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 PACIFIC: 50-275 Diablo Canyon Nuclear Power Plant, Unit 1, Pacific Gas      05000275  
 50-323 Diablo Canyon Nuclear Power Plant, Unit 2, Pacific Gas      05000323  
 AUTH. NAME      AUTHOR AFFILIATION  
 CRANE, P. A.      Pacific Gas & Electric Co.  
 RECIPIENT 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.

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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*

Attachments (40)

*Boo!  
SE 1/1*

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8001180 2-21



1944

1. The first part of the report deals with the general situation of the country and the progress of the war. It is a very interesting and informative account of the events of the year.

2. The second part of the report deals with the economic situation of the country. It is a very detailed and thorough analysis of the economic conditions and the measures taken to improve them.

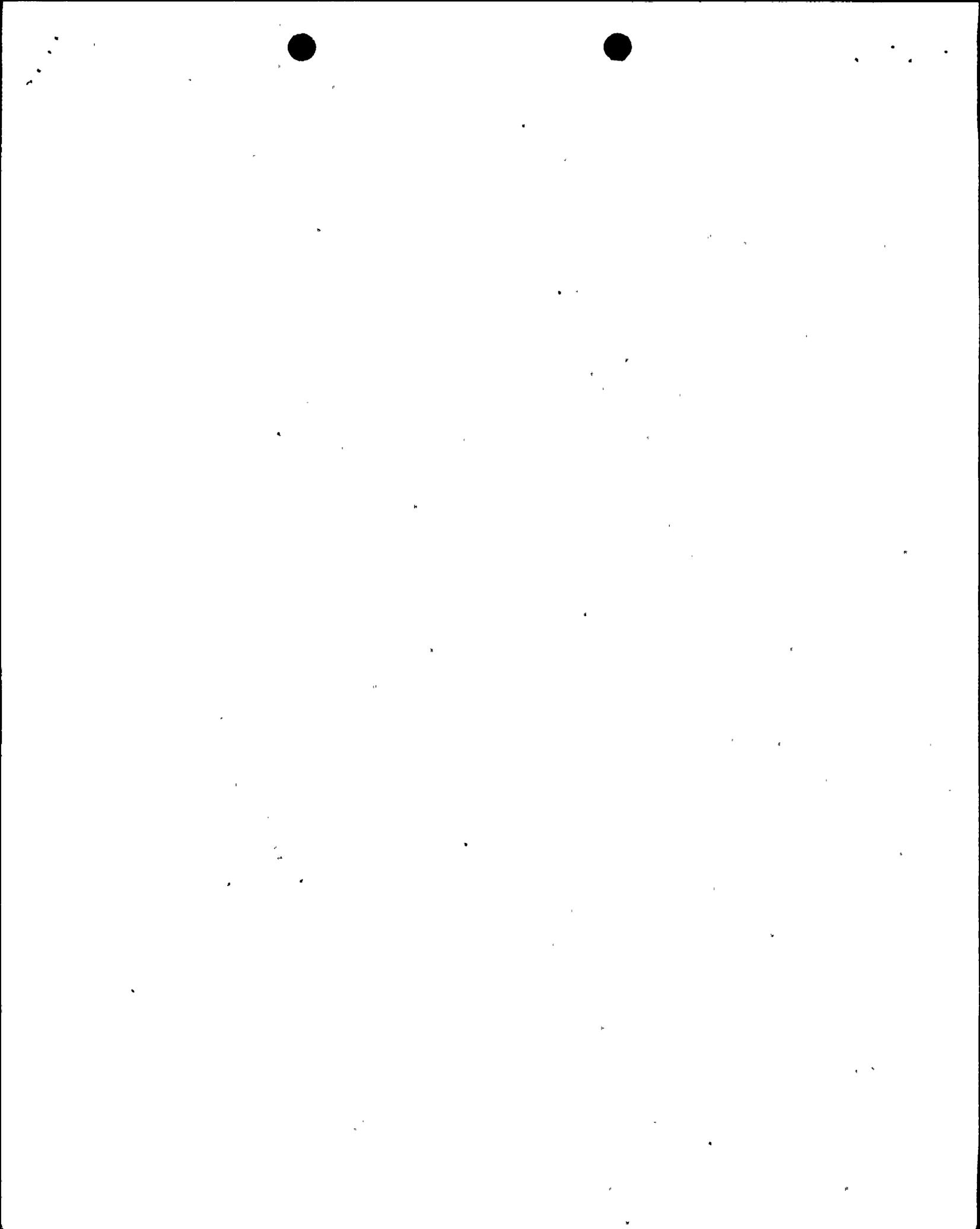
3. The third part of the report deals with the social situation of the country. It is a very comprehensive and up-to-date survey of the social conditions and the efforts to improve them.

4. The fourth part of the report deals with the cultural situation of the country. It is a very interesting and detailed account of the cultural life and the efforts to improve it.

5. The fifth part of the report deals with the political situation of the country. It is a very thorough and up-to-date survey of the political conditions and the efforts to improve them.

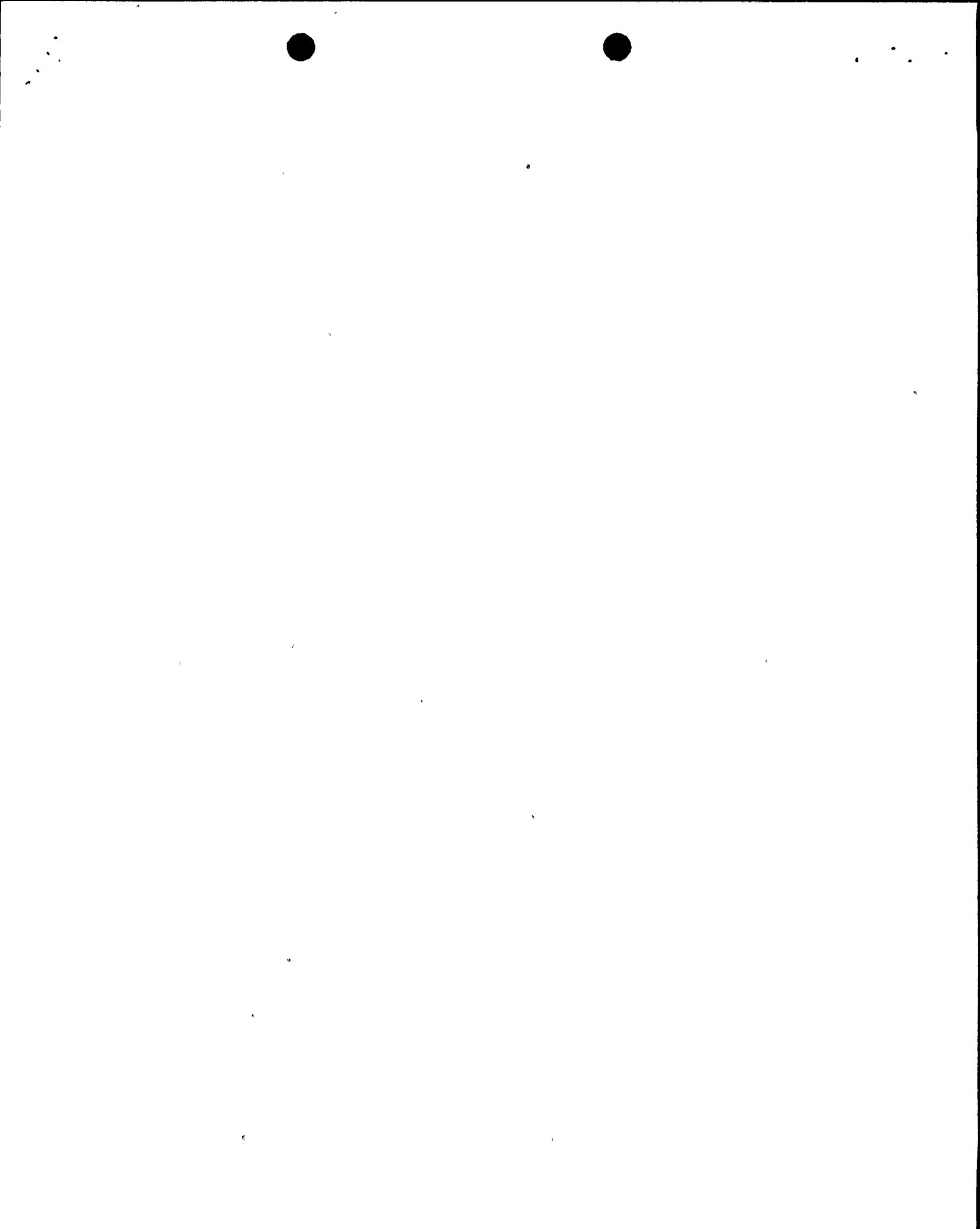
CLASS IE EQUIPMENT INSIDE CONTAINMENT  
WITH POTENTIAL FOR EXPOSURE TO SEVERE ENVIRONMENT

Equip- ment Function	Location	Manufac- turer	Model No. or Identifi- cation No.	Abnormal or Accident Environment			Qualified Environment			Oper- ability Require- ments	Oper- ability Demon- strated	Accur- acy Require- ments (% of span)	Accur- acy Demon- strated (% of span)	Qualifi- cation Refer- ence and Methods
				Peak Temper- ature Pres- sure Humid- idity	Chemis- try Condi- tion	Inter- grated Dose Radia- tion Type	Peak Temper- ature Pres- sure Humid- idity	Chemis- try Condi- tion	Inter- grated Dose Radia- tion Type					
1. P & Δ P Transmitters														
a) Pres- surizer pres- sure	Contain- ment El. 122'	Rosemount	1152	344°F 47 psig 100% RH	Boric acid NaOH dis- solved in Water 8.8 pH	5.5x10 <sup>7</sup> Gamma	350°F 60 psig 0% RH 316°F 70 psig 100% RH Fig. 7&8	-	5x10 <sup>6</sup> Gamma	Trip-5 min.	50 Hr. Post DBE	0.5%	0.5%	Rosemount Report 117415 (test)
b) Pres- surizer level	Contain- ment El. 96'	Barton	764 (Lot 1)	344°F 47 psig 100% RH	Boric acid NaOH dis- solved in water 8.8 pH	5.5x10 <sup>7</sup> 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. % NaOH dis- solved in water	LOCA 5x10 <sup>7</sup> Gamma SLB 1.13 x 10 <sup>5</sup> 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) Con- tain- ment sump level	Contain- ment El. 98'	Barton	764 (Lot 1)	344°F 47 psig 100% RH	Boric acid NaOH dis- solved in water 8.8 pH	5.5x10 <sup>7</sup> 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. % NaOH dis- solved in water	LOCA 5x10 <sup>7</sup> Gamma SLB 1.13 x 10 <sup>5</sup> Gamma	Trip 5 min. monitor 4 mo.	4 months Post- DBE	Trip +10% -∞ moni- tor ±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

Equip- ment Function	Location	Manufac- turer	Model No. or Identi- fication No.	Abnormal or Accident Environment			Qualified Environment			Oper- ability Require- ments	Oper- ability Demon- strated	Accur- acy Require- ments (% of span)	Accur- acy Demon- strated (% of span)	Qualifi- cation Refer- ence and Methods
				Peak Temper- ature Pres- sure Humid- idity	Chemis- try Condi- tion	Inter- grated Dose Radia- tion Type	Peak Temper- ature Pres- sure Humid- idity	Chemis- try Condi- tion	Inter- grated Dose Radia- tion Type					
d) RCS wide range pres- sure	Contain- ment El. 96'	Barton	763 (Lot 1)	344°F 47 psig 100% RH	Boric acid N <sub>2</sub> OH dis- solved in water 8.8 pH	5.5x10 <sup>7</sup> 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 <sub>2</sub> OH dis- solved in water	LOCA 5x10 <sup>7</sup> Gamma SLB 1.13 x 10 <sup>5</sup> 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 (nar- row)	Contain- ment El. 122	Barton	764 (Lot 1)	344°F 47 psig 100% RH	Boric acid N <sub>2</sub> OH dis- solved in water 8.8 pH	5.5x10 <sup>7</sup> 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 <sub>2</sub> OH dis- solved in water	LOCA 5x10 <sup>7</sup> Gamma SLB 1.13 x 10 <sup>5</sup> 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	Contain- ment El. 122	Rosemount	1152	344°F 47 psig 100% RH	Boric acid N <sub>2</sub> OH dis- solved in water 8.8 pH	5.5x10 <sup>7</sup> Gamma	350°F 60 psig 0% RH 316°F 70 psig 100% RH Fig. 7&8	-	5x10 <sup>6</sup> Gamma	Trip 5 min.	>50 hr. Post DBE	0.5%	0.5%	Rosemount Report 117415 (Test)
g) Con- tain- ment pres- sure sen- sor	Contain- ment El. 104- 109	Barton	351	344°F 47 psig 100% RH	Boric acid N <sub>2</sub> OH dis- solved in water 8.8 pH	5.5x10 <sup>7</sup> Gamma	>320°F Fig. 5-3 & 6.3 66 psig 100% RH	1.140 wt. % boric acid and 0.17 wt. % N <sub>2</sub> OH dis- solved in water	1.8x10 <sup>7</sup> Gamma	Trip 5 min. monitor 4 mo.	4 months post DBE	1.5% trip 4% moni- tor	+5% -2.06%	WCAP 9157 (Test)



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

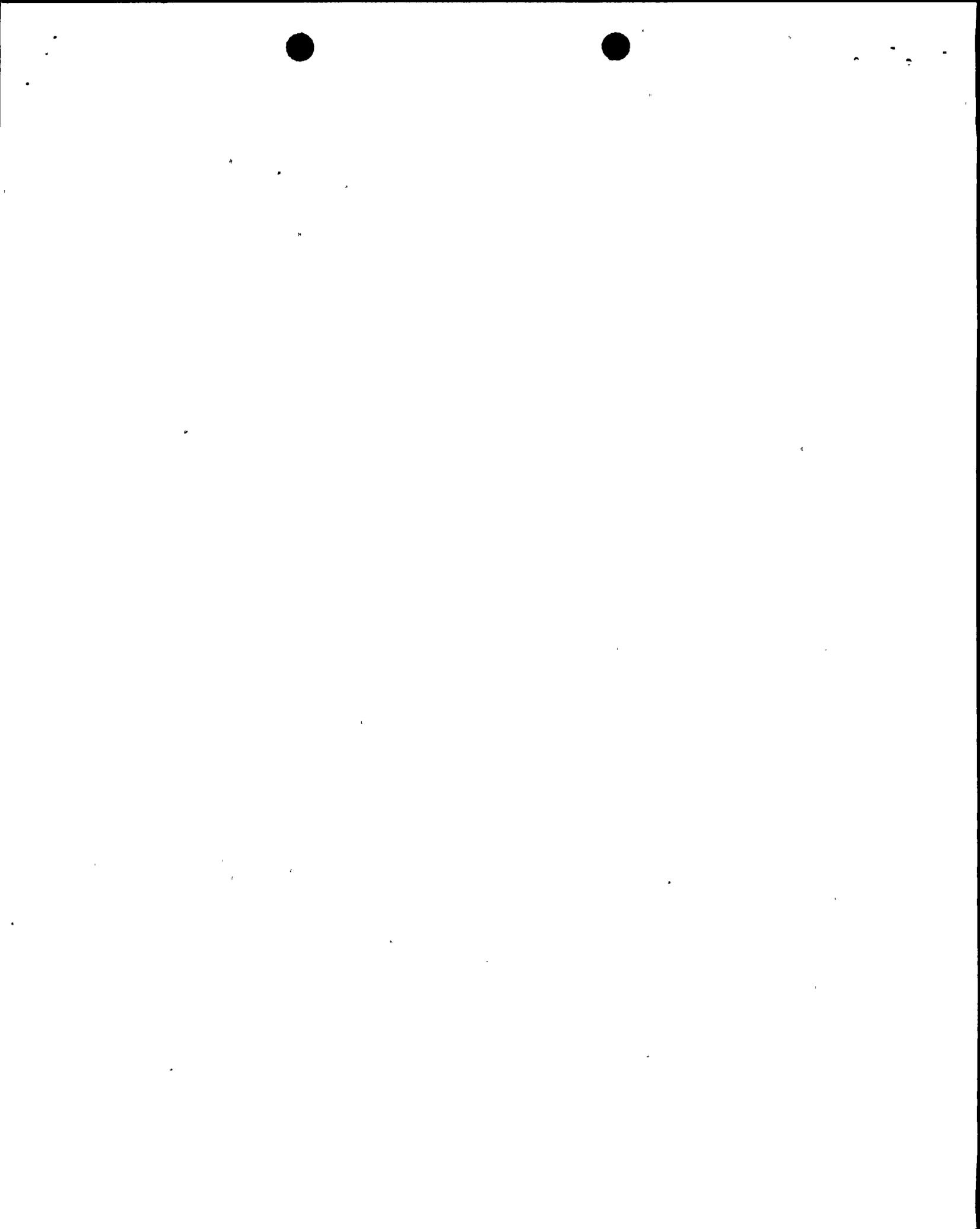
Equip- ment Function	Location	Manufac- turer	Model No. or Identi- fication No.	Abnormal or Accident Environment			Qualified Environment			Oper- ability Require- ments	Oper- ability Demon- strated	Accur- acy Require- ments (% of span)	Accur- acy Demon- strated (% of span)	Qualifi- cation Refer- ence and Methods
				Peak Temper- ature Pres- sure Humid- idity	Chemis- try Condi- tion	Inter- grated Dose Radia- tion Type	Peak Temper- ature Pres- sure Humid- idity	Chemis- try Condi- tion	Inter- grated Dose Radia- tion Type					
2. Resis- tance temp- erature detec- tor														
a) Reac- tor cool- ant system temp.	Contain- ment El. 107- 117	Sostman	11834 B-1	344°F 47 psig 100% RH	Boric acid NaOH dis- solved in water 8.8 pH	6.5x10 <sup>7</sup> Gamma	>320 °F see Fig. 5-3 and 6.3 66 psig 100% RH	1.146 wt. % boric acid and 0.17 wt. % NaOH dis- solved in H <sub>2</sub> O	1x10 <sup>8</sup> Gamma	30 sec. Post- SLB	40 yr. life over 30 sec. Post- SLB	±.2%	±.2%	WCAP 9157 (Test)



CLASS I E EQUIPMENT INSIDE CONTAINMENT  
WITH POTENTIAL FOR EXPOSURE TO SEVERE ENVIRONMENT

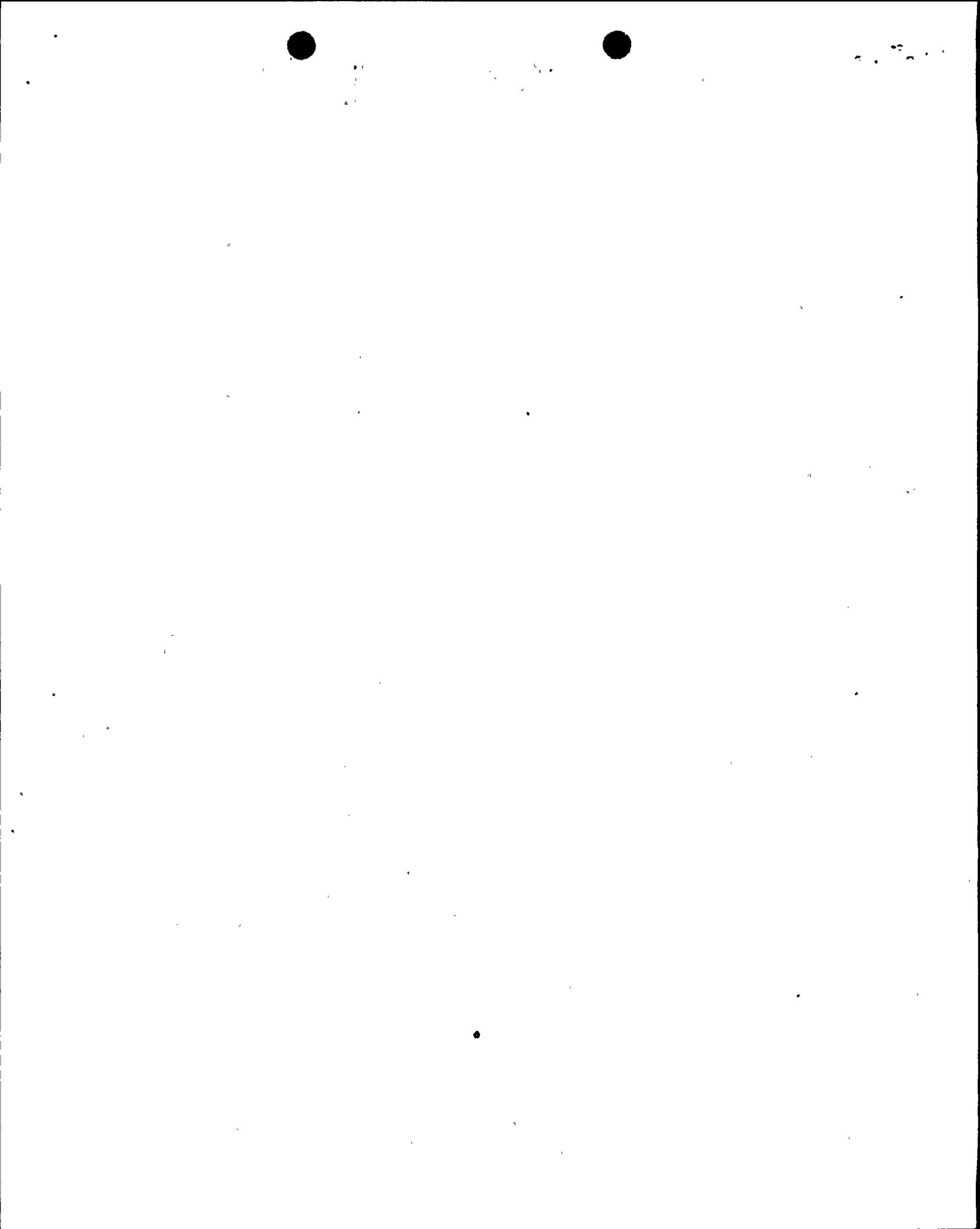
Equip- ment Function	Location	Manufac- turer	Model No. or Identi- fication No.	Abnormal or Accident Environment			Qualified Environment			Oper- ability Require- ments	Oper- ability Demon- strated	Accur- acy Require- ments (% of span)	Accur- acy Demon- strated (% of span)	Qualifi- cation Refer- ence and Methods
				Peak Temper- ature Pres- sure Humid- idity	Chemis- try Condi- tion	Inter- grated Dose Radia- tion Type	Peak Temper- ature Pres- sure Humid- idity	Chemis- try Condi- tion	Inte- grated Dose Radia- tion Type					
System mounted limit switches	Various	NAMCO	EA 180	344°F 47 psig 100% RH	Boric acid NaOH Dis- solved in water 8.8 pH	6.5x10 <sup>7</sup> Gamma	LOCA 340°F 70 psig	Boric acid NaOH Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> Dis- solved in water 10-11 pH	204x10 <sup>6</sup> Gamma	Maintain open contact	Main- tained open contact	N/A	N/A	Acme Cleveland Report - 3/3/78 (Test)
4. Solenoid valves														
a) Post acci- dent sole- noid valves	Various	ASCO	NP8321A5E	344°F 47 psig 100% RH	Boric acid NaOH Dis- solved in water 8.8 pH	5.5x10 <sup>7</sup> Gamma	346°F 110 psig	3000 ppm Boric acid .064M Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> & NaOH in water 9.5 - 10.5 pH	200x10 <sup>6</sup>	Operate	Operated	N/A	N/A	Asco Test Report AQS21678/TR Rev. A (Test)
b) Contain ment iso- lation solenoid valves .	Various	ASCO	8300 8302 8316* 8321*	344°F 47 psig 100% RH	Boric acid NaOH Dis- solved in water 8.8 pH	5.5x10 <sup>7</sup> Gamma	-	-	-	Fail properly	Failed properly	N/A	N/A	NS-CE-755 C. Eicheldinger to D. B. Vassallo (Analysis)
5. Valve motor oper- ators	Various	Limitorque	SMB- 0,00,000	344°F 47 psig 100% RH	Boric acid NaOH Dis- solved in water 8.8 pH	5.5x10 <sup>7</sup> Gamma	340°F 78 psi 100% RH	Boric acid Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> Dis- solved in water 10.5 pH	2.04x10 <sup>8</sup> 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.



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Equip- ment Function	Location	Manufac- turer	Model No. or Identi- fication No.	Abnormal or Accident Environment			Qualified Environment			Oper- ability Require- ments	Oper- ability Demon- strated	Accur- acy Require- ments (% of span)	Accur- acy Demon- strated (% of span)	Qualifi- cation Refer- ence and Methods
				Peak Temper- ature Pres- sure Humid- idity	Chemis- try Condi- tion	Inter- grated Dose Radia- tion Type	Peak Temper- ature Pres- sure Humid- idity	Chemis- try Condi- tion	Inter- grated Dose Radia- tion Type					
6. Contain- ment fan cooler motors	Contain- ment El. 140	Westing- house	300/100 h.p.	344°F. 47 psig 100% RH	Boric acid NaOH dis- solved in water 8.8 pH	5.5x10 <sup>7</sup> Gamma	324°F 80 psig 100% RH	Boric acid & NaOH 9.5 pH	2x10 <sup>8</sup> 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. Elec- trical pene- trations	Contain- ment El. 120-135	General Electric	NS02/03/ 04	344°F 47 psig 100% RH	Boric acid NaOH dis- solved in water 8.8 pH	5.5x10 <sup>7</sup> Gamma	340°F 103 psig 100%	NaOH/ H <sub>3</sub> BO <sub>3</sub> pH > 10	5x10 <sup>7</sup> 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. Elec- trical cables	Various	Continen- tal	Silicon/ Silicon	344°F 47 psig 100% RH	Boric acid NaOH dis- solved in water 8.8 pH	5.5x10 <sup>7</sup> Gamma	PENDING			N/A	N/A	N/A	N/A	
		Boston	Silicon/ Hypalon	344°F 47 psig 100% RH	Boric acid NaOH dis- solved in water 8.8 pH	5.5x10 <sup>7</sup> Gamma	340°F 70 psig 100%	NaOH/ H <sub>3</sub> BO <sub>3</sub> pH > 9	1.8x10 <sup>8</sup> 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

Equip- ment Function	Location	Manufac- turer	Model No. or Identi- fication No.	Abnormal or Accident Environment			Qualified Environment			Oper- ability Require- ments	Oper- ability Demon- strated	Accur- acy Require- ments (% of span)	Accur- acy Demon- strated (% of span)	Qualifi- cation Refer- ence and Methods
				Peak Temper- ature Pres- sure Humid- idity	Chemis- try Condi- tion	Inter- grated Dose Radia- tion Type	Peak Temper- ature Pres- sure Humid- idity	Chemis- try Condi- tion	Inter- grated Dose Radia- tion Type					
		Raychem	Stilan	344°F 47 psig 100% RH	Boric acid N <sub>A</sub> OH dis- solved in water 8.8 pH	5.5x10 <sup>7</sup> Gamma	357° 70 psig 100%	N <sub>A</sub> OH H <sub>3</sub> BO <sub>3</sub> pH 9.5<11	2x10 <sup>8</sup> 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 <sub>A</sub> OH dis- solved in water 8.8 pH	5.5x10 <sup>7</sup> Gamma	346°F 113 psig 100%	NAOH H <sub>3</sub> BO <sub>3</sub> pH > 10	2x10 <sup>8</sup> 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 <sub>A</sub> OH dis- solved in water 8.8 pH	5.5x10 <sup>7</sup> Gamma	392°F 50 psig 100%	N <sub>A</sub> OH H <sub>3</sub> BO <sub>3</sub> pH > 9	1.8x10 <sup>8</sup> Gamma	N/A	N/A	N/A	N/A	PGandE Engr'g Research Test Report and Boston I.W. Test Rep. 9273 (Test)
9. Elect- rical Termi- nations		Raychem	Sealed splice	344°F 47 psig 100% RH	Boric acid N <sub>A</sub> OH dis- solved in water 8.8 pH	5.5x10 <sup>7</sup> Gamma	357°F 70 psig 100%	N <sub>A</sub> OH. H <sub>3</sub> BO <sub>3</sub> pH 9.5 < 11	2x10 <sup>8</sup> Gamma	N/A	N/A	N/A	N/A	Franklin Instit. Report F-C4033-3 (1-75) (Test)



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MEETING SUMMARY DISTRIBUTION

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Docket File 50-275- JAN 11 1980

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