REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:8001180221 DOC.DATE: 80/01/14 NOTARIZED: NO DOCKET #
FACIL:50-275 Diablo Canyon Nuclear Power Plant, Unit 1, Pacific Ga 05000275
50-323 Diablo Canyon Nuclear Power Plant, Unit 2, Pacific Ga 05000323
AUTH.NAME AUTHOR AFFILIATION
CRANE,P.A. Pacific Gas & Electric Co.
RECIP.NAME RECIPIENT AFFILIATION
STOLZ,J.F. Light Water Reactors Branch 1

SUBJECT: Responds to NRC 791102 ltr re environ qualification of Class IE electrical equipment.Forwards tabulation of equipment located inside containment.Info re chemical makeup of qualified environ for Continental Cable will be supplied.

DISTRIBUTION CODE: B001B COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 7
TITLE: PSAR/FSAR AMDTS and Related Correspondence

NOTES: J. HANCHETT W/1 CY ALL MATL

	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL
ACTION:	05 PM.B. BUCKLEY	1	1	AD AD1 LWR	1	0
	BC LWR #1	1	0	LA LWR #1	1	0
INTERNAL:	01 REG FILE	1	1	02 NRC PDR	1	1
	06 I & E	2	2	08 OPERA LIC BR	1	1
	09 GEOSCIEN BR	4	4	10 QAB	1	1
	11 MECH ENG BR	1	1	12 STRUC ENG BR	1	1
	13 MATL ENG BR	2	2	15 REAC SYS BR	1	1
	16 ANALYSIS BR	1	1	17 CORE PERF BR	1	1
	18 AUX SYS BR	1	1	19 CONTAIN SYS	1	1
	20 I & C SYS BR	1	1	21 POWER SYS BR	1	1
	22 AD SITE TECH	1	0	26 ACCDNT ANLYS	1	1
	27 EFFL TRT SYS	1	1	28 RAD ASMT BR	1	1
	29 KIRKWOOD	1	1	AD FOR ENG	1	0
	AD PLANT SYS	1	0	AD REAC SAFETY	1	0
	AD SITE ANLYSIS	1	0	DIRECTOR NRR	1	0
	HYDRO-METEOR BR	2	2	MPA	1	0
	OELD	1	0			
EXTERNAL:	03 LPDR	1	1	04 NSIC	1	1
	30 ACRS	10	10			

LTR
MOORE
EPB#1
S. KIRSLIS
EPB#1

JAN 21 1980

MA 4

W

TOTAL NUMBER OF COPIES REQUIRED: LTTR ~~51~~ 57 ENCL ~~40~~ 41

PACIFIC GAS AND ELECTRIC COMPANY

PG&E

77 BEALE STREET, 31ST FLOOR • SAN FRANCISCO, CALIFORNIA 94106 • (415) 781-4211

MALCOLM H. FURBUSH
VICE PRESIDENT AND GENERAL COUNSEL

ROBERT OHLBACH
ASSOCIATE GENERAL COUNSEL

CHARLES T. VAN DEUSEN
PHILIP A. CRANE, JR.
HENRY J. LaPLANTE
JOHN B. GIBSON
ARTHUR L. HILLMAN, JR.
CHARLES W. THISSELL
DANIEL E. GIBSON
ASSISTANT GENERAL COUNSEL

GILBERT L. HARRICK
GLENN WEST, JR.
JOSEPH I. KELLY
HOWARD V. GOLUB
JAMES C. LOGSDON
ROBERT L. BORDON
PETER W. HANSCHEN
THEODORE L. LINDBERG, JR.
DOUGLAS A. OGLESBY
EDWARD J. McGANNEY
DAN GRAYSON LUBBOCK
JACK F. FALLIN, JR.
BERNARD J. DELLASANTA
JOSHUA BARLEY
JOSEPH B. ENGLERT, JR.
ROBERT L. HARRIS
RICHARD F. LOCKE
DAVID L. LUDVIGSON
SENIOR COUNSEL

J. PETER BAUMGARTNER
STEVEN P. BURKE
PAMELA CHAPPELLE
AUDREY DAINES
MICHAEL D. DESMARAIS
GARY P. ENCINAS
JOHN N. FRYE
PATRICK O. GOLDEN
KERMIT R. KUBITZ
MEREK E. LIPSON
JOHN R. LOW
RICHARD L. MEISS
ROGER J. PETERS
ROBERT R. RICKETT
SHIRLEY A. SANDERSON
JO ANN SHAFFER
LOUIS E. VINCENT
SHIRLEY A. WOO
KENNETH YANG
DIANA BERGHAUSEN
LEIGH B. CASSIDY
HEATHER B. CISSNA
BRIAN B. DENTON
WILLIAM H. EDWARDS
DONALD D. ERICKSON
DAVID C. GILBERT
JUAN M. JAYO
F. RONALD LAUPHEIMER
HARRY W. LONG, JR.
ROBERT B. McLENNAN
RICHARD H. MOSS
J. MICHAEL REIDENBACH
IVOR E. SAMSON
SUE ANN LEVIN SCHIFF
JACK W. SHUCK
DAVID J. WILLIAMSON
BRUCE R. WORTHINGTON
ATTORNEYS

January 14, 1980

Mr. John F. Stolz, Chief
Light Water Reactors Branch No. 1
Division of Project Management
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Re: Docket No. 50-275
Docket No. 50-323
Diablo Canyon Units 1 & 2

Dear Mr. Stolz:

In response to your letter of November 2, 1979 regarding Environmental Qualification of Class IE Electrical Equipment, attached is a tabulation of equipment located inside containment. Additional information as to the chemical makeup of the qualified environment for Continental Cable will be supplied when available from the manufacturer. Information concerning equipment located outside containment and aging investigations will be submitted in accordance with the schedule contained in our letter dated December 5, 1979.

Kindly acknowledge receipt of this material on the enclosed copy of this letter and return it to me in the enclosed addressed envelope.

Very truly yours,

Philip A. Crane, Jr.

Attachments (40)

B001
SE 1/1

8001180 221

A

CLASS IE EQUIPMENT INSIDE CONTAINMENT
WITH POTENTIAL FOR EXPOSURE TO SEVERE ENVIRONMENT

Equipment Function	Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment: Peak Temperature Pressure Humidity	Abnormal or Accident Environment: Chemistry Condition	Abnormal or Accident Environment: Integrated Dose Radiation Type	Qualified Environment: Peak Temperature Pressure Humidity	Qualified Environment: Chemistry Condition	Qualified Environment: Integrated Dose Radiation Type	Operability Requirements	Operability Demonstrated	Accuracy Requirements (% of span)	Accuracy Demonstrated (% of span)	Qualification Reference and Methods
1. P & Δ P Transmitters														
a) Pressurizer pressure	Containment El. 122'	Rosemount	1152	344°F 47 psig 100% RH	Boric acid N_AOH dissolved in Water 8.8 pH	$5.5x10^7$ Gamma	350°F 60 psig 0% RH 316°F 70 psig 100% RH Fig. 7&8	-	$5x10^6$ Gamma	Trip-5 min.	50 Hr. Post DBE	0.5%	0.5%	Rosemount Report 117415 (test)
b) Pressurizer level	Containment El. 96'	Barton	764 (Lot 1)	344°F 47 psig 100% RH	Boric acid N_AOH dissolved in water 8.8 pH	$5.5x10^7$ Gamma	LOCA 280°F 78 psia 100% RH Fig. 3-1 SLB 380°F 75 psig 100% RH Fig. 3-19 thru 3-22	1.14 wt. % Boric acid and 0.17 wt. % N_AOH dissolved in water	LOCA $5x10^7$ Gamma SLB $1.13 x 10^5$ Gamma	Trip 5 min. monitor 4 mo.	4 months Post-DBE	Trip +10% -∞ monitor ±25%	0 to 5 <5% max. error 5 min. to 4 mo. 17%	NS-TMA-1950 Anderson to Stolz NS-TMA-2120 Anderson to Stolz (Test)
c) Containment sump level	Containment El. 98'	Barton	764 (Lot 1)	344°F 47 psig 100% RH	Boric acid N_AOH dissolved in water 8.8 pH	$5.5x10^7$ Gamma	LOCA 280°F 78 psia 100% RH Fig. 3-1 SLB 380°F 75 psig 100% RH Fig. 3-19 Thru 3-22	1.14 wt. % Boric acid and 0.17 wt. % N_AOH dissolved in water	LOCA $5x10^7$ Gamma SLB $1.13 x 10^5$ Gamma	Trip 5 min. monitor 4 mo.	4 months Post-DBE	Trip +10% -∞ monitor ±25%	0 to 5 <5% max. error 5 min. to 4 mo. 17%	NS-TMA-1950 Anderson to Stolz NS-TMA-2120 Anderson to Stolz (Test)

CLASS IE EQUIPMENT INSIDE CONTAINMENT
WITH POTENTIAL FOR EXPOSURE TO SEVERE ENVIRONMENT

Equipment Function	Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment: Peak Temperature Pressure Humidity	Abnormal or Accident Environment: Chemistry Condition	Abnormal or Accident Environment: Integrated Dose Radiation Type	Qualified Environment: Peak Temperature Pressure Humidity	Qualified Environment: Chemistry Condition	Qualified Environment: Integrated Dose Radiation Type	Operability Requirements	Operability Demonstrated	Accuracy Requirements (% of span)	Accuracy Demonstrated (% of span)	Qualification Reference and Methods
d) RCS wide range pressure	Containment El. 96'	Barton	763 (Lot 1)	344°F 47 psig 100% RH	Boric acid N_AOH dissolved in water 8.8 pH	$5.5x10^7$ Gamma	LOCA 280°F 78 psia 100% RH Fig. 3-1 SLB 380°F 75 psig 100% RH Fig. 3-19 thru 3-22	1.14 wt. % Boric acid and 0.17 wt. % N_AOH dissolved in water	LOCA $5x10^7$ Gamma SLB $1.13 x 10^5$ Gamma	Trip 5 min. monitor 4 mo.	4 months Post-DBE	±10%	<±10%	NS-TMA-1950 Anderson to Stolz NS-TMA-2120 Anderson To Stolz (Test)
e) Steam Gen. level (narrow)	Containment El. 122	Barton	764 (Lot 1)	344°F 47 psig 100% RH	Boric acid N_AOH dissolved in water 8.8 pH	$5.5x10^7$ Gamma	LOCA 280°F 78 psia 100% RH Fig. 3-1 SLB 380°F 75 psig 100% RH Fig. 3-19 thru 3-22	1.14 wt. % Boric acid and 0.17 wt. % N_AOH dissolved in water	LOCA $5x10^7$ Gamma SLB $1.13 x 10^5$ Gamma	Trip 5 min. monitor 4 mo.	4 months Post-DBE	Trip +10% -∞ monitor ±25%	0 to 5 min. <5% Max. error 5 min. to 4 mo. 17%	NS-TMA-1950 Anderson to Stolz NS-TMA-2120 Anderson to Stolz (Test)
f) Steam flow	Containment El. 122	Rosemount	1152	344°F 47 psig 100% RH	Boric acid N_AOH dissolved in water 8.8 pH	$5.5x10^7$ Gamma	350°F 60 psig 0% RH 316°F 70 psig 100% RH Fig. 7&8	-	$5x10^6$ Gamma	Trip 5 min.	>50 hr. Post DBE	0.5%	0.5%	Rosemount Report 117415 (Test)
g) Containment pressure sensor	Containment El. 104-109	Barton	351	344°F 47 psig 100% RH	Boric acid N_AOH dissolved in water 8.8 pH	$5.5x10^7$ Gamma	>320°F Fig. 5-3 & 6.3 66 psig 100% RH	1.140 wt. % boric acid and 0.17 wt. % N_AOH dissolved in water	$1.8x10^7$ Gamma	Trip 5 min. monitor 4 mo.	4 months post DBE	1.5% trip 4% monitor	+.5% -2.06%	WCAP 9157 (Test)

CLASS IE EQUIPMENT INSIDE CONTAINMENT
WITH POTENTIAL FOR EXPOSURE TO SEVERE ENVIRONMENT

Equipment Function	Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment: Peak Temperature Pressure Humidity	Abnormal or Accident Environment: Chemistry Condition	Abnormal or Accident Environment: Integrated Dose Radiation Type	Qualified Environment: Peak Temperature Pressure Humidity	Qualified Environment: Chemistry Condition	Qualified Environment: Integrated Dose Radiation Type	Operability Requirements	Operability Demonstrated	Accuracy Requirements (% of span)	Accuracy Demonstrated (% of span)	Qualification Reference and Methods
2. Resistance temperature detector														
a) Reactor coolant system temp.	Containment El. 107-117	Sostman	11834 B-1	344°F 47 psig 100% RH	Boric acid N_AOH dissolved in water 8.8 pH	6.5×10^7 Gamma	>320 °F see Fig. 5-3 and 6.3 66 psig 100% RH	1.146 wt. % boric acid and 0.17 wt. % N_AOH dissolved in H_2O	1×10^8 Gamma	30 sec. Post-SLB	40 yr. life over 30 sec. Post-SLB	±.2%	±.2%	WCAP 9157 (Test)

CLASS IE EQUIPMENT INSIDE CONTAINMENT
WITH POTENTIAL FOR EXPOSURE TO SEVERE ENVIRONMENT

Equipment Function	Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment: Peak Temperature Pressure Humidity	Abnormal or Accident Environment: Chemistry Condition	Abnormal or Accident Environment: Integrated Dose Radiation Type	Qualified Environment: Peak Temperature Pressure Humidity	Qualified Environment: Chemistry Condition	Qualified Environment: Integrated Dose Radiation Type	Operability Requirements	Operability Demonstrated	Accuracy Requirements (% of span)	Accuracy Demonstrated (% of span)	Qualification Reference and Methods
Stem mounted limit switches	Various	NAMCO	EA 180	344°F 47 psig 100% RH	Boric acid N_AOH Dissolved in water 8.8 pH	6.5×10^7 Gamma	LOCA 340°F 70 psig	Boric acid N_AOH $N_{A2}S_2O_3$ Dissolved in water 10-11 pH	204×10^6 Gamma	Maintain open contact	Maintained open contact	N/A	N/A	Acme Cleveland Report - 3/3/78 (Test)
4. Solenoid valves														
a) Post accident solenoid valves	Various	ASCO	NP8321A5E	344°F 47 psig 100% RH	Boric acid N_AOH Dissolved in water 8.8 pH	5.5×10^7 Gamma	346°F 110 psig	3000 ppm Boric acid .064M $N_{A2}S_2O_3$ & N_AOH in water 9.5 - 10.5 pH	200×10^6	Operate	Operated	N/A	N/A	Asco Test Report AQS21678/TR Rev.A (Test)
b) Containment isolation solenoid valves	Various	ASCO	8300 8302 8316* 8321*	344°F 47 psig 100% RH	Boric acid N_AOH Dissolved in water 8.8 pH	5.5×10^7 Gamma	-	-	-	Fail properly	Failed properly	N/A	N/A	NS-CE-755 C. Eicheldinger to D. B. Vassallo (Analysis)
5. Valve motor operators	Various	Limitorque	SMB-0,00,000	344°F 47 psig 100% RH	Boric acid N_AOH Dissolved in water 8.8 pH	5.5×10^7 Gamma	340°F 78 psi 100% RH	Boric acid $N_{a2}S_2O_3$ Dissolved in water 10.5 pH	2.04×10^8 Gamma	Operate	Operated	N/A	N/A	Limitorque Test Reports #600456 & #600376 (Test)

*Special valves with all plastic parts replaced with stainless steel or brass parts to withstand higher temperatures.

CLASS IE EQUIPMENT INSIDE CONTAINMENT
WITH POTENTIAL FOR EXPOSURE TO SEVERE ENVIRONMENT

				Abnormal or Accident Environment			Qualified Environment							
Equipment Function	Location	Manufacturer	Model No. or Identification No.	Peak Temperature Pressure Humidity	Chemistry Condition	Integrated Dose Radiation Type	Peak Temperature Pressure Humidity	Chemistry Condition	Integrated Dose Radiation Type	Operability Requirements	Operability Demonstrated	Accuracy Requirements (% of span)	Accuracy Demonstrated (% of span)	Qualification Reference and Methods
6. Containment fan cooler motors	Containment El. 140	Westinghouse	300/100 h.p.	344°F 47 psig 100% RH	Boric acid N_AOH dissolved in water 8.8 pH	$5.5x10^7$ Gamma	324°F 80 psig 100% RH	Boric acid & N_aOH 9.5 pH	$2x10^8$ Gamma	1 yr. post -DBA	Per IEEE 324 thermally aged to simulate end of life conditions (40 yr. life)	N/A	N/A	WCAP 7829 letters PGandE to NRC 1-19-78 and 2-10-78 (Test)
7. Electrical penetrations	Contain- El. 120-135	General Electric	NS02/03/04	344°F 47 psig 100% RH	Boric acid N_AOH dissolved in water 8.8 pH	$5.5x10^7$ Gamma	340°F 103 psig 100%	N_AOH/ H_3BO_3 pH > 10	$5x10^7$ Gamma	N/A	N/A	N/A	N/A	G.E. Series 100 Test Report Letter- G.E. to Allison NRC - 11/6/78
8. Electrical cables	Various	Continental	Silicon/ Silicon	344°F 47 psig 100% RH	Boric acid N_AOH dissolved in water 8.8 pH	$5.5x10^7$ Gamma		PENDING		N/A	N/A	N/A	N/A	
		Boston	Silicon/ Hypalon	344°F 47 psig 100% RH	Boric acid N_AOH dissolved in water 8.8 pH	$5.5x10^7$ Gamma	340°F 70 psig 100%	N_AOH/ H_3BO_3 pH > 9	$1.8x10^8$ Gamma	N/A	N/A	N/A	N/A	Boston I.W. Test Report 9273 (Test)

CLASS IE EQUIPMENT INSIDE CONTAINMENT
WITH POTENTIAL FOR EXPOSURE TO SEVERE ENVIRONMENT

Equipment Function	Location	Manufacturer	Model No. or Identification No.	Abnormal or Accident Environment: Peak Temperature Pressure Humidity	Abnormal or Accident Environment: Chemistry Condition	Abnormal or Accident Environment: Integrated Dose Radiation Type	Qualified Environment: Peak Temperature Pressure Humidity	Qualified Environment: Chemistry Condition	Qualified Environment: Integrated Dose Radiation Type	Operability Requirements	Operability Demonstrated	Accuracy Requirements (% of span)	Accuracy Demonstrated (% of span)	Qualification Reference and Methods
		Raychem	Stilan	344°F 47 psig 100% RH	Boric acid N_AOH dissolved in water 8.8 pH	$5.5x10^7$ Gamma	357° 70 psig 100%	N_AOH H_3BO_3 pH 9.5<11	$2x10^8$ Gamma	N/A	N/A	N/A	N/A	Franklin Inst. Test Report F-C4033-2 Jan. 1975 (Test)
		Okonite	Tefzel	344°F 47 psig 100 RH	Boric acid N_AOH dissolved in water 8.8 pH	$5.5x10^7$ Gamma	346°F 113 psig 100%	N_AOH H_3BO_3 pH > 10	$2x10^8$ Gamma	N/A	N/A	N/A	N/A	Dupont Test Report IEEE 383-1974 (Test)
		Boston	Silicon glass braid/ Kapton/ Hypalon	344°F 47 psig 100% RH	Boric acid N_AOH dissolved in water 8.8 pH	$5.5x10^7$ Gamma	392°F 50 psig 100%	N_aOH H_3BO_3 pH > 9	$1.8x10^8$ Gamma	N/A	N/A	N/A	N/A	PGandE Engr'g Research Test Report and Boston I.W. Test Rep. 9273 (Test)
9. Electrical Terminations		Raychem	Sealed splice	344°F 47 psig 100% RH	Boric acid N_AOH dissolved in water 8.8 pH	$5.5x10^7$ Gamma	357°F 70 psig 100%	N_AOH. H_3BO_3 pH 9.5< 11	$2x10^8$ Gamma	N/A	N/A	N/A	N/A	Franklin Instit. Report F-C4033-3 (1-75) (Test)

MEETING SUMMARY DISTRIBUTION
LWR-1

Docket File 50-275 JAN 11 1980
NRC PDR
Local PDR
TIC
NRR Reading
LWR 1 File
H. Denton
E. G. Case
H. Berkow
D. Ross
D. Vassallo
J. Stolz
R. Baer
O. Parr
L. Rubenstein
S. Varga
C. Heltemes
L. Crocker
B. Kirschner
F. Williams
R. Mattson
R. DeYoung
Project Manager
Attorney, ELD
E. Hylton
IE (3)
ACRS (16)
R. Denise
R. Birkel
B. Buckley
A. Dromerick
L. Kintner
H. Rood
H. Silver
C. Stahle
D. Tibbitts
J. Lee
M. Rushbrook
M. Service

NRC Participants
Appropriate IE Regional Offices
L. Soffer
P. Stoddart
A. S. Hintze
J. Buchanan
S. N. Hou
V. Benaroya
IE Region I IE Region V
IE Region II
IE Region III
IE Region IV
Caseload Forecast Panel Meetings Only

J. Rothfleisch
T. Abell
G. Matthews
W. Lovelace
S. Boyd
H. Berkow
L. Schaub
Trip Participants