CEOG COMBUSTION ENGINEERING OWNERS GROUP

ABB Inc.	Baltimore Gas & Electric Calvert Cliffs 1, 2	Entergy Operations, Inc. ANO 2 WSES Unit 3	Korea Electric Power Corp. YGN 3, 4 Ulchin 3, 4	Omaha Public Power District Ft. Calhoun
Arizona Public Service Co. Palo Verde 1, 2, 3	Consumers Energy Co. Palisades	Florida Power & Light Co. St. Lucie 1, 2	Northeast Utilities Service Co. Millstone 2	Southern California Edison SONGS 2, 3

NRC CEOG Project Number 692

April 7, 2000
CEOG-00-096

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Subject: NRC Review of Topical Report CE NPSD-1167

Reference: J. S. Cushing (NRC) to R. L. Phelps (CEOG), "Request for Additional Information regarding CE NPSD-1167, 'Elimination of Pressure Sensor Response Time Testing Requirements, Rev 01', (TAC No. MA6010)," dated March 30, 2000.

The Combustion Engineering Owners Group submitted Topical Report CE NPSD-1167, Rev 01 for staff review in September 1999. To complete the topical report review, additional information was requested, Reference above, on the historical calibration data of certain transmitters with variable damping installed at the St. Lucie nuclear power plant.

Requested information on the measured response times for the St. Lucie Unit 1 RCS flow transmitters is summarized in the attached table. Details of the measured data (reproduced from microfiche) are shown on the accompanying data sheets; also attached is the procedure used by FP&L to record response time results for these circuit elements.

If you have any questions, please contact me.

Very truly yours,

R J Phelps

Ralph Phelps, Chairman
CE Owners Group

cc w/attach: J. S. Cushing (NRC)
P. J. Loeser (NRC)
D. W. McQuade (ABB)

cc w/o: S. W. Lurie (ABB)
G. C. Bischoff (ABB)
I. C. Rickard, (ABB)
CEOG Members

D047

Florida Power & Light - St. Lucie Unit 1 RCS Flow transmitter data.

The following table summarizes the response time data for the St. Lucie Unit 1 RCS flow transmitters. This data is a measure of the response time of the RCS flow instrumentation from the input of the flow transmitter to the output of the RPS trip bistable. As this data includes the response time for the signal processing card and the RPS bistable as well as the flow transmitter, it is judged to be conservative when considering an allocated value for the flow transmitter.

Measured Response Time, milliseconds									
Channel	A	A	A	A	B	B	C	D	D
Date	1990	1991	1995	1997	1990	1993	1990	1990	1993
RCS Flow 1	334	220	210	276	138	202	380	206	198
RCS Flow 2	156	222	---	246	246	206	248	156	---
Matrix	44	42	42	---	44	42	44	44	42

Data sheets for these flow transmitters are attached. For all the data with the exception of the data for channel A taken in 1997, the response time recorded on the data sheet is the sum of the response time from the input of the transmitter to the output of the RPS trip bistable and the response time of the RPS Matrix. FP&L measures the RPS Matrix response times separately and all six combinations are recorded on the data sheet. The response time from the transmitter input to the output of the RPS trip bistable is then measured. The response time recorded on the data sheet is the sum of the longest matrix response time recorded and the response time from the transmitter input to the RPS bistable output. The data in the table above reflects the subtraction of the matrix response time from the recorded data. A copy of the St. Lucie Unit 1 I&C procedure for performing response time testing is also attached.

Prior to 1990, St. Lucie Unit 1 utilized RCS flow loop transmitters from a different manufacturer. The above data reflects the currently-installed Rosemount Model 1154HH6RAN0037 transmitters.

NUCLEAR PLANT WORK ORDER

Plant: PBL | Unit: 01

Component Tag Number: ZC 1-1600009

Job Started / Date: 3-21-90

Describe the trouble found and your analysis of the cause or reason:

Scheduled outage surveillance requirement

Describe work/repair as performed: NOTIFIED ... COMPLETED ... PROCEDURE ... TESTING PROCEDURE TO BE REVISED ... 3-23-90 PERFORMED SECT. 9.9 (Steps 1-7) ... Tested response time on PDT 1121B ... and PDT 1111B ... 3-27-90 PERFORMED TIME RESPONSE ON LT-9073 D ... SECT. 9.6 ... 1-6 ... Completed all of remaining sections of ... procedure. All sections completed and SAT

Replacement Component Tag #: N/A

Manufacturer: N/A

Serial No. of Installed Equipment:

Serial No. of Removed Equipment:

Model / Part No.:

Suggestions or recommendations ... for future planning ... : ... drawing is confusing ... will be ... to show exact ...

[illegible]

1-2

APPENDIX A

2.0 NPWO WORK DETAIL SHEET (continued)

Nuclear Plant Work Order Journeyman's Work Report Work Detail Continuation Sheet	Plant PSL	Unit	NPWO/JO Spec ER	Work Request No. XA
		01	8029/61	900113092106

Section Continued: ☐ Investigation Results ☐ Detailed Instructions ☒ Work Performed Page Continued 2

PDT-1111, A, B, C and PDT-1121, A, B, C, D newly installed on PWO 6794/61. This procedure performed on these as post-maintenance testing requirements.
ALSO PT-07-2C was replaced and was time responsed on this PWO. See PWO # 6248/61 for replacement details.
PT-07-2D replaced on PWO 6249/61 and time responsed on this PWO.

☐ Continued

4-11

1

ST. LUCIE UNIT 1
I & C PROCEDURE NO. 1-1400053, REVISION 0
REACTOR PROTECTIVE AND ENGINEERING SAFEGUARDS SYSTEM TESTING

DATA SHEET

Unit # 1 Channel D

Procedure Step	Function	RPS Acceptable Times	Actual Time RPS	ESG	SEC.
9.1.3	AB Matrix	—	.042	N/A	sec.
9.1.6	AC Matrix	—	.042	N/A	sec.
9.1.9	AD Matrix	—	.042	N/A	sec.
9.1.13	BC Matrix	—	.042	N/A	sec.
9.1.16	BD Matrix	—	.044	N/A	sec.
9.1.20	CD Matrix	—	.040	N/A	sec.
9.2.10	P-1102 HI PZR Press	.90	.482	N/A	sec.
9.3.5	P-07-2 HI Cont Press	1.40	.454	CIS=.376 SIAS=.360 CSAS=.216 ← (9.3.12)	sec.
9.4.8	P-8013 Lo SG Press Asym S.G. Trip	.9	.530	MSIS = .462	sec.
		.9	.694	N/A	sec.
9.4.19	P-8023 Lo SG Press Asym S.G. Trip	.9	.382	MSIS = .264	sec.
X		.9	.546	N/A	sec.
9.5.4	L-9013 Lo S.G. Lvl	.9	.638	N/A	sec.
X 9.5.10	L-9023 Lo S.G. Lvl	.9	.830	N/A	sec.
9.6.5	P-1111 Lo Flow	.65	.250	N/A	sec.
9.6.12	P-1121 Lo Flow	.65	.200	N/A	sec.
9.7.7	P-1102 TM/LP & ESG Lo Pzr. Press	.9	.404	SIAS .196 CIS .214	sec.
9.8.7	N.I. LPD	.4	.072	N/A	sec.
9.8.7	N.I. HI Power	.4	.148	N/A	sec.
9.8.7	N.I. TM/LP	.9	.158	N/A	sec.
9.9.8	T-1112C HI Power	.4	.150	N/A	sec.
	TM/LP	.9	.168	N/A	sec.
9.9.11	T-1122C HI Power	.4	.154	N/A	sec.
	TM/LP	.9	.172	N/A	sec.
9.9.14	T-1112H HI Power	.4	.140	N/A	sec.
	TM/LP	.9	.162	N/A	sec.
9.9.17	T-1122H Hr Pwr	.4	.148	N/A	sec.
	TM/LP	.9	.166	N/A	sec.
9.10.5	LT-07-2	1	N/A	.770 ~~N/A~~	sec.

CDW 4-12-93

4-5

1

ST. LUCIE UNIT 1
I & C PROCEDURE NO. 1-1400053, REVISION 0
REACTOR PROTECTIVE AND ENGINEERING SAFEGUARDS SYSTEM TESTING

DATA SHEET

Unit # 1 Channel A

Procedure Step	Function	RPS Acceptable Times	Actual Time		
			RPS	ESG	SEC.
9.1.3	AB Matrix	—	.042	N/A	sec.
9.1.6	AC Matrix	—	.042	N/A	sec.
9.1.9	AD Matrix	—	.042	N/A	sec.
9.1.13	BC Matrix	—	.042	N/A	sec.
9.1.16	BD Matrix	—	.044	N/A	sec.
9.1.20	CD Matrix	—	.040	N/A	sec.
9.2.10	P-1102 HI PZR Press	.90		N/A	sec.
9.3.5	P-07-2 HI Cont Press	1.40			sec.
9.4.8	P-8013 Lo SG Press	.9			sec.
	Asym S.G. Trip	.9			sec.
9.4.19	P-8023 Lo SG Press	.9			sec.
	Asym S.G. Trip	.9			sec.
9.5.4	L-9013 Lo S.G. Lvl	.9		N/A	sec.
9.5.10	L-9023 Lo S.G. Lvl	.9		N/A	sec.
9.6.5	P-1111 Lo Flow	.65	.378	N/A	sec.
9.6.12	P-1121 Lo Flow	.65	.200	N/A	sec.
9.7.7	P-1102 TM/LP & ESG Lo Pzr. Press	.9			sec.
9.8.7	N.I. LPD	.4		N/A	sec.
9.8.7	N.I. HI Power	.4		N/A	sec.
9.8.7	N.I. TM/LP	.9		N/A	sec.
9.9.8	T-1112C HI Power	.4		N/A	sec.
	TM/LP	.9		N/A	sec.
9.9.11	T-1122C HI Power	.4		N/A	sec.
	TM/LP	.9		N/A	sec.
9.9.14	T-1112H HI Power	.4		N/A	sec.
	TM/LP	.9		N/A	sec.
9.9.17	T-1122H Hr Pwr	.4		N/A	sec.
	TM/LP	.9		N/A	sec.
9.10.5	LT-07-2	1		N/A	sec.

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ST. LUCIE UNIT 1
I & C PROCEDURE NO. 1-1400053, REVISION 0
REACTOR PROTECTIVE AND ENGINEERING SAFEGUARDS SYSTEM TESTING

DATA SHEET

Unit # 1 Channel B

Procedure Step	Function	RPS Acceptable Times	Actual Time RPS	ESG	SEC.
9.1.3	AB Matrix	---	.042	N/A	sec.
9.1.6	AC Matrix	---	.042	N/A	sec.
9.1.9	AD Matrix	---	.042	N/A	sec.
9.1.13	BC Matrix	---	.042	N/A	sec.
9.1.16	BD Matrix	---	.044	N/A	sec.
9.1.20	CD Matrix	---	.040	N/A	sec.
9.2.10	P-1102 HI PZR Press	.90		N/A	sec.
9.3.5	P-07-2 HI Cont Press	1.40			sec.
9.4.8	P-8013 Lo SG Press	.9			sec.
	Asym S.G. Trip	.9			sec.
9.4.19	P-8023 Lo SG Press	.9			sec.
	Asym S.G. Trip	.9			sec.
9.5.4	L-9013 Lo S.G. Lvl	.9		N/A	sec.
9.5.10	L-9023 Lo S.G. Lvl	.9		N/A	sec.
9.6.5	P-1111 Lo Flow	.65	.182	N/A	sec.
9.6.12	P-1121 Lo Flow	.65	.290	N/A	sec.
9.7.7	P-1102 TM/LP & ESG Lo Pzr. Press	.9			sec.
9.8.7	N.I. LPD	.4		N/A	sec.
9.8.7	N.I. Hi Power	.4		N/A	sec.
9.8.7	N.I. TM/LP	.9		N/A	sec.
9.9.8	T-1112C HI Power	.4		N/A	sec.
	TM/LP	.9		N/A	sec.
9.9.11	T-1122C HI Power	.4		N/A	sec.
	TM/LP	.9		N/A	sec.
9.9.14	T-1112H HI Power	.4		N/A	sec.
	TM/LP	.9		N/A	sec.
9.9.17	T-1122H Hr Pwr	.4		N/A	sec.
	TM/LP	.9		N/A	sec.
9.10.5	LT-07-2	1		N/A	sec.

1/-11

ST. LUCIE UNIT 1
I & C PROCEDURE NO. 1-1400053, REVISION 0
REACTOR PROTECTIVE AND ENGINEERING SAFEGUARDS SYSTEM TESTING

DATA SHEET

Unit # 1 Channel C

Procedure Step	Function	RPS Acceptable Times	Actual Time RPS	ESG	SEC.
9.1.3	AB Matrix	—	.042	N/A	sec.
9.1.6	AC Matrix	—	.042	N/A	sec.
9.1.9	AD Matrix	—	.042	N/A	sec.
9.1.13	BC Matrix	—	.044	N/A	sec.
9.1.16	BD Matrix	—	.040	N/A	sec.
9.1.20	CD Matrix	—		N/A	sec.
9.2.10	P-1102 HI PZR Press	.90			sec.
9.3.5	P-07-2 HI Cont Press	1.40			sec.
9.4.8	P-8013 Lo SG Press Asym S.G. Trip	.9			sec.
		.9			sec.
9.4.19	P-8023 Lo SG Press Asym S.G. Trip	.9			sec.
		.9			sec.
9.5.4	L-9013 Lo S.G. Lvl	.9		N/A	sec.
9.5.10	L-9023 Lo S.G. Lvl	.9		N/A	sec.
9.6.5	P-1111 Lo Flow	.65	✓.424	N/A	sec.
9.6.12	P-1121 Lo Flow	.65	✓.292	N/A	sec.
9.7.7	P-1102 TM/LP & ESG Lo Pzr. Press	.9			sec.
9.8.7	N.I. LPD	.4		N/A	sec.
9.8.7	N.I. HI Power	.4		N/A	sec.
9.8.7	N.I. TM/LP	.9		N/A	sec.
9.9.8	T-1112C HI Power	.4		N/A	sec.
	TM/LP	.9		N/A	sec.
9.9.11	T-1122C HI Power	.4		N/A	sec.
	TM/LP	.9		N/A	sec.
9.9.14	T-1112H HI Power	.4		N/A	sec.
	TM/LP	.9		N/A	sec.
9.9.17	T-1122H HI Pwr	.4		N/A	sec.
	TM/LP	.9		N/A	sec.
9.10.5	LT-07-2	1	✓ESG .336	~~N/A~~	sec.

U1 1991 REV 2 1-1

Component: _____ Sys: ___ Train: ___
Associate: _____ Assign Priority: E0
Name: RPS RESPONSE TIME TESTING Work Typ: 6

Location: CONTROL RM. W/O LMD: 2
Tsk LMD: 2

Defect/Request: _____

Fac: PEL Unit: 01
MASTER
WORK ORDER TASK

91033075 01

ER/PWO 63 / 8024
LOCATION: 915
PAGE 1 of 3

JOURNEYMANS WORK REPORT

Actual Start Date:	Time:	Actual Completion Date:	Time:
12-3-91	3:45P	12-14-91	19:00

Note: Journeyman shall sign and date text after their entires.

Trouble Found: NONE

Work/Repairs Performed: Performed SECTION 9.8.1 thru 9.8.10 of I+C Procedure No. 1-1400053. Michael Cooper 12-8-91

PERFORMED SECTION 9.2 & 9.7 of I+C
PROCEDURE # 1-1400053 for "A" CHANNEL. SAT SIGNAL 120991

PERFORMED SECTION 9.4 of I+C
PROCEDURE # 1-1400053 for "A" CHANNEL. SAT SIGNAL 121091

PERFORMED SECTION 9.3 of I+C
PROCEDURE # 1-1400053 for "A" CHANNEL for Mitchell 12-12-91

PERFORMED SECTION 9.10 of I+C
PROCEDURE # 1-1400053 for "A" CHANNEL for Mitchell

PERFORMED SECTIONS 9.5 & 9.6 of I+C
PROCEDURE # 1-1400053 for "A" CHANNEL. SAT SIGNAL 121191

Continued on Additional Sheets: (Y) N

Components Removed	Components Replaced
MANUF.	MANUF.
MOD.#	MOD.#
SER.#	SER.#

Suggestions For Future Planning/Variance Reason: _____

Foreman/Chief	Date	Supervisor	Date	QC Inspector	Date
		J Fregel	12-14-91		2-20-92

m

7-2

Component: _____ Sys: ___ Train: _
Associate: _____ Assign Priority: B0
Name: RPS RESPONSE TIME TESTING Work Typ: 6
Location: CONTROL RM. W/O LMD: 2
Defect/Request: _____ Tsk LMD: 2

Fac: PSL Unit:
MASTER
WORK ORDER TR
91033075 01
ER/PWO 63 / 8
LOCATION: 915
PAGE 1 of

JOURNEYMANS WORK REPORT

Work/Repairs Performed (cont.): PERFORMED SECT. 9.9 IC 1-1400053 CH'A" SAT
9 Hanley 12-13-91
Performed Section 9.1 of the
Procedure # 1-1400053 Rev 2 for RPS Logic Matrix
R. Vest 12/19/91

TEST EQUIP.
PSL - 825
PSL - 751
PSL - 759
PSL - 749
PSL - 738
PSL - 050
PSL - 051
PSL - 052
PSL - 053

Continued on Additional Sheets: Y N

7-4

ST. LUCIE UNIT 1
I & C PROCEDURE NO. 1-1400053, REVISION 2
REACTOR PROTECTIVE AND ENGINEERING SAFEGUARDS SYSTEM RESPONSE TIME TESTING

DATA SHEET

Unit # 1 Channel A

Procedure Step	Function	RPS Acceptable Times	Actual Time RPS	ESG	SEC.
9.1.3	AB Matrix	---	.042	N/A	sec.
9.1.6	AC Matrix	---	.040	N/A	sec.
9.1.9	AD Matrix	---	.042	N/A	sec.
9.1.13	BC Matrix	---	.042	N/A	sec.
9.1.16	BD Matrix	---	.042	N/A	sec.
9.1.20	CD Matrix	---	.042	N/A	sec.
9.2.10	P-1102 HI PZR Press	.90	✓ .610 ✓	N/A	sec.
9.3.5	P-07-2 HI Cont Press	1.40	✓ .310 ✓	SIAS ✓.186 ✓ CIS ✓.204 ✓	sec.
9.4.8	P-8013 Lo SG Press	.9	✓ .354 ✓	✓ .296 ✓	sec.
	Asym S.G. Trip	.9	✓ .610 ✓	N/A	sec.
9.4.19	P-8023 Lo SG Press	.9	✓ .492 ✓	✓ .388 ✓	sec.
	Asym S.G. Trip	.9	✓ .754 ✓	N/A	sec.
9.5.4	L-9013 Lo S.G. Lvl	.9	✓ .754 ✓	N/A	sec.
9.5.10	L-9023 Lo S.G. Lvl	.9	✓ .650 ✓	N/A	sec.
9.6.5	P-1111 Lo Flow	.65	✓ .262 ✓	N/A	sec.
9.6.12	P-1121 Lo Flow	.65	✓ .264 ✓	N/A	sec.
9.7.7	P-1102 TM/LP & ESG Lo Pzr. Press	.9	✓ .204 ✓	✓ .104 ✓	sec.
9.8.7	N.I. LPD	.4	.080	N/A	sec.
9.8.7	N.I. HI Power	.4	.156	N/A	sec.
9.8.7	N.I. TM/LP	.9	.272	N/A	sec.
9.9.8	T-1112C HI Power	.4	.160	N/A	sec.
	TM/LP	.9	.290	N/A	sec.
9.9.11	T-1122C HI Power	.4	.164	N/A	sec.
	TM/LP	.9	.288	N/A	sec.
9.9.14	T-1112H HI Power	.4	.164	N/A	sec.
	TM/LP	.9	.288	N/A	sec.
9.9.17	T-1122H Hr Pwr	.4	.164	N/A	sec.
	TM/LP	.9	.288	N/A	sec.
9.10.5	LT-07-2	1	N/A	✓ .222	sec.
9.3.12	P-07-2 HI-HI CONT PRESS	1	N/A	✓ .314 ✓	sec.

U1 1993

Component: _____ Sys: ___ Train: _
Associate: _____ Assign Priority: B2
Name: RPS RESPONSE TIME TESTI Work Typ: 6

Location: CONTROL RM. W/O LMD: 2
Tsk LMD: 2

Defect/Request: 92FYP8024 IC 1-1400053 RPS RESPON
SE T

Fac: PSL Unit: 01
MASTER
WORK ORDER TASK
93006942 01
ER/PWO 63 / 8024
LOCATION: 915
PAGE 2 of 3

JOURNEYMANS WORK REPORT

Actual Start Date:	Time:	Actual Completion Date:	Time:
5-9-93	0000	5-23-93	08:30

Note: Journeyman shall sign and date text after their entires.

Trouble Found:
_____ This section is Not Applicable for PMs or other planned jobs ____

TEST EQUIP.
PSL 0452 666
PSL 050 740
PSL 051 659
PSL 053 751
PSL 054 677
PSL 664 751
PSL ~~740~~
BL-758 599

Work/Repairs Performed:
obtained permission To START.

performed SAT 9.8 of IC 1-1400053 with SAT Results
R Watson 5/10/93

Continued on Additional Sheets: (Y) N

Suggestions For Future Planning/Variance Reason: _____

Supv/Foreman/Chief	Date	Supervisor	Date	QC Inspector	Date
		T Heigel	5/24/93	C Moon	6-7-93

711

Component: _____ Sys: ___ Train:
Associate: Assign Priority: B2
Title: RPS RESPONSE TIME TESTING Work Typ: 6

Location: CONTROL RM. W/O LMD: 2
Tsk LMD: 2

Defect/Request: 012FYP8024 IC 1-1400053 RPS RESPON
SE T

Fac: PSL Unit: 01
MASTER
WORK ORDER TASK

93006942 01

ER/PWO 63 / 8024
LOCATION: 915
PAGE 3 of 3

JOURNEYMANS WORK REPORT

Work/Repairs Performed (cont.): PERFORMED SECTION 9.9 WITH SAT RESULTS 5-17-93 Performed ~~Section~~ Steps Change 1 for transmitter PT-1102A Procedure Section 9.2, 9.7. Performed Steps Change 1 for PDT-1111A, 1111D Sections 9.6 Performed Sections 9.6 for PDT-1111B/1121B W.J. 5/18/93 Performed I&C Procedure 1-1400053 Section 9.10 on FT-07-2B, Section 9.4 Steps 1 thru 11 for PT-8013B, Steps Change #1 for transmitter PT-8013A, C, & D. D. Graham 5-19-93 RPS Logic Matrix

PERFORMED SECT. 9.1 OF I&C 1-1400053. ALSO PERFORMED STEPS 9.4.12 THRU 9.4.12. PERFORMED STEPS 9.4.12. THRU 9.4.22 FOR PT-8023A, PT-8023C, PT-8023D. D. Graham 5-21-93

Performed Steps Change #1 for transmitters PT-1102C & D procedure sections 9.2 & 9.7. Performed Procedure section 9.2 & 9.7 for transmitter PT-1102B Performed Section 9.2 for transmitter FT-07-2B D. Graham 5-22-93 5-23-93

Continued on Additional Sheets: Y N

ST. LUCIE PLANT
ADMINISTRATIVE PROCEDURE NO. 0010432, REVISION 66
NUCLEAR PLANT WORK ORDERS

APPENDIX H

NPWO SCOPE CHANGE

ST. LUCIE PLANT	UNIT	NPWO	SPEC ER	WORK REQUEST NUMBER
	1	8024	63	WR 93006942-01
DATE: 5-13-93		SCOPE CHANGE NUMBER:		ORIGINATOR:
TIME: 11:45 am/pm		SC 1		J. Hegel

SCOPE CHANGE INSTRUCTIONS:

Due to installation of new transmitters, Response time testing is a necessary requirement for Post Maint testing.

① Perform response time testing of the following transmitters using IC Procedure 1-1400053.

- PDT- 1111D
- PDT- 1111A
- PT- 1102A
- ~~PT- 1102B~~ IA ord. 5-13-93
- PT- 1102C
- PT- 1102D
- PT- 8013A
- PT- 8013C
- PT- 8013D
- PT- 8023A
- PT- 8023C
- PT- 8023D

OPS

ADDITIONAL RETEST RESULTING FROM THIS SCOPE CHANGE:

NONE.

3052
PROCEDURE
0010432
LETED
Cole
US

APPROVALS

SUPERVISOR:	QC INSPECTOR:	NPS/ANPS:
J Hegel		

FILL OUT WORK PERFORMED ON JOURNEYMAN'S WORK REPORT

ST. LUCIE UNIT 1
I & C PROCEDURE NO.-1-1400053, REVISION 2
REACTOR PROTECTIVE AND ENGINEERING SAFEGUARDS SYSTEM
RESPONSE TIME TESTING

DATA SHEET

Unit # 1 Channel B

Procedure Step	Function	RPS Acceptable Times	Actual Time RPS	ESG	SEC.
9.1.3	AB Matrix	—	.040	N/A	sec.
9.1.6	AC Matrix	—	.040	N/A	sec.
9.1.9	AD Matrix	—	.042	N/A	sec.
9.1.13	BC Matrix	—	.040	N/A	sec.
9.1.16	BD Matrix	—	.042	N/A	sec.
9.1.20	CD Matrix	—	.042	N/A	sec.
9.2.10	P-1102 HI PZR Press	.90	.306	N/A	sec.
9.3.5	P-07-2 HI Cont Press	1.40	.408	SIAS .366 CIS .350	sec.
9.4.8	P-8013 Lo SG Press	.9	.256	MSIS .170	sec.
	Asym S.G. Trip	.9	.286	N/A	sec.
9.4.19	P-8023 Lo SG Press	.9	.296	MSIS .192	sec.
	Asym S.G. Trip	.9	.320	N/A	sec.
9.5.4	L-9013 Lo S.G. Lvl	.9	.762	N/A	sec.
9.5.10	L-9023 Lo S.G. Lvl	.9	.656	N/A	sec.
9.6.5	P-1111 Lo Flow	.65	.244	N/A	sec.
9.6.12	P-1121 Lo Flow	.65	.248	N/A	sec.
9.7.7	P-1102 TM/LP & ESG Lo Pzr. Press	.9	.206	.252	sec.
9.8.7	N.I. LPD	.4	.080	N/A	sec.
9.8.7	N.I. HI Power	.4	.190	N/A	sec.
9.8.7	N.I. TM/LP	.9	.136	N/A	sec.
9.9.8	T-1112C HI Power	.4	.108	N/A	sec.
	TM/LP	.9	.096	N/A	sec.
9.9.11	T-1122C HI Power	.4	.152	N/A	sec.
	TM/LP	.9	.120	N/A	sec.
9.9.14	T-1112H HI Power	.4	.132	N/A	sec.
	TM/LP	.9	.130	N/A	sec.
9.9.17	T-1122H Hi Pwr	.4	.152	N/A	sec.
	TM/LP	.9	.130	N/A	sec.
9.10.5	LT-07-2	1	N/A	.312	sec.
9.3.12	P-07-2 HI-HI CONT PRESS	1	N/A	.620	sec.

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DATA SHEET

Unit # 1 Channel C

Procedure Step	Function	RPS Acceptable Times	Actual Time RPS	ESG	SEC.
9.1.3	AB Matrix	—	.040	N/A	sec.
9.1.6	AC Matrix	—	.040	N/A	sec.
9.1.9	AD Matrix	—	.042	N/A	sec.
9.1.13	BC Matrix	—	.040	N/A	sec.
9.1.16	BD Matrix	—	.042	N/A	sec.
9.1.20	CD Matrix	—	.042	N/A	sec.
9.2.10	P-1102 HI PZR Press	.90	.390	N/A	sec.
9.3.5	P-07-2 HI Cont Press	1.40		SIAS ____ CIS	sec.
9.4.8	P-8013 Lo SG Press	.9	.300	MSIS .216	sec.
	Asym S.G. Trip	.9	.340	N/A	sec.
9.4.19	P-8023 Lo SG Press	.9	.280	MSIS .208	sec.
	Asym S.G. Trip	.9	.350	N/A	sec.
9.5.4	L-9013 Lo S.G. Lvl	.9		N/A	sec.
9.5.10	L-9023 Lo S.G. Lvl	.9		N/A	sec.
9.6.5	P-1111 Lo Flow	.65		N/A	sec.
9.6.12	P-1121 Lo Flow	.65		N/A	sec.
9.7.7	P-1102 TM/LP & ESG Lo Pzr. Press	.9	.252	.252	sec.
9.8.7	N.I. LPD	.4		N/A	sec.
9.8.7	N.I. HI Power	.4		N/A	sec.
9.8.7	N.I. TM/LP	.9		N/A	sec.
9.9.8	T-1112C HI Power	.4		N/A	sec.
	TM/LP	.9		N/A	sec.
9.9.11	T-1122C HI Power	.4		N/A	sec.
	TM/LP	.9		N/A	sec.
9.9.14	T-1112H HI Power	.4		N/A	sec.
	TM/LP	.9		N/A	sec.
9.9.17	T-1122H Hr Pwr	.4		N/A	sec.
	TM/LP	.9		N/A	sec.
9.10.5	LT-07-2	1	N/A		sec.
9.3.12	P-07-2 HI-HI CONT PRESS	1	N/A		sec.

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DATA SHEET

Unit # 1 Channel D

Procedure Step	Function	RPS Acceptable Times	Actual Time RPS	ESG	SEC.
9.1.3	AB Matrix	—	.040	N/A	sec.
9.1.6	AC Matrix	—	.040	N/A	sec.
9.1.9	AD Matrix	—	.042	N/A	sec.
9.1.13	BC Matrix	—	.040	N/A	sec.
9.1.16	BD Matrix	—	.042	N/A	sec.
9.1.20	CD Matrix	—	.042	N/A	sec.
9.2.10	P-1102 HI PZR Press	.90	.416	N/A	sec.
9.3.5	P-07-2 HI Cont Press	1.40		SIAS ——— CIS	sec.
9.4.8	P-8013 Lo SG Press	.9	.276	MSIS .192	sec.
	Asym S.G. Trip	.9	.300	N/A	sec.
9.4.19	P-8023 Lo SG Press	.9	.390	MSIS .168	sec.
	Asym S.G. Trip	.9	.444	N/A	sec.
9.5.4	L-9013 Lo S.G. Lvl	.9		N/A	sec.
9.5.10	L-9023 Lo S.G. Lvl	.9		N/A	sec.
9.6.5	P-1111 Lo Flow	.65	.240	N/A	sec.
9.6.12	P-1121 Lo Flow	.65		N/A	sec.
9.7.7	P-1102 TM/LP & ESG Lo Pzr. Press	.9	.274	.254	sec.
9.8.7	N.I. LPD	.4		N/A	sec.
9.8.7	N.I. HI Power	.4		N/A	sec.
9.8.7	N.I. TM/LP	.9		N/A	sec.
9.9.8	T-1112C HI Power	.4		N/A	sec.
	TM/LP	.9		N/A	sec.
9.9.11	T-1122C HI Power	.4		N/A	sec.
	TM/LP	.9		N/A	sec.
9.9.14	T-1112H HI Power	.4		N/A	sec.
	TM/LP	.9		N/A	sec.
9.9.17	T-1122H HI Power	.4		N/A	sec.
	TM/LP	.9		N/A	sec.
9.10.5	LT-07-2	1	N/A		sec.
9.3.12	P-07-2 HI-HI CONT PRESS	1	N/A		sec.

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DATA SHEET

Unit # 1 Channel A

Procedure Step	Function	RPS Acceptable Times	Actual Time RPS	ESG	SEC.
9.1.3	AB Matrix	—	.040	N/A	sec.
9.1.6	AC Matrix	—	.040	N/A	sec.
9.1.9	AD Matrix	—	.042	N/A	sec.
9.1.13	BC Matrix	—	.040	N/A	sec.
9.1.16	BD Matrix	—	.042	N/A	sec.
9.1.20	CD Matrix	—	.042	N/A	sec.
9.2.10	P-1102 HI PZR Press	.90	.428	N/A	sec.
9.3.5	P-07-2 HI Cont Press	1.40		SIAS CIS	sec.
9.4.8	P-8013 Lo SG Press	.9	.316	MSIS .232	sec.
	Asym S.G. Trip	.9	.928	N/A	sec.
9.4.19	P-8023 Lo SG Press	.9	.248	MSIS .186	sec.
	Asym S.G. Trip	.9	.928	N/A	sec.
9.5.4	L-8013 Lo S.G. Lvl	.9		N/A	sec.
9.5.10	L-8023 Lo S.G. Lvl	.9		N/A	sec.
9.6.5	P-1111 Lo Flow	.65	.252	N/A	sec.
9.6.12	P-1121 Lo Flow	.65		N/A	sec.
9.7.7	P-1102 TM/LP & ESG Lo Pzr. Press	.9	.382	.256	sec.
9.8.7	N.I. LPD	.4		N/A	sec.
9.8.7	N.I. HI Power	.4		N/A	sec.
9.8.7	T-1112C TM/LP	.9		N/A	sec.
9.9.8	T-1112C HI Power	.4		N/A	sec.
	TM/LP	.9		N/A	sec.
9.9.11	T-1122C HI Power	.4		N/A	sec.
	TM/LP	.9		N/A	sec.
9.9.14	T-1112H HI Power	.4		N/A	sec.
	TM/LP	.9		N/A	sec.
9.9.17	T-1122H Hi Pwr	.4		N/A	sec.
	TM/LP	.9		N/A	sec.
9.10.5	LT-07-2	1	N/A		sec.
9.3.12	P-07-2 HI-HI CONT PRESS	1	N/A		sec.

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Roll / Frame
1647/2782

DATA SHEET

PWO 8024
12/29/97

Unit 1 Channel A

Procedure Step	Function	RPS Acceptable Times	RPS Bistable Trip Time	Actual Time Total RPS*	Actual Time ESG	Actual Time SEC.
9.1.3	AB Matrix	---	N/A	.042	N/A	sec.
9.1.6	AC Matrix	---	N/A	.042	N/A	sec.
9.1.9	AD Matrix	---	N/A	.040	N/A	sec.
9.1.13	BC Matrix	---	N/A	.042	N/A	sec.
9.1.16	BD Matrix	---	N/A	.042	N/A	sec.
9.1.20	CD Matrix	---	N/A	.040	N/A	sec.
9.2.13	P-1102 HI PZR Press	.90	.382	.634	N/A	sec.
9.3.6	P-07-2 HI Cont Press	1.40	.136	.178	SIAS .038 CIS .038	sec.
9.4.9	P-8013 Lo SG Press	.9	.196	.238	MSIS .192	sec.
	Asym S.G. Trip	.9	.276	.318	N/A	sec.
9.4.21	P-8023 Lo SG Press	.9	.200	.242	MSIS .182	sec.
	Asym S.G Trip	.9	.198	.240	N/A	
9.5.6	L-9013 Lo S.G. Lvl	.9	.576	.618	N/A	sec.
9.5.13	L-9023 Lo S.G. Lvl	.9	.214	.336	N/A	sec.
9.6.5	P-1111 Lo Flow	1.025	.276	.318	N/A	sec.
9.6.12	P-1121 Lo Flow	1.025	.246	.288	N/A	sec.
9.7.9	P-1102 TM/LP & ESG Lo Pzr. Press	.9	.266	.308	.302 / .318	sec.
9.8.7	N.I. LPD	.4	.040	.082	N/A	sec.
9.8.7	N.I. Hi Power	.4	.122	.164	N/A	sec.
9.8.7	N.I. TM/LP	.9	.130	.172	N/A	sec.
9.9.7	T-1112C Hi Power	.4	.116	.158	N/A	sec.
	TM/LP	.9	.120	.162	N/A	sec.
9.9.11	T-1122C Hi Power	.4	.116	.158	N/A	sec.
	TM/LP	.9	.122	.164	N/A	sec.
9.9.13	T-1112H Hi Power	.4	.120	.162	N/A	sec.
	TM/LP	.9	.120	.162	N/A	sec.
9.9.16	T-1122H Hr Pwr	.4	.116	.158	N/A	sec.
	TM/LP	.9	.120	.162	N/A	sec.
9.10.6	LT-07-2	1	N/A	N/A	.448	sec.
9.3.12	P-07-2 HI-HI CONT PRESS	1	N/A	N/A	.048	sec.

* Total RPS Actual Time = RPS Bistable Time + Longest Matrix Time From Section 9.1

/R12

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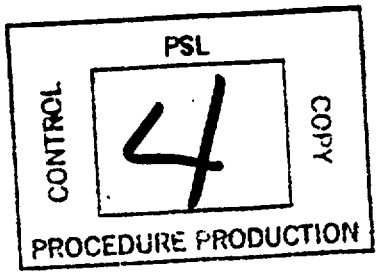

1.0 TITLE:

REACTOR PROTECTIVE AND ENGINEERING SAFEGUARDS SYSTEM RESPONSE TIME TESTING

2.0 REVIEW AND APPROVAL:

Reviewed by Facility Review Group 10/31 1989

Approved by G. J. Boissy Plant Manager 11/16 1989

Revision 12 Reviewed by FRG 11/18 & 11/24 1997

Approved by J. Scarola Plant General Manager 11/24 1997

3.0 PURPOSE:

3.1 To determine the time interval from when a monitored input to the RPS/ESG exceeds its trip setpoint until the protective action has been initiated.

3.2 These times will serve to verify the RPS/ESG responses are less than or equal to the response times listed in Appendix A, Table 3.3-2 and Appendix B, Table 3.3-5.

3.3 The response times obtained for transmitters will be added to the Integrated Safeguards Procedure 0400050 for emergency core cooling system response verification.

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4.0 PRECAUTIONS AND LIMITS:

4.1 Use extreme caution when connecting and disconnecting the NI signal and high voltage cables. These cables retain a capacitive charge. The cables are to be placed on their respective shorting jacks.

4.2 Use caution when making test connections during this procedure as the RPS/ESG and Sequence of Events Recorder will be energized.

4.3 Do not exceed 2.0 X 10^{-3} amperes on the input to the nuclear instrumentation from the current source test input.

4.4 Determine present requirements for the RPS/ESG channel to be tested. Record below and in the data sheet the channel being tested. Use the applicable tables for channel being tested.

RPS/ESG channel being tested._____

4.5 This procedure is written to be worked in mode 5 or 6. If required to run in any other mode it will be necessary to TC portions which effect bypassing safeguards.

4.6 Safeguards bistable bypasses may be in a bypass position. Ensure Safeguards bistable bypasses are left in the as found position for the applicable section being performed.

4.7 Whenever a transmitter is replaced, perform the applicable section of this procedure to verify system operability.

4.8 People operating the Response Time Test Rig must be qualified I&C Fund. 1701, courses 1720132, 1720328 and 1720329.

4.9 For operation of the Portable Low Pressure Response Time Test Rig, refer to Figure 1B, otherwise use Figure 1A for operation of the original Response Time Test Rig. /R12

4.10 Installation of a Transmation, in accordance with Table 2, to simulate a plant condition may be omitted if plant conditions are such that the bistable being tested is in the desired state for testing. /R12

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5.0 RELATED SYSTEM STATUS:

5.1 The plant will be shut down while performing this procedure.

5.2 The Sequence of Events Recorder (SOE) shall be operating while performing this procedure.

5.3 The NPS/ANPS shall be notified to ensure proper plant conditions for performing this procedure.

6.0 REFERENCES:

6.1 CWDs 372 through 379 and 381 through 388, 319, 564, 1182, 1183, 296, 956, 629, 312, 580, 315

6.2 Technical Manual 2998-8768

6.3 UFSAR Section 7.2.1.6

6.4 UFSAR Section 7.3.2.4

7.0 RECORDS REQUIRED:

7.1 A completed copy of this procedure shall be maintained in the plant files in accordance with QI 17-PR/PSL-1, "Quality Assurance Records."

8.0 MATERIAL AND EQUIPMENT REQUIRED:

8.1 RPS Response Time Test Stand (RTTS)

8.2 1K Decade box or equivalent (4) PSL_____

8.3 Precision DC current source 10^{-6} TO 10^{-3} amperes, Keithley 220 or equivalent. PSL_____

8.4 Portable Digital Voltmeter, Keithley 197 or equivalent (2) PSL_____

8.5 RPS Digital Panel meter for the channel under test. PSL_____

8.6 Heise Pressure gauge or equivalent PSL_____

8.7 RPS time response test box (NI RTD)

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8.0 MATERIAL AND EQUIPMENT REQUIRED: (continued)

8.8 Small nitrogen bottle (3200 #)

8.9 RPS bistable extender card

8.10 Portable Low Pressure Response Time Test Rig /R12

8.11 Transmation or equivalent current source (2)

8.12 RPS Keys: 62, 117, 93-100, 86

8.13 ESG Keys: 63, 125, 129, 128

8.14 AFAS Keys: 192

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9.0 DETAILED PROCEDURE: INITIAL

NOTE
Sections 9.1 through 9.10 can be performed in any order, however, each section should be fully completed prior to beginning the next section.

9.1 RPS Logic Matrix

NOTE
Keys required for this section #93-95 ZPMB, #97-100 Lo S/G Press.

NOTE
This section will determine the response time from a bistable trip output contact to the trip circuit breakers (TCB) opening. This time will be added to the transmitter bistable response time in later sections.

1. A. Ensure/Bypass RPS Channel A, B, C and D, ZPMB and LO SG PRESS bypass keys are in BYPASS. _____

   B. With all RPS bistables untripped, close the TCBs. _____

   C. Place the RPS Lo S/G Press bypass switch to the OFF position in Channel A. _____

2. Place the RPS Lo S/G Press bypass switch in Channel B to the OFF position. _____

3. From the printout on the SER, determine the time from when the RPS Lo S/G Press Channel B bistable tripped to when the last TCB opened. Record this time on the data sheet as the AB matrix response time. Include a copy of the SER printout with this procedure. _____

4. Return RPS Channel B Lo S/G Press bypass key to BYPASS and reset the RPS Lo S/G Press bistable trip unit. Close all TCBs. _____

5. Place the RPS Lo S/G Press bypass switch in Channel C to the OFF position. _____

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9.0 DETAILED PROCEDURE: (continued) INITIAL

9.1 (continued)

6. From the printout on the SER, determine the time from when the RPS Lo S/G Press Channel C bistable tripped to when the last TCB opened. Record this time on the data sheet as the AC matrix response time. Include a copy of the SER printout with this procedure. _____

7. A. Return RPS Channel C Lo S/G Press bypass key to BYPASS and reset the Lo S/G Press bistable trip unit. _____

   B. Close all TCBs. _____

8. Place the RPS Lo S/G Press bypass switch in Channel D to the OFF position. _____

9. From the printout on the SER, determine the time from when the RPS Lo S/G Press Channel D bistable tripped to when the last TCB opened. Record this time on the data sheet as the AD matrix response time. Include a copy of the SER printout with this procedure. _____

10. A. Return RPS Channel D Lo S/G Press bypass key to BYPASS and reset the RPS Lo S/G Press bistable trip unit. _____

    B. Close all TCBs. _____

11. A. Return RPS Channel A Lo S/G Press bypass key to BYPASS. _____

    B. Place the Channel B Lo S/G Press bypass key to OFF position. _____

12. Place the RPS Lo S/G Press bypass switch in Channel C to the OFF position. _____

13. From the printout on the SER, determine the time from when the RPS Lo S/G Press Channel C bistable tripped to when the last TCB opened. Record this time on the data sheet as the BC matrix response time. Include a copy of the SER printout with this procedure. _____

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9.0 DETAILED PROCEDURE: (continued) INITIAL

9.1 (continued)

14. A. Return RPS Channel C Lo S/G Press bypass key to BYPASS and reset the Lo S/G Press bistable trip unit. _____

B. Close all TCBs. _____

15. Place the RPS Lo S/G Press bypass switch in Channel D to the OFF position. _____

16. From the printout on the SER, determine the time from when the RPS Lo S/G Press Channel D bistable tripped to when the last TCB opened. Record this time on the data sheet as the BD matrix response time. Include a copy of the SER printout with this procedure. _____

17. A. Return RPS Channel D Lo S/G Press bypass key to BYPASS and reset the Lo S/G Press bistable trip unit. _____

B. Close all TCBs. _____

18. A. Return RPS Channel B Lo S/G Press bypass key to BYPASS. _____

B. Place the Channel C Lo S/G Press bypass key to the OFF position. _____

19. Place the RPS Lo S/G Press bypass switch in Channel D to the OFF position. _____

20. From the printout on the SER, determine the time from when the RPS Lo S/G Press Channel D bistable tripped to when the TCB opened. Record this time on the data sheet as the CD matrix response time. Include a copy of the SER printout with this procedure. _____

21. Return RPS Channel C and Channel D Lo S/G Press bypass key to BYPASS and reset the Lo S/G Press bistable trip unit. _____

22. Ensure all RPS Lo S/G Press bypass keys are in BYPASS and reset the Lo S/G Press bistables. _____

23. Place all TCB's in the position desired by the ANPS. _____

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9.0 DETAILED PROCEDURE: (continued) INITIAL

9.2 RPS High Pressurizer Pressure Trip

NOTE
Keys required for this Section include:
86 RPS Hi PZR Press
63 ESG Cabinet Door
125 ESG Press Press SIAS
129 ESG Press Press ATWS

1. Notify the NPS/ANPS of work to be performed. _____

2. For the channel under test, ensure/place the PRESSURIZER PRESSURE SIAS and PRESSURIZER PRESSURE ATWS bistable trip modules in the Engineered Safeguards Cabinet to Bypass. (BA-X06, BA-X12 where X is either 1, 2, 3 or 4 depending on channel selected.) _____

3. Inhibit the RPS HI PZR PRESS bistable on the channel being tested by inserting the bypass key. _____

4. Install the response time test set (RTTS) at the PZR PRESS transmitter to be tested, in accordance with Figure 1 for the test set connections and Table 1 for the RTTS pressure settings.

   Performed by_____

5. Select TRIP SP on the RPSCIP Meter Input selector switch. _____

6. Select BISTABLE on the RPSCIP trip unit Input Selector Switch. _____

7. Remove the HI PZR PRESS RPS bistable and insert the bistable extender card. Place the bistable into the extender card. _____

8. Insert the trip test cable into the RPS HI PZR PRESS bistable trip test socket. _____

9. Record the HI PZR PRESS trip setpoint_____V.

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9.0 DETAILED PROCEDURE: (continued) INITIAL

9.2 (continued)

10. Using the coarse and fine BISTABLE TRIP SET POINT pots, adjust the Press Bistable trip voltage to 1.8V. (course pot located on the side of the bistable unit.)

    Performed by_____ Verified by_____

11. Remove the HI PZR PRESS bypass key and reset the bistable. _____

12. Initiate the response time test by pushing PB-1 on the RTTS. _____

13. From the printout on the SER, determine the time from when the test was initiated to when the bistable under test tripped. If section 9.1 has been performed, Then add this time to the longest matrix time of section 9.1 and record it on the data sheet. Include a copy of the SER printout with this procedure. _____ /R12

14. Return the Bistable Trip Setpoint voltage to that recorded in step 9.2.9. _____V

    Performed by_____ Verified by_____

15. Disconnect the RTTS and return the HI PZR PRESS transmitter to normal, record on Table 1.

    Performed by_____

16. Bypass the RPS HI PZR PRESS bistable by inserting the bypass key. _____

17. Remove the bistable from the extender card and return it to the RPS cabinet. _____

18. Remove the bypass key from the RPS HI PZR PRESS bistable and reset the bistable. _____

19. Return the RPSCIP trip unit INPUT SELECT SWITCH to BISTABLE and the METER INPUT selector switch to AUX. _____

20. Reset the ATWS Bistable in the ESG cabinet. _____

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9.0 DETAILED PROCEDURE: (continued) INITIAL

9.2 (continued)

21. Remove the bypass keys from the safeguards modules BA-X12, ATWS. Do not remove the bypass from BA-X06, Pressurizer Pressure SIAS if it was bypassed at the start of this section of the procedure. _____

9.3 RPS/ESG High Containment Pressure Trip

NOTE
Keys required for this section include: # 63 ESG Cabinet Door

CAUTION
Be absolutely sure that Operations is aware of what equipment will be operated by the safeguards. If you are not aware of the safeguards operational interlocks do not continue with this procedure until you consult with the I&C supervisor responsible for the system.

1. Inform the ANPS of the equipment that will be operated.

ANPS APPROVAL TO PROCEED._____

The below listed equipment will be actuated:

AM 503, A SIAS

Reactor Aux. Bldg. Exh., HVE-10A, CWD 510

AM 513, A CIS

Waste gas control isolation valve 6554, CWD 564
Stm Gen 1A blowdown iso, FCV-23-3, CWD 319
Stm Gen 1B blowdown iso, FCV-23-5, CWD 319
Kitchen exh isolation FCV-25-24, CWD 1182

AM 613, B CIS

Waste gas iso valve V 6555, CWD 564
Stm gen 1A blowdown isol, FCV-23-4, CWD 319.
Stm Gen 1B iso valve, FCV-23-6, CWD 319
Kitchen Exh Isolation, FCV-25-25, CWD 1183

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9.0 DETAILED PROCEDURE: (continued) INITIAL

9.3 (continued)

2. Set up the RTTS at the Containment Pressure Transmitter to be tested, in accordance with Figure 1 for the test set interconnections and adjust the pressure settings as shown in Table 1.

   Performed by_____

3. Set up the ESG to trip SA SIAS module AM503, SA CIS module 513 and SB CIS module AM 613 by performing the following steps.

   A. On actuation cabinet SA place the TEST PERMISSIVE SWITCH to SIAS CONT PRESS. _____

   B. On actuation Cabinet SA place the TEST GROUP SWITCH to GROUP 3. _____

   C. On actuation cabinet SB place the PERMISSIVE TEST SWITCH to CIS CONT. PRESS. _____

   D. On actuation Cabinet SB place the TEST GROUP SWITCH to GROUP 3. _____

   E. Unbypass BA-X01, BA-X02 and BA-X03, for the Channel under test. _____

   F. On actuation cabinet SA press and hold the BOTTOM test pushbutton on actuation module AM503. _____

   G. On actuation cabinet SB press and hold the TOP test pushbutton on actuation module AM 613. _____

4. Initiate the response time testing by pushing PB-1 on the RTTS. Safeguards and RPS will trip. _____

5. Release the pushbuttons on the safeguards cabinet. Have Operations reset ONLY the B CIS from RTGB 106 at this time. _____

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9.0 DETAILED PROCEDURE: (continued) INITIAL

9.3 (continued)

6. From the printout on the SER, determine the time from when the test was initiated to when the RPS bistable under test tripped, and when the ESG actuation modules actuated. For the ESG record this time on the data sheet. For the RPS, If section 9.1 has been performed, Then add this time to the longest time from section 9.1 and record this time on the data sheet. Include a copy of the SER printout with this procedure. _____/R12

7. Set up the RTTS to the same pressures as per section 9.3.1, Table 1 & Figure 1.

   Performed by_____Verified by_____

8. Set up the ESG to trip SA CSAS module AM 521 by performing the following:

   A. On actuation cabinet SA place the TEST PERMISSIVE SWITCH to CSAS CONT PRESS. _____

   B. Place the TEST GROUP SWITCH to GROUP 3. _____

   C. On actuation cabinet SA, module AM 521 press and hold the BOTTOM black test button. _____

9. Initiate the response time testing by pushing PB-1 on the RTTS. Safeguards and RPS will trip. _____

10. Release the pushbuttons on the safeguards cabinet. Have Operations reset the A SIAS, A CIS and A CSAS, from RTGB 106 at this time. _____

11. Operations should return all valves listed above to their desired positions and re-enable the diesel start at this time. _____

12. From the printout on the SER, determine the time from when the test was initiated to when the ESG CSAS actuation module actuated. Record this time on the data sheet. Include a copy of the SER printout with this procedure. _____

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9.0 DETAILED PROCEDURE: (continued) INITIAL

9.3 (continued)

13. All safeguards switches adjusted (in 9.3.7 A, B and 9.3.2 A - D) above should be returned to operate at this time.

    Performed by_____Verified by_____

14. Disconnect the RTTS and restore the transmitter to its normal configuration, record on Table 1.

    Performed by_____

15. Bypass BA-X01, X02 and X03.

    Performed by_____Verified by_____

16. Reset the RPS Hi Cont. Press. Bistable. _____

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9.0 DETAILED PROCEDURE: (continued) INITIAL

9.4 RPS/ESG Lo S/G Press and Asymmetric SG trips.

NOTE
Keys required for this Section include:
63 ESG Cabinet Door
125 ESG Press Press SIAS
129 ESG Press Press ATWS
192 ASFAS Cabinet Doors

1. Inform the ANPS of the equipment that will be operated.

   The following equipment will be actuated.

Main Steam Isolation Valve HCV-08-1A, CWD 312.

Pressurizer Steam Sample Valve V5202, CWD 580.

NPS/ANPS APPROVAL TO PROCEED_____

2. A. Place the AFAS Channel under test to bypass. Depress the AFAS-1 and AFAS-2 Bypass pushbuttons.

   Performed by_____ Verified by_____

   B. Install up the RTTS at the A S/G Pressure Transmitter to be tested, in accordance with Figure 1 for the Test Set interconnections and adjust the pressure setting as shown in Table 1.

   Performed by_____

3. A. On the RPS Channel under test, place the Lo S/G Press bypass switch to the OFF position. (Transmitter must be at A1 pressure setting). _____

   B. On the RPS Channel under test, place the ZERO POWER MODE bypass to OFF. _____

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9.0 DETAILED PROCEDURE: (continued) INITIAL

9.4 (continued)

4. For the channel under test, install Transmations in accordance with Table 2 and simulate an input for the B S/G pressure loop (13.60 ma) and the Pressurizer Pressure loop approximately (11.50 ma). This will remove the TM/LP trip. Reset the TM/LP trip.

   Performed by_____

5. Enable the MSIS trip. Remove the MSIS channel trips and blocks by performing the following steps:

   A. Bypass SG1A Bistable modules BA 108, 208, 308 and 408.

      Performed by_____ Verified by_____

   B. Remove the SG1A block by:

      1. In any two measurement channels, remove the SG1A Block modules BA-X09, where X is 1, 2, 3 or 4 depending on the channel being worked.

      2. As soon as the SG1A block clears, reinstall the two SG1A Block modules.

      3. Unbypass SG1A Bistable BA-X08 for the channel being tested.

6. Set up ESG actuation cabinet SA to trip the MSIS module AM 528.

   A. On actuation cabinet SA.

      1. Place the TEST PERMISSIVE SWITCH to STM GEN ISOLATION. _____

      2. Place the GROUP TEST SWITCH to GROUP NO TEST. _____

      3. On actuation module AM 528 press and hold the TOP black TEST pushbutton. _____

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9.0 DETAILED PROCEDURE: (continued) INITIAL

9.4 (continued)

7. Initiate the response time test by pushing PB-1 on the RTTS. _____

8. Release the TEST button being held on the ESG. Have Operations reset the A MSIS and any valve actuations at this time. _____

9. From the printout on the SER, determine the time from when the test was initiated to when the RPS bistable tripped. If section 9.1 has been performed, Then add this time to the longest matrix time recorded on section 9.1 and record this value on the data sheet. Also determine the time from when the test was initiated to when the safeguards module tripped. Record this value on the data sheet. Include a copy of the SER printout with this procedure. _____ /R12

10. Return the ESG to service by:

   A. Have operations re-establish the MSIS block. Verify that MSIS is blocked. _____

   B. Bypass bistable BA-X08 unbypassed in Step 9.4.4.B.3 above.

      Performed by_____ Verified by_____

   C. Return all safeguards switches moved (in Steps 9.4.5.A (1 and 2) above to operate.

      Performed by_____ Verified by_____

11. Disconnect the RTTS and return the A S/G pressure transmitter to its normal configuration, record on Table 1.

    Performed by_____

12. Disconnect the simulated input for the B S/G and return to normal configuration, record on Table

    Performed by_____

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9.0 DETAILED PROCEDURE: (continued) INITIAL

9.4 (continued)

13. Install the RTTS at the B S/G Pressure Transmitter to be tested, in accordance with Figure 1 for the Test Set interconnections and adjust the pressure setting as shown in Table 1.

    Performed by_____

14. On the RPS Channel under test, place the Lo S/G Press bypass switch to the OFF position. (Transmitter must be at A1 pressure setting). _____

15. For the channel under test, install a Transmation in accordance with Table 2 and simulate an input for an A S/G pressure loop approximately (13.60 ma) and the Pressurizer Pressure Loop (11.50 ma). This will remove the TM/LP trip. Reset the TM/LP trip.

    Performed by_____

> CAUTION
> The order of removing and replacing ESG bistables is very important. Failure to remove and replace modules correctly may cause reportable safeguards actuations. Be very careful to remove and replace exactly in the order called out in this procedure.

16. Enable the MSIS trip. Remove the MSIS channel trips and blocks by performing the following steps:

    A. Bypass SG1B Bistable modules BA110, 210, 310 and 410.

       Performed by_____ Verified by_____

    B. Remove the SG1B block by:

       1. In any two measurement channels, remove the SG1B block modules, BA-X10, where X is a 1, 2, 3 or 4 depending on what channel is being worked. _____

       2. As soon as the SG1B block has been removed, reinstall the two SG1B block modules. _____

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9.0 DETAILED PROCEDURE: (continued) INITIAL

9.4 (continued)

17. Inform the ANPS of the equipment that will be operated.

The following equipment will be actuated.

Main Steam Isolation Valve HCV-08-1B, CWD 315

NPS/ANPS APPROVAL TO PROCEED_____

18. Set up ESG actuation cabinet SB to trip the MSIS module AM 628. _____

A. On actuation cabinet SB:

1. Place the TEST PERMISSIVE SWITCH to STM GEN ISOLATION. _____

2. Place the GROUP TEST SWITCH to GROUP NO TEST. _____

3. On actuation module AM 628 press and hold the the TOP black TEST button. _____

B. Remove the bypass on SG1B bistable BA-X10 on channel to be tested. _____

19. Initiate the response time test by pushing PB-1 on the RTTS. _____

20. Release the TEST button being held on the ESG. Have Operations reset the B MSIS and any valve actuations at this time. _____

21. From the printout on the SER, determine the time from when the test was initiated to when the RPS bistable tripped. If section 9.1 has been performed, Then add this time to the longest matrix time recorded on section 9.1 and record this value on the data sheet. Also determine the time from when the test was initiated to when the safeguards module tripped. Record this value on the data sheet. Include a copy of the SER printout with this procedure. _____ /R12

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9.0 DETAILED PROCEDURE: (continued) INITIAL

9.4 (continued)

22. Return the ESG to service by:

A. Have operations re-establish the MSIS block. Verify that MSIS is blocked. _____

B. Bypass module BA-X10 on which the bypass was removed in step 9.4.16.B.

C. Return all safeguards switches moved (in Step 9.4.16.A (1 - 2)) above to operate.

Performed by_____ Verified by_____

23. Disconnect the RTTS and return the B S/G pressure transmitter and record on Table 1 to its normal configuration.

Performed by_____

24. Disconnect the simulated input for the A S/G and return to normal configuration, record on Table 2.

Performed by_____

25. Disconnect the simulated input for Pzr Press installed in step 9.4.3, record on Table 2.

Performed by_____

26. On the RPS Channel under test, return the ZERO POWER MODE bypass and the LO S/G PRESS bypass to the position desired by Operations.

Performed by_____ I.V._____

27. Place the AFAS Channel under test to normal condition by removing the AFAS-1 and AFAS-2 Bypass.

Performed by_____ I.V._____

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9.0 DETAILED PROCEDURE: (continued) INITIAL

9.5 RPS Lo S/G Level

NOTE
Keys required for this section include: # 192 AFAS Cabinet Doors

1. Inhibit the AFAS Channel under test by depressing the level AFAS-1 and AFAS-2 Bypass pushbuttons.

   Performed by_____ Verified by_____

2. Install the RTTS at the A S/G water level transmitter for the channel to be tested in accordance with Figure 1 for the Test set connections and Table 1 for the Pressure settings. Apply pressure to the low side of the transmitter with the high side vented.

   Performed by_____

3. Install a Transmation in accordance with Table 2 and simulate a normal level input signal for the B S/G water level loop (14.4 mADC).

   Performed by_____

4. Reset the S/G Level bistable trip unit.

   Performed by_____

5. Initiate the response time test by pushing PB-1 on the RTTS. _____

6. From the printout on the SER, determine the time from when the test was initiated to when the Lo S/G Level bistable tripped. If section 9.1 has been performed, Then add this time to the longest matrix time from section 9.1 and record it on the data sheet. Include a copy of the SER printout with this package. _____/R12

7. Disconnect the RTTS and return the A S/G level transmitter disconnected in step 9.5.2 to its normal configuration, record on Table 1.

   Performed by_____

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9.0 DETAILED PROCEDURE: (continued) INITIAL

9.5 (continued)

8. Remove the simulated input signal installed in step 9.5.4 and restore to its normal configuration, record on Table 2.

   Performed by_____

9. Install the RTTS at the B S/G water level transmitter for the channel to be tested. In accordance with Figure 1 for the test set connections and Table 1 for pressure settings. Apply pressure to the low side of transmitter with the high side vented.

   Performed by_____

10. Install a Transmation in accordance with Table 2 and simulate a normal level input signal for the A SG water level loop (14.4 mADC)

    Performed by_____

11. Reset the S/G Level bistable trip unit.

    Performed by_____

12. Initiate the response time test by pushing PB-1 on the RTTS. _____

13. From the printout on the SER, determine the time when the test was initiated to when the Lo S/G Level bistable tripped. If section 9.1 has been performed, Then add this time to the longest matrix time from section 9.1 and record it on the data sheet. Include a copy of the SER printout with this procedure. _____ /R12

14. Disconnect the RTTS and return the B S/G level transmitter to its normal configuration, record on Table 1.

    Performed by_____

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9.0 DETAILED PROCEDURE: (continued)

9.5 (continued)

15. Remove the simulated input signal and restore to its normal configuration, record on Table 2.

    Performed by_____

16. Return the AFAS Channel under test to normal by depressing the AFAS-1 and AFAS-2 Bypass pushbuttons. Verify lights have extinguished.

    Performed by_____ Verified by_____

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9.0 DETAILED PROCEDURE: (continued) INITIAL

9.6 RPS Low Reactor Coolant Flow

1. Install the RTTS at the A S/G Delta P transmitter for the channel to be tested, in accordance with Figure 1 for the test set connections and adjust the pressure settings as shown in Table 1.

   Performed by_____

2. Ensure/Place the Zero Power Mode Bypass switch, for the channel under test, to the OFF position. (Transmitter must be at the A1 pressure setting). _____

3. Install a Transmation in accordance with Table 2 and simulate a normal flow input signal for the B SG flow loop not being tested (approximately 16 M.A.). Reset the S/G Lo Flow trip unit.

   Performed by_____

4. Initiate the response time by pushing PB-1 on the RTTS. _____

5. From the printout on the SER, determine the time from when the test was initiated to when the Low flow bistable tripped. If section 9.1 has been performed, Then add this time to the longest matrix time from section 9.1 and record it on the data sheet. Include a copy of the SER printout with this procedure. _____ /R12

6. Disconnect the RTTS and return the A S/G Delta P transmitter to its normal configuration, record on Table 1.

   Performed by_____

7. Disconnect the simulated flow input signal and return to normal configuration record on Table 2.

   Performed by_____

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9.0 DETAILED PROCEDURE: (continued) INITIAL

9.6 (continued)

8. Install the RTTS at the B S/G Delta P transmitter for the channel to be tested, in accordance with Figure 1 for the test set connections and adjust the pressure settings as shown in Table 1.

   Performed by_____

9. Ensure/Place the Zero Power Mode Bypass switch, for the channel under test, to the OFF position. (Transmitter must be at A1 pressure setting). _____

10. Install a Transmation in accordance with Table 2 and simulate a normal flow input signal for the A SG flow loop not being tested (approximately 16 M.A.). Reset the S/G Lo Flow trip unit.

    Performed by_____

11. Initiate the response time test by pushing PB-1 on the RTTS. _____

12. From the printout on the SER, determine the time from when the test was initiated to when the Low flow bistable tripped. If section 9.1 has been performed, Then add this time to the longest matrix time from section 9.1 and record it on the data sheet. Include a copy of the SER printout with this procedure. _____/R12

13. Disconnect the RTTS and return the B S/G Delta P transmitter to its normal configuration, record on Table 1.

    Performed by_____

14. Disconnect the simulated flow input signal and return to normal configuration, record on Table 2.

    Performed by_____

15. Place the Zero Power Mode Bypass switch in the position required by Ops. _____

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9.0 DETAILED PROCEDURE: (continued)

9.7 RPS Thermal Margin/Low Pressure/ ESG LOW PRESSURIZER PRESSURE

NOTE
Keys required for this Section include:
63 ESG Cabinet Door
125 ESG Press Press SIAS
129 ESG Press Press ATWS

NOTE
Be absolutely sure that operations is aware of what equipment will be operated by the safeguards. If you are not aware of safeguards operational interlocks DO NOT continue with this procedure until you consult with the I&C supervisor responsible for the system.

1. Inform the ANPS of the equipment that will be operated.

   The below listed equipment will be actuated

AM 503, A SIAS

NONE

AM 513, A CIS

Waste gas control isolation valve 6554, CWD 564

Stm Gen 1A blowdown iso, FCV-23-3, CWD 319

Stm Gen 1B blowdown iso, FCV-23-5, CWD 319

Kitchen exh isolation FCV-25-24, CWD 1182

ATWS may actuate during setup. This will cause the motor generator breakers (output) to open, if shut.

ANPS APPROVAL TO PROCEED_____

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9.0 DETAILED PROCEDURE: (continued) INITIAL

9.7 (continued)

2. Bypass Pressurizer Pressure ATWS module BA-X12 on the channel being tested. _____

3. Install the RTTS at the Pressurizer pressure transmitter to be tested, in accordance with Figure 1 for the test set connections and adjust the pressure as shown in Table 1.

   Performed by_____

4. Ensure/Place the Zero Power Mode Bypass switch, for the channel under test, to the OFF position. Reset the TM/LP trip unit. (Transmitter must be at the A1 pressure setting). _____

> CAUTION
> The order of removing and replacing ESG bistables is very important. Be very careful to remove and replace exactly in the order called out in this procedure.

5. Enable the SIAS trip. Remove the installed channel trips and blocks by performing the following steps:

   A. Bypass Pressurizer Pressure Bistable modules BA 106, 206, 306 and 406.

      Performed by_____ Verified by_____

   B. Remove the Pressurizer Pressure block by:

      1. In any two measurement channels, remove the Pressurizer Pressure Block modules BA-X07, where X is a 1, 2, 3 or 4 depending on the channel being worked.

      2. As soon as the Pressurizer Pressure block clears, reinstall the two Pressurizer Pressure Block modules.

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9.0 DETAILED PROCEDURE: (continued) INITIAL

9.7 (continued)

6. Set up ESG to trip SA SIAS module AM 503 and SA CIS module 513 by performing the following steps.

   A. On actuation cabinet SA place the TEST PERMISSIVE SWITCH to SIAS PRESS PRESS. _____

   B. On actuation Cabinet SA place the TEST GROUP SWITCH to GROUP 3. _____

   C. On actuation cabinet SA press and hold the TOP test pushbutton on actuation module AM 503. _____

   D. Remove the bypass on bistable X06 on the channel being tested. _____

7. Initiate the response time test by pushing PB-1 on the RTTS. _____

8. Release the TEST buttons being held on the ESG. Have Operations reset the A SIAS and A CIS at this time from RTGB 106. _____

9. From the printout on the SER, determine the time from when the test was initiated to when the RPS bistable tripped. If section 9.1 has been performed, Then add this time to the longest matrix time recorded on section 9.1. Record this value on the data sheet. Also, from the SER, determine the time from when the test was initiated to when the safeguards module tripped. Record this value on the data sheet. Include a copy of the SER printout with this procedure. _____ /R12

10. Disconnect the RTTS and return the pressurizer pressure transmitter to its normal configuration. Record on Table 1.

    Performed by_____

11. Place the Zero Power Mode Bypass switch back to the position found in step 9.7.4. _____

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9.0 DETAILED PROCEDURE: (continued) INITIAL

9.7 (continued)

12. Return the ESG to service by:

A. Have operations re-establish the SIAS block. Verify both A and B actuation cabinets are blocked. _____

Performed by_____ Verified by_____

B. Rebypass module BA-X06, Pressurizer Pressure Bistable.

Performed by_____ Verified by_____

C. Unbypass and remove the key from bistable BA-X12.

Performed by_____ Verified by_____

D. Return all safeguards switches moved (in Steps 9.7.6.A-C) above to operate.

Performed by_____ Verified by_____

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9.0 DETAILED PROCEDURE: (continued) INITIAL

9.8 Local Power Density

NOTE
Keys required for this Section include:
117 RPS NI Test Enable Key
62 RPS Cabinet Doors

1. On the N.I. RMSP Drawer

   A. Place the PR TEST switch to the Zero position. _____

   B. Place the Test Enable key switch in the TEST ENABLE position. _____

2. For the channel under test, turn both CB-1 A.C. power on the RMSP and NI Pwr Supply drawers OFF. Wait approximately one minute for the cable discharge before entering the drawer.

   Performed by_____ I.V._____

3. On the Rear of the N.I. RMSP Drawer

   A. Observing precaution 4.1, HIGH VOLTAGE, disconnect the cables at J12 and J13 on the rear of the RMSP and J4 on the NI Pwr Supply drawer.

      Performed by_____ I.V._____

   B. Place the NI Pwr Supply drawer J4, J12 and J13 cable on their discharge jacks.

      Performed by_____ I.V._____

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RESPONSE TIME TESTING

9.0 DETAILED PROCEDURE: (continued) INITIAL

9.8 (continued)

CAUTION
Do not exceed 2 MA output on current source.

4. Installation of Test Equipment

   A. Connect the current source. (Keithley 220 or equivalent) and test switch as shown in Figure 2 on connector J13.

      Performed by_____ I.V._____

   B. Turn CB-1 A.C. power, to the RMSP and NI Pwr Supply Drawers ON.

      Performed by_____ I.V._____

   C. Return the Test Enable key switch is in NORMAL and place the PR TEST switch to OPR. _____

5. A. Place the Zero Power Mode Bypass switch to OFF. _____

   B. Install a transmation on loop P-1102 for channel/under test, in accordance with Table 2; simulate a pressurizer pressure input to clear TM/LP, bistable trips & pre-trips (approximately 12.0 ma).

      Performed by_____ /R12

   C. Turn the test box switch ON and adjust the current until the High Power, LPD and TM/LP units are tripped. Current shall be negative polarity and shall NOT exceed 2 madc. _____ /R12

   D. Return the test box switch to OFF. _____ /R12

6. Initiate the response time test by setting the test switch to ON. _____

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9.0 DETAILED PROCEDURE: (continued) INITIAL

9.8 (continued)

7. From the printout on the SER, determine the time from when the test was initiated to when the LPD, High Power and TM/LP bistable tripped. If section 9.1 has been performed, Then add each time to the longest matrix time recorded in section 9.1 and record these times on the datasheet. Include a copy of the SER printout with this procedure. _____

8. On the N.I. RMSP Drawer

   A. Place the PR TEST switch to ZERO. _____

   B. Place the Test Enable key switch in the TEST ENABLE position. _____

   C. Turn CB-1 AC power, to the RMSP and NI Pwr Supply drawers to OFF.

      Performed by_____ Independently Verified by_____

   D. Reconnect the input cables J4, J12 and J13.

      Performed by_____ Independently Verified by_____

   E. Remove the simulated input signal installed in step 9.8.5D, P-1102, and restore the circuit to normal configuration, record on Table 2.

      Performed by_____

9. Turn CB-1 AC power, to the RMSP and NI Pwr Supply drawers ON.

   Performed by_____ Independently Verified by_____

10. Return the PR TEST switch to OPR.

    Performed by_____ Verified by_____

11. Return the Test Enable key switch to the NORMAL position.

    Performed by_____ Verified by_____

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9.0 DETAILED PROCEDURE: (continued) INITIAL

9.8 (continued)

12. Return the Zero Power Mode Bypass switch to the position required by Operations.

Performed by_____ Verified by_____

9.9 High Power and TM/LP (Temp.)

1. Refer to CWDs 381 through 384, and in accordance with Table 2. Lift and tag the 4 RTD input cables for the RPS channel under test.

Performed by_____

2. Connect 4 decade boxes, to simulate power operation of T_c=548 deg (approx. 420 ohms) and T_H=595 deg (approx. 434 ohms). _____

3. Place the Zero Power Mode Bypass switch in the OFF position. _____

4. A. Using a transmation, install a Transmation in accordance with Table 2 and simulate a pressurizer pressure signal (P-1102) to the TM/LP trip unit to remove the trip condition. (approximately 16 M.A.)

Performed by_____

B. Set the Decade Box for TC2 to zero ohms. _____

5. Connect the test box as shown in Figure 3 for RTD TC1. _____

6. Initiate the test by throwing the test switch from position A to B. _____

7. From the printout on the SER, determine the time from when the test was initiated to when the HI power and TM/LP trip units trip. If section 9.1 has been performed, Then add these times to the longest matrix time recorded in section 9.1 and record this on the data sheet. Include a copy of the SER printout with this procedure. _____ /R12

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9.0 DETAILED PROCEDURE: (continued) INITIAL

9.9 (continued)

8. A. Remove the test box from TC1. Connect it as shown in Figure 3 for RTD TC2. _____

B. Set the Decade Box for TC1 to zero ohms. _____

C. Set the Decade Box for TC2 to approximately 420 ohms. _____

9. Initiate the test by throwing the test switch from position A to B. _____

10. From the printout on the SER, determine the time from when the test was initiated to when the HI power and TM/LP trip units trip. Add these times to the longest matrix time recorded in section 9.1 and record this on the data sheet Include a copy of the SER printout with this procedure. _____

11. A. Remove the test box from TC2 and connect it as shown in Figure 3 for RTD TH1. _____

B. Set the Decade Box for TH2 to approximately 460 ohms. _____

C. Set the Decade Box for TH1 to approximately 412 ohms, verify TH on RPS is approximately 600°F. _____

12. Initiate the test by throwing the test switch from position B to A. _____

13. From the printout on the SER, determine the time from when the test was initiated to when the HI power and TM/LP trip units trip. If section 9.1 has been performed, Then add these times to the longest matrix time recorded in section 9.1 and record this on the data sheet. Include a copy of the SER printout with this procedure. _____ /R12

14. A. Remove the test box from TH1 and connect it as shown in Figure 3 for RTD TH2. _____

B. Set the Decade Box for TH1 to approximately 460 ohms. _____

C. Set the Decade Box for TH2 to approximately 412 ohms, verify TH on RPS is approximately 600°F. _____

15. Initiate the test by throwing the test switch from position B to A. _____

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9.0 DETAILED PROCEDURE: (continued) INITIAL

9.9 (continued)

16. From the printout on the SER, determine the time from when the test was initiated to when the HI power and TM/LP trip units trip. If section 9.1 has been performed, Then add these times to the longest matrix time recorded in section 9.1 and record this on the data sheet. Include a copy of the SER printout with this procedure. _____ /R12

17. Remove the test box and reland the cables lifted in step 9.9.1 and 9.9.5., record on Table 2.

    Performed by_____

18. Return the channel in test to Zero Power Mode Bypass switch ON. _____

9.10 ESG Refueling water storage tank level LT-07-2

NOTE
Keys required for this Section include:
63 ESG Cabinet Door
128 ESG Refuel LVL RAS

1. A. On the ESG, bypass the RWT bistable trip for the channel under test. (BA-X05) _____

   B. Install the response time test set (RTTS) at the RWT level transmitter to be tested in accordance with Figure 1 for the test set interconnections and Table 1 for the pressure settings on the RTTS.

   C. Use LIS-07-3 (CWD 296) for the SOE input cable. Record on Table 2.

      Performed by_____

2. A. On ESG cabinet SA, position the test permissive switch to RAS REFUELING LEVEL. _____

   B. Position the TEST GROUP switch to GROUP 5. (This group is not used, no components will be actuated.) _____

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9.0 DETAILED PROCEDURE: (continued) INITIAL

9.10 (continued)

3. A. On actuation cabinet SA, RAS actuation module group 5, press and hold the TOP black test pushbutton until RAS actuation. _____

B. Remove the bypass installed in 9.10.1.A above. (BA-X05) _____

C. Initiate the response time test by pushing PB-1 on the RTTS. _____

4. Reset the RAS actuation from the RTGB 106. _____

5. Bypass module BA-X05. _____

6. From the printout on the SER, determine the time from when the test was initiated to when the RAS module tripped. Record on the data sheet. Include a copy of the SER printout with this procedure. _____

7. A. Disconnect the RTTS and return the refueling water level transmitter to service. Record on Table 1.

B. Restore LIS-07-3 to its normal configuration. Record on Table 2.

Performed by_____

9.11 Review Data Sheet

1. A. Ensure the longest matrix time from section 9.1 is added to each RPS Bistable Trip Time and entered into the data sheet. /R12

B. Review the data sheet and verify that no RPS times exceeded the acceptable time and that no ESG times exceeded 1 second.

C. A copy of the data sheet must be submitted to Tech. Staff for procedure 0400050.

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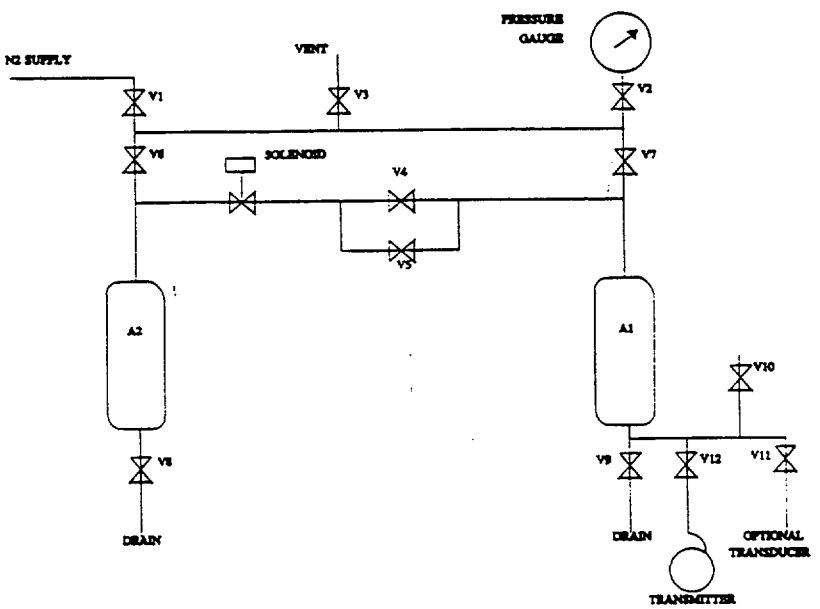
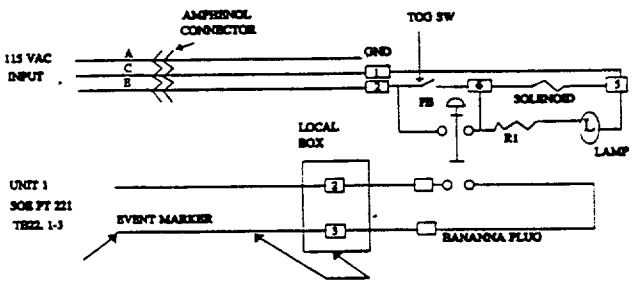
FIGURE 1A
PRESSURE TAP INTERCONNECTIONS





NOTE I
Control Room end of SOE test cables located under radio console. Jumper from radio console to SOE cabinet is above ceiling.

SP1-196 & SP1-197 Control Room end of the cable is located in the Calorimetric and Aux Cabinet

NOTE II
Field cables located in containment as follows:
Cable #17134, 45', A/SG by SIT Tanks, B1359
Cable #17136, 45', B/SG by SIT Tanks, B1433
Calbe #17156, 62', B/SG by SG Wall, B1098

Spare Field Cables located in RAB
Cable SP1-197, Conduit # 11187L, next to PS-23-4
Cable SP1-196, Conduit # 11186L, next to PS-23-5

NOTE III
1) Use only analog pressure gauges, selected for the range required for that transmitter being tested.
2) Isolate gauge prior to initiation of test, to protect it from potential slamming.

(1400053A.WPG)

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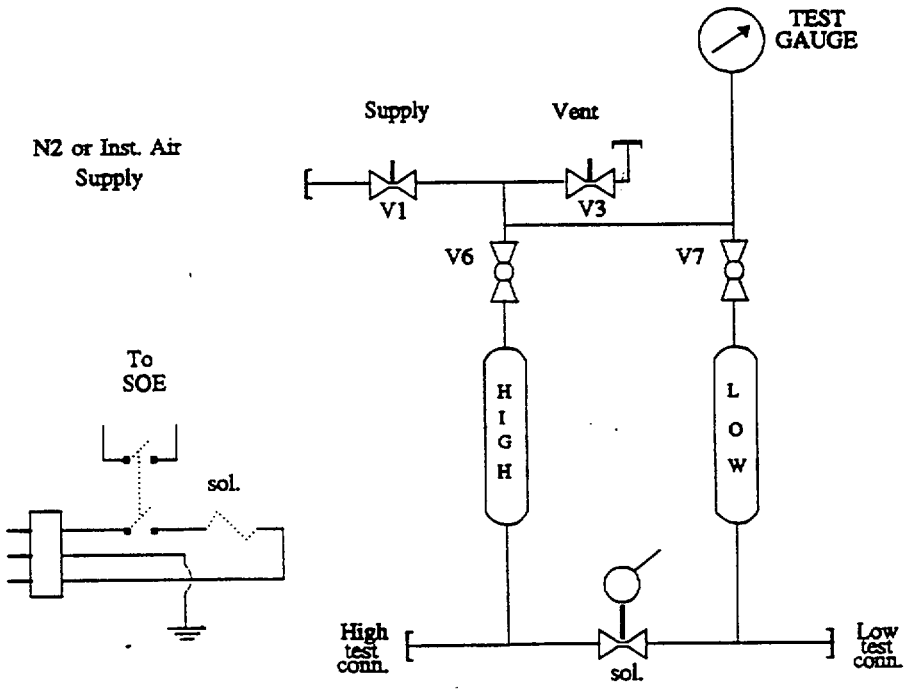
FIGURE 1B
PORTABLE LOW PRESSURE RESPONSE TIME TEST RIG



(1400053B.WPG)

NOTE

The High tank must always have the Higher pressure, due to solenoid valve seat sealing. For Decreasing trip setpoints, connect the High side test connection to the transmitter. For Increasing trip setpoints, connect the Low side test connection to the transmitter. Do NOT use the Portable Test Rig for PT-8013s, PT-8023s and PT-1102s. Connect the SOE wires using Figure 1A.

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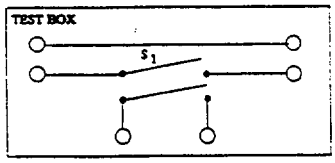
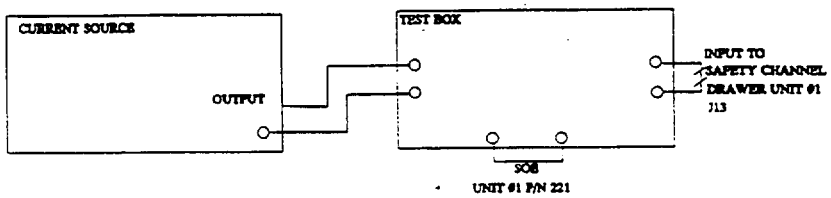
FIGURE 2
CURRENT SOURCE CONNECTIONS TO N.I. CHANNEL



SWITCH CLOSE TO TRIP



(1400053B.WPG)

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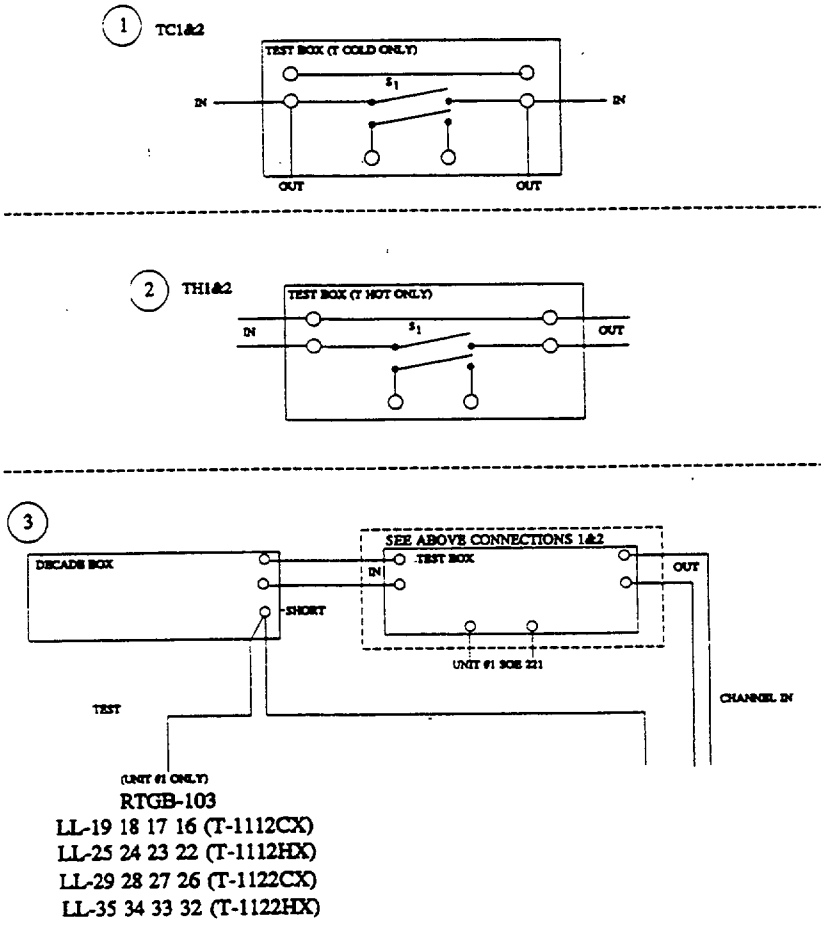
FIGURE 3
DECADE BOX INTERCONNECTIONS FOR HOT AND COLD LEG TEMPERATURES



RTGB-103
LL-19 18 17 16 (T-1112CX)
LL-25 24 23 22 (T-1112HX)
LL-29 28 27 26 (T-1122CX)
LL-35 34 33 32 (T-1122HX)

(1400053C.WPG)

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TABLE 1A
REACTOR PROTECTIVE SYSTEM TEST SET PRESSURE SETTING

Procedure Step	Function	Transmitter	Location	Setpoint	A1 Press.	A2 Press.	Installed by/ I.V. by	Removed by/ I.V. by
9.2.4	Hi Pzr Press	PT-1102A	RCB/66/S-23/E-34	1700 psi	1650 psi	1800 psi		
9.3.2	Hi Cont. Press	PT-07-2A	RAB/19/N-RA1/W-RAE	5.1 psi	0 psi	50 psi		
9.4.2.B	A Lo SG Press	PT-8013A	RCB/50/N-54/W-4	626 psi	650 psi	100 psi		
9.4.13	B Lo SG Press	PT-8023A	RCB/50/S-53/E-12	626 psi	650 psi	100 psi		
9.5.2	A Lo SG Lvl	LT-9013A	RCB/49/N-53/W-3	5.5 psi	4.25 psi	* 10.5 psi		
9.5.9	B Lo SG Lvl	LT-9023A	RCB/49/S-52/E-11	5.5 psi	4.25 psi	* 10.5 psi		
9.6.1	A Lo RCS Flow	PDT-1111A	RCB/67/N-28/E-11	28 psi	30 psi	0.0 psi		
9.6.8	B Lo RCS Flow	PDT-1121A	RCB/66/S-38/E-11	28 psi	30 psi	0.0 psi		
9.7.3	RPS TM/LP	PT-1102A	RCB/66/S-23/E-34	1890 psi	1920 psi	1200 psi		
	ESG Lo Pzr Press			1700 psi				
9.10.1.B	RWT Level	LT-07-2A	RWT/19/N-12/W-25	2.5 psi	3.0 psi	0.0 psi		

* Reverse output transmitter

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TABLE 1B
REACTOR PROTECTIVE SYSTEM TEST SET PRESSURE SETTING

Procedure Step	Function	Transmitter	Location	Setpoint	A1 Press.	A2 Press.	Installed by/ I.V. by	Removed by/ I.V. by
9.2.4	Hi Pzr Press	PT-1102B	RCB/27/S-24/E-50	1700 psi	1650 psi	1800 psi		
9.3.2	Hi Cont. Press	PT-07-2B	RAB/19/N-RA1/W-RAG	5.1 psi	0.0 psi	50 psi		
9.4.2.B	A Lo SG Press	PT-8013B	RCB/50/N-50/W-22	626 psi	650 psi	100 psi		
9.4.13	B Lo SG Press	PT-8023B	RCB/50/S-54/W-5	626 psi	650 psi	100 psi		
9.5.2	A Lo SG Lvl	LT-9013B	RCB/49/N-50/W-21	5.5 psi	4.25 psi	* 10.5 psi		
9.5.9	B Lo SG Lvl	LT-9023B	RCB/49/S-53/W-5	5.5 psi	4.25 psi	* 10.5 psi		
9.6.1	A Lo RCS Flow	PDT-1111B	RCB/67/N-37/W-11	28 psi	30 psi	0.0 psi		
9.6.8	B Lo RCS Flow	PDT-1121B	RCB/66/S-38/W-11	28 psi	30 psi	0.0 psi		
9.7.3	RPS TM/LP	PT-1102B	RCB/27/S-24/E-50	1890 psi	1920 psi	1200 psi		
	ESG Lo Pzr Press			1700 psi				
9.10.1.B	RWT Level	LT-07-2B	RWT/19/S-10/W-25	2.5 psi	3.0 psi	0.0 psi		

* Reverse output transmitter

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TABLE 1C
REACTOR PROTECTIVE SYSTEM TEST SET PRESSURE SETTING

Procedure Step	Function	Transmitter	Location	Setpoint	A1 Press.	A2 Press.	Installed by/ I.V. by	Removed by/ I.V. by
9.2.4	Hi Pzr Press	PT-1102C	RCB/27/S-24/E-50	1700 psi	1650 psi	1800 psi		
9.3.2	Hi Cont. Press	PT-07-2C	RAB/19/N-RA1/W-RAE	5.1 psi	0.0 psi	50 psi		
9.4.2.B	A Lo SG Press	PT-8013C	RCB/50/N-54/E-5	626 psi	650 psi	100 psi		
9.4.13	B Lo SG Press	PT-8023C	RCB/50/S-51/E-18	626 psi	650 psi	100 psi		
9.5.2	A Lo SG Lvl	LT-9013C	RCB/49/N-53/E-6	5.5 psi	4.25 psi	* 10.5 psi		
9.5.9	B Lo SG Lvl	LT-9023C	RCB/49/S-50/E-18	5.5 psi	4.25 psi	* 10.5 psi		
9.6.1	A Lo RCS Flow	PDT-1111C	RCB/67/N-37/E-11	28 psi	30 psi	0.0 psi		
9.6.8	B Lo RCS Flow	PDT-1121C	RCB/66/S-38/E-11	28 psi	30 psi	0.0 psi		
9.7.3	RPS TM/LP	PT-1102C	RCB/27/S-24/E-50	1890 psi	1920 psi	1200 psi		
	ESG Lo Pzr Press			1700 psi				
9.10.1.B	RWT Level	LT-07-2C	RWT/19/N-10/W-25	2.5 psi	3.0 psi	0.0 psi		

* Reverse output transmitter

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TABLE 1D
REACTOR PROTECTIVE SYSTEM TEST SET PRESSURE SETTING

Procedure Step	Function	Transmitter	Location	Setpoint	A1 Press.	A2 Press.	Installed by/ I.V. by	Removed by/ I.V. by
9.2.4	Hi Pzr Press	PT-1102D	RCB/66/S-26/E-32	1700 psi	1650 psi	1800 psi		
9.3.2	Hi Cont. Press	PT-07-2D	RAB/19/N-RA1/W-RAE	5.1 psi	0.0 psi	50 psi		
9.4.2.B	A Lo SG Press	PT-8013D	RCB/50/N-52/W-14	626 psi	650 psi	100 psi		
9.4.13	B Lo SG Press	PT-8023D	RCB/50/S-54/E-2	626 psi	650 psi	100 psi		
9.5.2	A Lo SG Lvl	LT-9013D	RCB/49/N-51/W-13	5.5 psi	4.25 psi	* 10.5 psi		
9.5.9	B Lo SG Lvl	LT-9023D	RCB/49/S-53/E-3	5.5 psi	4.25 psi	* 10.5 psi		
9.6.1	A Lo RCS Flow	PDT-1111D	RCB/67/N-37/W-11	28 psi	30 psi	0.0 psi		
9.6.8	B Lo RCS Flow	PDT-1121D	RCB/66/S-38/W-11	28 psi	30 psi	0.0 psi		
9.7.3	RPS TM/LP	PT-1102D	RCB/66/S-26/E-32	1890 psi	1920 psi	1200 psi		
	ESG Lo Pzr Press			1700 psi				
9.10.1.B	RWT Level	LT-07-2D	RWT/19/S-15/W-25	2.5 psi	3.0 psi	0.0 psi		

* Reverse output transmitter

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TABLE 2A
REACTOR PROTECTIVE SYSTEM TEST SET PRESSURE SETTING

Procedure Step	Transmitter	CWD	RTGB-Location	RTGB-Terminals Transmitter Input	Installed by	I.V. by	Removed by	I.V. by
9.4.4	PT-1102A	372	RTGB-106	HHH-1(+)/2(-)				
	PT-8023A	379	RTGB-106	KKK-1(+)/2(-)				
9.4.15	PT-8013A	378	RTGB-106	JJJ-7(+)/8(-)				
9.5.3	LT-0923A	377	RTGB-102	UU-8(+)/16(-)				
9.5.10	LT-9013A	376	RTGB-102	UU-1(+)/14(-)				
9.6.3	PDT-1121A	385	RTGB-103	LL-41(+)/40(-)				
9.6.10	PDT-1111A	385	RTGB-103	LL-36(+)/37(-)				
9.8.5.D	PT-1102A	372	RTGB-106	HHH-1(+)/2(-)				
9.9.1	TE-1112CA	381	RTGB-103	LL-16/17/18/19				
	TE-1112HA	381	RTGB-103	LL-22/23/24/25				
	TE-1122CA	381	RTGB-103	LL-26/27/28/29				
	TE-1122HA	381	RTGB-103	LL-32/33/34/35				
9.9.4.A	PT-1102A	372	RTGB-106	HHH-1(+)/2(-)				
9.10.1.C	LIS-07-3	296	RWT/19/ N-12/W-25	B154E-1(-)/2(+)				
			RTGB-106	NN-17(-)/18(+)				

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TABLE 2B
REACTOR PROTECTIVE SYSTEM TEST SET PRESSURE SETTING

Procedure Step	Transmitter	CWD	RTGB-Location	RTGB-Terminals Transmitter Input	Installed by	I.V. by	Removed by	I.V. by
9.4.4	PT-1102B	373	RTGB-106	QQQ-1(+)/2(-)				
	PT-8023B	379	RTGB-106	NNN-1(+)/2(-)				
9.4.15	PT-8013B	378	RTGB-106	PPP-7(+)/8(-)				
9.5.3	LT-0923B	377	RTGB-102	VV-8(+)/16(-)				
9.5.10	LT-9013B	376	RTGB-102	VV-1(+)/14(-)				
9.6.3	PDT-1121B	386	RTGB-103	MM-41(+)/40(-)				
9.6.10	PDT-1111B	386	RTGB-103	MM-36(+)/37(-)				
9.8.5.D	PT-1102B	373	RTGB-106	HHH-1(+)/2(-)				
9.9.1	TE-1112CB	382	RTGB-103	MM-16/17/18/19				
	TE-1112HB	382	RTGB-103	MM-22/23/24/25				
	TE-1122CB	382	RTGB-103	MM-26/27/28/29				
	TE-1122HB	382	RTGB-103	MM-32/33/34/35				
9.9.4.A	PT-1102A	373	RTGB-106	HHH-1(+)/2(-)				
9.10.1.C	LIS-07-3	296	RWT/19/ N-12/W-25	B154E-1(-)/2(+)				
			RTGB-106	NN-17(-)/18(+)				

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TABLE 2C
REACTOR PROTECTIVE SYSTEM TEST SET PRESSURE SETTING

Procedure Step	Transmitter	CWD	RTGB-Location	RTGB-Terminals Transmitter Input	Installed by	I.V. by	Removed by	I.V. by
9.4.4	PT-1102C	374	RTGB-106	RRR-1(+)/2(-)				
	PT-8023C	379	RTGB-106	TTT-1(+)/2(-)				
9.4.15	PT-8013C	378	RTGB-106	SSS-7(+)/8(-)				
9.5.3	LT-0923C	377	RTGB-102	WW-8(+)/15(-)				
9.5.10	LT-9013C	376	RTGB-102	WW-1(+)/14(-)				
9.6.3	PDT-1121C	387	RTGB-103	NN-41(+)/40(-)				
9.6.10	PDT-1111C	387	RTGB-103	NN-36(+)/37(-)				
9.8.5.D	PT-1102C	374	RTGB-106	RRR-1(+)/2(-)				
9.9.1	TE-1112CC	383	RTGB-103	NN-16/17/18/19				
	TE-1112HC	383	RTGB-103	NN-22/23/24/25				
	TE-1122CC	383	RTGB-103	NN-26/27/28/29				
	TE-1122HC	383	RTGB-103	NN-32/33/34/35				
9.9.4.A	PT-1102C	374	RTGB-106	RRR-1(+)/2(-)				
9.10.1.C	LIS-07-3	296	RWT/19/ N-12/W-25	B154E-1(-)/2(+)				
			RTGB-106	NN-17(-)/18(+)				

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TABLE 2D
REACTOR PROTECTIVE SYSTEM TEST SET PRESSURE SETTING

Procedure Step	Transmitter	CWD	RTGB-Location	RTGB-Terminals Transmitter Input	Installed by	I.V. by	Removed by	I.V. by
9.4.4	PT-1102D	375	RTGB-106	YYY-1(+)/2(-)				
	PT-8023D	379	RTGB-106	WWW-1(+)/2(-)				
9.4.15	PT-8013D	378	RTGB-106	XXX-7(+)/8(-)				
9.5.3	LT-0923D	377	RTGB-102	XX-8(+)/15(-)				
9.5.10	LT-9013D	376	RTGB-102	XX-1(+)/14(-)				
9.6.3	PDT-1121D	388	RTGB-103	PP-41(+)/40(-)				
9.6.10	PDT-1111D	388	RTGB-103	PP-36(+)/37(-)				
9.8.5.D	PT-1102D	375	RTGB-106	YYY-1(+)/2(-)				
9.9.1	TE-1112CD	384	RTGB-103	PP-16/17/18				
	TE-1112HD	384	RTGB-103	PP-22/23/24/25				
	TE-1122CD	384	RTGB-103	PP-26/27/28/29				
	TE-1122HD	384	RTGB-103	PP-32/33/34/35				
9.9.4.A	PT-1102D	375	RTGB-106	YYY-1(+)/2(-)				
9.10.1.C	LIS-07-3	296	RWT/19/ N-12/W-25	B154E-1(-)/2(+)				
			RTGB-106	NN-17(-)/18(+)				

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RESPONSE TIME TESTING

DATA SHEET

Unit 1 Channel _____

Procedure Step	Function	RPS Acceptable Times	RPS Bistable Trip Time	Actual Time Total RPS*	Actual Time ESG	Actual Time SEC.
9.1.3	AB Matrix	---	N/A		N/A	sec.
9.1.6	AC Matrix	---	N/A		N/A	sec.
9.1.9	AD Matrix	---	N/A		N/A	sec.
9.1.13	BC Matrix	---	N/A		N/A	sec.
9.1.16	BD Matrix	---	N/A		N/A	sec.
9.1.20	CD Matrix	---	N/A		N/A	sec.
9.2.13	P-1102 HI PZR Press	.90			N/A	sec.
9.3.6	P-07-2 HI Cont Press	1.40			SIAS_____ CIS_____	sec.
9.4.9	P-8013 Lo SG Press	.9			MSIS_____	sec.
	Asym S.G. Trip	.9			N/A	sec.
9.4.21	P-8023 Lo SG Press	.9			MSIS_____	sec.
	Asym S.G. Trip	.9			N/A	
9.5.6	L-9013 Lo S.G. Lvl	.9			N/A	sec.
9.5.13	L-9023 Lo S.G. Lvl	.9			N/A	sec.
9.6.5	P-1111 Lo Flow	1.025			N/A	sec.
9.6.12	P-1121 Lo Flow	1.025			N/A	sec.
9.7.9	P-1102 TM/LP & ESG Lo Pzr. Press	.9				sec.
9.8.7	N.I. LPD	.4			N/A	sec.
9.8.7	N.I. Hi Power	.4			N/A	sec.
9.8.7	N.I. TM/LP	.9			N/A	sec.
9.9.7	T-1112C Hi Power	.4			N/A	sec.
	TM/LP	.9			N/A	sec.
9.9.11	T-1122C Hi Power	.4			N/A	sec.
	TM/LP	.9			N/A	sec.
9.9.13	T-1112H Hi Power	.4			N/A	sec.
	TM/LP	.9			N/A	sec.
9.9.16	T-1122H Hr Pwr	.4			N/A	sec.
	TM/LP	.9			N/A	sec.
9.10.6	LT-07-2	1	N/A	N/A		sec.
9.3.12	P-07-2 HI-HI CONT PRESS	1	N/A	N/A		sec.

* Total RPS Actual Time = RPS Bistable Time + Longest Matrix Time From Section 9.1

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APPENDIX A
TABLE 3.3-2
REACTOR PROTECTIVE INSTRUMENTATION RESPONSE TIMES

FUNCTIONAL UNIT	RESPONSE TIME
1. Manual Reactor Trip	Not Applicable
2. Power Level - High	Less than or equal to 0.40 seconds * # and less than or equal to 8.0 seconds ##
3. Reactor Coolant Flow - Low	Less than or equal to 1.025 seconds
4. Pressurizer Pressure - High	Less than or equal to 0.90 seconds
5. Containment Pressure - High	Less than or equal to 1.40 seconds
6. Steam Generator Pressure - Low	Less than or equal to 0.90 seconds
7. Steam Generator Water Level - Low	Less than or equal to 0.90 seconds
8. Local Power Density - High	Less than or equal to 0.40 seconds * # and less than or equal to 8.0 seconds ##
9. Thermal Margin/Low Pressure	Less than or equal to 0.90 seconds * # and less than or equal to 8.0 seconds ##
9a. Steam Generator Pressure Difference - High	Less than or equal to 0.90 seconds
10. Loss of Turbine--Hydraulic Fluid Pressure - Low	Not Applicable
11. Wide Range Logarithmic Neutron Flux Monitor	Not Applicable

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* Neutron detectors are exempt from response time testing. Response time shall be measured from detector output or input of first electronic component in channel.

\# Response time does not include contribution of RTDs.

\## RTD response time only. This value is equivalent to the time interval required for the RTDs output to achieve 63.2% of its total change when subjected to a step change in RTD temperature.

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APPENDIX B
TABLE 3.3-5
ENGINEERED SAFETY FEATURES RESPONSE TIMES
(Page 1 of 3)

INITIATING SIGNAL AND FUNCTION	RESPONSE TIME IN SECONDS
1. Manual	
a. SIAS	
Safety Injection (ECCS)	Not Applicable
Containment Fan Coolers	Not Applicable
Feedwater Isolation	Not Applicable
Containment Isolation	Not Applicable
b. CSAS	
Containment Spray	Not Applicable
c. CIS	
Containment Isolation	Not Applicable
Shield Building Ventilation System	Not Applicable
d. RAS	
Containment Sump Recirculation	Not Applicable
e. MSIS	
Main Steam Isolation	Not Applicable
Feedwater Isolation	Not Applicable
f. AFAS	
Auxiliary Feedwater Actuation	Not Applicable

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TABLE 3.3-5
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INITIATING SIGNAL AND FUNCTION	RESPONSE TIME IN SECONDS
2. Pressurizer Pressure-Low	
a. Safety Injection (ECCS)	Less than or equal to 30.0*/19.5**
b. Containment Isolation ***	Less than or equal to 30.5*/20.5**
c. Containment Fan Coolers	Less than or equal to 30.0*/17.0**
d. Feedwater Isolation	Less than or equal to 60.0
3. Containment Pressure-High	
a. Safety Injection (ECCS)	Less than or equal to 30.0*/19.5**
b. Containment Isolation***	Less than or equal to 30.5*/20.5**
c. Shield Building Ventilation System	Less than or equal to 30.0*/14.0**
d. Containment Fan Coolers	Less than or equal to 30.0*/17.0**
e. Feedwater Isolation	Less than or equal to 60.0
4. Containment Pressure -- High-High	
a. Containment Spray	Less than or equal to 30.0*/18.5**

Table Notation

* Diesel generator starting and sequence loading delays included.
** Diesel generator starting and sequence loading delays not included. Offsite power available.
*** Not applicable to containment isolation valve I-MV-18-1.

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APPENDIX B
TABLE 3.3-5
ENGINEERED SAFETY FEATURES RESPONSE TIMES
(Page 3 of 3)

INITIATING SIGNAL AND FUNCTION	RESPONSE TIME IN SECONDS
5. Containment Radiation-High	
a. Containment Isolation***	Less than or equal to 30.5*/20.5**
b. Shield Building Ventilation System	Less than or equal to 30.0*/14.0**
6. Steam Generator Pressure-Low	
a. Main Steam Isolation	Less than or equal to 6.9
b. Feedwater Isolation	Less than or equal to 60.0
7. Refueling Water Storage Tank-Low	
a. Containment Sump Recirculation	Less than or equal to 91.5
8. Steam Generator Level-Low	
a. Auxiliary Feedwater	Greater than or equal to 205**, less than or equal to 305*

Table Notation

* Diesel generator starting and sequence loading delays included.
** Diesel generator starting and sequence loading delays not included. Offsite power available.
*** Not applicable to containment isolation valve I-MV-18-1.