX01A	DSL GEN A STARTING AIR RCVR A	13MM018			
1MDGAX01B	DSL GEN A STARTING AIR RCVR B	13MM018			
1MDGAY01	COMB AIR INTAKE EXPANSION JT	13MM018			
1MDGAY02	EXHAUST EXP JNT ENGINE MOUNTED	13MM018			
1MDGAY03	EXP JNT ENGINE EXHAUST	13MM018			
1MDGAY04	EXHAUST EXP JNT	13MM018			
1MDGAY11	EXP JNT ENGINE CLNG WTR RETURN	13MM018			
1MDGAY12	EXP JNT CLNG WTR PUMP SUCTION	13MM018			
1MDGAY13	EXP JNT CLNG WTR PMP DISCHARGE	13MM018			
1MDGAY14	EXP JNT ENGINE CLNG WTR SUPPLY	13MM018			
1MDGAY15	EXP JNT WARMUP PMP DISCHARGE	13MM018			
1MDGAY18	EXP JOINT TURBO CLR OUTLET HDR	13MM018			
1MDGAY19	EXP JOINT TURBO COOLER SUPPLY	13MM018			
1MDGAY20	EXP JNT ENGINE LUBE OIL SUPPLY	13MM018			
1MDGAY21	EXP JNT LUBE OIL PMP DISCHARGE	13MM018			
1MDGAY22	EXP JNT OIL WARMUP PMP SUCTION	13MM018			

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 36 of 202)

04/19/82 15:38:46	EQUIPMENT-NOM CLASS	PAGE 16	(DG-2)
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO	
1MDGAY23	EXP JNT LUBE OIL PUMP SUCTION	13MM018	
1MDGAY24	EXP JOINT TURBO COOLER OUTLET	13MM018	
1MDGAY25	FLEX METAL HOSE TURNING GEAR	13MM018	
1MDGBC03	TURBOCHARGER	13MM018	
1MDGBF01A	AIR INTERCOOLERS/HEATERS	13MM018	
1MDGBE01B	AIR INTERCOOLERS/HEATERS	13MM018	
1MDGBE02	GOVERNOR OIL COOLER	13MM018	
1MDGBE03	FUEL OIL COOLER	13MM018	
1MDGBE04	LUBE OIL COOLER	13MM018	
1MDGBE05	JACKET WATER COOLER	13MM018	
1MDGBF03	DSL GEN B AIR INTAKE FILTER	13MM018	
1MDGBF04	DSL GEN B AIR INTAKE SILENCER	13MM018	
1MDGBF05	DSL GEN B EXHAUST SILENCER	13MM018	
1MDGBF06A	DSL GEN B STARTING AIR FLTR A	13MM018	
1MDGBF06B	DSL GEN B STARTING AIR FLTR B	13MM018	
1MDGBF07	DSL GEN B L.O. SUMP STRAINER	13MM018	
1MDGBF08	DEL GEN B LO FILTER	13MM018	
1MDGBF09A	DEL GEN B LO STRAINER A	13MM018	
1MDGBF09B	DEL GEN B LO STRAINER B	13MM018	
1MDGBF10A	DEL GEN B TURBO RGGS LO FLTR A	13MM018	
1MDGBF10B	DEL GEN B TURBO RGGS LO FLTR B	13MM018	
1MDGBF11A	DEL GEN B FO SUCT STRAINER A	13MM018	
1MDGBF11B	DEL GEN B FO SUCT STRAINER B	13MM018	
1MDGBF12A	DEL GEN B FO DISCH FILTER A	13MM018	
1MDGBF12B	DEL GEN B FO DISCH FILTER B	13MM018	
1MDGBH01	DIESEL GENERATOR B	13MM018	
1MDGBM01	DSL GEN B JACKET WTR CIRC HTR	13MM018	
1MDGBM02	DSL GEN B LO CIRC HEATER	13MM018	
1MDGBP01	DSL GEN B JACKET WTR CIRC PUMP	13MM018	
1MDGBP02	DEL GEN ENG DR JACKET WTR PUMP	13MM018	
1MDGBP03	DEL GEN ENG DR LO PUMP	13MM018	
1MDGBP04	DSL GEN B LO CIRC PUMP	13MM018	
1MDGBP05	DEL GEN ENG DR FO BOOSTER PUMP	13MM018	
1MDGBX01A	DSL GEN A STARTING AIR RCVR A	13MM018	
1MDGBX01B	DSL GEN A STARTING AIR RCVR B	13MM018	
1MDGBY01	COMB AIR INTAKE EXPANSION JT	13MM018	
1MDGBY02	EXHAUST EXP JNT ENGINE MOUNTED	13MM018	
1MDGBY03	EXP JNT ENGINE EXHAUST	13MM018	
1MDGBY04	EXHAUST EXP JNT	13MM018	
1MDGBY11	EXP JNT ENGINE CLNG WTR RETURN	13MM018	
1MDGBY12	EXP JNT CLNG WTR PMP SUCTION	13MM018	
1MDGBY13	EXP JNT CLNG WTR PMP DISCHARGE	13MM018	
1MDGBY14	EXP JNT ENGINE CLNG WTR SUPPLY	13MM018	
1MDGBY15	EXP JNT WARMUP PMP DISCHARGE	13MM018	
1MDGBY18	EXP JOINT TURBO CLR OUTLET HOR	13MM018	
1MDGBY19	EXP JOINT TURBO COOLER SUPPLY	13MM018	
1MDGBY20	EXP JNT ENGINE LUBE OIL SUPPLY	13MM018	
1MDGBY21	EXP JNT LUBE OIL PMP DISCHARGE	13MM018	
1MDGBY22	EXP JNT OIL WARMUP PMP SUCTION	13MM018	
1MDGBY23	EXP JNT LUBE OIL PUMP SUCTION	13MM018	
1MDGBY24	EXP JOINT TURBO COOLER OUTLET	13MM018	
1MDGBY25	FLEX METAL HOSE TURNING GEAR	13MM018	

ENVIRONMENTAL QUALIFICATION REPORT
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APPENDIX D

PVNGS 1, 2&3

Table D-1
CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 37 of 202)

04/19/82 16:06:57		INSTRUMENT -"0" CLASS	PAGE 16	(DG-3)
TAG NUMBER	DESCRIPTION	RECHTEL SPEC/PD		
1J0GAFV 0013	DG A CRANKING AIR VLV LEFT BK	M-018		
1J0GAFV 0015	DG A CRANKING AIR VLV RIGHT BK	M-018		
1J0GAHCV 0009	DG A STARTING AIR RECR A OUT	M-018		
1J0GAHCV 0011	DG A STARTING AIR RECR B OUT	M-018		
1J0GAHS 0001	DG A AIR START/STOP CONTRL RH	J-200		
1J0GAHS 0003	DG A AIR START LOCAL PANEL	M-018		
1J0GAHS 0007	DG A MODE CONTROL LOCAL PANEL	M-018		
1J0GAHS 0017	DG A LUBE OIL CIRC PUMP	M-018		
1J0GAHS 0019	DG A LUBE OIL WARM UP HTR	M-018		
1J0GAHS 0021	DG A JACKET WTR CIRC PUMP	M-018		
1J0GAHS 0027	DG A JACKET WTR HEATER	M-018		
1J0GAHS 0029	DG A EMERG STOP PR(LOCAL PNL)	M-018		
1J0GALC 0007	DG A FO DAY TK LEVEL CONTROL	M-018		
1J0GAPSL 0003	DG A LUBE OIL LO PRESS TRIP	M-018		
1J0GAPSL 0005	DG A LUBE OIL LO PRESS TRIP	M-018		
1J0GAPSL 0009	DG A LUBE OIL LO PRESS TRIP	M-018		
1J0GAPSV 0005	DG A START AIR RECEIVER A	M-018		
1J0GAPSV 0007	DG A START AIR RECEIVER B	M-018		
1J0GAPY 0001	DG A ENGINE LUBE OIL PRESS	M-018		
1J0GAPY 0003	DG A FUEL OIL PRES AFTER FLTR	M-018		
1J0GAPY 0005	DG A TURBO LUBE OIL PRESS	M-018		
1J0GAPY 0007	DG A JACKET WTR PRES ENG INLT	M-018		
1J0GASC 0001	DG A GOV ACTUATOR EL SPEED CTL	M-018		
1J0GASI 0031	DG A ENGINE SPEED(LOCAL PANEL)	M-018		
1J0GASSH 0003	DG A OVSD COMB AIR TRIP IND 1	M-018		
1J0GASSH 0005	DG A OVSD COMB AIR TRIP IND 2	M-018		
1J0GAST 0001	DG A ENG SPEED MAG PICKUP # 1	M-018		
1J0GAST 0003	DG A ENG SPEED MAG PICKUP # 2	M-018		
1J0GAUV 0001	DG A COOL WTR SURGE TK	J-603		
1J0GAUV 0003	DG A STARTING AIR RIGHT BK # 2	M-018		
1J0GAUV 0005	DG A STARTING AIR LEFT BK # 1	M-018		
1J0GAUV 0007	DG A STARTING AIR LEFT BK # 2	M-018		
1J0GAUV 0009	DG A EMERG MODE FUEL CNTR # 1	M-018		
1J0GAUV 0011	DG A EMERG MODE FUEL CNTR # 2	M-018		
1J0GAUV 0015	DG A STARTING AIR RIGHT BK # 1	M-018		
1J0GAUV 0285	VOID	M-018		
1J0GAXCV 0029A	EXC FLOW CHK VLV FOR PI-29	J-705		
1J0GAXCV 0029R	EXC FLOW CHK VLV FOR PI-29	J-705		
1J0GAZSH 0289	DG A FO DAY TANK SHUT OFF	P-221A		
1J0GBFV 0014	DG B CRANKING AIR VLV LEFT BK	M-018		
1J0GBFV 0016	DG B CRANKING AIR VLV RIGHT BK	M-018		
1J0GBHCV 0010	DG B STARTING AIR RECR A OUT	M-018		
1J0GBHCV 0012	DG B STARTING AIR RECR B OUT	M-018		
1J0GBHS 0002	DG B AIR START/STOP CONTRL RH	J-200		
1J0GBHS 0004	DG B AIR START LOCAL PANEL	M-018		
1J0GBHS 0008	DG B MODE CONTROL LOCAL PANEL	M-018		
1J0GBHS 0018	DG B LUBE OIL CIRC PUMP	M-018		
1J0GBHS 0020	DG B LUBE OIL WARM UP HTR	M-018		
1J0GBHS 0022	DG B JACKET WTR CIRC PUMP	M-018		
1J0GBHS 0028	DG B JACKET WTR HEATER	M-018		
1J0GBHS 0030	DG B EMERG STOP PR(LOCAL PNL)	M-018		
1J0GBLC 0008	DG B FO DAY TK LEVEL CONTROL	M-018		
1J0GBPSL 0004	DG B LUBE OIL LO PRESS TRIP	M-018		
1J0GBPSL 0006	DG B LUBE OIL LO PRESS TRIP	M-018		

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 38 of 202)

12/1/82 02128102	INSTRUMENTS BY SYSTEM		PAGE 18
IAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO	(DG-4)
1J0GANS 0001	UG A AIR START/STOP CONYL RM	J-200	
1J0GALC 0001	UG A COOL WTR SURGE TK	M-018	
1J0GAPY 0001	UG A ENGINE CUBE OIL PRESS	M-018	
1J0GASC 0001	UG A GUV ACTUATOR EL SPEED CIL	M-018	
1J0GAST 0001	UG A ENG SPEED MAG PICKUP # 1	M-018	
1J0GAUV 0001	UG A COOL WTR SURGE YR	J-603	
1J0GBHS 0002	UG B AIR START/STOP CONYL RM	J-200	
1J0GBLC 0002	UG B COOL WTR SURGE TK	M-018	
1J0GBPY 0002	UG B ENGINE CUBE OIL PRESS	M-018	
1J0GBSC 0002	UG B GUV ACTUATOR EL SPEED CIL	M-018	
1J0GBST 0002	UG B ENG SPEED MAG PICKUP # 1	M-018	
1J0GBUV 0002	UG B COOL WTR SURGE YR	J-603	
1J0GBHS 0002A	UG B AIR START/STOP DISCUNEC1	J-200	
1J0GBHS 0002B	UG B AIR START/STOP DISCUNEC1	J-200	
1J0GANS 0003	UG A AIR START LOCAL PANEL	M-018	
1J0GAPSL 0003	UG A CUBE OIL LO PRESS TRIP	M-018	
1J0GAPY 0003	UG A FUEL OIL PRES AFTER FLTR	M-018	
1J0GASH 0003	UG A OVSU CUM AIR TRIP IND 1	M-018	
1J0GAST 0003	UG A ENG SPEED MAG PICKUP # 2	M-018	
1J0GAUV 0003	UG A STARTING AIR RIGHT BK # 2	M-018	
1J0GBHS 0004	UG B AIR START LOCAL PANEL	M-018	
1J0GBPSL 0004	UG B CUBE OIL LO PRESS TRIP	M-018	
1J0GBPY 0004	UG B FUEL OIL PRES AFTER FLTR	M-018	
1J0GBSH 0004	UG B OVSU CUM AIR TRIP IND 1	M-018	
1J0GBST 0004	UG B ENG SPEED MAG PICKUP # 2	M-018	
1J0GBUV 0004	UG B STARTING AIR RIGHT BK # 2	M-018	
1J0GAPSL 0005	UG A COBE OIL LO PRESS TRIP	M-018	
1J0GAPSV 0005	UG A START AIR RECEIVER A	M-018	
1J0GAPY 0005	UG A TORBO CUBE OIL PRESS	M-018	
1J0GASH 0005	UG A OVSU CUM AIR TRIP IND 2	M-018	
1J0GAUV 0005	UG A STARTING AIR LEFT BK # 1	M-018	
1J0GBPSL 0006	UG B COBE OIL LO PRESS TRIP	M-018	
1J0GBPSV 0006	UG B START AIR RECEIVER A	M-018	
1J0GBPY 0006	UG B TORBO CUBE PRESS	M-018	
1J0GBSH 0006	UG B OVSU CUM AIR TRIP IND 2	M-018	
1J0GBUV 0006	UG B STARTING AIR LEFT BK # 1	M-018	
1J0GARS 0007	UG A MODE CONTROL LOCAL PANEL	M-018	
1J0GALC 0007	UG A FUEL OIL LEVEL CONTRL	M-018	
1J0GAPSL 0007	UG A CUBE OIL LO PRESS TRIP	M-018	
1J0GAPSV 0007	UG A START AIR RECEIVER B	M-018	
1J0GAPY 0007	UG A JACKET WTR PRES ENG INLI	M-018	
1J0GAUV 0007	UG A STARTING AIR LEFT BK # 2	M-018	
1J0GBRS 0008	UG B MODE CONTROL LOCAL PANEL	M-018	
1J0GBLC 0008	UG B FUEL OIL LEVEL CONTRL	M-018	
1J0GBPSL 0008	UG B CUBE OIL LO PRESS TRIP	M-018	
1J0GBPSV 0008	UG B START AIR RECEIVER B	M-018	
1J0GBPY 0008	UG B JACKET WTR PRES ENG INLI	M-018	
1J0GBUV 0008	UG B STARTING AIR LEFT BK # 2	M-018	
1J0GANCV 0009	UG A STARTING AIR RECR A OUT	M-018	
1J0GAPSL 0009	UG A COBE OIL LO PRESS TRIP	M-018	
1J0GAUV 0009	UG A EMERG MODE FUEL CNTR # 1	M-018	
1J0GBHCV 0010	UG B STARTING AIR RECR A OUT	M-018	
1J0GBPSL 0010	UG B COBE OIL LO PRESS TRIP	M-018	
1J0GBUV 0010	UG B EMERG MODE FUEL CNTR # 1	M-018	

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 39 of 202)

12/1/82 02128102	INSTRUMENTS BY SYSTEM		PAGE 17
TAG NUMBER	DESCRIPTION	BECHTEL SPEC780	(DG-5)
1J0GACV 0011	OG A STARTING AIR RECK B 001	M-018	
1J0GACSL0011	OG A COOC MTR SURGE TR	M-018	
1J0GAUV 0011	OG A EMERG AQUE FUEL CNTR B 2	M-018	
1J0GACV 0012	OG B STARTING AIR RECK B 001	M-018	
1J0GACSL0012	OG B COOC MTR SURGE TR	M-018	
1J0GBOV 0012	OG B EMERG AQUE FUEL CNTR B 4	M-018	
1J0GAPV 0013	OG A CRANKING AIR VLV LEFT BK	M-018	
1J0GBAV 0014	OG B CRANKING AIR VLV LEFT BK	M-018	
1J0GAPV 0015	OG A CRANKING AIR VLV RIGHT BK	M-018	
1J0GAUV 0015	OG A STARTING AIR RIGHT BK B 1	M-018	
1J0GBAV 0016	OG B CRANKING AIR VLV RIGHT BK	M-018	
1J0GBOV 0016	OG B STARTING AIR RIGHT BK B 1	M-018	
1J0GAS 0017	OG A LOBE UYL CIRC PUMP	M-018	
1J0GBAS 0018	OG B LOBE UYL CIRC PUMP	M-018	
1J0GAS 0019	OG A LOBE UYL WARR OP AIR	M-018	
1J0GBAS 0020	OG B LOBE OIL WARM UP MTR	M-018	
1J0GAS 0021	OG A JACKET MTR CIRC PUMP	M-018	
1J0GBAS 0022	OG B JACKET MTR CIRC PUMP	M-018	
1J0GAS 0027	OG A JACKET MTR HEATER	M-018	
1J0GBAS 0028	OG B JACKET MTR HEATER	M-018	
1J0GAS 0029	OG A EMERG STOP PB(LOCAL PNL)	M-018	
1J0GATW 0029	THERMOWELL FOR TE-29 OG A JW	J-556	
1J0GAXCV 0029A	EXC FLOW CHK VLV FOR PI-29	J-705	
1J0GAXCV 0029B	EXC FLOW CHK VLV FOR PI-29	J-705	
1J0GBAS 0030	OG B EMERG STOP PB(LOCAL PNL)	M-018	
1J0GBTW 0030	THERMOWELL FOR TE-30 OG B JW	J-556	
1J0GBXCV 0030A	EXC FLOW CHK VLV FOR PI-30	J-705	
1J0GBXCV 0030B	EXC FLOW CHK VLV FOR PI-30	J-705	
1J0GAS 0031	OG A ENGINE SPEED(LOCAL PANEL)	M-018	
1J0GATW 0031	THERMOWELL FOR TE-31 OG A JW	J-556	
1J0GBTW 0032	THERMOWELL FOR TE-32 OG B JW	J-556	
1J0GATCL 0037	OG A JACKET MTR TEMP TO ENGINE	M-018	
1J0GBTCL 0038	OG B JACKET MTR TEMP TO ENGINE	M-018	
1J0GATW 0039	THERMOWELL FOR TI-39 OG A JW	J-556	
1J0GBTW 0040	THERMOWELL FOR TI-40 OG B JW	J-556	
1J0GATW 0041	THERMOWELL FOR TI-41 OG A JW	J-556	
1J0GBTW 0042	THERMOWELL FOR TI-42 OG B JW	J-556	
1J0GATW 0043	THERMOWELL FOR TI-43 OG A JW	J-556	
1J0GBTW 0044	THERMOWELL FOR TI-44 OG B JW	J-556	
1J0GATW 0045	THERMOWELL FOR TI-45 OG A JW	J-556	
1J0GBTW 0046	THERMOWELL FOR TI-46 OG B JW	J-556	
1J0GATW 0047	SPARE	J-556	
1J0GBTW 0048	SPARE	J-556	
1J0GATW 0049	OG A TEST WELL JAC MTR FR ENG	M-018	
1J0GBTW 0050	OG B TEST WELL JAC MTR FR ENG	M-018	
1J0GNPI 0051	OG A JACKET MTR ENGINE PHP DIS	M-018	
1J0GNPI 0061	OG A JACKET MTR CIRC PHP SUCTI	M-018	
1J0GAPCV 0067	OG A TURBO BRG OIL PRESS CNTR	M-018	
1J0GBPCV 0068	OG B TURBO BRG OIL PRESS CNTR	M-018	
1J0GAPSV 0081	OG A ENG DRIVEN L.O. PP RELIEF	M-018	
1J0GBPSV 0082	OG B ENG DRIVEN L.O. PP RELIEF	M-018	
1J0GAPSV 0083	OG A L.O. CIRC. PP RELIEF	M-018	
1J0GBPSV 0084	OG B L.O. CIRC. PP RELIEF	M-018	
1J0GAPSV 0085	OG A TURBO FILTER INLET RELIEF	M-018	

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 40 of 202)

12/17/82 02:28:02

Q INSTRUMENTS BY SYSTEM

PAGE 18

(DG-6)

TAG NUMBER

DESCRIPTION

BECHTEL
SPEC/PO

1J0GBPSV 0086	DG B TURBO FILTER INLET RELIEF	M=018
1J0GATW 0089	TEST WELL DG A L.O. TO COOLER	J=556
1J0GBTW 0090	TEST WELL DG B L.O. TO COOLER	J=556
1J0GATW 0091	THERMOWELL FOR TI-91 DG A L.O.	J=556
1J0GBTW 0092	THERMOWELL FOR TI-92 DG B L.O.	J=556
1J0GATW 0093	THERMOWELL FOR TE-93 DG A L.O.	J=556
1J0GBTW 0096	THERMOWELL FOR TE-96 DG B L.O.	J=556
1J0GATCV 0097	DG A LUBE OIL TEMP CONTROL VLV	M=018
1J0GBTCV 0098	DG B LUBE OIL TEMP CONTROL VLV	M=018
1J0GATW 0099	THERMOWELL FOR TI-99 DG A L.O.	J=556
1J0GBTW 0100	THERMOWELL FOR TI-100 DG B LO	J=556
1J0GATW 0101	DG A LO TO ENG BRG TEST WELL	J=556
1J0GBTW 0102	DG B LO TO ENG BRG TEST WELL	J=556
1J0GATW 0103	THERMOWELL FOR TE-103 DG A L/O	J=556
1J0GBTW 0104	THERMOWELL FOR TE-104 DG B L/O	J=556
1J0GATCL 0105	DG A L.O. TEMP TO ENGINE BRGS	M=018
1J0GBTCL 0106	DG B L.O. TEMP TO ENGINE BRGS	M=018
1J0GATW 0109	THERMOWELL FOR TI-109 DG A LO	J=556
1J0GBTW 0110	THERMOWELL FOR TI-110 DG B LO	J=556
1J0GATCV 0269	DG A JACKET WTR TO ENG TP CNTR	M=018
1J0GBTCV 0270	DG B JACKET WTR TO ENG TP CNTR	M=018
1J0GATV 0271	DG A AIR INTERCLR HEATER A	M=018
1J0GBTV 0272	DG B AIR INTERCLR HEATER A	M=018
1J0GATV 0273	DG A AIR INTERCLR HEATER B	M=018
1J0GBTV 0274	DG B AIR INTERCLR HEATER B	M=018
1J0GAUV 0283	VOID	M=018
1J0GNAV 0283	DG A ENGINE VIBRATION TRIP	M=018
1J0GBUV 0286	VOID	M=018
1J0GNAV 0286	DG B ENGINE VIBRATION TRIP	M=018
1J0GAUY 0329	DG A START AIR DISTRIBUTOR	M=018
1J0GBUY 0330	DG B START AIR DISTRIBUTOR	M=018
1J0GAUY 0331	DG A START AIR DISTRIBUTOR	M=018
1J0GBUY 0332	DG B START AIR DISTRIBUTOR	M=018

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APPENDIX D

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 41 of 202)

04/19/82 15:50:39	VALVE-NOM CLASS	PAGE 24	(DG-7)
TAG NUMBER	R/SPEC/		
1P0GAV001	13PM221A		
1P0GAV002	13PM221A		
1P0GAV003	13PM221A		
1P0GAV004	13PM221A		
1P0GAV006	13PM221A		
1P0GAV007	13PM221A		
1P0GAV019	13PM221A		
1P0GAV024	13PM221A		
1P0GAV038	13PM221B		
1P0GAV041	13PM221B		
1P0GAV044	13PM221A		
1P0GAV048	13PM221A		
1P0GAV054	13PM221A		
1P0GAV057	13PM221A		
1P0GAV058	13PM221A		
1P0GAV061	13PM221A		
1P0GAV063	13PM221A		
1P0GAV066	13PM221A		
1P0GAV067	13PM221A		
1P0GAV070	13PM221A		
1P0GAV071	13PM221A		
1P0GAV074	13PM221A		
1P0GAV075	13PM221A		
1P0GAV078	13PM221A		
1P0GAV084	13PM221A		
1P0GAV317	13MM018		
1P0GAV318	13MM018		
1P0GAV356	13MM018		
1P0GAV357	13MM018		
1P0GAV358	13MM018		
1P0GAV359	13MM018		
1P0GAV362	13MM018		
1P0GAV363	13MM018		
1P0GAV364	13MM018		
1P0GAV369	13MM018		
1P0GAV370	13MM018		
1P0GAV371	13MM018		
1P0GAV374	13MM018		
1P0GAV384	13MM018		
1P0GAV385	13MM018		
1P0GAV394	13MM018		
1P0GAV395	13MM018		
1P0GAV010	13PM221A		
1P0GAV011	13PM221A		
1P0GAV012	13PM221A		
1P0GAV013	13PM221A		
1P0GAV015	13PM221A		
1P0GAV016	13PM221A		
1P0GAV018	13PM221A		
1P0GAV025	13PM221A		
1P0GAV047	13PM221A		
1P0GAV049	13PM221A		
1P0GAV050	13PM221B		
1P0GAV051	13PM221B		
1P0GAV053	13PM221A		

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 42 of 202)

04/19/82 15150139	VALVE-"M" CLASS	PAGE 25	(DG-8)
TAG NUMBER	R/SPFC/		
1PNGRV055	13PM221A		
1PNGRV056	13PM221A		
1PNGRV059	13PM221A		
1PNGRV062	13PM221A		
1PNGRV064	13PM221A		
1PNGRV065	13PM221A		
1PNGRV068	13PM221A		
1PNGRV069	13PM221A		
1PNGRV072	13PM221A		
1PNGRV073	13PM221A		
1PNGRV076	13PM221A		
1PNGRV077	13PM221A		
1PNGRV079	13PM221A		
1PNGRV085	13PM221A		
1PNGRV417	13MH018		
1PNGRV418	13MH018		
1PNGRV457	13MH018		
1PNGRV458	13MH018		
1PNGRV459	13MH018		
1PNGRV460	13MH018		
1PNGRV462	13MH018		
1PNGRV463	13MH018		
1PNGRV464	13MH018		
1PNGRV465	13MH018		
1PNGRV469	13MH018		
1PNGRV470	13MH018		
1PNGRV471	13MH018		
1PNGRV474	13MH018		
1PNGRV484	13MH018		
1PNGRV485	13MH018		
1PNGRV494	13MH018		
1PNGRV495	13MH018		
1PNGRV499	13MH018		
1PNGNV052	13PM221A		
1PNGNV053	13PM221A		
1PNGNV054	13PM221A		
1PNGNV057	13PM221A		
1PNGNV374	13MH018		
1PNGNV384	13MH018		
1PNGNV385	13MH018		
1PNGNV394	13MH018		
1PNGNV395	13MH018		
1PNGNV474	13MH018		
1PNGNV484	13MH018		
1PNGNV485	13MH018		
1PNGNV494	13MH018		
1PNGNV495	13MH018		
1PNGNV500	13MH018		
1PNGNV502	13MH018		
1PNGNV600	13MH018		
1PNGNV602	13MH018		

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ENVIRONMENTAL QUALIFICATION REPORT
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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 43 of 202)

04/19/82 15:50:39		VALVE="ON" CLASS	PAGE 27	DEMINERALIZED WATER	(DW-1)
TAG NUMBER		R/SPEC/			
1PDMFV061		13PM221A			
1PDMFV062		13PM221A			
1PDMFV135		13PM221A			
1PDMNV133		13PM221A			
1PDMNV134		13PM221A			

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Table D-1
 CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 44 of 202)

04/19/82 15:38:46	EQUIPMENT-NO CLASS	PAGE 18	(DW-2)
TAG NUMBER	DESCRIPTION	BECHTFL SPEC/PO	
1MDWE1106	PENETRATION-DEMIN WATER	13HM500	

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APPENDIX D

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 45 of 202)

04/19/82 1513R146		EQUIPMENT="00" CLASS	PAGE 20	ESSENTIAL CHILLED WATER	(EC-1)
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO			
1JECAP01	AUX PWR PNL FOR ECA-E01	13MM723			
1JECAP03	CONTROL PNL FOR ECA-E01	13MM723			
1JECRF02	AUX PWR PNL FOR ECR-E01	13MM723			
1JECRF04	CONTROL PNL FOR ECR-E01	13MM723			
1MECAF01	ESSENTIAL CHILLER	13MM723			
1MECAF01	ESS CHILL WTR STARTUP STRAINER	13MM093			
1MECAP01	ESSEN CHILLED WTR CIRC PUMP	13MM093			
1MECAT01	ESSENTIAL CHILLED WTR EXP TNK	13MM105			
1MECBF01	ESSENTIAL CHILLER	13MM723			
1MECHF01	ESS CHILL WTR STARTUP STRAINER	13MM093			
1MECBP01	ESSEN CHILLED WTR CIRC PUMP	13MM093			
1MECBT01	ESSENTIAL CHILLED WTR EXP TNK	13MM105			

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 46 of 202)

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Q INSTRUMENTS BY SYSTEM

PAGE 20
(EC-2)

TAG NUMBER

DESCRIPTION

BECHTEL
SPEC/PO

1JECAMS 0001A	ESS CHW PP & CHLR-A CONT
1JECBMS 0002A	ESS CHW PP & CHLR-B CONT
1JECAXCV 0003	EXC FLOW CHK VLV FOR PI-03
1JECBXC 0004	EXC FLOW CHK VLV FOR PI-04
1JECATW 0005	ESS CHLR-A I/L TEMP
1JECBTW 0006	ESS CHLR-B I/L TEMP
1JECATW 0007	ESS CHLR-A OUT TEMP
1JECBTW 0008	ESS CHLR-B OUT TEMP
1JECATW 0011	ESS CHLR-A DISCH TEMP
1JECBTW 0012	ESS CHLR-B DISCH TEMP
1JECALC 0015	ESS CHW-A EXP TK LEVEL CONT
1JECALSL 0015	ESS CHW-A EXP TK LEVEL CONT
1JECALT 0015	ESS CHLD WTR SURGE TK A LEVEL
1JECALV 0015	ESS CHW-A EXP TK LEVEL CONT
1JECALY 0015A	I/E CONVERTER
1JECAXCV 0015A	EXC FLOW CHK VLV FOR BRIDLE
1JECALY 0015B	I/E CONVERTER
1JECAXCV 0015B	EXC FLOW CHK VLV FOR BRIDLE
1JECBLC 0016	ESS CHW-B EXP TK LEVEL CONT
1JECBLSL 0016	ESS CHW-B EXP TK LEVEL CONT
1JECBLT 0016	ESS CHLD WTR SURGE TK B LEVEL
1JECBLV 0016	ESS CHW-B EXP TK LEVEL CONT
1JECBLY 0016A	I/E CONVERTER
1JECBXC 0016A	EXC FLOW CHK VLV FOR BRIDLE
1JECBLY 0016B	I/E CONVERTER
1JECBXC 0016B	EXC FLOW CHK VLV FOR BRIDLE
1JECATW 0023	THERMOWELL FOR TI-25
1JECBTW 0026	THERMOWELL FOR TI-26
1JECATW 0027	THERMOWELL FOR TI-27
1JECBTW 0028	THERMOWELL FOR TI-28
1JECATV 0029	CON RM ESS AHU-A CHW TEMP CONT
1JECBTV 0030	CON RM ESS AHU-B CHW TEMP CONT
1JECATW 0031	THERMOWELL FOR TI-31
1JECBTW 0032	THERMOWELL FOR TI-32
1JECATW 0033	THERMOWELL FOR TI-33
1JECBTW 0034	ESF SWGR RM AHU-B CHW OUT TEMP
1JECAMCV 0035	ESF SWGR RM AHU-A BYPASS VLV
1JECBMCV 0036	ESF SWGR RM AHU-B BYPASS VLV
1JECATW 0037	ELEC PEN RM ACU-A CHW I/L TEMP
1JECBTW 0038	ELEC PEN RM ACU-B CHW I/L TEMP
1JECATW 0039	ELEC PEN RM ACU-A CHW OUT TEMP
1JECBTW 0040	ELEC PEN RM ACU-B CHW OUT TEMP
1JECAMCV 0041	ELEC PEN RM ACU-A BYPASS VLV
1JECBMCV 0042	ELEC PEN RM ACU-B BYPASS VLV
1JECBTW 0044	AUX FW PP RM ACU-B CHW I/L TEM
1JECBTW 0046	AUX FW PP RM ACU-B CHW OUT TEM
1JECBMCV 0048	AUX FW PP RM ACU-B BYPASS VLV
1JECATW 0049	ECW PP RM ACU-A CHW I/L TEMP
1JECBTW 0050	ECW PP RM ACU-B CHW I/L TEMP
1JECATW 0051	ECW PP RM ACU-A CHW OUT TEMP
1JECBTW 0052	ECW PP RM ACU-B CHW OUT TEMP
1JECAMCV 0053	ECW PP RM ACU-A BYPASS VLV
1JECBMCV 0054	ECW PP RM ACU-B BYPASS VLV
1JECATW 0055	LPSI PP RM ACU-A CHW I/L TEMP

J-200

J-200

J-705

J-705

J-556

J-556

J-556

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J-556

J-556

J-111

J-111

J-311

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J-556

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Table D-1

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Q INSTRUMENTS BY SYSTEM

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(EC-3)

TAG NUMBER

DESCRIPTION

BECHTEL
SPEC/PO

1JECBTH 0056	LPSI PP RM ACU-B CHW I/L TEMP	J-556
1JECATH 0057	LPSI PP RM ACU-A CHW OUT TEMP	J-556
1JECBTH 0058	LPSI PP RM ACU-B CHW OUT TEMP	J-556
1JECAMCV 0059	LPSI PP RM ACU-A BYPASS VLV	J-6018
1JECBHCV 0060	LPSI PP RM ACU-B BYPASS VLV	J-6018
1JECATH 0061	HPSI PP RM ACU-A CHW I/L TEMP	J-556
1JECBTH 0062	HPSI PP RM ACU-B CHW I/L TEMP	J-556
1JECATH 0063	HPSI PP RM ACU-A CHW OUT TEMP	J-556
1JECBTH 0064	HPSI PP RM ACU-B CHW OUT TEMP	J-556
1JECAMCV 0065	HPSI PP RM ACU-A BYPASS VLV	J-6018
1JECBHCV 0066	HPSI PP RM ACU-B BYPASS VLV	J-6018
1JECATH 0067	CS PP RM ACU-A CHW I/L TEMP	J-556
1JECBTH 0068	CS PP RM ACU-B CHW I/L TEMP	J-556
1JECATH 0069	CS PP RM ACU-A CHW OUT TEMP	J-556
1JECBTH 0070	CS PP RM ACU-B CHW OUT TEMP	J-556
1JECAMCV 0071	CS PP RM ACU-A BYPASS VLV	J-6018
1JECBHCV 0072	CS PP RM ACU-B BYPASS VLV	J-6018
1JECAPSV 0073	ESS CHW-A EXP TK RELIEF VLV	J-691
1JECBPSV 0076	ESS CHW-B EXP TK RELIEF VLV	J-691
1JECAPSV 0095	ESF SWGR RM ESS AHU A O/L	J-691
1JECBPSV 0096	ESF SWGR RM ESS AHU B O/L	J-691
1JECAPSV 0097	CONT RM ESS AHU A O/L	J-691
1JECBPSV 0098	CONT RM ESS AHU B O/L	J-691
1JECAPSV 0099	ELEC PENET RM WEST ESS ACU O/L	J-691
1JECBPSV 0100	ELEC PENET RM EAST ESS ACU O/L	J-691
1JECAPSV 0101	ECW PP RM ESS ACU A O/L	J-691
1JECBPSV 0102	ECW PP RM ESS ACU B O/L	J-691
1JECAPSV 0103	CS RM ESS ACU A O/L	J-691
1JECBPSV 0104	CS RM ESS ACU B O/L	J-691
1JECAPSV 0105	HPSI PP RM ESS ACU A O/L	J-691
1JECBPSV 0106	HPSI PP RM ESS ACU B O/L	J-691
1JECAPSV 0107	LPSI PP RM ESS ACU A O/L	J-691
1JECBPSV 0108	LPSI PP RM ESS ACU B O/L	J-691
1JECBPSV 0109	AUX FEED WTR PP RM ESS ACU B	J-691
1JECATH 0111	AUX FW PP RM A ESS ACU I/L	J-556
1JECATH 0113	AUX FW PP RM A ESS ACU O/L	J-556
1JECAMCV 0115	AUX FW PP RM A ESS ACU	J-6018
1JECAPSV 0117	AUX FW PP RM A ESS ACU	J-691
1JECBHCV 0118	CHAN B EQUIP RM ESS ACU	J-6018
1JECAMCV 0119	CHAN B EQUIP RM ESS ACU	J-6018
1JECBPSV 0120	CHAN B EQUIP RM ESS ACU	J-691
1JECAPSV 0121	CHAN A EQUIP RM ESS ACU	J-691
1JECBTH 0122	CHAN B EQUIP RM ESS ACU O/L	J-556
1JECATH 0123	CHAN A EQUIP RM ESS ACU O/L	J-556
1JECBTH 0124	CHAN B EQUIP RM ESS ACU I/L	J-556
1JECATH 0125	CHAN A EQUIP RM ESS ACU I/L	J-556
1JECAPDSLO501	ESS CHLR A COMPR OIL	M-723
1JECBDSLO502	ESS CHLR B COMPR OIL	M-723
1JECATSH 0503	ESS CHLR A COMPR MOTOR	M-723
1JECATE 0503A	ESS CHLR A COMPR MOTOR	M-723
1JECATE 0503B	ESS CHLR A COMPR MOTOR	M-723
1JECBTSH 0504	ESS CHLR B COMPR MOTOR	M-723
1JECBTE 0504A	ESS CHLR B COMPR MOTOR	M-723
1JECBTE 0504B	ESS CHLR B COMPR MOTOR	M-723

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 48 of 202)

12/17/82 02128102	Q INSTRUMENTS BY SYSTEM		PAGE 22
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO	(EC-4)
1JECATE 0505	ESS CHLR A COMPR BRG OIL	M-723	
1JECATSH 0505	ESS CHLR A COMPR BRG OIL	M-723	
1JECATZ 0505	ESS CHLR A COMPR IMP DISPL	M-723	
1JECBTE 0506	ESS CHLR B COMPR BRG OIL	M-723	
1JECBTSH 0506	ESS CHLR B COMPR BRG OIL	M-723	
1JECBZ 0506	ESS CHLR B COMPR IMP DISPL	M-723	
1JECAPV 0507	ESS CHLR A COMPR GUIDE VANE	M-723	
1JECAZS 0507	ESS CHLR A COMPR GUIDE VANE	M-723	
1JECBEV 0508	ESS CHLR B COMPR GUIDE VANE	M-723	
1JECBZS 0508	ESS CHLR B COMPR GUIDE VANE	M-723	
1JECAPDI 0509	ESS CHLR A COMPR OIL	M-723	
1JECBPD 0510	ESS CHLR B COMP OIL DIFF PRESS	M-723	
1JECATI 0511	ESS CHLR A COMPR OIL RSVR	M-723	
1JECBTI 0512	ESS CHLR B COMPR OIL RSVR	M-723	
1JECATI 0513	ESS CHLR A COMPR THRUST BRG	M-723	
1JECBTI 0514	ESS CHLR B COMPR THRUST BRG	M-723	
1JECALG 0515	ESS CHLR A COMPR OIL	M-723	
1JECBLG 0516	ESS CHLR B COMPR OIL	M-723	
1JECATSH 0517	ESS CHLR A COMPR OIL HTR	M-723	
1JECBTSH 0518	ESS CHLR B COMPR OIL HTR	M-723	
1JECATSH 0519	ESS CHLR A COOLER HGBP	M-723	
1JECATV 0519	ESS CHLR A HOT GAS BYPASS	M-723	
1JECBTSH 0520	ESS CHLR B COOLER HGBP	M-723	
1JECBTV 0520	ESS CHLR B HOT GAS BYPASS	M-723	
1JECAPCV 0523	ESS CHLR A COMPR ECON GAS	M-723	
1JECBPCV 0524	ESS CHLR B COMPR ECON GAS	M-723	
1JECAPDCV 0525	ESS CHLR A COMPR MAIN OIL	M-723	
1JECBPCV 0526	ESS CHLR B COMPR MAIN OIL	M-723	
1JECAMS 0527	ESS CHLR A OIL PP START	M-723	
1JECBMS 0528	ESS CHLR B OIL PP START	M-723	
1JECATSL 0529	ESS CHLR A COOLER REFRIG	M-723	
1JECBTSL 0530	ESS CHLR B COOLER REFRIG	M-723	
1JECATSL 0531	ESS CHLR A COOLER WATER	M-723	
1JECBTSL 0532	ESS CHLR B COOLER WATER	M-723	
1JECAFE 0533	ESS CHLR A CHW OIL	J-425	
1JECAPSL 0533	ESS CHW A MINIMUM FLOW	J-111	
1JECAPT 0533	ESS CHW A FLOW	J-311	
1JECAPY 0533A	I/E CONVERTOR	J-111	
1JECAPY 0533C	OUTPUT ISOLATOR	J-111	
1JECBPE 0534	ESS CHLR B CHW O/L	J-425	
1JECBPSL 0534	ESS CHW B MINIMUM FLOW	J-111	
1JECBPT 0534	ESS CHW B FLOW	J-311	
1JECBPY 0534A	I/E CONVERTOR	J-111	
1JECBPY 0534C	OUTPUT CONVERTOR	J-111	
1JECAPI 0535	ESS CHLR A COOLER REFRIG	M-723	
1JECBPI 0536	ESS CHLR B COOLER REFRIG	M-723	
1JECATW 0539	ESS CHLR A COOLER REFRIG	M-723	
1JECBTW 0540	ESS CHLR B COOLER REFRIG	M-723	
1JECATI 0541A	ESS CHLR A COOLER LVG WATER	M-723	
1JECATW 0541B	ESS CHLR A COOLER ENTG WATER	M-723	
1JECATI 0541B	ESS CHLR A COOLER ENTG WATER	M-723	
1JECATW 0541B	ESS CHLR A COOLER ENTG WATER	M-723	
1JECBTI 0542A	ESS CHLR B COOLER LVG WATER	M-723	
1JECBTW 0542A	ESS CHLR B COOLER LVG WATER	M-723	

Table D-1

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Q INSTRUMENTS BY SYSTEM

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(EC-5)

TAG NUMBER

DESCRIPTION

BECHTEL
SPEC/PO

1JECBTI 0542B	ESS CHLR B COOLER ENTG WATER	M-723
1JECBTW 0542B	ESS CHLR B COOLER ENTG WATER	M-723
1JECALG 0543	ESS CHLR A COOLER REFRIG	M-723
1JECBLG 0544	ESS CHLR B COOLER REFRIG	M-723
1JECAPG 0545	ESS CHLR A EVAP FILTER-DRYER	M-723
1JECBFG 0546	ESS CHLR B EVAP FILTER-DRYER	M-723
1JECATC 0547	ESS CHLR A COOLER BRINE	M-723
1JECATE 0547	ESS CHLR A COOLER BRINE	M-723
1JECATH 0547	ESS CHLR A COOLER BRINE	M-723
1JECBTC 0548	ESS CHLR B COOLER BRINE	M-723
1JECBTE 0548	ESS CHLR B COOLER BRINE	M-723
1JECBTW 0548	ESS CHLR B COOLER BRINE	M-723
1JECAPSV 0549A	ESS CHLR A COOLER	M-723
1JECAPSV 0549B	ESS CHLR A COOLER	M-723
1JECBPSV 0550A	ESS CHLR B COOLER	M-723
1JECBPSV 0550B	ESS CHLR B COOLER	M-723
1JECAPSH 0551	ESS CHLR A COND REFRIG	M-723
1JECBPSH 0552	ESS CHLR B COND REFRIG	M-723
1JECAP I 0553	ESS CHLR A COND REFRIG	M-723
1JECBP I 0556	ESS CHLR B COND REFRIG	M-723
1JECATH 0559	ESS CHLR A COND LIQUID	M-723
1JECBTW 0560	ESS CHLR B COND LIQUID	M-723
1JECATI 0561A	ESS CHLR A COND LVG WATER	M-723
1JECATH 0561A	ESS CHLR A COND LVG WATER	M-723
1JECATI 0561B	ESS CHLR A COND ENTG WATER	M-723
1JECATH 0561B	ESS CHLR A COND ENTG WATER	M-723
1JECBTI 0562A	ESS CHLR B COND LVG WATER	M-723
1JECBTW 0562A	ESS CHLR B COND LVG WATER	M-723
1JECBTI 0562B	ESS CHLR B COND ENTG WATER	M-723
1JECBTW 0562B	ESS CHLR B COND ENTG WATER	M-723
1JECALCV 0563A	ESS CHLR A ECONOM REFRIG	M-723
1JECALCV 0563B	ESS CHLR A ECONOM REFRIG	M-723
1JECBLCV 0564A	ESS CHLR B ECONOM REFRIG	M-723
1JECBLCV 0564B	ESS CHLR B ECONOM REFRIG	M-723
1JECAPSV 0565A	ESS CHLR A STOR TK	M-723
1JECAPSV 0565B	ESS CHLR A STOR TK	M-723
1JECBPSV 0566A	ESS CHLR B STOR TK	M-723
1JECBPSV 0566B	ESS CHLR B STOR TK	M-723
1JECAPDSH0569	ESS CHLR A PURGE SAFETY	M-723
1JECBPSH0570	ESS CHLR B PURGE SAFETY	M-723
1JECAPDSH0571	ESS CHLR A PURGE OPERATING	M-723
1JECBPSH0572	ESS CHLR B PURGE OPERATING	M-723
1JECAP I 0573	ESS CHLR A PURGE SEPARATOR	M-723
1JECBP I 0574	ESS CHLR B PURGE SEPARATOR	M-723
1JECALI 0575	ESS CHLR A PURGE WATER	M-723
1JECBLI 0576	ESS CHLR B PURGE WATER	M-723
1JECALI 0577	ESS CHLR A PURGE REFRIG	M-723
1JECBLI 0578	ESS CHLR B PURGE REFRIG	M-723
1JECAPV 0579	ESS CHLR A PURGE AIR DISCH	M-723
1JECBPV 0580	ESS CHLR B PURGE AIR DISCH	M-723
1JECATE 0593	ESS CHLR A COMPR REFRIG DISCH	M-723
1JECATSH 0593	ESS CHLR A COMPR REFRIG DISCH	M-723
1JECBTE 0594	ESS CHLR B COMPR REFRIG DISCH	M-723
1JECBTSH 0594	ESS CHLR B COMPR REFRIG DISCH	M-723

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CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 50 of 202)

ENVIRONMENTAL QUALIFICATION REPORT
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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 51 of 202)

04/19/82 15:50:39	VALVE="0" CLASS	PAGE 29	(EC-7)
TAG NUMBER	R/SPFC/		
1PECAV001	13PM221A		
1PECAV002	13PM221B		
1PECAV004	13PM221A		
1PECAV005	13PM221A		
1PECAV006	13PM221A		
1PECAV007	13PM221A		
1PECAV008	13PM221B		
1PECAV009	13PM221A		
1PECAV010	13PM221A		
1PECAV011	13PM221B		
1PECAV012	13PM221A		
1PECAV013	13PM221A		
1PECAV015	13PM221A		
1PECAV016	13PM221A		
1PECAV017	13PM221A		
1PECAV018	13PM221A		
1PECAV019	13PM221B		
1PECAV020	13PM221A		
1PECAV021	13PM221A		
1PECAV022	13PM221A		
1PECAV023	13PM221A		
1PECAV025	13PM221A		
1PECAV026	13PM221A		
1PECAV027	13PM221A		
1PECAV031	13PM221A		
1PECAV033	13PM221A		
1PECAV034	13PM221A		
1PECAV035	13PM221A		
1PECAV037	13PM221A		
1PECAV038	13PM221A		
1PECAV039	13PM221A		
1PECAV040	13PM221A		
1PECAV041	13PM221A		
1PECAV042	13PM221A		
1PECAV043	13PM221A		
1PECAV082	13PM221A		
1PECAV084	13PM221A		
1PECAV085	13PM221A		
1PECAV090	13PM221A		
1PECAV091	13PM221A		
1PECAV092	13PM221A		
1PECAV098	13PM221A		
1PECAV099	13PM221A		
1PECAV105	13PM221A		
1PECAV106	13PM221A		
1PECAV107	13PM221A		
1PECAV108	13PM221A		
1PECAV109	13PM221A		
1PECAV112	13PM221A		
1PECAV122	13PM221A		
1PECAV123	13PM221A		
1PECAV124	13PM221A		
1PECAV125	13PM221A		
1PECAV134	13PM221A		
1PECAV140	13PM221A		

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 52 of 202)

04/19/82 15:50:39	VALVE-"0" CLASS	PAGE 30	(EC-8)
TAG NUMBER	R/SPEC/		
1PFCV141	13PM221A		
1PFCV142	13PM221A		
1PFCV144	13PM221A		
1PFCV145	13PM221A		
1PFCV146	13PM221A		
1PFCV152	13PM221A		
1PFCV162	13PM221A		
1PFCV163	13PM221A		
1PFCV166	13PM221A		
1PFCV171	13PM221A		
1PFCV172	13PM221A		
1PFCV173	13PM221A		
1PFCV174	13PM221A		
1PFCV184	13PM221A		
1PFCV185	13PM221A		
1PFCV186	13PM221A		
1PFCV187	13PM221A		
1PFCV188	13PM221A		
1PFCV189	13PM221A		
1PFCV192	13PM221A		
1PFCV193	13PM221A		
1PFCV198	13PM221A		
1PFCV199	13PM221A		
1PFCV200	13PM221A		
1PFCV201	13PM221B		
1PFCV202	13PM221B		
1PFCV203	13PM221A		
1PFCV204	13PM221A		
1PFCV205	13PM221A		
1PFCV206	13PM221A		
1PFCV207	13PM221A		
1PFCV209	13PM221A		
1PFCV210	13PM221A		
1PFCV211	13PM221A		
1PFCV212	13PM221A		
1PFCV218	13PM221C		
1PFCV219	13PM221C		
1PFCV220	13PM221C		
1PFCV230	13PM221C		
1PFCV231	13PM221C		
1PFCV300			
1PFCV301			
1PFCV302			
1PFCV303			
1PFCV304			
1PFCV305			
1PFCV306			
1PFCV307			
1PFCV308			
1PFCV309			
1PFCV310			
1PFCV311			
1PFCV312			
1PFCV313			
1PFCV314			

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ENVIRONMENTAL QUALIFICATION REPORT
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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 53 of 202)

04/19/82 15150139	VALVE-MOM CLASS	PAGE 31	(EC-9)
TAG NUMBER	R/SPFC/		
1PFCV315			
1PFCV316			
1PFCV317			
1PFCV318			
1PFCV319			
1PFCV320			
1PFCV321			
1PFCV322			
1PFCV323			
1PFCV324			
1PFCV325			
1PFCV326			
1PFCRV028	13PM221A		
1PFCRV029	13PM221A		
1PFCRV030	13PM221A		
1PFCRV037	13PM221A		
1PFCRV045	13PM221B		
1PFCRV046	13PM221B		
1PFCRV047	13PM221A		
1PFCRV048	13PM221A		
1PFCRV049	13PM221A		
1PFCRV050	13PM221A		
1PFCRV051	13PM221A		
1PFCRV052	13PM221A		
1PFCRV053	13PM221A		
1PFCRV054	13PM221A		
1PFCRV055	13PM221A		
1PFCRV056	13PM221A		
1PFCRV057	13PM221B		
1PFCRV058	13PM221B		
1PFCRV059	13PM221A		
1PFCRV060	13PM221A		
1PFCRV061	13PM221A		
1PFCRV062	13PM221A		
1PFCRV063	13PM221A		
1PFCRV064	13PM221A		
1PFCRV065	13PM221B		
1PFCRV066	13PM221A		
1PFCRV068	13PM221B		
1PFCRV069	13PM221A		
1PFCRV070	13PM221A		
1PFCRV071	13PM221A		
1PFCRV072	13PM221A		
1PFCRV073	13PM221A		
1PFCRV074	13PM221A		
1PFCRV075	13PM221A		
1PFCRV076	13PM221A		
1PFCRV077	13PM221A		
1PFCRV078	13PM221A		
1PFCRV079	13PM221A		
1PFCRV080	13PM221A		
1PFCRV081	13PM221A		
1PFCRV083	13PM221A		
1PFCRV101	13PM221A		
1PFCRV102	13PM221A		

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Table D-1
CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 54 of 202)

04/19/R2 15150139		VALVE="0" CLASS	PAGE 32	(EC-10)
TAG NUMBER	R/SPEC/			
1PFCRV104	13PM221A			
1PFCRV113	13PM221A			
1PFCRV114	13PM221A			
1PFCRV115	13PM221A			
1PFCRV116	13PM221A			
1PFCRV117	13PM221A			
1PFCRV118	13PM221A			
1PFCRV121	13PM221A			
1PFCRV126	13PM221A			
1PFCRV127	13PM221A			
1PFCRV128	13PM221A			
1PFCRV129	13PM221A			
1PFCRV130	13PM221A			
1PFCRV131	13PM221A			
1PFCRV135	13PM221A			
1PFCRV143	13PM221A			
1PFCRV147	13PM221A			
1PFCRV148	13PM221A			
1PFCRV149	13PM221A			
1PFCRV155	13PM221A			
1PFCRV161	13PM221A			
1PFCRV165	13PM221A			
1PFCRV167	13PM221A			
1PFCRV168	13PM221A			
1PFCRV169	13PM221A			
1PFCRV175	13PM221A			
1PFCRV176	13PM221A			
1PFCRV177	13PM221A			
1PFCRV194	13PM221A			
1PFCRV195	13PM221A			
1PFCRV208	13PM221C			
1PFCRV213	13PM221A			
1PFCRV214	13PM221C			
1PFCRV215	13PM221A			
1PFCRV216	13PM221A			
1PFCRV217	13PM221A			
1PFCRV221	13PM221C			
1PFCRV222	13PM221C			
1PFCRV223	13PM221C			
1PFCRV228	13PM221C			
1PFCRV229	13PM221C			
1PFCRV232	13PM221C			
1PFCRV233	13PM221C			
1PFCRV400				
1PFCRV401				
1PFCRV402				
1PFCRV403				
1PFCRV404				
1PFCRV405				
1PFCRV406				
1PFCRV407				
1PFCRV408				
1PFCRV409				
1PFCRV410				
1PFCRV411				

ENVIRONMENTAL QUALIFICATION REPORT
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APPENDIX D

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 55 of 202)

04/19/82 15:50:39		VALVE-"O" CLASS	PAGE 33	(EC-11)
TAG NUMBER	R/SPEC/			
1PECRV412				
1PECRV413				
1PECRV414				
1PECRV415				
1PECRV416				
1PECRV417				
1PECRV418				
1PECRV419				
1PECRV420				
1PECRV421				
1PECRV422				
1PECRV423				
1PECRV424				
1PECRV425				
1PECRV426				
1PECNV226	13PM221C			
1PECNV227	13PM221C			

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Table D-1
CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 56 of 202)

04/19/82 15:38:46		EQUIPMENT-NOM CLASS	PAGE 22	ESSENTIAL COOLING WATER	(EW-1)
TAG NUMBER	DESCRIPTION	BFCHTFL SPEC/PU			
1MEWAE01	ECWS HEAT EXCHANGER	13MM071			
1MEWAF01	ECWS PUMP STARTUP STRAINER	13MM093			
1MEWAP01	ECWS PUMP	13MM093			
1MEWAT01	ECWS SURGE TANK	13MM105			
1MEWBF01	ECWS HEAT EXCHANGER	13MM071			
1MEWBF01	ECWS PUMP STARTUP STRAINER	13MM093			
1MEWBP01	ECWS PUMP	13MM093			
1MEWBT01	ECWS SURGE TANK	13MM105			

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 57 of 202)

12/17/02 02:28:02		Q INSTRUMENTS BY SYSTEM		PAGE 26 (EW-2)
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO		
1JEWANS' 0001	ECW PP A	J=200		
1JEWBHS' 0002	ECW PP B	J=200		
1JEWANCV 0003	ECW PP A SUCT	J=603		
1JEWBHCV 0006	ECW PP B SUCT	J=603		
1JEWAFE' 0013	ECW PP A DISCH FLOW	J=425		
1JEWART' 0013	ECW PP A DISCH FLOW	J=311		
1JEWBEF' 0014	ECW PP B DISCH FLOW	J=425		
1JEWBTY' 0014	ECW PP B DISCH FLOW	J=311		
1JEWANCV 0041	CLG WTR INLET TO SHUTDOWN HX A	J=603		
1JEWBHCV 0042	CLG WTR INLET TO SHUTDOWN HX B	J=603		
1JEWATH 0045	CLG WTR INLET TO SHUTDOWN HX A	J=556		
1JEWBTW 0046	CLG WTR INLET TO SHUTDOWN HX B	J=556		
1JEWAPSV 0047	SHELL SIDE SHUTDOWN HX A RELIEF	J=691		
1JEWBPSV 0048	SHELL SIDE SHUTDOWN HX B RELIEF	J=691		
1JEWATH 0049	CLG WTR OUTLET FR SHUTDOWN HX A	J=556		
1JEWBTW 0050	CLG WTR OUTLET FR SHUTDOWN HX B	J=556		
1JEWATH 0051	CLG WTR O/L FR SHUTDOWN HX A	J=556		
1JEWBTW 0052	CLG WTR O/L FR SHUTDOWN HX B	J=556		
1JEWANCV 0053	CLG WTR O/L FR SHUTDOWN HX A	J=603		
1JEWBHCV 0054	CLG WTR O/L FR SHUTDOWN HX B	J=603		
1JEWATH 0057	CLG WTR TO ESS CHILLER A	J=556		
1JEWBTW 0058	CLG WTR TO ESS CHILLER B	J=556		
1JEWATH 0059	CLG WTR FR ESS CHILLER A	J=556		
1JEWBTW 0060	CLG WTR FR ESS CHILLER B	J=556		
1JEWAPSV 0061	CLG WTR FR ESS CHILLER A	J=691		
1JEWBPSV 0062	CLG WTR FR ESS CHILLER B	J=691		
1JEWAFE' 0063	CLG WTR O/L FR ESS CHILLER A	J=425		
1JEWBEF' 0064	CLG WTR O/L FR ESS CHILLER B	J=425		
1JEWANS 0065	CROSSTIE VLV FR NCWS	J=200		
1JEWAVV 0065	CROSSTIE VLV FR NCWS	J=603		
1JEWBHCV 0066	CROSSTIE VLV FROM NCWS	J=603		
1JEWANCV 0067	CROSSTIE TO NCWS FR FP HX A	J=603		
1JEWBHCV 0068	CROSSTIE TO NCWS FR FP HX B	J=603		
1JEWANCV 0071	ECWS HX A INLET	J=603		
1JEWBHCV 0072	ECWS HX B INLET	J=603		
1JEWATH 0077	ECWS HX A INLET	J=556		
1JEWBTW 0078	ECWS HX B INLET	J=556		
1JEWAPSV 0079	ECWS HX A SHELL SIDE RELIEF	M=071		
1JEWBPSV 0080	ECWS HX B SHELL SIDE RELIEF	M=071		
1JEWATH 0081	ECWS HX A OUTLET TEMP	J=556		
1JEWBTW 0082	ECWS HX B OUTLET TEMP	J=556		
1JEWATE 0083	ECW PP A DISCH TEMP	J=556		
1JEWATH 0083	ECWS PP A OUTLET TEMP	J=556		
1JEWBTW 0084	ECW PP B DISCH TEMP	J=556		
1JEWBTW 0084	ECWS PP B OUTLET TEMP	J=556		
1JEWAXCV 0089A	EXC FLOW CHK VLV FOR BRIDLE	J=703		
1JEWAXCV 0089B	EXC FLOW CHK VLV FOR BRIDLE	J=703		
1JEWBXCVC 0090A	EXC FLOW CHK VLV FOR BRIDLE	J=703		
1JEWBXCVC 0090B	EXC FLOW CHK VLV FOR BRIDLE	J=703		
1JEWALC 0091	ECWS SURGE TK A	J=111		
1JEWALSL 0091	ECWS SURGE TANK A	J=111		
1JEWALSL 0091	ECWS SURGE TK A	J=111		
1JEWALT 0091	ESS CLG WTR SURGE TK A LEVEL	J=311		
1JEWALV 0091	ECWS SURGE TANK A MAKEUP	J=603		

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Table D-1

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12/17/82 02:28:02		Q INSTRUMENTS BY SYSTEM		PAGE 27
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO	(EW-3)	
1JEWALY 0091A	ECMS SURGE TK A LEVEL	J-111		
1JEWALY 0091B	ECMS SURGE TK A LEVEL	J-111		
1JEWALY 0091C	ECMS SURGE TANK A	J-111		
1JEWALY 0091D	ECM CLG WATER CROSS TIE VALVE	J-111		
1JEWBLC 0092	ECMS SURGE TK B	J-111		
1JEWBLSL 0092	ECMS SURGE TK B	J-111		
1JEWBLT 0092	ESS CLG WTR SURGE TK B LEVEL	J-311		
1JEWBLV 0092	ECMS SURGE TANK B MAKEUP	J-603		
1JEWBLV 0092A	ECMS SURGE TK B LEVEL	J-111		
1JEWBLV 0092B	ECMS SURGE TK B LEVEL	J-111		
1JEWAPSV 0103	ECMS SURGE TANK A RELIEF	J-691		
1JEWBPSV 0104	ECMS SURGE TANK B RELIEF	J-691		
1JEWAPSV 0105	ECMS SURGE TANK A VAC RELIEF	J-691		
1JEWBPSV 0106	ECMS SURGE TANK B VAC RELIEF	J-691		
1JEWAMCV 0133	ECMS I/L TO PP HX A	J-603		
1JEWBHCV 0134	ECMS I/L TO PP HX B	J-603		
1JEWAMCV 0135	ECMS PP A DISCH VALVE	J-603		
1JEWBHCV 0136	ECMS PP B DISCH VALVE	J-603		
1JEWAMS 0145	CROSSTIE VLV TO NCMS	J-200		
1JEWAVV 0145	CROSSTIE VLV TO NCMS	J-603		
1JEWBHCV 0146	CROSSTIE VALVE TO NCMS	J-603		
1JEWAPSL 0151	ESS CHILLER A O/L FLOW	J-111		
1JEWAPT 0151	ESS CHILLER A O/L FLOW	J-311		
1JEWARY 0151A	I/E CONVERTOR	J-111		
1JEWARY 0151C	OUTPUT ISOLATOR	J-111		
1JEWBPSL 0152	ESS CHILLER B O/L FLOW	J-111		
1JEWBPT 0152	ESS CHLR B O/L FLOW	J-311		
1JEWBFY 0152A	I/E CONVERTOR	J-111		
1JEWBFY 0152C	OUTPUT ISOLATOR	J-111		
1JEWAFD 0161	SHUTDOWN HTXR A OUTLET	J-425		
1JEWBFO 0162	SHUTDOWN HTXR B OUTLET	J-425		
1JEWAFD 0163	RADIATION MONITOR O/L	J-425		
1JEWBFO 0164	RADIATION MONITOR O/L	J-425		
1JEWAFD 0165	RADIATION MONITOR I/L	J-425		
1JEWBFO 0166	RADIATION MONITOR I/L	J-425		

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 59 of 202)

04/19/82 15:50:39	VALVE="MOM" CLASS	PAGE 35	(EW-4)
TAG NUMBER	R/SPEC/		
1PFWAV002	13PM221A		
1PFWAV005	13PM221A		
1PFWAV006	13PM221A		
1PFWAV007	13PM221A		
1PFWAV011	13PM221A		
1PFWAV015	13PM221B		
1PFWAV018	13PM221A		
1PFWAV020	13PM221A		
1PFWAV021	13PM221B		
1PFWAV022	13PM221B		
1PFWAV051	13PM221A		
1PFWAV052	13PM221A		
1PFWAV054	13PM221A		
1PFWAV071	13PM221A		
1PFWAV072	13PM221A		
1PFWAV073	13PM221A		
1PFWAV074	13PM221A		
1PFWAV079	13PM221A		
1PFWAV087	13PM221A		
1PFWAV088	13PM221A		
1PFWAV094	13PM221A		
1PFWAV095	13PM221A		
1PFWAV098	13PM221A		
1PFWAV099	13PM221A		
1PFWAV103	13PM221A		
1PFWAV104	13PM221A		
1PFWAV105	13PM221A		
1PFWAV107	13PM221A		
1PFWAV110	13PM221A		
1PFWAV111	13PM221A		
1PFWAV115	13PM221A		
1PFWAV117	13PM221A		
1PFWAV118	13PM221A		
1PFWAV133	13PM221A		
1PFWAV144	13PM221A		
1PFWAV145	13PM221A		
1PFWAV150	13PM221A		
1PFWAV154	13PM221A		
1PFWAV155	13PM221A		
1PFWAV156	13PM221A		
1PFWAV157	13PM221A		
1PFWAV158	13PM221A		
1PFWAV159	13PM221A		
1PFWAV160	13PM221A		
1PFWAV161	13PM221A		
1PFWAV162	13PM221A		
1PFWAV163	13PM221A		
1PFWAV164	13PM221A		
1PFWAV181	13PM221A		
1PFWAV204	13PM221A		
1PFWAV209	13PM221A		
1PFWAV210	13PM221A		
1PFWAV211	13PM221A		
1PFWAV212	13PM221A		
1PFWAV213	13PM221A		

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 60 of 202)

04/19/82 15:50:39	VALVE="Q" CLASS	PAGE 36	(EW-5)
TAG NUMBER	R/SPEC/		
1PEWAV214	13PM221A		
1PEWAV215	13PM221A		
1PEWAV222	13PM221A		
1PEWAV223	13PM221A		
1PEWAV224	13PM221A		
1PEWAV231	13PM221A		
1PEWAV023	13PM221A		
1PEWAV024	13PM221B		
1PEWAV026	13PM221A		
1PEWAV027	13PM221A		
1PEWAV029	13PM221A		
1PEWAV031	13PM221A		
1PEWAV032	13PM221A		
1PEWAV034	13PM221A		
1PEWAV035	13PM221A		
1PEWAV036	13PM221A		
1PEWAV037	13PM221A		
1PEWAV038	13PM221A		
1PEWAV039	13PM221A		
1PEWAV040	13PM221A		
1PEWAV043	13PM221B		
1PEWAV044	13PM221B		
1PEWAV050	13PM221A		
1PEWAV069	13PM221A		
1PEWAV070	13PM221A		
1PEWAV077	13PM221A		
1PEWAV078	13PM221A		
1PEWAV080	13PM221A		
1PEWAV083	13PM221A		
1PEWAV084	13PM221A		
1PEWAV086	13PM221A		
1PEWAV093	13PM221A		
1PEWAV108	13PM221A		
1PEWAV109	13PM221A		
1PEWAV112	13PM221A		
1PEWAV116	13PM221A		
1PEWAV119	13PM221A		
1PEWAV120	13PM221A		
1PEWAV134	13PM221A		
1PEWAV147	13PM221A		
1PEWAV149	13PM221A		
1PEWAV152	13PM221A		
1PEWAV165	13PM221A		
1PEWAV166	13PM221A		
1PEWAV167	13PM221A		
1PEWAV168	13PM221A		
1PEWAV169	13PM221A		
1PEWAV170	13PM221A		
1PEWAV171	13PM221A		
1PEWAV172	13PM221A		
1PEWAV173	13PM221A		
1PEWAV174	13PM221A		
1PEWAV175	13PM221A		
1PEWAV185	13PM221A		
1PEWAV186	13PM221A		

PVNGS 1, 2&3

ENVIRONMENTAL QUALIFICATION REPORT
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Table D-1
CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 61 of 202)

04/19/82 15:50:39		VALVE="O" CLASS	PAGE 37	(EW-6)
TAG NUMBER		R/SPEC/		
1PEW8V187		13PM221A		
1PEW8V205		13PM221A		
1PEW8V206		13PM221A		
1PEW8V207		13PM221A		
1PEW8V208		13PM221A		
1PEW8V216		13PM221A		
1PEW8V217		13PM221A		
1PEW8V218		13PM221A		
1PEW8V219		13PM221A		
1PEW8V220		13PM221A		
1PEW8V221		13PM221A		
1PEW8V225		13PM221A		
1PEW8V226		13PM221A		
1PEW8V227		13PM221A		
1PEW8V228		13PM221A		

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 62 of 202)

04/19/A2 1513814A	EQUIPMENT-NOM CLASS	PAGE 24
TAG NUMBER	DESCRIPTION	BECHTFL SPEC/PO
1EFND280	ELECT PENTRTN-	13EM035

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Table D-1

CLASS 1E ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 63 of 202)

04/19/82 15:38:46		EQUIPMENT-"0" CLASS	PAGE 26	<u>FIRE PROTECTION SYSTEM</u>	(FP-1)
TAG NUMBER	DESCRIPTION	BECHTFL SPEC/PI			
1MFPEI07	PENETRATION-FIRE PROTECTION	13MH500			

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 64 of 202)

04/19/82 15:50:39		VALVE="M" CLASS	PAGE 39	(FP-2)
TAG NUMBER		R/SPEC/		
1PFPEV089		13PM221B		
1PFPEV090		13PM221B		
1PFPNV142		13PM221A		
1PFPNV199		13PM221A		

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 65 of 202)

04/19/82 15:38:46		EQUIPMENT-"O" CLASS	PAGE 28	SERVICE GASES (N ₂ , AND H ₂)	(GA-1)
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO			
1MGAE1129	PENETRATION-NIT SUPPLY	13MM500			
1MGAE1130	PENETRATION-NIT SUPPLY	13MM500			

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Table D-1
 CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 66 of 202)

12/17/82 02:28102		Q INSTRUMENTS BY SYSTEM		PAGE 29
TAG NUMBER		DESCRIPTION	BECHTEL SPEC/PO	(GA-2)
1JGAAMS	0001	N2 TO S1 TKS ISOL VLV	J-200	
1JGAUV	0001	N2 TO S1 TKS ISOL VLV	J-603C	
1JGAUV	0001A	SPARE	J-603	
1JGAAMS	0002	N2 TO SG AND ROT ISOL VLV	J-200	
1JGAUV	0002	N2 TO SG AND ROT ISOL VLV	J-603	
1JGAUV	0002A	SPARE	J-603	

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Table D-1
 CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 67 of 202)

04/19/82 15:50:39	VALVE="O" CLASS	PAGE 41	(GA-3)
TAG NUMBER	R/SPEC/		
1PGAEO11	13PH221A		
1PGAEO15	13PH221A		
1PGANVO26	13PH221A		
1PGANVO27	13PH221A		
1PGANVO57	13PH221A		
1PGANVO61	13PH221A		

Table D-1
 CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 68 of 202)

04/19/82 15138146	EQUIPMENT-"O" CLASS	PAGE 30	GASEOUS RADWASTE	(GR-1)
TAG NUMBER	DESCRIPTION	RECHTFL SPEC/PO		
1MGRE1152	PENETRATION-VENT HDR	13HM500		

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CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 69 of 202)

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 70 of 202)

04/19/82 15:50:39		VALVE="O" CLASS	PAGE 43	(GR-3)
TAG NUMBER		R/SPEC/		
1PGRNV097		13PM221A		
1PGRNV098		13PM221A		
1PGRNV099		13PM221A		

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 71 of 202)

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EQUIPMENT-400 CLASS

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HVAC - AUXILIARY BUILDING

(HA-1)

TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PU
1MHAAM00 207	FIRE DAMPER	13MM598
1MHAAM00 208	FIRE DAMPER	13MM598
1MHAAM00 209	FIRE DAMPER	13MM598
1MHAAM00 210	FIRE DAMPER	13MM598
1MHAAM00 211	FIRE DAMPER	13MM598
1MHAAM00 212	FIRE DAMPERS	13MM598
1MHAAM00 213	FIRE DAMPERS	13MM598
1MHAAM00 214	MOTORIZED DAMPER	13MM598
1MHAAM00 214	MOTORIZED DAMPER	13MM598
1MHAAM01	PNEUM LOW-LEAKAGE DAMPER MOTOR	13MM598
1MHAAM02	PNEUM LOW-LEAKAGE DAMPER MOTOR	13MM598
1MHAAM03	PNEUM LOW-LEAKAGE DAMPER MOTOR	13MM598
1MHAAM04	PNEUM LOW-LEAKAGE DAMPER MOTOR	13MM598
1MHAAM05	PNEUM LOW-LEAKAGE DAMPER MOTOR	13MM598
1MHAAM06	PNEUM LOW-LEAKAGE DAMPER MOTOR	13MM598
1MHAAM37	FIRE DAMPERS	13MM598
1MHAAM39	FIRE DAMPERS	13MM598
1MHAAZ01	HPSI PUMP ROOM ESSENTIAL ACU	13MM721
1MHAAZ02	LPSI PUMP ROOM ESSENTIAL ACU	13MM721
1MHAAZ03	CS PUMP ROOM ESSENTIAL ACU	13MM721
1MHAAZ04	ESF PUMP ROOM-AUXILIARY FW	13MM721
1MHAAZ05	ECW PUMP ROOM ESSEN ACU	13MM721
1MHAAZ06	FLEC PFN ROOM ESSEN ACU	13MM721
1MHABM00 215	MOTORIZED DAMPER	13MM598
1MHABM00 217	MOTORIZED DAMPER	13MM598
1MHABM01	PNEUM LOW-LEAKAGE DAMPER MOTOR	13MM598
1MHABM02	PNEUM LOW-LEAKAGE DAMPER MOTOR	13MM598
1MHABM03	PNEUM LOW-LEAKAGE DAMPER MOTOR	13MM598
1MHABM04	PNEUM LOW-LEAKAGE DAMPER MOTOR	13MM598
1MHABM05	PNEUM LOW-LEAKAGE DAMPER MOTOR	13MM598
1MHABM06	PNEUM LOW-LEAKAGE DAMPER MOTOR	13MM598
1MHABM38	FIRE DAMPERS	13MM598
1MHABM40	FIRE DAMPERS	13MM598
1MHABZ01	HPSI PUMP ROOM ESSENTIAL ACU	13MM721
1MHABZ02	LPSI PUMP ROOM ESSENTIAL ACU	13MM721
1MHABZ03	CS PUMP ROOM ESSENTIAL ACU	13MM721
1MHABZ04	AUX FW PUMP ROOM ESSEN ACU MD	13MM721
1MHABZ05	ECW PUMP ROOM ESSEN ACU	13MM721
1MHABZ06	ELEC PFN ROOM ESSEN ACU	13MM721
1MHANM39	FIRE DAMPER	13MM598
1MHANM40	FIRE DAMPER	13MM598

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CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 72 of 202)

Q INSTRUMENTS BY SYSTEM

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(HA-2)

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 73 of 202)

04/19/82 15:38:44		EQUIPMENT="Q" CLASS	PAGE 34	HVAC - CONTAINMENT	(HC-1)
TAG NUMBER	DESCRIPTION	BFCHEL SPEC/PO			
1EHEN253	ELECT PENTRYN-SHLD INSTR	13EM035			
1MHCEU25A	PENETRATION-CONT PRESS	13MM500			
1MHCEU25B	PENETRATION-CONT PRESS	13MM500			
1MHCEU32A	PENETRATION-CONT PRESS	13MM500			
1MHCEU32B	PENETRATION, SPARE-CONT PRESS	13MM500			
1MHCEU32C	PENETRATION, SPARE-CONT PRESS	13MM500			
1MHCEU54A	PENETRATION-CONT PRESS	13MM500			
1MHCEU54B	PENETRATION, SPARE-CONT PRESS	13MM500			
1MHCEU54C	PENETRATION, SPARE-CONT PRESS	13MM500			
1MHCEU55	PENETRATION-CONT PRESS	13MM500			
1MHCEU62A	PENETRATION-CONT PRESS	13MM500			
1MHCEU62B	PENETRATION, SPARE-CONT PRESS	13MM500			
1MHCEU62C	PENETRATION, SPARE-CONT PRESS	13MM500			
1MHENU01	MAIN STEAM LINE PENETRATION	13MM500			
1MHENU02	MAIN STEAM LINE PENETRATION	13MM500			
1MHENU03	FEEDWATER LINE PENETRATION	13MM500			
1MHENU04	MAIN STEAM LINE PENETRATION	13MM500			
1MHENU08	MAIN STEAM LINE PENETRATION	13MM500			
1MHENU10	FEEDWATER LINE PENETRATION	13MM500			

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 74 of 202)

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TAG NUMBER		DESCRIPTION		BECHTEL SPEC/PO
1JHCNTE 0042A		CONTH TEMP-WEST WALL SG 1		M-598
1JHCNTE 0042A1		CONTH TEMP-WEST WALL SG 1		M-598
1JHCNTE 0042B		CONTH TEMP-EAST WALL SG 1		M-598
1JHCNTE 0042B1		CONTH TEMP-EAST WALL SG 1		M-598
1JHCNTE 0042C		CONTH TEMP-NORTHEAST WALL		M-598
1JHCNTE 0042C1		CONTH TEMP-NORTHEAST WALL		M-598
1JHCNTE 0042D		CONTH TEMP-SOUTHEAST WALL		M-598
1JHCNTE 0042D1		CONTH TEMP-SOUTHEAST WALL		M-598
1JHCNTE 0042E		CONTH TEMP-PRESSURIZER AREA		M-598
1JHCNTE 0042E1		CONTH TEMP-PRESSURIZER AREA		M-598
1JHCBHS 0044		CONTH ATM RAD MON IV CONT		J-200
1JHCBUV 0044		CONTH ATM RAD MON IV		J-603
1JHCAHS 0045		CONTH ATM RAD MON IV CONT		J-200
1JHCAUV 0045		CONTH ATM RAD MON IV		J-603
1JHCAHS 0046		CONTH ATM RAD MON IV CONT		J-200
1JHCAUV 0046		CONTH ATM RAD MON IV		J-603
1JHCBHS 0047		CONTH ATM RAD MON IV CONT		J-200
1JHCBUV 0047		CONTH ATM RAD MON IV		J-603
1JHCAHS 0074		CONTH PRESS TRANSMITTER-A		J-200
1JHCAHV 0074		CONTH PRESSURE TRANSMITTER-A		J-603
1JHCBHS 0075		CONTH PRESS TRANSMITTER-B		J-200
1JHCBHV 0075		CONTH PRESSURE TRANSMITTER-B		J-603
1JHCCHS 0076		CONTH PRESS TRANSMITTER-C		J-200
1JHCCHV 0076		CONTH PRESSURE TRANSMITTER-C		J-603
1JHCDHS 0077		CONTH PRESS TRANSMITTER-D		J-200
1JHCDHV 0077		CONTH PRESSURE TRANSMITTER-D		J-603
1JHCAPT 0351A		CONTH PRESS A		N-001
1JHCAPT 0351A		CONTH PRESS A HI		J-311
1JHCAPT 0351B		CONTH PRESS B		N-001
1JHCAPT 0351B		CONTH PRESS B HI		J-311
1JHCAPT 0351C		CONTH PRESS C		N-001
1JHCAPT 0351C		CONTH PRESS C HI		J-311
1JHCAPT 0351D		CONTH PRESS D		N-001
1JHCAPT 0351D		CONTH PRESS D HI		J-311
1JHCAPT 0352A		CONTH PRESS A		N-001
1JHCAPT 0352A		CONTH PRESS A		J-311
1JHCAPT 0352B		CONTH PRESS B		N-001
1JHCAPT 0352B		CONTH PRESS B		J-311
1JHCAPT 0352C		CONTH PRESS C		N-001
1JHCAPT 0352C		CONTH PRESS C		J-311
1JHCAPT 0352D		CONTH PRESS D		N-001
1JHCAPT 0352D		CONTH PRESS D		J-311
1JHCAPT 0353A		CONTH PRESS WIDE RANGE A		J-111
1JHCAPT 0353A		CONTH PRESS WIDE RANGE A		N-001
1JHCAPT 0353A		CONTH PRESS WIDE RANGE A		J-311
1JHCAPT 0353A		I/E CONVERTOR		J-111
1JHCAPT 0353B		CONTH PRESS WIDE RANGE B		J-111
1JHCAPT 0353B		CONTH PRESS WIDE RANGE B		J-311
1JHCAPT 0353B		I/E CONVERTOR		J-111

12/17/82 02:28:02

Q INSTRUMENTS BY SYSTEM

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(HC-2)

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 75 of 202)

04/19/82 15:50:39		VALVE="NOM" CLASS	PAGE 45	(HC-3)
TAG NUMBER		R/SPEC/		
1PHCNV001		13PH221A		
1PHCNV002		13PH221A		
1PHCNV003		13PH221A		

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 76 of 202)

04/19/82 15138146		EQUIPMENT-NO CLASS	PAGE 36	HVAC - DIESEL GENERATOR BUILDING
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO	(HD-1)	
1MH0AA01	DIESEL GEN CONT RM ESSEN AHU	13MM721		
1MH0AJ01	DIESEL GEN RM ESS EXHAUST FAN	13MM598		
1MH0AM01	RACK DRAFT DAMPER	13MM598		
1MH0AM02	FIRE DAMPER	13MM598		
1MH0AM03	FIRE DAMPER	13MM598		
1MH0AM05	FIRE DAMPER	13MM598		
1MH0BA01	DIESEL GEN CONT RM ESSEN AHU	13MM721		
1MH0BJ01	DIESEL GEN RM ESS EXHAUST FAN	13MM598		
1MH0BM02	FIRE DAMPER	13MM598		
1MH0BM03	FIRE DAMPER	13MM598		
1MH0BM05	FIRE DAMPER	13MM598		

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CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 77 of 202)

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 78 of 202)

04/19/82 15138146		EQUIPMENT="Q" CLASS	PAGE 38	HVAC - FUEL BUILDING	(HF-1)
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PQ			
1MHFAF01	FUEL BLDG ESSEN HEATER	13MM721			
1MHFAJ01	FUEL AND AUX BLDG EXH ESS AFU	13MM721			
1MHFAM01	PNEUM LOW-LEAKAGE DAMPER MOTOR	13MM598			
1MHFAM02	PNEUM LOW-LEAKAGE DAMPER MOTOR	13MM598			
1MHFAM03	PNEUM LOW-LEAKAGE DAMPER MOTOR	13MM598			
1MHFAM04	PNEUM LOW-LEAKAGE DAMPER MOTOR	13MM598			
1MHFAM05	ELECTRIC LOW-LEAKAGE DAMPER	13MM598			
1MHFAM06	ELECTRIC LOW-LEAKAGE DAMPER	13MM598			
1MHFAM07	RACK DRAFT DAMPER	13MM598			
1MHFBF01	FUEL BLDG ESSEN HEATER	13MM721			
1MHFBJ01	FUEL AND AUX BLDG EXH ESS AFU	13MM721			
1MHFBM01	PNEUM LOW-LEAKAGE DAMPER MOTOR	13MM598			
1MHFBM02	PNEUM LOW-LEAKAGE DAMPER MOTOR	13MM598			
1MHFBM03	PNEUM LOW-LEAKAGE DAMPER MOTOR	13MM598			
1MHFBM04	PNEUM LOW-LEAKAGE DAMPER MOTOR	13MM598			
1MHFBM05	ELECTRIC LOW-LEAKAGE DAMPER	13MM598			
1MHFBM06	ELECTRIC LOW-LEAKAGE DAMPER	13MM598			
1MHFBM07	RACK DRAFT DAMPER	13MM598			
1MHFBM08	FIRE DAMPER	13MM598			

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 79 of 202)

12/17/82 02:28:02	O INSTRUMENTS BY SYSTEM		PAGE 39
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO	(HF-2)
1JHFBHS 0025	NORMAL SUPPLY ISOL=TRAIN B	J=200	
1JHFBUY 0025	NORMAL SUPPLY ISOL=TRAIN B	M=598	
1JHFAHS 0026	NORMAL SUPPLY ISOL=TRAIN A	J=200	
1JHFAUY 0026	NORMAL SUPPLY ISOL=TRAIN A	M=598	
1JHFAHS 0027	NORMAL EXHAUST ISOL=TRAIN A	J=200	
1JHFAUY 0027	NORMAL EXHAUST ISOL=TRAIN A	M=598	
1JHFBHS 0028	NORMAL EXHAUST ISOL=TRAIN B	J=200	
1JHFBUY 0028	NORMAL EXHAUST ISOL=TRAIN B	M=598	
1JHFAHE 0052	ESSENTIAL EXHAUST AFU A MSTR	M=721B	
1JHFAHSH 0052	ESSENTIAL EXHAUST AFU A MSTR	M=721B	
1JHFBHE 0053	ESSENTIAL EXHAUST AFU B MSTR	M=721B	
1JHFBHSH 0053	ESSENTIAL EXHAUST AFU B MSTR	M=721B	
1JHFAHS 0062	ESS EXH AFU A-AUX BLDG EXH	J=200	
1JHFBHS 0063	ESS EXH AFU B-AUX BLDG EXH	J=200	
1JHFAHS 0064	ESS EXH AFU A-FUEL BLDG EXH	J=200	
1JHFBHS 0065	ESS EXH AFU B-FUEL BLDG EXH	J=200	
1JHFAPDI 0070	FB NEGATIVE PRES MONITOR	J=111	
1JHEABDSL0070	FB NEGATIVE PRES MONITOR	J=111	
1JHFAPDT 0070	FB NEGATIVE PRES MONITOR	M=598	
1JHFATDI 0073	ESS EXH AFU A CHAR DIFF TEMP	J=111	
1JHEATDSH0073	ESS EXH AFU A CHAR DIFF TEMP	J=111	
1JHFATDT 0073	ESS EXH AFU A CHAR DIFF TEMP	M=721B	
1JHFATDY 0073	I/E CONVERTER	J=111	
1JHEBTDI 0074	ESS EXH AFU B CHAR DIFF TEMP	J=111	
1JHFBTDSH0074	ESS EXH AFU B CHAR DIFF TEMP	J=111	
1JHFBTDY 0074	ESS EXH AFU B CHAR DIFF TEMP	M=721B	
1JHEBTDY 0074	I/E CONVERTER	J=111	
1JHFBPDSL0082	ESS EXH AFU B HEPA FILT	M=721B	

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 80 of 202)

04/19/82 15:50:39		VALVE="O" CLASS	PAGE 47	HVAC - FUEL BUILDING	(HF-3)
TAG NUMBER		P/SPFC/			
1PHFRV005		13PM221A			
1PHFRV006		13PM221A			

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 81 of 202)

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EQUIPMENT="00" CLASS

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HVAC - CONTROL BUILDING

(HJ-1)

TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO
1JHJAE01	CHLORINE DETECTOR PANEL	13JM391
1JHJBF01	CHLORINE DETECTOR PANEL	13JM391
1MHJAF04	CONTROL ROOM ESSENTIAL AHU	13MM721
1MHJAF06	SOUND ATTENUATOR	13MM598
1MHJAF07	SOUND ATTENUATOR	13MM598
1MHJAF08	SOUND ATTENUATOR	13MM598
1MHJAF09	SOUND ATTENUATOR	13MM598
1MHJAJ01A	CTRL RLG RATT RM ESSEN EX FAN	13MM598
1MHJAJ01B	CTRL RLG RATT RM ESSEN EX FAN	13MM598
1MHJAM00 101	FIRE DAMPER	13MM598
1MHJAM00 120	FIRE DAMPER	13MM598
1MHJAM00 121	FIRE DAMPER	13MM598
1MHJAM00 122	FIRE DAMPER	13MM598
1MHJAM00 125	FIRE DAMPER	13MM598
1MHJAM00 131	FIRE DAMPER	13MM598
1MHJAM00 133	FIRE DAMPER	13MM598
1MHJAM00 134	FIRE DAMPER	13MM598
1MHJAM00 140	FIRE DAMPER	13MM598
1MHJAM00 150	FIRE DAMPER	13MM598
1MHJAM00 200	FIRE DAMPER	13MM598
1MHJAM01	PNEUM RUBBLE-TIGHT DAMPER	13MM598
1MHJAM02	DAMPER-MOTOR	13MM598
1MHJAM03	DAMPER-MOTOR	13MM598
1MHJAM04	MANUEL VOLUME DAMPER	13MM598
1MHJAM05	FIRE DAMPER	13MM598
1MHJAM06	FIRE DAMPER	13MM598
1MHJAM07	FIRE DAMPER	13MM598
1MHJAM08	FIRE DAMPER	13MM598
1MHJAM09	FIRE DAMPER	13MM598
1MHJAM10	FIRE DAMPER	13MM598
1MHJAM11	FIRE DAMPER	13MM598
1MHJAM12	FIRE DAMPER	13MM598
1MHJAM13	FIRE DAMPER	13MM598
1MHJAM14	MANUEL VOLUME DAMPER	13MM598
1MHJAM15	PNEUM RUBBLE-TIGHT DAMPER	13MM598
1MHJAM16	PNEUM RUBBLE-TIGHT DAMPER	13MM598
1MHJAM17	BACK DRAFT DAMPER	13MM598
1MHJAM18	FIRE DAMPER	13MM598
1MHJAM19	FIRE DAMPER	13MM598
1MHJAM20	FIRE DAMPER	13MM598
1MHJAM21	FIRE DAMPER	13MM598
1MHJAM27	FIRE DAMPER	13MM598
1MHJAM23	PNEUM LOW-LEAKAGE DAMPER MOTOR	13MM598
1MHJAM24	FIRE DAMPER	13MM598
1MHJAM25	PNEUM LOW-LEAKAGE DAMPER	13MM598
1MHJAM26	FIRE DAMPER	13MM598
1MHJAM28	PNEUM LOW-LEAKAGE DAMPER MOTOR	13MM598
1MHJAM29	FIRE DAMPER	13MM598
1MHJAM30	FIRE DAMPER	13MM598
1MHJAM31	FIRE DAMPER	13MM598
1MHJAM32	FIRE DAMPER	13MM598
1MHJAM33	FIRE DAMPER	13MM598
1MHJAM34	PNEUM LOW-LEAKAGE DAMPER MOTOR	13MM598
1MHJAM35	FIRE DAMPER	13MM598

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APPENDIX D

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 82 of 202)

04/19/82 15:38:46		EQUIPMENT-00 CLASS	PAGE 41	(HJ-2)
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO		
1MHJAM36	PNEUM LOW-LEAKAGE DAMPER MOTOR	13MM598		
1MHJAM37	FIRE DAMPER	13MM598		
1MHJAM38	BACK DRAFT DAMPER	13MM598		
1MHJAM39	MANUAL VOLUME DAMPER	13MM598		
1MHJAM40	MANUAL VOLUME DAMPER	13MM598		
1MHJAM41	BACK DRAFT DAMPERS	13MM598		
1MHJAM42	FIRE DAMPER	13MM598		
1MHJAM43	FIRE DAMPER	13MM598		
1MHJAM44	FIRE DAMPER	13MM598		
1MHJAM45	BACK DRAFT DAMPERS	13MM598		
1MHJAM46	FIRE DAMPER	13MM598		
1MHJAM47	FIRE DAMPER	13MM598		
1MHJAM48	FIRE DAMPER	13MM598		
1MHJAM49	FIRE DAMPER	13MM598		
1MHJAM50	FIRE DAMPER	13MM598		
1MHJAM51	PNEUM LOW-LEAKAGE DAMPER MOTOR	13MM598		
1MHJAM52	PNEUM RUMBLE-TIGHT DAMPER	13MM598		
1MHJAM53	PNEUM LOW-LEAKAGE DAMPER	13MM598		
1MHJAM54	PNEUM LOW-LEAKAGE DAMPER MOTOR	13MM598		
1MHJAM55	PNEUM LOW-LEAKAGE DAMPER MOTOR	13MM598		
1MHJAM56	PNEUM RUMBLE-TIGHT DAMPER	13MM598		
1MHJAM57	PNEUM RUMBLE-TIGHT DAMPER	13MM598		
1MHJAM58	PNEUM RUMBLE-TIGHT DAMPER	13MM598		
1MHJAM59	PNEUM RUMBLE-TIGHT DAMPER	13MM598		
1MHJAM60	BACK DRAFT DAMPERS	13MM598		
1MHJAM61	BACK DRAFT DAMPERS	13MM598		
1MHJAM62	PNEUM LOW-LEAKAGE DAMPER	13MM598		
1MHJAM63	FIRE DAMPER	13MM598		
1MHJAM64	FIRE DAMPER	13MM598		
1MHJAM65	FIRE DAMPER	13MM598		
1MHJAM66	PNEUM LOW-LEAKAGE MOTOR DAMPER	13MM598		
1MHJAM67	FIRE DAMPER	13MM598		
1MHJAM68	FIRE DAMPER	13MM598		
1MHJAM69	FIRE DAMPER	13MM598		
1MHJAM70	FIRE DAMPER	13MM598		
1MHJAM71	FIRE DAMPER	13MM598		
1MHJAM73	FIRE DAMPER	13MM598		
1MHJAZ03	CTROL RLG ESF SWGR RM ESS AHU	13MM721		
1MHJAZ04	ESF EQUIPMENT CHANNEL "A" AHU	13MM598		
1MHJBFO4	CONTROL ROOM ESSENTIAL AHU	13MM721		
1MHJBF10	SOUND ATTENUATOR	13MM598		
1MHJBF11	SOUND ATTENUATOR	13MM598		
1MHJBF12	SOUND ATTENUATOR	13MM598		
1MHJBF13	SOUND ATTENUATOR	13MM598		
1MHJBF14	SOUND ATTENUATOR	13MM598		
1MHJBJO1A	CTROL RLG RATT RM ESSEN EX FAN	13MM598		
1MHJBJO1B	CTROL RLG RATT RM ESSEN EX FAN	13MM598		
1MHJBMO0 100	FIRE DAMPER	13MM598		
1MHJBMO0 103	FIRE DAMPER	13MM598		
1MHJBMO0 135	FIRE DAMPER	13MM598		
1MHJBMO1	PNEUM RUMBLE-TIGHT DAMPER	13MM598		
1MHJBMO2	DAMPER-MOTOR	13MM598		
1MHJBMO3	DAMPER-MOTOR	13MM598		
1MHJBMO4	MANUEL VOLUME DAMPER	13MM598		

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 83 of 202)

(HJ-3)

04/19/82 15:38:46		EQUIPMENT="0" CLASS	PAGE 42	(HJ-3)
TAG NUMBER	DESCRIPTION	BECHTFL SPEC/PO		
1MHJBM05	MANUEL VOLUME DAMPER	13MM598		
1MHJBM06	RACK DRAFT DAMPER	13MM598		
1MHJBM07	FIRE DAMPER	13MM598		
1MHJBM08	FIRE DAMPER	13MM598		
1MHJBM10	PNEUM RUBBLE-TIGHT DAMPER	13MM598		
1MHJBM11	FIRE DAMPER	13MM598		
1MHJBM13	PNEUM RUBBLE-TIGHT DAMPER	13MM598		
1MHJBM14	FIRE DAMPER	13MM598		
1MHJBM15	FIRE DAMPER	13MM598		
1MHJBM16	FIRE DAMPER	13MM598		
1MHJBM17	FIRE DAMPER	13MM598		
1MHJBM18	FIRE DAMPER	13MM598		
1MHJBM19	FIRE DAMPER	13MM598		
1MHJBM20	FIRE DAMPER	13MM598		
1MHJBM21	FIRE DAMPER	13MM598		
1MHJBM22	FIRE DAMPER	13MM598		
1MHJBM23	PNEUM RUBBLE-TIGHT DAMPER	13MM598		
1MHJBM24	PNEUM RUBBLE-TIGHT DAMPER	13MM598		
1MHJBM25	FIRE DAMPER	13MM598		
1MHJBM26	FIRE DAMPER	13MM598		
1MHJBM27	RACK DRAFT DAMPER	13MM598		
1MHJBM28	PNEUM LOW-LEAKAGE DAMPER	13MM598		
1MHJBM29	FIRE DAMPER	13MM598		
1MHJBM30	FIRE DAMPER	13MM598		
1MHJBM31	PNEUM LOW-LEAKAGE DAMPER	13MM598		
1MHJBM32	PNEUM LOW-LEAKAGE DAMPER	13MM598		
1MHJBM33	FIRE DAMPER	13MM598		
1MHJBM34	PNEUM LOW-LEAKAGE DAMPER	13MM598		
1MHJBM35	FIRE DAMPER	13MM598		
1MHJBM36	FIRE DAMPER	13MM598		
1MHJBM38	PNEUM LOW-LEAKAGE DAMPER	13MM598		
1MHJBM39	FIRE DAMPER	13MM598		
1MHJBM40	FIRE DAMPER	13MM598		
1MHJBM41	FIRE DAMPER	13MM598		
1MHJBM42	RACK DRAFT DAMPER	13MM598		
1MHJBM43	MANUAL VOLUME DAMPER	13MM598		
1MHJBM44	MANUAL VOLUME DAMPER	13MM598		
1MHJBM45	RACK DRAFT DAMPER	13MM598		
1MHJBM46	FIRE DAMPER	13MM598		
1MHJBM47	FIRE DAMPER	13MM598		
1MHJBM48	RACK DRAFT DAMPER	13MM598		
1MHJBM49	FIRE DAMPER	13MM598		
1MHJBM50	FIRE DAMPER	13MM598		
1MHJBM51	FIRE DAMPER	13MM598		
1MHJBM52	PNEUM LOW-LEAKAGE DAMPER	13MM598		
1MHJBM53	FIRE DAMPER	13MM598		
1MHJBM54	PNEUM LOW-LEAKAGE DAMPER MOTOR	13MM598		
1MHJBM55	PNEUM RUBBLE-TIGHT DAMPER	13MM598		
1MHJBM56	PNEUM RUBBLE-TIGHT DAMPER	13MM598		
1MHJBM57	PNEUM RUBBLE-TIGHT DAMPER	13MM598		
1MHJBM58	PNEUM LOW-LEAKAGE DAMPER	13MM598		
1MHJBM60	RACK DRAFT DAMPER	13MM598		
1MHJBM61	RACK DRAFT DAMPER	13MM598		
1MHJBM62	FIRE DAMPER	13MM598		

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 84 of 202)

04/19/82 15:38:46		EQUIPMENT="00" CLASS	PAGE 43	(HJ-4)
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO		
14HJB63	FIRE DAMPER	13MM598		
14HJB64	FIRE DAMPER	13MM598		
14HJB65	FIRE DAMPER	13MM598		
14HJB66	PNFUM LOW-LEAKAGE MOTOR DAMPER	13MM598		
14HJB67	FIRE DAMPER	13MM598		
14HJB68	FIRE DAMPER	13MM598		
14HJB69	FIRE DAMPER	13MM598		
14HJB70	FIRE DAMPER	13MM598		
14HJB71	FIRE DAMPER	13MM598		
14HJB72	FIRE DAMPER	13MM598		
14HJB75	FIRE DAMPER	13MM598		
14HJB203	CTROL BLDG ESF SWGR RM ESS AHU	13MM721		
14HJB204	ESF ROOM CHANNEL "B" AHU	13MM721		
14HJMS07	SOUND ATTENUATOR	13MM598		
14HJNM10	FIRE DAMPER	13MM598		
14HJNM45	FIRE DAMPER	13MM598		

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APPENDIX D

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 85 of 202)

12/17/82 02:28102		Q INSTRUMENTS BY SYSTEM		PAGE 41
TAG NUMBER		DESCRIPTION	BECHTEL SPEC/PO	(HJ-5)
1JHJAMS	0007	CON RM NORM AHU ISOL VALVES	J=200	
1JHJAU	0007A	CON RM NORM AHU DSCH IV	M=598	
1JHJAU	0007B	CON RM NORM AHU RECIRC AIR IV	M=598	
1JHJBHS	0008	CON RM NORM AHU ISOL VALVES	J=200	
1JHJBUI	0008A	CON RM NORM AHU DSCH IV	M=598	
1JHJBUI	0008B	CON RM NORM AHU RECIRC AIR IV	M=598	
1JHJAMS	0010	CON RM CMCTN RM ISOL VALVES	J=200	
1JHJAU	0010A	CON RM CMCTN RM 1/L AIR IV	M=598	
1JHJAU	0010B	CON RM CMCTN RM OUT AIR IV	M=598	
1JHJBHS	0011	CON RM CMCTN RM ISOL VALVES	J=200	
1JHJBUI	0011A	CON RM CMCTN RM 1/L AIR IV	M=598	
1JHJBUI	0011B	CON RM CMCTN RM OUT AIR IV	M=598	
1JHJAMS	0028	CON RM ESS AHU-A	J=200	
1JHJBHS	0029	CON RM ESS AHU-B	J=200	
1JHJBHS	0034	CON RM ESS AHU-A OUTSIDE IV	J=200	
1JHJBHS	0035	CON RM ESS AHU-B OUTSIDE IV	J=200	
1JHJAMS	0036	CON RM ESS AHU-A OUTSIDE IV	J=200	
1JHJAMS	0037	CON RM ESS AHU-B OUTSIDE IV	J=200	
1JHJBHS	0038	CON RM SMOKE SUCT & MKU AIR IV	J=200	
1JHJBUI	0038A	CON RM SMOKE EXH MKU AIR IV	M=598	
1JHJBUI	0038B	CON RM SMOKE EXH FAN SUCT IV	M=598	
1JHJAMS	0039	CON RM SMOKE SUCT & MKU AIR IV	J=200	
1JHJAU	0039A	CON RM SMOKE EXH MKU AIR IV	M=598	
1JHJAU	0039B	CON RM SMOKE EXH FAN SUCT IV	M=598	
1JHJBHS	0040	CON RM TOILET & KITCHEN EXH IV	J=200	
1JHJBUI	0040A	CON RM TOILET NORM EXH FAN IV	M=598	
1JHJBUI	0040B	CON RM KITCHEN NORM EXH FAN IV	M=598	
1JHJAMS	0041	CON RM TOILET & KITCHEN EXH IV	J=200	
1JHJAU	0041A	CON RM TOILET NORM EXH FAN IV	M=598	
1JHJAU	0041B	CON RM KITCHEN NORM EXH FAN IV	M=598	
1JHJAMS	0058	ESF SWGR RM ESS TRAIN-A IV	J=200	
1JHJAU	0058A	ESF SWGR RM ESS TRAIN-A IV	M=598	
1JHJAU	0058B	ESF SWGR RM ESS TRAIN-A IV	M=598	
1JHJAU	0058C	DC EQUIP RM CHAN A	M=598	
1JHJAU	0058D	ESF RMS AEC NORMAL SUPPLY ISOL	M=598	
1JHJBHS	0060	VOID	J=200	
1JHJAMS	0061	ESF SWGR RM ESS TRAIN-A IV	J=200	
1JHJAU	0061A	ESF SWGR RM ESS TRAIN-A IV	M=598	
1JHJAU	0061B	ESF SWGR RM ESS TRAIN-A IV	M=598	
1JHJBHS	0062	ESF SWGR RM ESS TRAIN-B IV	J=200	
1JHJBUI	0062A	ESF SWGR RM ESS TRAIN-B IV	M=598	
1JHJBUI	0062B	ESF SWGR RM ESS TRAIN-B IV	M=598	
1JHJBUI	0062D	ESF SWGR RM ESS TRAIN-B IV	M=598	
1JHJBUI	0062E	ESF RMS B&D NORM SUPPLY ISOL	M=598	
1JHJAU	0062F	TAG REVISED TO HJB=UY-62F	M=598	
1JHJBUI	0062F	ESF RMS B&D ESS AHU DISCH ISOL	M=598	
1JHJAMS	0067	ESF SWGR RM ESS AHU-A	J=200	
1JHJBHS	0068	ESF SWGR RM ESS AHU-B	J=200	
1JHJAMS	0081	BATTERY RM-A ESS EXH FAN	J=200	
1JHJAPDSH0081		BATT RM A ESS EXH FAN	M=598	
1JHJBHS	0082	BATTERY RM-B ESS EXH FAN	J=200	
1JHJBPDH0082		BATT RM B ESS EXH FAN	M=598	
1JHJAMS	0083	BATTERY RM-C ESS EXH FAN	J=200	
1JHJAPDSH0083		BATT RM C ESS EXH FAN	M=598	

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 86 of 202)

12/17/82 02:28:02		Q INSTRUMENTS BY SYSTEM		PAGE 42 (HJ-6)
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO		
1JHJBHS 0084	BATTERY RM-D ESS EXH FAN	J=200		
1JHJBPD3H0084	BATT RM D ESS EXH FAN	H=598		
1JHJAMS 0096	ESF EQUIP RM SHK EXH IV	J=200		
1JHJAUY 0096	ESF EQUIP RM SHK EXH IV	H=598		
1JHJAMS 0097	ESF EQUIP RMS A&C SHK EXH IV	J=200		
1JHJAUY 0097A	ESF EQUIP RMS A&C SHK EXH IV	H=598		
1JHJAUY 0097B	ESF EQUIP RMS A&C SHK EXH IV	H=598		
1JHJAUY 0097C	ESF EQUIP RMS A&C SHK EXH IV	H=598		
1JHJBHS 0106	ESF EQUIP RMS B&D SHK EXH IV	J=200		
1JHJBUI 0104A	ESF EQUIP RMS B&D SHK EXH IV	H=598		
1JHJBUI 0104B	ESF EQUIP RMS B&D SHK EXH IV	H=598		
1JHJBUI 0104C	ESF EQUIP RMS B&D SHK EXH IV	H=598		
1JHJAMS 0108	ESF SWGR RM ESS TRAIN-A IV	J=200		
1JHJAUY 0106	ESF SWGR RM ESS TRAIN-A IV	H=598		
1JHJATE 0123	CR HVAC TRAIN-A CHW SUP	H=598		
1JHJATIC 0123	CR HVAC TRAIN-A CHW SUP	H=598		
1JHJBTE 0124	CR HVAC TRAIN-B CHW SUP	H=598		
1JHJBTE 0124	CR HVAC TRAIN-B CHW SUP	H=598		
1JHJAMS 0133	ESF EQUIP RM ESS AHU A FAN DP	J=200		
1JHJBHS 0136	ESF EQUIP RM ESS AHU B FAN DP	J=200		
1JHJNHS 0139	ESF SWITCH GR RM NORMAL AHU	J=200		

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CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 87 of 202)

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 88 of 202)

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O INSTRUMENTS BY SYSTEM

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TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO
1JHPAHS 0001	H2 CONT TR A UPSTM SUP ISOL	J-200
1JHPAUV 0001	H2 CONT TR A UPSTM SUP ISOL	P-221A
1JHPBHS 0002	H2 CONT TR B UPSTM SUP ISOL	J-200
1JHPBHV 0002	H2 CONT TR B UPSTM SUP ISOL	P-221A
1JHPAHS 0003	H2 CONT TR A DOWNSTM SUP ISOL	J-200
1JHPAUV 0003	H2 CONT TR A DOWNSTM SUP ISOL	P-221A
1JHPBHS 0004	H2 CONT TR B DOWNSTM SUP ISOL	J-200
1JHPBHV 0004	H2 CONT TR B DOWNSTM SUP ISOL	P-221A
1JHPAHS 0005	H2 CONT TR A RETURN ISOL	J-200
1JHPAUV 0005	H2 CONT TR A RETURN ISOL	P-221A
1JHPBHS 0006	H2 CONT TR B RETURN ISOL	J-200
1JHPBHV 0006	H2 CONT TR B RETURN ISOL	P-221A
1JHPAHS 0007	H2 ANALY CH A INLET VLV	J-200
1JHPAHV 0007A	H2 ANALY A INLET VLV	J-603
1JHPAHV 0007B	H2 ANALY A INLET VLV	J-603
1JHPBHS 0008	H2 ANALY B INLET ISOL	J-200
1JHPBHV 0008A	H2 ANALY B INLET ISOL	J-603
1JHPBHV 0008B	H2 ANALY B INLET ISOL	J-603
1JHPAAE 0009	CONTAINMENT H2 ANALY A	J-359
1JHPAAI 0009	CONTAINMENT H2 ANALY A	J-111
1JHPAAIT 0009	CONTAINMENT H2 ANALY A	J-359
1JHPAASH 0009	CONTAINMENT H2 ANALY A	J-359
1JHPAAY 0009	I/E CONVERTER	J-111
1JHPAUTC 0009	H2 ANALY CH A CONT RM SUBPANEL	J-359
1JHPAUR 0009	CNMT H2/CNMT WATER LVL ANALY A	J-111
1JHPAFIC 0009A	H2 ANALY CALIBRATION GAS	J-359
1JHPAHS 0009A	H2 ANALY CH A OFF/STBY/ANALYZE	J-359
1JHPAHV 0009A	H2 ANALY CALIBRATION GAS	J-359
1JHPAFIC 0009B	H2 ANALY REAGENT GAS	J-359
1JHPAHS 0009B	H2 ANALY CH A SAMPLE/ZERO/SPAN	J-359
1JHPAHV 0009B	H2 ANALY REAGENT GAS	J-359
1JHPAHS 0009C	H2 ANALY CH A REMOTE SELECT	J-359
1JHPAHS 0009D	H2 ANAL CH A SHPL/ZERO/SPAN	J-359
1JHPAHS 0009E	H2 ANAL CH A LOCAL/REMOTE SEL	J-359
1JHPBAE 0010	CONTAINMENT H2 ANALY B	J-359
1JHPBAI 0010	CONTAINMENT H2 ANALY B	J-111
1JHPBAIT 0010	CONTAINMENT H2 ANALY B	J-359
1JHPBASH 0010	CONTAINMENT H2 ANALY B	J-359
1JHPRAY 0010	I/E CONVERTER	J-111
1JHPBUIC 0010	H2 ANALY CH B CONT RM SUBPANEL	J-359
1JHPBFIC 0010A	H2 ANALY CALIBRATION GAS	J-359
1JHPBHS 0010A	H2 ANALY CH B OFF/STBY/ANALYZE	J-359
1JHPBHV 0010A	H2 ANALY CALIBRATION GAS	J-359
1JHPBFIC 0010B	H2 ANALY REAGENT GAS	J-359
1JHPBHS 0010B	H2 ANALY CH B SAMPLE/ZERO/SPAN	J-359
1JHPBHV 0010B	H2 ANALY REAGENT GAS	J-359
1JHPBHS 0010C	H2 ANALY CH B REMOTE SELECT	J-359
1JHPBHS 0010D	H2 ANAL CH B SHPL/ZERO/SPAN	J-359
1JHPBHS 0010E	H2 ANAL CH B LOCAL/REMOTE SEL	J-359
1JHPATSHL0013	CONT H2 ANAL A CHAMBER TEMP	J-359
1JHPBTSHL0014	CONT H2 ANAL B CHAMBER TEMP	J-359
1JHPAFE 0015	H2 ANALY OUTLET	J-359
1JHPAFI 0015	H2 ANALY OUTLET	J-359
1JHPADSL0015	H2 ANAL OUTLET	J-359

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 89 of 202)

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O INSTRUMENTS BY SYSTEM

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TAG NUMBER

DESCRIPTION

BECHTEL
SPEC/PO

1JHPBFE 0016	H2 ANALY OUTLET	J-359
1JHPBFI 0016	H2 ANALY OUTLET	J-359
1JHPBPSL0016	H2 ANAL OUTLET	J-359
1JHPAHS 0017	CONT H2 ANAL A ON-STBY-OFF	J-359
1JHPBHS 0018	CONT H2 ANAL B ON-STBY-OFF	J-359
1JHPAPSL 0019	H2 ANALY CALIBRATION GAS	J-359
1JHPBPSL 0020	H2 ANALY CALIBRATION GAS	J-359
1JHPAPSL 0021	H2 ANALY REAGENT GAS	J-359
1JHPBPSL 0022	H2 ANALY REAGENT GAS	J-359
1JHPAHS 0023	SAMPLING SYSTEM RETURN ISL VLV	J-200
1JHPAUV 0023	SAMPLING SYSTEM RETURN ISL VLV	J-603
1JHPAHS 0024	SAMPLING SYSTEM SUP ISL VLV	J-200
1JHPAUV 0024	SAMPLING SYSTEM SUP ISL VLV	J-603
1JHPAHS 0027	H2 ANAL CH A ALARM RESET	J-359
1JHPBHS 0028	H2 ANAL CH B ALARM RESET	J-359
1JHPAPCV 0041	H2 ANALY CALIBRATION GAS	J-359
1JHPBPCV 0042	H2 ANALY CALIBRATION GAS	J-359
1JHPAPCV 0043	H2 ANALY REAGENT GAS	J-359
1JHPBPCV 0044	H2 ANALY REAGENT GAS	J-359
1JHPAPCV 0045	H2 ANALY INLET	J-359
1JHPBPCV 0046	H2 ANALY INLET	J-359
1JHPAPCV 0047	H2 ANALY BYPASS	J-359
1JHPBPCV 0048	H2 ANALY BYPASS	J-359
1JHPAPCV 0049	H2 ANALY OUTLET	J-359
1JHPBPCV 0050	H2 ANALY OUTLET	J-359
1JHPAFI 0051	H2 ANALY BYPASS	J-359
1JHPBEI 0052	H2 ANALY BYPASS	J-359
1JHPAPSH 0053	H2 ANALY SAMPLE CYLINDER	J-359
1JHPAPSL 0053	H2 ANALY SAMPLE CYLINDER	J-359
1JHPBPSH 0054	H2 ANALY SAMPLE CYLINDER	J-359
1JHPBPSL 0054	H2 ANALY SAMPLE CYLINDER	J-359
1JHPAPI 0055	H2 ANALY INLET	J-359
1JHPBPI 0056	H2 ANALY INLET	J-359
1JHPAHS 0061	H2 RECOMBINER VENT DAMPER	J-200
1JHPBHS 0062	H2 RECOMBINER VENT DAMPER	J-200
1JHPAETC 0063	H2 ANALY SAMPLE BYPASS	J-359
1JHPBFIC 0064	H2 ANALY SAMPLE BYPASS	J-359
AJHPAFE 0501	H2 RECOMB I/L GAS FLOW	N-993
AJHPAEI 0501	H2 RECOMB I/L GAS FLOW	N-993
AJHPAFSL 0501	H2 RECOMB I/L GAS FLOW LOW	N-993
AJHPAFT 0501	H2 RECOMB I/L GAS FLOW	N-993
AJHPAEY 0501	H2 RECOMB I/L GAS FLOW	N-993
AJHPBFE 0502	H2 RECOMB I/L GAS FLOW	N-993
AJHPBFI 0502	H2 RECOMB I/L GAS FLOW	N-993
AJHPBPSL 0502	H2 RECOMB I/L GAS FLOW LOW	N-993
AJHPBPT 0502	H2 RECOMB I/L GAS FLOW	N-993
AJHPBPFY 0502	H2 RECOMB I/L GAS FLOW	N-993
AJHPATE 0503	H2 RECOMB BLOWER OUT TEMP	N-993
AJHPATSH 0503	H2 RECOMB BLOWER OUT TEMP HI	N-993
AJHPBTE 0504	H2 RECOMB BLOWER OUT TEMP	N-993
AJHPBTSH 0504	H2 RECOMB BLOWER OUT TEMP HI	N-993
AJHPATE 0505	H2 RECOMB HEATER TEMP	N-993
AJHPATSH 0505	H2 RECOMB HEATER TEMP HI	N-993
AJHPBTE 0506	H2 RECOMB HEATER TEMP	N-993

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PER REQUIREMENTS OF NUREG-0588

APPENDIX D

PVNGS 1,2&3

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 90 of 202)

12/17/82 02:28102	Q INSTRUMENTS BY SYSTEM	PAGE 46 (HP-4)
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO
AJHPBTSH 0506	H2 RECOMB HEATER TEMP HI	N-993
AJHPATE 0507	H2 RECOMB HEATER TEMP	N-993
AJHPATE 0508	H2 RECOMB HEATER TEMP	N-993
AJHPATE 0509	H2 RECOMB HEATER GAS TEMP	N-993
AJHPATSH 0509	H2 RECOMB HEATER GAS TEMP	N-993
AJHPATSHH0509	H2 RECOMB HEATER GAS TEMP	N-993
AJHPBTE 0510	H2 RECOMB HEATER GAS TEMP	N-993
AJHPBTSH 0510	H2 RECOMB HEATER GAS TEMP	N-993
AJHPATSHH0510	H2 RECOMB HEATER GAS TEMP	N-993
AJHPATE 0511	H2 RECOMB HEATER GAS TEMP	N-993
AJHPBTE 0512	H2 RECOMB HEATER GAS TEMP	N-993
AJHPATE 0513	H2 RECOMB REACTION CHMB	N-993
AJHPATIC 0513	H2 RECOMB REACTION CHMB TEMP	N-993
AJHPBTE 0514	H2 RECOMB REACTION CHMB	N-993
AJHPBTIC 0514	H2 RECOMB REACTION CHMB TEMP	N-993
AJHPATE 0515	H2 RECOMB REACTION CHMB	N-993
AJHPATSH 0515	H2 RECOMB REACTION CHMB TEMP	N-993
AJHPATSL 0515	H2 RECOMB REACTION CHMB TEMP	N-993
AJHPBTE 0516	H2 RECOMB REACTION CHMB	N-993
AJHPBTSH 0516	H2 RECOMB REACTION CHMB TEMP	N-993
AJHPBTSL 0516	H2 RECOMB REACTION CHMB TEMP	N-993
AJHPATE 0517	H2 RECOMB HE I/L TEMP	N-993
AJHPATISH0517	H2 RECOMB HE I/L TEMP HI	N-993
AJHPBTE 0518	H2 RECOMB HE I/L TEMP	N-993
AJHPBTISH0518	H2 RECOMB HE I/L TEMP HI	N-993
AJHPATE 0519	H2 RECOMB HE I/L TEMP	N-993
AJHPBTE 0520	H2 RECOMB HE I/L TEMP	N-993
AJHPATE 0521	H2 RECOMB GAS RETURN TEMP	N-993
AJHPATISH0521	H2 RECOMB GAS RETURN TEMP HI	N-993
AJHPBTE 0522	H2 RECOMB GAS RETURN TEMP	N-993
AJHPBTISH0522	H2 RECOMB GAS RETURN TEMP HI	N-993
AJHPATE 0523	H2 RECOMB GAS RETURN TEMP	N-993
AJHPBTE 0524	H2 RECOMB GAS RETURN TEMP	N-993
AJHPAHS 0527	H2 RECOMB START-STOP SWITCH	N-993
AJHPBHS 0528	H2 RECOMB START-STOP SWITCH	N-993
AJHPAHS 0529	H2 RECOMB TEST SWITCH	N-993
AJHPBHS 0530	H2 RECOMB TEST SWITCH	N-993
AJHPAHS 0531	H2 RECOMB ACK SWITCH	N-993
AJHPBHS 0532	H2 RECOMB ACK SWITCH	N-993

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 91 of 202)

(HP-5)

04/19/82 15:50:39	VALVE="0" CLASS	PAGE 49
TAG NUMBER	R/SPEC/	
1PHRAV001	13PM221A	
1PHRAV002	13PM221A	
1PHRAV005	13PM221A	
1PHRAV010	13PM221A	
1PHRAV013	13PM221A	
1PHRAV014	13PM221A	
1PHRAV015	13PM221A	
1PHRAV016	13PM221A	
1PHRAV017	13PM221A	
1PHRAV018	13PM221A	
1PHRAV025	13PM221A	
1PHRAV026	13PM221A	
1PHRAV027	13PM221A	
1PHRAV028	13PM221A	
1PHRAV029	13PM221A	
1PHRAV030	13PM221A	
1PHRAV031	13PM221A	
1PHRAV032	13PM221A	
1PHRAV035	13PM221A	
1PHRAV003	13PM221A	
1PHRAV004	13PM221A	
1PHRAV006	13PM221A	
1PHRAV011	13PM221A	
1PHRAV012	13PM221A	
1PHRAV019	13PM221A	
1PHRAV020	13PM221A	
1PHRAV021	13PM221A	
1PHRAV022	13PM221A	
1PHRAV023	13PM221A	
1PHRAV034	13PM221A	

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 92 of 202)

04/19/82 15:38:46		EQUIPMENT-"Q" CLASS	PAGE 47	HVAC - MISCELLANEOUS SITE STRUCTURES
TAG NUMBER	DESCRIPTION	RFCHTEL SPEC/PO		
1PHSAJ01	VANEAXIAL FAN, 20000 ACFM	13MM598		
1MHSRJ01	VANEAXIAL FAN, 20000 ACFM	13MM598		

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 93 of 202)

04/19/82 15178146		EQUIPMENT-NOM CLASS	PAGE 49	INSTRUMENT AND SERVICE AIR (IA-1)
TAG NUMRER	DESCRIPTION	BECHTEL SPEC/PO		
1MIAEU31	PENETRATION-INST AIR	13MM500		
1MIAEU59	PENETRATION-SERVICE AIR	13MM500		

Table D-1
CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 94 of 202)

12/17/82 02:28:02		Q INSTRUMENTS BY SYSTEM		PAGE 48 (IA-2)
TAG NUMBER		DESCRIPTION	BECHTEL SPEC/PO	
1J1AAHS 0002		INST AIR CTMT ISO VLV	J-200	
1J1AAUV 0002		INST AIR CTMT ISO VLV	J-603	
1J1AAUV 0002A		SPARE	J-603	

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 95 of 202)

04/19/82 15:50:39	VALVE-"O" CLASS	PAGE 51	<u>INSTRUMENT SERVICE AIR</u>	(IA-3)
TAG NUMBER	B/SPEC/			
1PIAEV021	13PM221A			
1PIAEV072	13PM221B			
1PIAEV073	13PM221B			
1PIAEV291	13PM221A			
1PIAEV296	13PM221A			

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 96 of 202)

04/19/82 15:38:46		EQUIPMENT="Q" CLASS	PAGE 53	13.8-KV POWER
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO		
1ENAN231	ELECT PENTRTN=15KV PWR(RCP 2B)	13EM035		
1ENAN233	ELECT PENTRTN	13EM035		
1ENAN244	ELECT PENTRTN=15KV PWR(RCP 1B)	13EM035		
1ENAN245	ELECT PENTRTN=15KV PWR(RCP 1A)	13EM035		
1ENAN270	ELECT PENTRTN=15KV PWR(RCP 2A)	13EM035		

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 97 of 202)

04/19/82 15138146		EQUIPMENT-NO" CLASS	PAGE 55	NUCLEAR COOLING WATER	(NC-1)
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO			
1MNCEU33	PENETRATION=NC WTR SUPPLY	13MM500			
1MNCEU34	PENETRATION=NC WTR RETURN	13MM500			

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 98 of 202)

12/17/82 02:28102	Q INSTRUMENTS BY SYSTEM		PAGE 50 (NC-2)
TAG NUMBER	DESCRIPTION	RECHTEL SPEC/PO	
1JNCAHCV 0244	FUEL POOL HX A NCWS I/L ISOL	J=605	
1JNCBHCV 0245	FUEL POOL HX B NCWS I/L ISOL	J=605	
1JNCATH 0246	FUEL POOL HX A NCWS I/L	J=556	
1JNCBTH 0247	FUEL POOL HX B NCWS I/L	J=556	
1JNCAPSV 0250	FUEL POOL HX A NCWS RELIEF	M=071	
1JNCBPSV 0251	FUEL POOL HX B NCWS RELIEF	M=071	
1JNCATH 0254	FUEL POOL HX A NCWS OUT	J=556	
1JNCBTH 0255	FUEL POOL HX A NCWS OUT	J=556	
1JNCABE 0256	FUEL POOL HX A NCWS OUT	J=425	
1JNCBFE 0257	FUEL POOL HX B NCWS OUT	J=425	
1JNCAHCV 0258	FUEL POOL HX A NCWS OUT	J=605	
1JNCBHCV 0259	FUEL POOL HX B NCWS OUT	J=605	
1JNCAHCV 0262	FUEL POOL HX A NCWS I/L	J=605	
1JNCBHCV 0263	FUEL POOL HX B NCWS I/L	J=605	
1JNCAHCV 0264	FUEL POOL HX A NCWS OUT	J=605	
1JNCBHCV 0265	FUEL POOL HX B NCWS OUT	J=605	
1JNCBHS 0401	NCWS SUP EXT CONT ISOL VLV	J=200	
1JNCBUV 0401	NCWS SUP EXT CONT ISOL VLV	J=605	
1JNCAHS 0402	NCWS RET EXT CONT ISOL VLV	J=200	
1JNCAUV 0402	NCWS RET EXT CONT ISOL VLV	J=605	
1JNCBHS 0403	NCWS RET INT CONT ISOL VLV	J=200	
1JNCBUV 0403	NCWS RET INT CONT ISOL VLV	J=605	
1JNCAFSL 0474	RCP 1B CLR OUT	J=111	
1JNCAET 0474	RCP 1B CLR OUT	J=311	
1JNCAFY 0474A	RCP 1B CLR OUT	J=111	
1JNCAFY 0474B	RCP 1B CLR OUT	J=111	
1JNCAFY 0474C	RCP 1B CLR OUT	J=111	
1JNCAFY 0474D	RCP 1B CLR OUT	J=111	
1JNCAFY 0474E	RCP 1B CLR OUT	J=111	
1JNCAFSL 0475	RCP 1A CLR OUT	J=111	
1JNCAFT 0475	RCP 1A CLR OUT	J=311	
1JNCAFY 0475A	RCP 1A CLR OUT	J=111	
1JNCAFY 0475B	RCP 1A CLR OUT	J=111	
1JNCAFY 0475C	RCP 1A CLR OUT	J=111	
1JNCAFY 0475D	RCP 1A CLR OUT	J=111	
1JNCAFY 0475E	RCP 1A CLR OUT	J=111	
1JNCAFSL 0476	RCP 2B CLR OUT	J=111	
1JNCAFT 0476	RCP 2B CLR OUT	J=311	
1JNCAFY 0476A	RCP 2B CLR OUT	J=111	
1JNCAFY 0476B	RCP 2B CLR OUT	J=111	
1JNCAFY 0476C	RCP 2B CLR OUT	J=111	
1JNCAFY 0476D	RCP 2B CLR OUT	J=111	
1JNCAFY 0476E	RCP 2B CLR OUT	J=111	
1JNCAFSL 0477	RCP 2A CLR OUT	J=111	
1JNCAET 0477	RCP 2A CLR OUT	J=311	
1JNCAFY 0477A	RCP 2A CLR OUT	J=111	
1JNCAFY 0477B	RCP 2A CLR OUT	J=111	
1JNCAFY 0477C	RCP 2A CLR OUT	J=111	
1JNCAFY 0477D	RCP 2A CLR OUT	J=111	
1JNCAFY 0477E	RCP 2A CLR OUT	J=111	
1JNCBESL 0494	RCP 1B CLR OUTLET	J=111	
1JNCBFT 0494	RCP 1B CLR OUTLET	J=311	
1JNCBFT 0494A	RCP 1B CLR OUTLET	J=111	
1JNCBFT 0495	RCP 1A CLR OUTLET	J=111	

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 99 of 202)

12/17/82 02128102

Q INSTRUMENTS BY SYSTEM

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(NC-3)

TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO
1JNCBFT 0495	RCP 1A CLR OUTLET	J-311
1JNCBFT 0495A	RCP 1A CLR OUTLET	J-111
1JNCBFTSL 0496	RCP 2B CLR OUTLET	J-111
1JNCBFT 0496	RCP 2B CLR OUTLET	J-311
1JNCBFT 0496A	RCP 2B CLR OUTLET	J-111
1JNCBESL 0497	RCP 2A CLR OUTLET	J-111
1JNCBFT 0497	RCP 2A CLR OUTLET	J-311
1JNCBFT 0497A	RCP 2A CLR OUTLET	J-111

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 100 of 202)

04/19/82 15:50:39 .		VALVE="M" CLASS	PAGE 53	(NC-4)
TAG NUMBER		R/SPFC/		
1PNCV102		13PM221A		
1PNCV107		13PM221A		
1PNCV108		13PM221A		
1PNCV109		13PM221A		
1PNCV110		13PM221A		
1PNCV191		13PM221A		
1PNCV202		13PM221A		
1PNCV203		13PM221A		
1PNCV204		13PM221A		
1PNCV205		13PM221A		
1PNCV300		13PM221A		
1PNCV301		13PM221A		
1PNCV104		13PM221A		
1PNCV111		13PM221A		
1PNCV112		13PM221A		
1PNCV113		13PM221A		
1PNCV114		13PM221A		
1PNCV192		13PM221A		
1PNCV200		13PM221A		
1PNCV201		13PM221A		
1PNCV206		13PM221A		
1PNCV207		13PM221A		
1PNCV208		13PM221A		
1PNCV209		13PM221A		
1PNCV298		13PM221A		
1PNCV299		13PM221A		
1PNCV118		13PM221B		
1PNCV210		13PM221A		
1PNCV211		13PM221A		
1PNCV215		13PM221A		
1PNCV284		13PM221A		
1PNCV285		13PM221A		
1PNCV286		13PM221A		
1PNCV287		13PM221A		

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 101 of 202)

04/19/82 15:38:46		EQUIPMENT="NO" CLASS	PAGE 57	480V POWER SWITCHGEAR
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO		
1ENGZ01	ELECT PENTRTN=600V PWR	13EM035		
1ENGZ03	ELECT PENTRTN=600V PWR	13EM035		
1ENGZ07	ELECT PENTRTN=600V PWR	13EM035		
1ENGZ11	ELECT PENTRTN=600V PWR	13EM035		
1ENGZ13	ELECT PENTRTN=600V PWR	13EM035		
1ENGZ32	ELECT PENTRTN=600V PWR	13EM035		
1ENGZ68	ELECT PENTRTN=600V PWR	13EM035		
1ENGZ69	ELECT PENTRTN=600V PWR CONST	13EM035		
1ENGZ71	ELECT PENTRTN=600V PWR	13EM035		
1ENGZ88	ELECT PENTRTN=600V PWR	13EM035		
1ENGZ90	ELECT PENTRTN=600V PWR	13EM035		

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 102 of 202)

04/19/82 15:38:46		EQUIPMENT="M" CLASS	PAGE 59	480V POWER, MCC
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PD		
1ENHNZ06	ELECT PENTRTN	13EN035		
1ENHNZ08	ELECT PENTRTN-600V PWR & CNTL	13EN035		
1ENHNZ09	ELECT PENTRTN	13EN035		
1ENHNZ10	ELECT PENTRTN-600V PWR & CNTL	13EN035		
1ENHNZ12	ELECT PENTRTN-600V PWR & CNTL	13EN035		
1ENHNZ15	ELECT PENTRTN-600VOLT PWR&CNTL	13EN035		
1ENHNZ17	ELECT PENTRTN-600V PWR & CNTL	13EN035		
1ENHNZ19	ELECT PENTRTN-600V PWR & CNTL	13EN035		
1ENHNZ20	ELECT PENTRTN	13EN035		
1ENHNZ21	ELECT PENTRTN	13EN035		
1ENHNZ63	ELECT PENTRTN	13EN035		
1ENHNZ73	ELECT PENTRTN	13EN035		

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 103 of 202)

04/19/82 15:38:46		EQUIPMENT-NOM CLASS	PAGE 61
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO	
1ENN8V13	480-120V CLASS IE VOLT RGLTR	13EM105	
1ENN8V14	480-120V CLASS IE VOLT RGLTR	13EM105	

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 104 of 202)

04/19/82 15:50:39		VALVE="O" CLASS	PAGE 55	13.8 KV POWER SYSTEM
TAG NUMBER		R/SPEC/		
1PNSNV106		13NM001		
1PNSNV107		13NM001		
1PNSNV108		13NM001		
1PNSNV109		13NM001		
1PNSNV110		13NM001		
1PNSNV111		13NM001		
1PNSNV116		13NM001		
1PNSNV118		13NM001		
1PNSNV120		13NM001		
1PNSNV122		13NM001		
1PNSNV129		13NM001		
1PNSNV130		13NM001		
1PNSNV131		13NM001		
1PNSNV132		13NM001		
1PNSVV200				
1PNSVV201				
1PNSVV202				
1PNSVV203				
1PNSVV204				
1PNSVV205				
1PNSVV206				
1PNSVV207				
1PNSVV208				

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APPENDIX D

PVNGS 1,2&3

Table D-1
CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 105 of 202)

04/19/82 15:38:46		EQUIPMENT="NON" CLASS	PAGE 63	<u>4.16-KV POWER</u>
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO		
1EPRAS03	4.16KV CLASS IE INDOOR SWGR	13EM009		
1EPBBS04	4.16KV CLASS IE INDOOR SWGR	13EM009		

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Table D-1
CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 106 of 202)

04/19/82 15138146		EQUIPMENT="O" CLASS	PAGE 65	FUEL POOL COOLING AND CLEANUP	(PC-1)
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO			
1JPCNE01	VOID	13NM001			
1MPCAE01	FUEL POOL COOLING HEAT EXCHNG.	13MM071			
1MPCAP01	FUEL POOL COOLING PUMP	13MM093			
1MPCRF01	FUEL POOL COOLING HEAT EXCHNG.	13MM071			
1MPCRP01	FUEL POOL COOLING PUMP	13MM093			
1MPCEM01	FUEL TRANSFER TUBE ASSEMBLY	13NM001			
1MPCEM01A	TRANSFER TUBE BLIND FLANGE	13NM001			
1MPCEM01R	TRANSFER TUBE RAILS	13NM001			
1MPCEM02	TRANSFER TUBE SUPPORT STAND	13NM001			
1MPCU150	PENETRATION-REF POOL	13MM500			
1MPCU151	PENETRATION-REF POOL	13MM500			
1MPCU153	PENETRATION-REFUELING POOL	13CM152			

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 107 of 202)

12/17/82 02:28:02		Q INSTRUMENTS BY SYSTEM		PAGE 53
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO	(PC-2)	
1JPCAMS 0007	FL PD CLG PP 1	J=200		
1JPCBMS 0008	FL PD CLG PP 2	J=200		
1JPCAPT 0009	FL PD CLG PP 1 DSCH	J=311		
1JPCBPT 0010	FL PD CLG PP 2 DSCH	J=311		
1JPCATW 0013	FL PD HE 1 I/L	J=556		
1JPCBTW 0014	FL PD HE 2 I/L	J=556		
1JPCATW 0015	FL PD COOLING HX A OUTLET	J=556		
1JPCBTW 0016	FL PD COOLING HX B OUTLET	J=556		
1JPCAPSV 0035	FL PD HE A	M=071		
1JPCBPSV 0036	FL PD HE B	M=071		

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 108 of 202)

04/19/82 15:50:39.	VALVE="NO" CLASS	PAGE 57	(PC-3)
TAG NUMBER	B/SPEC/		
1PPCAV011	13PM231		
1PPCAV012	13PM221A		
1PPCAV013	13PM221B		
1PPCAV014	13PM231		
1PPCAV015	13PM231		
1PPCAV027	13PM231		
1PPCAV029	13PM221A		
1PPCAV031	13PM221A		
1PPCAV032	13PM221A		
1PPCAV034	13PM221A		
1PPCAV129	13PM221A		
1PPCAV139	13PM221A		
1PPCAV140	13PM221A		
1PPCAV143	13PM221A		
1PPCAV220	13PM221C		
1PPCRV007	13PM221A		
1PPCRV016	13PM221A		
1PPCRV017	13PM221B		
1PPCRV018	13PM231		
1PPCRV019	13PM231		
1PPCRV020	13PM221A		
1PPCRV025	13PM221A		
1PPCBV026	13PM231		
1PPCRV030	13PM221A		
1PPCRV069	13PM231		
1PPCRV131	13PM221A		
1PPCRV141	13PM221A		
1PPCRV142	13PM221A		
1PPCRV144	13PM221A		
1PPCRV219	13PM221C		
1PPCEV028	13PM231		
1PPCEV070	13PM221B		
1PPCEV071	13PM221B		
1PPCEV074	13PM221B		
1PPCEV075	13PM221B		
1PPCEV076	13PM221B		
1PPCEV081	13PM221B		
1PPCEV110	13PM221B		
1PPCEV121	13PM221B		
1PPCEV127	13PM221A		
1PPCEV123	13PM221B		
1PPCEV124	13PM221B		
1PPCEV125	13PM221B		
1PPCEV126	13PM221A		
1PPCEV137	13PM221A		
1PPCEV138	13PM221A		
1PPCFV145	13PM221A		
1PPCFV148	13PM221A		
1PPCEV157	13PM221A		
1PPCEV159	13PM221A		
1PPCEV171	13PM221A		
1PPCEV172	13PM221A		
1PPCEV207	13PM221A		
1PPCEV208	13PM221A		
1PPCNV024	13PM231		

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Table D-1
CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 109 of 202)

04/19/82 15:50:39		VALVE-MOM CLASS	PAGE 58	(PC-4)
TAG NUMBER		R/SPFC/		
1PPCNV036		13PM231		
1PPCNV118		13NM001		
1PPCNV207		13PM221A		
1PPCNV215		13PM231		
1PPCNV217		13PM221C		
1PPCNV218		13PM221C		

Table D-1
 CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 110 of 202)

04/19/82 15:38:46	EQUIPMENT-NOM CLASS	PAGE 67
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO
1EPEAG01	DIESEL GENERATOR	13MM018

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 111 of 202)

04/19/82 15:38:46		EQUIPMENT-NOM CLASS	PAGE 69	480V POWER, SWITCHGEAR
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO		
AFPGAX31	SPARE LC CL 1E XFMR (DRY TYPE)	13EM117		
AFPGAX35	SPARE LC CL 1E XFMR (DRY TYPE)	13EM117		
1FPGA131	480V CLASS 1E LOAD CENTER	13EM017		
1FPGA133	480V CLASS 1E LOAD CENTER	13EM017		
1FPGA135	480V CLASS 1E LOAD CENTER	13EM017		
1FPGA137	480V CLASS 1E LOAD CENTER	13EM017		
1FPGA134	480V CLASS 1E LOAD CENTER	13EM017		
1FPGA136	480V CLASS 1E LOAD CENTER	13EM017		

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 112 of 202)

04/19/82 15:38:46		EQUIPMENT-POW CLASS	PAGE 71	480V POWER, MCC
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO		
1EPHAM31	480V CLASS IE MCC	13EM018		
1EPHAM33	480V CLASS IE MCC	13EM018		
1EPHAM34	480V CLASS IE MCC	13EM018		
1EPHAM37	480V CLASS IE MCC	13EM018		
1EPHAZ4A	ELECT PENTRTN-600V PWR&CNTRL	13EM035		
1EPHAZ4B	ELECT PENTRTN	13EM035		
1EPHAZ52	ELECT PENTRTN	13EM035		
1EPHBM32	480V CLASS IE MCC	13EM018		
1EPHBM34	480V CLASS IE MCC	13EM018		
1EPHBM36	480V CLASS IE MCC	13EM018		
1EPHBM38	480V CLASS IE MCC	13EM018		
1EPHBZ34	ELECT PENTRTN	13EM035		
1EPHBZ35	ELECT PENTRTN-600V PWR&CNTRL	13EM035		
1EPHBZ39	ELECT PENTRTN	13EM035		
1EPHBZ40	ELEC PENTRTN	13EM035		
1EPHBZ41	ELECT PENTRTN	13EM035		
1EPHCN53	ELEC PENTRTN-SHLD INSTR	13EM035		
1EPHCZ23	ELECT PENTRTN BLANK	13EM035		
1EPHCZ24	ELECT PENTRTN BLANK	13EM035		
1EPHCZ29	ELECT PENTRTN-600V PWR&CNTRL	13EM035		
1EPHN743	ELECT PENTRTN-600V PWR&CNTRL	13EM035		
1EPHNZ8A	ELECT PENTRTN-600V PWR&CNTRL	13EM035		

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 113 of 202)

04/19/82 15138146		EQUIPMENT-NOM CLASS	PAGE 73	125V-DC POWER
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO		
1EPKAD21	125VDC CLASS IE DISTR PNL	13EM021		
1EPKAD23	125VDC CLASS IE DISTR PNL	13EM021		
1EPKAF11	125VDC CL IE BATT, A	13EM050		
1EPKAF11R	125VDC CL IE BATT RACK, A	13EM050		
1EPKAH11	125 VDC BATT CHGR, A	13EM051		
1EPKAH15	125 VDC BATT CHGR, AC	13EM051		
1EPKAM41	125VDC CLASS IE CNTL CTR	13EM021		
1EPKB022	125VDC CLASS IE DISTR PNL	13EM021		
1EPKB024	125VDC CLASS IE DISTR PNL	13EM021		
1EPKB0F12	125VDC CL IE BATT, B	13EM050		
1EPKB0F12R	125VDC CL IE BATT RACK, B	13EM050		
1EPKBH12	125 VDC BATT CHGR, B	13EM051		
1EPKBH16	125 VDC BATT CHGR, BD	13EM051		
1EPKBH42	125VDC CLASS IE CNTL CTR	13EM021		
1EPKCB43	CL IE 480V NEMA TY 1 STARTER	13EM018		
1EPKC023	125VDC CLASS IE DISTR PNL	13EM021		
1EPKC024	125VDC CLASS IE DISTR PNL	13EM021		
1EPKCF13R	125VDC CL IE BATT RACK, C	13EM050		
1EPKCH13	125 VDC BATT CHGR, C	13EM051		
1EPKCM43	125VDC CLASS IE CNTL CTR	13EM021		
1EPKCN43	120V AC CLASS IE INVERTOR	13EM054		
1EPKDR44	CL IE 480V NEMA TY 1 STARTER	13EM018		
1EPKDF14	125VDC CL IE BATT, D	13EM050		
1EPKDF14R	125VDC CL IE BATT RACK, D	13EM050		
1EPKDH14	125 VDC BATT CHGR, D	13EM051		
1EPKDM44	125VDC CLASS IE CNTL CTR	13EM021		
1EPKDN44	120V AC CLASS IE INVERTOR	13EM054		

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Table D-1
 CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 114 of 202)

04/19/82 15:38:46		EQUIPMENT-"0" CLASS	PAGE 75
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO	
1FPMCZ23	BLANK	13EM035	
1FPMCZ24	BLANK	13EM035	

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Table D-1
CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 115 of 202)

04/19/82 15138146		EQUIPMENT-NO CLASS	PAGE 77	<u>INSTRUMENT AC POWER</u>
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO		
1FPNAD25	120VAC CLASS IE DISTR PNL	13EM020		
1FPNAN11	120VAC CLASS IE INVERTER	13EM054		
1FPNAV25	480-120VAC CLASS IE VOLT RGLTR	13EM105		
1FPNH026	120VAC CLASS IE DISTR PNL	13EM020		
1FPNBN12	120VAC CLASS IE INVERTER	13EM054		
1FPNBV26	480-120VAC CLASS IE VOLT RGLTR	13EM105		
1FPNC027	120VAC CLASS IE DISTR PNL	13EM020		
1FPNCN13	120VAC CLASS IE INVERTER	13EM054		
1FPNCV27	480-120VAC CLASS IE VOLT RGLTR	13EM105		
1FPND028	120VAC CLASS IE DISTR PNL	13EM020		
1FPNDN14	120VAC CLASS IE INVERTER	13EM054		
1FPNDV28	480-120VAC CLASS IE VOLT RGLTR	13EM105		
1FPNNV29	480-120V CL IE VOLT RGLTR	13EM105		

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PVNGS 1,2&3

Table D-1
 CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 116 of 202)

04/19/82 15138146		EQUIPMENT="MOM" CLASS	PAGE 79	ESSENTIAL LIGHTING
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO		
1FQRAV01	LINE REGULATORS WITH XFMR	13EM105		
1FQRAV02	480V-120 VAC CLASS IE VOLT REG	13EM105		
1FQRBV02	LINE REGULATORS WITH XFMR	13EM105		

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Table D-1
CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 117 of 202)

04/19/82 15138146	EQUIPMENT="Q" CLASS	PAGE 81	<u>IN-PLANT COMMUNICATIONS</u>
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO	
1EQFN757	ELECT PENRTN-COMM&SHLD INSTR	13EM035	

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 118 of 202)

04/19/82 15:38:46		EQUIPMENT-"0" CLASS	PAGE 83	REACTOR COOLANT	(RC-1)
TAG NUMREP	DESCRIPTION	BECHTFL SPEC/PO			
1JRCEA01A	RCP 1A XMITTER RACK	13NM001			
1JRCEA01B	RCP 1B XMITTER RACK	13NM001			
1JRCEA01C	RCP 2A XMITTER RACK	13NM001			
1JRCEA01D	RCP 2B XMITTER RACK	13NM001			
1JRCEA02A	RCP 1A XMITTER RACK	13NM001			
1JRCEA02B	RCP 1B XMITTER RACK	13NM001			
1JRCEA02C	RCP 2A XMITTER RACK	13NM001			
1JRCEA02D	RCP 2B XMITTER RACK	13NM001			
1JRCEA03	PRESSURIZER XMITTER RACK	13NM001			
1MRCA02A	RCP OIL LIFT PUMP (1A)	13NM001			
1MRCA02B	RCP OIL LIFT PUMP (2A)	13NM001			
1MRCA02C	RCP OIL LIFT PUMP (1B)	13NM001			
1MRCA02D	RCP OIL LIFT PUMP (2B)	13NM001			
1MRCE01A	STEAM GENERATOR (1)	13NM001			
1MRCE01B	STEAM GENERATOR (2)	13NM001			
1MRCE01H	SG. SLIDING BEARINGS AND SHIMS	13NM001			
1MRCE01I	INSULATION, STEAM GENERATOR	13NM001			
1MRCE01K	KEYWAY BEARINGS STEAM GENERATOR	13NM001			
1MRCE01L	STM. GEN. UPPER SUPPORT LEVERS	13NM001			
1MRCE01P	NOZZLE PLUGS STEAM GENERATOR	13NM001			
1MRCE01S	SNUBBERS, STEAM GENERATOR	13NM001			
1MRCE01V	STM. GEN. BASE CIRCULAR SHIM	13NM001			
1MRCE01W	STM. GEN. BASE WASHERS	13NM001			
1MRCE01X	SLIDING BASE, STEAM GENERATOR	13NM001			
1MRCE04A	RC PUMP SEAL COOLER (1A)	13NM001			
1MRCE04B	RC PUMP SEAL COOLER (1A)	13NM001			
1MRCE04C	RC PUMP SEAL COOLER (1B)	13NM001			
1MRCE04D	RC PUMP SEAL COOLER (1B)	13NM001			
1MRCE04E	RC PUMP SEAL COOLER (2A)	13NM001			
1MRCE04F	RC PUMP SEAL COOLER (2A)	13NM001			
1MRCE04G	RC PUMP SEAL COOLER (2B)	13NM001			
1MRCE04H	RC PUMP SEAL COOLER (2B)	13NM001			
1MRCE05A	RC PUMP HP COOLER (1A)	13NM001			
1MRCE05B	RC PUMP HP COOLER (1B)	13NM001			
1MRCE05C	RC PUMP HP COOLER (2A)	13NM001			
1MRCE05D	RC PUMP HP COOLER (2B)	13NM001			
1MRCE02A	RC PUMP HP COOLER FILTER (1A)	13NM001			
1MRCE02B	RC PUMP HP COOLER FILTER (1B)	13NM001			
1MRCE02C	RC PUMP HP COOLER FILTER (2A)	13NM001			
1MRCE02D	RC PUMP HP COOLER FILTER (2B)	13NM001			
1MRCE01A	R.C. PUMP (1A)-INTERNAL	13NM001			
1MRCE01B	R.C. PUMP (1B)-INTERNAL	13NM001			
1MRCE01C	R.C. PUMP (2A)-INTERNAL	13NM001			
1MRCE01D	R.C. PUMP (2B)-INTERNAL	13NM001			
1MRCE01EH	RCP UPPER HORIZ. COLUMNS	13NM001			
1MRCE01EL	RCP LOWER HORIZ. COLUMNS	13NM001			
1MRCE01FP	RCP COOLING WATER PIPING	13NM001			
1MRCE01GS	RCP SEAL LIFT RIG	13NM001			
1MRCE01HR	RCP COUPLING REMOVAL TOOL	13NM001			
1MRCE01I	R.C. PUMP (1A) - BOWL	13NM001			
1MRCE01IN	INSULATION, R.C. PUMP	13NM001			
1MRCE01J	R.C. PUMP (1B) - BOWL	13NM001			
1MRCE01JC	RCP CASING AND SKIRT	13NM001			
1MRCE01K	R.C. PUMP (2A) - BOWL	13NM001			

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 119 of 202)

04/19/82 15:38:46		EQUIPMENT-NOM CLASS	PAGE 84	(RC-2)
TAG NUMBER	DESCRIPTION	RECHTFL SPEC/PO		
1MRCEP01L	R. C. PUMP (2B) - ROWL	13NM001		
1MRCEP01LV	RCP VERTICAL COLUMNS, CLEVISSES	13NM001		
1MRCEP01O	RCP MOTOR WATER PIPE (4)	13NM001		
1MRCEP01R	RCP MOTOR MISC INSTRUMENT (4)	13NM001		
1MRCEP01S	RCP SNIFFERS	13NM001		
1MRCEP01T	RCP TENSIONERS	13NM001		
1MRCEP01U	ROTATING ELEMENT, RCP	13NM001		
1MRCEP01V	DIFFUSER, RCP	13NM001		
1MRCEP01W	SEAL HOUSING AND COVER, RCP	13NM001		
1MRCEP01X	LURE OIL SYSTEM, RCP	13NM001		
1MRCEP01Y	HP COOLER AND VALVES, RCP	13NM001		
1MRCEP01Z	SEAL PIPING, RCP	13NM001		
1MRCEV01I	INSULATION, PIPE	13NM001		
1MRCEX01	REACTOR VESSEL	13NM001		
1MRCEX01H	CENM CUTTER	13NM001		
1MRCEX01C	COLUMNS, REACTOR VESSEL	13NM001		
1MRCEX01F	REACTOR VESSEL FLOW SKIRT	13NM001		
1MRCEX01H	REACTOR VESSEL SHIMS	13NM001		
1MRCEX01I	INSULATION, REACTOR VESSEL	13NM001		
1MRCEX01K	CENM BLANKS	13NM001		
1MRCEX01N	RV STUD AND NUT TOOLS	13NM001		
1MRCEX01P	REACTOR COOLANT PIPING	13NM001		
1MRCEX01R	RV AND SG FASTENERS	13NM001		
1MRCEX02	PRESSURIZER	13NM001		
1MRCFP01K		13NM001		
1MRCNF03A	OIL COOLER (1A)	13NM001		
1MRCNF03B	OIL COOLER (1B)	13NM001		
1MRCNF03C	OIL COOLER (2A)	13NM001		
1MRCNF03D	OIL COOLER (2B)	13NM001		
1MRCNF01A	OIL LIFT PUMP FILTER 1A	13NM001		
1MRCNF01B	OIL LIFT PUMP FILTER 1B	13NM001		
1MRCNF01C	OIL LIFT PUMP FILTER 2A	13NM001		
1MRCNF01D	OIL LIFT PUMP FILTER 2B	13NM001		
1MRCNP02AT	RCP INSTRUMENT, JUNCTION BOX	13NM001		
1MRCNP02AP	RCP POWER JUNCTION BOX	13NM001		
1MRCNP02BJ	RCP INSTRUMENT, JUNCTION BOX	13NM001		
1MRCNP02BP	RCP POWER JUNCTION BOX	13NM001		
1MRCNP02CJ	RCP INSTRUMENT, JUNCTION BOX	13NM001		
1MRCNP02CP	RCP POWER JUNCTION BOX	13NM001		
1MRCNP02DI	RCP INSTRUMENT, JUNCTION BOX	13NM001		
1MRCNP02DP	RCP POWER JUNCTION BOX	13NM001		
1MRCNT01A	OIL LIFT TANK (1)	13NM001		
1MRCNT01B	OIL LIFT TANK (2)	13NM001		
1MRCNT01C	OIL LIFT TANK (3)	13NM001		
1MRCNT01D	OIL LIFT TANK (4)	13NM001		

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 120 of 202)

12/17/82 02:28:02

Q INSTRUMENTS BY SYSTEM

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(RC-3)

TAG NUMBER

DESCRIPTION

BECHTEL
SPEC/PO

1JRCAMS	0100-4	PRZR BACKUP HTR BRKR A
1JRCBMS	0100-5	PRZR BACKUP HTR BRKR B
1JRCEPV	0100E	PRZR SPRAY CONT SYS
1JRCEPV	0100F	PRZR SPRAY CONT SYS
1JRCEPT	0100X	PRESSURIZER PRESS CONT SYS
1JRCEPT	0100Y	PRESSURIZER PRESS CONT SYS
1JRCAMS	010041	PRZR BACKUP HTR--RS
1JRCBMS	010051	PRZR BACKUP HTR--RS
1JRCBMS	010052	PRZR BACKUP HTR DISCONNECT
1JRCAMS	0101	REACTOR VESSEL HEAD VENT
1JRCAMV	0101	REACTOR VESSEL HEAD VENT
1JRCETH	0101	PRESURIZER SURGE LINE
1JRCAP1	0101A	PRZR PRESS
1JRCAPT	0101A	PRZR PRESS-PPS HI/CPC
1JRCAPY	0101A	I/E CONVERTOR
1JRCBP1	0101B	PRZR PRESS
1JRCBPT	0101B	PRZR PRESS-PPS HI/CPC
1JRCBPY	0101B	I/E CONVERTOR
1JRCCP1	0101C	PRZR PRESS
1JRCCPT	0101C	PRZR PRESS-PPS HI/CPC
1JRCCPY	0101C	I/E CONVERTOR
1JRCDP1	0101D	PRZR PRESS
1JRCDPT	0101D	PRZR PRESS-PPS HI/CPC
1JRCDPY	0101D	I/E CONVERTOR
1JRCBMS	0102	REACTOR VESSEL HEAD VENT
1JRCBMV	0102	REACTOR VESSEL HEAD VENT
1JRCAP1	0102A	PRZR PRESS/VAR SETPOINT
1JRCAP1	0102A1	PRZR PRESS--RS
1JRCAPR	0102A	PRZR PRESS
1JRCAP1	0102A	PRZR PRESS-PPS LO/BYPASS
1JRCAPY	0102A	I/E CONVERTOR
1JRCBP1	0102B	PRZR PRESS/VAR SETPOINT
1JRCBP1	0102B1	PRZR PRESS--RS
1JRCBPT	0102B	PRZR PRESS-PPS LO/BYPASS
1JRCBPY	0102B	I/E CONVERTOR
1JRCCP1	0102C	PRZR PRESS/VAR SETPOINT
1JRCCPT	0102C	PRZR PRESS-PPS LO/BYPASS
1JRCCPY	0102C	I/E CONVERTOR
1JRCDP1	0102D	PRZR PRESS/VAR SETPOINT
1JRCDPT	0102D	PRZR PRESS-PPS LO/BYPASS
1JRCDPY	0102D	I/E CONVERTOR
1JRCAMS	0103	PRESSURIZER VENT
1JRCAMV	0103	PRESSURIZER VENT
1JRCAPC	0103	PRZR PRESS S/D CLG INTERLOCK
1JRCAP1	0103	PRZR PRESS
1JRCAPSH	0103	PRZR PRESS
1JRCAPT	0103	PRZR PRESS
1JRCAPY	0103	I/E CONVERTOR
1JRCEPD	0103	PRESSURIZER VENT
1JRCETH	0103	SPRAY FROM COLD LEG 1A
1JRCAPSH	0103-1	PRZR PRESS
1JRCASY	0103A	RC PUMPS 1A/1B/2A/2B F(X)
1JRCBSY	0103B	RC PUMPS 1A/1B/2A/2B F(X)
1JRCCSY	0103C	RC PUMPS 1A/1B/2A/2B F(X)

J=200

J=200

N=001

N=001

N=001

N=001

N=001

N=001

N=001

J=200

J=603

N=001

N=001

N=001

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N=001

N=001

N=001

N=001

N=001

N=001

N=001

J=200

J=603

N=001

N=001

N=001

N=001

N=001

N=001

N=001

N=001

N=001

N=001

N=001

N=001

N=001

N=001

J=200

J=603

N=001

N=001

N=001

N=001

N=001

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N=001

N=001

N=001

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 121 of 202)

12/17/82 02:28:02		Q INSTRUMENTS BY SYSTEM	PAGE 36 (RC-4)
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO	
1JRCDSY 0103D	RC PUMPS 1A/1B/2A/2B F(X)	N=001	
1JRCBPC 0104	PRZR PRESS S/D CLG INTERLOCK	N=001	
1JRCBPT 0104	PRZR PRESS	N=001	
1JRCBPSH 0104	PZR PRESS	N=001	
1JRCBPT 0104	PRZR PRESS	N=001	
1JRCBPT 0104	I/E CONVERTOR	N=001	
1JRCBPT 0104	SPRAY FROM COLD LEG 1B	N=001	
1JRCBPT 0104	PRZR PRESS	N=001	
1JRCBPSH 0104-1	PRESSURIZER/AV HD VENT TO ROT	J=200	
1JRCBPT 0105	PRESSURIZER/AV HD VENT TO ROT	J=603	
1JRCBHV 0105	PRZR PRESS S/D CLG INTERLOCK	N=001	
1JRCBPC 0105	PRZR PRESS	N=001	
1JRCBPT 0105	PRZR PRESS	N=001	
1JRCBPT 0105	I/E CONVERTOR	N=001	
1JRCBPT 0105	PRESSURIZER SURGE LINE	N=001	
1JRCBPT 0105	PRESSURIZER/AV HD VENT TO CONT	J=200	
1JRCBPT 0105	PRESSURIZER/AV HD VENT TO CONT	J=603	
1JRCBPT 0105	PRZR PRESS S/D CLG INTERLOCK	N=001	
1JRCBPT 0105	PRZR PRESS LO	N=001	
1JRCBPT 0105	PRZR PRESS LO	N=001	
1JRCBPT 0105	I/E CONVERTOR	N=001	
1JRCBPT 0105	PRESSURIZER VENT	J=200	
1JRCBPT 0105	PRESSURIZER VENT	N=001	
1JRCBPT 0105	PRESSURIZER VENT	J=200	
1JRCBPT 0105	PRESSURIZER VENT	N=001	
1JRCBPT 0105	PRZR LEVEL	N=001	
1JRCBPT 0105	PRZR LEVEL=RS	N=001	
1JRCBPT 0105	PRZR LEVEL	N=001	
1JRCBPT 0105	PRZR LEVEL CONT SYS	N=001	
1JRCBPT 0105	I/E CONVERTOR	N=001	
1JRCBPT 0105	E/E CONVERTOR	N=001	
1JRCBPT 0105	PRZR LEVEL	N=001	
1JRCBPT 0105	PRZR LEVEL=RS	N=001	
1JRCBPT 0105	PRZR LEVEL CONT SYS	N=001	
1JRCBPT 0105	E/E CONVERTOR	N=001	
1JRCBPT 0105	I/E CONVERTOR	N=001	
1JRCBPT 0105	RC HOT LEG TO SG 1 TEMP STRAT	N=001	
1JRCBPT 0105	RC HOT LEG TO SG 1 TEMP STRAT	N=001	
1JRCBPT 0105	RC HOT LEG TO SG 1 TEMP STRAT	N=001	
1JRCBPT 0105	RC HOT LEG TO SG 1 TEMP STRAT	N=001	
1JRCBPT 0105	RC HOT LEG TO SG1	N=001	
1JRCBPT 0105	RC COLD LEG 1B	N=001	
1JRCBPT 0105	RC HOT/COLD LEGS 1/1A	N=001	
1JRCBPT 0105	RC COLD LEG 1A	N=001	
1JRCBPT 0105	RC COLD LEG 1A	N=001	
1JRCBPT 0105	RC COLD LEGS 1A/2A	N=001	
1JRCBPT 0105	R/E CONVERTER RC COLD LEG 1A	N=001	
1JRCBPT 0105	RC COLD LEG 1A	N=001	
1JRCBPT 0105	RC HOT LEG 1A	N=001	
1JRCBPT 0105	RC COLD LEG 1B	N=001	
1JRCBPT 0105	RC COLD LEG 1B	N=001	
1JRCBPT 0105	RC COLD LEGS 1B/2B	N=001	
1JRCBPT 0105	R/E CONVERTER RC COLD LEG 1B	N=001	
1JRCBPT 0105	RC COLD LEG 1B	N=001	

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 122 of 202)

12/17/82 02128102	Q INSTRUMENTS BY SYSTEM		PAGE 57 (RC-5)
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO	
1JRCBTW 0112CB	RC COLD LEG 1B	N=001	
1JRCCTE 0112CC	RC COLD LEG 1A	N=001	
1JRCCTT 0112CC	RC COLD LEGS 1A/2A	N=001	
1JRCCTT 0112CC	R/E CONVERTER RC COLD LEG 1A	N=001	
1JRCCTW 0112CC	RC HOT LEG 1A	N=001	
1JRCCTE 0112CD	RC COLD LEG 1B	N=001	
1JRCCTT 0112CD	RC COLD LEGS 1B/2B	N=001	
1JRCCTT 0112CD	R/E CONVERTER RC COLD LEG 1B	N=001	
1JRCCTW 0112CD	RC COLD LEG 1B	N=001	
1JRCATE 0112HA	RC HOT LEG TO SG 1	N=001	
1JRCATE 0112H1	RC HOT LEG TO SG 1	N=001	
1JRCATT 0112HA	RC HOT LEGS 1/2	N=001	
1JRCATT 0112H1	RC HOT LEG TO SG 1=RS	N=001	
1JRCATT 0112HA	RC HOT LEG TO SG 1	N=001	
1JRCATT 0112H1	RC HOT LEG TO SG 1	N=001	
1JRCATW 0112HA	RC HOT LEG TO SG 1	N=001	
1JRCBTE 0112HB	RC HOT LEG TO SG 1	N=001	
1JRCBTE 0112H2	RC HOT LEG TO SG 1	N=001	
1JRCBT1 0112HB	RC HOT LEGS 1/2	N=001	
1JRCBT1 0112HB	RC HOT LEG TO SG 1	N=001	
1JRCBT1 0112H2	RC HOT LEG TO SG 1	N=001	
1JRCBTW 0112HB	RC HOT LEG TO SG 1	N=001	
1JRCCTE 0112HC	RC HOT LEG TO SG 1	N=001	
1JRCCTT 0112HC	RC HOT LEGS 1/2	N=001	
1JRCCTT 0112HC	RC HOT LEG TO SG 1	N=001	
1JRCCTW 0112HC	RC HOT LEG TO SG 1	N=001	
1JRCCTE 0112HD	RC HOT LEG TO SG 1	N=001	
1JRCCTT 0112HD	RC HOT LEGS 1/2	N=001	
1JRCCTT 0112HD	RC HOT LEG TO SG 1	N=001	
1JRCCTW 0112HD	RC HOT LEG TO SG 1	N=001	
1JRCASE 0113A	RC PUMP 1A	N=001	
1JRCAST 0113A	RC PUMP 1A	N=001	
1JRCBSE 0113B	RC PUMP 1A	N=001	
1JRCBST 0113B	RC PUMP 1A	N=001	
1JRCCE 0113C	RC PUMP 1A	N=001	
1JRCCE 0113C	RC PUMP 1A	N=001	
1JRCCE 0113D	RC PUMP 1A	N=001	
1JRCCE 0113D	RC PUMP 1A	N=001	
1JRCATE 0113	RC COLD LEG 1A	N=001	
1JRCAT1 0113	RC COLD LEG 1A	N=001	
1JRCATSL 0113	RC TEMP	N=001	
1JRCATT 0113	RC COLD LEG 1A	N=001	
1JRCATW 0113	RC COLD LEG 1A	N=001	
1JRCATY 0113	I/E CONVERTER	N=001	
1JRCAPDI 0115A	STM GEN 1 PRIMARY LOOP	N=001	
1JRCAPDT 0115A	STM GEN 1 PRIMARY LOOP	N=001	
1JRCAPDY 0115A	STM GEN 1 PRIMARY LOOP	N=001	
1JRCBPDI 0115B	STM GEN 1 PRIMARY LOOP	N=001	
1JRCBPDY 0115B	STM GEN 1 PRIMARY LOOP	N=001	
1JRCBPDY 0115B	STM GEN 1 PRIMARY LOOP	N=001	
1JRCBPDY 0115C	STM GEN 1 PRIMARY LOOP	N=001	
1JRCBPDY 0115C	STM GEN 1 PRIMARY LOOP	N=001	
1JRCBPDY 0115C	STM GEN 1 PRIMARY LOOP	N=001	
1JRCBPDY 0115D	STM GEN 1 PRIMARY LOOP	N=001	

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 123 of 202)

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Q INSTRUMENTS BY SYSTEM

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(RC-6)

TAG NUMBER

DESCRIPTION

BECHTEL
SPEC/PO

1JRCDDT 01150	STM GEN 1 PRIMARY LOOP
1JRCDDY 01150	STM GEN 1 PRIMARY LOOP
1JRCETW 0121HA	RC HOT LEG TO SG 2 TEMP STRAT
1JRCETW 0121HB	RC HOT LEG TO SG 2 TEMP STRAT
1JRCETW 0121HC	RC HOT LEG TO SG 2 TEMP STRAT
1JRCETW 0121HD	RC HOT LEG TO SG 2 TEMP STRAT
1JRCETW 0121X	RC HOT LEG 2
1JRCETW 0121Y	RC COLD LEG 2A
1JRCATR 0122	RC HOT/COLD - LEGS 2/2A
1JRCATE 0122CA	RC COLD LEG 2A
1JRCATE 0122C1	RC COLD LEG 2A
1JRCATT 0122CA	R/E CONVERTER RC COLD LEG 2A
1JRCATT 0122C1	RC COLD LEG 2A
1JRCATW 0122CA	RC COLD LEG 2A
1JRCBTE 0122CB	RC COLD LEG 2B
1JRCBTE 0122C2	RC COLD LEG 2B
1JRCBTY 0122CB	R/E CONVERTER RC COLD LEG 2B
1JRCBTY 0122C2	RC COLD LEG 2B
1JRCBTW 0122CB	RC COLD LEG 2B
1JRCCTE 0122CC	RC COLD LEG 2A
1JRCCTY 0122CC	R/E CONVERTER RC COLD LEG 2A
1JRCCTW 0122CC	RC COLD LEG 2A
1JRCOTE 0122CD	RC COLD LEG 2B
1JRCOTY 0122CD	R/E CONVERTER RC COLD LEG 2B
1JRCOTW 0122CD	RC COLD LEG 2B
1JRCATE 0122HA	RC HOT LEG TO SG 2
1JRCATE 0122H1	RC HOT LEG TO SG 2
1JRCATT 0122HA	RC HOT LEG TO SG 2
1JRCATT 0122H1	RC HOT LEG TO SG 2
1JRCATW 0122HA	RC HOT LEG TO SG 2
1JRCBTE 0122HB	RC HOT LEG TO SG 2
1JRCBTE 0122H2	RC HOT LEG TO SG 2
1JRCBTY 0122H1	RC HOT LEG TO SG 2 - RS
1JRCBTY 0122HB	RC HOT LEG TO SG 2
1JRCBTY 0122H2	RC HOT LEG TO SG 2
1JRCBTW 0122HB	RC HOT LEG TO SG 2
1JRCCTE 0122HC	RC HOT LEG TO SG 2
1JRCCTY 0122HC	RC HOT LEG TO SG 2
1JRCCTW 0122HC	RC HOT LEG TO SG 2
1JRCOTE 0122HD	RC HOT LEG TO SG 2
1JRCOTY 0122HD	RC HOT LEG TO SG 2
1JRCOTW 0122HD	RC HOT LEG TO SG 2
1JRCASE 0123A	RC PUMP 1B
1JRCAST 0123A	RC PUMP 1B
1JRCBSF 0123B	RC PUMP 1B
1JRCBST 0123B	RC PUMP 1B
1JRCCE 0123C	RC PUMP 1B
1JRCCE 0123C	RC PUMP 1B
1JRCCE 0123D	RC PUMP 1B
1JRCCE 0123D	RC PUMP 1B
1JRCCE 0123D	RC COLD LEG 2B
1JRCBTY 0123	RC COLD LEG 2B
1JRCBTY 0123	RC TEMP
1JRCBTY 0123	RC COLD LEG 2B

N=001

N=001

N=001

N=001

N=001

N=001

N=001

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N=001

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CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 124 of 202)

12/17/82 02128102	Q INSTRUMENTS BY SYSTEM		PAGE 39
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO	(RC-7)
1JRCBTW 0125	RC COLD LEG 2B	N=001	
1JRCBTY 0125	I/E CONVERTOR	N=001	
1JRCAPDT 0125A	STM GEN 2 PRIMARY LOOP	N=001	
1JRCAPDY 0125A	STM GEN 2 PRIMARY LOOP	N=001	
1JRCBPDY 0125B	STM GEN 2 PRIMARY LOOP	N=001	
1JRCBRDY 0125B	STM GEN 2 PRIMARY LOOP	N=001	
1JRCCPDY 0125C	STM GEN 2 PRIMARY LOOP	N=001	
1JRCCPDY 0125C	STM GEN 2 PRIMARY LOOP	N=001	
1JRCCPDY 0125D	STM GEN 2 PRIMARY LOOP	N=001	
1JRCCPDY 0125D	STM GEN 2 PRIMARY LOOP	N=001	
1JRCASE 0133A	RC PUMP 2A	N=001	
1JRCAST 0133A	RC PUMP 2A	N=001	
1JRCBSE 0133B	RC PUMP 2A	N=001	
1JRCBST 0133B	RC PUMP 2A	N=001	
1JRCCSE 0133C	RC PUMP 2A	N=001	
1JRCCST 0133C	RC PUMP 2A	N=001	
1JRCCSE 0133D	RC PUMP 2A	N=001	
1JRCCST 0133D	RC PUMP 2A	N=001	
1JRCEPT 0138	PRESSURIZER/RV HEAD VENT LEAK	J=311	
1JRCAST 0143A	RC PUMP 2B	N=001	
1JRCAST 0143A	RC PUMP 2B	N=001	
1JRCBSE 0143B	RC PUMP 2B	N=001	
1JRCBST 0143B	RC PUMP 2B	N=001	
1JRCCSE 0143C	RC PUMP 2B	N=001	
1JRCCST 0143C	RC PUMP 2B	N=001	
1JRCCSE 0143D	RC PUMP 2B	N=001	
1JRCCST 0143D	RC PUMP 2B	N=001	
1JRCEPT 0156	RCP 1A CONTROLLED BLEEDOFF	N=001	
1JRCEPT 0166	RCP 1B CONTROLLED BLEEDOFF	N=001	
1JRCEPT 0176	RCP 2A CONTROLLED BLEEDOFF	N=001	
1JRCEPT 0186	RCP 2B CONTROLLED BLEEDOFF	N=001	
1JRCAPR 0190A	RCS PRESSURE WIDE RANGE	N=001	
1JRCAPT 0190A	RCS PRESSURE WIDE RANGE	N=001	
1JRCAPY 0190A	I/E CONVERTOR	N=001	
1JRCPY 0190B	RCS PRESSURE WIDE RANGE	N=001	
1JRCPY 0190B	I/E CONVERTOR	N=001	
1JRCAPI 0199A	PZR OVER PRESS TRIP TO SPS	N=001	
1JRCAPI 0199A	PZR OVER PRESS TRIP TO SPS	N=001	
1JRCPY 0199B	PZR OVER PRESS TRIP TO SPS	N=001	
1JRCPY 0199B	PZR OVER PRESS TRIP TO SPS	N=001	
1JRCCPI 0199C	PZR OVER PRESS TRIP TO SPS	N=001	
1JRCCPI 0199C	PZR OVER PRESS TRIP TO SPS	N=001	
1JRCCPI 0199D	PZR OVER PRESS TRIP TO SPS	N=001	
1JRCCPI 0199D	PZR OVER PRESS TRIP TO SPS	N=001	
1JRCEPSV 0200	PRESSURIZER SAFETY VALVE	N=001	
1JRCEPSV 0201	PRESSURIZER SAFETY VALVE	N=001	
1JRCEPSV 0202	PRESSURIZER SAFETY VALVE	N=001	
1JRCEPSV 0203	PRESSURIZER SAFETY VALVE	N=001	
1JRCEHV 0403	REACTOR VSL SEAL DRAIN TO RDT	N=001	
1JRCEHV 0430	RCP 1A CONTROLLED BLEEDOFF	N=001	
1JRCEHV 0431	RCP 1B CONTROLLED BLEEDOFF	N=001	
1JRCEHV 0432	RCP 2A CONTROLLED BLEEDOFF	N=001	
1JRCEHV 0433	RCP 2B CONTROLLED BLEEDOFF	N=001	
1JRCHV 0446	RCP 1A HP COOLER INLET	N=001	

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 125 of 202)

12/17/82 02:28102		Q INSTRUMENTS BY SYSTEM		PAGE 60
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO	(RC-8)	
1JRCNHV 0447	RCP 1B HP COOLER INLET	N=001		
1JRCNHV 0448	RCP 2A HP COOLER INLET	N=001		
1JRCNHV 0449	RCP 2B HP COOLER INLET	N=001		
1JRCNHV 0450	RCP 1A HP COOLER OUTLET	N=001		
1JRCNHV 0451	RCP 1B HP COOLER OUTLET	N=001		
1JRCNHV 0452	RCP 2A HP COOLER OUTLET	N=001		
1JRCNHV 0453	RCP 2B HP COOLER OUTLET	N=001		
1JRCEFO 0724	PRZR SAMPLE HEAT EXCH NO 3	J=425		
1JRCEFO 0725	PRZR SAMPLE HEAT EXCH NO 2	J=425		
1JRCEZE 0726	PRESR RELIEF VLV	J=366		
1JRCEZY 0726	PRESR RELIEF VLV	J=366		
1JRCEZE 0727	PRESR RELIEF VLV	J=366		
1JRCEZY 0727	PRESR RELIEF VLV	J=366		
1JRCEZE 0728	PRESR RELIEF VLV	J=366		
1JRCEZY 0728	PRESR RELIEF VLV	J=366		
1JRCEZE 0729	PRESR RELIEF VLV	J=366		
1JRCEZY 0729	PRESR RELIEF VLV	J=366		

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 126 of 202)

04/19/82 15150139	VALVE-HON CLASS	PAGE 60	(RC-9)
TAG NUMBER	R/SPEC/		
1PRCAV206	13NH001		
1PRCAV208	13NH001		
1PRCAV216	13NH001		
1PRCAV277	13NH001		
1PRCAV284	13NH001		
1PRCAV285	13NH001		
1PRCAV297	13NH001		
1PRCAV298	13NH001		
1PRCAV274	13NH001		
1PRCAV275	13NH001		
1PRCAV204	13NH001		
1PRCAV272	13NH001		
1PRCCV273	13NH001		
1PRCCV280	13NH001		
1PRCCV281	13NH001		
1PRCDV205	13NH001		
1PRCDV270	13NH001		
1PRCDV271	13NH001		
1PRCDV278	13NH001		
1PRCDV279	13NH001		
1PRCEV001	13PH221A		
1PRCEV056	13PH221A		
1PRCEV057	13PH221A		
1PRCEV058	13PH221A		
1PRCEV059	13PH221A		
1PRCEV060	13PH221A		
1PRCEV061	13PH221A		
1PRCEV062	13PH221A		
1PRCEV090	13PH221C		
1PRCEV200	13PH221C		
1PRCEV207	13NH001		
1PRCEV209	13NH001		
1PRCEV210	13NH001		
1PRCEV211	13NH001		
1PRCEV212	13NH001		
1PRCEV213	13NH001		
1PRCEV214	13NH001 C		
1PRCEV215	13NH001 C		
1PRCEV216	13NH001 C		
1PRCEV217	13NH001		
1PRCEV232	13NH001 C		
1PRCEV233	13NH001 C		
1PRCEV234	13NH001 C		
1PRCEV235	13NH001 C		
1PRCEV236	13NH001 C		
1PRCEV237	13NH001 C		
1PRCEV238	13NH001 C		
1PRCEV240	13NH001 C		
1PRCEV241	13NH001 C		
1PRCEV242	13NH001 C		
1PRCEV243	13NH001 C		
1PRCEV244	13NH001 C		
1PRCEV248	13NH001		
1PRCEV249	13NH001		
1PRCEV252	13NH001		

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 127 of 202)

04/19/82 15:50:39	VALVE="0" CLASS	PAGE 61	(RC-10)
TAG NUMBER	R/SPEC/		
1PRCEV253	13NH001		
1PRCEV256	13NH001		
1PRCEV257	13NH001		
1PRCEV260	13NH001		
1PRCEV261	13NH001		
1PRCEV282	13NH001		
1PRCEV283	13NH001		
1PRCEV292	13NH001		
1PRCEV293	13NH001		
1PRCEV294	13NH001		
1PRCEV295	13NH001		
1PRCEV296	13NH001		
1PRCEV299	13NH001		
1PRCEV332	13NH001 C		
1PRCEV333	13NH001 C		
1PRCEV334	13NH001 C		
1PRCEV335	13NH001 C		
1PRCEV872	13PH221C		
1PRCEV873	13PH221C		
1PRCEV874	13PH221C		
1PRCEV875	13PH221C		
1PRCEV876	13PH221C		
1PRCNV015	13PH221A		
1PRCNV063	13PH221A		
1PRCNV067	13PH221A		
1PRCNV068	13PH221A		
1PRCNV069	13PH221A		
1PRCNV070	13PH221A		
1PRCNV071	13PH221A		
1PRCNV072	13PH221A		
1PRCNV073	13PH221A		
1PRCNV074	13PH221A		
1PRCNV075	13PH221A		
1PRCNV076	13PH221A		
1PRCNV077	13PH221A		
1PRCNV078	13PH221A		
1PRCNV112	13NH001		
1PRCNV113	13NH001		
1PRCNV114	13NH001		
1PRCNV115	13NH001		
1PRCNV320	13NH001		
1PRCNV321	13NH001		
1PRCNV322	13NH001		
1PRCNV323	13NH001		
1PRCNV344	13NH001		
1PRCNV345	13NH001		
1PRCNV346	13NH001		
1PRCNV347	13NH001		
1PRCNV367	13NH001		
1PRCNV368	13NH001		
1PRCNV369	13NH001		
1PRCNV370	13NH001		
1PRCNV380	13NH001		
1PRCNV381	13NH001		
1PRCNV382	13NH001		

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 128 of 202)

04/19/82 15:50:39	VALVE-NOM CLASS	PAGE 62	(RC-11)
TAG NUMBER	R/SPEC/		
1PRCNV383	13NH001		
1PRCNV481	13NH001		
1PRCNV482	13NH001		
1PRCNV700	13NH001		
1PRCNV701	13NH001		
1PRCNV702	13NH001		
1PRCNV703	13NH001		
1PRCNV712	13NH001		
1PRCNV713	13NH001		
1PRCNV714	13NH001		
1PRCNV715	13NH001		
1PRCNV716	13NH001		
1PRCNV717	13NH001		
1PRCNV718	13NH001		
1PRCNV719	13NH001		
1PRCNV724	13NH001		
1PRCNV725	13NH001		
1PRCNV726	13NH001		
1PRCNV727	13NH001		
1PRCNV736	13NH001		
1PRCNV737	13NH001		
1PRCNV738	13NH001		
1PRCNV739	13NH001		
1PRCNV740	13NH001		
1PRCNV741	13NH001		
1PRCNV742	13NH001		
1PRCNV743	13NH001		
1PRCNV752	13NH001		
1PRCNV753	13NH001		
1PRCNV754	13NH001		
1PRCNV755	13NH001		
1PRCNV772	13NH001		
1PRCNV773	13NH001		
1PRCNV774	13NH001		
1PRCNV775	13NH001		
1PRCNV796	13NH001		
1PRCNV797	13NH001		
1PRCNV798	13NH001		
1PRCNV799	13NH001		
1PRCNVA00	13NH001		
1PRCNVA01	13NH001		
1PRCNVA02	13NH001		
1PRCNVA03	13NH001		
1PRCNVA68	13NH001		
1PRCNV870	13NH001		
1PRCNVA71	13NH001		

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 129 of 202)

04/19/82 15138146		EQUIPMENT-NOM CLASS	PAGE 86	<u>RADIOACTIVE WASTE DRAINS</u>	(RD-1)
TAG NIMRER	DESCRIPTION	BECHTEL SPEC/PO			
1MRDE1109	PENETRATION-RAD SUMP SUMPS	13HM500			

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 130 of 202)

12/17/82 02:28102		Q INSTRUMENTS BY SYSTEM		PAGE 62
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO	(RD-2)	
1JRDAMS 0023	INT CONT ISOL VLV FR RW SUMP	J=200		
1JRDAUV 0023	INT CONT ISOL VLV FR RW SUMP	P=221B		
1JRDHHS 0024	EXT CONT ISOL VLV FR RW SUMP	J=200		
1JRDBUV 0024	EXT CONT ISOL VLV FR RW SUMP	P=221B		
1JRDBUY 0024	EXT CONT ISOL VLV FR RW SUMP	P=221B		
1JRDALSH 0147	CONT SPRAY PMP RM A	J=481		
1JROBLSH 0148	CONT SPRAY PMP RM B	J=481		
2JROALSH 0149	HI PR SI PMP RM A	J=481		
1JROBLSH 0150	HI PR SI PMP RM B	J=481		
1JRDALSH 0151	LO PR SI PMP RM A	J=481		
1JROBLSH 0152	LO PR SI PMP RM B	J=481		
1JROBHS 0507	CONT SUMPS O/L FOR PASS	J=603		
1JRDBUV 0407	CONT SUMPS O/L FOR PASS	J=603		
1JRDELS 0410	CONT RW SUMP (EAST)	J=475		
1JRDELT 0410	CONT RW SUMP (EAST)	J=475		
1JRDELE 0411	CONT RW SUMP (WEST)	J=475		
1JRDELT 0411	CONT RW SUMP (WEST)	J=475		

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 131 of 202)

04/19/82 15:50:30	VALVE="M" CLASS	PAGE 64	(RD-3)
TAG NUMBER	R/SPEC/		
1PRDAV018	13PM221B		
1PRDAV020	13PM221B		
1PRDAV021	13PM221B		
1PRDAV022	13PM221B		
1PRDAV023	13PM221B		
1PRDAV049	13PM221A		
1PRDAV050	13PM221B		
1PRDRV040	13PM221B		
1PRDRV041	13PM221B		
1PRDRV042	13PM221B		
1PRDRV043	13PM221B		
1PRDRV048	13PM221B		
1PRDRV051	13PM221A		
1PRDRV052	13PM221B		
1PRONV090	13PM221A		

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 132 of 202)

04/19/82 15:38:46		EQUIPMENT-NAME CLASS	PAGE 88	IN-CORE REACTOR INSTRUMENTATION
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO	(RI-1)	
1ERTZ49	ELECT PENTRTN-SHLD INSTR	13EM035		
1ERT8735	ELEC PENTRTN-SHLD INSTR	13EM035		
1ERTCZ30	ELECT PENTRTN-SHLD INSTR	13EM035		
1ERTDZ79	ELECT PENTRTN-SHLD INSTR	13EM035		

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 133 of 202)

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Q INSTRUMENTS BY SYSTEM

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(RI-2)

TAG NUMBER

DESCRIPTION

BECHTEL
SPEC/PO

1JRICNE 0001	IN-CORE DETECTOR J=9	N=001
1JRICTE 0001	IN-CORE T/C (CORE EXIT)=J=9	N=001
1JRIALE 0001A	REACTOR VESSEL	N=001
1JRIABLE 0001B	REACTOR VESSEL	N=001
1JRIONE 0002	IN-CORE DETECTOR H=9	N=001
1JRIOTE 0002	IN-CORE T/C (CORE EXIT)=H=9	N=001
1JRIALE 0002A	REACTOR VESSEL	N=001
1JRIABLE 0002B	REACTOR VESSEL	N=001
1JRIANE 0003	IN-CORE DETECTOR K=10	N=001
1JRIOTE 0003	IN-CORE T/C (CORE EXIT)=K=10	N=001
1JRIABLE 0003A	REACTOR VESSEL	N=001
1JRIABLE 0003B	REACTOR VESSEL	N=001
1JRIANE 0004	IN-CORE DETECTOR J=7	N=001
1JRIOTE 0004	IN-CORE T/C (CORE EXIT)=J=7	N=001
1JRIABLE 0004A	REACTOR VESSEL	N=001
1JRIABLE 0004B	REACTOR VESSEL	N=001
1JRIANE 0005	IN-CORE DETECTOR G=8	N=001
1JRIOTE 0005	IN-CORE T/C (CORE EXIT)=G=8	N=001
1JRIABLE 0005A	REACTOR VESSEL	N=001
1JRIABLE 0005B	REACTOR VESSEL	N=001
1JRIANE 0006	IN-CORE DETECTOR L=7	N=001
1JRIOTE 0006	IN-CORE T/C (CORE EXIT)=L=7	N=001
1JRIABLE 0006A	REACTOR VESSEL	N=001
1JRIABLE 0006B	REACTOR VESSEL	N=001
1JRIONE 0007	IN-CORE DETECTOR J=12	N=001
1JRIOTE 0007	IN-CORE T/C (CORE EXIT)=J=12	N=001
1JRIABLE 0007A	REACTOR VESSEL	N=001
1JRIABLE 0007B	REACTOR VESSEL	N=001
1JRIANE 0008	IN-CORE DETECTOR F=10	N=001
1JRIOTE 0008	IN-CORE T/C (CORE EXIT)=F=10	N=001
1JRIABLE 0008A	REACTOR VESSEL	N=001
1JRIABLE 0008B	REACTOR VESSEL	N=001
1JRIANE 0009	IN-CORE DETECTOR M=8	N=001
1JRIOTE 0009	IN-CORE T/C (CORE EXIT)=M=8	N=001
1JRIANE 0010	IN-CORE DETECTOR F=7	N=001
1JRIOTE 0010	IN-CORE T/C (CORE EXIT)=F=7	N=001
1JRIANE 0011	IN-CORE DETECTOR M=11	N=001
1JRIOTE 0011	IN-CORE T/C (CORE EXIT)=M=11	N=001
1JRIANE 0012	IN-CORE DETECTOR N=9	N=001
1JRIOTE 0012	IN-CORE T/C (CORE EXIT)=N=9	N=001
1JRIANE 0013	IN-CORE DETECTOR H=5	N=001
1JRIOTE 0013	IN-CORE T/C (CORE EXIT)=H=5	N=001
1JRIANE 0014	IN-CORE DETECTOR K=13	N=001
1JRIOTE 0014	IN-CORE T/C (CORE EXIT)=K=13	N=001
1JRIANE 0015	IN-CORE DETECTOR F=12	N=001
1JRIOTE 0015	IN-CORE T/C (CORE EXIT)=F=12	N=001
1JRICNE 0016	IN-CORE DETECTOR G=13	N=001
1JRICTE 0016	IN-CORE T/C (CORE EXIT)=G=13	N=001
1JRICNE 0017	IN-CORE DETECTOR L=5	N=001
1JRICTE 0017	IN-CORE T/C (CORE EXIT)=L=5	N=001
1JRICNE 0018	IN-CORE DETECTOR F=5	N=001
1JRICTE 0018	IN-CORE T/C (CORE EXIT)=F=5	N=001
1JRICNE 0019	IN-CORE DETECTOR J=4	N=001
1JRICTE 0019	IN-CORE T/C (CORE EXIT)=J=4	N=001

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 134 of 202)

12/17/82 02128102		O INSTRUMENTS BY SYSTEM		PAGE 65
TAG NUMBER		DESCRIPTION	BECHTEL SPEC/PO	(RI-3)
1JRICNE 0020		IN-CORE DETECTOR M=13	N=001	
1JRICTE 0020		IN-CORE T/C (CORE EXIT)=M=13	N=001	
1JRIONE 0021		IN-CORE DETECTOR D=8	N=001	
1JRIOTE 0021		IN-CORE T/C (CORE EXIT)=D=8	N=001	
1JRIONE 0022		IN-CORE DETECTOR P=10	N=001	
1JRIOTE 0022		IN-CORE T/C (CORE EXIT)=P=10	N=001	
1JRIONE 0023		IN-CORE DETECTOR D=11	N=001	
1JRIOTE 0023		IN-CORE T/C (CORE EXIT)=D=11	N=001	
1JRIONE 0024		IN-CORE DETECTOR P=7	N=001	
1JRIOTE 0024		IN-CORE T/C (CORE EXIT)=P=7	N=001	
1JRIONE 0025		IN-CORE DETECTOR N=5	N=001	
1JRIOTE 0025		IN-CORE T/C (CORE EXIT)=N=5	N=001	
1JRICNE 0026		IN-CORE DETECTOR D=6	N=001	
1JRICTE 0026		IN-CORE T/C (CORE EXIT)=D=6	N=001	
1JRICNE 0027		IN-CORE DETECTOR P=12	N=001	
1JRICTE 0027		IN-CORE T/C (CORE EXIT)=P=12	N=001	
1JRIANE 0028		IN-CORE DETECTOR R=9	N=001	
1JRIATE 0028		IN-CORE T/C (CORE EXIT)=R=9	N=001	
1JRIONE 0029		IN-CORE DETECTOR M=3	N=001	
1JRIOTE 0029		IN-CORE T/C (CORE EXIT)=M=3	N=001	
1JRIONE 0030		IN-CORE DETECTOR K=15	N=001	
1JRIOTE 0030		IN-CORE T/C (CORE EXIT)=K=15	N=001	
1JRIANE 0031		IN-CORE DETECTOR G=15	N=001	
1JRIATE 0031		IN-CORE T/C (CORE EXIT)=G=15	N=001	
1JRIANE 0032		IN-CORE DETECTOR C=7	N=001	
1JRIATE 0032		IN-CORE T/C (CORE EXIT)=C=7	N=001	
1JRIANE 0033		IN-CORE DETECTOR L=3	N=001	
1JRIATE 0033		IN-CORE T/C (CORE EXIT)=L=3	N=001	
1JRIANE 0034		IN-CORE DETECTOR R=11	N=001	
1JRIATE 0034		IN-CORE T/C (CORE EXIT)=R=11	N=001	
1JRIONE 0035		IN-CORE DETECTOR E=4	N=001	
1JRIOTE 0035		IN-CORE T/C (CORE EXIT)=E=4	N=001	
1JRIONE 0036		IN-CORE DETECTOR N=14	N=001	
1JRIOTE 0036		IN-CORE T/C (CORE EXIT)=N=14	N=001	
1JRIONE 0037		IN-CORE DETECTOR C=12	N=001	
1JRIOTE 0037		IN-CORE T/C (CORE EXIT)=C=12	N=001	
1JRIONE 0038		IN-CORE DETECTOR F=3	N=001	
1JRIOTE 0038		IN-CORE T/C (CORE EXIT)=F=3	N=001	
1JRIONE 0039		IN-CORE DETECTOR R=6	N=001	
1JRIOTE 0039		IN-CORE T/C (CORE EXIT)=R=6	N=001	
1JRIONE 0040		IN-CORE DETECTOR M=15	N=001	
1JRIOTE 0040		IN-CORE T/C (CORE EXIT)=M=15	N=001	
1JRICNE 0041		IN-CORE DETECTOR B=9	N=001	
1JRICTE 0041		IN-CORE T/C (CORE EXIT)=B=9	N=001	
1JRIONE 0042		IN-CORE DETECTOR M=16	N=001	
1JRIOTE 0042		IN-CORE T/C (CORE EXIT)=M=16	N=001	
1JRIANE 0043		IN-CORE DETECTOR D=14	N=001	
1JRIATE 0043		IN-CORE T/C (CORE EXIT)=D=14	N=001	
1JRIONE 0044		IN-CORE DETECTOR K=2	N=001	
1JRIOTE 0044		IN-CORE T/C (CORE EXIT)=K=2	N=001	
1JRIONE 0045		IN-CORE DETECTOR E=15	N=001	
1JRIOTE 0045		IN-CORE T/C (CORE EXIT)=E=15	N=001	
1JRIONE 0046		IN-CORE DETECTOR N=3	N=001	
1JRIOTE 0046		IN-CORE T/C (CORE EXIT)=N=3	N=001	

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Table D-1

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12/17/82 02:28:02		Q INSTRUMENTS BY SYSTEM		PAGE 66
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO	(RI-4)	
1JRIDNE 0047	IN-CORE DETECTOR G-2	N=001		
1JRIDTE 0047	IN-CORE T/C (CORE EXIT)-G-2	N=001		
1JRICNE 0048	IN-CORE DETECTOR L-16	N=001		
1JRICTE 0048	IN-CORE T/C (CORE EXIT)-L-16	N=001		
1JRICNE 0049	IN-CORE DETECTOR B-6	N=001		
1JRICTE 0049	IN-CORE T/C (CORE EXIT)-B-6	N=001		
1JRICNE 0050	IN-CORE DETECTOR S-12	N=001		
1JRICTE 0050	IN-CORE T/C (CORE EXIT)-S-12	N=001		
1JRIANE 0051	IN-CORE DETECTOR C-4	N=001		
1JRIATE 0051	IN-CORE T/C (CORE EXIT)-C-4	N=001		
1JRIANE 0052	IN-CORE DETECTOR R-14	N=001		
1JRIATE 0052	IN-CORE T/C (CORE EXIT)-R-14	N=001		
1JRIANE 0053	IN-CORE DETECTOR T-9	N=001		
1JRIATE 0053	IN-CORE T/C (CORE EXIT)-T-9	N=001		
1JRIANE 0054	IN-CORE DETECTOR B-13	N=001		
1JRIATE 0054	IN-CORE T/C (CORE EXIT)-B-13	N=001		
1JRIANE 0055	IN-CORE DETECTOR A-10	N=001		
1JRIATE 0055	IN-CORE T/C (CORE EXIT)-A-10	N=001		
1JRIANE 0056	IN-CORE DETECTOR T-7	N=001		
1JRIATE 0056	IN-CORE T/C (CORE EXIT)-T-7	N=001		
1JRIANE 0057	IN-CORE DETECTOR R-3	N=001		
1JRIATE 0057	IN-CORE T/C (CORE EXIT)-R-3	N=001		
1JRIANE 0058	IN-CORE DETECTOR F-17	N=001		
1JRIATE 0058	IN-CORE T/C (CORE EXIT)-F-17	N=001		
1JRIANE 0059	IN-CORE DETECTOR M-1	N=001		
1JRIATE 0059	IN-CORE T/C (CORE EXIT)-M-1	N=001		
1JRIANE 0060	IN-CORE DETECTOR D-2	N=001		
1JRIATE 0060	IN-CORE T/C (CORE EXIT)-D-2	N=001		
1JRIANE 0061	IN-CORE DETECTOR P-16	N=001		
1JRIATE 0061	IN-CORE T/C (CORE EXIT)-P-16	N=001		

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 136 of 202)

12/17/82 02128102		Q INSTRUMENTS BY SYSTEM		PAGE 68
TAG NUMBER		DESCRIPTION	BECHTEL SPEC/PO	
1JRKUA	0002C	IE ANNUNCIATOR	J-108	
1JRKB	0002D	IE ANNUNCIATOR	J-108	
1JRKUA	0004D	IE ANNUNCIATOR	J-108	
1JRKB	0004E	IE ANNUNCIATOR	J-108	

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 137 of 202)

04/19/82 15:38:46		EQUIPMENT="0" CLASS	PAGE 90	MAIN CONTROL BOARD
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PD		
1JRMAR01	CONTROL BOARD-ELECT MIMIC BUS	13JM200		
1JRMAR02	CONTROL BOARD-ESE SYSTEM	13JM200		
1JRMAR03	CONTROL BOARD-CVCS MIMIC	13JM200		
1JRMAR04	CONTROL BOARD-RRS	13JM200		
1JRMAR05	CONTROL BOARD-PPS COND SYSTEM	13JM200		
1JRMAR06	CONTROL BOARD-MS/TG	13JM200		
1JRMAR07	CONTROL BOARD-AUX SYSTEMS	13JM200		
1JRMAR01	CONTROL BOARD-ELECT MIMIC BUS	13JM200		
1JRMAR02	CONTROL BOARD-ESE SYSTEM	13JM200		
1JRMAR03	CONTROL BOARD-CVCS MIMIC	13JM200		
1JRMAR04	CONTROL BOARD-RRS	13JM200		
1JRMAR05	CONTROL BOARD-PPS COND SYSTEM	13JM200		
1JRMAR06	CONTROL BOARD-MS/TG	13JM200		
1JRMAR07	CONTROL BOARD-AUX SYSTEMS	13JM200		
1JRMAR02	CONTROL BOARD-ESE SYSTEM	13JM200		
1JRMAR04	CONTROL BOARD-RRS	13JM200		
1JRMAR05	CONTROL BOARD-PPS COND SYSTEM	13JM200		
1JRMAR02	CONTROL BOARD-ESE SYSTEM	13JM200		
1JRMAR04	CONTROL BOARD-RRS	13JM200		
1JRMAR05	CONTROL BOARD-PPS COND SYSTEM	13JM200		
1JRMAR01	CONTROL BOARD-ELECT MIMIC BUS	13JM200		
1JRMAR02	CONTROL BOARD-ESE SYSTEM	13JM200		
1JRMAR03	CONTROL BOARD-CVCS MIMIC	13JM200		
1JRMAR04	CONTROL BOARD-RRS	13JM200		
1JRMAR05	CONTROL BOARD-PPS COND SYSTEM	13JM200		
1JRMAR06	CONTROL BOARD-MS/TG	13JM200		
1JRMAR07	CONTROL BOARD-AUX SYSTEMS	13JM200		

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Table D-1

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04/19/82 15:38:46		EQUIPMENT-NO CLASS	PAGE 92	ENGINEERED SAFETY FEATURES ACTUATION
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO	(SA-1)	
1ESAAZ47	ELECT PENTRTN-SHLD INSTR	13EM035		
1ESABZ37	ELEC PENTRTN-SHLD INSTR	13EM035		
1ESACZ28	ELECT PENTRTN-SHLD INSTR	13EM035		
1ESADZ81	ELECT PENTRTN-SHLD INSTR	13EM035		
1ESADZ85	ELECT PENTRTN-	13EM035		
1JSAAC01	ESFAS AUX RELAY CABINET A	13NM001		
1JSAAC02	ROP ESFAS CABINET	13JM104		
1JSAAC02A	ROP ESFAS CABINET	13JM104		
1JSAAC02B	ROP ESFAS CABINET	13JM104		
1JSAAC03	AUXILIARY PROTECTIVE CABINET A	13NM001		
1JSAAC04	ELECTRONIC ISOL SYS CAB A	13JM108		
1JSABC01	ESFAS AUX RELAY CABINET B	13NM001		
1JSABC02	ROP ESFAS CABINET	13JM104		
1JSABC02A	ROP ESFAS CABINET	13JM104		
1JSABC02B	ROP ESFAS CABINET	13JM104		
1JSABC03	AUXILIARY PROTECTIVE CABINET B	13NM001		
1JSABC04	ELECTRONIC ISOL SYS CAB B	13JM108		
1JSACC03	AUXILIARY PROTECTIVE CABINET C	13NM001		
1JSACC04	ELECTRONIC ISOL SYS CAB C	13JM108		
1JSADC03	AUXILIARY PROTECTIVE CABINET D	13NM001		
1JSADC04	ELECTRONIC ISOL SYS CAB D	13JM108		
1JSANCO2A	ROP ESFAS CABINET	13JM104		
1JSANCO2B	ROP ESFAS CABINET	13JM104		

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 139 of 202)

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Q INSTRUMENTS BY SYSTEM

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(SA-2)

TAG NUMBER

DESCRIPTION

RECHTEL
SPEC/PO

1JSAHHS 0001	SIAS MANUAL ACTUATION A	J-200
1JSABHS 0002	SIAS MANUAL ACTUATION B	J-200
1JSACHS 0003	SIAS MANUAL ACTUATION C	J-200
1JSADHS 0004	SIAS MANUAL ACTUATION D	J-200
1JSAHHS 0005	CIAS MANUAL ACTUATION A	J-200
1JSABHS 0006	CIAS MANUAL ACTUATION B	J-200
1JSACHS 0007	CIAS MANUAL ACTUATION C	J-200
1JSADHS 0008	CIAS MANUAL ACTUATION D	J-200
1JSAHHS 0009A	MSIS MANUAL ACTUATION A	J-200
1JSAHHS 0009B	MSIS MANUAL ACTUATION A	N-001
1JSABHS 0010A	MSIS MANUAL ACTUATION B	J-200
1JSABHS 0010B	MSIS MANUAL ACTUATION B	N-001
1JSACHS 0011A	MSIS MANUAL ACTUATION C	J-200
1JSACHS 0011B	MSIS MANUAL ACTUATION C	N-001
1JSADHS 0012A	MSIS MANUAL ACTUATION D	J-200
1JSAHHS 0012B	MSIS MANUAL ACTUATION D	N-001
1JSAHHS 0013	CSAS MANUAL ACTUATION A	J-200
1JSABHS 0014	CSAS MANUAL ACTUATION B	J-200
1JSACHS 0015	CSAS MANUAL ACTUATION C	J-200
1JSADHS 0016	CSAS MANUAL ACTUATION D	J-200
1JSAHHS 0017	AFAS-1 MANUAL ACTUATION A	J-200
1JSABHS 0018	AFAS-1 MANUAL ACTUATION B	J-200
1JSACHS 0019	AFAS-1 MANUAL ACTUATION C	J-200
1JSADHS 0020	AFAS-1 MANUAL ACTUATION D	J-200
1JSAHHS 0021	AFAS-2 MANUAL ACTUATION A	J-200
1JSABHS 0022	AFAS-2 MANUAL ACTUATION B	J-200
1JSACHS 0023	AFAS-2 MANUAL ACTUATION C	J-200
1JSADHS 0024	AFAS-2 MANUAL ACTUATION D	J-200
1JSAHHS 0025	CPIAS MANUAL ACTUATION A	J-200
1JSABHS 0026	CPIAS MANUAL ACTUATION B	J-200
1JSAHHS 0027	CREFAS MANUAL ACTUATION A	J-200
1JSABHS 0028	CREFAS MANUAL ACTUATION B	J-200
1JSAHHS 0029	FBEVAS MANUAL ACTUATION A	J-200
1JSABHS 0030	FBEVAS MANUAL ACTUATION B	J-200
1JSAHHS 0031	CRVIAS MANUAL ACTUATION A	J-200
1JSABHS 0032	CRVIAS MANUAL ACTUATION B	J-200
1JSAUIC 0033	CORE PROTECTION CALC OP MOD A	N-001
1JSABUIC 0034	CORE PROTECTION CALC OP MOD B	N-001
1JSACUIC 0035	CORE PROTECTION CALC OP MOD C	N-001
1JSAUIC 0036	CORE PROTECTION CALC OP MOD D	N-001
1JSAUIC 0037	PPS REMOTE OPER MODULE A	N-001
1JSABUIC 0038	PPS REMOTE OPER MODULE B	N-001
1JSACUIC 0039	PPS REMOTE OPER MODULE C	N-001
1JSAUIC 0040	PPS REMOTE OPER MODULE D	N-001
1JSAHHS 0041	RAS MANUAL ACTUATION A	J-200
1JSABHS 0044	RAS MANUAL ACTUATION B	J-200
1JSACHS 0045	RAS MANUAL ACTUATION C	J-200
1JSADHS 0046	RAS MANUAL ACTUATION D	J-200

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CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 140 of 202)

04/19/82 15138144		EQUIPMENT-NOM CLASS	PAGE 94	REACTOR PROTECTION SYSTEM	(RB-1)
TAG NUMBER	DESCRIPTION	BFCHEL SPEC/PO			
1JSRAA01	PRESSURIZER XMITTER RACK-PPS	13NM001			
1JSRAA02	SG 1/RCP 1B XMITTER RACK-PPS	13NM001			
1JSRAA03	SI TK/RCP 1A XMITTER RACK-PPS	13NM001			
1JSRAA04	SG 1/SI TK 1R XMITTER RACK-PPS	13NM001			
1JSRAA05	SG 2/RCP 2A XMITTER RACK-PPS	13NM001			
1JSRAA06	SG 2/RCP 2R XMITTER RACK-PPS	13NM001			
1JSRAC01	PLANT PROTECTION SYSTEM CAB	13NM001			
1JSRAC02A	PROCESS PROTECTIVE CABINET A1	13NM001			
1JSRAC02B	PROCESS PROTECTIVE CABINET A2	13NM001			
1JSRAC03	REACTOR TRIP SWITCHGEAR A	13NM001			
1JSRAC04	SUPPLEMENTARY PROTECTION A	13NM001			
1JSRBA01	PRESSURIZER XMITTER RACK-PPS	13NM001			
1JSRBA02	SG 1/RCP 1R XMITTER RACK-PPS	13NM001			
1JSRBA03	SG 1/RCP 1A XMITTER RACK-PPS	13NM001			
1JSRBA04	SI TK/RCP 2A XMITTER RACK-PPS	13NM001			
1JSRBA05	SG 2/SI TK 2R XMITTER RACK-PPS	13NM001			
1JSRBA06	SG 2/RCP 2R XMITTER RACK-PPS	13NM001			
1JSRBC01	PLANT PROTECTION SYSTEM CAB	13NM001			
1JSRBC02A	PROCESS PROTECTIVE CABINET B1	13NM001			
1JSRBC02B	PROCESS PROTECTIVE CABINET B2	13NM001			
1JSRBC03	REACTOR TRIP SWITCHGEAR B	13NM001			
1JSRBC04	SUPPLEMENTARY PROTECTION B	13NM001			
1JSRCA01	PRESSURIZER XMITTER RACK-PPS	13NM001			
1JSRCA02	SG 1/RCP 1R XMITTER RACK-PPS	13NM001			
1JSRCA03	SG 1/RCP 1A XMITTER RACK-PPS	13NM001			
1JSRCA04	SG 2/RCP 2R XMITTER RACK-PPS	13NM001			
1JSRCA05	SG 2/RCP 2A XMITTER RACK-PPS	13NM001			
1JSRCC01	PLANT PROTECTION SYSTEM CAB	13NM001			
1JSRCC02A	PROCESS PROTECTIVE CABINET C	13NM001			
1JSRCC03	REACTOR TRIP SWITCHGEAR C	13NM001			
1JSRCC04	SUPPLEMENTARY PROTECTION C	13NM001			
1JSRDA01	PRESSURIZER XMITTER RACK-PPS	13NM001			
1JSRDA02	SG 1/RCP 1R XMITTER RACK-PPS	13NM001			
1JSRDA03	SG 1/RCP 1A XMITTER RACK-PPS	13NM001			
1JSRDA04	SG 2/RCP 2R XMITTER RACK-PPS	13NM001			
1JSRDA05	SG 2/RCP 2A XMITTER RACK-PPS	13NM001			
1JSRDC01	PLANT PROTECTION SYSTEM CAB	13NM001			
1JSRDC02A	PROCESS PROTECTIVE CABINET D	13NM001			
1JSRDC03	REACTOR TRIP SWITCHGEAR D	13NM001			
1JSRDC04	SUPPLEMENTARY PROTECTION D	13NM001			
1JSRNC03A	REACTOR TRIP SWITCHGEAR	13NM001			
1JSRNC03B	REACTOR TRIP SWITCHGEAR	13NM001			
1JSRNC03C	REACTOR TRIP SWITCHGEAR	13NM001			
1JSRNC03D	REACTOR TRIP SWITCHGEAR	13NM001			

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Q INSTRUMENTS BY SYSTEM

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TAG NUMBER

DESCRIPTION

BECHTEL
SPEC/PO

(RB-2)

1JSBAHS 0001
1JSBBHS 0002
1JSBCHS 0003
1JSBDHS 0004
1JSBAHS 0005
1JSBBHS 0006
1JSBCHS 0007
1JSBDHS 0008
1JSBAHS 0009
1JSBBHS 0010
1JSBCHS 0011
1JSBDHS 0012

MANUAL REACTOR TRIP CH A
MANUAL REACTOR TRIP CH B
MANUAL REACTOR TRIP CH C
MANUAL REACTOR TRIP CH D
SG PRESS VAR SETPOINT RESET
SG PRESS VAR SETPOINT RESET
SG PRESS VAR SETPOINT RESET
SG PRESS VAR SETPOINT RESET
SG PRESS VAR SETPOINT RESET
PZR PRESS VAR SETPOINT RESET
PZR PRESS VAR SETPOINT RESET
PZR PRESS VAR SETPOINT RESET
PZR PRESS VAR SETPOINT RESET

J=200
J=200
J=200
J=200
N=001
N=001
N=001
N=001
N=001
N=001
N=001
N=001
N=001

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 142 of 202)

04/19/82 15178146	EQUIPMENT="O" CLASS	PAGE 98	EX-CORE NEUTRON MONITORING (SE-1)
TAG NUMBER	DESCRIPTION	BECHTFL SPEC/PO	
1ESEA751	ELECT PENRTN-SHLD INSTR&COAX	13EM035	
1ESER736	ELECT PENRTN-SHLD INSTR&COAX	13EM035	
1ESFN775	ELECT PENRTN-SHLD INSTR&COAX	13EM035	

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Table D-1

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12/17/82 02:28:02	Q INSTRUMENTS BY SYSTEM		PAGE 74 (SE-2)
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO	
1JSEAJI 0001A	NEUTRON FLX LOG POWER CH A	N=001	
1JSEAJI 0001A1	EX-CORE LOG POWER CH A - RS	N=001	
1JSEAJI 0001A	POWER RATE OF CHANGE CH A	N=001	
1JSEAJR 0001A	LINEAR/CALIB LINEAR POWER A	N=001	
1JSEAJSHL0001A	LINEAR/CALIB LINEAR PWR DEV A	N=001	
1JSEAJY 0001A	E/E CONVERTOR	N=001	
1JSEAJY 0001A1	E/E CONVERTOR	N=001	
1JSEAJY 0001A2	E/E CONVERTOR	N=001	
1JSEAJY 0001A3	E/E CONVERTOR	N=001	
1JSEANE 0001A	EX-CORE DETECTOR SAFETY CH A	N=001	
1JSEANT 0001A	PRE-AMP	N=001	
1JSEBJI 0001B	NEUTRON FLX LOG POWER CH B	N=001	
1JSEBJI 0001B1	EX-CORE LOG POWER CH B - RS	N=001	
1JSEBJI 0001B	POWER RATE OF CHANGE CH B	N=001	
1JSEBJR 0001B	LINEAR/CALIB LINEAR POWER B	N=001	
1JSEBJSHL0001B	LINEAR/CALIB LINEAR PWR DEV B	N=001	
1JSEBJY 0001B	E/E CONVERTOR	N=001	
1JSEBJY 0001B1	E/E CONVERTOR	N=001	
1JSEBJY 0001B2	E/E CONVERTOR	N=001	
1JSEBJY 0001B3	E/E CONVERTOR	N=001	
1JSEBNE 0001B	EX-CORE DETECTOR SAFETY CH B	N=001	
1JSEBNT 0001B	PRE-AMP	N=001	
1JSECJI 0001C	NEUTRON FLX LOG POWER C	N=001	
1JSECJI 0001C	POWER RATE OF CHANGE CH C	N=001	
1JSECJR 0001C	LINEAR/CALIB LINEAR POWER C	N=001	
1JSECJSHL0001C	LINEAR/CALIB LINEAR PWR DEV C	N=001	
1JSECJY 0001C	E/E CONVERTOR	N=001	
1JSECJY 0001C1	E/E CONVERTOR	N=001	
1JSECJY 0001C2	E/E CONVERTOR	N=001	
1JSECJY 0001C3	E/E CONVERTOR	N=001	
1JSECNE 0001C	EX-CORE DETECTOR SAFETY CH C	N=001	
1JSECNT 0001C	PRE-AMP	N=001	
1JSEDJI 0001D	NEUTRON FLX LOG POWER CH D	N=001	
1JSEDJI 0001D	POWER RATE OF CHANGE CH D	N=001	
1JSEDJR 0001D	LINEAR/CALIB LINEAR POWER D	N=001	
1JSEDJSHL0001D	LINEAR/CALIB LINEAR PWR DEV D	N=001	
1JSEDJY 0001D	E/E CONVERTOR	N=001	
1JSEDJY 0001D1	E/E CONVERTOR	N=001	
1JSEDJY 0001D2	E/E CONVERTOR	N=001	
1JSEDJY 0001D3	E/E CONVERTOR	N=001	
1JSEDNE 0001D	EX-CORE DETECTOR SAFETY CH D	N=001	
1JSEDNT 0001D	PRE-AMP	N=001	
1JSEAJI 0003A	LOCAL POWER DENSITY MARGIN A	N=001	
1JSEBJI 0003B	LOCAL POWER DENSITY MARGIN B	N=001	
1JSECJI 0003C	LOCAL POWER DENSITY MARGIN C	N=001	
1JSEDJI 0003D	LOCAL POWER DENSITY MARGIN D	N=001	
1JSEAJI 0004A	DNBR MARGIN CH A	N=001	
1JSEBJI 0004B	DNBR MARGIN CH B	N=001	
1JSECJI 0004C	DNBR MARGIN CH C	N=001	
1JSEDJI 0004D	DNBR MARGIN CH D	N=001	

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Table D-1
CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 144 of 202)

04/19/82 15178146		EQUIPMENT="M" CLASS	PAGE 100	REACTOR CONTROL	(SF-1)
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO			
1ESFA750	ELECT PENTRTN-SHLD INSTR	13EM035			
1FSF8738	ELEC PENTRTN-SHLD INSTR	13EM035			
1FSF8742	ELECT PENTRTN-SHLD INSTR	13EM035			
1FSFC722	ELECT PENTRTN-SHLD INSTR	13EM035			
1FSFC725	ELECT PENTRTN-SHLD INSTR	13EM035			
1FSFC726	ELECT PENTRTN-SHLD INSTR	13EM035			
1FSFC727	ELECT PENTRTN-SHLD INSTR	13EM035			
1FSFD777	ELECT PENTRTN-SHLD INSTR	13EM035			
1FSFD778	ELECT PENTRTN-SHLD INSTR	13EM035			
1ESFD783	ELECT PENTRTN-SHLD INSTR&COAX	13EM035			
1FSFN202	ELECT PENTRTN-SHLD INSTR	13EM035			
1FSFN218	ELECT PENTRTN-SHLD INSTR	13EM035			
1ESFN758	ELECT PENTRTN-600V PWR (CEDMS)	13EM035			
1ESFN764	ELECT PENTRTN-600V PWR (CEDMS)	13EM035			
1FSFN765	ELECT PENTRTN-600V PWR (CEDMS)	13EM035			
1FSFN76A	ELECT PENTRTN-600V PWR (CEDMS)	13EM035			
1FSFN772	ELECT PENTRTN-600V PWR (CEDMS)	13EM035			
1ESFN774	ELECT PENTRTN-600V PWR (CEDMS)	13EM035			
1ESFN77A	ELECT PENTRTN-600V PWR (CEDMS)	13EM035			
1ESFN780	ELECT PENTRTN	13EM035			
1ESFN782	ELECT PENTRTN-600V PWR (CEDMS)	13EM035			
1ESFN784	ELECT PENTRTN-600V PWR (CEDMS)	13EM035			
1FSFN787	ELECT PENTRTN-SHLD INSTR	13EM035			
1ESFN789	ELECT PENTRTN-SHLD INSTR	13EM035			
1ESFN791	ELECT PENTRTN-SHLD INSTR	13EM035			
1JSFNC03	NSSS CONTROL SYSTEMS CABINET	13NM001			

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APPENDIX D

PVNGS 1,2&3

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 145 of 202)

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Q INSTRUMENTS BY SYSTEM

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SF-2)

TAG NUMBER

DESCRIPTION

BECHTEL
SPEC/PO

1JSFBZT 0001A	CEA 1 REED SWITCH POS TRANS 1
1JSFCZT 0001B	CEA 1 REED SWITCH POS TRANS 2
1JSFBZT 0002A	CEA 2 REED SWITCH POS TRANS 1
1JSFDZT 0002B	CEA 2 REED SWITCH POS TRANS 2
1JSFBZT 0003A	CEA 3 REED SWITCH POS TRANS 1
1JSECZT 0003B	CEA 3 REED SWITCH POS TRANS 2
1JSFAZT 0004A	CEA 4 REED SWITCH POS TRANS 1
1JSFCZT 0004B	CEA 4 REED SWITCH POS TRANS 2
1JSFBZT 0005A	CEA 5 REED SWITCH POS TRANS 1
1JSFCZT 0005B	CEA 5 REED SWITCH POS TRANS 2
1JSFBZT 0006A	CEA 6 REED SWITCH POS TRANS 1
1JSEDZT 0006B	CEA 6 REED SWITCH POS TRANS 2
1JSFBZT 0007A	CEA 7 REED SWITCH POS TRANS 1
1JSFDZT 0007B	CEA 7 REED SWITCH POS TRANS 2
1JSFBZT 0008A	CEA 8 REED SWITCH POS TRANS 1
1JSFCZT 0008B	CEA 8 REED SWITCH POS TRANS 2
1JSFBZT 0009A	CEA 9 REED SWITCH POS TRANS 1
1JSECZT 0009B	CEA 9 REED SWITCH POS TRANS 2
1JSFAZT 0010A	CEA 10 REED SWITCH POS TRANS 1
1JSFCZT 0010B	CEA 10 REED SWITCH POS TRANS 2
1JSFAZT 0011A	CEA 11 REED SWITCH POS TRANS 1
1JSFCZT 0011B	CEA 11 REED SWITCH POS TRANS 2
1JSFBZT 0012A	CEA 12 REED SWITCH POS TRANS 1
1JSECZT 0012B	CEA 12 REED SWITCH POS TRANS 2
1JSFBZT 0013A	CEA 13 REED SWITCH POS TRANS 1
1JSFCZT 0013B	CEA 13 REED SWITCH POS TRANS 2
1JSFBZT 0014A	CEA 14 REED SWITCH POS TRANS 1
1JSFDZT 0014B	CEA 14 REED SWITCH POS TRANS 2
1JSFBZT 0015A	CEA 15 REED SWITCH POS TRANS 1
1JSECZT 0015B	CEA 15 REED SWITCH POS TRANS 2
1JSFAZT 0016A	CEA 16 REED SWITCH POS TRANS 1
1JSFCZT 0016B	CEA 16 REED SWITCH POS TRANS 2
1JSFBZT 0017A	CEA 17 REED SWITCH POS TRANS 1
1JSFCZT 0017B	CEA 17 REED SWITCH POS TRANS 2
1JSFBZT 0018A	CEA 18 REED SWITCH POS TRANS 1
1JSEDZT 0018B	CEA 18 REED SWITCH POS TRANS 2
1JSFBZT 0019A	CEA 19 REED SWITCH POS TRANS 1
1JSFCZT 0019B	CEA 19 REED SWITCH POS TRANS 2
1JSFAZT 0020A	CEA 20 REED SWITCH POS TRANS 1
1JSFCZT 0020B	CEA 20 REED SWITCH POS TRANS 2
1JSFBZT 0021A	CEA 21 REED SWITCH POS TRANS 1
1JSECZT 0021B	CEA 21 REED SWITCH POS TRANS 2
1JSFBZT 0022A	CEA 22 REED SWITCH POS TRANS 1
1JSFDZT 0022B	CEA 22 REED SWITCH POS TRANS 2
1JSFBZT 0023A	CEA 23 REED SWITCH POS TRANS 1
1JSFDZT 0023B	CEA 23 REED SWITCH POS TRANS 2
1JSFBZT 0024A	CEA 24 REED SWITCH POS TRANS 1
1JSECZT 0024B	CEA 24 REED SWITCH POS TRANS 2
1JSFBZT 0025A	CEA 25 REED SWITCH POS TRANS 1
1JSFCZT 0025B	CEA 25 REED SWITCH POS TRANS 2
1JSFAZT 0026A	CEA 26 REED SWITCH POS TRANS 1
1JSFCZT 0026B	CEA 26 REED SWITCH POS TRANS 2
1JSFAZT 0027A	CEA 27 REED SWITCH POS TRANS 1
1JSECZT 0027B	CEA 27 REED SWITCH POS TRANS 2

N=001

N=001

N=001

N=001

N=001

N=001

N=001

N=001

N=001

N=001

N=001

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 146 of 202)

12/17/82 02:28:02		Q INSTRUMENTS BY SYSTEM		PAGE 17
TAG NUMBER		DESCRIPTION	BECHTEL SPEC/PO	(SF-3)
1JSFBZT	0028A	CEA 28 REED SWITCH POS TRANS 1	N=001	
1JSFCZT	0028B	CEA 28 REED SWITCH POS TRANS 2	N=001	
1JSFBZT	0029A	CEA 29 REED SWITCH POS TRANS 1	N=001	
1JSFCZT	0029B	CEA 29 REED SWITCH POS TRANS 2	N=001	
1JSFBZT	0030A	CEA 30 REED SWITCH POS TRANS 1	N=001	
1JSEDZT	0030B	CEA 30 REED SWITCH POS TRANS 2	N=001	
1JSFBZT	0031A	CEA 31 REED SWITCH POS TRANS 1	N=001	
1JSFCZT	0031B	CEA 31 REED SWITCH POS TRANS 2	N=001	
1JSEAZT	0032A	CEA 32 REED SWITCH POS TRANS 1	N=001	
1JSFCZT	0032B	CEA 32 REED SWITCH POS TRANS 2	N=001	
1JSFBZT	0033A	CEA 33 REED SWITCH POS TRANS 1	N=001	
1JSECTZ	0033B	CEA 33 REED SWITCH POS TRANS 2	N=001	
1JSFBZT	0034A	CEA 34 REED SWITCH POS TRANS 1	N=001	
1JSFDZT	0034B	CEA 34 REED SWITCH POS TRANS 2	N=001	
1JSFBZT	0035A	CEA 35 REED SWITCH POS TRANS 1	N=001	
1JSFDZT	0035B	CEA 35 REED SWITCH POS TRANS 2	N=001	
1JSFBZT	0036A	CEA 36 REED SWITCH POS TRANS 1	N=001	
1JSECTZ	0036B	CEA 36 REED SWITCH POS TRANS 2	N=001	
1JSFBZT	0037A	CEA 37 REED SWITCH POS TRANS 1	N=001	
1JSFCZT	0037B	CEA 37 REED SWITCH POS TRANS 2	N=001	
1JSEAZT	0038A	CEA 38 REED SWITCH POS TRANS 1	N=001	
1JSFCZT	0038B	CEA 38 REED SWITCH POS TRANS 2	N=001	
1JSFAZT	0039A	CEA 39 REED SWITCH POS TRANS 1	N=001	
1JSECTZ	0039B	CEA 39 REED SWITCH POS TRANS 2	N=001	
1JSFBZT	0040A	CEA 40 REED SWITCH POS TRANS 1	N=001	
1JSFCZT	0040B	CEA 40 REED SWITCH POS TRANS 2	N=001	
1JSFBZT	0041A	CEA 41 REED SWITCH POS TRANS 1	N=001	
1JSFCZT	0041B	CEA 41 REED SWITCH POS TRANS 2	N=001	
1JSFBZT	0042A	CEA 42 REED SWITCH POS TRANS 1	N=001	
1JSEDZT	0042B	CEA 42 REED SWITCH POS TRANS 2	N=001	
1JSFBZT	0043A	CEA 43 REED SWITCH POS TRANS 1	N=001	
1JSFCZT	0043B	CEA 43 REED SWITCH POS TRANS 2	N=001	
1JSEAZT	0044A	CEA 44 REED SWITCH POS TRANS 1	N=001	
1JSFCZT	0044B	CEA 44 REED SWITCH POS TRANS 2	N=001	
1JSFBZT	0045A	CEA 45 REED SWITCH POS TRANS 1	N=001	
1JSECTZ	0045B	CEA 45 REED SWITCH POS TRANS 2	N=001	
1JSFBZT	0046A	CEA 46 REED SWITCH POS TRANS 1	N=001	
1JSFDZT	0046B	CEA 46 REED SWITCH POS TRANS 2	N=001	
1JSFBZT	0047A	CEA 47 REED SWITCH POS TRANS 1	N=001	
1JSFDZT	0047B	CEA 47 REED SWITCH POS TRANS 2	N=001	
1JSFBZT	0048A	CEA 48 REED SWITCH POS TRANS 1	N=001	
1JSECTZ	0048B	CEA 48 REED SWITCH POS TRANS 2	N=001	
1JSFBZT	0049A	CEA 49 REED SWITCH POS TRANS 1	N=001	
1JSFCZT	0049B	CEA 49 REED SWITCH POS TRANS 2	N=001	
1JSEAZT	0050A	CEA 50 REED SWITCH POS TRANS 1	N=001	
1JSFCZT	0050B	CEA 50 REED SWITCH POS TRANS 2	N=001	
1JSFAZT	0051A	CEA 51 REED SWITCH POS TRANS 1	N=001	
1JSFCZT	0051B	CEA 51 REED SWITCH POS TRANS 2	N=001	
1JSFBZT	0052A	CEA 52 REED SWITCH POS TRANS 1	N=001	
1JSFCZT	0052B	CEA 52 REED SWITCH POS TRANS 2	N=001	
1JSFBZT	0053A	CEA 53 REED SWITCH POS TRANS 1	N=001	
1JSFCZT	0053B	CEA 53 REED SWITCH POS TRANS 2	N=001	
1JSFBZT	0054A	CEA 54 REED SWITCH POS TRANS 1	N=001	
1JSFDZT	0054B	CEA 54 REED SWITCH POS TRANS 2	N=001	

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APPENDIX D

PVNGS 1, 2&3

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 147 of 202)

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(SF-4)

1JSFBZT	0035A	CEA 55 REED SWITCH POS TRANS 1	N=001
1JSFDZT	0035B	CEA 55 REED SWITCH POS TRANS 2	N=001
1JSFBZT	0036A	CEA 56 REED SWITCH POS TRANS 1	N=001
1JSFDZT	0036B	CEA 56 REED SWITCH POS TRANS 2	N=001
1JSFBZT	0037A	CEA 57 REED SWITCH POS TRANS 1	N=001
1JSFCZT	0037B	CEA 57 REED SWITCH POS TRANS 2	N=001
1JSFBZT	0038A	CEA 58 REED SWITCH POS TRANS 1	N=001
1JSFCZT	0038B	CEA 58 REED SWITCH POS TRANS 2	N=001
1JSEBZT	0039A	CEA 59 REED SWITCH POS TRANS 1	N=001
1JSFCZT	0039B	CEA 59 REED SWITCH POS TRANS 2	N=001
1JSFAZT	0060A	CEA 60 REED SWITCH POS TRANS 1	N=001
1JSFCZT	0060B	CEA 60 REED SWITCH POS TRANS 2	N=001
1JSFAZT	0061A	CEA 61 REED SWITCH POS TRANS 1	N=001
1JSFCZT	0061B	CEA 61 REED SWITCH POS TRANS 2	N=001
1JSEAZT	0062A	CEA 62 REED SWITCH POS TRANS 1	N=001
1JSFCZT	0062B	CEA 62 REED SWITCH POS TRANS 2	N=001
1JSFBZT	0063A	CEA 63 REED SWITCH POS TRANS 1	N=001
1JSECZT	0063B	CEA 63 REED SWITCH POS TRANS 2	N=001
1JSFBZT	0064A	CEA 64 REED SWITCH POS TRANS 1	N=001
1JSFCZT	0064B	CEA 64 REED SWITCH POS TRANS 2	N=001
1JSEBZT	0065A	CEA 65 REED SWITCH POS TRANS 1	N=001
1JSFCZT	0065B	CEA 65 REED SWITCH POS TRANS 2	N=001
1JSFBZT	0066A	CEA 66 REED SWITCH POS TRANS 1	N=001
1JSEDZT	0066B	CEA 66 REED SWITCH POS TRANS 2	N=001
1JSFBZT	0067A	CEA 67 REED SWITCH POS TRANS 1	N=001
1JSFDZT	0067B	CEA 67 REED SWITCH POS TRANS 2	N=001
1JSEBZT	0068A	CEA 68 REED SWITCH POS TRANS 1	N=001
1JSFCZT	0068B	CEA 68 REED SWITCH POS TRANS 2	N=001
1JSFBZT	0069A	CEA 69 REED SWITCH POS TRANS 1	N=001
1JSECZT	0069B	CEA 69 REED SWITCH POS TRANS 2	N=001
1JSFAZT	0070A	CEA 70 REED SWITCH POS TRANS 1	N=001
1JSFCZT	0070B	CEA 70 REED SWITCH POS TRANS 2	N=001
1JSFAZT	0071A	CEA 71 REED SWITCH POS TRANS 1	N=001
1JSFCZT	0071B	CEA 71 REED SWITCH POS TRANS 2	N=001
1JSFBZT	0072A	CEA 72 REED SWITCH POS TRANS 1	N=001
1JSECZT	0072B	CEA 72 REED SWITCH POS TRANS 2	N=001
1JSFBZT	0073A	CEA 73 REED SWITCH POS TRANS 1	N=001
1JSFCZT	0073B	CEA 73 REED SWITCH POS TRANS 2	N=001
1JSEBZT	0074A	CEA 74 REED SWITCH POS TRANS 1	N=001
1JSFDZT	0074B	CEA 74 REED SWITCH POS TRANS 2	N=001
1JSFBZT	0075A	CEA 75 REED SWITCH POS TRANS 1	N=001
1JSEDZT	0075B	CEA 75 REED SWITCH POS TRANS 2	N=001
1JSFBZT	0076A	CEA 76 REED SWITCH POS TRANS 1	N=001
1JSFCZT	0076B	CEA 76 REED SWITCH POS TRANS 2	N=001
1JSFBZT	0077A	CEA 77 REED SWITCH POS TRANS 1	N=001
1JSFCZT	0077B	CEA 77 REED SWITCH POS TRANS 2	N=001
1JSFAZT	0078A	CEA 78 REED SWITCH POS TRANS 1	N=001
1JSECZT	0078B	CEA 78 REED SWITCH POS TRANS 2	N=001
1JSFAZT	0079A	CEA 79 REED SWITCH POS TRANS 1	N=001
1JSFCZT	0079B	CEA 79 REED SWITCH POS TRANS 2	N=001
1JSEBZT	0080A	CEA 80 REED SWITCH POS TRANS 1	N=001
1JSFCZT	0080B	CEA 80 REED SWITCH POS TRANS 2	N=001
1JSFBZT	0081A	CEA 81 REED SWITCH POS TRANS 1	N=001
1JSECZT	0081B	CEA 81 REED SWITCH POS TRANS 2	N=001

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PVNGS 1, 2&3

ENVIRONMENTAL QUALIFICATION REPORT
PER REQUIREMENTS OF NUREG-0588

APPENDIX D

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 148 of 202)

12/17/82 02:28102		Q INSTRUMENTS BY SYSTEM		PAGE 79
TAG NUMBER		DESCRIPTION	BECHTEL SPEC/PO	(SF-5)
1JSFBZT 0082A		CEA 82 REED SWITCH POS TRANS 1	N=001	
1JSFDZT 0082B		CEA 82 REED SWITCH POS TRANS 2	N=001	
1JSFBZT 0083A		CEA 83 REED SWITCH POS TRANS 1	N=001	
1JSFCZT 0083B		CEA 83 REED SWITCH POS TRANS 2	N=001	
1JSFAZT 0084A		CEA 84 REED SWITCH POS TRANS 1	N=001	
1JSECZT 0084B		CEA 84 REED SWITCH POS TRANS 2	N=001	
1JSFBZT 0085A		CEA 85 REED SWITCH POS TRANS 1	N=001	
1JSFCZT 0085B		CEA 85 REED SWITCH POS TRANS 2	N=001	
1JSFBZT 0086A		CEA 86 REED SWITCH POS TRANS 1	N=001	
1JSFDZT 0086B		CEA 86 REED SWITCH POS TRANS 2	N=001	
1JSFBZT 0087A		CEA 87 REED SWITCH POS TRANS 1	N=001	
1JSECZT 0087B		CEA 87 REED SWITCH POS TRANS 2	N=001	
1JSFAZT 0088A		CEA 88 REED SWITCH POS TRANS 1	N=001	
1JSFCZT 0088B		CEA 88 REED SWITCH POS TRANS 2	N=001	
1JSFBZT 0089A		CEA 89 REED SWITCH POS TRANS 1	N=001	
1JSFCZT 0089B		CEA 89 REED SWITCH POS TRANS 2	N=001	

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APPENDIX D

PVNGS 1, 2&3

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 149 of 202)

04/19/82 15:38:46		EQUIPMENT-NOM CLASS	PAGE 102	MAIN STEAM	(SG-1)
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO			
1JSGAC01	MSFIS LOGIC CAR TRAIN A	13JM105			
1JSGBC01	MSFIS LOGIC CAR TRAIN B	13JM105			
1JSGE401	MAIN STEAM FLOW XMITTER RACK	13NM001			
1JSGNC01	VUID	13NM001			
1JSGNC01A	MSFIS LOGIC CAR TRAIN A	13JM105			
1JSGNC01B	MSFIS LOGIC CAR TRAIN B	13JM105			
1MSGAX01A	ATM DUMP VALVE ACCUMULATORS	13MM105			
1MSGAX01B	ATM DUMP VALVE ACCUMULATORS	13MM105			
1MSGHY01A	ATM DUMP VALVE ACCUMULATORS	13MM105			
1MSGRY01B	ATM DUMP VALVE ACCUMULATORS	13MM105			
1MSGEU01	PENETRATION-MAIN STEAM LINE	13MM500			
1MSGEU02	PENETRATION-MAIN STEAM LINE	13MM500			
1MSGEU03	PENETRATION-MAIN STEAM LINE	13MM500			
1MSGEU04	PENETRATION-MAIN STEAM LINE	13MM500			
1MSGEU0A	PENETRATION-MAIN FEED LINE	13MM500			
1MSGEU10	PENETRATION-FEEDWATER	13MM500			
1MSGEU12	PENETRATION-FEEDWATER	13MM500			
1MSGEU4A	PENETRATION-SG BLOWDOWN	13MM500			
1MSGEU47	PENETRATION-SG BLOWDOWN	13MM500			
1MSGEU4A	PENETRATION-SG SAMPLE	13MM500			
1MSGEU49	PENETRATION-SG SAMPLE	13MM500			

ENVIRONMENTAL QUALIFICATION REPORT
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APPENDIX D

PVNGS 1,2&3

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 150 of 202)

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APPENDIX D

PVNGS 1, 2&3

12/17/82 02128102	Q INSTRUMENTS BY SYSTEM		PAGE 81 (SG-2)
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO	
1JSGEHV 0041	SG 1 COLD LEG BLOWN ISOL	P=2218	
1JSGNHS 0041	SG 1 COLD LEG BLOWN ISOL	J=200	
1JSGEHV 0042	SG 2 HOT LEG BLOWN ISOL	P=2218	
1JSGNHS 0042	SG 2 HOT LEG BLOWN ISOL	J=200	
1JSGEHV 0043	SG 1 HOT LEG BLOWN ISOL	P=2218	
1JSGNHS 0043	SG 1 HOT LEG BLOWN ISOL	J=200	
1JSGEHV 0044	SG 2 COLD LEG BLOWN ISOL	P=2218	
1JSGNHS 0044	SG 2 COLD LEG BLOWN ISOL	J=200	
1JSGBHS 0130	SG 1 DOWNCOMER FW DWNSTR ISOL	J=200	
1JSGBUY 0130	SG 1 DOWNCOMER FW DWNSTR ISOL	P=2218	
1JSGBUY 0130A	SG 1 DOWNCOMER FW DWNSTR ISOL	P=2218	
1JSGBUY 0130B	SG 1 DOWNCOMER FW DWNSTR ISOL	P=2218	
1JSGBUY 0132	SG 1 ECONOMIZER FW DWNSTR ISOL	H=234A	
1JSGBHS 0132A	SG 1 ECONOMIZER FW DWNSTR ISO	J=200	
1JSGBUY 0132A	SG 1 ECONOMIZER FW DWNSTR ISOL	H=234A	
1JSGBHS 0132B	SG 1 ECONOMIZER FW DWNSTR ISO	J=200	
1JSGBUY 0132B	SG 1 ECONOMIZER FW DWNSTR ISOL	H=234A	
1JSGBHS 0132C	SG 1 ECONOMIZER FW DWNSTR ISO	J=200	
1JSGBUY 0132C	SG 1 ECONOMIZER FW DWNSTR ISOL	H=234A	
1JSGBUY 0132D	SG 1 ECONOMIZER FW DWNSTR ISOL	H=234A	
1JSGAUV 0134	SG 1 STM SUPPLY TO AF PP TURB	P=2218	
1JSGAHS 0134A	SG 1 STM SUPPLY TO AF PP TURB	J=200	
1JSGAHS 0134B	SG 1 STM SUPPLY TO AF PP TURB	N=001	
1JSGBHS 0135	MAIN FW ISOL VLV 2 SG 2 UPPER	J=200	
1JSGBUY 0135	SG 2 DOWNCOMER FW DWNSTR ISOL	P=2218	
1JSGBUY 0135A	SG 2 DOWNCOMER FW DWNSTR ISOL	P=2218	
1JSGBUY 0135B	SG 2 DOWNCOMER FW DWNSTR ISOL	P=2218	
1JSGBUY 0137	SG 2 ECONOMIZER FW DWNSTR ISOL	H=234A	
1JSGBHS 0137A	SG 2 ECONOMIZER FW DWNSTR ISO	J=200	
1JSGBUY 0137A	SG 2 ECONOMIZER FW DWNSTR ISOL	H=234A	
1JSGBHS 0137B	SG 2 ECONOMIZER FW DWNSTR ISO	J=200	
1JSGBUY 0137B	SG 2 ECONOMIZER FW DWNSTR ISOL	H=234A	
1JSGBHS 0137C	SG 2 ECONOMIZER FW DWNSTR ISO	J=200	
1JSGBUY 0137C	SG 2 ECONOMIZER FW DWNSTR ISOL	H=234A	
1JSGBUY 0137D	SG 2 ECONOMIZER FW DWNSTR ISOL	H=234A	
1JSGAUV 0138	SG 2 STM SUPPLY TO AF PP TURB	P=2218	
1JSGAHS 0138A	SG 2 STM SUPPLY TO AF PP TURB	J=200	
1JSGAHS 0138B	SG 2 STM SPLY TO AF PP TURB-RS	N=001	
1JSGAHS 0138C	SG 2 STM TO AF PP TURB OVRD	J=200	
1JSGAHS 0138D	SG 2 STM TO AF PP TURB OVRD-RS	N=001	
1JSGEUV 0169	SG 1 MSIV BYPASS	P=2218	
1JSGAHS 0169A	SG 1 MSIV BYPASS	J=200	
1JSGAUV 0169A	SG 1 MSIV BYPASS	P=2218	
1JSGBHS 0169B	SG 1 MSIV BYPASS	J=200	
1JSGBUY 0169B	SG 1 MSIV BYPASS	P=2218	
1JSGEUV 0170	SG 1 LN 1 MSIV	H=234A	
1JSGAHS 0170A	SG 1 LN 1 MSIV	J=200	
1JSGAUV 0170A	SG 1 LN 1 MSIV	H=234A	
1JSGAUV 0170B	SG 1 LN 1 MSIV	H=234A	
1JSGBHS 0170B	SG 1 LN 1 MSIV	J=200	
1JSGAHS 0170C	SG 1 LN 1 MSIV	J=200	
1JSGAUV 0170C	SG 1 LN 1 MSIV	H=234A	
1JSGAUV 0170D	SG 1 LN 1 MSIV	H=234A	
1JSGBHS 0170D	SG 1 LN 1 MSIV	J=200	

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 151 of 202)

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Q INSTRUMENTS BY SYSTEM

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TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO
1JSGBUY 0170E	SG 1 LN 1 MSIV	M-234A
1JSGBUY 0170F	SG 1 LN 1 MSIV	M-234A
1JSGBUY 0170G	SG 1 LN 1 MSIV	M-234A
1JSGBUY 0170H	SG 1 LN 1 MSIV	M-234A
1JSGEUV 0171	SG 2 LN 1 MSIV	M-234A
1JSGAHS 0171A	SG 2 LN 1 MSIV	J-200
1JSGAUU 0171A	SG 2 LN 1 MSIV	M-234A
1JSGAUU 0171B	SG 2 LN 1 MSIV	M-234A
1JSGBHS 0171B	SG 2 LN 1 MSIV	J-200
1JSGAHS 0171C	SG 2 LN 1 MSIV	J-200
1JSGAUU 0171C	SG 2 LN 1 MSIV	M-234A
1JSGAUU 0171D	SG 2 LN 1 MSIV	M-234A
1JSGBUY 0171E	SG 2 LN 1 MSIV	J-200
1JSGBUY 0171F	SG 2 LN 1 MSIV	M-234A
1JSGBUY 0171G	SG 2 LN 1 MSIV	M-234A
1JSGBUY 0171H	SG 2 LN 1 MSIV	M-234A
1JSGAHS 0172	SG 1 DOWNCOMER FW UPSTR ISOL	J-200
1JSGAUU 0172	SG 1 DOWNCOMER FW UPSTR ISOL	P-221B
1JSGAUU 0172A	SG 1 DOWNCOMER FW UPSTR ISOL	P-221B
1JSGAUU 0172B	SG 1 DOWNCOMER FW UPSTR ISOL	P-221B
1JSGAUU 0174	SG 1 ECONOMIZER FW UPSTR ISOL	M-234A
1JSGAHS 0174A	SG 1 ECONOMIZER FW UPSTR ISO	J-200
1JSGAUU 0174A	SG 1 ECONOMIZER FW UPSTR ISOL	M-234A
1JSGAHS 0174B	SG 1 ECONOMIZER FW UPSTR ISO	J-200
1JSGAUU 0174B	SG 1 ECONOMIZER FW UPSTR ISOL	M-234A
1JSGAHS 0174C	SG 1 ECONOMIZER FW UPSTR ISO	J-200
1JSGAUU 0174C	SG 1 ECONOMIZER FW UPSTR ISOL	M-234A
1JSGAUU 0174D	SG 1 ECONOMIZER FW UPSTR ISOL	M-234A
1JSGAHS 0175	SG 2 DOWNCOMER FW UPSTR ISOL	J-200
1JSGAUU 0175	SG 2 DOWNCOMER FW UPSTR ISOL	P-221B
1JSGAUU 0175A	SG 2 DOWNCOMER FW UPSTR ISOL	P-221B
1JSGAUU 0175B	SG 2 DOWNCOMER FW UPSTR ISOL	P-221B
1JSGAHS 0177	VOIDED	J-200
1JSGAUU 0177	SG 2 ECONOMIZER FW DWNSTR ISOL	M-234A
1JSGAHS 0177A	SG 2 ECONOMIZER FW UPSTR ISO	J-200
1JSGAUU 0177A	SG 2 ECONOMIZER FW DWNSTR ISOL	M-234A
1JSGAHS 0177B	SG 2 ECONOMIZER FW UPSTR ISO	J-200
1JSGAUU 0177B	SG 2 ECONOMIZER FW DWNSTR ISOL	M-234A
1JSGAHS 0177C	SG 2 ECONOMIZER FW UPSTR ISO	J-200
1JSGAUU 0177C	SG 2 ECONOMIZER FW DWNSTR ISOL	M-234A
1JSGAUU 0177D	SG 2 ECONOMIZER FW DWNSTR ISOL	M-234A
1JSGBHV 0178	SG 1 LN 2 ATM OHP VLV	J-601A
1JSGBZE 0178	SG 1 LN 2 ATM OHP VLV	J-601A
1JSGBZT 0178	SG 1 LN 2 ATM OHP VLV	J-601A
1JSGEPX 0178	STRIP RESISTOR SG 1	J-601A
1JSGBHC 0178A	SG 1 LN 2 ATM OHP VLV CR	J-111
1JSGBHS 0178A	SG 1 LN 2 ATM OHP VLV	J-200
1JSGBHY 0178A	SG 1 LN 2 ATM OHP VLV	J-601A
1JSGBHC 0178B	SG 1 LN 2 ATM OHP VLV RS	J-111
1JSGDHS 0178B	SG 1 LN 2 ATM OHP VLV	J-200
1JSGDHY 0178B	SG 1 LN 2 ATM OHP VLV	J-601A
1JSGBHS 0178C	SG 1 LN 2 ATM OHP VLV RS	N-001
1JSGBHY 0178C	I/P CONVERTER	J-312A

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(SG-4)

TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO	(SG-4)
1J5GBHY 0178D	I/E CONVERTER	J=111	
1J5GDHS 0178D	SG 1 LN 2 ATM DMP VLV RS	N=001	
1J5GBHS 0178E	VOIDED	J=111	
1J5GBHY 0178E	CONTROL MODULE	J=111	
1J5GBHY 0178F	E/I CONVERTER	J=111	
1J5GBHY 0178G	MAIN STEAM SYSTEM	J=111	
1J5GBHY 0178H	E/I CONVERTER	N=001	
1J5GBHY 0178J	I/E CONVERTER	N=001	
1J5GDHS 0178J	SG 1 LN 2 ADV DISCONNECT RS	N=001	
1J5GBHY 0178K	I/E CONVERTER	J=111	
1J5GBHY 0178L	E/I CONVERTER	J=111	
1J5GBHY 0178M	E/I CONVERTER	J=366	
1J5GAHV 0179	SG 2 LN 2 ATM DMP VLV	J=601A	
1J5GAZE 0179	SG 2 LN 2 ATM DMP VLV	J=601A	
1J5GAZT 0179	SG 2 LN 2 ATM DMP VLV	J=601A	
1J5GEFX 0179	STRIP RESISTOR SG 2	J=601A	
1J5GAHIC 0179A	SG 2 LN 2 ATM DMP VLV CR	J=111	
1J5GAHS 0179A	SG 2 LN 2 ATM DMP VLV	J=200	
1J5GAHY 0179A	SG 2 LN 2 ATM DMP VLV	J=601A	
1J5GAHIC 0179B	SG 2 LN 2 ATM DMP VLV RS	J=111	
1J5GCMS 0179B	SG 2 LN 2 ATM DMP VLV	J=200	
1J5GCHY 0179B	SG 2 LN 2 ATM DMP VLV	J=601A	
1J5GAHS 0179C	SG 2 LN 2 ATM DMP VLV RS	N=001	
1J5GAHY 0179C	I/P CONVERTER	J=312A	
1J5GAHY 0179D	I/E CONVERTER	J=111	
1J5GCMS 0179D	SG 2 LN 2 ATM DMP VLV RS	N=001	
1J5GAHS 0179E	VOIDED	J=111	
1J5GAHY 0179E	CONTROL MODULE	J=111	
1J5GAHY 0179F	E/I CONVERTER	J=111	
1J5GAHY 0179G	CONTROL MODULE	J=111	
1J5GAHY 0179H	E/I CONVERTER	J=366	
1J5GEUV 0180	SG 1 LN 2 MSIV	M=234A	
1J5GAHS 0180A	SG 1 LN 2 MSIV	J=200	
1J5GAUY 0180A	SG 1 LN 2 MSIV	M=234A	
1J5GAUY 0180B	SG 1 LN 2 MSIV	M=234A	
1J5GBHS 0180B	SG 1 LN 2 MSIV	J=200	
1J5GAHS 0180C	SG 1 LN 2 MSIV	J=200	
1J5GAUY 0180C	SG 1 LN 2 MSIV	M=234A	
1J5GAUY 0180D	SG 1 LN 2 MSIV	M=234A	
1J5GBHS 0180D	SG 1 LN 2 MSIV	J=200	
1J5GBUY 0180E	SG 1 LN 2 MSIV	M=234A	
1J5GBUY 0180F	SG 1 LN 2 MSIV	M=234A	
1J5GBUY 0180G	SG 1 LN 2 MSIV	M=234A	
1J5GBUY 0180H	SG 1 LN 2 MSIV	M=234A	
1J5GEUV 0181	SG 2 LN 2 MSIV	M=234A	
1J5GAHS 0181A	SG 2 LN 2 MSIV	J=200	
1J5GAUY 0181A	SG 2 LN 2 MSIV	M=234A	
1J5GAUY 0181B	SG 2 LN 2 MSIV	M=234A	
1J5GBHS 0181B	SG 2 LN 2 MSIV	J=200	
1J5GBUY 0181B	VOIDED	M=234A	
1J5GAHS 0181C	SG 2 LN 2 MFIV	J=200	
1J5GAUY 0181C	SG 2 LN 2 MSIV	M=234A	
1J5GAUY 0181D	SG 2 LN 2 MSIV	M=234A	
1J5GBHS 0181D	SG 2 LN 2 MFIV	J=200	

ENVIRONMENTAL QUALIFICATION REPORT
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APPENDIX D

PVNGS 1, 2&3

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Table D-1

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TAG NUMBER		DESCRIPTION	BECHTEL SPEC/PD	(SG-5)
1JSGBUY	0181E	SG 2 LN 2 MSIV	M=234A	
1JSGBUY	0181F	SG 2 LN 2 MSIV	M=234A	
1JSGBUY	0181G	SG 2 LN 2 MSIV	M=234A	
1JSGBUY	0181H	SG 2 LN 2 MSIV	M=234A	
1JSGEUV	0183	SG 2 MSIV BYPASS	P=221B	
1JSGAHS	0183A	SG 2 MSIV BYPASS	J=200	
1JSGAUY	0183A	SG 2 MSIV BYPASS	P=221B	
1JSGBHS	0183B	SG 2 MSIV BYPASS	J=200	
1JSGBUY	0183B	SG 2 MSIV BYPASS	P=221B	
1JSGAHV	0184	SG 1 LN 1 ATM DMP VLV	J=601A	
1JSGAZE	0184	SG 1 LN 1 ATM DMP VLV	J=601A	
1JSGAZT	0184	SG 1 LN 1 ATM DMP VLV	J=601A	
1JSGAHIC	0184A	SG 1 LN 1 ATM DMP VLV CR	J=111	
1JSGAHS	0184A	SG 1 LN 1 ATM DMP VLV CR	J=200	
1JSGAHY	0184A	SG 1 LN 1 ATM DMP VLV	J=601A	
1JSGAHIC	0184B	SG 1 LN 1 ATM DMP VLV	J=111	
1JSGCHS	0184B	SG 1 LN 1 ATM DMP VLV CR	J=200	
1JSGCHY	0184B	SG 1 LN 1 ATM DMP VLV	J=601A	
1JSGAHS	0184C	SG 1 LN 1 ATM DMP VLV RS	N=001	
1JSGAHY	0184C	I/P CONVERTER	J=312A	
1JSGCHS	0184D	SG 1 LN 1 ATM DMP VLV RS	N=001	
1JSGAHY	0184H	E/I CONVERTER	J=366	
1JSGBHV	0185	SG 2 LN 1 ATM DMP VLV	J=601A	
1JSGBZE	0185	SG 2 LN 1 ATM DMP VLV	J=601A	
1JSGBZT	0185	SG 2 LN 1 ATM DMP VLV	J=601A	
1JSGBHC	0185A	SG 2 LN 2 ATM DMP VLV CR	J=111	
1JSGBHS	0185A	SG 2 LN 1 ATM DMP VLV CR	J=200	
1JSGBHY	0185A	SG 2 LN 1 ATM DMP VLV	J=601A	
1JSGBHC	0185B	SG 2 LN 1 ATM DMP VLV=RS	J=111	
1JSGCHS	0185B	SG 2 LN 1 ATM DMP VLV CR	J=200	
1JSGDHY	0185B	SG 2 LN 1 ATM DMP VLV	J=601A	
1JSGBHS	0185C	SG 2 LN 1 ATM DMP VLV RS	J=200	
1JSGBHY	0185C	I/P CONVERTER	J=312A	
1JSGBHY	0185D	I/E CONVERTER	J=111	
1JSGDHS	0185D	SG 2 LN 1 ATM DMP VLV RS	N=001	
1JSGBHY	0185E	CONTROL MODULE	J=111	
1JSGBHY	0185F	E/I CONVERTER	J=111	
1JSGBHY	0185G	MAIN STEAM SYSTEM	J=111	
1JSGBHY	0185H	E/I CONVERTER	N=001	
1JSGBHY	0185J	I/E CONVERTER	N=001	
1JSGDHS	0185J	SG 2 LN 1 ADV DISCONNECT RS	N=001	
1JSGBHY	0185K	I/E CONVERTER	J=111	
1JSGBHY	0185L	E/I CONVERTER	J=111	
1JSGBHY	0185M	E/I CONVERTER	J=366	
1JSGBHS	0200	SG 1 CHEM INJ	J=200	
1JSGBHV	0200	SG 1 CHEM INJ	N=001	
1JSGBHS	0201	SG 2 CHEM INJ	J=200	
1JSGBHV	0201	SG 2 CHEM INJ	N=001	
1JSGAHS	0204	SG 1 COLD LEG BLDWN SHPL ISOL	J=200	
1JSGAUV	0204	SG 1 COLD LEG BLDWN SHPL ISOL	N=001	
1JSGAHS	0211	SG 1 HOT LEG BLDWN SHPL ISOL	J=200	
1JSGAUV	0211	SG 1 HOT LEG BLDWN SHPL ISOL	N=001	
1JSGBHS	0219	SG 1 COLD LEG BLDWN SHPL ISOL	J=200	
1JSGBUV	0219	SG 1 COLD LEG BLDWN SHPL ISOL	N=001	

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 ENVIRONMENTAL QUALIFICATION REPORT
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APPENDIX D

PVNGS 1, 2&3

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 154 of 202)

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APPENDIX D

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TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO	
1JSGAHS 0220	SG 1 DOWNCOMER BLOWN SMPL ISOL	J=200	
1JSGAUV 0220	SG 1 DOWNCOMER BLOWN SMPL ISOL	N=001	
1JSGBHS 0221	SG 1 DOWNCOMER BLOWN SMPL ISOL	J=200	
1JSGBUV 0221	SG 1 DOWNCOMER BLOWN SMPL ISOL	N=001	
1JSGBHS 0222	SG 2 COLD LEG BLOWN SMPL ISOL	J=200	
1JSGBUV 0222	SG 2 COLD LEG BLOWN SMPL ISOL	N=001	
1JSGAHS 0223	SG 2 COLD LEG BLOWN SMPL ISOL	J=200	
1JSGAUV 0223	SG 2 COLD LEG BLOWN SMPL ISOL	N=001	
1JSGBHS 0224	SG 2 HOT LEG BLOWN SMPL ISOL	J=200	
1JSGBUV 0224	SG 2 HOT LEG BLOWN SMPL ISOL	N=001	
1JSGAHS 0225	SG 2 HOT LEG BLOWN SMPL ISOL	J=200	
1JSGAUV 0225	SG 2 HOT LEG BLOWN SMPL ISOL	N=001	
1JSGBHS 0226	SG 2 DOWNCOMER BLOWN SMPL ISOL	J=200	
1JSGBUV 0226	SG 2 DOWNCOMER BLOWN SMPL ISOL	N=001	
1JSGAHS 0227	DELETED	N=001	
1JSGAUV 0227	SG 2 DOWNCOMER BLOWN SMPL ISOL	J=200	
1JSGBHS 0228	SG 2 DOWNCOMER BLOWN SMPL ISOL	N=001	
1JSGBUV 0228	SG 1 HOT LEG BLOWN SMPL ISOL	J=200	
1JSGAHJS 0229	SG 1 HOT LEG BLOWN SMPL ISOL	N=001	
1JSGAPI 0229	MSIV & FWIV SELECTOR SW TR A	J=200	
1JSGAPSL 0229	MSIV & FWIV ACCUM PRESS TR A	J=111	
1JSGAPT 0229	SG 1 LN 1 MSIV 170	J=111	
1JSGAPY 0229	MSIV ACCUM NO 1 FOR 170	M=234A	
1JSGBHS 0230	I/E CONVERTOR	J=111	
1JSGBPT 0230	MSIV & FWIV SELECTOR SW TR B	J=200	
1JSGBPSL 0230	MSIV & FWIV ACCUM PRESS TR B	J=111	
1JSGAPT 0231	SG 1 LN 1 MSIV 170	J=111	
1JSGAPY 0231	MSIV ACCUM NO 2 FOR 170	M=234A	
1JSGBPT 0231	I/E CONVERTOR	J=111	
1JSGAPSL 0231	SG 1 LN 1 MSIV 170	J=111	
1JSGAPT 0231	MSIV ACCUM NO 1 FOR 100	M=234A	
1JSGAPY 0231	I/E CONVERTOR	J=111	
1JSGBPT 0232	SG 2 LN 1 MSIV 171	J=111	
1JSGBPSL 0232	MSIV ACCUM NO 2 FOR 100	M=234A	
1JSGAPT 0233	I/E CONVERTOR	J=111	
1JSGAPY 0233	SG 2 LN 1 MSIV 171	J=111	
1JSGBPT 0233	MSIV ACCUM 1 FOR 171	M=234A	
1JSGBPSL 0234	I/E CONVERTOR	J=111	
1JSGAPT 0235	SG 2 LN 1 MSIV 171	J=111	
1JSGAPY 0235	MSIV ACCUM 2 FOR 171	M=234A	
1JSGBPT 0235	I/E CONVERTOR	J=111	
1JSGBPSL 0236	SG 2 LN 1 MSIV 171	J=111	
1JSGAPT 0237	MSIV ACCUM 1 FOR 101	M=234A	
1JSGAPY 0237	I/E CONVERTOR	J=111	
1JSGBPT 0237	SG 2 LN 1 MSIV 171	J=111	
1JSGBPSL 0238	MSIV ACCUM 2 FOR 101	M=234A	
1JSGAPT 0239	I/E CONVERTOR	J=111	
1JSGAPY 0239	SG 1 ECONOMIZER FW UPSTR ISOL	J=111	
1JSGBPT 0239	FWIV ACCUM FOR 174	M=234A	
1JSGBPSL 0240	I/E CONVERTOR	J=111	
1JSGAPT 0241	SG 1 ECONOMIZER FW UPSTR ISOL	J=111	
1JSGAPY 0241	FWIV ACCUM FOR 174	M=234A	
1JSGBPT 0241	I/E CONVERTOR	J=111	
1JSGBPSL 0242	SG 2 ECONOMIZER FW DWNSTR ISOL	J=111	

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Q INSTRUMENTS BY SYSTEM

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TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO
1JSGAPT 0238A	FWIV ACCUM FOR 177	M-234A
1JSGAPY 0238A	I/E CONVERTOR	J-111
1JSGAPSL 0238B	SG 2 ECONOMIZER FW DWNSTR ISOL	J-111
1JSGAPT 0238B	FWIV ACCUM FOR 177	M-234A
1JSGAPY 0238B	I/E CONVERTOR	J-111
1JSGBPSL 0239A	SG 1 ECONOMIZER FW DWNSTR ISOL	J-111
1JSGBPT 0239A	FWIV ACCUM FOR 132	M-234A
1JSGBPY 0239A	I/E CONVERTOR	J-111
1JSGBPSL 0239B	SG 1 ECONOMIZER FW DWNSTR ISOL	M-234A
1JSGBPT 0239B	FWIV ACCUM FOR 132	J-111
1JSGBPY 0239B	I/E CONVERTOR	J-111
1JSGBPSL 0240A	SG 2 ECONOMIZER FW DWNSTR ISOL	J-111
1JSGBPT 0240A	FWIV ACCUM FOR 137	M-234A
1JSGBPY 0240A	I/E CONVERTOR	J-111
1JSGBPSL 0240B	SG 2 ECONOMIZER FW DWNSTR ISOL	J-111
1JSGBPT 0240B	FWIV ACCUM FOR 137	M-234A
1JSGBPY 0240B	I/E CONVERTOR	J-111
1JSGEPSSH 0241	UV-170 MSIV HYD	M-234A
1JSGEPSSH 0242	UV-180 MSIV HYD	M-234A
1JSGEPSSH 0243	UV-171 MSIV HYD	M-234A
1JSGEPSSH 0244	UV-181 MSIV HYD	M-234A
1JSGAPSH 0245	UV-174 MSIV HYD	M-234A
1JSGAPSH 0246	UV-177 MSIV HYD	M-234A
1JSGBPSH 0247	UV-132 MSIV HYD	M-234A
1JSGBPSH 0248	UV-137 MSIV HYD	M-234A
1JSGAHS 0250	MSIV FAST CLOSE SG NO 1	J-200
1JSGAHS 0251	MSIV FAST CLOSE SG NO 2	J-200
1JSGBHS 0252	MSIV FAST CLOSE SG NO 1	J-200
1JSGBHS 0253	MSIV FAST CLOSE SG NO 2	J-200
1JSGAPSL 0260	AIR RESVR FOR 170	M-234A
1JSGBPSL 0261	AIR RESVR FOR 170	M-234A
1JSGAPSL 0262	AIR RESVR FOR 180	M-234A
1JSGBPSL 0263	AIR RESVR FOR 180	M-234A
1JSGAPSL 0264	AIR RESVR FOR 171	M-234A
1JSGBPSL 0265	AIR RESVR FOR 171	M-234A
1JSGAPSL 0266	AIR RESVR FOR 181	M-234A
1JSGBPSL 0267	AIR RESVR FOR 181	M-234A
1JSGAPSL 0268	AIR RESVR FOR 174	M-234A
1JSGAPSL 0269	AIR RESVR FOR 177	M-234A
1JSGBPSL 0270	AIR RESVR FOR 132	M-234A
1JSGBPSL 0271	AIR RESVR FOR 137	M-234A
1JSGAHS 0275	SG 1 LN 1 MAIN STEAM ISOL	J-200
1JSGBHS 0276	SG 1 LN 1 MAIN STEAM ISOL	J-200
1JSGAHS 0277	SG 2 LN 1 MAIN STEAM ISOL	J-200
1JSGBHS 0278	SG 2 LN 1 MAIN STEAM ISOL	J-200
1JSGAHS 0279	SG 1 LN 2 MAIN STEAM ISOL	J-200
1JSGBHS 0280	SG 1 LN 2 MAIN STEAM ISOL	J-200
1JSGAHS 0281	SG 2 LN 2 MAIN STEAM ISOL	J-200
1JSGBHS 0282	SG 2 LN 2 MAIN STEAM ISOL	J-200
1JSGAHS 0283	SG 2 ECONOMIZER FW ISOL	J-200
1JSGAHS 0284	SG 1 ECONOMIZER FW ISOL	J-200
1JSGBHS 0285	SG 2 ECONOMIZER FW ISOL	J-200
1JSGBHS 0286	SG 1 ECONOMIZER FW ISOL	J-200
1JSGBPT 0301	SG 1 LN 2 ATM DMP N2 TANK	J-311

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PVNGS 1, 2&3

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TAG NUMBER

DESCRIPTION

BECHTEL
SPEC/PO

1JSG8PSV 0302	SG 1 LN 2 ATM DMP N2 TANK	J-691
1JSG8PCV 0303	SG 1 LN 2 ATM DMP N2 SUPPLY	J-691
1JSG8PSV 0305	SG 1 LN 2 ATM DMP N2 SUPPLY	J-691
1JSG8PSL 0306	SG1 LN2 SG2 LN1 DUMP AIR SPPLY	J-111
1JSG8PT 0306	SG1 LN2 SG2 LN1 DUMP AIR SPPLY	J-311
1JSG8PV 0306A	SG 1 LN 2 ATM DMP N2 SUPPLY	J-603
1JSG8PY 0306A	I/E CONVERTOR	J-111
1JSG8PV 0306B	SG 2 LN 1 ATM DMP N2 SUPPLY	J-603
1JSG8PY 0306B	SG1 LN2 SG2 LN1 DUMP AIR SPPLY	J-111
1JSGAPT 0308	SG 2 LN 2 ATM DUMP N2 TANK	J-311
1JSGAPSV 0309	SG 2 LN 2 ATM DUMP N2 TANK	J-691
1JSGAPCV 0310	SG 2 LN 2 ATM DUMP N2 SUPPLY	J-691
1JSGAPSV 0312	SG 2 LN 2 ATM DUMP N2 SUPPLY	J-691
1JSGAPSL 0313	SG2 LN2 SG1 LN1 DUMP AIR SPPLY	J-111
1JSGAPT 0313	SG2 LN2 SG1 LN1 DUMP AIR SPPLY	J-311
1JSGAPV 0313A	SG 2 LN 2 ATM DMP N2 SUPPLY	J-603
1JSGAPY 0313A	I/E CONVERTOR	J-111
1JSGAPV 0313B	SG 1 LN 1 ATM DMP N2 SUPPLY	J-603
1JSGAPY 0313B	SG2 LN2 SG1 LN1 DUMP AIR SUPPLY	J-111
1JSGAPT 0315	SG 1 LN 1 ATM DMP N2 TANK	J-311
1JSGAPSV 0316	SG 1 LN 1 ATM DMP N2 TANK	J-691
1JSGAPCV 0317	SG 1 LN 1 ATM DMP N2 SUPPLY	J-691
1JSGAPSV 0319	SG 1 LN 1 ATM DMP N2 SUPPLY	J-691
1JSG8PT 0321	SG2 LN 1 ATM DMP N2 TANK	J-311
1JSG8PSV 0322	SG2 LN 1 ATM DMP N2 TANK	J-691
1JSG8PCV 0323	SG2 LN 1 ATM DMP N2 SUPPLY	J-691
1JSG8PSV 0325	SG2 LN 1 ATM DMP N2 SUPPLY	J-691
1JSGAHS 0500P	SG 1 UPSTM BLOWN ISOL	J-200
1JSGAUV 0500P	SG 1 UPSTM BLOWN ISOL	P-2218
1JSGAUY 0500P	SG 1 UPSTM BLOWN ISOL	P-2218
1JSGBHS 0500Q	SG 1 DWNSTM BLOWN ISOL	J-200
1JSGBUV 0500Q	SG 1 DWNSTM BLOWN ISOL	P-2218
1JSGBUY 0500Q	SG 1 DWNSTM BLOWN ISOL	P-2218
1JSGBHS 0500R	SG 2 UPSTM BLOWN ISOL	J-200
1JSGBUV 0500R	SG 2 UPSTM BLOWN ISOL	P-2218
1JSGBUY 0500R	SG 2 UPSTM BLOWN ISOL	P-2218
1JSGAHS 0500S	SG 2 DWNSTM BLOWN ISOL	J-200
1JSGAUV 0500S	SG 2 DWNSTM BLOWN ISOL	P-2218
1JSGAUY 0500S	SG 2 DWNSTM BLOWN ISOL	P-2218
1JSGEPSV 0554	SG 2 MAIN STM LN 1	N=001
1JSGEPSV 0555	SG 2 MAIN STM LN 1	N=001
1JSGEPSV 0556	SG 2 MAIN STM LN 1	N=001
1JSGEPSV 0557	SG 2 MAIN STM LN 1	N=001
1JSGEPSV 0558	SG 2 MAIN STM LN 2	N=001
1JSGEPSV 0559	SG 2 MAIN STM LN 2	N=001
1JSGEPSV 0560	SG 2 MAIN STM LN 2	N=001
1JSGEPSV 0561	SG 2 MAIN STM LN 2	N=001
1JSGEPSV 0572	SG 1 MAIN STM LN 1	N=001
1JSGEPSV 0573	SG 1 MAIN STM LN 1	N=001
1JSGEPSV 0574	SG 1 MAIN STM LN 1	N=001
1JSGEPSV 0575	SG 1 MAIN STM LN 1	N=001
1JSGEPSV 0576	SG 1 MAIN STM LN 2	N=001
1JSGEPSV 0577	SG 1 MAIN STM LN 2	N=001
1JSGEPSV 0578	SG 1 MAIN STM LN 2	N=001

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ENVIRONMENTAL QUALIFICATION REPORT
PER REQUIREMENTS OF NUREG-0588

APPENDIX D

PVNGS 1, 2&3

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 157 of 202)

12/17/82 02128102	Q INSTRUMENTS BY SYSTEM	PAGE 88
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO
1JSGEPSV 0579	SG 1 MAIN STM LN 2	N=001
1JSGEPSV 0691	SG 1 MAIN STM LN 2	N=001
1JSGEPSV 0692	SG 1 MAIN STM LN 1	N=001
1JSGEPSV 0694	SG 2 MAIN STM LN 2	N=001
1JSGEPSV 0695	SG 2 MAIN STM LN 1	N=001
1JSGEZE 0696	MAIN STEAM RELIEF VLV	J=366
1JSGNZY 0696	MAIN STEAM RELIEF VLV	J=366
1JSGEZE 0697	MAIN STEAM RELIEF VLV	J=366
1JSGNZY 0697	MAIN STEAM RELIEF VLV	J=366
1JSGEZE 0698	MAIN STEAM RELIEF VLV	J=366
1JSGNZY 0698	MAIN STEAM RELIEF VLV	J=366
1JSGEZE 0699	MAIN STEAM RELIEF VLV	J=366
1JSGNZY 0699	MAIN STEAM RELIEF VLV	J=366
1JSGEZE 0700	MAIN STEAM RELIEF VLV	J=366
1JSGNZY 0700	MAIN STEAM RELIEF VLV	J=366
1JSGEZE 0701	MAIN STEAM RELIEF VLV	J=366
1JSGNZY 0701	MAIN STEAM RELIEF VLV	J=366
1JSGEZE 0702	MAIN STEAM RELIEF VLV	J=366
1JSGNZY 0702	MAIN STEAM RELIEF VLV	J=366
1JSGEZE 0703	MAIN STEAM RELIEF VLV	J=366
1JSGNZY 0703	MAIN STEAM RELIEF VLV	J=366
1JSGEZE 0704	MAIN STEAM RELIEF VLV	J=366
1JSGNZY 0704	MAIN STEAM RELIEF VLV	J=366
1JSGEZE 0705	MAIN STEAM RELIEF VLV	J=366
1JSGNZY 0705	MAIN STEAM RELIEF VLV	J=366
1JSGEZE 0706	MAIN STEAM RELIEF VLV	J=366
1JSGNZY 0706	MAIN STEAM RELIEF VLV	J=366
1JSGEZE 0707	MAIN STEAM RELIEF VLV	J=366
1JSGNZY 0707	MAIN STEAM RELIEF VLV	J=366
1JSGEZE 0708	MAIN STEAM RELIEF VLV	J=366
1JSGNZY 0708	MAIN STEAM RELIEF VLV	J=366
1JSGEZE 0709	MAIN STEAM RELIEF VLV	J=366
1JSGNZY 0709	MAIN STEAM RELIEF VLV	J=366
1JSGEZE 0710	MAIN STEAM RELIEF VLV	J=366
1JSGNZY 0710	MAIN STEAM RELIEF VLV	J=366
1JSGEZE 0711	MAIN STEAM RELIEF VLV	J=366
1JSGNZY 0711	MAIN STEAM RELIEF VLV	J=366
1JSGEZE 0712	MAIN STEAM RELIEF VLV	J=366
1JSGNZY 0712	MAIN STEAM RELIEF VLV	J=366
1JSGEZE 0713	MAIN STEAM RELIEF VLV	J=366
1JSGNZY 0713	MAIN STEAM RELIEF VLV	J=366
1JSGEZE 0714	MAIN STEAM RELIEF VLV	J=366
1JSGNZY 0714	MAIN STEAM RELIEF VLV	J=366
1JSGEZE 0715	MAIN STEAM RELIEF VLV	J=366
1JSGNZY 0715	MAIN STEAM RELIEF VLV	J=366
1JSGEFE 1011	SG 1 LN 1	N=001
1JSGEFE 1012	SG 1 LN 2	N=001
1JSGAPI 1013A	SG 1	N=001
1JSGAPI 1013A1	SG 1 - REMOTE SHUTDOWN	N=001
1JSGAPR 1013A	SG 1 / SG 2	N=001
1JSGART 1013A	SG 1	N=001
1JSGAPY 1013A	I/E CONVERTOR	N=001
1JSGBPI 1013B	SG 1	N=001
1JSGBPI 1013B1	SG 1 - REMOTE SHUTDOWN	N=001

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 ENVIRONMENTAL QUALIFICATION REPORT
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APPENDIX D

PVNGS 1, 2&3

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 158 of 202)

12/17/82 02:28:02		Q INSTRUMENTS BY SYSTEM		PAGE 89
TAG NUMBER		DESCRIPTION	BECHTEL SPEC/PO	(SG-10)
1JSGBPT 1013B		SG 1	N=001	
1JSGBPY 1013B		I/E CONVERTOR	N=001	
1JSGCPT 1013C		SG 1	N=001	
1JSGCPT 1013C		SG 1	N=001	
1JSGCPY 1013C		I/E CONVERTOR	N=001	
1JSGDPT 1013D		SG 1	N=001	
1JSGDPT 1013D		SG 1	N=001	
1JSGDPY 1013D		I/E CONVERTOR	N=001	
1JSGAPT 1023A		SG 2	N=001	
1JSGAPT 1023A		SG 2	N=001	
1JSGAPY 1023A		I/E CONVERTOR	N=001	
1JSGBPT 1023B		SG 2	N=001	
1JSGBPY 1023B		SG 2	N=001	
1JSGCPT 1023C		I/E CONVERTOR	N=001	
1JSGCPT 1023C		SG 2	N=001	
1JSGCPY 1023C		SG 2	N=001	
1JSGDPT 1023D		I/E CONVERTOR	N=001	
1JSGDPT 1023D		SG 2	N=001	
1JSGDPY 1023D		SG 2	N=001	
1JSGALY 1113A		I/E CONVERTOR	N=001	
1JSGALY 1113A1		SG 1 / SG 2 WIDE RANGE	N=001	
1JSGALY 1113A2		SG 1 - REMOTE SHUTDOWN	J=111	
1JSGALR 1113A		SG 1 / SG 2 WIDE RANGE	J=111	
1JSGALT 1113A		SG 1 / SG 2 WIDE RANGE	N=001	
1JSGALY 1113A		SG 1 WIDE RANGE	N=001	
1JSGBLT 1113B		I/E CONVERTOR	N=001	
1JSGBLT 1113B1		SG 1 / SG 2 WIDE RANGE	N=001	
1JSGBLT 1113B2		SG 1 - REMOTE SHUTDOWN	J=111	
1JSGBLT 1113B		SG 1 / SG 2 WIDE RANGE	J=111	
1JSGBLY 1113B		SG 1 WIDE RANGE	N=001	
1JSGCLT 1113C		I/E CONVERTOR	N=001	
1JSGCLT 1113C		SG 1 / SG 2 WIDE RANGE	N=001	
1JSGCLT 1113C		SG 1 WIDE RANGE	N=001	
1JSGCLY 1113C		I/E CONVERTOR	N=001	
1JSGDLY 1113D		SG 1 / SG 2 WIDE RANGE	N=001	
1JSGDLY 1113D		SG 1 WIDE RANGE	N=001	
1JSGDLY 1113D		I/E CONVERTOR	N=001	
1JSGALT 1114A		SG 1 / SG 2 NARROW RANGE	N=001	
1JSGALT 1114A		SG 1 NARROW RANGE	N=001	
1JSGALY 1114A		I/E CONVERTOR	N=001	
1JSGBLT 1114B		SG 1 / SG 2 NARROW RANGE	N=001	
1JSGBLT 1114B		SG 1 NARROW RANGE	N=001	
1JSGBLY 1114B		I/E CONVERTOR	N=001	
1JSGCLT 1114C		SG 1 / SG 2 NARROW RANGE	N=001	
1JSGCLT 1114C		SG 1 NARROW RANGE	N=001	
1JSGCLY 1114C		I/E CONVERTOR	N=001	
1JSGDLY 1114D		SG 1 / SG 2 NARROW RANGE	N=001	
1JSGDLY 1114D		SG 1 NARROW RANGE	N=001	
1JSGDLY 1114D		I/E CONVERTOR	N=001	
1JSGALT 1123A		SG 2 WIDE RANGE	N=001	
1JSGALY 1123A		I/E CONVERTOR	N=001	
1JSGBLT 1123B		SG 2 WIDE RANGE	N=001	
1JSGBLY 1123B		I/E CONVERTOR	N=001	
1JSGCLT 1123C		SG 2 WIDE RANGE	N=001	

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 159 of 202)

12/17/82 02:28:02		Q INSTRUMENTS BY SYSTEM		PAGE 90 (SG-11)
TAG NUMBER		DESCRIPTION	RECHTEL SPEC/PO	
1JSGCLY 1123C		I/E CONVERTOR	N-001	
1JSGOLT 1123D		SG 2 WIDE RANGE	N-001	
1JSGDLY 1123D		I/E CONVERTOR	N-001	
1JSGALT 1124A		SG 2 NARROW RANGE	N-001	
1JSGALY 1124A		I/E CONVERTER	N-001	
1JSGBLT 1124B		SG 2 NARROW RANGE	N-001	
1JSGBLY 1124B		I/E CONVERTER	N-001	
1JSGCLT 1124C		SG 2 NARROW RANGE	N-001	
1JSGCLY 1124C		I/E CONVERTER	N-001	
1JSGOLT 1124D		SG 2 NARROW RANGE	N-001	
1JSGDLY 1124D		I/E CONVERTER	N-001	
1JSGAHS 1133		STM TRAP SGN-M23 ISOL VLV	J-200	
1JSGAUV 1133		STM TRAP SGN-M23 ISOL VLV	J-603	
1JSGAHS 1134		STM TRAP SGN-M24 ISOL VLV	J-200	
1JSGAUV 1134		STM TRAP SGN-M24 ISOL VLV	J-603	
1JSGBHS 1135		STM TRAP SGN-M01,M02 ISOL VLVS	J-200	
1JSGBUV 1135A		STM TRAP SGN-M01 ISOL VLV	J-603	
1JSGBUV 1135B		STM TRAP SGN-M02 ISOL VLV	J-603	
1JSGBHS 1136		STM TRAP SGN-M03,M04 ISOL VLVS	J-200	
1JSGAUV 1136A		STM TRAP SGN-M03 ISOL VLV	J-603	
1JSGBUV 1136A		STM TRAP SGN-M03 ISOL VLV	J-603	
1JSGBUV 1136B		STM TRAP SGN-M04 ISOL VLV	J-603	

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ENVIRONMENTAL QUALIFICATION REPORT
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APPENDIX D

PVNGS 1,2&3

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 160 of 202)

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VALVE="00" CLASS"

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(SG-12)

TAG NUMBER R/SPEC/

1PSGAV043	13PM221B
1PSGAV044	13PM221B
1PSGAV265	13PM221A
1PSGAV266	13PM221A
1PSGAV298	13PM221A
1PSGAV301	13PM221A
1PSGAV299	13PM221A
1PSGAV300	13PM221A
1PSGEV003	13PM221B
1PSGEV005	13PM221B
1PSGEV006	13PM221B
1PSGEV007	13PM221B
1PSGEV023	13PM221B
1PSGEV026	13PM221C
1PSGEV029	13PM221B
1PSGFV032	13PM221C
1PSGEV039	A
1PSGFV041	13PM221C0
1PSGEV048	13PM221B
1PSGEV084	13PM221B
1PSGEV092	13PM221A
1PSGEV096	13PM221A
1PSGEV100	13PM221A
1PSGEV103	13PM221A
1PSGEV104	13PM221A
1PSGEV105	13PM221A
1PSGEV106	13PM221A
1PSGEV112	13PM221A
1PSGEV113	13PM221A
1PSGEV114	13PM221A
1PSGEV127	13PM221A
1PSGEV128	13PM221A
1PSGEV133	13PM221A
1PSGEV134	13PM221A
1PSGEV139	13PM221A
1PSGEV140	13PM221A
1PSGEV145	13PM221A
1PSGEV146	13PM221A
1PSGEV167	13PM221C
1PSGEV169	13PM221C
1PSGEV263	13PM221A
1PSGEV264	13PM221A
1PSGEV289	13PM221B
1PSGEV290	13PM221B
1PSGEV291	13PM221A
1PSGEV292	13PM221A
1PSGFV293	13PM221C
1PSGEV294	13PM221C
1PSGEV295	13PM221C0
1PSGEV296	13NM001 0
1PSGEV304	13PM221A
1PSGEV306	13PM221C
1PSGEV308	13PM221A
1PSGEV309	13PM221A
1PSGEV310	13PM221A

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 ENVIRONMENTAL QUALIFICATION REPORT
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APPENDIX D

PVNGS 1, 2&3

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 161 of 202)

04/19/82 15:50:39	VALVE-MOM CLASS	PAGE 67	(SG-13)
TAG NUMBER	R/SPFC/		
1PSGEV311	13PM221A		
1PSGEV322	13PM221A		
1PSGEV334	13PM221A		
1PSGEV335	13PM221A		
1PSGEV336	13PM221A		
1PSGEV337	13PM221A		
1PSGEV338	13PM221A		
1PSGEV339	13PM221A		
1PSGEV341	13PM221A		
1PSGEV342	13PM221A		
1PSGEV343	13PM221A		
1PSGEV344	13PM221A		
1PSGEV345	13PM221A		
1PSGEV346	13PM221A		
1PSGEV348	13PM221A		
1PSGEV350	13PM221A		
1PSGEV351	13PM221A		
1PSGEV352	13PM221A		
1PSGEV353	13PM221A		
1PSGEV354	13PM221A		
1PSGEV355	13PM221A		
1PSGEV356	13PM221A		
1PSGEV357	13PM221A		
1PSGEV358	13PM221A		
1PSGEV360	13PM221A		
1PSGEV361	13PM221A		
1PSGEV362	13PM221A		
1PSGEV363	13PM221A		
1PSGEV364	13PM221A		
1PSGEV365	13PM221A		
1PSGEV367	13PM221C		
1PSGEV368	13PM221A		
1PSGEV369	13PM221A		
1PSGEV370	13PM221A		
1PSGEV371	13PM221A		
1PSGEV372	13PM221C		
1PSGEV373	13PM221A		
1PSGEV374	13PM221A		
1PSGEV375	13PM221A		
1PSGEV376	13PM221A		
1PSGEV377	13PM221A		
1PSGEV378	13PM221A		
1PSGEV379	13PM221A		
1PSGEV380	13PM221A		
1PSGEV382	13PM221A		
1PSGEV384	13PM221A		
1PSGEV415	13PM221A		
1PSGEV416	13PM221A		
1PSGEV418	13PM221C		
1PSGEV420	13PM221C		
1PSGEV524	13PM221C		
1PSGEV525	13PM221C		
1PSGEV552	13PM221C		
1PSGEV553	13PM221C		
1PSGEV586	13PM221A		

ENVIRONMENTAL QUALIFICATION REPORT
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APPENDIX D

PVNGS 1, 2&3

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 162 of 202)

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VALVE="0" CLASS

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(SG-14)

TAG NUMBER R/SPEC/

1PSGEV590	13PH221C
1PSGEV603	13PH221A
1PSGEV608	13PH221A
1PSGEV609	13PH221A
1PSGEV610	13PH221C
1PSGEV611	13PH221A
1PSGEV613	13PH221C
1PSGEV614	13PH221C
1PSGEV615	13PH221C
1PSGEV616	13PH221C
1PSGEV617	13PH221C
1PSGEV618	13PH221C
1PSGEV619	13PH221C
1PSGEV620	13PH221C
1PSGEV621	13PH221C
1PSGEV622	13PH221C
1PSGEV623	13PH221C
1PSGEV624	13PH221C
1PSGEV625	13PH221C
1PSGEV626	13PH221C
1PSGEV627	13PH221C
1PSGEV628	13PH221C
1PSGEV629	13PH221C
1PSGEV630	13PH221C
1PSGEV631	13PH221C
1PSGEV632	13PH221C
1PSGEV633	13PH221C
1PSGEV634	13PH221C
1PSGEV635	13PH221C
1PSGEV636	13PH221C
1PSGEV637	13PH221C
1PSGEV638	13PH221C
1PSGEV639	13PH221C
1PSGEV640	13PH221C
1PSGEV642	13PH221B
1PSGEV644	13PH221A
1PSGEV652	13PH221B
1PSGEV653	13PH221B
1PSGEV658	13PH221C
1PSGEV659	13PH221C
1PSGEV660	13PH221A
1PSGEV661	13PH221A
1PSGEV662	13PH221C
1PSGEV663	13PH221C
1PSGEV665	13PH221A
1PSGEV666	13PH221A
1PSGEV693	13PH221B
1PSGNV267	13PH221A
1PSGNV268	13PH221A
1PSGNV432	13PH221B

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APPENDIX D

PVNGS 1,2&3

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 163 of 202)

04/19/82 15138146	EQUIPMENT-NOM CLASS	PAGE 104	SAFETY PARAMETER DISPLAY (SH-1)
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO	
1JSHAC01	OSPDS CH. A PROCESSOR	13NM001	
1JSHAC02	OSPDS ISOLATION CABINET	13NM001	
1JSHRC01	OSPDS CH B PROCESSOR	13NM001	
1JSHRC02	OSPDS ISOLATION CABINET	13NM001	
1JSHCC02	OSPDS ISOLATION CABINET	13NM001	
1JSHDC02	OSPDS ISOLATION CABINET	13NM001	

ENVIRONMENTAL QUALIFICATION REPORT
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APPENDIX D

PVNGS 1,2&3

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 164 of 202)

12/17/82 02:28:02

Q INSTRUMENTS BY SYSTEM

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(SH-2)

TAG NUMBER

DESCRIPTION

BECHTEL
SPEC/PO

1JSHAUC 0001
 1JSHAUI 0001
 1JSHBUC 0002
 1JSHBUI 0002
 1JSHATR 0003
 1JSHATR 0004

QUAL SAFETY PARA DIS CHA KEYBD
 QUAL SAFETY PARA DIS CH A
 QUAL SAFETY PARA DIS CHB KEYBD
 QUAL SAFETY PARA DIS CH B
 TEMP SAT HAR=RCS/REAC VES LVL
 CORE EXT TEMP/TEMP SAT HAR=CET

N=001
 N=001
 N=001
 N=001
 J=111
 J=111

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APPENDIX D

PVNGS 1,2&3

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 165 of 202)

04/19/82 15:38:46		EQUIPMENT-NOM CLASS	PAGE 106	SAFETY INJECTION	(SI-1)
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO			
1JSTEA01A	SI TK 2A XMITTER RACK	13NM001			
1JSTEA01B	SI TK 2B XMITTER RACK	13NM001			
1JSTEA01C	SI TK 1A XMITTER RACK	13NM001			
1JSTEA01D	SI TK 1B XMITTER RACK	13NM001			
1MSTAE01	SHUTDOWN COOLING HEAT EXCHNGR	13NM001			
1MSTAF01	LPSI PP 1 STARTUP STRAINER	13PM201			
1MSTAF02	HPSI PP 1 STARTUP STRAINER	13PM201			
1MSTAF03	CS PP 1 STARTUP STRAINER	13PM201			
1MSTAF04	CONT. RECIRC. SUMP 1 SCREEN	13CM069			
1MSTAF05	SPRAY CHEM ADD PP1 ST-UP STRNR	13PM407			
1MSTAM03	CONTAINMENT SPRAY NOZZLES	13NM001			
1MSTAM04	CONTAINMENT SPRAY NOZZLES	13NM001			
1MSTAP01	LPSI PUMP 1	13NM001			
1MSTAP02	HPSI PUMP 1	13NM001			
1MSTAP03	CONTAINMENT SPRAY PUMP 1	13NM001			
1MSTAP05	SPRAY CHEM ADD PUMP 1	13NM001			
1MSTAU21	PENETRATION-CONT SPRAY	13MM500			
1MSTAU23	PENETRATION-RECIRCULATION	13MM500			
1MSTAU26	PENETRATION-SHUTDOWN COOLING	13MM500			
1MSTBF01	SHUTDOWN COOLING HEAT EXCHNGR	13NM001			
1MSTBF01	LPSI PP 2 STARTUP STRAINER	13PM201			
1MSTBF02	HPSI PP 2 STARTUP STRAINER	13PM201			
1MSTBF03	CS PP 2 STARTUP STRAINER	13PM201			
1MSTBF04	CONT. RECIRC. SUMP 2 SCREEN	13CM069			
1MSTBF05	SPRAY CHEM ADD PP2 ST-UP STRNR	13PM407			
1MSTBM03	CONTAINMENT SPRAY NOZZLES	13NM001			
1MSTBM04	CONTAINMENT SPRAY NOZZLES	13NM001			
1MSTBP01	LPSI PUMP 2	13NM001			
1MSTBP02	HPSI PUMP 2	13NM001			
1MSTBP03	CONTAINMENT SPRAY PUMP 2	13NM001			
1MSTBP05	SPRAY CHEM ADD PUMP 2	13NM001			
1MSTBU22	PENETRATION-CONT SPRAY	13MM500			
1MSTBU24	PENETRATION-RECIRCULATION	13MM500			
1MSTBU27	PENETRATION-SHUTDOWN COOLING	13MM500			
1MSTEM01	TRISODIUM PHOSPHATE BASKETS				
1MSTEU13	PENETRATION-HP SI	13MM500			
1MSTEU14	PENETRATION-HP SI	13MM500			
1MSTEU15	PENETRATION-HP SI	13MM500			
1MSTEU16	PENETRATION-HP SI	13MM500			
1MSTEU17	PENETRATION-LP SI	13MM500			
1MSTEU18	PENETRATION-LP SI	13MM500			
1MSTEU19	PENETRATION-LP SI	13MM500			
1MSTEU20	PENETRATION-LP SI	13MM500			
1MSTEU28	PENETRATION-SI TANK DRAIN	13MM500			
1MSTEU67	PENETRATION-LONG TERM RECIRC 1	13MM500			
1MSTEU77	PENETRATION-LONG TERM RECIRC 2	13MM500			
1MSTEX01A	SAFETY INJECTION TANK (2A)	13NM001			
1MSTEX01B	SAFETY INJECTION TANK (2B)	13NM001			
1MSTEX01C	SAFETY INJECTION TANK (1A)	13NM001			
1MSTEX01D	SAFETY INJECTION TANK (1B)	13NM001			
1MSTEX03	SPRAY CHEMICAL STORAGE TANK	13NM001			

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PVNGS 1,2&3

ENVIRONMENTAL QUALIFICATION REPORT
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APPENDIX D

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 166 of 202)

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TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO
1JSIAHS 0001	HPSI PP A	J-200
1JSIBHS 0002	HPSI PP B	J-200
1JSIAHS 0003	LPSI PP A	J-200
1JSIBHS 0004	LPSI PP B	J-200
1JSIAHS 0005	CNTMT SPRAY PP A	J-200
1JSIBHS 0006	CNTMT SPRAY PP B	J-200
1JSIAHS 0017A	SI TK VENT VLVs A PWR DISC	J-200
1JSIAHS 0017B	SI TK VENT VLVs A PWR DISC=RS	N-001
1JSIBHS 0018A	SI TK VENT VLVs B PWR DISC	J-200
1JSIBHS 0018B	SI TK VENT VLVs B PWR DISC=RS	N-001
1JSIBHS 0018C	SI TK VENT VLVs PWR DISC=DISC	N-001
1JSIAED 0019	LPSI PP A RECIRC	N-001
1JSIBFO 0020	LPSI PP B RECIRC	N-001
1JSIAFO 0021	CS PP A RECIRC	N-001
1JSIBFO 0022	CS PP B RECIRC	N-001
1JSIAED 0023	HOT LEG INJ A BYPASS	J-425
1JSIBFO 0024	HOT LEG INJ B BYPASS	J-425
1JSIAED 0025	HPSI A RECIRC TO RMT	N-001
1JSIBFO 0026	HPSI B RECIRC TO RMT	N-001
1JSIEFO 0027	SI LOOP 2A RELIEF	J-425
1JSIEFO 0028	SI LOOP 2B RELIEF	J-425
1JSIEFO 0029	SI LOOP 1A RELIEF	J-425
1JSIEFO 0030	SI LOOP 1B RELIEF	J-425
1JSIAED 0031	CNTMT SPRAY HDR NO 1 AUX SPRAY	J-425
1JSIBFO 0032	CNTMT SPRAY HDR NO 2 AUX SPRAY	J-425
1JSIAFO 0033	CNTMT SPRAY HDR NO 1 AUX SPRAY	J-425
1JSIBFO 0034	CNTMT SPRAY HDR NO 2 AUX SPRAY	J-425
1JSIAFO 0039	LPSI DSCH HDR 1A	J-425
1JSIBFO 0040	LPSI DSCH HDR 2A	J-425
1JSIAFO 0041	LPSI DSCH HDR 1B	J-425
1JSIBFO 0042	LPSI DSCH HDR 2B	J-425
1JSIAFO 0043	HPSI A DSCH HDR 1B	J-425
1JSIBFO 0044	HPSI B DSCH HDR 1B	J-425
1JSIAFO 0045	HPSI A DSCH HDR 1A	J-425
1JSIBFO 0046	HPSI B DSCH HDR 1A	J-425
1JSIAED 0047	HPSI A DSCH HDR 2B	J-425
1JSIBFO 0048	HPSI B DSCH HDR 2B	J-425
1JSIAFO 0049	HPSI A DSCH HDR 2A	J-425
1JSIBFO 0050	HPSI B DSCH HDR 2A	J-425
1JSIAFO 0051	CONT SPRAY HDR	J-425
1JSIAFO 0052	CONT SPRAY HDR	J-425
1JSIAFO 0053	CONT SPRAY HDR	J-425
1JSIAFO 0054	CONT SPRAY HDR	J-425
1JSIBFO 0055	CONT SPRAY HDR	J-425
1JSIBFO 0056	CONT SPRAY HDR	J-425
1JSIBFO 0057	CONT SPRAY HDR	J-425
1JSIBFO 0058	CONT SPRAY HDR	J-425
1JSIAHS 0060	SI SPRAY CHEM ADDITION PP A	J-200
1JSIBHS 0061	SI SPRAY CHEM ADDITION PP B	J-200
1JSIEXCV 0066	EXC FLOW CHK VLV FOR PI-66	J-705
1JSIEFO 0087	SI DRAIN TO RDT	J-425
1JSIEFO 0090	S/D COOLING LINE NO 1	J-425
1JSIEFO 0091	S/D COOLING LINE NO 2	J-425
1JSIEPSV 0100	SPRAY CHEM STOR TK	N-001

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APPENDIX D

PVNGS 1, 2&3

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 167 of 202)

12/17/82 02:28:02	Q INSTRUMENTS BY SYSTEM		PAGE 95
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO	(SI-3)
1JSIEPSV 0118	SPRAY CHEM STOR TK	N=001	
1JSIBPSV 0140	CONTMT RECIRC SUMP B RELIEF	N=001	
1JSIBPSV 0141	FUEL POOL CLG B RELIEF TO EDT	N=001	
1JSIAPSV 0150	FUEL POOL CLG A RELIEF TO EDT	N=001	
1JSIAPSV 0151	CONTMT RECIRC SUMP A RELIEF	N=001	
1JSIAPSV 0159	SPRAY CHEM PP A SUCTION	N=001	
1JSIBPSV 0160	SPRAY CHEM PP B SUCTION	N=001	
1JSIAPSV 0161	LPSI A TO FUEL POOL CLG RELIEF	N=001	
1JSIAPSV 0162	LPSI A TO FUEL POOL CLG RELIEF	N=001	
1JSIBPSV 0166	HPST PP B LONG TERM CLG	N=001	
1JSIBPSV 0169	S/D CLG TRAIN B	N=001	
1JSIAPSV 0178	SPRAY CHEM PP A RELIEF	N=001	
1JSIAPSV 0179	S/D CLG TRAIN A RETURN RELIEF	N=001	
1JSIBPSV 0187	SPRAY CHEM PP B RELIEF	N=001	
1JSIBPSV 0189	S/D CLG TRAIN B RETURN RELIEF	N=001	
1JSIBPSV 0191	S/D CLG HE OUT TRAIN B TO EDT	N=001	
1JSIBPSV 0192	LPSI B TO FUEL POOL CLG RELIEF	N=001	
1JSIBPSV 0193	LPSI B TO FUEL POOL CLG RELIEF	N=001	
1JSIAPSV 0194	S/D CLG HE OUT TRAIN A TO EDT	N=001	
1JSIEPSV 0211	SI TK 1	N=001	
1JSIEPSV 0221	SI TK 2	N=001	
1JSIEPSV 0231	SI TK 3	N=001	
1JSIEPSV 0241	SI TK 4	N=001	
1JSIEPSV 0250	SPRAY CHEM STORAGE TANK	N=001	
1JSIAPSV 0285	TRAIN A RECIRC THERMAL RELIEF	N=001	
1JSIBPSV 0286	TRAIN B RECIRC THERMAL RELIEF	N=001	
1JSIBPSV 0287	S/D CLG THERMAL RELIEF TRAIN B	N=001	
1JSIEPSV 0288	SI DRN HDR RELIEF TO EDT	N=001	
1JSIAPSV 0289	S/D CLG THERMAL RELIEF TRAIN A	N=001	
1JSIATE 0303X	S/D CLG HE OUT TRAIN A	N=001	
1JSIATI 0303X	S/D CLG HE OUT TRAIN A	N=001	
1JSIATT 0303X	R/E CONVERTOR	N=001	
1JSIATW 0303X	S/D CLG HE OUT TRAIN A	N=001	
1JSIBTE 0303Y	S/D CLG HE OUT TRAIN B	N=001	
1JSIBTI 0303Y	S/D CLG HE OUT TRAIN B	N=001	
1JSIBTI 0303Y	R/E CONVERTOR	N=001	
1JSIBTW 0303Y	S/D CLG HE OUT TRAIN B	N=001	
1JSIAFE 0306	LPSI PP A HDR DSCH	N=001	
1JSIAFI 0306	LPSI PP A HDR DSCH	N=001	
1JSIAFT 0306	LPSI PP A HDR DSCH	N=001	
1JSIAFY 0306	I/E CONVERTOR	N=001	
1JSIAHS 0306	LPSI PP A HDR DSCH	J=200	
1JSIAHV 0306	LPSI PP A HDR DSCH	N=001	
1JSIAZI 0306	LPSI PP A HDR DSCH	J=200	
1JSIAZI 0306	LPSI PP A HDR DSCH	N=001	
1JSIAFI 0306-1	LPSI PP A HDR DSCH=RS	N=001	
1JSIAFY 0306-1	SO. ROOT CONVERTOR	N=001	
1JSIBEE 0307	LPSI PP B HDR DSCH	N=001	
1JSIBFI 0307	LPSI PP B HDR DSCH	N=001	
1JSIBFT 0307	LPSI PP B HDR DSCH	N=001	
1JSIBFY 0307	I/E CONVERTOR	N=001	
1JSIBHS 0307	LPSI PP B HDR DSCH	J=200	
1JSIBHV 0307	LPSI PP B HDR DSCH	N=001	
1JSIBZI 0307	LPSI PP B HDR DSCH	J=200	

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APPENDIX D

PVNGS 1,2&3

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 168 of 202)

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Q INSTRUMENTS BY SYSTEM

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PVNGS 1, 2&3

TAG NUMBER

DESCRIPTION

BECHTEL
SPEC/PO

1JSIBZT 0307	LPSI PP B HDR DSCH	N=001
1JSIBFI 0307-1	LPSI PP B HDR DSCH=RS	N=001
1JSIBFY 0307-1	SO. ROOT CONVERTOR	N=001
1JSIAFE 0308	SPRAY CHEM PP A DISCH	N=001
1JSIAFI 0308	SPRAY CHEM PP A DISCH	N=001
1JSIAET 0308	SPRAY CHEM PP A DISCH	N=001
1JSIAFY 0308	I/E CONVERTOR	N=001
1JSIAPY 0308-1	SO. ROOT CONVERTOR	N=001
1JSIBFE 0309	SPRAY CHEM PP B DISCH	N=001
1JSIBFI 0309	SPRAY CHEM PP B DISCH	N=001
1JSIBFT 0309	SPRAY CHEM PP B DISCH	N=001
1JSIBFY 0309-1	I/E CONVERTOR	N=001
1JSIBFY 0309-1	SO. ROOT CONVERTOR	N=001
1JSIBFE 0311	HPSI FLOW TO RC 2A	N=001
1JSIBFI 0311	HPSI FLOW TO RC 2A/2B	N=001
1JSIBFT 0311	HPSI FLOW TO RC 2A	N=001
1JSIBFY 0311	I/E CONVERTOR.	N=001
1JSIBLI 0311	SI TK5 1/2	N=001
1JSIBLT 0311	SI TK 1	N=001
1JSIBLY 0311	I/E CONVERTOR	N=001
1JSIBPI 0311	SI TK5 1/2	N=001
1JSIBPT 0311	SI TK 1	N=001
1JSIBPY 0311	I/E CONVERTOR	N=001
1JSIBFI 0311-1	HPSI FLOW TO RC 2A/2B	J=111
1JSIBFY 0311-1	SO. ROOT CONVERTOR	N=001
1JSIBPI 0311-1	SI TK 1=RS	N=001
1JSIBPT 0313	SI TK5 1/2	N=001
1JSIBPSLLO313	SI TK 1	N=001
1JSIBPT 0313	SI TK 1	N=001
1JSIBPY 0313	I/E CONVERTOR	N=001
1JSIBPSL 0313-1	SI TK 1=1E ALARM	N=001
1JSIBFE 0321	HPSI FLOW TO RC 2B	N=001
1JSIBFT 0321	HPSI FLOW TO RC 2B	N=001
1JSIBFY 0321	I/E CONVERTOR	N=001
1JSIBLT 0321	SI TK 2	N=001
1JSIBLY 0321	I/E CONVERTOR	N=001
1JSIBPT 0321	SI TK 2	N=001
1JSIBPY 0321	I/E CONVERTOR	N=001
1JSICH3 0321	HPSI PP A LONG TERM CLG	J=200
1JSICHV 0321	HPSI PP A LONG TERM CLG	N=001
1JSICZ1 0321	HPSI PP A LONG TERM CLG	J=200
1JSICZT 0321	HPSI PP A LONG TERM CLG	N=001
1JSIBFY 0321-1	SO. ROOT CONVERTOR	N=001
1JSIBPI 0321-1	SI TK 2=RS	N=001
1JSIBHS 0322	HOT LEG INJ CHK VLV LEAK ISOL	J=200
1JSIBUV 0322	HOT LEG INJ CHK VLV LEAK ISOL	N=001
1JSIBUY 0322	HOT LEG INJ CHK VLV LEAK ISOL	N=001
1JSIBPSHH0322	SI TK 2	N=001
1JSIBPSLLO323	SI TK 2	N=001
1JSIBPT 0323	SI TK 2	N=001
1JSIBPY 0323	I/E CONVERTOR	N=001
1JSIBPSL 0323-1	SI TK 2=1E ALARM	N=001
1JSIAFE 0331	HPSI FLOW TO RC 1A	N=001
1JSIAFI 0331	HPSI FLOW TO RC 1A/1B	N=001

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 169 of 202)

12/17/82 02:28:02		O INSTRUMENTS BY SYSTEM		PAGE 97
TAG NUMBER		DESCRIPTION	BECHTEL SPEC/PO	(SI-5)
1JSTAFY	0331	HPSI FLOW TO RC 1A	N=001	
1JSTAFY	0331	I/E CONVERTOR	N=001	
1JSTALI	0331	SI TKS 3/4	N=001	
1JSTALT	0331	SI TK 3	N=001	
1JSTALY	0331	I/E CONVERTOR	N=001	
1JSTAPI	0331	SI TKS 3/4	N=001	
1JSTAPT	0331	SI TK 3	N=001	
1JSTAPY	0331	I/E CONVERTOR	N=001	
1JSTOHS	0331	HPSI PP B LONG TERM CLG	J=200	
1JSTOHV	0331	HPSI PP B LONG TERM CLG	N=001	
1JSTOZI	0331	HPSI PP B LONG TERM CLG	J=200	
1JSTOZT	0331	HPSI PP B LONG TERM CLG	N=001	
1JSTAFI	0331-1	HPSI FLOW TO RC 1A/1B	J=111	
1JSTAFY	0331-1	SQ. ROOT CONVERTOR	N=001	
1JSTAPI	0331-1	SI TK 3--RS	N=001	
1JSTBHS	0332	HOT LEG INJ CHK VLV LEAK ISOL	J=200	
1JSTBHV	0332	HOT LEG INJ CHK VLV LEAK ISOL	N=001	
1JSTBUY	0332	HOT LEG INJ CHK VLV LEAK ISOL	N=001	
1JSTAPI	0333	SI TKS 3/4	N=001	
1JSTAPSHH0333		SI TK 3	N=001	
1JSTAPSLLO333		SI TK 3	N=001	
1JSTAPT	0333	SI TK 3	N=001	
1JSTAPY	0333	I/E CONVERTOR	N=001	
1JSTAPSL	0333-1	SI TK 3--IE ALARM	N=001	
1JSTAPE	0338	CONT SPRAY PP A DSCH	N=001	
1JSTAPI	0338	CONT SPRAY PP A DSCH	N=001	
1JSTAPT	0338	CONT SPRAY PP A DSCH	N=001	
1JSTAFY	0338	I/E CONVERTOR	N=001	
1JSTAFY	0338-1	SQ. ROOT CONVERTOR	N=001	
1JSTAPE	0341	HPSI FLOW TO RC 1B	N=001	
1JSTAPT	0341	HPSI FLOW TO RC 1B	N=001	
1JSTAFY	0341	I/E CONVERTOR	N=001	
1JSTALT	0341	SI TK 4	N=001	
1JSTALY	0341	I/E CONVERTOR	N=001	
1JSTAPT	0341	SI TK 4	N=001	
1JSTAPY	0341	I/E CONVERTOR	N=001	
1JSTAPY	0341-1	SQ. ROOT CONVERTOR	N=001	
1JSTAPI	0341-1	SI TK 4--RS	N=001	
1JSTAPSHH0343		SI TK 4	N=001	
1JSTAPSLLO343		SI TK 4	N=001	
1JSTAPT	0343	SI TK 4	N=001	
1JSTAPY	0343	I/E CONVERTOR	N=001	
1JSTAPSL	0343-1	SI TK 4--IE ALARM	N=001	
1JSTBLI	0344	VOIDED	N=001	
1JSTBLSLLO344		SPRAY CHEM STORAGE TANK	N=001	
1JSTBLT	0344	SPRAY CHEM STORAGE TANK	N=001	
1JSTBLY	0344	I/E CONVERTOR	N=001	
1JSTALI	0345	SPRAY CHEM STORAGE TANK	N=001	
1JSTALSLO345		SPRAY CHEM STORAGE TANK	N=001	
1JSTALT	0345	SPRAY CHEM STORAGE TANK	N=001	
1JSTALY	0345	I/E CONVERTOR	N=001	
1JSTAXCV	0346	EXC FLOW CHK VLV FOR PI=346	J=705	
1JSTBXC	0347	EXC FLOW CHK VLV FOR PI=347	J=705	
1JSTBFE	0348	CONT SPRAY PP B DSCH	N=001	

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 170 of 202)

12/17/82 02:28:02		Q INSTRUMENTS BY SYSTEM		PAGE 98
TAG NUMBER		DESCRIPTION	BECHTEL SPEC/PO	(SI-6)
1JSIBFI 0348		CONT SPRAY PP B DSCH	N=001	
1JSIBFT 0348		CONT SPRAY PP B DSCH	N=001	
1JSIBFY 0348		I/E CONVERTOR	N=001	
1JSIBLI 0348		SPRAY CHEM STORAGE TANK	N=001	
1JSIBLSL 0348		SPRAY CHEM STORAGE TANK	N=001	
1JSIBLT 0348		SPRAY CHEM STORAGE TANK	N=001	
1JSIBLY 0348		I/E CONVERTOR	N=001	
1JSIBFY 0348-1		SO, ROOT CONVERTOR	N=001	
1JSIALY 0349		SPRAY CHEM STORAGE TANK	N=001	
1JSIALSL 0349		SPRAY CHEM STORAGE TANK	N=001	
1JSIALT 0349		SPRAY CHEM STORAGE TANK	N=001	
1JSIALY 0349		I/E CONVERTOR	N=001	
1JSIATR 0351		S/D CLG TRIN A	N=001	
1JSIATE 0351X		S/D CLG TRIN A	N=001	
1JSIATZ 0351X		S/D CLG TRIN A==RS	N=001	
1JSIATT 0351X		R/E CONVERTOR	N=001	
1JSIATM 0351X		S/D CLG TRIN A	N=001	
1JSIATE 0351Y		S/D CLG TRIN A	N=001	
1JSIATT 0351Y		S/D CLG TRIN A==RS	N=001	
1JSIATT 0351Y		R/E CONVERTOR	N=001	
1JSIATM 0351Y		S/D CLG TRIN A	N=001	
1JSIBTR 0352		S/D CLG TRIN B	N=001	
1JSIBTE 0352X		S/D CLG TRIN B	N=001	
1JSIBTI 0352X		S/D CLG TRIN B==RS	N=001	
1JSIBTT 0352X		R/E CONVERTOR	N=001	
1JSIBTW 0352X		S/D CLG TRIN B	N=001	
1JSIBTE 0352Y		S/D CLG TRIN B	N=001	
1JSIBTI 0352Y		S/D CLG TRIN B==RS	N=001	
1JSIBTT 0352Y		R/E CONVERTOR	N=001	
1JSIBTW 0352Y		S/D CLG TRIN B	N=001	
1JSIAFE 0390		HPSI PP A LONG TERM CLG	N=001	
1JSIAFI 0390		HPSI PP A LONG TERM CLG	N=001	
1JSIAFT 0390		HPSI PP A LONG TERM CLG	N=001	
1JSIAFY 0390		I/E CONVERTOR	N=001	
1JSIAFY 0390-1		SO, ROOT CONVERTOR	N=001	
1JSIBEE 0391		HPSI PP B LONG TERM CLG	N=001	
1JSIBFI 0391		HPSI PP B LONG TERM CLG	N=001	
1JSIBFT 0391		HPSI PP B LONG TERM CLG	N=001	
1JSIBFY 0391		I/E CONVERTOR	N=001	
1JSIBFY 0391-1		SO, ROOT CONVERTOR	N=001	
1JSIEPSV 0407		SI DRN RELIEF TO EDT	N=001	
1JSIBPSV 0409		HPSI B THERMAL RELIEF TO EDT	N=001	
1JSIAPSV 0417		HPSI A THERMAL RELIEF TO EDT	N=001	
1JSIAPSV 0439		LPSI A THERMAL RELIEF TO EDT	N=001	
1JSIBPSV 0449		LPSI B THERMAL RELIEF TO EDT	N=001	
1JSIAPSV 0468		HPSI PP A LONG TERM CLG	N=001	
1JSIAPSV 0469		S/D CLG TRIN A	N=001	
1JSIEPSV 0473		SI DRN VENT TO RDT	N=001	
1JSIEPSV 0474		SI DRN RELIEF TO RDT	N=001	
1JSIBHS 0602		SPRAY CHEM PP B	J=200	
1JSIBUV 0602		SPRAY CHEM PP B SUCTION	N=001	
1JSIAHS 0603		SPRAY CHEM PP A	J=200	
1JSIAUV 0603		SPRAY CHEM PP A SUCTION	N=001	
1JSIAHS 0604		HPSI PP A LONG TERM CLG	J=200	

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APPENDIX D

PVNGS 1, 2&3

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 171 of 202)

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TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO	(SI-7)
1JSIAHV 0604	HPSI PP A LONG TERM CLG	N=001	
1JSIAZI 0604	HPSI PP A LONG TERM CLG	J=200	
1JSIAZI 0604	HPSI PP A LONG TERM CLG	N=001	
1JSIAHV 0605	SI TK 1 VENT	N=001	
1JSIAHS 0605A	SI TK 1 VENT==CR	J=200	
1JSIAHS 0605B	SI TK 1 VENT==RS	N=001	
1JSIAHV 0606	SI TK 2 VENT	N=001	
1JSIAHS 0606A	SI TK 2 VENT==CR	J=200	
1JSIAHS 0606B	SI TK 2 VENT==RS	N=001	
1JSIAHV 0607	SI TK 3 VENT	N=001	
1JSIAHS 0607A	SI TK 3 VENT==CR	J=200	
1JSIAHS 0607B	SI TK 3 VENT==RS	N=001	
1JSIAHV 0608	SI TK 4 VENT	N=001	
1JSIAHS 0608A	SI TK 4 VENT==CR	J=200	
1JSIAHS 0608B	SI TK 4 VENT==RS	N=001	
1JSIBHS 0609	HPSI PP B LONG TERM CLG	J=200	
1JSIBHV 0609	HPSI PP B LONG TERM CLG	N=001	
1JSIBZI 0609	HPSI PP B LONG TERM CLG	J=200	
1JSIBZI 0609	HPSI PP B LONG TERM CLG	N=001	
1JSIBHS 0611	SI TK 1 FILL/DRN	J=200	
1JSIBUV 0611	SI TK 1 FILL/DRN	N=001	
1JSIBUY 0611	SI TK 1 FILL/DRN	N=001	
1JSIBHS 0612	N2 SUPPLY SI TK 1	J=200	
1JSIBHV 0612	N2 SUPPLY SI TK 1	N=001	
1JSIBHY 0612	N2 SUPPLY SI TK 1	N=001	
1JSIBHV 0613	SI TK 1 VENT	N=001	
1JSIBHS 0613A	SI TK 1 VENT==CR	J=200	
1JSIBHS 0613B	SI TK 1 VENT==RS	N=001	
1JSIBHS 0613C	SI TK 1 VENT DISCONNECT (RS)	N=001	
1JSIBHS 0614	SI TK 1 ISOL	J=200	
1JSIBUV 0614	SI TK 1 ISOL	N=001	
1JSIBZI 0614	SI TK 1 ISOL	J=200	
1JSIBZI 0614	SI TK 1 ISOL	N=001	
1JSIBHS 0615	LPSI FLOW CONTROL TO RC 2A	J=200	
1JSIBUV 0615	LPSI FLOW CONTROL TO RC 2A	N=001	
1JSIBZI 0615	LPSI FLOW CONTROL TO RC 2A	J=200	
1JSIBZI 0615	LPSI FLOW CONTROL TO RC 2A	N=001	
1JSIBHS 0616	HPSI 2 FLOW CONTROL TO RC 2A	J=200	
1JSIBUV 0616	HPSI 2 FLOW CONTROL TO RC 2A	N=001	
1JSIBZI 0616	HPSI 2 FLOW CONTROL TO RC 2A	J=200	
1JSIBZI 0616	HPSI 2 FLOW CONTROL TO RC 2A	N=001	
1JSIAHS 0617	HPSI 1 FLOW CONTROL TO RC 2A	J=200	
1JSIAUV 0617	HPSI 1 FLOW CONTROL TO RC 2A	N=001	
1JSIAZI 0617	HPSI 1 FLOW CONTROL TO RC 2A	J=200	
1JSIAZI 0617	HPSI 1 FLOW CONTROL TO RC 2A	N=001	
1JSIBHS 0618	SI TK 1 CHECK VLV LEAK LN ISOL	J=200	
1JSIBUV 0618	SI TK 1 CHECK VLV LEAK LN ISOL	N=001	
1JSIBUY 0618	SI TK 1 CHECK VLV LEAK LN ISOL	N=001	
1JSIAHS 0619	N2 STOP SI TK 1	J=200	
1JSIAHV 0619	N2 STOP SI TK 1	N=001	
1JSIAHY 0619	N2 STOP SI TK 1	N=001	
1JSIBHS 0621	SI TK 2 FILL/DRN	J=200	
1JSIBUV 0621	SI TK 2 FILL/ DRN	N=001	
1JSIBUY 0621	SI TK 2 FILL/ DRN	N=001	

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 ENVIRONMENTAL QUALIFICATION REPORT
 PER REQUIREMENTS OF NUREG-0588

APPENDIX D

PVNGS 1, 2&3

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 172 of 202)

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Q INSTRUMENTS BY SYSTEM

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(SI-8)

TAG NUMBER

DESCRIPTION

BECHTEL
SPEC/PO

1JS1BHS 0622	N2 SUPPLY SI TK 2	J-200
1JS1BHV 0622	N2 SUPPLY SI TK 2	N-001
1JS1BHY 0622	N2 SUPPLY SI TK 2	N-001
1JS1BHV 0623	SI TK 2 VENT	N-001
1JS1BHS 0623A	SI TK 2 VENT=CR	J-200
1JS1BHS 0623B	SI TK 2 VENT=RS	N-001
1JS1BHS 0623C	SI TK 2 VENT DISCONNECT (RS)	N-001
1JS1BHS 0624	SI TK 2 ISOL	J-200
1JS1BUV 0624	SI TK 2 ISOL	N-001
1JS1BZI 0624	SI TK 2 ISOL	J-200
1JS1BZI 0624	SI TK 2 ISOL	N-001
1JS1BHS 0625	LPSI FLOW CONTROL TO RC 2B	J-200
1JS1BUV 0625	LPSI FLOW CONTROL TO RC 2B	N-001
1JS1BZI 0625	LPSI FLOW CONTROL TO RC 2B	J-200
1JS1BZI 0625	LPSI FLOW CONTROL TO RC 2B	N-001
1JS1BHS 0626	HPSI 2 FLOW CONTROL TO RC 2B	J-200
1JS1BUV 0626	HPSI 2 FLOW CONTROL TO RC 2B	N-001
1JS1BZI 0626	HPSI 2 FLOW CONTROL TO RC 2B	J-200
1JS1BZI 0626	HPSI 2 FLOW CONTROL TO RC 2B	N-001
1JS1AHS 0627	HPSI 1 FLOW CONTROL TO RC 2B	J-200
1JS1AUV 0627	HPSI 1 FLOW CONTROL TO RC 2B	N-001
1JS1AZI 0627	HPSI 1 FLOW CONTROL TO RC 2B	J-200
1JS1AZT 0627	HPSI 1 FLOW CONTROL TO RC 2B	N-001
1JS1BHS 0628	SI TK 2 CHECK VLV LEAK LN ISOL	J-200
1JS1BUV 0628	SI TK 2 CHECK VLV LEAK LN ISOL	N-001
1JS1BUV 0628	SI TK 2 CHECK VLV LEAK LN ISOL	N-001
1JS1AHS 0629	N2 SUPPLY SI TK 2	J-200
1JS1AHV 0629	N2 SUPPLY SI TK 2	N-001
1JS1AHY 0629	N2 SUPPLY SI TK 2	N-001
1JS1BHS 0631	SI TK 3 FILL/DRN	J-200
1JS1BUV 0631	SI TK 3 FILL/DRN	N-001
1JS1BUV 0631	SI TK 3 FILL/DRN	N-001
1JS1BHS 0632	N2 SUPPLY SI TK 3	J-200
1JS1BHV 0632	N2 SUPPLY SI TK 3	N-001
1JS1BHY 0632	N2 SUPPLY SI TK 3	N-001
1JS1BHV 0633	SI TK 3 VENT	N-001
1JS1BHS 0633A	SI TK 3 VENT=CR	J-200
1JS1BHS 0633B	SI TK 3 VENT=RS	N-001
1JS1BHS 0633C	SI TK 3 VENT DISCONNECT (RS)	N-001
1JS1AHS 0634	SI TK 3 ISOL	J-200
1JS1AUV 0634	SI TK 3 ISOL	N-001
1JS1AZI 0634	SI TK 3 ISOL	J-200
1JS1AZT 0634	SI TK 3 ISOL	N-001
1JS1AHS 0635	LPSI FLOW CONTROL TO RC 1A	J-200
1JS1AUV 0635	LPSI FLOW CONTROL TO RC 1A	N-001
1JS1AZI 0635	LPSI FLOW CONTROL TO RC 1A	J-200
1JS1AZT 0635	LPSI FLOW CONTROL TO RC 1A	N-001
1JS1BHS 0636	HPSI B FLOW CONTROL TO RC 1A	J-200
1JS1BUV 0636	HPSI B FLOW CONTROL TO RC 1A	N-001
1JS1BZI 0636	HPSI B FLOW CONTROL TO RC 1A	J-200
1JS1BZI 0636	HPSI B FLOW CONTROL TO RC 1A	N-001
1JS1AHS 0637	HPSI A FLOW CONTROL TO RC 1A	J-200
1JS1AUV 0637	HPSI A FLOW CONTROL TO RC 1A	N-001
1JS1AZI 0637	HPSI A FLOW CONTROL TO RC 1A	J-200

ENVIRONMENTAL QUALIFICATION REPORT
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APPENDIX D

PVNGS 1, 2&3

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 173 of 202)

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Q INSTRUMENTS BY SYSTEM

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(SI-9)

TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO
1JSIAZT 0637	HPSI A FLOW CONTROL TO RC 1A	N=001
1JSIBHS 0638	SI TK 3 CHECK VLV LEAK LN ISOL	J=200
1JSIBUV 0638	SI TK 3 CHECK VLV LEAK LN ISOL	N=001
1JSIBUY 0638	SI TK 3 CHECK VLV LEAK LN ISOL	N=001
1JSIAHS 0639	N2 SUPPLY SI TK 3	J=200
1JSIAHV 0639	N2 SUPPLY SI TK 3	N=001
1JSIAHY 0639	N2 SUPPLY SI TK 3	N=001
1JSIBHS 0641	SI TK 4 FILL/DRN	J=200
1JSIBUV 0641	SI TK 4 FILL/DRN	N=001
1JSIBUY 0641	SI TK 4 FILL/DRN	N=001
1JSIBHS 0642	N2 SUPPLY SI TK 4	J=200
1JSIBHV 0642	N2 SUPPLY SI TK 4	N=001
1JSIBHY 0642	N2 SUPPLY SI TK 4	N=001
1JSIBHV 0643	SI TK 4 VENT	N=001
1JSIBHS 0643A	SI TK 4 VENT=CR	J=200
1JSIBHS 0643B	SI TK 4 VENT=RS	N=001
1JSIBHS 0643C	SI TK 4 VENT DISCONNECT (RS)	N=001
1JSIAHS 0644	SI TK 4 ISOL	J=200
1JSIAUV 0644	SI TK 4 ISOL	N=001
1JSIAZI 0644	SI TK 4 ISOL	J=200
1JSIAZT 0644	SI TK 4 ISOL	N=001
1JSIAHS 0645	LPSI FLOW CONTROL TO RC 1B	J=200
1JSIAUV 0645	LPSI FLOW CONTROL TO RC 1B	N=001
1JSIAZI 0645	LPSI FLOW CONTROL TO RC 1B	J=200
1JSIAZT 0645	LPSI FLOW CONTROL TO RC 1B	N=001
1JSIBHS 0646	HPSI 2 FLOW CONTROL TO RC 1B	J=200
1JSIBUV 0646	HPSI 2 FLOW CONTROL TO RC 1B	N=001
1JSIBZI 0646	HPSI 2 FLOW CONTROL TO RC 1B	J=200
1JSIBZT 0646	HPSI 2 FLOW CONTROL TO RC 1B	N=001
1JSIAHS 0647	HPSI 1 FLOW CONTROL TO RC 1B	J=200
1JSIAUV 0647	HPSI 1 FLOW CONTROL TO RC 1B	N=001
1JSIAZI 0647	HPSI 1 FLOW CONTROL TO RC 1B	J=200
1JSIAZT 0647	HPSI 1 FLOW CONTROL TO RC 1B	N=001
1JSIBHS 0648	SI TK 4 CHECK VLV LEAK LN ISOL	J=200
1JSIBUV 0648	SI TK 4 CHECK VLV LEAK LN ISOL	N=001
1JSIBUY 0648	SI TK 4 CHECK VLV LEAK LN ISOL	N=001
1JSIAHS 0649	N2 STOP SI TK 4	J=200
1JSIAHV 0649	N2 STOP SI TK 4	N=001
1JSIAHY 0649	N2 STOP SI TK 4	N=001
1JSIAHS 0651	S/D CLG ISOL LOOP 1	J=200
1JSIAUV 0651	S/D CLG ISOL LOOP 1	N=001
1JSIAZI 0651	S/D CLG ISOL LOOP 1	J=200
1JSIAZT 0651	S/D CLG ISOL LOOP 1	N=001
1JSIBHS 0652	S/D CLG ISOL LOOP 2	J=200
1JSIBUV 0652	S/D CLG ISOL LOOP 2	N=001
1JSIBZI 0652	S/D CLG ISOL LOOP 2	J=200
1JSIBZT 0652	S/D CLG ISOL LOOP 2	N=001
1JSICHS 0653	S/D CLG ISOL LOOP 1	J=200
1JSICUV 0653	S/D CLG ISOL LOOP 1	N=001
1JSICZI 0653	S/D CLG ISOL LOOP 1	J=200
1JSICZT 0653	S/D CLG ISOL LOOP 1	N=001
1JSIDHS 0654	S/D CLG ISOL LOOP 2	J=200
1JSIDUV 0654	S/D CLG ISOL LOOP 2	N=001
1JSIDZI 0654	S/D CLG ISOL LOOP 2	J=200

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 174 of 202)

12/17/82 02:28102		O INSTRUMENTS BY SYSTEM		PAGE 102
TAG NUMBER		DESCRIPTION	BECHTEL SPEC/PO	(SI-10)
1JS102T 0654		S/D CLG ISOL LOOP 2	N=001	
1JS1AHS 0655		S/D CLG CONT ISOL LOOP 1	J=200	
1JS1AUV 0655		S/D CLG CONT ISOL LOOP 1	N=001	
1JS1BHS 0656		S/D CLG CONT ISOL LOOP 2	J=200	
1JS1BUV 0656		S/D CLG CONT ISOL LOOP 2	N=001	
1JS1AHS 0657		S/D CLG TEMP CONTROL TRAIN A	J=200	
1JS1AHV 0657		S/D CLG TEMP CONTROL TRAIN A	N=001	
1JS1AZI 0657		S/D CLG TEMP CONTROL TRAIN A	J=200	
1JS1AZT 0657		S/D CLG TEMP CONTROL TRAIN A	N=001	
1JS1BHS 0658		S/D CLG TEMP CONTROL TRAIN B	J=200	
1JS1BHV 0658		S/D CLG TEMP CONTROL TRAIN B	N=001	
1JS1BZI 0658		S/D CLG TEMP CONTROL TRAIN B	J=200	
1JS1BZT 0658		S/D CLG TEMP CONTROL TRAIN B	N=001	
1JS1BHS 0659		TRAIN B RECIRC TO RWT	J=200	
1JS1BUV 0659		TRAIN B RECIRC TO RWT	N=001	
1JS1BHS 0659=1		TRAIN B RECIRC TO RWT=RS	N=001	
1JS1AHS 0660		TRAIN A RECIRC TO RWT	J=200	
1JS1AUV 0660		TRAIN A RECIRC TO RWT	N=001	
1JS1AHS 0660=1		TRAIN A RECIRC TO RWT=RS	N=001	
1JS1EHV 0661		SI DRN TO RDT	N=001	
1JS1HHV 0661		SI DRN TO RDT	N=001	
1JS1AHS 0664		CS PMP A TO RWT ISOL	J=200	
1JS1AUV 0664		CS PMP A TO RWT ISOL	N=001	
1JS1BHS 0665		CS PMP B TO RWT ISOL	J=200	
1JS1BUV 0665		CS PMP B TO RWT ISOL	N=001	
1JS1AHS 0666		HPSI PMP A TO RWT ISOL	J=200	
1JS1AUV 0666		HPSI PMP A TO RWT ISOL	N=001	
1JS1BHS 0667		HPSI PMP B TO RWT ISOL	J=200	
1JS1BUV 0667		HPSI PMP B TO RWT ISOL	N=001	
1JS1BHS 0668		LPSI PMP B TO RWT ISOL	J=200	
1JS1BUV 0668		LPSI PMP B TO RWT ISOL	N=001	
1JS1AHS 0669		LPSI PMP A TO RWT ISOL	J=200	
1JS1AUV 0669		LPSI PMP A TO RWT ISOL	N=001	
1JS1BHS 0671		CONT SPRAY CONTROL TRAIN B	J=200	
1JS1BUV 0671		CONT SPRAY CONTROL TRAIN B	N=001	
1JS1BZI 0671		CONT SPRAY CONTROL TRAIN B	J=200	
1JS1BZT 0671		CONT SPRAY CONTROL TRAIN B	N=001	
1JS1AHS 0672		CONT SPRAY CONTROL TRAIN A	J=200	
1JS1AUV 0672		CONT SPRAY CONTROL TRAIN A	N=001	
1JS1AZI 0672		CONT SPRAY CONTROL TRAIN A	J=200	
1JS1AZT 0672		CONT SPRAY CONTROL TRAIN A	N=001	
1JS1AHS 0673		CONT SUMP ISOL TRAIN A	J=200	
1JS1AUV 0673		CONT SUMP ISOL TRAIN A	N=001	
1JS1AHS 0674		CONT SUMP ISOL TRAIN A	J=200	
1JS1AUV 0674		CONT SUMP ISOL TRAIN A	N=001	
1JS1BHS 0675		CONT SUMP ISOL TRAIN B	J=200	
1JS1BUV 0675		CONT SUMP ISOL TRAIN B	N=001	
1JS1BHS 0676		CONT SUMP ISOL TRAIN B	J=200	
1JS1BUV 0676		CONT SUMP ISOL TRAIN B	N=001	
1JS1AHS 0678		S/D CLG HE ISOL TRAIN A	J=200	
1JS1AHV 0678		S/D CLG HE ISOL TRAIN A	N=001	
1JS1AZI 0678		S/D CLG HE ISOL TRAIN A	J=200	
1JS1AZT 0678		S/D CLG HE ISOL TRAIN A	N=001	
1JS1BHS 0679		S/D CLG HE ISOL TRAIN B	J=200	

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 175 of 202)

12/17/82 02128102		Q INSTRUMENTS BY SYSTEM	PAGE 103 (SI-11)
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO	
1JSIBHV 0679	S/D CLG HE ISOL TRAIN B	N=001	
1JSIBZI 0679	S/D CLG HE ISOL TRAIN B	J=200	
1JSIBZT 0679	S/D CLG HE ISOL TRAIN B	N=001	
1JSIBHS 0680	SPRAY CHEM PP B DSCH TO CS PP	J=200	
1JSIBUV 0680	SPRAY CHEM PP B DSCH TO CS PP	N=001	
1JSIAHS 0681	SPRAY CHEM PP A DSCH TO CS PP	J=200	
1JSIAUV 0681	SPRAY CHEM PP A DSCH TO CS PP	N=001	
1JSIAHS 0682	RWT RETURN HDR CONT ISOL VLV	J=200	
1JSIAUV 0682	RWT RETURN HDR CONT ISOL VLV	N=001	
1JSIAUV 0682	RWT RETURN HDR CONT ISOL VLV	N=001	
1JSIAHS 0683	LPSI PP A ISOL	J=200	
1JSIAHV 0683	LPSI PP A ISOL	N=001	
1JSIAHS 0684	S/D CLG HE ISOL TRAIN A	J=200	
1JSIAHV 0684	S/D CLG HE ISOL TRAIN A	N=001	
1JSIAHS 0685	LPSI-CONT SPRAY PP CROSS A	J=200	
1JSIAHV 0685	LPSI-CONT SPRAY PP CROSS A	N=001	
1JSIAHS 0686	CONT SPRAY A CROSS CONNECT	J=200	
1JSIAHV 0686	CONT SPRAY A CROSS CONNECT	N=001	
1JSIAHS 0687	CONT SPRAY ISOL TRAIN A	J=200	
1JSIAHV 0687	CONT SPRAY ISOL TRAIN A	N=001	
1JSIAHS 0688	S/D CLG HE A BYPASS	J=200	
1JSIAHV 0688	S/D CLG HE A BYPASS	N=001	
1JSIBHS 0689	S/D CLG HE ISOL TRAIN B	J=200	
1JSIBHV 0689	S/D CLG HE ISOL TRAIN B	N=001	
1JSIBHS 0690	S/D CLG LOOP B WARMUP BYPASS	J=200	
1JSIBHV 0690	S/D CLG LOOP B WARMUP BYPASS	N=001	
1JSIAHS 0691	S/D CLG LOOP A WARMUP BYPASS	J=200	
1JSIAHV 0691	S/D CLG LOOP A WARMUP BYPASS	N=001	
1JSIBHS 0692	LPSI PP B ISOL	J=200	
1JSIBHV 0692	LPSI PP B ISOL	N=001	
1JSIBHS 0693	S/D CLG HE B BYPASS	J=200	
1JSIBHV 0693	S/D CLG HE B BYPASS	N=001	
1JSIBHS 0694	LPSI-CONT SPRAY PP CROSS B	J=200	
1JSIBHV 0694	LPSI-CONT SPRAY PP CROSS B	N=001	
1JSIBHS 0695	CONT SPRAY ISOL TRAIN B	J=200	
1JSIBHV 0695	CONT SPRAY ISOL TRAIN B	N=001	
1JSIBHS 0696	CONT SPRAY B CROSS CONNECT	J=200	
1JSIBHV 0696	CONT SPRAY B CROSS CONNECT	N=001	
1JSIAHS 0698	HPSI PP A DSCH	J=200	
1JSIAHV 0698	HPSI PP A DSCH	N=001	
1JSIBHS 0699	HPSI PP B DSCH	J=200	
1JSIBHV 0699	HPSI PP B DSCH	N=001	
1JSIALT 0704	CONHTY SPRAY SYS A HDR WTR LVL	J=311	
1JSIBLT 0705	CONHTY SPRAY SYS B HDR WTR LVL	J=311	
1JSIALI 0706	CONTAINMENT WATER LEVEL	J=111	
1JSIALT 0706	CONTAINMENT WATER LEVEL	J=475	
1JSIEFO 0706	RESTRICTION ORIFICE FOR PT-319	J=425	
1JSIALE 0706A	CONTAINMENT WATER LEVEL	J=475	
1JSIALE 0706B	CONTAINMENT WATER LEVEL	J=475	
1JSIBLI 0707	CONTAINMENT WATER LEVEL	J=111	
1JSIBLT 0707	CONTAINMENT WATER LEVEL	J=475	
1JSIEFO 0707	RESTRICTION ORIFICE FOR PT-329	J=425	
1JSIBLE 0707A	CONTAINMENT WATER LEVEL	J=475	
1JSIBLE 0707B	CONTAINMENT WATER LEVEL	J=475	

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APPENDIX D

PVNGS 1,2&3

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 176 of 202)

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Q INSTRUMENTS BY SYSTEM

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(SI-12)

TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO
1JSIAHS 0708	RECIRC SUMP A FOR PASS	J-200
1JSIAHV 0708	TAG # REVISED TO UV-708	J-603
1JSIAUV 0708	RECIRC SUMP A FOR PASS	J-603
1JSIEFO 0708	RESTRICTION ORIFICE FOR PT-339	J-425
1JSIAHS 0709	HPSI PP A RECIRC FOR PASS	J-200
1JSIAHV 0709	TAG # REVISED TO UV-709	J-603
1JSIAUV 0709	HPSI PP A FOR PASS	J-603
1JSIEFO 0709	RESTRICTION ORIFICE FOR PT-349	J-425
1JSIBHS 0710	HPSI PP B RECIRC FOR PASS	J-200
1JSIBHV 0710	TAG # REVISED TO UV-710	J-603
1JSIBUV 0710	HPSI PP B FOR PASS	J-603
1JSIEFO 0710	RESTRICTION ORIFICE FOR PT-390	J-425
1JSIEFO 0711	RESTRICTION ORIFICE FOR PT-391	J-425
1JSINTE 0712	CONTNT RECIRC SUMP TRAIN A	J-556
1JSINTE 0713	CONTNT RECIRC SUMP TRAIN A	J-556

PVNGS 1, 2&3

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APPENDIX D

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 177 of 202)

04/19/82 15:50:39	VALVE="0" CLASS	PAGE 70	(SI-13)
TAG NUMBER	B/SPEC/		
1PSIAV004	13PM221A		
1PSIAV005	13PM221A		
1PSIAV006	13PM221A		
1PSIAV007	13PM221A		
1PSIAV009	13PM221A		
1PSIAV016	13PM221A		
1PSIAV018	13PM221A		
1PSIAV023	13PM221A		
1PSIAV028	13PM221A		
1PSIAV032	13PM221A		
1PSIAV037	13PM221A		
1PSIAV039	13PM221A		
1PSIAV046	13PM221A		
1PSIAV047	13PM221A		
1PSIAV055	13PM221A		
1PSIAV056	13PM221A		
1PSIAV068	13PM221A		
1PSIAV069	13PM221A		
1PSIAV070	13PM221A		
1PSIAV071	13PM221A		
1PSIAV080	13PM221A		
1PSIAV081	13PM221A		
1PSIAV083	13PM221A		
1PSIAV084	13PM221A		
1PSIAV088	13PM221A		
1PSIAV089	13PM221A		
1PSIAV105	13NM001 C		
1PSIAV130	13NM001		
1PSIAV148	13NM001		
1PSIAV156	13NM001		
1PSIAV157	13NM001 C		
1PSIAV164	13NM001		
1PSIAV170	13NM001		
1PSIAV172	13NM001 C		
1PSIAV174	13NM001 C		
1PSIAV175	13NM001 C		
1PSIAV184	13NM001 C		
1PSIAV201	13NM001 C		
1PSIAV203	13NM001 C		
1PSIAV205	13NM001 C		
1PSIAV207	13NM001 C		
1PSIAV218	13NM001 C		
1PSIAV253	13NM001		
1PSIAV256	13NM001		
1PSIAV257	13NM001 C		
1PSIAV260	13NM001 C		
1PSIAV262	13NM001 C		
1PSIAV270	13NM001		
1PSIAV271	13NM001		
1PSIAV274	13NM001		
1PSIAV404	13NM001 C		
1PSIAV416	13NM001 C		
1PSIAV419	13NM001 C		
1PSIAV421	13NM001 C		
1PSIAV424	13NM001 C		

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APPENDIX D

PVNGS 1,2&3

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 178 of 202)

04/19/82 15:50:39	VALVE-MOM CLASS	PAGE 71	(SI-14)
TAG NUMBER	R/SPEC/		
1PSIAV429	13NM001 C		
1PSIAV433	13NM001 C		
1PSIAV434	13NM001 C		
1PSIAV435	13NM001 C		
1PSIAV437	13NM001 C		
1PSIAV438	13NM001 C		
1PSIAV443	13NM001 C		
1PSIAV450	13NM001 C		
1PSIAV451	13NM001 C		
1PSIAV458	13NM001 C		
1PSIAV459	13NM001 C		
1PSIAV465	13NM001 C		
1PSIAV470	13NM001 C		
1PSIAV476	13NM001 C		
1PSIAV483	13NM001 C		
1PSIAV485	13NM001 C		
1PSIAV486	13NM001 C		
1PSIAV523	13NM001		
1PSIAV550	13NM001		
1PSIAV551	13NM001		
1PSIAV552	13NM001		
1PSIAVR01	13PM221A		
1PSIAVR07	13PM221A		
1PSIAVR10	13PM221A		
1PSIAVR11	13PM221A		
1PSIAVR17	13PM221A		
1PSIAVR19	13PM221A		
1PSIAVR20	13PM221A		
1PSIAVR21	13PM221A		
1PSIAVR24	13PM221A		
1PSIAVR28	13PM221A		
1PSIAVR33	13PM221A		
1PSIAVR36	13PM221A		
1PSIAVR39	13PM221A		
1PSIAVR40	13PM221A		
1PSIAVR41	13PM221A		
1PSIAVR48	13PM221A		
1PSIAVR49	13PM221A		
1PSIAVR50	13PM221A		
1PSIAVR51	13PM221A		
1PSIAVR56	13PM221A		
1PSIAVR59	13PM221A		
1PSIAVR64	13PM221A		
1PSIAVR66	13PM221A		
1PSIAVR74	13PM221A		
1PSIAVR76	13PM221A		
1PSIAVR84	13PM221A		
1PSIAVR85	13PM221A		
1PSIAVR92	13PM221A		
1PSIAVR99	13PM221A		
1PSIAV902	13PM221A		
1PSIAV906	13PM221A		
1PSIAV908	13PM221A		
1PSIAV909	13PM221A		
1PSIAV925	13PM221A		

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 179 of 202)

04/19/82 15:50:39	VALVE="M" CLASS	PAGE 72	(SI-15)
TAG NUMBER	R/SPFC/		
1PSIAV926	13PM221A		
1PSIAV927	13PM221A		
1PSIAV932	13PM221A		
1PSIAV935	13PM221C		
1PSIAV936	13PM221C		
1PSIAV940	13PM221C		
1PSIAV944	13PM221A		
1PSIAV945	13PM221A		
1PSIRV011	13PM221A		
1PSIRV012	13PM221A		
1PSIRV013	13PM221A		
1PSIRV014	13PM221A		
1PSIRV015	13PM221A		
1PSIRV017	13PM221A		
1PSIRV019	13PM221A		
1PSIRV024	13PM221A		
1PSIRV030	13PM221A		
1PSIRV031	13PM221A		
1PSIRV040	13PM221A		
1PSIRV041	13PM221A		
1PSIRV042	13PM221A		
1PSIRV045	13PM221A		
1PSIRV050	13PM221A		
1PSIRV057	13PM221A		
1PSIRV073	13PM221A		
1PSIRV074	13PM221A		
1PSIRV075	13PM221A		
1PSIRV090	13PM221A		
1PSIRV091	13PM221A		
1PSIRV092	13PM221A		
1PSIRV093	13PM221A		
1PSIRV094	13PM221A		
1PSIRV096	13PM221A		
1PSIRV097	13PM221A		
1PSIRV098	13PM221A		
1PSIRV104	13NM001		
1PSIRV120	13NM001		
1PSIRV128	13NM001		
1PSIRV155	13NM001		
1PSIRV158	13NM001 C		
1PSIRV164	13PM221A		
1PSIRV176	13NM001 C		
1PSIRV177	13NM001 C		
1PSIRV180	13NM001 C		
1PSIRV182	13NM001 C		
1PSIRV185	13NM001 C		
1PSIRV200	13NM001 C		
1PSIRV207	13NM001 C		
1PSIRV204	13NM001 C		
1PSIRV206	13NM001 C		
1PSIRV208	13NM001 C		
1PSIRV219	13NM001 C		
1PSIRV254	13NM001		
1PSIRV264	13NM001 C		
1PSIRV266	13NM001 C		

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APPENDIX D

PVNGS 1, 2&3

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 180 of 202)

04/19/82 15:50:39	VALVE="O" CLASS	PAGE 73	(SI-16)
TAG NUMBER	R/SPEC/		
1PS1RV268	13NM001 C		
1PS1RV272	13NM001		
1PS1RV273	13NM001		
1PS1RV400	13NM001		
1PS1RV402	13NM001 C		
1PS1RV405	13NM001 C		
1PS1RV408	13NM001 C		
1PS1RV418	13NM001 C		
1PS1RV420	13NM001 C		
1PS1RV426	13NM001 C		
1PS1RV427	13NM001 C		
1PS1RV436	13NM001 C		
1PS1RV440	13NM001 C		
1PS1RV441	13NM001 C		
1PS1RV442	13NM001 C		
1PS1RV445	13NM001 C		
1PS1RV446	13NM001 C		
1PS1RV447	13NM001 C		
1PS1RV448	13NM001 C		
1PS1RV454	13NM001		
1PS1RV455	13NM001		
1PS1RV478	13NM001		
1PS1RV482	13NM001 C		
1PS1RV484	13NM001		
1PS1RV487	13NM001		
1PS1RV509	13NM001		
1PS1RV533	13NM001		
1PS1RV553	13NM001		
1PS1RV554	13NM001		
1PS1RV555	13NM001		
1PS1RV814	13PM221A		
1PS1RV815	13PM221A		
1PS1RV825	13PM221A		
1PS1RV829	13PM221A		
1PS1RV831	13PM221A		
1PS1RV832	13PM221A		
1PS1RV834	13PM221A		
1PS1RV837	13PM221A		
1PS1RV842	13PM221A		
1PS1RV843	13PM221A		
1PS1RV852	13PM221A		
1PS1RV853	13PM221A		
1PS1RV854	13PM221A		
1PS1RV855	13PM221A		
1PS1RV861	13PM221A		
1PS1RV862	13PM221A		
1PS1RV867	13PM221A		
1PS1RV869	13PM221A		
1PS1RV870	13PM221A		
1PS1RV871	13PM221A		
1PS1RV879	13PM221A		
1PS1RV886	13PM221A		
1PS1RV891	13PM221A		
1PS1RV895	13PM221A		
1PS1RV896	13PM221A		

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APPENDIX D

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Table D-1
CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 181 of 202)

04/19/82 15:50:39	VALVE-"0" CLASS	PAGE 74	(SI-17)
TAG NUMBER	B/SPEC/		
1PS1AV900	13PH221A		
1PS1AV904	13PH221A		
1PS1AV905	13PH221A		
1PS1AV907	13PH221A		
1PS1AV910	13PH221A		
1PS1AV931	13PH221A		
1PS1AV933	13PH221C		
1PS1AV937	13PH221C		
1PS1AV938	13PH221C		
1PS1AV939	13PH221C		
1PS1AV941	13PH221A		
1PS1AV942	13PH221A		
1PS1EV059	13PH221A		
1PS1EV060	13PH221A		
1PS1EV061	13PH221A		
1PS1EV062	13PH221A		
1PS1EV063	13PH221A		
1PS1EV064	13PH221A		
1PS1EV085	13PH221A		
1PS1EV099	13PH221A		
1PS1EV101	13NM001		
1PS1EV108	13NM001		
1PS1EV113	13NM001		
1PS1EV114	13NM001		
1PS1EV115	13NM001 C		
1PS1EV116	13NM001 C		
1PS1EV117	13NM001		
1PS1EV119	13NM001		
1PS1EV123	13NM001 C		
1PS1EV124	13NM001 C		
1PS1EV125	13NM001 C		
1PS1EV126	13NM001 C		
1PS1EV127	13NM001		
1PS1EV129	13NM001		
1PS1EV133	13NM001 C		
1PS1EV134	13NM001 C		
1PS1EV135	13NM001 C		
1PS1EV136	13NM001 C		
1PS1EV137	13NM001		
1PS1EV139	13NM001		
1PS1EV143	13NM001 C		
1PS1EV144	13NM001 C		
1PS1EV145	13NM001 C		
1PS1EV146	13NM001 C		
1PS1EV147	13NM001		
1PS1EV149	13NM001		
1PS1EV152	13NM001		
1PS1EV165	13NM001		
1PS1EV188	13NM001		
1PS1EV210	13NM001		
1PS1EV212	13NM001		
1PS1EV213	13NM001 C		
1PS1EV214	13NM001 C		
1PS1EV215	13NM001 C		
1PS1EV216	13NM001 C		

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APPENDIX D

PVNGS 1,2&3

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 182 of 202)

04/19/82 15:50:39	VALVE-MOM CLASS	PAGE 75	(SI-18)
TAG NUMBER	R/SPEC/		
1PSIEV217	13NM001 C		
1PSIEV220	13NM001		
1PSIEV222	13NM001 C		
1PSIEV223	13NM001 C		
1PSIEV224	13NM001 C		
1PSIEV225	13NM001 C		
1PSIEV226	13NM001 C		
1PSIEV227	13NM001 C		
1PSIEV228	13NM001 C		
1PSIEV229	13NM001 C		
1PSIEV230	13NM001		
1PSIEV232	13NM001 C		
1PSIEV233	13NM001 C		
1PSIEV234	13NM001 C		
1PSIEV235	13NM001 C		
1PSIEV236	13NM001 C		
1PSIEV237	13NM001 C		
1PSIEV238	13NM001 C		
1PSIEV239	13NM001 C		
1PSIEV240	13NM001		
1PSIEV242	13NM001		
1PSIEV243	13NM001		
1PSIEV244	13NM001		
1PSIEV245	13NM001 C		
1PSIEV246	13NM001 C		
1PSIEV247	13NM001 C		
1PSIEV248	13NM001		
1PSIEV249	13NM001		
1PSIEV252	13NM001		
1PSIEV258	13NM001		
1PSIEV259	13NM001		
1PSIEV281	13NM001		
1PSIEV282	13NM001		
1PSIEV283	13NM001		
1PSIEV284	13NM001		
1PSIEV29A	13NM001		
1PSIEV460	13NM001		
1PSIEV461	13NM001		
1PSIEV462	13NM001		
1PSIEV463	13NM001		
1PSIEV464	13NM001		
1PSIEV500	13NM001 C		
1PSIEV501	13NM001 C		
1PSIEV506	13NM001 C		
1PSIEV508	13NM001		
1PSIEV510	13NM001		
1PSIEV511	13NM001		
1PSIEV516	13NM001 C		
1PSIEV522	13NM001 C		
1PSIEV525	13NM001 C		
1PSIEV526	13NM001 C		
1PSIEV532	13NM001 C		
1PSIEV535	13NM001 C		
1PSIEV536	13NM001 C		
1PSIEV540	13NM001		

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APPENDIX D

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 183 of 202)

04/19/82 15:50:39	VALVE="0" CLASS	PAGE 76	SAFETY INJECTION	(SI-19)
TAG NUMBER	B/SPEC/			
1PSIEV541	13NH001			
1PSIEV542	13NH001			
1PSIEV543	13NH001			
1PSIEV803	13PH221A			
1PSIEV804	13PH221A			
1PSIEV826	13PH221A			
1PSIEV827	13PH221A			
1PSIEV830	13PH221A			
1PSIEV835	13PH221A			
1PSIEV838	13PH221A			
1PSIEV857	13PH221A			
1PSIEV858	13PH221A			
1PSIEV860	13PH221A			
1PSIEV863	13NH001A			
1PSIEV865	13PH221A			
1PSIEV868	13PH221A			
1PSIEV872	13PH221A			
1PSIEV877	13PH221A			
1PSIEV878	13PH221A			
1PSIFV880	13PH221A			
1PSIEV881	13PH221A			
1PSIEV882	13PH221A			
1PSIEV883	13PH221A			
1PSIEV887	13PH221A			
1PSIEV888	13PH221A			
1PSIEV894	13PH221A			
1PSIEV897	13PH221A			
1PSIEV898	13PH221A			
1PSIEV911	13PH221A			
1PSIEV915	13PH221A			
1PSIEV916	13PH221A			
1PSIEV919	13PH221A			
1PSIEV920	13PH221A			
1PSIEV921	13PH221A			
1PSIEV922	13PH221A			
1PSIEV923	13PH221A			
1PSIEV924	13PH221A			
1PSIEV930	13PH221A			
1PSIEV947	13PH221A			

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APPENDIX D

PVNGS 1,2&3

Table D-1
CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 184 of 202)

04/19/82 15:38:46		EQUIPMENT="MOM" CLASS	PAGE 108	ESSENTIAL SPRAY PONDS	(SP-1)
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO			
1MSPA01	SPRAY POND A CLG NOZZLES	13MM185			
1MSPA02	SPRAY POND A JUNCTION BXS	13MM185			
1MSPA01	ESPS PUMP & DRIVE	13MM095			
1MSPB01	SPRAY POND B CLG NOZZLES	13MM185			
1MSPB02	SPRAY POND B JUNCTION BXS	13MM185			
1MSPB01	ESPS PUMP & DRIVE	13MM095			

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APPENDIX D

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 185 of 202)

12/17/82 02128102		Q INSTRUMENTS BY SYSTEM		PAGE 106
TAG NUMRER	DESCRIPTION	BECHTEL SPEC/PO	(SP-2)	
1JSPAHS 0001	ESP PP A	J=200		
1JSPBHS 0002	ESP PP B	J=200		
1JSPART 0005	ESP PP A DISCH FLOW	J=311		
1JSPNFE 0005	ESP PP A DISCH FLOW	J=449		
1JSPBFT 0006	ESP PP B DISCH FLOW	J=311		
1JSPNFE 0006	ESP PP B DISCH FLOW	J=449		
1JSPBFE 0007	ESP TRAIN A I/L FLOW	J=449		
1JSPBFE 0008	ESP TRAIN B I/L FLOW	J=449		
1JSPATM 0023	ECW HX A I/L	J=556		
1JSPBTM 0024	ECW HX B I/L	J=556		
1JSPAXCV 0025	EXCESS FL CHK VLV FOR PI 25	J=705		
1JSPBXCVCV 0026	EXCESS FLOW CHECK VLV PI-26	J=705		
1JSPAPSV 0029	ECW HX A	M=071		
1JSPBPSV 0030	ECW HX B	M=071		
1JSPAXCV 0031	EXCESS FL CHK VLV FOR PI 31	J=705		
1JSPBXCVCV 0032	EXCESS FL CHK VLV FOR PI 32	J=705		
1JSPATM 0035	ECW HX A OUT	J=556		
1JSPBTM 0036	ECW HX B OUT	J=556		
1JSPATM 0037	ECW HX A OUT	J=556		
1JSPBTM 0038	ECW HX B OUT	J=556		
1JSPAHCVCV 0045	ECW HX A I/L	J=605		
1JSPBHCVCV 0046	ECW HX B I/L	J=605		
1JSPAHCVCV 0047	ECW HX A OUT	J=605		
1JSPBHCVCV 0048	ECW HX B OUT	J=605		
1JSPAHS 0049	ESP A I/L SPRAY OR BY-PASS	J=200		
1JSPAHV 0049A	ESP A I/L	J=605		
1JSPAHV 0049B	ESP A I/L SPRAY BY-PASS	J=605		
1JSPBHS 0050	ESP B I/L SPRAY OR BY-PASS	J=200		
1JSPBHV 0050A	ESP B I/L	J=605		
1JSPBHV 0050B	ESP B I/L SPRAY BY-PASS	J=605		
1JSPAXCV 0057	EXCESS FL CHK VLV FOR PI 57	J=705		
1JSPBXCVCV 0058	EXCESS FL CHK VLV FOR PI 58	J=705		
1JSPAFO 0059	ESP A SPRAY BY-PASS	J=425		
1JSPBFO 0060	ESP B SPRAY BY-PASS	J=425		
1JSPAHCVCV 0125	DG A JKT WTR CLR I/L	J=605		
1JSPBHCVCV 0126	DG B LUBE OIL CLR I/L	J=605		
1JSPAHCVCV 0127	DG A JKT WTR CLR OUT	J=605		
1JSPBHCVCV 0128	DG B LUBE OIL CLR OUT	J=605		
1JSPAHCVCV 0129	DG A AIR APT CLRS I/L	J=605		
1JSPBHCVCV 0130	DG B AIR APT CLRS I/L	J=605		
1JSPAHCVCV 0131	DG A AIR APT CLRS OUT	J=605		
1JSPBHCVCV 0132	DG B AIR APT CLRS OUT	J=605		
1JSPAHCVCV 0133	DG A LUBE OIL CLR I/L	J=605		
1JSPBHCVCV 0134	DG B JKT WTR CLR I/L	J=605		
1JSPAHCVCV 0135	DG A LUBE OIL CLR OUT	J=605		
1JSPBHCVCV 0136	DG B JKT WTR CLR OUT	J=605		
1JSPAPSV 0137	DG A FUEL OIL CLR OUT	J=691		
1JSPBPSV 0138	DG B LUBE OIL CLR OUT	J=691		
1JSPAPSV 0139	DG A JKT WTR CLR OUT	J=691		
1JSPBPSV 0140	DG B AIR APT CLR OUT	J=691		
1JSPAPSV 0141	DG A AIR APT CLR OUT	J=691		
1JSPBPSV 0142	DG B JKT WTR CLR OUT	J=691		
1JSPAPSV 0143	DG A LUBE OIL CLR OUT	J=691		
1JSPBPSV 0144	DG B FUEL OIL CLR OUT	J=691		

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 186 of 202)

12/17/82 02:28:02		Q INSTRUMENTS BY SYSTEM		PAGE 107
TAG NUMBER		DESCRIPTION	BECHTEL SPEC/PO	(SP-3)
1JSPATW 0145		DG A COOLING WATER I/L TEMP	J-556	
1JSPBTW 0146		DG B COOLING WATER I/L TEMP	J-556	
1JSPATW 0147		DG A FUEL OIL CLR OUT	J-556	
1JSPBTW 0148		DG B FUEL OIL CLR OUT	J-556	
1JSPATW 0149		DG A JKT WTR CLR OUTLET	J-556	
1JSPBTW 0150		DG B JKT WTR CLR OUTLET	J-556	
1JSPATW 0151		DG A AIR AFTER CLR OUTLET	J-556	
1JSPBTW 0152		DG B AIR AFTER CLR OUTLET	J-556	
1JSPATW 0153		DG A LUBE OIL COOLER OUTLET	J-556	
1JSPBTW 0154		DG B LUBE OIL COOLER OUTLET	J-556	
1JSPATW 0189		DG A JKT WTR CLR OUTLET	J-556	
1JSPBTW 0190		DG B JKT WTR CLR OUTLET	J-556	
1JSPATW 0191		DG A AIR AFTER CLR OUTLET	J-556	
1JSPBTW 0192		DG B AIR AFTER CLR OUTLET	J-556	
1JSPATW 0193		DG A LUBE OIL COOLER OUTLET	J-556	
1JSPBTW 0194		DG B LUBE OIL COOLER OUTLET	J-556	
1JSPATW 0195		DG A JKT WTR CLR OUTLET	J-556	
1JSPBTW 0196		DG B JKT WTR CLR OUTLET	J-556	
1JSPATW 0197		DG A AIR AFTER CLR OUTLET	J-556	
1JSPBTW 0198		DG B AIR AFTER CLR OUTLET	J-556	
1JSPATW 0199		DG A LUBE OIL COOLER OUTLET	J-556	
1JSPBTW 0200		DG B LUBE OIL COOLER OUTLET	J-556	
1JSPAXCV 0201		SPARE	J-705	
1JSPBXCVC 0202		SPARE	J-705	
1JSPAXCV 0203		SPARE	J-705	
1JSPBXCVC 0204		SPARE	J-705	
1JSPAXCV 0205		SPARE	J-705	
1JSPBXCVC 0206		SPARE	J-705	
1JSPENCVC 0207		ESP WATER TRANSFER	J-605	
1JSPENCVC 0208		ESP WATER TRANSFER	J-605	
1JSPATE 0213		RETAGGED AS JSPNTE 213	J-556	
1JSPATW 0213		ESP PP A DISCH TEMP	J-556	
1JSPNTE 0213		ESP PP A DISCH TEMP	J-556	
1JSPATE 0214		RETAGGED AS JSPNTE 214	J-556	
1JSPBTW 0214		ESP PP B DISCH TEMP	J-556	
1JSPNTE 0214		ESP PP B DISCH TEMP	J-556	

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APPENDIX D

PVNGS 1,2&3

Table D-1.

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 187 of 202)

04/19/82 15:50:39		VALVE="0" CLASS	PAGE 78	(SP-4)
TAG NUMBER	R/SPEC/			
1PSPAV028	13PM221C			
1PSPAV034	13PM221C			
1PSPAV035	13PM221C			
1PSPAV036	13PM221C			
1PSPAV037	13PM231			
1PSPAV039	13PM221C			
1PSPAV040	13PM221A			
1PSPAV041	13PM221B			
1PSPAV043	13PM221C			
1PSPAV044	13PM221C			
1PSPAV045	13PM221C			
1PSPAV082	13PM221C			
1PSPAV083	13PM221C			
1PSPAV084	13PM221C			
1PSPAV085	13PM221C			
1PSPAV086	13PM221C			
1PSPAV087	13PM221C			
1PSPAV088	13PM221C			
1PSPAV096	13PM231			
1PSPAV097	13PM221C			
1PSPAV098	13PM221C			
1PSPAV109	13PM221C			
1PSPAV111	13PM221C			
1PSPAV112	13PM221C			
1PSPAV113	13PM221C			
1PSPAV116	13PM221C			
1PSPAV128	13PM221C			
1PSPAV334	13MH018C			
1PSPAV337	13MH018C			
1PSPAV339	13MH018C			
1PSPRV011	13PM221C			
1PSPRV012	13PM221B			
1PSPRV014	13PM221C			
1PSPRV015	13PM221C			
1PSPRV016	13PM221C			
1PSPRV017	13PM221C			
1PSPRV020	13PM221C			
1PSPRV022	13PM221C			
1PSPRV024	13PM231			
1PSPRV025	13PM221C			
1PSPRV026	13PM221C			
1PSPRV079	13PM221C			
1PSPRV080	13PM221C			
1PSPRV090	13PM221C			
1PSPRV091	13PM221C			
1PSPRV092	13PM221C			
1PSPRV093	13PM221C			
1PSPRV094	13PM221C			
1PSPRV095	13PM231			
1PSPRV099	13PM221C			
1PSPRV100	13PM221C			
1PSPRV113	13PM221C			
1PSPRV114	13PM221C			
1PSPRV117	13PM221C			
1PSPRV118	13PM221C			

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APPENDIX D

PVNGS 1,2&3

Table D-1
CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 188 of 202)

04/19/82 15:50:39		VALVE="M" CLASS	PAGE 79	(SP-5)
TAG NUMBER		R/SPEC/		
1PSPRV129		13PH221C		
1PSPRV434		13MH018C		
1PSPRV437		13MH018C		
1PSPRV439		13MH018C		

ENVIRONMENTAL QUALIFICATION REPORT
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APPENDIX D

PVNGS 1,2&3

Table D-1
 CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 189 of 202)

04/19/82 15:38:46		EQUIPMENT-"0" CLASS	PAGE 110	<u>RADIATION MONITORING</u>	(SQ-1)
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO			
1JSOAC01	SRMS CONTR RM CABINET-TRAIN A	13NM997			
1JSORC01	SRMS CONTR RM CABINET-TRAIN B	13NM997			
1JSONC02	NSSS RADIATION MONITORING CAR	13NM001			

ENVIRONMENTAL QUALIFICATION REPORT
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APPENDIX D

PVNGS 1,2&3

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 190 of 202)

12/17/82 02:28:02	Q INSTRUMENTS BY SYSTEM		PAGE 109
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO	(SQ-2)
1JSQBR1 0001	HC CONTMT ATMOS	N=997	
1JSQBRU 0001	HC CONTMT ATMOS	N=997	
1JSQART 0029	HJ CONTROL ROOM VENT A	N=997	
1JSQARR 0029	MULTIPOINT RECORDER	N=997	
1JSQARSH 0029	HJ CONTROL ROOM VENT A	N=997	
1JSQARU 0029	HJ CONTROL ROOM VENT A	N=997	
1JSQARY 0029A	D/A CONVERTOR	N=997	
1JSQARY 0029B	ISOLATION/INTERFACE DEVICE	N=997	
1JSQART 0030	HJ CONTROL ROOM VENT B	N=997	
1JSQBRSH 0030	HJ CONTROL ROOM VENT B	N=997	
1JSQBRU 0030	HJ CONTROL ROOM VENT B	N=997	
1JSQBRY 0030A	D/A CONVERTOR	N=997	
1JSQBRY 0030B	ISOLATION/INTERFACE DEVICE	N=997	
1JSQARI 0031	HF FUEL POOL AREA	N=997	
1JSQARSH 0031	HF FUEL POOL AREA	N=997	
1JSQARU 0031	HF FUEL POOL AREA	N=997	
1JSQARY 0031A	D/A CONVERTOR	N=997	
1JSQBRY 0031B	ISOLATION/INTERFACE DEVICE	N=997	
1JSQBR1 0032	HF FUEL BLDG EXHAUST	N=997	
1JSQBRSH 0032	HF FUEL BLDG EXHAUST	N=997	
1JSQBRU 0032	SPARE	N=997	
1JSQBRY 0032A	D/A CONVERTOR	N=997	
1JSQBRY 0032B	ISOLATION/INTERFACE DEVICE	N=997	
1JSQARE 0033	SQ RFLG MACH AREA DETCTR-ANNUN	N=997	
1JSQARI 0033	CP REFUELING MACHINE AREA	N=997	
1JSQARU 0033	CP REFUELING MACHINE AREA	N=997	
1JSQARY 0033A	D/A CONVERTOR	N=997	
1JSQARY 0033B	ISOLATION/INTERFACE DEVICE	N=997	
1JSQBR1 0034	CP CONTMT PURGE	N=997	
1JSQBRU 0034	CP CONTMT PURGE	N=997	
1JSQBRY 0034A	D/A CONVERTOR	N=997	
1JSQBRY 0034B	ISOLATION/INTERFACE DEVICE	N=997	
1JSQARSH 0037	CP PRE-ACCESS PURGE AREA A	N=997	
1JSQARU 0037	CP PRE-ACCESS PURGE AREA A	N=997	
1JSQARY 0037A	D/A CONVERTOR	N=997	
1JSQARY 0037B	ISOLATION/INTERFACE DEVICE	N=997	
1JSQBRSH 0038	CP PRE-ACCESS PURGE AREA B	N=997	
1JSQBRU 0038	CP PRE-ACCESS PURGE AREA B	N=997	
1JSQBRY 0038A	D/A CONVERTOR	N=997	
1JSQBRY 0038B	ISOLATION/INTERFACE DEVICE	N=997	
1JSQNRU 0139	MAIN STM LINE EFFLUENT	N=997	
1JSQNRE 0139A	MAIN STM LINE EFFLUENT	N=997	
1JSQNRE 0139B	MAIN STM LINE EFFLUENT	N=997	
1JSQNRU 0140	MAIN STM LINE EFFLUENT	N=997	
1JSQNRE 0140A	MAIN STM LINE EFFLUENT	N=997	
1JSQNRE 0140B	MAIN STM LINE EFFLUENT	N=997	
1JSQNRB 0141	CONDENSOR VAC PP/GLND SEAL EXH	N=997	
1JSQNRE 0141	CONDENSOR VAC PP/GLND SEAL EXH	N=997	
1JSQNRU 0141	CONDENSOR VAC PP/GLND SEAL EXH	N=997	
1JSQNRB 0142	CONDENSOR VAC PP/GLND SEAL EXH	N=997	
1JSQNRE 0142	CONDENSOR VAC PP/GLND SEAL EXH	N=997	
1JSQNRU 0142	CONDENSOR VAC PP/GLND SEAL EXH	N=997	
1JSQNRB 0143	PLANT VENT MON LOW SAMPLER	N=997	
1JSQNRE 0143	PLANT VENT MON LOW	N=997	

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 191 of 202)

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Q INSTRUMENTS BY SYSTEM

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(SQ-3)

TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO
1JSQNRU 0143	PLANT VENT MON LOW	N-997
1JSQNRB 0144	PLANT VENT MON HI SAMPLER	N-997
1JSQNRB 0144	PLANT VENT MON HI	N-997
1JSQNRU 0144	PLANT VENT MON HI	N-997
1JSQBRB 0145	FUEL BLDG B VENT EXH MON LOW	N-997
1JSQBRU 0145	FUEL BLDG B VENT EXH MON LOW	N-997
1JSQBRB 0146	FUEL BLDG VNT EXH MON HI CH-B	N-997
1JSQBRU 0146	FUEL BLDG VNT EXH MON HI CH-B	N-997
1JSQARB 0148	IN CONTMT AREA MON CH-A	N-997
1JSQARU 0148	IN CONTMT AREA MON CH-A	N-997
1JSQBRB 0149	CONTMT HI RANGE MON CH-B	N-997
1JSQBRU 0149	CONTMT HI RANGE MON CH-B	N-997
1JSQARB 0150	PRIMARY COOLANT MON CH-A	N-997
1JSQARU 0150	PRIMARY COOLANT MON CH-A	N-997
1JSQBRB 0151	PRIMARY COOLANT MON CH-B	N-997
1JSQBRU 0151	PRIMARY COOLANT MON CH-B	N-997
1JSQNRU 0152	PERSONNEL IARM SOCHX-WEST	N-997
1JSQNRB 0152A	PERSONNEL IARM SOCHX-WEST	N-997
1JSQNRB 0152A	PERS IARM SOCHX-WEST	N-997
1JSQNRB 0152B	PERSONNEL IARM ECM-EAST	N-997
1JSQNRB 0152B	PERS IARM SOCHX-EAST	N-997
1JSQNRB 0152C	PERSONNEL IARM STAIRWAY-SOUTH	N-997
1JSQNRB 0152C	PERS IARM STAIRWAY-SOUTH	N-997
1JSQNRB 0152D	PERSONNEL IARM STAIRWAY-NORTH	N-997
1JSQNRB 0152D	PERS IARM STAIRWAY-NORTH	N-997
1JSQNRU 0153	PERSONNEL IARM-ECMHX-WEST	N-997
1JSQNRB 0153A	PERSONNEL IARM-ECMHX-WEST	N-997
1JSQNRB 0153A	PERS IARM ECMHX-WEST	N-997
1JSQNRB 0153B	PERSONNEL IARM H2 RECOM CHG PP	N-997
1JSQNRB 0153B	PERS IARM H2 RECOM CHG PHP	N-997
1JSQNRB 0153C	PERSONNEL IARM H2 RECOMB MCC	N-997
1JSQNRB 0153C	PERS IARM H2 RECOMB MCC	N-997
1JSQNRU 0154	PERS IARM BORIC ACID WEST PIPE	N-997
1JSQNRB 0154A	PERS IARM BORIC ACID WEST PIPE	N-997
1JSQNRB 0154A	PERS IARM BORIC ACID WEST PIPE	N-997
1JSQNRB 0154B	PERS IARM-HG SETS LOAD ENTER E	N-997
1JSQNRB 0154B	PERS IARM-HG SETS LOAD ENTER E	N-997
1JSQNRB 0154C	PERS IARM CNTRL RM MON	N-997
1JSQNRB 0154C	PERS IARM CNTRL RM MON	N-997
1JSQNRU 0155	PERS IARM A-SIDE	N-997
1JSQNRB 0155A	PENET IARM A-SIDE	N-997
1JSQNRB 0155B	PENET IARM A-SIDE	N-997
1JSQNRB 0155C	PENET IARM WEST PIPING PENET	N-997
1JSQNRU 0156	PENET IARM EAST PIPING PENET	N-997
1JSQNRB 0156A	PENET IARM EAST PIPING PENET	N-997
1JSQNRB 0156B	PENET IARM WEST ELEC PENET	N-997
1JSQNRB 0156C	PENET IARM EAST ELEC PENET	N-997
1JSQNRU 0157	PENET IARM A-SIDE MSSS PENET	N-997
1JSQNRB 0157A	PENET IARM A-SIDE MSSS	N-997
1JSQNRB 0157B	PENET IARM B-SIDE MSSS	N-997
1JSQNRB 0157C	PENET IARM WEST ELEC PENET	N-997
1JSQNRU 0158	PENET IARM EAST ELEC PENET	N-997
1JSQNRB 0158A	PENET IARM EAST ELEC PENET	N-997
1JSQNRB 0158B	PENET IARM WEST PENET AUX BLDG	N-997

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APPENDIX D

Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 192 of 202)

12/17/82 02:28:02		O INSTRUMENTS BY SYSTEM		PAGE 111
TAG NUMBER		DESCRIPTION	BECHTEL SPEC/PO	(SQ-4)
1J50NRE	0158C	PENET IARM EAST PENET AUX BLDG	N=997	
1J50NRE	0158D	PENET IARM HOT LAB PASS	N=997	

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PVNGS 1,2&3

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Table D-1
 CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 193 of 202)

04/19/R2 15138146	EQUIPMENT-"O" CLASS	PAGE 112	NUCLEAR SAMPLING SYSTEM	(SS-1)
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PU		
1MSSE1142	PENETRATION-SAMPLING	13MM500		

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 194 of 202)

12/17/82 02128102		Q INSTRUMENTS BY SYSTEM	PAGE 113 (SS-2)
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO	
1JSSNPSV 0109	GAS SAMPLE RETURN	N=001	
1JSSNPSV 0124	PRESR S/S SAMPLE RETURN	N=001	
1JSSBUV 0200	HOT LEG SAMPLE CNTMT ISOL	N=001	
1JSSBHS 0200A	HOT LEG SAMPLE CNTMT ISOL	J=200	
1JSSBUV 0201	PRESR SURGE SAMPLE CNTMT ISOL	N=001	
1JSSBHS 0201A	PRESR SURGE SAMPLE CNTMT ISOL	J=200	
1JSSBUV 0202	PRESR S/S SAMPLE CNTMT ISOL	N=001	
1JSSBHS 0202A	PRESR S/S SAMPLE CNTMT ISOL	J=200	
1JSSAUV 0203	HOT LEG SAMPLE CNTMT ISOL	N=001	
1JSSAHS 0203A	HOT LEG SAMPLE CNTMT ISOL	J=200	
1JSSAUV 0204	PRESR SURGE SAMPLE CNTMT ISOL	N=001	
1JSSAHS 0204A	PRESR SURGE SAMPLE CNTMT ISOL	J=200	
1JSSAUV 0205	PRESR S/S SAMPLE CNTMT ISOL	N=001	
1JSSAHS 0205A	PRESR S/S SAMPLE CNTMT ISOL	J=200	

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Table D-1

CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 195 of 202)

04/19/82 15:50:39		VALVE="ON" CLASS	PAGE 81	SAMPLING SYSTEM	(SS-3)
TAG NUMBER		R/SPEC/			
1PSSAV130		13NH001 C			
1PSSAV161		13NH001 C			
1PSSAV127		13NH001 C			
1PSSAV178		13NH001 C			
1PSSEV009		13PH221A			
1PSSEV010		13PH221A			
1PSSEV011		13PH221A			
1PSSEV013		13PH221A			
1PSSEV014		13PH221A			
1PSSEV016		13PH221A			
1PSSEV017		13PH221A			
1PSSEV131		13NH001 C			
1PSSEV133		13NH001 C			
1PSSEV135		13NH001 C			
1PSSEV152		13NH001 C			
1PSSEV154		13NH001 C			
1PSSEV206		13NH001			
1PSSEV207		13NH001			
1PSSEV208		13NH001			
1PSSEV800		13PH221A			
1PSSEV802		13PH221A			
1PSSEV804		13PH221A			
1PSSNV004		13PH221A			
1PSSNV005		13PH221A			
1PSSNV006		13PH221A			
1PSSNV007		13PH221A			
1PSSNV008		13PH221A			

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Table D-1
CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 196 of 202)

04/19/82 15138146		EQUIPMENT-"Q" CLASS	PAGE 114	CHILLED WATER	(WC-1)
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO			
1MWCEU60	PENETRATION-CHILLED WTR	13HM500			
1MWCEU61	PENETRATION-CHILLED WTR	13HM500			

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Table D-1
CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 197 of 202)

12/17/82 02:28:02		Q INSTRUMENTS BY SYSTEM		PAGE 115
TAG NUMBER		DESCRIPTION	BECHTEL SPEC/PO	(WC-2)
1JWCBHS 0061		NORM CHW RETURN CONTH IV	J=200	
1JWCBUV 0061		NORM CHW RETURN CONTH IV	P=2218	
1JWCAHS 0062		NORM CHW RETURN CONTH IV	J=200	
1JWCAUV 0062		NORM CHW RETURN CONTH IV	P=2218	
1JWCBHS 0063		NORM CHW SUP CONTH IV	J=200	
1JWCBUV 0063		NORM CHW SUP CONTH IV	P=2218	

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Table D-1
 CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 198 of 202)

04/19/82 15:50:39	VALVE="0" CLASS	PAGE 83	(WC-3)
TAG NUMBER	R/SPFC/		
1PMCEV039	13PM221B		
1PMCEV158	13PM221A		
1PMCEV161	13PM221A		

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Table D-1
CLASS 1E ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 199 of 202)

04/19/82 15:38:46			EQUIPMENT="0" CLASS		PAGE 116	
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO				
1FZAAC01	AUX RELAY CAB CLASS 1E	13EM022				
1FZAAC02	ISOLATION RELAY CAB CLASS 1E	13EM022				
1FZAAC03	AUX RELAY CAB CLASS 1E	13EM022				
1FZAAC04	AUX RELAY CAB CLASS 1E	13EM022				
1FZAAC05	AUX RELAY CAB CLASS 1E	13EM022				
1FZAAC06	AUXILIARY RELAY CAB CLASS 1E	13EM022				
1FZABC01	AUX RELAY CAB CLASS 1E	13EM022				
1FZABC02	ISOLATION RELAY CAB CLASS 1E	13EM022				
1FZABC03	AUX RELAY CAB CLASS 1E	13EM022				
1FZABC04	AUX RELAY CAB CLASS 1E	13EM022				
1FZABC05	AUX RELAY CAB CLASS 1E	13EM022				
1FZABC06	AUXILIARY RELAY CAB CLASS 1E	13EM022				

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Table D-1
CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 200 of 202)

04/19/82 15138146			EQUIPMENT-NO# CLASS	PAGE 118
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO		
1JZCE401	SI TK 2A/SG 2 XMITTER RACK	13NM001		
1JZCE403	SI TK 1A/SG 1 XMITTER RACK	13NM001		
1JZCE405	XMITTER RACK-RC/CH	13NM001		
1JZCND01	TRANSFER SYSTEM CONTROL CONSOLE	13NM001		
1MZCE1164	PENETRATION, SPARE			
1MZCE1165	PENETRATION, SPARE			
1MZCE1166	PENETRATION, SPARE			
1MZCE1168	PENETRATION, SPARE			
1MZCE1169	PENETRATION, SPARE			
1MZCE1170	PENETRATION, SPARE			
1MZCE1171	PENETRATION, SPARE			
1MZCE1173	PENETRATION, SPARE			
1MZCE1174	PENETRATION, SPARE			
1MZCE1180	PENETRATION, SPARE			
1MZCE1181	PENETRATION, SPARE			
1MZCNG01	CONTAIN POLAR CRANE 225/35 TON	13MM063		

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Table D-1
CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 201 of 202)

04/19/82 15:38:46		EQUIPMENT-"0" CLASS	PAGE 120
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO	
1MZFEM01	SPENT FUEL RACKS	13NM001	
1MZFEM02	NEW FUEL RACKS	13NM001	
1MZFNG01	CASK HANDLING CRANE (150/15TON)	13MM062	
1MZFNG02	NEW FUEL HANDLING CRANE 10 TON	13MM062	

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Table D-1
CLASS IE ELECTRICAL EQUIPMENT BY SYSTEM (Sheet 202 of 202)

04/19/82 15:38:46			EQUIPMENT-NOM CLASS	PAGE 122
TAG NUMBER	DESCRIPTION	BECHTEL SPEC/PO		
1E2JAC01	AUX RELAY CAB CLASS-1E	13EM022		
1E2JAC02	ISOLATION RELAY CAB CLASS 1E	13EM022		
1E2JAC03	AUX RELAY CAB CLASS-1E	13EM022		
1E2JBC01	AUX RELAY CAB CLASS-1E	13EM022		
1E2JBC02	ISOLATION RELAY CAB CLASS 1E	13EM022		
1E2JBC03	AUX RELAY CAB CLASS-1E	13EM022		
1J2JAC02A	ROP ANALOG INSTR CABINET	13JM111		
1J2JAC02B	ROP ANALOG INSTR CABINET	13JM111		
1J2JAF01	REMOTE SHUTDOWN PANEL	13NM001		
1J2JRC02A	ROP ANALOG INSTR CABINET	13JM111		
1J2JHF01	REMOTE SHUTDOWN PANEL	13NM001		
1J2JBF02	DISCONNECT SWITCH PANEL	13NM001		
1J2JCF01	REMOTE SHUTDOWN PNL	13NM001		
1J2JDE01	REMOTE SHUTDOWN PNL	13NM001		
1J2JNF01	REMOTE SHUTDOWN PANEL	13NM001		

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APPENDIX E
COLD SHUTDOWN LIST

(Reprinted from Fire Protection
Evaluation Report, Amendment 3)



Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 1 of 100) ^(a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
AUXILIARY FEEDWATER							
Function: Maintain water inventory in the steam generators during hot standby, and effect a reactor shutdown							
Train: A (Channel A)	M-AFA-PO1 M-AFA-K01 J-AFA-E01	Auxiliary feed-water pump and turbine	E-AF57-AC-1RD	Turbine control feeder			X
			E-AF57-AC-1XA or E-AF57-AC-1XB	Turbine control Turbine control	SK-52A	SK-52B	SK-52C
			E-AF56-AC-1XA	Turbine speed signal			X
			E-AF56-AC-1XB or E-RM31-AC-1XD	Turbine speed display Turbine speed display	SI-52A	SI-52B	
			E-RM10-AC-1RB or E-ZJ01-AC-1RN	Turbine speed display power Turbine speed display power	SI-52A	SI-52B	

a. Required for hot shutdown and cold shutdown unless otherwise noted.
b. Required for cold shutdown only.
c. Both Valves SPA HV-49A and SPA HV-49B should not be coincidentally closed by any spuriously generated signals.
d. Both Valves SPB HV-50A and SPB HV-50B should not be coincidentally closed by any spuriously generated signals.
e. Class IE power available (due to backfit for TMI Task 41).

Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 2 of 100) (a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
AUXILIARY FEEDWATER (continued)	M-AFA-P01 M-AFA-K01 J-AFA-E01	Auxiliary feed-water pump and turbine	E-SG02-AC-1RH	AFW turbine ramp start		X	
			E-SG01-AC-1RH	AFW turbine pump start		X	
			E-ZJ01-AC-1RM	Rack power			
	J-AFA-HV-54	Auxiliary feed-water turbine trip and throttle valve	E-AF07-AC-1RC or E-AF07-AC-1RD	Valve open/close	HS-54A, HS-54D	HS-54B, HS-54F	
			E-AF07-AC-1RC or E-AF07-AC-1RD	Valve open/close			
			E-AF07-AC-1RC or E-AF07-AC-1RD	Turbine trip			
			E-AF07-AC-1RC or E-AF07-AC-1RD	Turbine trip			
			E-AF07-AC-1RA	MOV limit stop			
			E-AF07-AC-1KA	Valve feeder			
			E-AF07-AC-1KB	Valve feeder			
			E-AF07-AC-1RF	Valve open/close			
			E-AF07-AC-1RG	Valve open/close			
			E-AF07-AC-1RJ	Valve open/close			
	J-AFA-FT-40A	Auxiliary feed-water flow to SG No. 1	E-AF58-AC-1XA	Flow signal	FI-40A	FI-40B	
			E-RM31-AC-1XD or E-AF58-AC-1XC	Flow display			
			E-AF58-AC-1XC	Flow display			

Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 3 of 100) (a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
AUXILIARY FEEDWATER (continued)	J-AFA-FT-40A	Auxiliary feed-water flow to SG No. 1	E-ZJ01-AC-1RN	Display power	FI-40A	FI-40B	
			E-RM10-AC-1RD	Display power			
			E-ZJ01-AC-1RM	Rack power			
	J-AFA-FT-40B	Auxiliary feed-water flow to SG No. 2	E-AF58-AC-1XB	Flow signal			
			E-RM31-AC-1XD	Flow display			
			or E-AF58-AC-1XC	Flow display			
			E-ZJ01-AC-1RN	Display power			
			E-RM10-AC-1RD	Display power			
			E-ZJ01-AC-1RM	Rack power			
	J-AFA-HV-32	Auxiliary feed-water regulating valve to SG No. 1	E-AF04-AC-1RB	MOV limit stop	HS-32A	HS-32B	X X X
			E-AF04-AC-1RC	Valve open/close			
			or E-AF04-AC-1RD	Valve open/close			
			E-AF04-AC-1KA	Valve feeder			
			E-AF04-AC-1KB	Valve feeder			
			E-AF04-AC-1KC	Valve feeder			
			E-AF04-AC-1RA	Valve indication			
			E-AF04-AC-1RB	Valve open/close			
			E-AF04-AC-1RE	ESFAS			

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APPENDIX E

Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 5 of 100) (a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
AUXILIARY FEEDWATER (continued)	J-AFC-HV-33	Auxiliary feed-water regulating valve to SG No. 2	E-AF06-CC-1RE	ESFAS	HS-36A	HS-36B	X X X
			E-AF06-CC-1RJ	Valve indication			
			E-AF06-CC-1RH	Valve indication			
			E-AF06-CC-1RI	Valve indication			
	J-AFC-UV-36	Auxiliary feed-water isolation valve to SG No. 1	E-AF11-CC-1RB	MOV limit stop			
			E-AF11-CC-1RC	Valve open/close			
			E-AF11-CC-1RD	Valve open/close			
			E-AF11-CC-1KA	Valve feeder			
			E-AF11-CC-1KB	Valve feeder			
			E-AF11-CC-1KC	Valve feeder			
			E-AF11-CC-1RF	ESFAS			
	M-AFB-P01	Auxiliary feed-water pump (motor driven)	E-AF01-BC-1RD	Pump start/stop	HS-10		CS-3
			E-AF01-BC-1CA	Pump feeder			
			Integral with switchgear	Circuit disconnect			
			E-AF01-BC-1RB	ESFAS			
			E-AF01-BC-1RE	Current transformer			
Train: B (Channel B)							

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APPENDIX E

Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 6 of 100) ^(a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
AUXILIARY FEEDWATER (continued)	J-AFB-HV-30	Auxiliary feed-water regulating valve to SG No. 1	E-AF03-BC-1RB	Valve open/close	HS-30A	HS-30B	X
			or E-AF03-BC-1RC	Valve open/close			
			E-AF03-BC-1RD	ESFAS			
			E-AF03-BC-1RG	ESFAS			
			E-AF03-BC-1RA	MOV limit stop			
			E-AF03-BC-1KA	Valve feeder			
			E-AF03-BC-1RH	Circuit disconnect		HS-30E	
	J-AFB-HV-31	Auxiliary feed-water regulating valve to SG No. 2	E-AF03-BC-1RJ	Circuit disconnect	HS-31A	HS-31B	X
			E-AF03-BC-2RC	Valve open/close			
			or E-AF03-BC-2RB	Valve open/close			
			E-AF03-BC-2RA	MOV limit stop			
			E-AF03-BC-2KA	Valve feeder			
	J-AFB-HV-31	Auxiliary feed-water regulating valve to SG No. 2	E-AF03-BC-2RH	Circuit disconnect	HS-31A	HS-31E	X
			E-AF03-BC-2RJ	Circuit disconnect			
			E-AF03-BC-2RD	ESFAS			
			E-AF03-BC-2RG	ESFAS			

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Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 7 of 100) (a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
AUXILIARY FEEDWATER (continued)	J-AFB-UV-35	Auxiliary feed-water isolation valve to SG No. 2	E-AF05-BC-2RC or E-AF05-BC-2RB E-AF05-BC-2RA E-AF05-BC-2KA E-AF05-BC-2RH E-AF05-BC-2RJ E-AF05-BC-2RD E-AF05-BC-2RG	Valve open/close Valve open/close MOV limit stop Valve feeder Circuit disconnect Circuit disconnect ESFAS ESFAS	HS-35A	HS-35B HS-35E	X
	J-AFB-UV-34	Auxiliary feed-water isolation valve to SG No. 1	E-AF05-BC-1RC or E-AF05-BC-1RB E-AF05-BC-1RA E-AF05-BC-1KA E-AF05-BC-1RH E-AF05-BC-1RJ	Valve open/close Valve open/close MOV limit stop Valve feeder Circuit disconnect Circuit disconnect	HS-34A	H-34B HS-34E	
	J-AFB-UV-34	Auxiliary feed-water isolation valve to SG No. 1	E-AF05-BC-1RD E-AF05-BC-1RG	ESFAS ESFAS			
	J-AFB-FT-41A	Auxiliary feed-water flow to SG No. 1	E-AF58-BC-1XA	Flow signal			

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Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 8 of 100) ^(a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
AUXILIARY FEEDWATER (continued)	J-AFB-FT-41A	Auxiliary feed-water flow to SG No. 1	E-RM31-BC-1XD	Flow display	FI-41A	FI-41B	
			or E-AF58-BC-1XC	Flow display			
			E-ZJ02-BC-1RO	Display power			
			E-RM10-BC-1RD	Display power			
			E-ZJ02-BC-1RN	Rack power			
	J-AFB-FT-41B	Auxiliary feed-water flow to SG No. 2	E-AF58-BC-1XB	Flow signal	FI-41A	FI-41B	
			E-RM31-BC-1XD	Flow display			
			or E-AF58-BC-1XC	Flow display			
			E-ZJ02-BC-1RO	Display power			
			E-RM10-BC-1RD	Display power			
			E-ZJ02-BC-1RN	Rack power			
CONDENSATE STORAGE AND TRANSFER							
Function: Provide condensate to auxiliary feedwater pump for steam generator makeup and provide refill for ESF surge tanks							
Train: A (Channel A)	J-CTA-LT-35	Condensate storage tank level	E-CT54-AC-1XA	Tank level signal			
			E-AF58-AC-1XC	Tank level display			

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 9 of 100) ^(a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
CONDENSATE STORAGE AND TRANSFER (continued) Train: B (Channel B)	J-CTA-LT-35	Condensate storage tank level	E-RM31-AC-1XD	Tank level display	LI-35A		
			E-RM10-AC-1RB	Display power			
			E-ZJ01-AC-1RN	Display power			
			E-ZJ01-AC-1RM	Rack power			
	M-CTA-P01	Condensate transfer Transfer Pump No. 1	E-CT01-AC-1KA	Pump feeder			
			E-CT01-AC-1RA	Pump control	HS-15		
			E-CT01-AC-1RF	Pump control			
	J-CTB-LT-36	Condensate storage tank level	E-CT55-BC-1XA	Tank level signal			
			E-AF58-BC-1XC	Tank level display		LI-36B	
			E-RM31-BC-1XD	Tank level display	LI-36A		
			E-RM10-BC-1RB	Display Power			
			E-ZJ02-BC-1RO	Display power			
			E-ZJ02-BC-1RN	Rack power			

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Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 10 of 100) (a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
CONDENSATE STORAGE AND TRANSFER (continued) MAIN STEAM Function: Dissipate heat generated by NSSS through atmospheric dump valves, provide steam to AFW turbine-driven pump, and provide effective control of reactor coolant temperature during shutdown Train: A	M-CTB-P01	Condensate transfer Pump No. 2	E-CT01-BC-1KA	Pump feeder	HS-16		
			E-CT01-BC-1RA	Pump control			
			E-CT01-BC-1RE	Pump control			
			E-CT01-BC-1RF	Pump control			
	J-SGA-UV-134	Steam supply valve to auxiliary feed-water (turbine-driven) pump	E-SG01-AC-1RC	Valve start/stop	HS-134A	HS-134B	X
			E-SG01-AC-1RD	Valve start/stop			
			E-SG01-AC-1KA	Valve feeder			
			E-SG01-AC-1KB	Valve feeder			
			E-SG01-AC-1KC	Valve feeder			
			E-SG01-AC-1RB	Valve limit stop			

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Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 11 of 100) ^(a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
MAIN STEAM (continued)	J-SGA-UV-134	Steam supply valve to auxiliary feed-water (turbine-driven) pump	E-SG01-AC-1RE	ESFAS	HS-138A	HS-138B	
			E-SG01-AC-1RH	Turbine ramp start			
	J-SGA-UV-138	Steam supply valve to auxiliary feed-water (turbine-driven) pump	E-SG02-AC-1RC	Valve start/stop			
			or E-SG02-AC-1RD	Valve start/stop			
			E-SG02-AC-1KA	Valve feeder			X
			E-SG02-AC-1KB	Valve feeder			X
			E-SG02-AC-1KC	Valve feeder			X
			E-SG02-AC-1RB	Valve limit stop			X
			E-SG02-AC-1RE	ESFAS			
			E-SG02-AC-1RH	Turbine ramp start			
	J-SGA-PT-1013A	Steam generator No. 1 pressure	E-SG60-AC-1XB	Pressure signal	PI-1013A	PI-1013A-1	
			E-SG60-AC-1XA	Pressure signal			
			E-RM44-AC-1XC	Pressure display			
			or E-SG60-AC-1XD	Pressure display			
			E-SB01-AC-1RP	Display power			
			E-ZJ01-AC-1RN	Display power			

Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 12 of 100) (a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
MAIN STEAM (continued)	J-SGA-PT-1023A	Steam generator No. 2 pressure	E-SG60-AC-3XB	Pressure signal	PI-1023A	PI-1023A-1	
			E-SG60-AC-3XA	Pressure signal			
			E-RM44-AC-1XC	Pressure display			
			or E-SG60-AC-3XD	Pressure display			
			E-SB01-AC-1RP	Display power			
			E-ZJ01-AC-1RN	Display power			
	J-SGA-LT-1113A	Steam generator No. 1 level (wide range)	E-SG64-AC-1XB	Level signal	LI-1113A	LI-1113A-1	
			E-SG64-AC-1XA	Level signal			
			E-RM44-AC-1XC	Level display			
			or E-SG64-AC-1XD	Level display			
			E-SB01-AC-1RD	Display power			
			E-ZJ01-AC-1RN	Display power			
	J-SGA-LT-1123A	Steam generator No. 2 level (wide range)	E-SG64-AC-2XB	Level signal			
			E-SG64-AC-2XA	Level signal			
	J-SGA-LT-1123A	Steam generator No. 2 level (wide range)	E-RM44-AC-1XC	Level display	LI-1113A	LI-1123A-1	
			or E-SG64-AC-1XD	Level display			

Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 13 of 100) (a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
MAIN STEAM (continued)	J-SGA-LT-1123A	Steam generator No. 2 level (wide range)	E-SB01-AC-1RD or E-ZJ01-AC-1RN	Display power Display power			
	J-SGE-UV-170	Steam generator No. 1 line No. 1 main steam isolation valve	E-SG23-AC-1RA	Valve indication			
			E-SG23-AC-1RB	Valve indication			
			E-SG23-AC-1RD	Valve feeder			
			E-SG23-AC-1RE	Valve open/close	HS-251 HS-170A		
			E-SG23-AC-1RF	Valve open/close	HS-170C HS-275		
	J-SGE-UV-171	Steam generator No. 2 line No. 1 main steam isolation valve	E-SG23-AC-1RG	ESFAS			
			E-SG23-AC-2RA	Valve indication			
			E-SG23-AC-2RB	Valve indication			
			E-SG23-AC-2RD	Valve feeder			
			E-SG23-AC-2RE	Valve open/close	HS-250 HS-171A		
	J-SGE-UV-181	Steam generator No. 2 line No. 2 main steam isolation valve	E-SG23-AC-2RF	Valve open/close	HS-171C HS-277		
			E-SG23-AC-2RG	ESFAS			
			E-SG23-AC-4RA	Valve indication			
			E-SG23-AC-4RB	Valve indication			

Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 14 of 100) ^(a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location			
					Control Room	Remote Shutdown Panel	Local	
MAIN STEAM (continued)	J-SGE-UV-181	Steam generator No. 2 line No. 2 main steam isolation valve	E-SG23-AC-4RD	Valve feeder	HS-250 HS-181A			
			E-SG23-AC-4RE	Valve open/close				
	J-SGE-UV-181	Steam generator No. 2 line No. 2 main steam isolation valve	E-SG23-AC-4RF	Valve open/close	HS-181C HS-281			
			E-SG23-AC-4RG	ESFAS				
	J-SGE-UV-180	Steam generator No. 1 line No. 2 main steam isolation valve	E-SG23-AC-3RA	Valve indication	HS-251 HS-180A HS-180C HS-279			
			E-SG23-AC-3RB	Valve indication				
			E-SG23-AC-3RD	Valve feeder				
			E-SG23-AC-3RE	Valve open/close				
			E-SG23-AC-3RF	Valve open/close				
			E-SG23-AC-3RG	ESFAS				
	J-SGA-HV-179	Steam generator No. 2 line No. 2 atmospheric dump valve	E-SG21-AC-1RA	Solenoid 'A' coil feeder	HS-179A			HS-179C
			E-SG21-AC-1RB or E-SG21-AC-1RC	Solenoid 'A' open/close Solenoid 'A' open/close				
			E-SG21-CC-1RA	Solenoid 'B' coil feeder				

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Table E-1
EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 15 of 100) (a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
MAIN STEAM (continued)	J-SGA-HV-179	Steam generator No. 2 line No. 2 atmospheric dump valve	E-SG21-CC-1RB or E-SG21-CC-1RC	Solenoid 'B' open/close Solenoid 'B' open/close	HS-179B	HS-179D	
			E-SG51-AC-4XC or E-SG51-AC-4XD	Position control Position control	HIC-179A	HIC-179B	
			E-SG51-AC-4XB	Control signal to I/P converter			
	J-SGA-HV-179	Steam Generator No. 2 line No. 2 atmospheric dump valve	E-RM10-AC-1RD or E-ZJ01-AC-1RN	Controller power Controller power			
	J-SGA-HV-179	Steam generator No. 2 line No. 2 atmospheric dump valve accumulator X01B	E-SG57-AC-1XA	Pressure signal	PSL-313		
			E-SG27-AC-1RB	Solenoid PV313A open			
	J-SGA-HV-184	Steam generator No. 1 line No. 1 atmospheric dump valve	E-SG18-AC-1RA	Solenoid 'A' coil feeder			X
			E-SG18-AC-1RB or E-SG18-AC-1RC	Solenoid 'A' open/close Solenoid 'A' open/close	HS-184A	HS-184C	
			E-SG18-CC-1RA	Solenoid 'B' coil feeder			X

Table E-1
EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 16 of 100) (a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
MAIN STEAM (continued)	J-SGA-HV-184	Steam generator No. 1 line No. 1 atmospheric dump valve	E-SG18-CC-1RB or E-SG18-CC-1RC	Solenoid 'B' open/close Solenoid 'B' open/close	HS-184B	HS-184D	
			E-SG51-AC-1XC or E-SG51-AC-1XD	Position control Position control	HIC-184A	HIC-184B	
			E-SG51-AC-1XB	Control signal to I/P converter			
			E-SG51-AC-1XC or E-ZJ01-AC-1RN	Controller power Controller power			
			E-SG27-AC-1RC	Solenoid PV313B open	PSL-313		
			E-SG57-AC-1XA	Pressure signal			
	J-SGA-HV-184	Steam generator No. 1 line No. 1 atmospheric dump valve accumulator X01A	E-SG27-AC-1RC	Solenoid PV313B open	PSL-313		
	J-SGB-PT-1013B	Steam generator No. 1 pressure	E-SG61-BC-1XB	Pressure signal			
			E-SG61-BC-1XA	Pressure signal			
			E-RM45-BC-1XB or E-SG61-BC-1XD	Pressure display Pressure display	PI-1013B	PI-1013B-1	
			E-SB02-BC-1RO or E-ZJ02-BC-1RO	Display power Display power			
Train: B							

Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 17 of 100) (a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
MAIN STEAM (continued)	J-SGB-PT-1023B	Steam generator No. 2 pressure	E-SG61-BC-3XB	Pressure signal	PI-1023B	PI-1023B-1	
			E-SG61-BC-3XA	Pressure signal			
			E-RM45-BC-1XB	Pressure display			
			or E-SG61-BC-3XD	Pressure display			
			E-SB02-BC-1RO	Display power			
			or E-ZJ02-BC-1RO	Display power			
	J-SGB-LT-1113B	Steam generator No. 1 level (wide range)	E-SG65-BC-1XA	Level signal	LI-1113B	LI-1113B-1	
			E-SG65-BC-1XB	Level signal			
			E-RM45-BC-1XB	Level display			
			or E-SG65-BC-1XD	Level display			
			E-SB02-BC-1RO	Display power			
			or E-ZJ02-BC-1RO	Display power			
	J-SGB-LT-1123B	Steam generator No. 2 level (wide range)	E-SG65-BC-2XA	Level signal	LI-1113B	LI-1113B-1	
			E-SG65-BC-2XB	Level signal			
			E-RM45-BC-1XB	Level display			
			or E-SG65-BC-2XD	Level display			
			E-SB02-BC-1RO	Display power			
			or E-ZJ02-BC-1RO	Display power			

Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 18 of 100) ^(a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
MAIN STEAM (continued)	J-SGE-UV-170	Steam generator No. 1 line No. 1 main steam isolation valve	E-SG23-BC-1RA	Valve indication	HS-253 HS-170B		
			E-SG23-BC-1RB	Valve indication			
			E-SG23-BC-1RD	Valve feeder			
			E-SG23-BC-1RE	Valve open/close			
			E-SG23-BC-1RF	Valve open/close			
	J-SGE-UV-171	Steam generator No. 2 line No. 1 main steam isolation valve	E-SG23-BC-1RG	ESFAS	HS-170D HS-276		
			E-SG23-BC-2RA	Valve indication	HS-252 HS-171B		
			E-SG23-BC-2RB	Valve indication			
			E-SG23-BC-2RD	Valve feeder			
			E-SG23-BC-2RE	Valve open/close			
	J-SGE-UV-181	Steam generator No. 2 line No. 2 main steam isolation valve	E-SG23-BC-2RF	Valve open/close			
			E-SG23-BC-2RG	ESFAS	HS-252 HS-181B		
			E-SG23-BC-4RA	Valve indication			
			E-SG23-BC-4RB	Valve indication			
			E-SG23-BC-4RD	Valve feeder			
		E-SG23-BC-4RE	Valve open/close				

Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 19 of 100) ^(a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location			
					Control Room	Remote Shutdown Panel	Local	
MAIN STEAM (continued)	J-SGE-UV-181	Steam generator No. 2 line No. 2 main steam isolation valve	E-SG23-BC-4RF	Valve open/close	HS-181D HS-282			
			E-SG23-BC-4RG	ESFAS				
	J-SGE-UV-180	Steam generator No. 1 line No. 2 main steam isolation valve	E-SG23-BC-3RA	Valve indication	HS-253 HS-180B			
			E-SG23-BC-3RB	Valve indication				
			E-SG23-BC-3RD	Valve feeder				
			E-SG23-BC-3RE	Valve open/close				
			E-SG23-BC-3RF	Valve open/close				
	J-SGB-HV-178	Steam generator No. 1 line No. 2 atmospheric dump valve	E-SG23-BC-3RG	ESFAS	HS-180D HS-280			
			E-SG22-BC-1RA	Solenoid 'A' coil feeder	HS-178A			HS-178C
			E-SG22-BC-1RB or E-SG22-BC-1RC	Solenoid 'A' open/close Solenoid 'A' open/close				
			E-SG22-BC-1RD	Circuit disconnect	HS-178I			
			E-SG22-BC-2RG	Circuit disconnect				
			E-SG22-DC-1RA	Solenoid 'B' coil feeder				

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Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 20 of 100) ^(a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
MAIN STEAM (continued)	J-SGB-HV-178	Steam generator No. 1 line No. 2 atmospheric dump valve	E-SG22-DC-1RB or E-SG22-DC-1RC	Solenoid 'B' open/close Solenoid 'B' open/close	HS-178B	HS-178D HS-178J	
			E-SG22-DC-1RD	Circuit disconnect			
			E-SG22-DC-1RE	Circuit disconnect			
			E-SG51-BC-3XA or E-SG51-BC-3XD	Position control Position control	HIC-178A	HIC-178B	
			E-SG51-BC-3XB	Control signal to I/P converter			
			E-RM10-BC-1RD or E-ZJ02-BC-1RO	Controller power Controller power			
			(Later)	Circuit disconnect			
	J-SGB-HV-178	Steam generator No. 1 line No. 2 atmospheric dump valve accumulator X01B	E-SG27-BC-1RB E-SG57-BC-1XA	Solenoid PV306A open Pressure signal	PSL-306		
	J-SGB-HV-185	Steam generator No. 2 line No. 1 atmospheric dump valve	E-SG20-BC-1RA	Solenoid 'A' coil feeder			X

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Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 21 of 100) (a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
MAIN STEAM (continued)	J-SGB-HV-185	Steam generator No. 2 line No. 1 atmospheric dump valve	E-SG20-BC-1RB	Solenoid 'A' open/close	HS-185A	HS-185C	X
			E-SG20-BC-1RC	Solenoid 'A' open/close			
			E-SG20-BC-1RD	Circuit disconnect			
			E-SG20-BC-2RG	Circuit disconnect			
			E-SG20-DC-1RA	Solenoid 'B' coil feeder	HS-185B	HS-185D	
			E-SG20-DC-1RB or E-SG20-DC-1RC	Solenoid 'B' open/close Solenoid 'B' open/close			
			E-SG20-DC-1RD	Circuit disconnect			
			E-SG20-DC-1RE	Circuit disconnect			
	J-SGB-HV-185	Steam generator No. 2 line No. 1 atmospheric dump valve accumulator	E-SG51-BC-2XA or E-SG51-BC-2XD	Position control Position control	HIC-185A	HIC-185B	
			E-SG51-BC-2XB	Control signal to I/P converter			
			E-SG51-BC-2XC	Controller power			
			E-ZJ02-BC-1RO	Controller power			
			(Later)	Circuit disconnect			

Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 22 of 100) ^(a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
MAIN STEAM (continued)	J-SGB-HV-185	Steam generator No. 2 line No. 1 atmospheric dump valve accumulator X01A	E-SG27-BC-1RC E-SG57-BC-1XA	Solenoid PV306B open Pressure signal	PSL-306		
REACTOR COOLANT							
Function: Provide sufficient cooling during shutdown operations to preclude significant fuel damage							
Train: A	M-RCE-B01 M-RCE-B09 M-RCE-A14	Pressurizer backup heaters	E-RC10-NC-1FA E-RC10-NC-1FB E-RC10-AC-1RA E-RC10-AC-1RD E-RC10-AC-1RE E-RC10-AC-1RB	Heater feeder Heater feeder Heater on/off Heater on/off ESFAS override ESFAS	HS-100-4	HS-100-4-1	X X X
	J-RCA-LT-110X	Pressurizer level	E-RC74-AC-1XC E-RC74-AC-1XB E-RM44-AC-1XA E-RC74-AC-1XD E-RC74-AC-1XA	Level signal Level signal Level display Level display Level recorder	LI-110X LR-110X	LI-110X-1	

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Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
REACTOR COOLANT (continued)	J-RCA-LT-110X	Pressurizer level	E-SB01-AC-1RP	Display power			
			E-ZJ01-AC-1RN	Display power			
			E-SB01-AC-1RN	Rack power			
	J-RCA-TE-112HA	Hot-leg Loop 1 temperature	E-RC57-AC-1XC	Temperature sensor			
			E-RM44-AC-1XB	Temperature display	TI-112HA		
			E-RC57-AC-1XE	Temperature display		TI-112HA-1	
			E-RC57-AC-1XA	Temperature recorder	TR-112HA		
			E-SB01-AC-1RP	Display power			
			E-ZJ01-AC-1RN	Display power			
			E-SB01-AC-1RN	Rack power			
	J-RCA-PT-102A	Pressurizer pressure	E-RC64-AC-1XB	Pressure signal			
			E-RC64-AC-1XC	Pressure signal			
			E-RM44-AC-1XC	Pressure display	PI-102A		
			E-RC64-AC-1XA	Pressure recorder or	PR-102A		
			E-RC64-AC-1XD	Pressure display		PI-102A-1	
			E-SB01-AC-1RP	Display power			

Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
REACTOR COOLANT (continued) Train: B	J-RCA-PT-102A	Pressurizer pressure	E-ZJ01-AC-1RN	Display power			
			E-SB01-AC-1RN	Rack power			
	M-RCE-B18 M-RCE-B10 M-RCE-A05	Pressurizer backup heaters	E-RC10-NC-2FA	Heater feeder			X
			E-RC10-NC-2FB	Heater feeder			X
			E-RC10-BC-1RA	Heater on/off	HS-100-5		
			E-RC10-BC-1RB	Heater on/off			
			E-RC10-BC-1RD	Heater on/off	HS-100-5-1		
			E-RC10-BC-1RE	SIAS override			X
			E-RC10-BC-1RA	ESFAS			
			E-RC10-BC-1RC	Circuit disconnect		HS-100-5-2	
			E-RC10-BC-1RH	Circuit disconnect			
	J-RCB-LT-110Y	Pressurizer level	E-RC74-BC-1XA	Level signal			
			E-RC74-BC-1XB	Level signal			
			E-RM44-BC-1XA	Level display	LI-110Y		
			E-SB02-BC-1RN	Rack power			
			E-RC74-BC-1XC	Level display		LI-110Y-1	
			E-SB02-BC-1RO	Display power			
			E-ZJ02-BC-1RO	Display power			

Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 25 of 100) (a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
REACTOR COOLANT (continued)	J-RCB-TE-122HB	Hot-leg loop 1 temperature	E-RC57-BC-2XA	Temperature sensor	TI-122HB	TI-122HB-1	
			E-RC57-BC-2XB	Temperature sensor			
			E-RM45-BC-1XA	Temperature display			
			E-RC57-BC-2XD	or Temperature display			
			E-SB02-BC-1RO	Display power			
			E-ZJ02-BC-1RO	Display power			
	J-RCB-PT-102B	Pressurizer pressure	E-SB02-BC-1RN	Rack power	PI-102B	PI-102B-1	
			E-RC64-BC-1XA	Pressure signal			
			E-RC64-BC-1XB	Pressure signal			
			E-RM45-BC-1XB	Pressure display			
			E-RC64-BC-1XC	or Pressure display			
			E-SB02-BC-1RO	Display power			
			E-ZJ02-BC-1RO	Display power			
			E-SB02-BC-1RN	Rack power			

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OFFSITE POWER AVAILABLE (Sheet 26 of 100) ^(a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
SAFETY INJECTION AND SHUTDOWN COOLING Function: Provide RCS makeup and decay heat removal capability Train: A	J-SIA-FT-306	LPSI pump No. 1 flow(b)	E-SI80-AC-1XA	Flow signal	FI-306	FI-306-1	
			E-SI80-AC-1XC	Flow display			
			or E-RM42-AC-1XC	Flow display			
			E-SB01-AC-1RS	Display power			
			E-ZJ01-AC-1RN	Display power			
	J-SIA-HV-608	SIT No. 4 vent valve(b)	E-SB01-AC-1RM	Rack power	HS-608A	HS-608B	
			E-SI51-AC-2RA	Solenoid open/			
			or E-SI51-AC-2RB	close Solenoid open/			
				close			
			E-SI51-AC-2RC	Solenoid coil			
				feeder			
			E-SI51-AC-2RD	Solenoid coil			
				feeder			
			E-SI51-AC-2RE	Solenoid coil			
				feeder			
			E-SI51-AC-2RB	Valve open/close			

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
SAFETY INJECTION AND SHUTDOWN COOLING (continued)	J-SIA-HV-605	SIT No. 1 vent valve (b)	E-SI50-AC-1RA or E-SI50-AC-1RB	Solenoid open/ close Solenoid open/ close	HS-605A	HS-605B	
			E-SI50-AC-1RC	Solenoid coil feeder			
			E-SI50-AC-1RD	Solenoid coil feeder			
			E-SI50-AC-1RE	Solenoid coil feeder			
	J-SIA-HV-606	SIT No. 2 vent valve (b)	E-SI50-AC-2RA or E-SI50-AC-2RB	Solenoid open/ close Solenoid open/ close	HS-606A	HS-606B	
			E-SI50-AC-2RC	Solenoid open/ close			
			E-SI50-AC-2RD	Solenoid open/ close			
			E-SI50-AC-2RE	Solenoid open/ close			
	J-SIA-HV-607	SIT No. 3 vent valve (b)	E-SI51-AC-1RA	Solenoid open/ close	HS-607A	HS-607B	
			E-SI51-AC-1RB	Solenoid open/ close			
			E-SI51-AC-1RC	Solenoid coil feeder			

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location			
					Control Room	Remote Shutdown Panel	Local	
SAFETY INJECTION AND SHUTDOWN COOLING (continued)	J-SIA-HV-607	SIT No. 3 vent valve (b)	E-SI51-AC-1RD	Solenoid coil feeder	HS-617			
			E-SI51-AC-1RE	Solenoid coil feeder				
	J-SIA-UV-617	Containment penetration external isolation valve hp header No. 1	E-SI09-AC-1RA	MOV limit stops valve				
			E-SI09-AC-1RC	Valve open/close				
			E-SI09-AC-1KA	Valve feeder				
			E-SI09-AC-1RB	Valve open/close				
	J-SIA-UV-627	Containment penetration external isolation valve hp header No. 1	E-SI09-AC-2RA	MOV limit stop				HS-627
			E-SI09-AC-2RC	Valve open/close				
			E-SI09-AC-2KA	Valve feeder				
			E-SI09-AC-2RB	Valve open/close				
	J-SIA-UV-637	Containment penetration external isolation valve hp header No. 1	E-SI10-AC-1RA	MOV limit stop				HS-637
			E-SI10-AC-1RC	Valve open/close				
			E-SI10-AC-1KA	Valve feeder				
			E-SI10-AC-1RB	Valve open/close				
	J-SIA-UV-647	Containment penetration external isolation valve hp header No. 1	E-SI10-AC-2RA	MOV limit stop				HS-647
			E-SI10-AC-2RC	Valve open/close				

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
SAFETY INJECTION AND SHUTDOWN COOLING (continued)	J-SIA-UV-647	Containment penetration external isolation valve hp header No. 1-	E-SI10-AC-2KA	Valve feeder	HS-635		
			E-SI10-AC-2RB	Valve open/close			
	J-SIA-UV-635	Containment penetration external isolation valve lp header No. 1(b)	E-SI08-AC-1RA	MOV limit stop			
			E-SI08-AC-1RC	Valve open/close			
			E-SI08-AC-1KA	Valve feeder			
			E-SI08-AC-1RB	Valve open/close			
	J-SIA-UV-645	Containment penetration external isolation valve lp header No. 1(b)	E-SI08-AC-2RA	MOV limit stop	HS-645		
			E-SI08-AC-2RB	Valve open/close			
			E-SI08-AC-2KA	Valve feeder			
			E-SI08-AC-2RC	Valve open/close			
	J-SIA-HV-691	Shutdown cooling warmup bypass valve (b)	E-SI28-AC-1RA	MOV limit stop	HS-691		
			E-SI28-AC-1RB	Valve open/close			
			E-SI28-AC-1KA	Valve feeder			
			E-SI28-AC-1RC	ESFAS (bypass O/L)			
	J-SIA-UV-669	LPSI pumps to RWT isolation valves (b)	E-SI19-AC-1RA	MOV limit stop	HS-669		
			E-SI19-AC-1RC	Valve open/close			
			E-SI19-AC-1KA	Valve feeder			
			E-SI19-AC-1RB	ESFAS			

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EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 30 of 100) ^(a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
SAFETY INJECTION AND SHUTDOWN COOLING (continued)	J-SIA-UV-634	SIT No. 3 isolation valve (b)	E-SI05-AC-1RB	MOV limit stop	HS-634		
			E-SI05-AC-1RE	MOV limit stop			
			E-SI05-AC-1RG	Valve open/close			
			E-SI05-AC-1KB	Valve feeder			
			E-SI05-AC-1KA	Valve feeder			
			E-SI05-AC-1RH	ESFAS			
			E-SI05-AC-1RI	Valve open/close			
	J-SIA-UV-644	SIT No. 4 isolation valve (b)	E-SI05-AC-2RB	MOV limit stop	HS-644		
			E-SI05-AC-2RE	MOV limit stop			
			E-SI05-AC-2RG	Valve open/close			
			E-SI05-AC-2KB	Valve feeder			
			E-SI05-AC-2RA	SESS			
			E-SI05-AC-2KA	Valve feeder			
			E-SI05-AC-2RH	ESFAS			
	J-SIA-HV-683	LPSI pump suction isolation valve (b)	E-SI05-AC-2RI	Valve open/close	HS-683		
			E-SI26-AC-1RA	MOV limit stop			
			E-SI26-AC-1RB	Valve open/close			
			E-SI26-AC-1KA	Valve feeder			
			E-SI26-AC-1RC	ESFAS			

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
SAFETY INJECTION AND SHUTDOWN COOLING (continued)	J-SIA-TE-351X	SDC heat exchanger inlet temperature (b)	E-SI80-AC-3XA	Temperature signal	TR-351	TI-351X	
			E-SI80-AC-3XD	Temperature display			
			E-SI80-AC-3XC	Temperature display			
			E-ZJ01-AC-1RN	Display power			
			E-SB01-AC-1RM	Rack power			
	J-SIA-TE-351Y	LPSI temperature at heat exchanger outlet (b)	E-SI80-AC-4XA	Temperature signal	TR-351	TI-351Y	
			E-SI80-AC-4XC	Temperature display			
			E-SI80-AC-3XD	Temperature display			
			E-ZJ01-AC-1RN	Display power			
			E-SB01-AC-1RM	Rack power			
	J-SIA-UV-651	Shutdown cooling isolation valve (b)	E-SI13-AC-1RB	MOV limit stop	HS-651		
			E-SI13-AC-1RC	MOV limit stop			
			E-SI13-AC-1RE	Valve open/close			
			E-SI13-AC-1KA	Valve feeder			
			E-SI13-AC-1KB	Valve feeder			

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EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 32 of 100) ^(a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
SAFETY INJECTION AND SHUTDOWN COOLING (continued)	J-SIA-UV-653	Shutdown cooling containment isolation valve ^(b)	E-SI14-CC-1RA	Valve open/close	HS-653		
			E-SI14-CC-1RB	MOV limit stop			
			E-SI14-CC-1RC	MOV limit stop			
			E-SI14-CC-1RD	MOV limit stop			
			E-SI14-CC-1KB	Valve feeder			
			E-SI14-CC-1KC	Valve feeder			
			E-SI14-CC-1KD	Valve feeder			
			E-SI14-CC-1FA	Valve feeder (DC)			
	J-SIA-UV-655	Shutdown cooling containment isolation valve ^(b)	E-SI15-AC-1RA	Valve open/close	HS-655		
			E-SI15-AC-1RC	MOV limit stop			
			E-SI15-AC-1KA	Valve feeder			
			E-SI15-AC-1RB	Valve open/close			
	M-SIA-P01	LPSI pump ^(b)	E-SI02-AC-1RA	Pump start/stop	HS-3		
			E-I02-AC-1RB	Override permissive			
			E-SI02-AC-1CA	Override permissive			
			E-SI02-AC-1CA	Pump feeder			
			E-SI02-AC-1RC	Pump start/stop			
			1-SI02-AC-1RJ	Pump indication			

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
SAFETY INJECTION AND SHUTDOWN COOLING (continued)	J-SIA-HV-685	LPSI pump cross-connect valve to SDC heat exchanger ^(b)	E-SI30-AC-1RA	MOV limit stop	HS-685		
			E-SI30-AC-1RB	Valve open/close			
			E-SI30-AC-1KA	Valve feeder			
			E-SI30-AC-1RC	ESFAS			
	J-SIA-HV-686	Containment spray/LPSI cross-connect valve ^(b)	E-SI31-AC-1RA	MOV limit stop	HS-686		
			E-SI31-AC-1RB	Valve open/close			
			E-SI31-AC-1KA	Valve feeder			
			E-SI31-AC-1RC	ESFAS			
	J-SIA-UV-672	Containment spray control valve ^(b)	E-SI20-AC-1RA	MOV limit stop	HS-672		
			E-SI20-AC-1RC	Valve open/close			
			E-SI20-AC-1KA	Valve feeder			
			E-SI20-AC-1RB	ESFAS			
	J-SIA-HV-657	Shutdown cooling temperature control valve ^(b)	E-SI27-AC-1RA	MOV limit stop	HS-657		
			E-SI27-AC-1RB	Valve open/close			
			E-SI27-AC-1KA	Valve feeder			
			E-SI27-AC-1RC	ESFAS			

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
SAFETY INJECTION AND SHUTDOWN COOLING (continued)	J-SIA-HV-687	Containment spray isolation valve (b)	E-SI24-AC-1RA	MOV limit stop	HS-687		
			E-SI24-AC-1RB	Valve open/close			
			E-SI24-AC-1KA	Valve feeder			
			E-SI24-AC-1RC	ESFAS			
	J-SIA-HV-306	LPSI header discharge valve (b)	E-SI23-AC-1RA	MOV limit stop	HS-306		
			E-SI23-AC-1RB	Valve open/close			
			E-SI23-AC-1KA	Valve feeder			
			E-SI23-AC-1RD	ESFAS			
	J-SIA-HV-684	Shutdown cooling heat exchanger isolation valve (b)	E-SI25-AC-1RA	MOV limit stop	HS-684		
			E-SI25-AC-1RB	Valve open/close			
			E-SI25-AC-1KA	Valve feeder			
			E-SI25-AC-1RC	ESFAS (bypass O/L)			
	J-SIA-HV-678	Shutdown cooling heat exchanger isolation valve (b)	E-SI33-AC-1RA	MOV limit stop	HS-678		
			E-SI33-AC-1RC	Valve open/close			
			E-SI33-AC-1RD	ESFAS			
			E-SI33-AC-1KA	Valve feeder			

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EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
SAFETY INJECTION AND SHUTDOWN COOLING (continued)	J-SIA-HV-688	Shutdown cooling heat exchanger bypass valve (b)	E-SI29-AC-1RA	MOV limit stop	HS-688		
			E-SI29-AC-1RB	Valve open/close			
			E-SI29-AC-1KA	Valve feeder			
			E-SI29-AC-1RC	ESFAS (bypass O/L)			
	J-SIA-PT-341	SIT No. 4 pressure	E-SI71-AC-2XB	Pressure signal	PI-341		
			E-SI71-AC-2XA	Pressure signal			
	J-SIA-PT-341	SIT No. 4 pressure	E-RM42-AC-1XB	Pressure display			
			E-SI71-AC-2XC	Pressure display			
			E-SB01-AC-1RS	Display power			
			E-ZJ01-AC-1RN	Display power			
	J-SIA-PT-331	SIT No. 3 pressure	E-SB01-AC-1RM	Rack power	PI-331		
			E-SI71-AC-1XB	Pressure signal			
			E-SI71-AC-1XA	Pressure signal			
			E-RM42-AC-1XB	Pressure display			
			E-SI71-AC-1XC	Pressure display			
			E-SB01-AC-1RS	Display power			
			E-ZJ01-AC-1RN	Display power			
			E-SB01-AC-1RM	Rack power			

Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
SAFETY INJECTION AND SHUTDOWN COOLING (continued) Train: B	J-SIB-FT-307	LPSI pump No. 2 flow (b)	E-SI81-BC-1XA	Flow signal	FI-307	FI-307-1	
			E-RM42-BC-1XC	Flow display			
			or E-SI81-BC-1XC	Flow display			
			E-SB02-BC-1RM	Display power			
			E-ZJ02-BC-1RO	Display power			
			E-SB02-BC-1RD	Rack power			
	J-SIB-HV-643	SIT No. 4 vent valve (b)	E-SI53-BC-2RA	Solenoid open/	HV-643A	HV-643B	
			or E-SI53-BC-2RB	close Solenoid open/			
	J-SIB-HV-643	SIT No. 4 vent valve (b)	E-SI53-BC-2RC	Solenoid coil feeder	HS-633A	HS-633B	
			E-SI53-BC-2RD	Solenoid coil feeder			
			E-SI53-BC-2RE	Solenoid coil feeder			
			(later)	Circuit disconnect			
	J-SIB-HV-633	SIT No. 3 vent valve (b)	E-SI53-BC-1RA	Solenoid open/	HS-633A	HS-633B	
			or E-SI53-BC-1RB	close Solenoid open/			
				close			

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
SAFETY INJECTION AND SHUTDOWN COOLING (continued)	J-SIB-HV-633	SIT No. 3 vent valve ^(b)	E-SI53-BC-1RC	Solenoid coil feeder	HS-623A	HS-623B	
			E-SI53-BC-1RD	Solenoid coil feeder			
			E-SI53-BC-1RE	Solenoid coil feeder			
	J-SIB-HV-623	SIT No. 2 vent valve ^(b)	(later)	Circuit disconnect			
			E-SI52-BC-2RA	Solenoid open/close			
			E-SI52-BC-2RB	Solenoid open/close			
			E-SI52-BC-2RC	Solenoid coil feeder			
			E-SI52-BC-2RD	Solenoid coil feeder			
			E-SI52-BC-2RE	Solenoid coil feeder			
	J-SIG-HV-613	SIT No. 1 vent valve ^(b)	(later)	Circuit disconnect	HS-613A	HS-613B	
			E-SI52-BC-1RA or E-SI52-BC-1RB	Solenoid open/close			
			E-SI52-BC-1RC	Solenoid coil feeder			

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
SAFETY INJECTION AND SHUTDOWN COOLING (continued)	J-SIG-HV-613	SIT No. 1 vent valve ^(b)	E-SI52-BC-1RD	Solenoid coil feeder			
			E-SI52-BC-1RE	Solenoid coil feeder			
			(later)	Circuit disconnect			
	J-SIB-UV-616	Containment penetration external isolation valve hp header No. 2	E-SI11-BC-1RA	MOV limit stop	HS-616		
			E-SI11-BC-1RC	Valve open/close			
			E-SI11-BC-1KA	Valve feeder			
			E-SI11-BC-1RB	ESFAS			
	J-SIB-UV-626	Containment penetration external isolation valve hp header No. 2	E-SI11-BC-2RA	MOV limit stop	HS-626		
			E-SI11-BC-2RC	Valve open/close			
			E-SI11-BC-2KA	Valve feeder			
			E-SI11-BC-2RB	ESFAS			
	J-SIB-UV-636	Containment penetration external isolation valve hp header No. 2	E-SI12-BC-1RA	MOV limit stop	HS-636		
			E-SI12-BC-2RC	Valve open/close			
			E-SI12-BC-1KA	Valve feeder			
			E-SI12-BC-1RB	ESFAS			

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
SAFETY INJECTION AND SHUTDOWN COOLING (continued)	J-SIB-UV-646	Containment penetration external isolation valve hp header No. 2	E-SI12-BC-2RA	MOV limit stop	HS-646		
			E-SI12-BC-2RC	Valve open/close			
			E-SI12-BC-2KA	Valve feeder			
			E-SI12-BC-2RB	ESFAS			
	J-SIB-UV-615	Containment penetration external isolation valve lp header No. 2 ^(b)	E-SI07-BC-1RA	MOV limit stop	HS-615		
			E-SI07-BC-1RC	Valve open/close			
			E-SI07-BC-1KA	Valve feeder			
			E-SI07-BC-1RB	ESFAS			
	J-SIB-UV-625	Containment penetration external isolation valve lp header No. 2	(later)	Circuit disconnect	HS-625		
			E-SI07-BC-2RA	MOV limit stops			
			E-SI07-BC-2RC	Valve open/close			
			E-SI07-BC-2KA	Valve feeder			
	J-SIB-HV-690	Shutdown cooling warmup bypass valve (b)	E-SI07-BC-2RB	ESFAS	HS-690		
			(later)	Circuit disconnect			
			E-SI28-BC-1RA	MOV limit stops			
			E-SI28-BC-1RB	Valve open/close			
			E-SI28-BC-1KA	Valve feeder			
			E-SI28-BC-1RC	ESFAS			
			(later)	Circuit disconnect			

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OFFSITE POWER AVAILABLE (Sheet 40 of 100) (a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
SAFETY INJECTION AND SHUTDOWN COOLING (continued)	J-SIB-UV-668	LPSI pumps to RWT isolation valves (mini-flow) (b)	E-SI19-BC-1RA	MOV limit stops	HS-668		
			E-SI19-BC-1RC	Valve open/close			
			E-SI19-BC-1KA	Valve feeder			
			E-SI19-BC-1RB	ESFAS			
			(later)	Circuit disconnect			
	J-SIB-UV-614	SIT No. 1 isolation valve(b)	E-SI06-BC-1RC	MOV limit stop	HS-614		
			E-SI06-BC-1RF	MOV limit stop			
			E-SI06-BC-1RH	Valve open/close			
			E-SI06-BC-1KB	Valve feeder			
			E-SI06-BC-1KA	Valve feeder			
			E-SI06-BC-1RB	ESFAS			
			E-SI06-BC-1RG	Valve open/close			
			E-SI06-BC-2RC	MOV limit stop			
	J-SIB-UV-624	SIT No. 2 isolation valve(b)	E-SI06-BC-2RF	MOV limit stop	HS-624		
			E-SI06-BC-2RH	Valve open/close			
			E-SI06-BC-2KB	Valve feeder			
			E-SI06-BC-2KA	Valve feeder			
			E-SI06-BC-2RB	ESFAS			
			E-SI06-BC-2RG	Valve open/close			

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Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 41 of 100) (a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location			
					Control Room	Remote Shutdown Panel	Local	
SAFETY INJECTION AND SHUTDOWN COOLING (continued)	J-SIB-HV-692	LPSI pump suction isolation valve (b)	E-SI26-BC-1RA	MOV limit stop	HS-683			
			E-SI26-BC-1RB	Valve open/close				
			E-SI26-BC-1KA	Valve feeder				
			E-SI26-BC-1RC	ESFAS				
			(later)	Circuit disconnect				
	J-SIB-TE-352X	SDC heat exchanger inlet temperature (b)	E-SI81-BC-3XA	Temperature signal	TR-352			
			E-SI81-BC-3XD	Temperature display				
			E-SI81-BC-3XC	Temperature display				TI-352-X
			E-ZJ02-BC-1RO	Display power				
			E-SB02-RC-1RD	Rack power				
	J-SIB-TE-352Y	LPSI temperature at SDC heat exchanger outlet (b)	E-SI81-BC-4XA	Temperature signal	TI-352-Y			
			E-SI81-BC-4XC	Temperature display				
			E-ZJ02-BC-1RO	Display power				
			E-SB02-BC-1RD	Rack power				
			J-SIB-UV-652	SDC suction isolation valve (b)				E-SI13-BC-1RB
	E-SI13-BC-1RC	MOV limit stop						
	E-SI13-BC-1RE	Valve open/close						

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Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 42 of 100) ^(a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
SAFETY INJECTION AND SHUTDOWN COOLING (continued)	J-SIB-UV-652	SDC suction isolation valve (b)	E-SI13-BC-1KA	Valve feeder	HS-654		
			E-SI13-BC-1KB	Valve feeder			
			E-SI13-BC-1RD	Valve open/close			
			(later)	Circuit disconnect			
	J-SIB-UV-654	Shutdown cooling containment isolation valve (b)	E-SI14-DC-1RA	Valve open/close			
			E-SI14-DC-1RE	MOV limit stop			
			E-SI14-DC-1RC	MOV limit stop			
			E-SI14-DC-1RD	MOV limit stop			
			E-SI14-DC-1KC	Valve feeder			
			E-SI14-DC-1KD	Valve feeder			
			E-SI14-DC-1KB	Valve feeder (DC)			
			E-SI14-DC-1RB	Valve open/close			
			(later)	Circuit disconnect			
	J-SIB-UV-656	Shutdown cooling containment isolation valve (b)	E-SI15-BC-1RA	Valve open/close	HS-656		
			E-SI15-BC-1RB	MOV limit stop			
			E-SI15-BC-1RC	MOV limit stop			
			E-SI15-BC-1KA	Valve feeder			
			(later)	Circuit disconnect			

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Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 43 of 100) ^(a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
SAFETY INJECTION AND SHUTDOWN COOLING (continued)	M-SIB-P01	LPSI pump ^(b)	E-SI02-BC-1RA	Pump start/stop	HS-4		
			E-SI02-BC-1RB	Override permissive			
			E-SI02-BC-1RD	Override permissive			
			E-SI02-BC-1RJ	Pump indication			
			E-SI02-BC-1CA	Pump feeder			
			E-SI02-BC-1RC	Pump start/stop			
			E-SI02-BC-1RE	Motor current indication			
			Integral with switchgear	Circuit disconnect			
	J-SIB-HV-694	LPSI pump cross-connect valve to SDC heat exchanger ^(b)	E-SI30-BC-1RA	MOV limit stop	HS-694		
			E-SI30-BC-1RC	Valve open/close			
			E-SI30-BC-1KA	Valve feeder			
			E-SI30-BC-1RB	Valve open/close			
			(later)	Circuit disconnect			
	J-SIB-HV-696	Containment spray/LPSI cross-connect valve ^(b)	E-SI31-BC-1RA	MOV limit stop	HS-696		
			E-SI31-BC-1RB	Valve open/close			
			E-SI31-BC-1KA	Valve feeder			

Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 44 of 100) (a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
SAFETY INJECTION AND SHUTDOWN COOLING (continued)	J-SIB-HV-696	Containment spray/LPSI cross-connect valve (b)	E-SI31-BC-1RC (later)	ESFAS Circuit disconnect	HS-671		
	J-SIB-UV-671	Containment spray control valve (b)	E-SI20-BC-1RA	MOV limit stop			
			E-SI20-BC-1RC	Valve open/close			
			E-SI20-BC-1KA	Valve feeder			
	J-SIB-HV-658	SDC temperature control valve (b)	E-SI20-BC-1RB	ESFAS			
			E-SI27-BC-1RA	MOV limit stop			
			E-SI27-BC-1RB	Valve open/close			
			E-SI27-BC-1KA	Valve feeder			
	J-SIB-HV-695	Containment spray isolation valve (b)	E-SI27-BC-1RC (later)	ESFAS Circuit disconnect			
			E-SI24-BC-1RA	MOV limit stop			
			E-SI24-BC-1RB	Valve open/close			
			E-SI24-BC-1KA	Valve feeder			
	J-SIB-HV-307	LPSI header discharge valve (b)	E-SI24-BC-1RC (later)	ESFAS Circuit disconnect			
			E-SI23-BC-1RA	MOV limit stop			
			E-SI23-BC-1RB	Valve open/close			

Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 45 of 100) ^(a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
SAFETY INJECTION AND SHUTDOWN COOLING (continued)	J-SIB-HV-307	LPSI header discharge valve ^(b)	E-SI23-BC-1KA	Valve feeder	HS-689		
			E-SI23-BC-1RD (later)	ESFAS Circuit disconnect			
	J-SIB-HV-689	SDC heat exchanger isolation valve ^(b)	E-SI25-BC-1RA	MOV limit stop			
			E-SI25-BC-1RB	Valve open/close			
			E-SI25-BC-1KA	Valve feeder			
			E-SI25-BC-1RC (later)	ESFAS Circuit disconnect			
	J-SIB-HV-679	SDC heat exchanger isolation valve ^(b)	E-SI33-BC-1RA	MOV limit stop	HS-679		
			E-SI33-BC-1RC	Valve open/close			
			E-SI33-BC-1RD	ESFAS			
			E-SI33-BC-1KA	Valve feeder			
	J-SIB-HV-693	SDC heat exchanger bypass valve ^(b)	E-SI29-BC-1RA	MOV limit stop	HS-693		
			E-SI29-BC-1RB	Valve open/close			
			E-SI29-BC-1KA	Valve feeder			
			E-SI29-BC-1RC (later)	ESFAS Circuit disconnect			
	J-SIB-PT-321	SIT No. 2 pressure	E-SI71-BC-2XB	Pressure signal			

Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 46 of 100) (a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location			
					Control Room	Remote Shutdown Panel	Local	
SAFETY INJECTION AND SHUTDOWN COOLING (continued)	J-SIB-PT-321	SIT No. 2 pressure	E-RM42-BC-1XB	Pressure display	PI-321	PI-321-1		
			E-SI71-BC-2XC	Pressure display				
			E-SB02-BC-1RM	Display power				
			E-ZJ02-BC-1RO	Display power				
			E-SB02-BC-1RD	Rack power				
	J-SIB-PT-311	SIT No. 1 pressure	E-SI71-BC-1XB	Pressure signal	PI-311	PI-311-1		
			E-RM42-BC-1XB	Pressure display				
			E-SI71-BC-1XC	Pressure display				
			E-SB02-BC-1RM	Display power				
			E-ZJ02-BC-1RO	Display power				
			E-SB02-BC-1RD	Rack power				
CHEMICAL AND VOLUME CONTROL								
Function: Maintain system inventory, maintain RCS chemistry and purity, provide auxiliary spray to RCS pressurizer, and provide borated water for safety injection								
Train: A	J-CHA-HV-205	Pressurizer auxiliary spray valve(b)	E-CH39-AG-1RD or E-CH29-AC-1RE	Valve open/close Valve open/close	HS-205	HS-205-1		

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EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 47 of 100) ^(a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
CHEMICAL AND VOLUME CONTROL (continued)	J-CHA-HV-205	Pressurizer auxiliary spray valve ^(b)	E-CH39-AC-1RAB	Solenoid coil feeder	HS-218A		
			E-CH39-AC-1RB	Solenoid coil feeder			
			E-CH39-AC-1RC	Solenoid coil feeder			
	M-CHE-P01	Charging pump No. 3	E-CH26-AC-1RA	Pump start/stop			
			E-CH26-AC-1FA	Pump feeder			
			E-CH26-AC-1RB	Pump stop			
			E-CH26-AC-1RD	Pump stop			
			E-CH26-AC-1RE	Pump start/stop			
	J-CHA-LT-200	Refueling water tank level	E-CH02-AC-1XA	Level signal		LI-200-1	
			E-CH02-AC-1XB	Level display		LI-200-1	
			E-ZJ01-AC-1RN	Display power			
	J-CHA-PT-212	Charging line pressure	E-SB01-AC-1RN	Rack power	PI-212	PI-212-1	
			E-CHA1-AC-1XA	Pressure signal			
			E-RM43-AC-1XA	Pressure display			
			E-CHA1-AC-1XB	Pressure display			
			E-SB01-AC-1RP	Display power			
			E-ZJ01-AC-1RN	Display power			

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Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 48 of 100) ^(a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
CHEMICAL AND VOLUME CONTROL (continued)	J-CHA-PT-212	Charging line pressure	E-SB01-AC-1RN	Rack power	HS-506	HS-506-1	
	J-CHA-UV-506	RCP gland seal controlled bleedoff containment isolation valve	E-CH14-AC-1RB	Valve open/close			
			or E-CH14-AC-1RF	Valve open/close			
			E-CH14-AC-1RC	Solenoid coil feeder			
			E-CH14-AC-1RD	Solenoid coil feeder			
			E-CH14-AC-1RH	Solenoid coil feeder			
	M-CHA-P01	Charging pump No. 1	E-CH14-AC-1RA	Valve open/close	HS-216		
			E-CH24-AC-1RA	Pump start/stop			
			E-CH24-AC-1FA	Pump feeder			
			E-CH24-AC-1RB	Pump stop			
			E-CH24-AC-1RD	Pump stop			
	J-CHA-UV-516	Letdown isolation valve to regenerative heat-exchanger	E-CH24-AC-1RE	Pump start/stop	HS-516		
			E-CH12-AC-1RB	Valve open/close			
			or E-CH12-AC-1RF	Valve open/close			
			E-CH12-AC-1RC	Solenoid coil feeder			

Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 49 of 100) (a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
CHEMICAL AND VOLUME CONTROL (continued) Train: B	J-CHA-UV-516	Letdown isolation valve to regenerative heat-exchanger	E-CH12-AC-1RD	Solenoid coil feeder	HS-203	HS-203-1	
			E-CH12-AC-1RJ	Solenoid coil feeder			
			E-CH12-AC-1RA	ESFAS			
			E-CH12-AC-1RG	ESFAS			
			E-CH12-AC-1RH	ESFAS			
			E-CH12-AC-1RI	SESS			
	J-CHB-HV-203	Pressurizer auxiliary spray valve (b)	E-CH12-AC-1RJ	Valve control			
			E-CH39-BC-1RD	Valve open/close			
			or E-CH39-BC-1RE	Valve open/close			
			E-CH39-BC-1RA	Solenoid coil feeder			
			E-CH39-BC-1RB	Solenoid coil feeder			
			E-CH39-BC-1RC	Solenoid coil feeder			
	M-CHE-P01	Charging pump No. 3	E-CH26-BC-1RA	Pump start/stop			
			E-CH26-BC-1FA	Pump feeder			
			or E-CH26-EC-1FA	Pump feeder			
			E-CH39-BC-1RG	Circuit disconnect			

Table E-1
EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 50 of 100) ^(a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
CHEMICAL AND VOLUME CONTROL (continued)	M-CHE-P01	Charging pump No. 3	E-CH26-BC-1RB	Pump stop	LI-201	LI-201-1	
			E-CH26-BC-1RD	Pump stop			
			E-CH26-BC-1RE	Pump start/stop			
	J-CHB-LT-201	Refueling water tank level	E-CHC2-BC-1XA	Level signal			
			E-RM43-BC-1XA or	Level display			
			E-CHC2-BC-1XB	Level display			
			E-SB02-BC-1RO	Display power			
			E-SB02-BC-1RN	Rack power			
			E-ZJ02-BC-1RO	Display power			
	J-CHB-FT-212	Charging flow	E-CHA1-BC-1XA	Flow signal	FI-212	FI-212-1	
			E-RM43-BC-1XA or	Flow display			
			E-CHA1-BC-1XB	Flow display			
			E-SB02-BC-1RN	Rack power			
			E-ZJ02-BC-1RO	Display power			
	J-CHB-UV-505	RCP gland seal controlled bleedoff containment isolation valve (outside)	E-CH15-BC-1RB or	Valve open/close	HS-505	HS-505-1	
			E-CH15-BC-1RE	Valve open/close			
			E-CH15-BC-1RC	Solenoid coil feeder			
			E-CH15-BC-1RG	Solenoid coil feeder			

Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 51 of 100) (a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
CHEMICAL AND VOLUME CONTROL (continued)	J-CHB-UV-505	RCP gland seal controlled bleedoff containment isolation valve (outside)	E-CH15-BC-1RJ	Circuit disconnect		HS-505-2	CS-2
			E-CH15-BC-1RK	Circuit disconnect			
			E-CH15-BC-1RA	ESFAS			
	M-CHB-P01	Charging pump No. 2	E-CH25-BC-1RA	Pump start/stop	HS-217		
			E-CH25-BC-1FA	Pump feeder			
			Integral with load center	Circuit disconnect			
			E-CH25-BC-1RB	Pump stop			
			E-CH25-BC-1RD	Pump stop			
	J-CHB-UV-515	Letdown line to regenerative heat-exchanger valve	E-CH25-BC-1RE	Pump start/stop	HS-515		
			E-CH31-BC-1RB or	Valve open/close			
			E-CH31-BC-1RF	Valve open/close			
			E-CH31-BC-1RC	Solenoid coil feeder			
			E-CH31-BC-1RD	Solenoid coil feeder			
			E-CH31-BC-1RK	Solenoid coil feeder			
			E-CH25-BC-1RB	Valve stop			

Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 52 of 100) ^(a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
CHEMICAL AND VOLUME CONTROL (continued)	J-CHB-UV-515	Letdown line to regenerative heat-exchanger valve	E-CH25-BC-1RD E-CH25-BC-1RE E-CH25-BC-1RH E-CH25-BC-1RP	Valve stop Valve start/stop Circuit disconnect Circuit disconnect		HS-515-2	
Train: non-train related	J-CHN-UV-501 (e)	Volume control tank outlet	E-CH02-NC-1KA E-CH02-NC-1RA E-CH02-NC-1RB E-CH02-NC-1RE Integral with MCC	Valve feeder Valve open/close MOV limit stop Valve open/close Circuit disconnect	HS-501		CS-2 LC-227 CS-3
	J-CH7E-HV-536 (e)	RWT gravity feed valve	E-CH72-NC-1KA E-CH72-NC-1RA E-CH72-NC-1RB Integral with MCC	Valve feeder MOV limit stop Valve open/close Circuit disconnect	HS-536		CS-2 CS-3

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EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
ESSENTIAL SPRAY POND Function: Remove heat from ECWS and DG cooling water heat exchanger, and dissipate heat into the atmosphere Train: A	M-SPA-P01	Essential spray pond pump (b)	E-SP01-AC-1RF	Pump start/stop	HS-1		X
			E-SP01-AC-1CA	Pump feeder			
			E-SP01-AC-1RA	ESFAS			
			E-SP01-AC-1RC	Pump start/stop			
	J-SPA-HV-49A	ESP spray header inlet valve (b) (c)	E-SP06-AC-1KA	Valve feeder	HS-49		
			E-SP06-AC-1RA	MOV limit stop			
			E-SP06-AC-1RB	Valve open/close			
	J-SPA-HV-49B	ESP spray header bypass valve (b) (c)	E-SP07-AC-1KA	Valve feeder	HS-49		
			E-SP07-AC-1RA	MOV limit stop			
			E-SP07-AC-1RB	Valve open/close			
Train: B	M-HSA-J01	Essential spray pond pump house AHU	(later)	(later)			
	M-SPB-P01	Essential spray pond pump (b)	E-SP01-BC-1RF	Pump start/stop	HS-2		X
			E-SP01-BC-1CA	Pump feeder			
			Integral with switchgear	Circuit disconnect			CS-3

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OFFSITE POWER AVAILABLE (Sheet 54 of 100) (a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
ESSENTIAL SPRAY POND (continued)	J-SPB-HV-50A	ESP spray header inlet valve(b) (d)	E-SP06-BC-1KA	Valve feeder	HS-50		
			E-SP06-BC-1RA	MOV limit stop			
			E-SP06-BC-1RB	Valve open/close			
	J-SPB-HV-50B	ESP spray header bypass valve(b) (d)	E-SP07-BC-1KA	Valve feeder	HS-50		
			E-SP07-BC-1RA	MOV limit stop			
			E-SP07-BC-1RB	Valve open/close			
	M-HSB-J01	Essential spray pond pump house AHU	(later)	(later)			
ESSENTIAL CHILLED WATER							
Function: Supply chilled water to HVAC Systems for Control Building, Auxiliary Building, and Main Steam Support Structure							
Train: A	M-ECA-E01	Essential chiller A	E-EC01-AC-1CA	Motor feeder	HS-1A		
			E-EC01-AC-1RF	Motor start/stop			
			E-EC01-AC-1RB	Valve start/stop			
			E-EC01-AC-1RJ	Current transformer			
			E-EC01-AC-1RK	Chiller control			
			E-EC01-AC-1RC	ESFAS			

Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 55 of 100) (a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
ESSENTIAL CHILLED WATER (continued)	M-ECA-E01	Essential chiller A	E-EC01-AC-1RP	ESFAS	HS-2A		
			E-EC01-AC-1RH	ESFAS			
			E-EC01-AC-1RM	Essential cooling flow			
			E-EC01-AC-1RL	Essential chilled flow			
	M-ECA-P01	Essential chilled water circulation pump	E-EC03-AC-1RA	Pump start/stop			X
			E-EC03-AC-1KA	Pump feeder			
			E-EC03-AC-1RD	ESFAS			
	J-ECA-FT-533	Main chilled water supply flow	E-EC53-AC-1XA	Flow signal			
			E-EC01-AC-1RL	Flow signal			
			E-RM10-AC-1RE	Rack power			
	M-ECB-E01	Essential chiller B	E-EC01-BC-1CA	Motor feeder			X
			E-EC01-BC-1RF	Motor start/stop			
			Integral with switchgear	Circuit disconnect			
			E-EC01-BC-1RJ	Current transformer			
			E-EC01-BC-1RC	ESFAS			
			E-EC01-BC-1RP	ESFAS			
			E-EC01-BC-1RB	Valve start/stop			
Train: B							CS-3

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EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location					
					Control Room	Remote Shutdown Panel	Local			
ESSENTIAL CHILLED WATER (continued)	M-ECB-E01	Essential chiller B	E-EC01-BC-1RK	Chiller control						
			E-EC01-BC-1RD	Expansion tank level						
			E-EC01-BC-1RM	Essential cooling flow						
			E-EC01-BC-1RL	Essential chilled flow						
	M-ECB-P01	Essential chilled water circulation pump	E-EC03-BC-1RA	Pump start/stop					X	
			E-EC03-BC-1RD	ESFAS						
			E-EC03-BC-1KA	Pump feeder					X	
	J-ECB-FT-534	Main chilled water supply flow	E-EC53-BC-1XA	Flow signal						
			E-EC01-BC-1RL	Flow signal						
			E-ZJ02-BC-1RN	Rack power						
ESSENTIAL COOLING WATER										
Function: Remove heat from all essential components required for emergency shutdown, and reject heat to the essential spray ponds through ECWS heat exchanger										
Train: A	M-EWA-P01	ECWS pump	E-EW01-AC-1RA	Pump start/stop	HS-1					
			E-EW01-AC-1CA	Pump feeder					X	
			E-EW01-AC-1RC	ESFAS						

Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 57 of 100) ^(a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
ESSENTIAL COOLING WATER (continued) Train: B	J-EWA-LT91	ECWS surge tank level	E-EW54-AC-1XA	Level transmitter	HS-2		X CS-3
			E-EW02-AC-1RB	Valve open/close			
			E-RM10-AC-1RE	Rack power			
	J-EWA-FT151	Cooling water flow to essential chiller	E-EW52-AC-1XA	Flow signal			
			E-EC01-AC-1RM	Flow signal			
			E-RM10-AC-1RE	Rack power			
	M-EWB-P01	ECWS pump	E-EW01-BC-1RA	Pump start/stop			
			E-EW01-BC-1CA	Pump feeder			
			Integral with switchgear	Circuit disconnect			
			E-EW01-BC-1RC	ESFAS			
	J-EWB-LT92	ECW surge tank level	E-EW54-BC-1XA	Level transmitter			
			(Later)	Level switch			
			E-EW02-BC-1RB	Valve open/close			
			E-ZJ02-BC-1RN	Rack power			
	J-EWB-FT152	Cooling water flow to essential chiller	E-EW52-BC-1XA	Flow signal			
			E-EC01-BC-1RM	Flow signal			
			E-ZJ02-BC-1RN	Rack power			

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
HVAC - AUXILIARY BUILDING Function: Provide required environment for ESF equipment rooms Train: A	M-HAA-Z04	Auxiliary feed-water pump room A essential ACU	E-HA06-AC-1KA	ACU feeder			
			E-HA06-AC-1RB	ACU start/stop			
			E-HA06-AC-1RC	ACU start/stop			
			E-HA06-AC-1RA	ESFAS			
			E-HA06-AC-1RD	ACU start/stop			
	M-HAA-Z02	LPSI pump room essential ACU(b)	E-HA02-AC-1KA	ACU feeder			
			E-HA02-AC-1RB	ACU start/stop			X
			E-HA02-AC-1RA	ESFAS			
	M-HAA-Z05	Essential cooling water pump room essential ACU	E-HA04-AC-1KA	ACU feeder			
			E-HA04-AC-1RA	ESFAS			
			E-HA04-AC-1RB	ACU start/stop			X
			E-HA04-AC-1RD	ESFAS			
	M-HAA-Z06	Essential penetration room essential ACU	E-HA05-AC-1KA	ACU Feeder			
			E-HA05-AC-1RA	ESFAS			
			E-HA05-AC-1RC	ESFAS			
Train: B	M-HAB-Z04	Auxiliary feed-water pump room B essential ACU	E-HA06-BC-1KA	ACU feeder			X
			E-HA06-BC-1RC	ACU start/stop			

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location					
					Control Room	Remote Shutdown Panel	Local			
HVAC - AUXILIARY BUILDING (continued)	M-HAB-204	Auxiliary feedwater pump room B essential ACU	E-HA06-BC-1RB	ACU start/stop			X			
			E-HA06-BC-1RA	ESFAS						
			E-HA06-BC-1RD	ACU start/stop						
	M-HAB-202	LPSI pump room essential ACU(b)	E-HA02-BC-1KA	ACU feeder			X			
			E-HA02-BC-1RB	ACU start/stop						
			E-HA02-BC-1RA	ESFAS						
	M-HAB-205	Essential cooling water pump room essential ACU	E-HA04-BC-1KA	ACU feeder			X			
			E-HA04-BC-1RA	ESFAS						
			E-HA04-BC-1RB	ACU start/stop						
			E-HA04-BC-1RD	ESFAS						
	M-HAB-206	Essential penetration room essential ACU	E-HA05-BC-1KA	ACU feeder						
			E-HA05-BC-1RA	ESFAS						
			E-HA05-BC-1RC	ESFAS						
	HVAC-CONTROL BUILDING						HS-67			
	Function: Furnish the required environment for all ESF equipment and battery rooms									
	Train: A									
	M-HJA-203	ESF switchgear room essential air handling unit	E-HJ06-AC-1RA	Unit start/stop						
			E-HJ06-AC-1KA	Line feeder						

Table E-1

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
HVAC-CONTROL BUILDING (continued)	M-HJA-Z03	ESF switchgear room essential air handling unit	E-HJ06-AC-1RB E-HJ06-AC-1RC	LOP signal ESFAS			
	M-HJA-J01A	Control building battery rooms essential exhaust fans	E-HJ23-AC-1RA E-HJ23-AC-1KA E-HJ23-AC-1RB E-HJ23-AC-1RC	Unit start/stop Line feeder LOP signal ESFAS	HS-81		
	M-HJA-J01B	Control building battery rooms essential exhaust fan	E-HJ23-AC-2RA E-HJ23-AC-2KA E-HJ23-AC-2RB E-HJ23-AC-2RC	Unit start/stop Line feeder LOP signal ESFAS	HS-83		
Train: B	M-HJB-Z03	ESF switchgear room essential air handling unit	E-HJ06-BC-1RA E-HJ06-BC-1RF E-HJ06-BC-1KA E-HJ06-BC-1RB E-HJ06-BC-1RC	Unit start/stop Unit start/stop Line feeder LOP signal ESFAS	HS-68 HS-68		
			Integral with MCC	Circuit disconnect			CS-3
	M-HJB-J01A	Control building battery rooms essential exhaust fan	E-HJ23-BC-2RA E-HJ23-BC-2RF	Unit start/stop Unit start/stop	HS-84 HS-84		

Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
HVAC CONTROL BUILDING (continued)	M-HJB-J01A	Control building battery rooms essential exhaust fan	E-HJ23-BC-2KA	Line feeder			
			E-HJ23-BC-2RB	LOP signal			
			E-HJ23-BC-2RC	ESFAS			
			E-HJ23-BC-2RE	Unit start/stop			
			Integral with MCC	Circuit disconnect			CS-3
	M-HJB-J01B	Control building battery rooms essential exhaust fans	E-HJ23-BC-1RA	Unit start/stop	HS-82		
			E-HJ23-BC-1RE	Unit start/stop	HS-82		
			E-HJ23-BC-1KA	Line feeder			
			Integral with MCC	Circuit disconnect			CS-3
			E-HJ23-BC-1RB	LOP signal			
			E-HJ23-BC-1RC	ESFAS			
HVAC DIESEL BUILDING Function: Furnish the required environment for ESF equipment rooms Train: A	M-HDA-A01	Diesel generator control room air handling unit	E-HD05-AC-1RA	AHU indication			X
			E-HD05-AC-1RB	AHU start/stop			X
			E-HD05-AC-1RE	AHU start/stop			
			E-HD05-AC-1KA	AHU feeder			

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
HVAC DIESEL BUILDING (continued)	M-HDA-J01	Diesel generator essential exhaust fan	E-HD01-AC-1RA E-HD01-AC-1RC E-HD01-AC-1FA	Fan start/stop Fan start/stop Fan feeder			HS-13 X
Train: B	M-HDB-A01	Diesel generator control room air handling unit	E-HD05-BC-1RA E-HD05-BC-1RB E-HD05-BC-1RE E-HD05-BC-1KA	AHU indication AHU start/stop AHU start/stop AHU feeder			X X
	M-HDB-J01	Diesel generator essential exhaust fan	E-HD01-BC-1RA E-HD01-BC-1RC E-HD01-BC-1FA	Fan start/stop Fan start/stop Fan feeder			HS-14 X
STANDBY GENERATION							
Function: Provide onsite electrical power when offsite (normal) power is interrupted							
Train: A	M-DFA-P01	Diesel fuel oil transfer pump	E-DF01-AC-1RA E-DF01-AC-1RB E-DF01-AC-1RC E-DF01-AC-1KA E-DF01-AC-1RH	Pump start/stop Pump start/stop Pump start/stop Pump feeder Pump start/stop	HS-21B	HS-21A	X

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
STANDBY GENERATION (continued)	E-PEA-G01	Diesel generator 4.16 KV breaker	E-PE01-AC-1RA	Breaker trip-close	HS-503B		CS-1
			E-PE01-AC-1RB	Auto trip-close			X
			E-PE01-AC-1CC	Bus power supply			
			E-PE01-AC-1CB	Bus power supply			
			E-PE01-AC-1CA	Bus power supply			
			E-PE01-AC-1RD	Generator differential protection			
			E-PE01-AC-1RF	DG protection			
			E-PE01-AC-1RG	ESFAS signal			
			E-PE01-AC-1RE	Sequencer start			
		Diesel generator metering & relaying	E-PE01-AC-1RC	SEIS, SEAS			
			E-PE02-AC-1CA	DG power output			
			E-PE02-AC-1CB	DG power output			
			E-PE02-AC-1CC	DG power output			
			E-PE02-AC-1RA	Excitation & volt reg control			
			E-PE02-AC-1RB	Excitation & volt reg control			
			E-PE02-AC-1RC	Excitation & volt reg control			

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
STANDBY GENERATION (continued)	E-PEA-G01	Diesel generator metering & relaying	E-PE02-AC-1RD	Generator differential protection			
			E-PE02-AC-1RE	Generator field voltage	X		X
			E-PE02-AC-1RF	Generator field current	X		X
			E-PE02-AC-1KA	Generator field power			
			E-PE02-AC-1KB	Excitation power			
			E-PE02-NC-1RA	Metering and protection	X		X
			E-PE01-NC-1CA	Metering and protection	X		X
			E-PE01-NC-1RL	Metering and protection	X		X
			E-PE01-NC-1RD	Metering and protection	X		X
			E-PE02-NC-1RC	Metering and protection	X		X
			E-PE02-NC-1RB	Metering and protection	X		X
			E-PE02-NC-1RK	Metering and protection	X		X
			E-PE02-NC-1RJ	Metering and protection	X		X

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
STANDBY GENERATION (continued)	E-PEA-G01	Diesel generator metering and relaying	E-PE02-NC-1RH	Metering and protection	X		X
			E-PE02-NC-1RG	Metering	X		X
			E-PE02-NC-1RF	Metering	X		X
		Diesel generator tripping and voltage regulation	E-PE03-AC-1RA	Volt regulator control	X		X
			E-DG07-AC-1XA	Diesel engine control	X		X
			E-DG07-AC-1XB	Diesel engine control	X		X
		Diesel engine control	E-DG07-AC-1XC	Diesel engine control	X		X
			E-DG07-AC-1RK	Diesel engine control	X		X
			E-DG07-AC-1RJ	Diesel engine control	X		X
			E-DG07-AC-1RL	Diesel engine control	X		X
			E-DG07-AC-1RM	Diesel engine control	X		X
			E-DG07-AC-1RG	Diesel engine control	X		X
			E-DG07-AC-1RH	Diesel engine Control	X		X

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
STANDBY GENERATION (continued)	E-PEA-G01	Diesel engine control	E-DG07-AC-1RB	Diesel engine Control	X		X
			E-DG07-AC-1RC	Diesel engine Control	X		X
			E-DG07-AC-1RA	Diesel engine Control	X		X
			E-DG07-AC-1RD	Diesel engine Control	X		X
			E-DG07-AC-1RE	Diesel engine Control	X		X
			E-DG07-AC-1RF	Diesel engine Control	X		X
			E-DG07-AC-1RP	Diesel engine Control	X		X
			E-DG07-AC-1RQ	Diesel engine Control	X		X
	M-DFB-P01	Diesel fuel oil transfer pump	E-DF01-BC-1RA	Pump start/stop	HS-22B		
			E-DF01-BC-1RB	Pump start/stop		HS-22A	
			E-DF01-BC-1RC	Pump start/stop			
			E-DF01-BC-1RJ	Circuit disconnect		CS-3	
			E-DF01-BC-1RL	Circuit disconnect		CS-3	
			E-DF01-BC-1KA	Pump feeder			
			E-DF01-BC-1RH	Pump start/stop			X
Train: B							

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
STANDBY GENERATION (continued)	E-PEB-G02	Diesel generator 4.16-kV breaker	E-PE01-BC-1RA	Brkr trip-close	HS-504B		CS-1
			E-PE01-BC-1RB	Auto trip-close			X
			E-PE01-BC-1CC	Bus power supply			
			E-PE01-BC-1CB	Bus power supply			
			E-PE01-BC-1CA	Bus power supply			
			E-PE01-BC-1RE	Sequencer start			
			E-PE01-BC-1RD	Generator differential protection			
			E-PE01-BC-1RF	DG protection			
			E-PE01-BC-1RG	ESFAS signal			
			E-PE01-BC-1RC	SEIS, SEAS			
			Integral with switchgear	Circuit disconnect			CS-3
			E-PE02-BC-1CA	DG power output			
			E-PE02-BC-1CB	DG power output			
			E-PE02-BC-1CC	DG power output			
			E-PE02-BC-1KA	Generator field power			
			E-PE02-BC-1KB	Excitation power			
			E-PE02-BC-1RA	Excitation & voltage regulator control			

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
STANDBY GENERATION (continued)	E-PEB-G02	Diesel generator metering and relaying	E-PE02-BC-1RB	Excitation & voltage regulator control			
			E-PE02-BC-1RC	Excitation & voltage regulator control			
			E-PE02-BC-1RD	Generator differential protection			
			E-PE02-BC-1RE	Generator field volt	X		X
			E-PE02-BC-1RF	Generator field current	X		X
			E-PE02-NC-2RA	Metering and protection	X		X
			E-PE02-NC-2RB	Metering and protection	X		X
			E-PE02-NC-2RC	Metering and protection			
			E-PE02-NC-2RD	Metering and protection	X		X
			E-PE02-BC-1RE	Circuit disconnect		CS-3	
			E-PE02-BC-1RF	Circuit disconnect		CS-3	
			E-PE02-BC-1RG	Circuit disconnect		CS-3	
			E-PE02-BC-1RH	Circuit disconnect		CS-3	
			E-PE02-NC-2RF	Metering and protection	X		X

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
STANDBY GENERATION (continued)	E-PEB-G02	Diesel generator metering and relaying	E-PE02-NC-2RG	Metering and protection	X	CS-3	X
			E-PE02-NC-2RH	Metering and protection	X		X
			E-PE02-NC-2RG	Metering and protection	X		X
			E-PE02-NC-2RJ	Metering and protection	X		X
			E-PE02-NC-2RK	Metering and protection	X		X
			E-PE02-NC-2CA	Metering and protection	X		X
		Diesel generator tripping & voltage regulation	E-PE02-NC-2RL	Metering and protection	X		X
			E-PE03-BC-1RA	Voltage regulator control	X		X
		Diesel engine control	E-PE03-BC-1RB	Circuit disconnect			
			E-DG07-BC-1XA	Diesel engine control	X		X
			E-DG07-BC-1XB	Diesel engine control	X		X
			E-DG07-BC-1XC	Diesel engine control	X		X
			E-DG07-BC-1RK	Diesel engine control	X		X

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
STANDBY GENERATION (continued)	E-PEB-G02	Diesel engine control	E-DG07-BC-1RJ	Diesel engine control	X		X
			E-DG07-BC-1RL	Diesel engine control	X		X
			E-DG07-BC-1RR	Circuit disconnect		CS-4	
			E-DG07-BC-1RS	Circuit disconnect		CS-4	
			E-DG07-BC-1RJ	Circuit disconnect		CS-4	
			E-DG07-BC-1RW	Circuit disconnect		CS-4	
			E-DG07-BC-1RX	Circuit disconnect		CS-4	
			E-DG07-BC-1RM	Diesel engine control	X		X
			E-DG07-BC-1RG	Diesel engine control	X		X
			E-DG07-BC-1RH	Diesel engine control	X		X
			E-DG07-BC-1RB	Diesel engine control	X		X
			E-DG07-BC-1RC	Diesel engine control	X		X
			E-DG07-BC-1RA	Diesel engine control	X		X
			E-DG07-BC-1RQ	Diesel engine control	X		X

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
STANDBY GENERATION (Continued)	E-PEB-G02	Diesel engine control	E-DG07-BC-1RP	Diesel engine control	X		X
			E-DG07-BC-1RF	Diesel engine control	X		X
			E-DG07-BC-1RE	Diesel engine control	X		X
			E-DG07-BC-1RD	Diesel engine control	X		X
4160V-AC CLASS IE POWER							
Function: Provide power to class IE motors and load centers							
Train: A	E-PBA-503L	4160V class IE normal power supply	E-PB01-AC-1RA	Brkr open/close	HS-503L		CS-1
			E-PB01-AC-1RB	Load shed			
			E-PB01-AC-1RC	Supply voltage	EI-503L		X
Train: B	E-PBA-503K	4160V class IE alternate power supply	E-PB02-AC-1RA	Brkr open/close	HS-503K		CS-1
			E-PB02-AC-1RB	Load shed			
	E-PBB-504K	4160V class IE normal power supply	E-PB02-AC-1RC	Supply voltage	EI-503K		X
			E-PB01-BC-1RA	Brkr open/close	HS-504K		CS-1
			E-PB01-BC-1RB	Load shed			
			E-PB01-BC-1RC	Supply voltage	EI-504K		X
			Integral with switchgear	Circuit disconnect			CS-3

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
4160V-AC CLASS IE POWER (continued) 480V-AC CLASS IE POWER Function: Provide power to Class IE motor control centers and load centers Train: A	E-PBB-504L	4160V class IE alternate power supply	E-PB02-BC-1RA	Brkr open/close	HS-504L		CS-1
			E-PB02-BC-1RB	Load shed			
			E-PB02-BC-1RC	Supply voltage	EI-504L		X
			Integral with switchgear	Circuit disconnect			CS-3
	E-PHA-M31	480V class IE power supply	E-PH01-AC-1FA	Power supply to MCC E-PHA-M31			
			E-PH01-AC-1RA	Indication	X		
	E-PHA-M33	480V class IE power supply	E-PH01-AC-2FA	Power supply to MCC E-PHA-M33			
			E-PH01-AC-2RA	Indication	X		
	E-PHA-M35	480V class IE power supply	E-PH01-AC-3FA	Power supply to MCC E-PHA-M35			
			E-PH01-AC-3RA	Indication	X		
	E-PHA-M37	480V class IE power supply	E-PH02-AC-1FA	Power supply to MCC-PHA-M37			
			E-PH01-AC-1RA	Indication	X		

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
480V-AC CLASS IE POWER (continued) Train: B	E-PGA-L31	480V class IE power supply	E-PG06-AC-1RA	Brkr open/close	HS-L31B2		
			E-PG06-AC-1RB	Bus voltage	EI-L31		
			E-PG06-AC-1RC	ESFAS			
	E-PGA-L33	480V class IE power supply	E-PG07-AC-1RA	Brkr open/close	HS-L33B2		
			E-PG07-AC-1RC	Bus voltage	EI-L33		
			E-PG07-AC-1RE	ESFAS			
	E-PGA-L35	480 class IE power supply	E-PG08-AC-1RA	Brkr open/close	HS-L35B2		
			E-PG08-AC-1RC	Bus voltage	EI-L35		
			E-PG08-AC-1RE	ESFAS			
	E-PHB-M32	480V class IE power supply	E-PH03-BC-1FA	Power supply to MCC E-PHB-M32			
			E-PH03-BC-1RA	Indication	X		
	E-PHB-M34	480V class IE power supply	E-PH03-BC-2FA	Power supply to MCC E-PHB-M34			
			E-PH03-BC-2RA	Indication	X		
	E-PHB-M36	480V class IE power supply	E-PH03-BC-3FA	Power supply to MCC E-PHB-M36			
			E-PH03-BC-3RA	Indication	X		
	E-PHB-M38	480V class IE power supply	E-PH04-BC-1FA	Power supply to MCC E-PHB-M38			
			E-PH04-BC-1RA	Indication	X		

Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
480V-AC CLASS IE POWER (continued)	E-PGB-L32	480V class IE power supply	E-PG06-BC-1RA	Brkr open/close	HS-L32B2		
			E-PG06-BC-1RB	Bus voltage	EI-L32		
			E-PG06-BC-1RC	ESFAS			
			Integral with LC	Circuit disconnect			CS-1
	E-PGB-L34	480V class IE power supply	E-PG07-BC-1RA	Brkr open/close	HS-L34B2		
			E-PG07-BC-1RC	Bus voltage	EI-L34		
			E-PG07-BC-1RE	ESFAS			
			Integral with LC	Circuit disconnect			CS-1
	E-PGB-L36	480V class IE power supply	E-PG08-BC-1RA	Brkr open/close	HS-L36		
			E-PG08-BC-1RC	Bus voltage	EI-L36		
			E-PG08-BC-1RE	ESFAS			
			Integral with LC	Circuit disconnect			CS-2
126V-DC CLASS IE POWER							
Function: Provide dc control power for Class IE switchgear and load centers							
Train: A							
	E-PBA-S03	125 V-dc control power supply	E-PB03-AC-1KM	Switchgear control			

Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 75 of 100) (a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
125V-DC CLASS 1E POWER (continued)	E-PGA-L31	125 V-dc control power supply	E-PG03-AC-1KN	Switchgear control			
	E-PGA-L33	125 V-dc control power supply	E-PG03-AC-1KM	Switchgear control			
	E-PGA-L35	125 V-dc power control supply	E-PG03-AC-1KO	Switchgear control			
	E-PBB-S04	126 V-dc power control supply	E-PB06-BC-1KM	Switchgear control			
	E-PGB-L32	126 V-dc control power supply	E-PG06-BC-1KO	Switchgear control			
	E-PGB-L34	125 V-dc control power supply	E-PG06-BC-1KM	Switchgear control			
	E-PGB-L36	125 V-dc power control supply	E-PG06-BC-1KN	Switchgear control			
Train: B							
Function: Provide dc control power for auxiliary relay cabinets							
Train: A	E-ZAA-C01	125 V-dc power supply	E-ZA03-AC-1RO	Display power			
	E-ZAA-C03	125 V-dc power supply	E-ZA03-AC-1RM	Display power			

Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
126V-DC CLASS 1E POWER (continued) Train: B	E-ZAA-C04	125 V-dc power supply	E-ZA03-AC-1RN	Display power			
			E-ZA03-AC-1KU	Display power			
	E-ZAA-C05	125 V-dc power supply	E-ZA03-AC-1RP	Display power			
	E-ZAA-C06	125 V-dc power supply	E-ZA03-AC-1RQ	Display power			
	E-ZJA-C01	125 V-dc power supply	E-ZJ03-AC-1KM	Display power			
	E-ZJA-C03	125 V-dc power supply	E-ZJ03-AC-1KN	Display power			
	E-ZAB-C01	125 V-dc power supply	E-ZA06-BC-1RO	Display power			
	E-ZAB-C03	125 V-dc power supply	E-ZA06-BC-1RM	Display power			
	E-ZAB-C04	125 V-dc power supply	E-ZA06-BC-1RN	Display power			
	E-ZAB-C05	125 V-dc power supply	E-ZA06-BC-1RP	Display power			
	E-ZAB-C06	125 V-dc power supply	E-ZA06-BC-1RQ	Display power			
	E-ZJB-C01	125 V-dc power supply	E-ZJ06-BC-1KM	Display power			
	E-ZJB-C03	125 V-dc power supply	E-ZJ06-BC-1KN	Display power			

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EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
125V-DC CLASS 1E POWER (continued) Function: Provide 125V-DC steady state loads and supply charging current to 125V-DC batteries Train: A	E-PKA-H11	Battery charger A	E-PK04-AC-1KA	Batt chgr 480V feeder			
			E-PK04-AC-1RA	Load shed/sequencer	X		
			Integral with MCC	Brkr close/trip			X
			E-PK04-AC-1RB	Chgr dc voltage	EI-M4104		X
			E-PK04-AC-1RC	Chgr dc current	II-M4104		X
	E-PKA-H15	Battery charger AC	E-PK04-AC-1RE	Space heater			
			E-PK04-AC-2KA	Batt chgr 480V feeder			
			E-PK04-AC-2RA	Load shed/sequencer	X		
			Integral with MCC	Brkr close/trip			X
			E-PK04-AC-2RB	Chgr dc voltage	EI-M4105		X
			E-PK04-AC-2RC	Chgr dc current	II-M4105		X
			E-PK04-AC-2RE	Space heater			
			E-PK04-AC-2RF	Channel A output indication			X

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OFFSITE POWER AVAILABLE (Sheet 78 of 100) (a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
125V-DC CLASS 1E POWER (continued)	E-PKA-H15	Battery charger AC	E-PK04-AC-2RG	Channel A output indication	X		
			E-PK04-CC-2RA	Channel C output indication			X
			E-PK04-CC-2RB	Channel C output indication	X		
	E-PKA-H13	Battery charger C	E-PK04-AC-3KA	Batt chgr 480V feeder			
			E-PK04-AC-3RA	Load shed/sequencer	X		
			Integral with MCC	Brkr close/trip			X
			E-PK04-AC-3RB	Space heater			
			E-PK04-CC-1RA	Charger dc voltage	EI-M4304		X
			E-PK04-CC-1RB	Charger dc current	II-M4304		X
	E-PKA-M4102	125V-dc batt A brkr	E-PK01-AC-1FA	Battery leads			
			E-PK01-AC-1FB	Battery leads			
			E-PK01-AC-1FC	Battery leads			
			E-PK01-AC-1RA	Bus voltage	EI-M41		X
			E-PK01-AC-1RB	Brkr open/close	HS-M4102		X
			E-PK01-AC-1RE	Battery current	II-M4102		X

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
125V-DC CLASS 1E POWER (continued) Train: B	E-PKC-M4302	125V-dc batt C brkr	E-PK02-CC-1FA	Battery leads			
			E-PK02-CC-1FB	Battery leads			
			E-PK02-CC-1FC	Battery leads			
			E-PK02-CC-1RA	Bus voltage	EI-M43		X
			E-PK02-CC-1RB	Brkr open/close	HS-M4302		X
	E-PKB-H12	Battery charger B	E-PK02-CC-1RE	Battery current	II-M4302		X
			E-PK04-BC-1KA	Batt chgr 480V feeder			
			E-PK04-BC-1RA	Load shed/sequencer	X		
			Integral with MCC	Brkr close/trip			X
			E-PK04-BC-1RB	Chgr dc voltage	EI-M4204		X
			E-PK04-BC-1RC	Chgr dc current	II-M4204		X
			E-PK04-BC-1RE	Space heater			
			E-PK04-BC-1RF	Voltmeter disconnect			CS-1
			E-PK04-BC-1RG	Ammeter disconnect			CS-1
			Integral with MCC	Control disconnect			CS-1
	E-PKB-H16	Battery charger BD	E-PK04-BC-1MA	Batt chgr 480V feeder			

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
125V-DC CLASS 1E POWER (continued)	E-PKB-H16	Battery charger BD	E-PK04-BC-2RA	Load shed/sequencer	X		
			Integral with MCC	Brkr close/trip			X
			E-PK04-BC-2RB	Chgr dc voltage	EI-M4205		X
			E-PK04-BC-2RC	Chgr dc current	II-M4205		X
			E-PK04-BC-2RE	Space heater			
			E-PK04-BC-2RH	Voltmeter disconnect			CS-1
			E-PK04-BC-2RJ	Ammeter disconnect			CS-1
			Integral with MCC	Control disconnect			CS-1
			E-PK04-BC-2RF	Channel B output indication			X
			E-PK04-BC-2RG	Channel B output indication	X		
	E-PKB-H14	Battery charger D	E-PK04-DC-2RA	Channel D output indication			X
			E-PK04-DC-2RB	Channel D output indication	X		
			E-PK04-BC-3KA	Batt chgr 480V feeder			
			E-PK04-BC-3RA	Load shed/sequencer	X		

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
125V-DC CLASS 1E POWER (continued)	E-PKB-H14	Battery charger D	Integral with MCC	Brkr close/trip			X
			E-PK04-BC-3RB	Space heater			
			E-PK04-DC-1RA	Chgr dc.voltage	EI-M4404		X
			E-PK04-DC-1RB	Chgr dc current	II-M4404		X
			Integral with chgr	Vm and Am disconnect			CS-2
	E-PKB-M4202	125V-dc batt B brkr	Integral with MCC	Control disconnect			CS-1
			E-PK01-BC-1FA	Battery leads			
			E-PK01-BC-1FB	Battery leads			
			E-PK01-BC-1FC	Battery leads			
			E-PK01-BC-1RA	Bus voltage	EI-M42		X
			E-PK01-BC-1RB	Brkr open/close	HS-M4202		X
			E-PK01-BC-1RE	Battery current	II-M4202		X
			Integral with MCC	Circuit disconnect			CS-1
	E-PKD-M4402	125V-dc batt D brkr	E-PK02-DC-1FA	Battery leads			
			E-PK02-DC-1FB	Battery leads			
			E-PK02-DC-1FC	Battery leads			
			E-PK02-DC-1RA	Bus voltage	EI-M44		X

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
125V-DC CLASS 1E POWER (continued)	E-PKD-M4402	125V-dc batt D brkr	E-PK02-DC-1RB	Brkr open/close	HS-M4402		X
			E-PK02-DC-1RE	Battery current	II-M4402		X
			Integral with MCC	Circuit disconnect			CS-1

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
CONTAINMENT HYDROGEN CONTROL SYSTEM Function: Monitor and maintain containment atmosphere hydrogen concentration at acceptable limits	J-HPA-E02	Hydrogen analyzer	E-HP04AC-1XA	Hydrogen monitoring	X	-	-
			E-HP04AC-1RB				
			E-HP04AC-1RC				
			E-HP04AC-1RD				
			E-HP04AC-1RE				
			E-HP04AC-1KA				
	A-E-HPA-J05 (AN-HPA-D01)	Hydrogen recombiner	E-HP04AC-2RA	ESFAS	-	-	-
			E-HP04AC-2RB	ESFAS			
			E-HP04AC-2RC	System trouble alarm			
			E-HP04AC-2KA	Recombiner feeder			
	J-HPA-HV-7A	Hydrogen analyzer 'A' inlet valve	E-HP01-AC-1RA	Valve open	HS-7	-	-
			E-HP01-AC-1RB	MOV limit sw.			
			E-HP01-AC-1RI	MOV limit sw.			
	J-HPA-HV-7B	Analyzer outlet isolation valve	E-HP01-AC-1RA	Valve open	HS-7	-	-
			E-HP01-AC-1RC	MOV limit sw.			

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
CONTAINMENT HYDROGEN CONTROL SYSTEM (continued)	J-HPA-HV-7B	Analyzer outlet isolation valve	E-HP01-AC-1RF	Valve open	HS-1	-	
			E-HP01-AC-1RJ	MOV limit sw.			
	J-HPA-UV-1	Train 'A' upstream supply isolation valve	E-HP02-AC-1RF	Valve open/close			
			E-HP02-AC-1RE	Override permissive			
			E-HP02-AC-1RD	Valve open/close			X
			E-HP02-AC-1RB	MOV limit stop			X
			E-HP02-AC-1KA	Valve feeder			X
			E-HP02-AC-1KB	Valve feeder			X
	J-HPA-UV-3	Train 'A' downstream supply isolation valve	E-HP03-AC-1RE	Valve open/close	HS-3	-	X
			E-HP03-AC-1RD	Override permissive			
			E-HP03-AC-1RA	ESFAS			
			E-HP03-AC-1KA	Valve feeder			
			E-HP03-AC-1RB	ESFAS			
	J-HPA-UV-5	Train 'A' return isolation valve	E-HP03-AC-2RE	Valve open/close	HS-5	-	X
			E-HP03-AC-2RD	Override permissive			

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EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 85 of 100)^(a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
CONTAINMENT HYDROGEN CONTROL SYSTEM (continued)	J-HPA-UV-5	Train 'A' return isolation valve	E-HP03-AC-2RA	ESFAS	HS-2	-	
			E-HP03-AC-2KA	Valve feeder			X
			E-HP03-AC-2RB	ESFAS			
	J-HPB-UV-2	Train 'B' upstream supply isolation valve	E-HP02-BC-1RF	Valve open/close			X
			E-HP02-BC-1RB	MOV limit sw.			X
			E-HP02-BC-1KA	Valve feeder			X
			E-HP02-BC-1KB	Valve feeder			X
			E-HP02-BC-1RE	Override permissive			
			E-HP02-BC-1RG	ESFAS			
			E-HP02-BC-1RC	ESFAS			
	J-HPB-UV-4	Train 'B' downstream supply isolation valve	E-HP03-BC-1RE	Valve open/close	HS-4	-	X
			E-HP03-BC-1RC	MOV limit sw.			X
			E-HP03-BC-1RD	Override permissive			
			E-HP03-BC-1KA	Valve feeder			X
			E-HP03-BC-1RA	ESFAS			
			E-HP03-BC-1RB	ESFAS			

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EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 86 of 100)^(a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
CONTAINMENT HYDROGEN CONTROL SYSTEM (continued)	J-HPB-UV-6	Train 'B' return isolation valve	E-HP03-BC-2RE	Valve open/close	HS-6	-	X
			E-HP03-BC-2RC	MOV limit sw.			X
			E-HP03-BC-2RD	Override permissive			
			E-HP03-BC-2KA	Valve feeder			X
			E-HP03-BC-2RA	ESFAS			
			E-HP03-BC-2RB	ESFAS			
	J-HPB-E02	Train 'B' Post LOCA Hydrogen Monitoring	E-HP04-BC-1XA				
			E-HP04-BC-1RB				
			E-HP04-BC-1RC				
			E-HP04-BC-1RD				
			E-HP04-BC-1RE				
			E-HP04-BC-1KA	Monitoring pnl. feeder			
	A-E-HPB-J05	Train 'B' H ₂ recombiner	E-HP04-BC-2RA	ESFAS			
			E-HP04-BC-2RB	ESFAS			
			E-HP04-BC-2RC	System trouble alarm			
			E-HP04-BC-2KA	Recombiner feeder			

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EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
CONTAINMENT HYDROGEN CONTROL SYSTEM (continued)	J-HPB-HV-8A	Hydrogen analyzer B inlet valve	E-HP01-BC-1RA	Valve open	HS-8	-	-
			E-HP01-BC-1RB	MOV limit sw.			
			E-HP01-BC-1RE	Valve open			
			E-HP01-BC-1RI	MOV limit sw.			
			E-HP01-BC-1RM	Valve indication			
	J-HPB-HV-8B	Hydrogen analyzer 'B' outlet valve	E-HP01-BC-1RA	Valve open	HS-8	-	-
			E-HP01-BC-1RG	MOV limit sw.			
			E-HP01-BC-1RF	Valve open			
			E-HP01-BC-1RJ	MOV limit sw.			
CONTAINMENT PURGE SYSTEM Train 'A'	J-CPA-UV-2A	Outside ctmt. inlet isolation valve	E-CP01-AC-1RB	Valve open/close	HS-2	-	X
			E-CP01-AC-1RA	MOV limit sw.			
			E-CP01-AC-1KA	Valve Feeder			
			E-CP01-AC-1RC	Override permissive			
			E-CP01-AC-1RD	ESFAS			
			E-CP01-AC-1RG	ESFAS			
			E-CP01-AC-1RH	ESFAS			

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
CONTAINMENT PURGE SYSTEM (continued) Train 'A' (continued)	J-CPA-UV-4A	Outside ctmt. inlet isolation valve	E-CP03-AC-1RB	Valve open/close	HS-4	-	X
			E-CP03-AC-1RA	MOV limit sw.			X
			E-CP03-AC-1KA	Valve feeder			X
			E-CP03-AC-1RC	Override permissive			
			E-CP03-AC-1RD	ESFAS			
			E-CP03-AC-1RG	ESFAS			
	J-CPA-UV-2B	Inside ctmt. outlet isolation valve	E-CP03-AC-1RH	ESFAS	HS-2	-	
			E-CP02-AC-1RC	Valve open/close			X
			E-CP02-AC-1KB	Valve feeder			X
			E-CP02-AC-1KA	Valve feeder			X
			E-CP02-AC-1RA	MOV limit sw.			X
			E-CP02-AC-1RD	Override permissive			
			E-CP02-AC-1RE	ESFAS			
			E-CP02-AC-1RH	ESFAS			
			E-CP02-AC-1RF	ESFAS			
			E-CP02-AC-1RG	ESFAS			

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
CONTAINMENT PURGE SYSTEM (continued)							
Train 'A' (continued)	J-CPA-UV-4B	Inside ctmt. outlet isolation valve	E-CP04-AC-1RC	Valve open/close	HS-4	-	X
			E-CP04-AC-1KB	Valve feeder			X
			E-CP04-AC-1KA	Valve feeder			X
			E-CP04-AC-1RA	MOV limit sw.			
			E-CP04-AC-1RD	Override permissive			
			E-CP04-AC-1RE	ESFAS			
			E-CP04-AC-1RH	ESFAS			
			E-CP04-AC-1RF	ESFAS			
			E-CP04-AC-1RG	ESFAS			
Train 'B'	J-CPB-UV-3A	Inside ctmt. inlet isolation valve	E-CP02-BC-1RC	Valve open/close	HS-3	-	X
			E-CP02-BC-1KB	Valve feeder			X
			E-CP02-BC-1KA	Valve feeder			X
			E-CP02-BC-1RA	MOV limit sw.			
			E-CP02-BC-1RD	Override permissive			
			E-CP02-BC-1RE	ESFAS			
			E-CP02-BC-1RH	ESFAS			

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
CONTAINMENT PURGE SYSTEM (continued) Train 'B' (continued)	J-CPB-UV-3A	Inside ctmt. inlet isolation valve	E-CP02-BC-1RF	ESFAS	HS-5	-	X
			E-CP02-BC-1RG	ESFAS			
	J-CPB-UV-5A	Inside ctmt. inlet isolation valve	E-CP04-BC-1RC	Valve open/close			
			E-CP04-BC-1KB	Valve feeder			
			E-CP04-BC-1KA	Valve feeder			
			E-CP04-BC-1RA	MOV limit sw.			
			E-CP04-BC-1RD	Override permissive			
	J-CPB-UV-3B	Outside ctmt. outlet isolation valve	E-CP04-BC-1RE	ESFAS	HS-3	-	X
			E-CP01-BC-1RB	Valve open/close			
			E-CP01-BC-1RA	MOV limit sw.			
			E-CP01-BC-1KA	Valve feeder			
			E-CP01-BC-1RC	Override permissive			
			E-CP01-BC-1RD	ESFAS			
			E-CP01-BC-1RG	ESFAS			
			E-CP01-BC-1RH	ESFAS			

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
CONTAINMENT PURGE SYSTEM (continued) Train 'B' (continued)	J-CPB-UV-5B	Outside ctmt. outlet isolation valve	E-CP03-BC-1RB	Valve open/close	HS-5		X
			E-CP03-BC-1RA	MOV limit sw.			X
			E-CP03-BC-1KA	Valve feeder			X
			E-CP03-BC-1RC	Override permissive			
			E-CP03-BC-1RD	ESFAS			
			E-CP03-BC-1RG	ESFAS			
			E-CP03-BC-1RH	ESFAS			
RADIATION MONITORING SYSTEM	J-SQA-RU-37	Train A Power access purge area monitor	E-SQ01-AC-1RV				
			E-SQ01-AC-1RX				
			E-SQ01-AC-1RY				
	J-SQA-RU-38	Train B Power access purge area monitor	E-SQ01-BC-1RQ				
			E-SQ01-BC-1RR				
			E-SQ01-BC-1RS				

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
CONTAINMENT SPRAY SYSTEM TO SUPPLY CONTAINMENT SPRAY FOR IODINE REMOVAL SYSTEM (SAFETY INJECTION) Train 'A'	M-SIA-P03	Cont. spray pumps	E-SI03-AC-1RA	Pump start/stop	HS-5	-	X
			E-SI03-AC-1CA	Pump feeder			X
			E-SI03-AC-1RB	Override permissive			
			E-SI03-AC-1RD	Override permissive			X
			E-SI03-AC-1RC	Pump start/stop			
	J-SIA-UV-673	Shutdown cooling ctmt. iso. valve	E-SI03-AC-1RG	Saf. equip. inoperable status	HS-673	-	
			E-SI21-AC-1RD	Valve open/close			X
			E-SI21-AC-1RE	Override permissive			X
			E-SI21-AC-1KA	Valve feeder			X
			E-SI21-AC-1RC	Valve open/close			
			E-SI21-AC-1KB	Valve feeder			
			E-SI21-AC-1RB	MOV limit stop			
			E-SI21-AC-1RA	Saf. equip. actu. status			

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
CONTAINMENT SPRAY SYSTEM TO SUPPLY CONTAINMENT SPRAY FOR IODINE REMOVAL SYSTEM (SAFETY INJECTION) (continued) Train 'A' (continued)	J-SIA-UV-674	Shutdown cooling ctmt. sump iso. valve	E-SI22-AC-1RC	Valve open/close	HS-674	-	X
			E-SI22-AC-1RA	MOV limit stop			
			E-SI22-AC-1KA	Valve feeder			X
			E-SI22-AC-1RB	ESFAS			
			E-SI22-AC-1RE	Saf. equip. actuation status			
Train 'B'	M-SIB-P03	Containment spray pump	E-SI22-AC-1RD	Saf. equip. inoperable status	HS-6	-	
			E-SI03-BC-1RA	Pump start/stop			X
			E-SI03-BC-1CA	Pump feeder			X
			E-SI03-BC-1RC	Pump start/stop			
			E-SI03-BC-1RB	Override permissive			X
			E-SI03-BC-1RD	Override permissive			
			E-SI03-BC-1RG	Saf. equip. inoperable status			

Table E-1

EQUIPMENT REQUIRED FOR COLD SHUTDOWN WITHOUT
OFFSITE POWER AVAILABLE (Sheet 94 of 100)^(a)

System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
CONTAINMENT SPRAY SYTEM TO SUPPLY CONTAINMENT SPRAY FOR IODINE REMOVAL SYSTEM (SAFETY INJECTION) (continued) Train 'B' (continued)	J-SIB-UV-675	Containment sump iso. valve	E-SI21-BC-1RD	Valve open/close	HS-675	-	X
			E-SI21-BC-1KA	Valve feeder			X
			E-SI21-BC-1KB	Valve feeder			X
			E-SI21-BC-1RA	Saf. equip. actu. status			
			E-SI21-BC-1RB	MOV limit stop			
			E-SI21-BC-1RE	Override permissive			
	J-SIB-UV-676	Containment sump iso. valve	E-SI22-BC-1RC	Valve open/close	HS-676	-	X
			E-SI22-BC-1RA	MOV limit stop			
			E-SI22-BC-1KA	Valve feeder			X
			E-SI22-BC-1RB	ESFAS			
			E-SI22-BC-1RE	Saf. equip. actua- tion status			
			E-SI22-BC-1RD	Saf. equip. inoperable status			

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
CONTAINMENT SPRAY SYSTEM TO SUPPLY CONTAINMENT SPRAY FOR IODINE REMOVAL SYSTEM (SAFETY INJECTION) (continued) Train 'B' (continued)	M-SIA-P05	Spray chemical addition pumps	E-SI36-AC-1RA	Pump start/stop	HS-60		X
			E-SI36-AC-1KA	Pump feeder			X
			E-SI36-AC-1RB	ESFAS			
			E-SI36-AC-1RC	Override permissive			X
			E-SI36-AC-1RD	Saf. equip. inoperable status			
	J-SIA-UV-603	Spray chemical pumps suction valve	E-SI38-AC-1RD	Valve open/close	HS-603	-	X
			E-SI38-AC-1RK	Saf. equip. actuation status			
			E-SI38-AC-1RE	ESFAS			
			E-SI38-AC-1RH	Saf. equip. inoperable status			
	J-SIA-UV-681	Hydrazine, pump to ctmt. spray pump valve	E-SI37-AC-1RD	Valve open/close	HS-681	-	
			E-SI37-AC-1RK	Saf. equip. actuation status			
			E-SI37-AC-1RE	ESFAS			
			E-SI37-AC-1RH	Saf. equip. inoperable status			

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
CONTAINMENT SPRAY SYSTEM TO SUPPLY CONTAINMENT SPRAY FOR IODINE REMOVAL SYSTEM (SAFETY INJECTION) (continued) Train 'B' (continued)	M-SIB-P05	Spray chemical addition pump	E-SI36-BC-1RA	Pump start/stop	HS-61		X
			E-SI36-BC-1KA	Pump feeder			X
			E-SI36-BC-1RB	ESFAS			
			E-SI36-BC-1RC	Override permissive			X
			E-SI36-BC-1RD	Saf. equip. inoperable status			
	J-SIB-UV-602	Spray chemical pump suction valve	E-SI38-BC-1RD	Valve open/close	HS-602	-	
			E-SI38-BC-1RK	Saf. equip. actuation status			
			E-SI38-BC-1RE	ESFAS			
			E-SI38-BC-1RH	Saf. equip. inoperable status			
	J-SIB-UV-680	Hydrazine, pump to con- tainment spray pump	E-SI37-BC-1RD	Valve open/close	HS-681	-	
			E-SI37-BC-1RC	Valve open/close			
			E-SI37-BC-1RK	Saf. equip. actuation status			
			E-SI37-BC-1RE	ESFAS			
			E-SI37-BC-1RH	Saf. equip. inoperable status			

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
CONTAINMENT SPRAY SYSTEM TO SUPPLY CONTAINMENT SPRAY FOR IODINE REMOVAL SYSTEM (SAFETY INJECTION) (continued) Train 'B' (continued)	M-SIA-P02	HP safety injection pump	E-SI01-AC-1RA	Pump start/stop	HS-1		X
			E-SI01-AC-1RC	Pump start/stop			
			E-SI01-AC-1CA	Pump feeder			X
			E-SI01-AC-1RD	Override permissive			X
			E-SI01-AC-1RB	Override permissive			X
	J-SIA-HV-698	HPSI pump A discharge valve	E-SI01-AC-1RG	Saf. equip. inoperable status	HS-698	-	
			E-SI39-AC-1RB	Valve open/close			X
			E-SI39-AC-1RA	Valve open/close			X
			E-SI39-AC-1KA	Valve feeder			X
			E-SI39-AC-1RD	ESFAS			
			E-SI39-AC-1RC	Saf. equip. inoperable status			

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
CONTAINMENT SPRAY SYSTEM TO SUPPLY CONTAINMENT SPRAY FOR IODINE REMOVAL SYSTEM (SAFETY INJECTION) (continued) Train 'B' (continued)	M-SIB-P02	HP safety injection pump	E-SI01-BC-1RA	Pump start/stop	HS-2	-	X
			E-SI01-BC-1RC	Pump start/stop			
			E-SI01-BC-1CA	Pump feeder			X
			E-SI01-BC-1RD	Override permissive			X
			E-SI01-BC-1RB	Override permissive			X
			E-SI01-BC-1RG	Saf. equip. inoperable status			
	J-SIB-HV-699	HPSI pump B discharge valve	E-SI39-BC-1RB	Valve open/close	HS-699	-	X
			E-SI39-BC-1RA	MOV limit stop			X
			E-SI39-BC-1KA	Valve feeder			X
			E-SI39-BC-1RD	ESFAS			
			E-SI39-BC-1RC	Saf. equip. inoperable status			

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
RADIOACTIVE WASTE DRAIN SYSTEM	J-RDA-UV-23	Containment radwaste sumps internal isolation valve	E-RD08-AC-1RE	Valve open/close	HS-23	-	X
			E-RD08-AC-1KA	Valve feeder			X
			E-RD08-AC-1RA	ESFAS			
			E-RD08-AC-1RB	MOV limit sw.			
			E-RD08-AC-1RD	Override permissive			X
			E-RD08-AC-1KB	Valve feeder			X
			E-RD08-AC-1RG	ESFAS			
			E-RD08-AC-1RF	ESFAS			
	J-RDA-UV-24	Ctmt. rad-waste sumps external iso. valve	E-RD07-BC-1RG	Valve open	HS-24	-	
			E-RD07-BC-1RF	Override permissive			
			E-RD07-BC-1RD	Energize solenoid valve			
			E-RD07-BC-1RC	MOV limit sw.			
			E-RD07-BC-1RA	MOV limit sw.			
			E-RD07-BC-1RB	ESFAS			

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System	Device Tag Number	Description	Circuit	Circuit Function	Display/Control Location		
					Control Room	Remote Shutdown Panel	Local
RADIOACTIVE WASTE DRAIN SYSTEM (continued)	J-RDA-LSH-147	Level switch Train A	E-RD04-AC-1RA	Class '1E' annunciator	-	-	-
	J-RDA-LSH-149	Level switch Train A	E-RD04-AC-1RB	Class '1E' annunciator	-	-	-
	J-RDA-LSH-151	Level switch Train A	E-RD04-AC-1RC	Class '1E' annunciator	-	-	-
	J-RDB-LSH-148	Level switch Train B	E-RD05-BC-1RA	Class '1E' annunciator	-	-	-
	J-RDB-LSH-150	Level switch Train B	E-RD05-BC-1RB	Class '1E' annunciator	-	-	-
	J-RDB-LSH-152	Level switch Train B	E-RD05-BC-1RC	Class '1E' annunciator	-	-	-

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LIST OF NEW TMI-2 RELATED EQUIPMENT

POST ACCIDENT MONITORING

DESIGN CRITERIA

Post Accident Monitoring Instrumentation shall be provided in accordance with Regulatory Guide 1.97, Revision 2, "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Access Plant and Environs Conditions During and Following an Accident."

- 1) The following design and qualification criteria categories shall be used:

Category 1:

- Instrumentation shall be qualified in accordance with Regulatory Guide 1.89, NUREG-0588 and Regulatory Guide 1.100.
- Instrumentation shall be designed so that any single failure shall not result in loss of the surveillance function on the system level after an incident. Redundant or diverse channels shall be electrically independent and physically separated in accordance with Regulatory Guide 1.75.
- Instrumentation shall be powered from Class IE Power.
- Instrumentation shall be available prior to an accident except as provided in IEEE 279, paragraph 4.11 or as specified in Technical Specifications.
- Instrumentation shall be Quality Class Q.
- Continuous indication shall be provided.
- Recording shall be provided (one channel).

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- Transmission of signals for other use shall be through isolation devices.
- Types A, B, and C instruments shall be specifically identified on the control panels.

Category 2:

- Sensors shall be qualified in accordance with Regulatory Guide 1.89 and NUREG-0588. Seismic qualification in accordance with Regulatory Guide 1.100 shall be provided with the instrumentation is part of a safety related system.
- Instrumentation shall be powered from a non-Class IE instrument bus with Class IE Power as backup or from Class IE Power.
- The out-of-service interval shall be based on normal Technical Specification requirements on the applicable system.
- Sensors shall be Quality Class Q, (in some cases, Quality Class R) displays shall be Quality Class R.
- Display shall be on an individual instrument or on demand on a CRT.
- Data recording shall be provided for effluent radioactivity monitors, area radiation monitors, and meteorology monitors. Dedicated recorders shall be provided where direct or immediate trend or transient information is essential for operator informaiton or action.
- Transmission of signals for other use shall be through isolation devices.
- Types A, B, and C instruments shall be specifically identified on the control panels.

Category 3:

- Instrumentation shall be of high-quality commercial grade and shall be selected to withstand the service environment.
 - Display shall be on an individual instrument or on demand on a CRT. Data recording shall be provided for effluent radioactivity monitors, area radiation monitors, and meteorology monitors. Dedicated recorders shall be provided where direct or immediate trend or transient information is essential for operator information or action.
- 2) Servicing, testing, and calibration programs shall be provided to maintain the capability of the monitoring instrumentation. For those instruments where the required interval between testing will be less than the normal time interval between generating station shutdowns, a capability for testing during power operation shall be provided.
 - 3) Whenever means for removing channels from service are included in the design, the design shall facilitate administrative control of the access to such removal means.
 - 4) The design shall facilitate administrative control of the access to all setpoint adjustments, module calibration adjustments, and test points.
 - 5) The monitoring instrumentation design shall minimize the development of conditions that would cause meters, annunciators, recorders, alarms, etc., to give anomalous indications potentially confusing to the operator.

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- 6) The instrumentation shall be designed to facilitate the recognition, location, replacement, repair, or adjustment of malfunctioning components or modules.
- 7) To the extent practicable, monitoring instrumentation inputs shall be from sensors that directly measure the desired variables.
- 8) To the extent practical, the same instruments shall be used for accident monitoring as are used for the normal operations of the plant to enable the operator to use, during accident situations, instruments with which he is most familiar. However, where the required range of monitoring instrumentation results in a loss of instrumentation sensitivity in the normal operating range separate instruments shall be used.
- 9) Periodic testing shall be in accordance with the applicable portions of Regulatory Guide 1.118 pertaining to testing of instruments channels. (Note: Response time testing not usually needed.)

SYSTEM DESCRIPTION

- 1) Type A Variables: Those variables to be monitored that provide the primary information required to permit the control room operator to take specific manually controlled actions for which no automatic control is provided and which are required for safety systems to accomplish their safety function for design basis accident events. Primary information is that which is essential for the direct accomplishment of the specified safety functions; it does not include those variables which are associated with contingency actions that may also be identified in written procedures.

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A C-E review of emergency guidelines (LOCA, MSLB, SG tube rupture, ATWS, reactor trip, loss of feed and loss of forced flow) is completed to identify for each event:

Required Manual Action
Instrument Consulted
Required Range and Accuracy
Current Qualification Status

In addition, a review of the emergency procedures after they are developed will be performed to ensure the required variables have been identified.

- 2) Type B Variables: Those variables that provide information to indicate whether plant safety functions are being accomplished. Plant safety functions are (1) reactivity control, (2) core cooling, (3) maintaining reactor coolant system integrity, and (4) maintaining containment integrity (including radioactive effluent control). Variables are listed with designated ranges and category for design and qualification requirements. Key variables are indicated by design and qualification Category 1.

• Category 1

Variable	Requirement	Design Feature
Containment Sump Water Level - wide range	Bottom of Containment to 600,000 gallon equivalent	Sensor Range - 11 ft. (+6 in. above sump to +6 in. above maximum expected flood level) Display - 2 channels, Class IE, recording on one channel

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Type B Category 1 (Cont'd)

Variable	Requirement	Design Feature
Containment Pressure	0 to design pressure (60 psig) 10 psia to design pressure (60 psig)	Sensor Range - -5 psig to 180 psig Display - 2 channels, Class IE, Recording on one channel
Containment Isolation Valve Position (excluding check valves)	Closed - not closed	Display - Valve status for all automatic or remote manual containment isolation valves

• Category 2

Variable	Requirement	Design Feature
Containment Sump Water Level - Narrow Range	Sump	Sensor Range - +6 in. above bottom of Radwaste Drain Sump to +6 in. above top of sump Display - 1/sump, Sensor qualified to post LOCA environment, Seismic Category II

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• Type B Category 3

Variable	Requirement	Design Feature
RCS Soluble Boron Concentration	0 to 6000 ppm	Post Accident Sampling System: Range - 0 to 6000 ppm, remote sample, in-line automatic (grab sample backup)

- 3) Type C Variables - Those variables that provide information to indicate the potential for being breached or the actual breach of the barriers to fission product releases. The barriers are (1) fuel cladding, (2) primary coolant pressure boundary, and (3) containment.

• Category 1

Variable	Requirement	Design Feature
Radioactivity Concentration or Radiation Level in Circulating Primary Coolant	1/2 Tech Spec Limit to 100 times Tech Spec limit, R/hr	Sensor Range - 1R/hr to 10 ⁵ R/hr Display - CRT, non-Class IE, & 2 safety related channels displays at cabinet, Class IE, recording on one channel
Containment pressure	10 psia to design pressure (60 psig) 10 psia to 3 times design pressure	Sensor Range - -5 psig to 180 psig Display - 2 channels, Class IE, recording on one channel

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• Type C Category 1 (Con't)

Variable	Requirement	Design Feature
Containment Sump Water Level - Wide Range	Bottom of Contain- ment to 600,000 gallon equivalent	Sensor Range - 11 ft. (+6 in. above sump to +6 in. above maximum expected flood level) Display - 2 channels, Class IE, recording on one channel
Containment Hydrogen Concentration	0 to 10% (Capable of operating from 10 psia to maximum design pressure)	Sensor Range - 0 to 10% Available 30 min- utes after initia- tion of Safety Injection. Capable of operating from -5 psig to 60 psig (containment design pressure) Display - 2 channels, Class IE, recording on one channel

• Type C Category 2

Variable	Requirement	Design Feature
Containment Sump Water Level - Narrow Range	Sump	Sensor Range - +6 in. above bottom of Radwaste Drain Sump to 6 in. above top of sump

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• Type C Category 2 (Con't)

Variable	Requirement	Design Feature
Containment Sump (Con't)		Display - 1/sump Sensor qualified to post LOCA environ- ment, Seismic Category II
Containment Effluent Radio- activity - Noble Gases from Identified Release Points	10^{-6} μ Ci/cc to 10^{-2} μ Ci/cc	Sensor Range - 10^{-6} μ Ci/cc to 10^{-2} μ Ci/cc at plant Vent Display - CRT Sensor qualified to post accident environment, Seismic Category II
Radiation Expo- sure Rate (inside buildings or areas which are in direct contact with primary contain- ment where pene- trations and hatches are located)	10^{-1} R/hr to 10^4 R/hr	13 monitors Sensor Range - 10^{-1} R/hr to 10^4 R/hr Display - CRT Sensors qualified to post accident environment, Seismic Category II

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• Type C Category 2 (Con't)

Variable	Requirement	Design Feature
Effluent Radio-activity - Noble Gases (from buildings indicated above)	10^{-6} μ Ci/cc to 10^3 μ Ci/cc	Sensor Range - 10^{-6} μ Ci/cc to 10^5 μ Ci/cc at Fuel Building Vent Display - CRT Sensor qualified to post accident environment, Seismic Category II

• Category 3

Variable	Requirement	Design Feature
Analysis of Primary Coolant (Gamma Spectrum)	10 μ Ci/gm to 10 Ci/gm or TID-14844 source term in coolant volume	Post Accident Sampling System: Range - 10^{-3} μ Ci/cc to 10 Ci/cc Remote Sample, isotopic, in-line automatic (grab sample backup)
Containment Area Radiation	1 R/hr to 10^4 R/hr	Sensor Range - 1 R/hr to 10^4 R/hr Display - CRT

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• Category 3 (Con't)

Variable	Requirement	Design Feature
Effluent Radio-activity - Noble Gas Effluent from Condenser Air Removal System Exhaust	10^{-6} μ Ci/cc to 10^{-2} μ Ci/cc	Sensor Range - 10^{-6} μ Ci/cc to 10^{+3} μ Ci/cc Display - CRT Sensor qualified to post accident environment

- 4) Type D Variables - Those variables that provide information to indicate the operation of individual safety systems and other systems important to safety. These variables are to help the operator make appropriate decisions in using the individual systems important to safety in mitigating the consequences of an accident.

• Category 1

Variable	Requirement	Design Feature
Condensate Storage Tank Level	Plant Specific	Sensor Range - 0 to 50 ft. Display - 2 channels, Class IE, recording on one channel

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• Type D Category 2

Variable	Requirement	Design Feature
Primary System Safety Relief Valve Positions	Closed - Not Closed	Sensors qualified to post accident environment
Pressurizer Heater Status	Electric current	Sensor Range - 0 to 500 amps Sensors qualified to post accident environment
Safety/Relief Positions or Main Steam Flow	Closed - Not Closed	Sensors qualified to post accident environment
Auxiliary Feed- water Flow	0 to 110% Design Flow	Sensor Range - 0 to 2000 gpm = 0 to 228% Display - 2 channels, Class IE
Containment Atmosphere Temperature	40°F to 400°F	Sensor Range - 0 to 400°F Sensor qualified to post accident environment
Containment Sump Water Temperature	50°F to 250°F	Sensor Range - 50 to 250°F Sensor qualified to post accident environment Display - 1/sump

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• Type D Category 2 (Con't)

Variable	Requirement	Design Feature
Essential Cooling Water System Temperature	32°F to 200°F	Sensor Range - 0 to 200°F Display - 1/train, sensor qualified to post accident environment, Seismic Category II
Essential Cooling Water System	0 to 110% Design Flow	Sensor Range - 0 to 20,000 gpm = 0 to 114% Display - 1/train, sensor qualified to post accident environment, Seismic Category II
Emergency Ventilation Damper position	Open - Closed Status	Display - Damper status for all automatic or remote manual emergency ventilation dampers
Status of Standby Power and Other Energy Sources	Voltages, Currents, Pressures	Display - ESF bus voltages and currents, Class IE Low Pressure alarms on MSIV, MFIV and atmospheric dump valve accumulators. Sensor qualified to post accident environment, Seismic Category II

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• Type D Category 3

Variable	Requirement	Design Feature
Reactor Coolant Pump Status	Motor Current	Display - Pump motor Current
High-Level Radioactive Liquid Tank Level	Top to Bottom	Display - Sensor range 0-32,000 gal Main control room alarm of Radwaste System Trouble. Radwaste Systems are normally controlled from Radwaste Control Room. Main control room display on demand via CRT terminal.
Radioactive Gas Holdup Tank Pressure	0 to 150% Design Pressure	Display - Sensor range will be provided to comply with 0 to 150% design pressure. Main control room alarm of Radwaste System Trouble. Radwaste Systems are normally controlled from Radwaste Control Room. Main control room display on demand via CRT terminal.

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- 5) Type E Variables - Those variables to be monitored as required for use in determining the magnitude of the release of radioactive materials and continually assessing such releases.

• Category 1

Variable	Requirement	Design Feature
Containment Area Radiation-High Range	1 R/hr to 10^7 R/hr	Sensor Range: 1 R/hr 10^7 R/hr Display: CRT and 2 safety related channel displays at cabinet, Class 1E, Recording on one channel

• Type E Category 2

Variable	Requirement	Design Feature
Radiation Expo- sure Rate (inside buildings or areas where access is required to ser- vice Equipment important to safety)	10^{-1} R/hr to 10^4 R/hr	10 monitors Sensor Range - 10^{-1} R/hr to 10^4 R/hr Display - CRT Sensors qualified to post accident environment Local display and annunciation

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• Type E Category 2 (Con't)

Variable	Requirement	Design Feature
Containment or Purge Effluent - Noble Gases and Vent Flow Rate	10^{-6} $\mu\text{Ci/cc}$ to 10^5 $\mu\text{Ci/cc}$ 0 to 110% Vent Design Flow	Plant vent monitored as identified below
Common Plant Vent - Noble Gases and Vent Flow Rate	10^{-6} $\mu\text{Ci/cc}$ to 10^3 $\mu\text{Ci/cc}$ 0 to 110% Design Flow	Plant vent monitored as identified below
Auxiliary Build- ing - Noble Gases and Vent Flow Rate	10^{-6} $\mu\text{Ci/cc}$ to 10^3 $\mu\text{Ci/cc}$ 0 to 110% Vent Design Flow	Sensor Range - 10^{-9} $\mu\text{Ci/cc}$ to 10^5 $\mu\text{Ci/cc}$ at Plant Vent Display - CRT, non- Class IE Sensor qualified to post accident environment Calculated flow data is provided
Condenser Air Removal System Exhaust - Noble Gases and Vent Flow Rate	10^{-6} $\mu\text{Ci/cc}$ to 10^5 $\mu\text{Ci/cc}$ 0 to 110% Vent Design Flow	Sensor Range - 10^{-6} $\mu\text{Ci/cc}$ to 10^5 $\mu\text{Ci/cc}$ Display - CRT, Non- Class IE Sensor qualified to post accident environment Calculated flow data is provided

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• Type E Category 2 (Con't)

Variable	Requirement	Design Feature
Vent from Steam Generators Safety Relief Valves or Atmospheric Dump Valves - Noble Gases and Vent Flow Rate	10^{-1} $\mu\text{Ci/cc}$ to 10^3 $\mu\text{Ci/cc}$ (Duration of releases in seconds and Mass of Steam per Unit Time)	Monitor/Steam Line Sensor Range - 10^{-1} $\mu\text{Ci/cc}$ to 10^3 $\mu\text{Ci/cc}$ Display - CRT Sensors qualified to post Accident Environment
Fuel Building Vent - Noble Gases and Vent Flow Rate	10^{-6} $\mu\text{Ci/cc}$ to 10^2 $\mu\text{Ci/cc}$ 0 to 110% Vent Design Flow	Sensor Range - 10^{-6} $\mu\text{Ci/cc}$ to 10^2 $\mu\text{Ci/cc}$ Display - CRT Sensors qualified to post accident environment Calculated flow data is provided

• • Type E Category 3

Variable	Requirement	Design Feature
Particulates and Halogens at all Identified Release Points (except Steam Generator Safety Relief Valves or	10^{-3} $\mu\text{Ci/cc}$ to 10^2 $\mu\text{Ci/cc}$ 0 to 110% Vent Design Flow	Monitors at Plant Vent Fuel Building Vent Main Condenser Air Removal Exhaust Sensor Range - 10^{-3} $\mu\text{Ci/cc}$ to 10^2 $\mu\text{Ci/cc}$

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• Type E Category 3 (Con't)

Variable	Requirement	Design Feature
Atmospheric Steam		Calculated flow data is provided
Dump Valves and Condensor Air Removal System Exhaust) Sampling, with onsite analysis capability		
Airborn Radio-halogens and particulates (Portable Sampling with onsite analysis capability)	10^{-9} $\mu\text{Ci/cc}$ to 10^{-3} $\mu\text{Ci/cc}$	5×10^{-9} $\mu\text{Ci/cc}$ to 5×10^{-4} $\mu\text{Ci/cc}$ Particulate 5×10^{-10} $\mu\text{Ci/cc}$ to 5×10^{-5} $\mu\text{Ci/cc}$ Iodine 10^{-6} to 10^{-1} $\mu\text{Ci/cc}$ Halogens
Plant and Environs Radiation (Portable Instrumentation)	10^{-3} R/hr to 10^4 R/hr, photons 10^{-3} rads/hr to 10^4 rads/hr, beta radiations and low-energy photons	PVNGS will comply .
Plant and Environs Radio-activity (Portable Instrumentation)	Multichannel Gamma-Ray Spectrometer	PVNGS will comply

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• Type E Category 3 (Con't)

Variable	Requirement	Design Feature
Wind Direction	0 to 360° ($\pm 5^\circ$ accuracy with a deflection of 15°). Starting speed 0.45 mps (1.0 mph). Damping ratio between 0.4 and 0.6, distance constant 2 meters.	0 to 540° ($\pm 5^\circ$ accuracy). Starting threshold 0.75 mph. Damping ratio 0.4, distance constant 3.3 ft.
Wind Speed	0 to 30 mps (67 mph) ± 0.22 mps (0.5 mph) accuracy for wind speeds less than 0.45 mps (1.0 mph).	0 to 50 mph $\pm 1\%$ or 0.15 mph or whichever is greater, with a starting threshold of 0.6 mph.

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• Type E Category 3 (Con't)

Variable	Requirement	Design Feature
Estimation of Atmospheric Stability	Based on vertical temperature difference from primary system, -5°C to 10°C (-9°F to 18°F) and $\pm 0.15^\circ\text{C}$ accuracy per 50 meter intervals ($+0.3^\circ\text{F}$ accuracy per 164-foot intervals) or analogous range for alternative stability estimates	Based on a vertical difference of 160 ft, $\pm 6^\circ\text{F}$ analog and digital, $+18^\circ$ to -6°F analog only and $\pm 0.18^\circ\text{F}$ accuracy.
Accident Sampling Capability (Analysis Capability Onsite)		Post Accident Sampling System: (Remote Sample, in-line automatic grab sample backup)
Primary Coolant & Sump via Grab Sample	Grab Sample	Ranges:
• Gross Activity	10 $\mu\text{Ci/ml}$ to 10 Ci/ml	10^{-3} $\mu\text{Ci/cc}$ to 10 Ci/cc

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• Type E Category 3 (Con't)

Variable	Requirement	Design Feature
Primary Coolant (Con't)		
• Gamma Spec- trum	(Isotopic Analysis	Isotopic Analysis
• Boron Con- tent	0 to 6000 ppm	0 to 6000 ppm
• Chloride Content	0 to 20 ppm	0 to 20 ppm
• Dissolved Hydrogen	0 to 2000 cc (STP)/kg	0 to 2000 cc (STP)/kg
• Dissolved Oxygen	0 to 20 ppm	0 to 20 ppm
• pH	1 to 13	1 to 13
Accident Samp- ling Capability (Analysis Capa- bility On-Site)		Post Accident Samp- ling System: (Remote Sample, in-line (automatic)
Containment Air	Grab Sample	
• Hydrogen Content	0 to 10%	0 to 10%
• Oxygen Content	0 to 30%	0 to 30%
• Gamma Spectrum	(Isotopic Analysis	10^{-7} μ Ci/cc to 10^5 μ Ci/cc Isotopic Analysis



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RESPONSES TO NRC QUESTIONS
(LETTER, KNIGHTON TO VAN BRUNT, MARCH 14, 1983)

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RESPONSES TO NRC QUESTIONS

(LETTER, KNIGHTON TO VAN BRUNT, MARCH 14, 1983)

QUESTION 1.

Arizona Public Service Company (APS) commits to interim justification prior to power escalation above 5% of full power. However, 10 CFR 50.49(i) requires this prior to operating license issuance. The information is required 60 days prior to operating license issuance.

RESPONSE: The response is provided in the revised section 1.1.

QUESTION 2.

For Environmental Designator III, the 318°F temperature extreme is stated to apply to Class 1E cable only. An explanation is required why this temperature extreme is not applied to other equipment in the same area.

RESPONSE: Cable was the only item of Class 1E equipment which was in the vicinity of piping which could be affected by a postulated pipe break. Other Class 1E equipment in the auxiliary building would not be affected by any postulated pipe break of high energy lines.

QUESTION 3.

Note (b) page 4.1-146 states that subcompartments below 100' elevation are unaffected by the MSSS Design Basis Pipe Break. Can they be affected by other HELBS. An explanation should be supplied.

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RESPONSE: In accordance with the definition of high energy lines per Branch Technical Position MEB 3-1, Section B.2.E, no high energy lines exist in the MSSS below elevation 100 feet. Additionally, there are no HVAC penetrations that would connect the rooms below elevation 100 feet with the rooms above 100 feet.

QUESTION 4.

Section 3.3 does not explain the derivation of the qualification level of 3.3×10^7 rads gamma for Environmental Designator 1, Table 4.1-3. Provide an explanation for differences between Tables 4.1-3 and 3.3-5.

RESPONSE: Refer to the revised section 3.3. Additionally, it is noted that the value of 3.3×10^7 rads gamma provides margin over the baseline calculation described in section 3.3 (refer to table 3.3-5G).

QUESTION 5. The 30 day dose given in table 3.3-6 is 6.4×10^6 rads gamma, yet table 4.1-3 uses 1×10^6 rads gamma as a qualification parameter. Explain this apparent inconsistency.

RESPONSE: The value of 6.4×10^6 rads gamma as presented in table 3.3-6 is the dose for those rooms containing LPSI recirculation fluids under intact primary degraded core conditions. The value of 1×10^6 rads gamma is the overall auxiliary building dose for a design basis LOCA. Table 4.1-3 has been revised to reflect this distinction.

QUESTION 6.

Section 3.6 supplies no description of accelerated aging methodology. A description of the procedures used should be provided.

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RESPONSE: Accelerated aging methodology is evaluated on a case by case basis during review of supplier qualification documentation. In general Arrhenius methods are used. If other methods are used, proper justification is provided in the documentation package. Generically, equipment is subjected to thermal aging prior to a simulated design basis accident.

QUESTION 7.

The chemical spray parameters listed in table 4.1-3 and the very brief explanation in section 3.8 contains no explanation of the method used to determine the spray concentration. Provide this explanation and demonstrate conformance to NUREG-0588, Section 1.3.

RESPONSE: Refer to the revised section 3.8.

QUESTION 8.

Appendix B is apparently for BOP items only. Supply the checklist that NSSS items are reviewed with.

RESPONSE: The checklists identified in appendix B are used for NSSS as well as BOP. The title page for appendix B inadvertently referenced BOP only in the original issue. Refer to appendix B.

QUESTION 9.

If any out of containment areas other than Environmental Designators II, III, and VI see any radiation due to a DBA, supply a justification for exclusion of other areas from harsh environment designation.

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RESPONSE: The mild environment areas are defined as areas within the plant site which do not experience any significant increases in temperature, pressure, or radiation (greater than 10^3 rads) due to a design basis accident. These defined mild areas have no pipes containing process radioactive fluids and do not have the ability to holdup containment radioactivity leakage.

QUESTION 10.

If any NSSS or BOP supplied equipment is utilizing thermal equivalence analysis (see CENPD-255 Revision 3), supply an example for a specific equipment item.

RESPONSE: None of the submitted environmental qualification programs for BOP and NSSS utilize thermal equivalence approach to equipment qualification.

QUESTION 11.

The maximum operability time designated for any equipment is 30 days. Justify this low value.

RESPONSE: The 30 days operability time was a conservative estimate for the time required for the harsh environments to return to pre-accident conditions with the exception of radiation. As shown in figures 3.3-2 through 3.3-4, radiation sources at 30 days are less than one-one hundredth of their initial values. Consequently, the increase in radiation dose is negligible beyond 30 days.

At 30 days the only safety function that must be operable is shutdown cooling. For shutdown cooling one train of the shutdown cooling pumps, valves, heat exchangers and support equipment (HVAC and cooling water) must be operable.

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The operating shutdown cooling valves are motor operated and cannot fail in an unsafe manner since the valves fail as-is. The shutdown cooling heat exchangers are cooled by the essential cooling water system (ECWS). The heat exchangers are metallic and are insensitive to environmental stress. They are fully qualified for 40 years of service. Each pump is capable of providing 100% cooling and each train's pump can be aligned to provide flow to the other train's shutdown cooling heat exchanger. The pumps are shielded from shutdown cooling piping and are accessible for maintenance at 30 days.

HVAC serving the shutdown cooling compartments can be replaced by various methods such as portable coolers and fans. Thirty days provide ample time to install temporary cooling. Accordingly, a 30-day qualification period provides adequate assurance of operability.

At 30 days, the LPSI and CS pumps are redundant since spray cooling is not required at the same time as low pressure injection. Thus, within each of the two trains of the safety injection system there are two redundant pumps, either of which is adequate to provide flow for that train. Maintenance can be performed at 30 days, even on an operating train, since the LPSI and CS compartments are shielded from each other. Thus, the operability time for the PSI and CS pumps is 30 days.

The remaining piece of safety injection system equipment is the HPSI pump. One safety injection train's pump must operate until the time that its function can be performed by some other piece of equipment (assuming a single failure). Four months is an adequate time to restore the letdown line to operation and align a charging pump as replacement HPSI. Thus four months is used as the qualification period for the HPSI pumps.

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In the qualification process it has been determined that the HPSI, LPSI and CS pumps have demonstrated operability times in excess of the required times discussed above. See table 4.1-2 sheets 16, 17, and 18.

QUESTION 12.

It is unclear how the values for temperature and radiation for Environmental Designator II were arrived at. Supply an explanation. Please include the temperature profile used to determine the requirement.

RESPONSE: The Main Steam Support Structure is structurally divided into two areas. Elevations above 100 feet contain the main steam lines for which the MSLB environmental parameters are indicated. Since the floors in the upper section are open grated the environmental parameters are the same for all levels. The top of the MSSS is open to the atmosphere which limits the temperature and pressure during an MSLB to 300F and 21 psig. The below grade (below 100 feet) is physically separate from the area of the main steam lines by a reinforced concrete floor and therefore would not be affected by an MSLB. The entrance to the below grade areas of the MSSS is outside of the MSSS itself.

Auxiliary feedwater pumps and their associated valves and instruments are not required beyond 24 hours after an accident. Accordingly, airborne dose, per the Methodology of section 3.3.1.6, is 10^5 rads.

QUESTION 13.

Compliance with the rule on the environmental qualification 10 CFR 50.49 especially with equipment important to safety (para. B(2)) and equipment required by R.G. 1.97, Rev. 2

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(para. b(3)) and a statement that all safety-related component located in the harsh environment (para. b(1)) should be included in the qualification program. This should include equipment required for MELB, spent fuel handling accident, etc. (Required 60 days prior to OL).

RESPONSE: The response is provided in the revised section 1.1.

QUESTION 14.

Comparison of the systems list included in the EQ program with the list provided in Table 3.2-1 of the FSAR. Any omission should be justified.

RESPONSE: Table 2.2-1 of this report identifies the systems containing safety-related equipment located in a harsh environment. FSAR Table 3.2-1 is the quality classification of structures, systems, and components. The FSAR table includes safety and non-safety related equipment. Table G-1 lists structures, systems, and components indicating either inclusion in this report or the justification for exclusion.

QUESTION 15.

The category qualified (pending) is defined as the review is in progress and the documentation is not complete. The review of $\approx 85\%$ of the files should be completed with only retest, relocate or modification as the resolution of the open item. Provide the open item listing for all the packages defined as qualified (pending) and their resolutions with the scheduled date for completing the qualification.

RESPONSE: Refer to the revised tables 4.1-1 and 4.1-2. Category qualified (pending) is no longer used.

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Table G-1
SYSTEM COMPARISONS (Sheet 1 of 5)

FSAR Table 3.2-1 Principal Components	Inclusion in EQ Report or Justification for Exclusion
1. Reactor Equipment (Reactor Components)	Not Included Not Class IE ^(a)
2. (RC) Reactor Coolant System	Included
3. (CH) Chemical and Volume Control System	Included
4. (SI) Safety Injection and Shutdown Cooling System	Included
5. (SI) Containment Spray System	Included
6. Containment, Building Combustible Gas Control Systems	
(HP) Containment Hydrogen Control System	Included
7. Instrumentation and Control Systems	
(SB) Reactor Protection System	Included
(SA) Engineered Safety Features Actuation Systems	Included
(SE) Ex-Core Neutron Monitoring System	Included
8. Electric Systems	
(PB) Class IE 4.16-kV Power System	Included
(PG) Class IE 480-V Power Switchgear System	Included
(PH) Class IE 480-V Power MCC System	Included
(PK) Class IE 125-V DC Power System	Included
(PN) Class IE Instrument AC Power System	Included

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Table G-1
SYSTEM COMPARISONS (Sheet 2 of 5)

FSAR Table 3.2-1 Principal Components	Inclusion in EQ Report or Justification for Exclusion
<p>9. Component and Fuel Handling Equipment and Fuel Storage (FX) Fuel Handling and Storage System (PC) Fuel Pool Cooling and Cleanup System</p> <p>10. Water Systems (SP) Essential Spray Pond System (CW) Circulating Water System (EW) Essential Cooling Water System (NC) Nuclear Cooling Water System (TC) Turbine Cooling Water System (PW) Plant Cooling Water System (WC) Chilled Water System (EC) Essential Chilled Water System (DS) Domestic Water System (CT) Condensate Transfer and Storage System (DW) Demineralized Water System (TB) Cooling Tower Makeup and Blowdown System</p>	<p>Not Included Not Class IE^(a) Included</p> <p>Included Not Included Not Class IE Included Included Not Included Not Class IE Not Included Not Class IE Included Included Not Included Not Class IE Included Included Not Included Not Class IE</p>

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Table G-1
SYSTEM COMPARISONS (Sheet 3 of 5)

FSAR Table 3.2-1 Principal Components	Inclusion in EQ Report or Justification for Exclusion
11. Compressed Air Systems (IA) Instrument and Service Air System	Included
12. Sampling System (SS) Nuclear Sampling System	Included
13. Equipment and Floor Drains (RD) Radioactive Waste Drains System	Included
14. Chemical Addition System (SC) Secondary Chemical Control System	Not Included Not Class IE
15. Heating, Ventilation and Air Conditioning (HA) HVAC - Auxiliary Building (HF) HVAC - Fuel Building (HR) HVAC - Radwaste Building (HT) HVAC - Turbine Building (HC) HVAC - Containment Building (CP) Containment Purge System (HD) HVAC - Diesel Generator Building (HJ) HVAC - Control Building	Included Included Not Included Not Class IE Not Included Not Class IE Included Included Included Included
16. Fire Protection System (QK) Fire Detection and Alarm System	Included

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Table G-1
SYSTEM COMPARISONS (Sheet 4 of 5)

FSAR Table 3.2-1 Principal Components	Inclusion in EQ Report or Justification for Exclusion
17. Diesel Generator System (DF) Diesel Fuel Oil and Transfer Systems	Included
(DG) Diesel Generator Systems	Included
18. Compressed Gas Storage System (GA) Service Gas System (N ₂ and H ₂)	Included
19. Chemical Production System (CC) Chemical Production System	Not Included Not Class IE
20. Steam and Power Conversion System (SG) Main Steam System	Included
(GS) Turbine Steam Seal and Drain System	Not Included Not Class IE
(CI) Chlorine Injection System	Not Included Not Class IE
(CD) Condensate System	Not Included Not Class IE ^(a)
(AF) Auxiliary Feedwater System	Included
(AS) Auxiliary Steam System	Not Included Not Class IE
(SC) Secondary Chemical Control System	Not Included Not Class IE ^(a)
(OS) Lube Oil Storage, Transfer, and Purification System	Not Included Not Class IE
21. Liquid Radwaste System (LR) Liquid Radwaste System	Not Included Not Class IE

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Table G-1
SYSTEM COMPARISONS (Sheet 5 of 5)

FSAR Table 3.2-1 Principal Components	Inclusion in EQ Report or Justification for Exclusion
<div>22. Gaseous Radwaste System (GR) Gaseous Radwaste System</div> <div>23. Solid Radwaste System (SR) Solid Radwaste System</div> <div>24. Water Reclamation System</div> <div>25. Structures</div> <div>26. Water Reclamation Plant Structures</div> <div>27. Water Reclamation Supply System</div> <div>28. Radiation Monitoring System (SQ) Radiation Monitoring System</div> <div>29. Radiation Exposure and Maintenance System</div> <div>30. Accident Related Meteorological Data Collection Equipment</div>	<div>Included</div> <div>Not Included Not Class IE</div> <div>Not Included Not Class IE</div> <div>Not Included Not Class IE^(a)</div> <div>Not Included Not Class IE</div> <div>Not Included Not Class IE</div> <div>Included</div> <div>Not Included Not Class IE</div> <div>Not Included Not Class IE</div>
<div>a. Some components within the system which are considered important to safety are classified Quality Class Q Seismic Category I devices.</div>	

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QUESTION 16.

FSAR Table 6.2.1-9 shows that, for reactor at 102% power and for 8.75 ft.² MSLB break with the loss of one cooling train, the peak containment temperature is \cong 401°F. The EQ report shows only 370°F. Explain.

RESPONSE: The instantaneous peak vapor temperature is 401F. The peak surface temperature is 370F. Refer also to the revised section 3.2.1.

QUESTION 17.

Radiation environment (section 3.3) appears to be low as compared to the plant with the similar design. During the last telephone conversation the staff has asked to provide basis, assumption and sample calculation to determine the acceptability of the radiation dose. Also, if any place, credit is taken because of the location of the equipment a sample calculation with the basis and assumption should be provided.

RESPONSE: The response is provided in the revised section 3.3.

QUESTION 18.

Section 3.2-4 is missing and should be addressed.

RESPONSE: Section 3.2-4 has been added.

QUESTION 19.

Reference to R.G. 1.33 Rev. 2 and ANS-3.2/ANSI N18.7-1976 in appendix A should be added.

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RESPONSE: Refer to the revised appendix A.

QUESTION 20.

Difference between the spray environment during testing vs. required should be explained and the basis for acceptance should be provided.

RESPONSE: Refer to the revised tables 4.1-1 and 4.1-2. Each program is evaluated on a case by case basis for acceptability. The evaluations are stored in the central files. No qualification program is considered complete in which the spray environment falls short of specification requirements without acceptable justification.

QUESTION 21.

1 From the submittal it is unclear whether the field verification of equipment was performed.

RESPONSE: Field verification of equipment was performed while inspecting field mounting conditions to compare with the seismic reports. This was performed on all installed equipment which had seismic test requirements in the specification regardless of its respective environmental designator. This field mounting inspection had the secondary benefit of insuring that the specified environmental requirements was consistent with the actual location within the plant.

QUESTION 22.

Confirm that accuracy and response time requirement was considered for all the applicable equipment e.g. transmitters, switches etc.

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RESPONSE: Accuracy and response time requirements were extracted from qualification reports, where the supplier establishes the pass/fail criteria for the specific equipment undergoing the test program. Accuracy and response time requirements as stated in this report are as or more restrictive than the equipment specifications. In all situations where they were given in the test programs they were extracted and reported in tables 4.1-1 and 4.1-2.

QUESTION 23.

Provide the list of equipment below submergence and discuss the qualification for submergence. If this question has been answered before provide the reference to the question and answer.

RESPONSE: Refer to the revised section 3.7.

QUESTION 24.

Explain why the fig. 3.2-4 peaks to only 325°F and then drops to 250°F in 2 minutes. Is this only one of the spectrums of breaks or this is the most limiting one?

RESPONSE: The referenced figure represents the worst case break which would require a CPC trip. The rapid decrease to 250F is due to containment spray.

QUESTION 25.

In discussion of the drainage system in FSAR Section 9.3.3.2, credit has been taken for the level switches and pumps for the flood protection. Confirm that these equipments are included in the qualification program. Also credit has been taken for

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the check valves to avoid flooding because of the backflow. Please confirm that these check valves are safety-related and are included in your QA program.

RESPONSE: Although flooding is considered as a design basis accident, the sump pumps are non-Class 1E. Flood protection is provided by separation, not by pumping (refer to FSAR Section 9.3.3.2.1.1.2). The level switches found in the MSSS and in the HPSI, LPSI and CS pump rooms are Class 1E to advise the control room operator that flooding is occurring (see Specification JM-481, table 4.1-1 Sheet 40).

Check valves used in drains to common sumps are Class 1E however since they are mechanical devices only they do not appear in harsh environment qualification programs per NUREG-0588. These check valves are quality Class Q and are therefore included within the QA program.

QUESTION 26.

Provide a list of TMI Action Plan equipment in your program by it's I.D. number. Provide the qualification status of the TMI items which require qualification but are not in the qualification program at the present time. (Required within two weeks after the audit.)

RESPONSE: APS will provide a list of equipment added because of TMI plant modifications along with the qualification status of each program within the requested time frame.

QUESTION 27.

In many status sheet (#13, 15 etc.) the environmental parameter is not enveloped by the test and the status is defined as qualified without any explanation. Provide the explanation.

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RESPONSE: Footnotes have been added to the status sheets to explain apparent discrepancies. Refer to the revised tables 4.1-1 and 4.1-2.

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QUALIFICATION RELATED EQUIPMENT RETROFITS

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QUALIFICATION RELATED EQUIPMENT RETROFITS

Description and Tag #'s		Modification Required
Safety Injection System		
Limit Switch on Pneumatic Valves:		
Namco EA170-31100		
SI-322	Leakage Control Cont. Bldg. (Close)	Replace Limit Switches
SI-332		
SI-618		
SI-628		
SI-638		
SI-648		
Namco EA170-31302		
SI-611	Sit Level Cntrl. Cont. Bldg.	
SI-621		
SI-631		
SI-641		
SI-682		

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QUALIFICATION RELATED EQUIPMENT RETROFITS

Description and Tag #'s			Modification Required
Chemical and Volume Control System			
Limit Switch on Pneumatic Valves:			
Namco EA170-31302			
CH-515	Letdown Line	Cont. Bldg.	Replace Limit Switches
CH-516	Isolation	Cont. Bldg.	
CH-505	Controlled	Aux. Bldg.	
CH-506	Bleedoff Isolation	Cont. Bldg.	
CH-523	Letdown line Isolation	Aux. Bldg.	
CH-560	RDT to RDP	Cont. Bldg.	
CH-561	Isolation	Aux. Bldg.	
CH-580	R makeup water to RDT Isolation	Aux. Bldg.	
CH-240	Close to Allow Aux Spray	Contl. Bldg.	

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QUALIFICATION RELATED EQUIPMENT RETROFITS

Description and Tag #'s		Modification Required
Safety Injection System		
Solenoid Pilot Valve on Pneumatic Valves:		
ASCO NP-8320-A187-V		
SI-322	Cont. Bldg.	Replace elastomers and name plates and install vented conduit pull-fittings
SI-332	Cont. Bldg.	
SI-618	Cont. Bldg.	
SI-628	Cont. Bldg.	
SI-638	Cont. Bldg.	
SI-648	Cont. Bldg.	
SI-611	Cont. Bldg.	
SI-621	Cont. Bldg.	
SI-631	Cont. Bldg.	
SI-641	Cont. Bldg.	
SI-682	Cont. Bldg.	

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Description and Tag #'s		Modification Required
Chemical and Volume Control System		
Solenoid Pilot Valve on Pneumatic Valves:		
ASCO NP8320-A187-V		
CH-515	Cont. Bldg.	Replace elastomers and name plates.
CH-516	Cont. Bldg.	(Install vented conduit pull-fittings on valves located inside containment)
CH-505	Aux. Bldg.	
CH-506	Cont. Bldg.	
CH-523	Aux. Bldg.	
CH-560	Cont. Bldg.	
CH-561	Aux. Bldg.	
CH-240	Cont. Bldg.	
ASCO HT8321A1		
CH-580	Aux. Bldg.	Replace with complete solenoid valve with NP-1 series solenoid valve

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Description and Tag #'s			Modification Required
Secondary Chemistry			
Solenoid Valve Operator on Valves:			
Valcor Model V526-5683-1			
SC-204	Sample Line Isolation	Cont. Bldg.	Replace cover, cable connector, O-rings
SC-211		Cont. Bldg.	
SC-220		Cont. Bldg.	
SC-222		Cont. Bldg.	
SC-224		Cont. Bldg.	
SC-226		Cont. Bldg.	
Sample System			
Solenoid Operator on Valves:			
Valcor Model V526-5683-6			
SS-203	Sample line Isolation	Cont. Bldg	See SC-204 etc. above
SS-204		Cont. Bldg.	
SS-205		Cont. Bldg.	

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Description and Tag #'s		Modification Required
Safety Injection System		
Solenoid Valve Operator on Valves:		
Target Rock Model 77L-002		
SI-659	Miniflow	Aux. Bldg. Refurbish all valves
SI-660	Isolation	Aux. Bldg.
Target Rock Model 77L-001		
SI-605	Sit Vent (Close)	Cont. Bldg. Refurbish all valves
SI-606		Cont. Bldg.
SI-607		Cont. Bldg.
SI-608		Cont. Bldg.
SI-613		Cont. Bldg.
SI-623		Cont. Bldg.
SI-633		Cont. Bldg.
SI-643		Cont. Bldg.

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Description and Tag #'s		Modification Required
Chemical and Volume Control		
Solenoid Valve Operator on Valves:		
Target Rock Model 77L-003		
CH-203	Isolate Aux.	Cont. Bldg. Refurbish Valves
CH-205	Spray	Cont. Bldg.

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Description and Tag #'s			Modification Required
Safety Injection System			
Limitorque Motor Operator SMB-1-60 on Valves:			
SI-614	SIT Isolation	Cont. Bldg	Replace Motors with motors in Qual. Program.
SI-624		Cont. Bldg.	
SI-634		Cont. Bldg.	
SI-644		Cont. Bldg.	
SI-683	Align LPSI SDC	Aux. Bldg.	Replace Limit switches, torque switches, terminal strips.
SI-692		Aux. Bldg.	
SI-686	Isolate CSS	Aux. Bldg.	
SI-696		Aux. Bldg.	
SMB-3-100 on Valves:			
SI-651	Isolate SCS	Cont. Bldg.	See SI-614 etc, above
SI-652		Cont. Bldg.	
SMB-1-40 on Valves:			
SI-653		Cont. Bldg.	
SI-654		Cont. Bldg.	
SMB-1-40 on Valves:			
SI-306	Isolate SDC	Aux. Bldg.	See SI-683 etc, above
SI-307		Aux. Bldg.	
SI-690	Throttle LPSI	Aux. Bldg.	
SI-691		Aux. Bldg.	
SI-655	Isolate SCS from RCS	Aux. Bldg.	
SI-656		Aux. Bldg.	

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Description and Tag #'s		Modification Required
SMC-04-5 on Valves:		
SI-664	CSP miniflow Isolation	Aux. Bldg. See SI-683 etc, above
SI-665		Aux. Bldg.
SI-668	LPSI miniflow Isolation	Aux. Bldg.
SI-669		Aux. Bldg.
SMC-04-7 on Valves:		
SI-616	HPSI Control	Aux. Bldg.
SI-617		Aux. Bldg.
SI-626		Aux. Bldg.
SI-627		Aux. Bldg.
SI-636		Aux. Bldg.
SI-637		Aux. Bldg.
SI-646		Aux. Bldg.
SI-647		Aux. Bldg.
SI-666	HPSIP miniflow Isolation	Aux. Bldg.
SI-667		Aux. Bldg.
SMB-0-10 on Valves:		
SI-698	Align HPSI	Aux. Bldg.
SI-699		Aux. Bldg.
SMB-00-10 on Valves:		
SI-604	Hot Leg Insrt	Aux. Bldg.
SI-609		Aux. Bldg.
SI-673	Isolate Cont Sump	Cont. Bldg. See SI-614 etc, above

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Description and Tag #'s			Modification Required
SI-675	Isolate Cont Sump	Cont. Bldg.	See SI-614 etc. above
SI-674		Aux. Bldg.	See SI-683 etc. above
SI-676		Aux. Bldg.	
SMB-000-5 on Valves:			
SI-657	Throttle Sdchx	Aux. Bldg.	
SI-658		Aux. Bldg.	
SI-678		Aux. Bldg.	
SI-679			
SMB-0-25 (DC) on Valves:			
SI-321	Throttle HPSI	Aux. Bldg.	Replace Reliance DC motors with peerless DC motors
SI-331		Aux. Bldg.	
SB-3-150 on Valves:			
SI-615	Control LPSI/SIS	Aux. Bldg.	See SI-683 etc above
SI-625		Aux. Bldg.	
SI-635		Aux. Bldg.	
SI-645		Aux. Bldg.	
SB-0-25 on Valves:			
SI-671	Throttle CSS	Aux. Bldg.	
SI-672		Aux. Bldg.	
SMB-0-25 on Valves:			
SI-685	Isolate CSS	Aux. Bldg.	
SI-694		Aux. Bldg.	
SI-684		Aux. Bldg.	

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Description and Tag #'s			Modification Required
SI-687	Isolate CSS	Aux. Bldg.	See SI-683 etc. above
SI-688	CSP Bypass	Aux. Bldg.	
SI-689	Isolate CSS	Aux. Bldg.	
SI-693	CSP Bypass	Aux. Bldg.	
SI-695	Isolate CSS	Aux. Bldg.	

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Description and Tag #'s		Modification Required
Chemical and Volume Control		
Limitorque Motor Operator SMB-00-15 on Valves:		
CH-255 (NOTE 5)	Aux. Bldg.	See SI-683 etc. above
CH-254 (NOTE 5)	Aux. Bldg.	
SB-1-60 on Valves:		
CH-530 RWT Isolation	Aux. Bldg.	
CH-531	Aux. Bldg.	
CH-524 Charging Line Isolation	Aux. Bldg.	

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Description and Tag #'s	Modification Required
Transmitter Racks	Provide qualified means of wire terminations.

