ENCLOSURE 2

INDIAN POINT STATION

UNIT NO. 2

PT-M14A, REVISION 17

REACTOR PROTECTION LOGIC CHANNEL FUNCTIONAL TEST

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Indian Point Station
Unit No. 2
Revision ~~16~~ 17

TEST EQUIPMENT

1. Procedure Number and Title: PT-M14A Reactor Protection Logic Channel Functional Test

2. Suggested Equipment:

Description	Serial No. Or M&TE No.	Next Cal. Due Date	Used By: Initial/Date
Breaker Interlock Key	N/A	N/A	N/A
Flashlight	N/A	N/A	N/A
DVM			

Gauge Selection:

The range of a pressure gauge should be about 2 times the measured value. However, the range shall not exceed 3 times the maximum measured value.

Indian Point Station
Unit #2
Revision ~~16~~ 17

PT-M14A

REACTOR PROTECTION LOGIC CHANNEL FUNCTIONAL TEST

1.0 OBJECTIVE

To demonstrate the operability of the Reactor Protection System Logic relays.

2.0 PRECAUTIONS AND LIMITATIONS:

2.1 This test may be performed regardless of the plant operating status EXCEPT as indicated below:

a) The source range high flux trips can be tested only when the reactor power level is below 10^5 CPS.

b) The following conditions shall be present in order to perform the functional tests described herein:

1. At least three (3) reactor coolant pumps must be in service.
2. The pressurizer pressure must be above 1800 psig.
3. The pressurizer water level must be below 92% of span.
4. The turbine trip must be reset.

Functional tests performed in accordance with 2.1b.

Location in Procedure	Description
1. Para. 3.8	Source Range High Flux Trips, Table 1, Para. HH
2. Para. 3.9	Intermediate Range High Flux Trips, Table 2, Para. R
3. Para. 3.10	Power Range Low Range High Flux Trips, Table 3, Para. N.
4. Para. 3.18	Pressurizer Low Pressure Trips
5. Para. 3.19	Pressurizer High Water Level Trips
6. Para. 3.21	Reactor Coolant Low Flow Trips (2/4 Loops)

.7	(Para. 3.23)	Reactor Coolant Pump Circuit Breaker Trips (2/4 Pumps).
.8	(Para. 3.24)	6.9 KV Bus Undervoltage Trips.
.9	(Para. 3.25)	Turbine Autostop trips.

C) Reactor Power must be below the P-8 setpoint to perform the following functional tests.

Location in Procedure		Description
.1	(Para. 3.21)	Reactor Coolant Low Flow Trips (2/4 Loops)
.2	(Para. 3.23)	Reactor Coolant Pump Circuit Breaker TRips (2/4 Pumps)
.3	(Para. 3.27)	Verification of P-8 setpoint.

D) Four (4) reactor coolant pumps must be in operation to perform the following functional tests.

Location in Procedure		Description
.1	(Para. 3.20)	Reactor Coolant Low Flow Trip (Any Loop)
.2	(Para 3.22)	Reactor Coolant Pump Circuit Breaker Trip (Any Pump)
.3	(Para. 3.25)	Turbine Auto Stop

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E) Reactor Power must be below the P-7 setpoint (10% of full power) to perform the functional test associated with verification of the P-7 permissive, Para. 3.26 in the Procedure.

F) The RCS temperature must be above 375°F. to test the LoPar Temperature Protection Trip as per Para. 3.29.

2.2 Only one logic train may be tested at a time except as specified in Para. 3.9.Z throught 3.9 EE.

2.3 Under no circumstances shall both reactor trip bypass breakers be racked in at the same time.

NOTE: Bypass Breaker BYA is controlled by Train B and Breaker BYB is controlled by Train A.

2.4 All reactor trips must be cleared on the logic channel being tested.

2.5 During logic channel functional testing, various channel trip alarms will annunciate and various trip status lights will illuminate. It is not necessary to verify these actions since this has already been done during the analog channel testing phase, except as noted in the procedure.

2.6 Do not push in the test switches when these switches are in the left (normal) position.

2.7 After <u>each</u> coincidence logic test is completed, notify the SRO to reset the "First Out' Annunciator.

2.8 Technicians performing this test are required to complete Sections 3.0 on Page PT-M14A-69 and 4.0 on Page PT-M14A-70.

2.9 If portions of the test cannot be performed because it would require reducing power, the Operability Criteria shall not apply to those portions.

2.10 House Maintenance shall be notified every 6 months to perform M/P 16.33, Reactor Trip and BYpass Breakers P/M Semi-Annual Inspection, coincident with the normal performance of PT-M14A. The Bypass Breakers should be done one or two days prior to PT-M14A and the Reactor Trip Breakers should be done during PT-M14A (Sections 3.8 through 3.29).

2.11 The cognizant supervisor or his designee shall review the test for completeness and that the Test Results Section was completed accurately. After review, the cognizant supervisor or his designee shall sign and date in Section 5.0.

17 2.12 This procedure may be performed on less than the total number of components included if noted by the Test Engineer.

3.0 PROCEDURE

3.1 Unless specified otherwise, all logic test switches and indicating lamps are located in panel RLTRA for Channel A and RLTRB for Channel B.

3.2 The tables in this procedure are to be used in the following manner:

A. Column 2 (Action Initiated) describes the particular action to be performed such as pushing or rotating switches.

B. Column 1 (Permisssive Actuation Switches) describes the various test switches that must be simultaneously pushed with the switches in Column 2.

C. Letter designation in either Column 1 or 2 refer to the following conditions.:

R - Switch rotated to the right
P - Switch pushed
R/P - Switch rotated to the right and then push
L - Switch rotated to the left

D. Column 3 (test panel trip lamp on) refers to the test lamp associated with the switch actuation in Column 2.

E. Column 4 (Trip Bus Voltage Off) indicated when voltage should <u>not</u> exist (tripped condition) on the trip bus.

F. Column 5 (Remarks) if conditions of Column 3 and 4 are met for the switch actuations of Column 1 and 2 write an "S". If they are not met write a "U" and the condition <u>not met</u>.

G. Except where indicated otherwise, it is <u>not</u> necessary to maintain switches in the pushed position between steps.

<u>NOTE</u>: If the Reactor Trip Breaker is removed from the cubicle for Maintenance (M/P 16.33) during this test, the "Test Panel Trip Lamp Status" described in Column 3 of test tables will not function normally. To determine Trip Bus Voltage status described in Column 4 of test tables, install a D.C.V.M. on the 150 V.D.C. or higher scale* between Terminal Block RTA-1 (Wire No. ~~RTA)~~ and Terminal Block RD (Wire No. R2).
RTA-1 DRS 1/10/88

For the purpose of completing test table information the following shall apply:

* A Neon Test Light may be used.

D.C.V.M. Reading	Test Panel Trip Lamp ON	Trip Bus Voltage OFF	Reactor Protection
Approx. 125 VDC	NO	NO	Reset
Approx. 0 VDC	YES	YES	Tripped

Remove the D.C.V.M. prior to performing Step 3.31.

3.3 Obtain permission from Senior Watch Supervisor (SWS) to commence the test. The SWS shall initial below indicating that his permission is granted. Inform the Senior Reactor Operator (SRO) that the test is going to be performed. The SRO shall initial below indicating that he has been informed. The SRO is to be informed when the test is completed. The SRO shall initial under Section 4.0 on Page PT-M14A-70 indicating that he has been informed of the completion of the test.

Permission to initiate test. _____ SWS / Date

SRO Informed. _____ SRO / Date

	CHANNEL A	CHANNEL B
3.4 Unlock and open the panel door for the logic channel under test.		
3.5 Verify test panel power available indicating lights are illuminated.		
3.6 Verify all logic trip indicating lamps illuminate when depressed.		

NOTE: If preventive maintenance has been performed on the Bypass Breakers 52BYA or 52BYB, the maintenance must be complete and the breakers returned to their respective cubicles in the racked out and locked open position prior to proceeding with Step 3.7.

Breakers racked out and locked open: CH. A: _____ Signature / DATE

CH. B: _____ Signature / DATE

3.7 Prepare the Reactor Trip Breakers for logic channel testing as follows. Designations in parenthesis indicate Logic Channel B.

A) Verify RTA (RTB) Turb. Trip Monitor On.

Channel A_____ Initials Channel B_____ Initials

Verify BYA (BYB) Turb. Trip Monitor Off.

Channel A_____ Initials Channel B_____ Initials

B) Unlock, install control fuses and rack to the Test Position Bypass Breaker 52BYA (52BYB).

Channel A_____ Initials Channel B_____ Initials

C) Verify RTA (RTB) Turb. Trip Monitor On.

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Channel A_____ Initials Channel B_____ Initials

Verify BYA (BYB) Turb. Trip Monitor Off.

Channel A_____ Initials Channel B_____ Initials

D) In the Test Position close Bypass Breaker 52BYA (52BYB) from the local pushbutton at the Breaker.

Channel A_____ Initials Channel B_____ Initials

E) Verify Bypass Breaker 52BYA (52BYB) is closed by local observation of Breaker position.

Channel A_____ Initials Channel B_____ Initials

F) Verify RTA (RTB) Turb. Trip Monitor On.

Channel A_____ Initials Channel B_____ Initials

Verify BYA (BYB) Turb. Trip Monitor Off.

Channel A_____ Initials Channel B_____ Initials

G) Trip Bypass Breaker 52BYA (52BYB) via local pushbutton at the Breaker to validate its operability prior to placing the Breaker in service. Verify the Breaker is open by local observation of Breaker position.

Channel A_____ Initials Channel B_____ Initials

H) Verify RTA (RTB) Turb. Trip Monitor On.

Channel A_____ Initials Channel B_____ Initials

Verify BYA (BYB) Turb. Trip Monitor Off.

Channel A_____ Initials Channel B_____ Initials

I) Rack full into the Operate position Bypass Breaker 52BYA (52 BYB).

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Channel A_____ Initials Channel B_____ Initials

J) Verify RTA (RTB) Turb. Trip Monitor On.

Channel A_____ Initials Channel B_____ Initials

Verify BYA (BYB) Turb. Trip Monitor Off.

Channel A_____ Initials Channel B_____ Initials

K) Close Bypass Breaker 52BYA (52BYB) via pushbutton at the test panel.

Channel A_____ Initials Channel B_____ Initials

L) Verify RTA (RTB) Turb. Trip Monitor ~~On.~~ OFF / TPC-88-44T DRS 1/21/88

Channel A_____ Initials Channel B_____ Initials

Verify BYA (BYB) Turb. Trip Monitor Off.

Channel A_____ Initials Channel B_____ Initials

M) Verify Bypass Breaker 52BYA (52BYB) is closed by observing that the red indicating lamp is illuminated.

Channel A_____ Initials Channel B_____ Initials

N) Trip and reclose Bypass Breaker 52BYA (52BYB) at the test panel to validate its operability. Red indicating lamp is illuminated.

Channel A_____ Initials Channel B_____ Initials

O) Trip Reactor Trip Breaker RTA (52RTB) via pushbutton at the test panel and verify the breaker is open by observing that the green indicating lamp is illuminated.

Channel A_____ Initials Channel B_____ Initials

Verify RTA (RTB) Turb. Trip Monitor Off.

Channel A_____ Initials Channel B_____ Initials

Verify BYA (BYB) Turb. Trip Monitor On.

Channel A_____ Initials Channel B_____ Initials

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52RTA (52RTB) can be racked out and removed from the cubicle for Preventive Maintenance. The maintenance must be completed and the Breakers returned to their cubicles in the racked in and open position prior to performance of Section 3.31.

Were Breakers racked out and removed for PM?

Channel A: YES NO _____ Signature /Date

Channel B: YES NO _____ Signature /Date

If answer to Channels A & B above is YES, then verify the following:

Verify RTA (RTB) Turb. Trip Monitor Off.

Channel A_____ Initials Channel B_____ Initials

Verify BYA (BYB) Turb. Trip Monitor On.

Channel A_____ Initials Channel B_____ Initials

Was D.C.V.M. installed?

Channel A: YES NO _____ Signature /Date

Channel B: YES NO _____ Signature /Date

P) Place Channel A (Channel B) Reactor Protection Logic Key Interlock switch in the "Defeat" position. Verify that the red lamp on Unit 1 upper (Unit 2 upper) switchgear door illuminates and that "RTA & BYB Train A Defeat" (RTB & BYA Train B Defeat) alarm annunciates on SK panel.

Channel A_____ Initials

Channel B_____ Initials

TPC 18-1977

NOTE: If breaker 52 RTA(RTB) is racked out and fuses are removed for preventive maintenance, then red light will not be lit but alarm will actuate.

	Channel A	Channel B

3.8 High Flux Source Range

1. Record date when this seciton is started.

	Date	Date

2. This section is to be performed only when reactor power level is below 10^5 CPS. Verify reactor power level is below 10^5 CPS. _____ _____

3. On the logic test panel, rotate the Source Range Bypass Test switches 1/N 31B and 1/N 32B to the right and verify that their respective indicating lamps are illuminated. The source range high flux trips are now in the unbypassed mode. _____ _____

4. Verify tha the P-10 Permissive is in the unblocking condition by observing that the "Power Above P-10" lamp on the Flight Panel is extinguished. _____ _____

5. Perform the operations indicated in Table 1.

NOTE:

a) Steps 5Z through 5EE requires actuating switches in both logic trains A and B.

b) Prior to performing HH of Table 1 verify the following conditions are met:

1. At least three reactor coolant pumps in operation. _____ _____

2. Pressurizer water level is below 92%. _____ _____

3. Pressurizer pressure above 1800 psig. _____ _____

4. Turbine trip is reset. _____ _____

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Tabl
Source Range High Flux

3.8

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
a		Actuate SR High Flux Trip Sw. 1/N 31D (P)	YES	YES		YES	YES	
b		Release SR High Flux Trip Sw. 1/N 31D	NO	NO		NO	NO	
c		Actuate SR High Flux Trip Sw. 1/N 32D (P)	YES	YES		YES	YES	
d		Release SR High Flux Trip SW. 1/N 32D	NO	NO		NO	NO	
e		Energize SR Bypass Relay 31B by pushing sw. 1/N 31B (R/P)	NO	NO		NO	NO	
f	1/N 31B (R/P)	Actuate SR High Flux Trip Sw. 1/N 31D (P)	YES	NO		YES	NO	
g	1/N 31B (R)	Release SR High Flux Trip Sw. 1/N 31D	NO	NO		NO	NO	
h	1/N 31B (R/P)	Actuate SR High Flux Trip Sw. 1/N 32D (P)	YES	YES		YES	YES	
i	1/N 31B (R)	Release SR High Flux 1/N 32D and	NO	NO		NO	NO	
		SR Bypass Sw. 1/N 31B	YES	NO		YES	NO	
j		Energize SR Bypass Relay 32B by pushing Sw. 1/N 32B (R/P)	NO	NO		NO	NO	
k	1/N 32B (R/P)	Actuate SR High Flux Trip Sw. 1/N 31D (P)	YES	YES		YES	YES	
l	1/N 32B (R)	Release SR High Flux Trip Sw. 1/N 31D	NO	NO		NO	NO	
m	1/N 32B (R/P)	Actuate SR High Flux Trip Sw. 1/N 32 D (P)	YES	NO		YES	NO	
n	1/N 32B (R)	Release SR High Flux Trip Sw. 1/N 32D and	NO	NO		NO	NO	
		SR Bypass SW 1/N 32B	YES	NO		YES	NO	

3.8

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
o		Actuate P-6 and Manual SR Block as Follows						
p		Rotate Switch 1/N 35D to right, depress and maintain depressed	NO	NO		NO	NO	
q	1/N 35D (R/P)	Momentarily Position right and press SR Block Test Sw. 1/N 33A or 1/N 33B as applicable (R/P)	NO			NO		
r		Maintain 1/N 35D depressed until step s is completed. If this switch is released the source range permissive will return to the unblocked state and it will be necessary to repeat Steps o-q						
s	1/N 35D (R/P)	Actuate SR High Flux Trip 31D and (P)	YES	NO		YES	NO	
		SR High Flux Trip 32D (P)	YES	NO		YES	NO	
t	1/N 31D (P) 1/N 32D (P)	De-activate SR Manual Block by releasing 1/N 35D (Return left)	YES	YES		YES	YES	
u	Release 1/N 31D and 32D	Re-activate P-6 and Manual Block as Follows						
v		Rotate 1/N 36D Switch to Right, depress and Maintain depressed (R/P)	NO	NO		NO	NO	

Table 1 (Continued)
Source Range High Flux

3.8

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
w	1/N 36D (R/P)	Momentarily Position Right and press SR Block Test Switch 1/N 33A or 1/N 33B as applicable (R/P)	NO			NO		
x		Maintain 1/N 36D depressed until step DD is completed. If this switch is released the source range permissive will return to the unblocked state and it will be necessary to repeat steps u-w.						
y	1/N 36D (R/P)	Actuate SR High Flux Trip 1/N 31D and (P)	YES	NO		YES	NO	
		SR High Flux Trip 1/N 32D (P)	YES	NO		YES	NO	
z	1/N 31D (P)	Actuate IR Defeat Sw. Channel A on Flight Panel (P)	YES	NO		YES	NO	
AA	1/N 32D (P)	Release IR Defeat Sw.	NO	NO		NO	NO	
BB	1/N 36D (R/P)	Activate IR Defeat Sw. for Channel B on Flight Panel (P)	YES	NO		YES	NO	
CC		Release IR Defeat Sw.	NO	NO		NO	NO	
DD		Simultaneously Actuate Channel A and Channel B IR Defeat Sw. on Flight Panel (P)	YES	YES		YES	YES	
EE		Release IR Defeat Sw.	NO	YES		NO	YES	

Tabl (Continued)
Source Range High Flux

3.8

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
FF	1/N 36D R/P 1/N 31D (P) 1/N 32D (P)	Attempt to restore SR block by momentarily positioning 1/N 33A or 1/N 33B (as applicable) SR Block switch to the right and pushing. (R/P)	NO	NO		NO	NO	
GG	1/N 31D (P) 1/N 36D (R/P) 1/N 32D (P)	Release 1/N 33A or 1/N 33B (as applicable) and 1/N 36D (Return Left)	YES YES	YES		YES YES	YES YES	
HH	1/N 31D (P) 1/N 32D (P)	See Note 5b Actuate P-10 to block by positioning switches 1/N 42M and (R) 1/N 43M to the right (R)	YES YES	NO		YES YES	NO	
II		Release 1/N 31D and 1/N 32D and Return 1/N 42M and 1/N 43M to the left (L)	NO NO	NO		NO NO	NO	
JJ		Position SR Bypass Sw. 1/N 31B to the left (L)	YES*	NO		YES*	NO	
KK		Position SR Bypass Sw. 1/N 32B to the left (L)	YES*	NO		YES*	NO	

* If SR Bypass Switch on the NIS Racks is in the Bypass position, the Logic Panel Test Lamps will be extinguished.

3.9 High Flux Intermediate Range

1. Record reactor power level and date when this section was started

Channel A		Channel B	
% Power	Date	%Power	Da

2. On the logic test panel, rotate the intermediate range bypass test switches 1/N 35A and 1/N 36A to the right and verify their respective indicating lamps are illuminated. The intermediate range high flux trips are now in the unbypassed position.

Channel A	Channel

3. If reactor power is above 10% verify that the indicating lamps associated with IR switches 1/N 35D and 1/N 36D are not both illuminated and the lamp associated with 1/N 39A or 1/N 39B (as applicable) is not illuminated.

4. Position P-10 to unblock intermediate range trips by using either 4.a or 4.b, as applicable

   a) With Reactor Power Level Above 10%

      1) Rotate switches 1/N 41M, 1/N 42M and 1/N 43M to the right.

      2) Simultaneous push, then release the above switches.

      3) Reset the power range low range high flux trip by rotating to the right and pushing switch 1/N 47A.

      4) Release and rotate 1/N 47A to the left.

      5) Rotate 1/N 41M, 1/N 42M and 1/N 43M to the left.

   b) With Reactor Power Level Below 10%

      The P-10 permissive will be automatically unblocked. This may be verified by observing that the power above P-10 lamp on the flight panel is extinguished.

5. Perform the operations indicated in Table 2.

Note:

a) If reactor power level is above 25%, the intermediate range high flux trip bistables will be de-energized causing a reactor trip signal to occur. To test the channel under this condition, the Intermediate range High Flux trip relay test switches 1/N 35F and 1/N 36F must be positioned to the right and depressed to simulate an untripped condition. Column 1 is divided into two sections to specify permissive conditions required when above or below the 25% reactor power level.

b) "Reset" means to position the specified switch either to the left, when power level is less than 25%, or to the right and push when power level is greater than 25%. The indicating lamp associated with the test switch must be extinguished.

c) Prior to performing section r of Table 2 verify the following conditions:

	Channel A	Channel
1) At least three reactor coolant pumps are in operation.		
2) Pressurizer water level is below 92%		
3) Pressurizer pressure is above 1800 psig.		
4) Turbine trip reset		

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Inte diate Range High Flux Trip

3.9

Para.	Permissive Actuation Switches		Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Rema
	> 25%	<25%							
a	1/N36F(R/P)		Actuate I.R.High Flux Trip 1/N35F(R)	YES	YES		YES	YES	
b	1/N36F(R/P)		Reset 1/N 35F	NO	NO		NO	NO	
c	1/N35F(R/P)		Actuate IR High Flux Trip 1/N 36F (R)	YES	YES		YES	YES	
d	1/N35F(R/P)		Reset 1/N 36F	NO	NO		NO	NO	
e	1/N35F(R/P) 1/N36F(R/P)		Actuate I.R.Bypass 1/N 35A (R/P)	NO	NO		NO	NO	
f	1/N36F(R/P) 1/N35A(R/P)	1/N35A(R/P)	Actuate I.R.High Flux Trip 1/N 35F(R)	YES	NO		YES	NO	
g	1/N36F(R/P) 1/N35A(R/P)	1/N35A(R/P)	Reset 1/N 35F	NO	NO		NO	NO	
h	1/N35F(R/P) 1/N35A(R/P)	1/N35A(R/P)	Actuate I.R.High Flux Trip 1/N36F(R)	YES	YES		YES	YES	
i	1/N35F(R/P) 1/N35A(R/P)	1/N35A(R/P)	Reset 1/N 36F	NO	NO		NO	NO	
j	1/N35F(R/P) 1/N36F(R/P)		Release I.R.Bypass 1/N35A and maintain in right position(R)	YES	NO		YES	NO	
k	1/N35F(R/P) 1/N36F(R/P)		Actuate I.R.Bypass 1/N 36A (R/P)	NO	NO		NO	NO	
l	1/N36F(R/P) 1/N36A(R/P)	1/N36A(R/P)	Actuate I.R.HighFlux Trip 1/N 35F (R)	YES	YES		YES	YES	
m	1/N36F(R/P) 1/N36A(R/P)	1/N36A(R/P)	Reset 1/N 35F	NO	NO		NO	NO	
n	1/N35F(R/P) 1/N36A(R/P)	1/N36A(R/P)	Actuate I.R.High Flux Trip 1/N 36F (R)	YES	NO		YES	NO	
o	1/N35F(R/P) 1/N36A(R/P)	1/N36A(R/P)	Reset 1/N 36F	NO	NO		NO	NO	

Table 2 (Continued)
Intermediate Range High Flux Trip

3.9

Para.	Permissive Actuation Switches		Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remar
	> 25%	< 25%							
p	1/N35F(R/P) 1/N36F(R/P)		Release IR Bypass 1/N 36A and maintain in right position (R)	YES	NO		YES	NO	
q			Actuate 1/N35F(R) and 1/N 36F (R)	YES YES	YES		YES YES	YES	
r			(See Note 5c) Actuate 1/N41M(R) and 1/N 42M (R)	YES YES	YES		YES YES	YES	
s			Momentarily Actuate 1/N38A (R/P)	NO	NO		NO	NO	
t	1/N41P(R/P) 1/N42P(R/P) 1/N43P(R/P)		Simultaneously Actuate 1/N 41M (R/P) 1/N 42M (R/P)& 1/N 43M (R/P)	NO NO NO	YES		NO NO NO	YES	
u	1/N41P(R/P) 1/N42P(R/P) 1/N43P(R/P)		Release 1/N 41M (R) 1/N 42M (R) & 1/N 43M (R)	YES YES YES	YES		YES YES YES	YES	
v			Momentarily Actuate 1/N 38A(R/P)& 1/N 47A (R/P)	NO NO	NO		NO NO	NO	
w			Rotate 1/N 41M(L) 1/N 42M (L) and 1/N 43M to the left (L)	① ① ①			① ① ①		

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Inte[illegible]iate Range High Flux Trip

3.9

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remar
x		Rotate 1/N35A to the left (L)	YES ②			YES ②		
y		Rotate 1/N36A to the left (L)	YES ②			YES ②		
z		Rotate 1/N 35F to the left (L)	③			③		
aa		Rotate 1/N 36F to the left (L)	③			③		
bb		Rotate 1/N 38A to the left	YES			YES		
cc		Rotate 1/N 47A to the left	YES			YES		
dd		Position 1/N41P to the left	③			③		
ee		Position 1/N42P to the left	③			③		
ff		Position 1/N43P to the left	③			③		

① Lamp will be on if power > 10%; off if power < 10%
② Lamp will be off if bypass switch on IR NIS Drawer is in Bypass
③ Lamp will be on if power > 25%; off if power < 25%

3.10 <u>High Flux Power Range Low Range</u>

1. Record reactor power level and date this section was started.

Channel A		Channel B	
% Power	Date	% Power	Date

2. If reactor power is above 10% verify that indicating lamps associated with Intermediate range switches 1/N 35D and 1/N 36D are not both illuminated and the lamp associated with 1/N 39A or 1/N 39B (as applicable) is not illuminated.

Channel A	Channel

3. Position P-10 to unblock power range trips by using 3.a or 3.b, as applicable.

a) <u>With Reactor Power Above 10%</u>

1) Rotate switches 1/N 41M, 1/N 42M and 1/N 43M to the right.

2) Simultaneously push then release the above switches.

3) Reset the intermediate range permissive high flux trip by rotating to the right and pushing switch 1/N 38A.

4) Release and rotate 1/N 38A to the left.

5) Rotate 1/N 41M, 1/N 42M, 1/N 43M to the left.

b) <u>With Reactor Power Level Below 10%</u>

The P-10 permissive will be automatically unblocked. This may be verified by observing that the power above P-10 lamp on the flight panel is extinguished.

4. Perform the operations indicated in Table 3.

a) If reactor power level is above 25%, the power range high flux trip bistables will be de-energized causing a reactor trip signal to occur. To test the channel under this condition, the power range high flux trip relay test switches 1/N 41P, 1/N 42P, 1/N 43P and 1/N 44P must be positioned to the right and depressed to simulate an untripped condition. Column 1 is divided into two sections to specify permissive conditions required when above or below 25% reactor power.

b) "Reset" means to position the specified switch either to the left when power level is less than 25% or to the right and push when power level is greater than 25%. The indicating lamp associated with the test switch must be extinguished.

c) Prior to performing section n of Table 3, verify the following conditions.

	Channel A	Channel
1. At least three reactor coolant pumps are in operation.		
2. Pressurizer water level below 92%		
3. Pressurizer pressure above 1800 psig		
4. Turbine trip reset		

Table 3
Power Range Low Range High Flux

3.10

Para.	Permissive Actuation Switches		Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remar
	> 25%	< 25%							
a	1/N43P(R/P) 1/N44P(R/P)		Actuate L.R.High Flux Trip 1/N41P(R) and 1/N 42P (R)	YES YES	YES		YES YES	YES	
b	1/N43P(R/P) 1/N44P(R/P)		Reset High Flux Trip 1/N41P and 1/N 42P	NO	NO		NO	NO	
c	1/N42P(R/P) 1/N44P(R/P)		Actuate L.R.High Flux Trip 1/N41P(R) 1/N 43P (R)	YES YES	YES		YES YES	YES	
d	1/N42P(R/P) 1/N44P(R/P)		Reset 1/N 41P and 1/N 43P	NO	NO		NO	NO	
e	1/N42P(R/P) 1/N43P(R/P)		Actuate L.R.High Flux Trip 1/N41P (R) and 1/N44P (R)	YES YES	YES		YES YES	YES	
f	1/N42P(R/P) 1/N43P(R/P)		Reset 1/N44P and 1/N41P	NO	NO		NO	NO	
g	1/N41P(R/P) 1/N44P(R/P)		Actuate LR High Flux Trip 1/N42P and(R) 1/N 43P (R)	YES YES	YES		YES YES	YES	
h	1/N41P(R/P) 1/N44P(R/P)		Reset 1/N42P and 1/N43P	NO	NO		NO	NO	
i	1/N41P(R/P) 1/N43P(R/P)		Actuate LR High Flux Trip 1/N42P and (R) 1/N44P (R)	YES YES	YES.		YES YES	YES	
j	1/N41P(R/P) 1/N43P(R/P)		Reset 1/N42P and 1/N44P	NO	NO		NO	NO	
k	1/N41P(R/P) 1/N42P(R/P)		Actuate LR High Flux Trip 1/N43P and (R) 1/N44P (R)	YES YES	YES		YES YES	YES	

Table 3 (Continued)
Power Range Low Range High Flux

3.10

Para	Permissive Actuation Switches > 25%	Permissive Actuation Switches < 25%	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remar
l	1/N41P(R/P) 1/N42P(R/P)		Reset 1/N43P and 1/N44P	NO	NO		NO	NO	
m			Actuate LR High Flux Trips 1/N41P, 1/N42P, 1/N43P and 1/N44P (R)	YES	YES		YES	YES	
n			(See Note 4c) Actuate 1/N43M(R) and 1/N42M (R)	YES YES	YES		YES YES	YES	
o			Momentarily Actuate 1/N47A to put P-10 in Blocked Condition (R/P)	NO	NO		NO	NO	
p	1/N35F(R/P) 1/N36F(R/P)		Simultaneously Actuate 1/N42M(R/P) 1/N43M(R/P) and 1/N44M(R/P)	NO NO NO	YES		NO NO NO	YES	
q	1/N35F(R/P) 1/N36F(R/P)		Release 1/N42M(R) 1/N43M(R) and 1/N44M(R)	YES YES YES	YES		YES YES YES	YES	
r			Momentarily Actuate 1/N38A (R/P) and 1/N47A (R/P)	NO NO	NO		NO NO	NO	
s			Rotate 1/N42M 1/N43M and 1/N44M to the left (L)	① ① ①			① ① ①		
t			Rotate 1/N35F to the left (L)	②			②		

3.10

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remar
u		Rotate 1/N36F (L) to the left	②			②		
v		Rotate 1/N38A (L) to the left	YES			YES		
w		Rotate 1/N47A to the left (L)	YES			YES		
x		Rotate 1/N41P to the left (L)	②			②		
y		Rotate 1/N42P to the left (L)	②			②		
z		Rotate 1/N43P to the left (L)	②			②		
aa		Rotate 1/N44P to the left (L)	②			②		

① Lamp will be on if power > 10%; off if Power < 10%.
② Lamp will be on if power level is > 25%; off if power level < 25%.

3.11 Power Range High Range High Flux Trip

1. Record power level and date this section was started

Channel A		Channel B	
%Power	Date	%Power	Date

2. Perform the operations indicated in Table 4.

Table 4
Power Range High Range High Flux

3.11

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
a		Actuate High Flux Power Range 1/N41R(P) and 1/N42R (P)	YES YES	YES		YES YES	YES	
b		Release 1/N41R and 1/N42R	NO NO	NO		NO NO	NO	
c		Actuate High Flux Pwr.Range 1/N41R(P) and 1/N43R (P)	YES YES	YES		YES YES	YES	
d		Release 1/N41R and 1/N43R	NO NO	NO		NO NO	NO	
e		Actuate High Flux Pwr.Range 1/N41R(P) and 1/N44R (P)	YES YES	YES		YES YES	YES	
f		Release 1/N41R and 1/N44R	NO NO	NO		NO NO	NO	
g		Actuate High Flux Pwr.Range 1/N42R (P) and 1/N43R (P)	YES YES	YES		YES YES	YES	
h		Release 1/N42R and 1/N43R	NO NO	NO		NO NO	NO	
i		Actuate High Flux Pwr.Range 1/N42R(P) and 1/N44R (P)	YES YES	YES		YES YES	YES	
j		Release 1/N42R and 1/N44R	NO NO	NO		NO NO	NO	
k		Actuate High Flux Pwr.Range 1/N43R and 1/N44R	YES YES	YES		YES YES	YES	
l		Release 1/N43R and 1/N44R	NO NO	NO		NO NO	NO	

3.12 Overpower ΔT

	Channel A	Channel
1. Record date this section was started.	Date	Date
2. Perform operations indicated in Table 5.		

3.13 Overtemperature ΔT

1. Record date this section was started.	Date	Date
2. Perform the operations indicated in Table 6.		

3.14 Safety Injection

1. Record date this section was started.	Date	Date
2. Push SIAM-1 switch and verify associated indicating lamp illuminates and trip bus voltage is off.		
3. Release SIAM-1 and verify associated indicating lamp extinguishes.		
4. Push SIAM-2 switch and verify associated indicating lamp illuminates and trip bus voltage is off.		
5. Release SIAM-2 and verify associated indicating lamp extinguishes.		

3.15 Low S.G. Water Level and SF/FWF Mismatch

1. Record date test was started.	Date	Date
2. Perform the operations indicated in Table 7.		

3.16 Low-Low Steam Generator Water Level

1. Record date test was started.	Date	Dat
2. Perform operations indicated in Table 8.		

Table 5
Overpower ΔT

3.12

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remar
a		Actuate Overpower ΔT Sw. 1/N411C (P) and 1/N421C (P)	YES / YES	YES		YES / YES	YES	
b		Release 1/N411C and 1/N421C	NO / NO	NO		NO / NO	NO	
c		Actuate Overpower ΔT Sw. 1/N411C (P) and 1/N431C (P)	YES / YES	YES		YES / YES	YES	
d		Release 1/N411C and 1/N431C	NO / NO	NO		NO / NO	NO	
e		Actuate Overpower ΔT Sw. 1/N411C (P) and 1/N441C (P)	YES / YES	YES		YES / YES	YES	
f		Release 1/N411C and 1/N441C	NO / NO	NO		NO / NO	NO	
g		Actuate Overpower ΔT Sw. 1/N421C (P) and 1/N431C (P)	YES / YES	YES		YES / YES	YES	
h		Release 1/N421C and 1/N431C	NO / NO	NO		NO / NO	NO	
i		Actuate Overpower ΔT Sw. 1/N421C (P) and 1/N441C (P)	YES / YES	YES		YES / YES	YES	
j		Release 1/N421C and 1/N441C	NO / NO	NO		NO / NO	NO	
k		Actuate Overpower ΔT Sw. 1/N431C (P) and 1/N441C (P)	YES / YES	YES		YES / YES	YES	
l		Release 1/N431C 1/N441C	NO / NO	NO		NO / NO	NO	

Table
Overt[illegible]erature ΔT

3.13

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remar
a		Actuate Overtemp ΔT Switch 1/N 411A (P) and 1/N 421A (P)	YES YES	YES		YES YES	YES	
b		Release 1/N411A and 1/N 421A	NO NO	NO		NO NO	NO	
c		Actuate Overtemp ΔT Switch 1/N 411A (P) and 1/N 431A (P)	YES YES	YES		YES YES	YES	
d		Release 1/N 411A and 1/N 431A	NO NO	NO		NO NO	NO	
e		Actuate Overtemp ΔT Switch 1/N 411A (P) and 1/N 441A (P)	YES YES	YES		YES YES	YES	
f		Release 1/N 411A and 1/N 441A	NO NO	NO		NO NO	NO	
g		Actuate Overtemp ΔT Switch 1/N 421A (P) and 1/N 431A (P)	YES YES	YES		YES YES	YES	
h		Release 1/N 421A and 1/N 431A	NO NO	NO		NO NO	NO	
i		Actuate Overtemp ΔT Switch 1/N 421A and (P) 1/N 441A (P)	YES YES	YES		YES YES	YES	
j		Release 1/N 421A and 1/N 441A	NO NO	NO		NO NO	NO	
k		Actuate Overtemp ΔT Switch 1/N 431A and (P) 1/N 441A (P)	YES YES	YES		YES YES	YES	
l		Release 1/N 431A and 1/N 441A	NO NO	NO		NO NO	NO	

Table 7
Low S.G. Water Level and S/F / FWF Mismatch

3.15

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
a		Actuate Low Level Sw. LC-417K(P) and Mismatch Sw. FC-418D (P)	YES YES	YES		YES YES	YES	
b		Release LC-417K and FC-418D	NO NO	NO		NO NO	NO	
c		Actuate Low Level Sw. LC-417G(P) and Mismatch Sw. FC-418F (P)	YES YES	YES		YES YES	YES	
d		Release LC-417G and FC-418F	NO NO	NO		NO NO	NO	
e		Actuate Low Level Sw. LC-427K(P) and Mismatch Sw. FC-428F (P)	YES YES	YES		YES YES	YES	
f		Release LC-427K and FC-428F	NO NO	NO		NO NO	NO	
g		Actuate Low Level Sw. LC-427G(P) and Mismatch Sw. FC-428D (P)	YES YES	YES		YES YES	YES	
h		Release LC-427G and FC-428D	NO NO	NO		NO NO	NO	
i		Actuate Low Level Sw. LC-437K and Mismatch Sw. FC-438F	YES YES	YES		YES YES	YES	
j		Release LC-437K and FC-438F	NO NO	NO		NO NO	NO	
k		Actuate Low Level Sw. LC-437G(P) and Mismatch Sw. FC-438D (P)	YES YES	YES		YES YES	YES	
l		Release LC-437G and FC-438D	NO NO	NO		NO NO	NO	
m		Actuate Low Level Sw. LC-447K(P) and Mismatch Sw. FC-448D (P)	YES YES	YES		YES YES	YES	
n		Release LC-447K and FC-448D	NO NO	NO		NO NO	NO	
o		Actuate Low Level Sw. LC-447G and Mismatch Sw. FC-448F	YES YES	YES		YES YES	YES	
p		Release LC-447G and FC-448F	NO NO	NO		NO NO	NO	

Table [illegible]
Low-L[illegible] Steam Generator Water Level

3.16

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remar
a		Actuate Low Level Sw. LC-417B (P) and LC-417D (P) *	YES YES	YES		YES YES	YES	
b		Release LC-417B and LC-417D	NO NO	NO		NO NO	NO	
c		Actuate Low Level Sw. LC-417B (P) and LC-417F (P) *	YES YES	YES		YES YES	YES	
d		Release LC-417B and LC-417F	NO NO	NO		NO NO	NO	
e		Actuate Low Level Sw. LC-417D (P) and LC-417F (P) *	YES YES	YES		YES YES	YES	
f		Release LC-417D and LC-417F	NO NO	NO		NO NO	NO	
g		Actuate Low Level Sw. LC-427B (P) and LC-427D (P) *	YES YES	YES		YES YES	YES	
h		Release LC-427B and LC-427D	NO NO	NO		NO NO	NO	
i		Actuate Low Level Sw. LC-427B (P) and LC-427F (P) *	YES YES	YES		YES YES	YES	
j		Release LC-427B and LC-427F	NO NO	NO		NO NO	NO	
k		Actuate Low Level Sw. LC-427D (P) and LC-427F * (P)	YES YES	YES		YES YES	YES	
l		Release LC-427D and LC-427F	NO NO	NO		NO NO	NO	
m		Actuate Low Level Sw. LC-437B (P) and LC-437D (P) *	YES YES	YES		YES YES	YES	
n		Release LC-437B and LC-437D	NO NO	NO		NO NO	NO	
o		Actuate Low Level Sw. LC-437B (P) and LC-437F (P) *	YES YES	YES		YES YES	YES	
p		Release LC-437B and LC-437F	NO NO	NO		NO NO	NO	

* SEE NOTE ON NEXT PAGE.

Table [illegible]
Low-[illegible] Steam Generator Water Level

3.16

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
q		Actuate Low Level Sw. LC-437D (P) and LC-437F (P) *	YES YES	YES		YES YES	YES	
r		Release LC-437D and LC-437F	NO NO	NO		NO NO	NO	
s		Actuate Low Level Sw. LC-447B (P) and LC-447D (P) *	YES YES	YES		YES YES	YES	
t		Release LC-447B and LC-447D	NO NO	NO		NO NO	NO	
u		Actuate Low Level Sw. LC-447B (P) and LC-447F * (P)	YES YES	YES		YES YES	YES	
v		Release LC-447B and LC-447F	NO NO	NO		NO NO	NO	
w		Actuate Low Level Sw. LC-447D (P) and LC-447F (P) *	YES YES	YES		YES YES	YES	
x		Release LC-447D and LC-447F	NO NO	NO		NO NO	NO	

* WHEN ACTUATING LOW LEVEL SWITCHES, VERIFY THAT APPROX. 125 VDC EXISTS BETWEEN THE INDICATED POINTS. RECORD RESULTS ON PAGE PT-M14A-29A.

Table 8 (Continued)

Low-Low Steam Generator Water Level

3.16 (Continued)

When actuating Low-Low Level Switches, verify that approximately 125 VDC exists between the indicated points. (Ref. Print 9231-LL-3118-20)

	Test Points	125 VDC Exists
Train A		
SG 21	417 F-Y 6 to 417 B-Y 2	_____
SG 22	427 F-Y 6 to 427 B-Y 2	_____
SG 23	437 F-Y 6 to 437 B-Y 2	_____
SG 24	447 F-Y 6 to 447 B-Y 1	_____
Train B		
SG 21	417 F-Y 6 to 417 B-Y 2	_____
SG 22	427 F-Y 6 to 427 B-Y 2	_____
SG 23	437 F-Y 6 to 437 B-Y 2	_____
SG 24	447 F-Y 6 to 447 B-Y 2	_____

(Next page is PT-M14A-30)

3.17 Pressurizer High Pressure

	Channel A	Channel
1. Record date this section started.		
	Date	Date
2. Perform the operations indicated in Table 9.		

3.18 Pressurizer Low Pressure

1. Record date this section was started.		
a. Record reactor power level.		
2. If reactor power is less than 10% rotate 1/N 41M and 1/N 42M to the right to unblock the P-7 permissive.		
3. Pressurizer pressure must be above 1800 psig to test low pressure logic relays. Verify pressurizer pressure is above 1800 psig.		
4. Verify at least three reactor coolant pumps are in operation.		
5. Verify turbine trip is reset.		
6. Verify pressurizer level below 92%		
7. Perform operations indicated in Table 10.		

Tab[illegible]9

Pre[illegible]izer High Pressure Trip

3.17

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Test Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Test Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remar
a		Actuate High Press Sw. PC-455B (P) and PC-456B (P)	YES YES	YES		YES YES	YES	
b		Release PC-455B and PC-456B	NO NO	NO		NO NO	NO	
c		Actuate High Press Sw. PC-455B (P) and PC-457B (P)	YES YES	YES		YES YES	YES	
d		Release PC-455B and PC-457B	NO NO	NO		NO NO	NO	
e		Actuate High Press Sw. PC-456B (P) and PC-457B (P)	YES YES	YES		YES YES	YES	
f		Release PC-456B and PC-457B	NO NO	NO		NO NO	NO	

Tab[illegible]0
Pres[illegible]izer Low Pressure Trip

3.18

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
a		Actuate Low Press Sw. PC-455A (P) and PC-456A (P)	YES YES	YES		YES YES	YES	
b		Release PC-455A and PC-456A	NO NO	NO		NO NO	NO	
c		Actuate Low Press Sw. PC-455A (P) and PC-457A (P)	YES YES	YES		YES YES	YES	
d		Release PC-455A and PC-457A	NO NO	NO		NO NO	NO	
e		Actuate Low Press Sw. PC-455A (P) and PC-474A (P)	YES YES	YES		YES YES	YES	
f		Release PC-455A and PC-474A	NO NO	NO		NO NO	NO	
g		Actuate Low Press Sw. PC-456A (P) and PC-457A (P)	YES YES	YES		YES YES	YES	
h		Release PC-456A and PC-457A	NO NO	NO		NO NO	NO	
i		Actuate Low Press Sw. PC-456A (P) and PC-474A (P)	YES YES	YES		YES YES	YES	
j		Release PC-456A and PC-474A	NO NO	NO		NO NO	NO	
k		Actuate Low Press Sw. PC-457A (P) and PC-474A (P)	YES YES	YES		YES YES	YES	
l		Release PC-457A and PC-474A	NO NO	NO		NO NO	NO	
m		Position 1/N41M and 1/N42M to the left if previously actuated (1)	NO NO			NO NO		

(1) If previously rotated to the right.

3.19 Pressurizer High Water Level

	Channel A	Channel
1. Pressurizer water level must be below 92% to test the high water level logic relays. Verify pressure level is below 92%.		
2. Record date this section was started		
a. Record reactor power level		
3. If reactor power is less than 10% rotate 1/N 41M and 1/N 42M to the right to unblock the P-7 permissive.		
4. Verify at least three reactor coolant pumps must be in operation.		
5. Verify Turbine Trip reset.		
6. Verify pressurizer pressure above 1800 psig.		

7. Perform the operations indicated in Table 11.

Table 1[illegible]
Pressu[illegible]r High Water Level

3.19

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remark
a		Actuate Press Hi Water Level Sw. LC-459A and (P)	YES	YES		YES	YES	
		LC-460A (P)	YES			YES		
b		Release LC-459A and	NO	NO		NO	NO	
		LC-460A	NO			NO		
c		Actuate Press Hi Water Level Sw. LC-459A and (P)	YES	YES		YES	YES	
		LC-461A (P)	YES			YES		
d		Release LC-459A and	NO	NO		NO	NO	
		LC-461A	NO			NO		
e		Actuate Hi Water Level Sw. LC-460A (P)	YES	YES		YES	YES	
		and LC-461A (P)	YES			YES		
f		Release LC-460A and	NO	NO		NO	NO	
		LC-461A	NO			NO		
g		Rotate 1/N 41M and	NO			NO		
		1/N 42M to the left if	NO			NO		
		previously rotated to the right						

3.20 Reactor Coolant Low Flow (Any Loop)

3.20.1 Record date this section was started.

_____ _____
Channel A Channel B

3.20.1.A Record reactor power level.

_____ _____
Channel A Channel B

3.20.2 Verify all four reactor coolant pumps are in operation.

_____ _____
Channel A Channel B

3.20.3 Perform the operations indicated in Table 12.

3.20.3.A The P-8 permissive is to be unblocked by pushing in 1/N 41N and 1/N 42N if power is below 20%. 1R17

_____ _____
Channel A Channel B

Table [illegible]
React[illegible]oolant Low Flow Loop 21

3.20

Para.	Perm. Act. Sw. if < 50%	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remar
a	1/N41N(P) 1/N42N(P)	Actuate Low Flow Sw. FC-414(P) and FC-415(P)	YES YES	YES		YES YES	YES	
b	1/N41N(P) 1/N42N(P)	Release FC-414 and FC-415	NO NO	NO		NO NO	NO	
c	1/N41N(P) 1/N42N(P)	Actuate Low Flow Sw. FC-414(P) and FC-416(P)	YES YES	YES		YES YES	YES	
d	1/N41N(P) 1/N42N(P)	Release FC-414 and FC-416	NO NO	NO		NO NO	NO	
e	1/N41N(P) 1/N42N(P)	Actuate Low Flow Sw. FC-415(P) and FC-416(P)	YES YES	YES		YES YES	YES	
f	1/N41N(P) 1/N42N(P)	Release FC-415 and FC-416	NO NO	NO		NO NO	NO	
g		Release 1/N 41N and 1/N 42N	① ①			① ①		
h		Perform this step if Power below P-8 lamp on Flight Panel is illuminated.						
		Actuate Low Flow Sw. FC-415(P) and FC-416(P)	YES YES	NO		YES YES	NO	
i		Release FC-415 and FC-416	NO NO	NO		NO NO	NO	

① Lamp will be illuminated if Reactor Power Level is above the P-8 Setpoint, Lamp will be extinguished if Reactor Power Level is below the P-8 Setpoint.

Table 12 (Continued)
Reactor Coolant Low Flow Loop 22

3.20

Para.	Perm. Act. Sw. if < 50%	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
a	1/N41N(P)	Actuate Low Flow Sw. FC-424(P)	YES	YES		YES	YES	
	1/N42N(P)	and FC-425(P)	YES			YES		
b	1/N41N(P)	Release FC-424 and	NO	NO		NO	NO	
	1/N42N(P)	FC-425	NO			NO		
c	1/N41N(P)	Actuate Low Flow Sw. FC-424(P)	YES	YES		YES	YES	
	1/N42N(P)	and FC-426(P)	YES			YES		
d	1/N41N(P)	Release FC-424 and	NO	NO		NO	NO	
	1/N42N(P)	FC-426	NO			NO		
e	1/N41N(P)	Actuate Low Flow Sw. FC-425(P)	YES	YES		YES	YES	
	1/N42N(P)	and FC-426(P)	YES			YES		
f	1/N41N(P)	Release FC-425 and	NO	NO		NO	NO	
	1/N42N(P)	FC-426	NO			NO		
g		Release 1/N 41N and	①			①		
		and 1/N 42N	①			①		
h		Perform this step if Power below P-8 lamp is ILLUMINATED						
		Actuate Low Flow Sw. FC-425(P)	YES	NO		YES	NO	
		and FC-426(P)	YES			YES		
i		Release FC-425 and	NO	NO		NO	NO	
		FC-426	NO			NO		

① Lamp will be illuminated if Reactor Power Level is above the P-8 Setpoint; Lamp will be extinguished if Reactor Power Level is below the P-8 Setpoint.

Table 12 (Continued)
Reactor Coolant Low Flow Loop 23

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3.20

Para.	Perm: Act. Sw. if < 50%	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
a	1/N41N(P) 1/N42N(P)	Actuate Low Flow Sw. FC-434(P) and FC-435(P)	YES YES	YES		YES YES	YES	
b	1/N41N(P) 1/N42N(P)	Release FC-434 and FC-435	NO NO	NO		NO NO	NO	
c	1/N41N(P) 1/N42N(P)	Actuate Low Flow Sw. FC-434(P) and FC-436(P)	YES YES	YES		YES YES	YES	
d	1/N41N(P) 1/N42N(P)	Release FC-434 and FC-436	NO NO	NO		NO NO	NO	
e	1/N41N(P) 1/N42N(P)	Actuate Low Flow Sw. FC-435(P) and FC-436(P)	YES YES	YES		YES YES	YES	
f	1/N41N(P) 1/N42N(P)	Release FC-435 and FC-436	NO NO	NO		NO NO	NO	
g		Release 1/N 41N and 1/N 42N	① ①			① ①		
h		Perform this step if Power below P-8 lamp is illuminated Actuate Low Flow Sw. FC-435(P) and FC-436(P)	YES YES	NO		YES YES	NO	
i		Release FC-435 and FC-436	NO NO	NO		NO NO	NO	

① Lamp will be illuminated if Reactor Power Level is above the P-8 Setpoint; Lamp will be extinguished if Reactor Power Level is below the P-8 Setpoint.

Table 12 (Continued)
Reactor Coolant Low Flow Loop 24

3.20

Para.	Perm. Act. Sw. If < 50%	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remar
a	1/N41N(P) 1/N42N(P)	Actuate Low Flow Sw. FC-444(P) and FC-445(P)	YES YES	YES		YES YES	YES	
b	1/N41N(P) 1/N42N(P)	Release FC-444 and FC-445	NO NO	NO		NO NO	NO	
c	1/N41N(P) 1/N42N(P)	Actuate Low Flow Sw. FC-444(P) and FC-446(P)	YES YES	YES		YES YES	YES	
d	1/N41N(P) 1/N42N(P)	Release FC-444 and FC-446	NO NO	NO		NO NO	NO	
e	1/N41N(P) 1/N42N(P)	Actuate Low Flow Sw. FC-445(P) and FC-446(P)	YES YES	YES		YES YES	YES	
f	1/N41N(P) 1/N42N(P)	Release FC-445 and FC-446	NO NO	NO		NO NO	NO	
g		Release 1/N 41N and 1/N 42N	① ①			① ①		
h		Perform this step if Power below P-8 lamp is illuminated Actuate Low Flow Sw. FC-445 and FC-446	YES YES	NO		YES YES	NO	
i		Release FC-445 and FC-446	NO NO	NO		NO NO	NO	

① Lamp will be illuminated if Reactor Power Level is above the P-8 Setpoint; Lamp will be extinguished if Reactor Power Level is below the P-8 Setpoint;

3.21 Reactor Coolant Low Flow (2/4 Loops)

	Channel A	Channel
1. Record date this section was started.		
a. Record reactor power level.		
2. Verify reactor power level is below the P-8 setpoint.		
3. This section should be performed with four reactor coolant pumps in operation. If operating conditions prohibit this, the test may be performed with three (3) reactor coolant pumps in operation. However, a complete verification of the reactor trip matrix is not possible. Record the number of reactor coolant pumps in operation.		
4. If the reactor power level is below 10%, position P-7 permissive switches to unblock by rotating 1/N 41M and 1/N 42M to the right.		
5. Verify pressurizer level is below 92%.		
6. Verify pressurizer pressure is above 1800 psig.		
7. Verify turbine trip is reset.		
8. Perform operations listed in Table 13.		

Table 13
Reactor Coolant Low Flow (2/4 Loops)

3.21

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
a		Actuate Low Flow Sw. FC-414(P)	YES	YES		YES	YES	
		FC-415(P)	YES			YES		
		FC-424(P)	YES			YES		
		FC-425(P)	YES			YES		
b		Release FC-414	NO	NO		NO	NO	
		FC-415	NO			NO		
		FC-424	NO			NO		
		FC-425	NO			NO		
c		Actuate Low Flow Sw. FC-414(P)	YES	YES		YES	YES	
		FC-415(P)	YES			YES		
		FC-434(P)	YES			YES		
		FC-435(P)	YES			YES		
d		Release FC-414	NO	NO		NO	NO	
		FC-415	NO			NO		
		FC-434	NO			NO		
		FC-435	NO			NO		
e		Actuate Low Flow Sw. FC-415(P)	YES	YES		YES	YES	
		FC-416(P)	YES			YES		
		FC-444(P)	YES			YES		
		FC-445(P)	YES			YES		
f		Release FC-415	NO	NO		NO	NO	
		FC-416	NO			NO		
		FC-444	NO			NO		
		FC-445	NO			NO		
g		Actuate Low Flow Sw. FC-424(P)	YES	YES		YES	YES	
		FC-426(P)	YES			YES		
		FC-434(P)	YES			YES		
		FC-436(P)	YES			YES		
h		Release FC-424	NO	NO		NO	NO	
		FC-426	NO			NO		
		FC-434	NO			NO		
		FC-436	NO			NO		

Table 13 (Continued)
Reactor Coolant Low Flow (2/4 Loops)

3.21

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remar
i		Actuate Low Flow Sw. FC-425(P)	YES	YES		YES	YES	
		FC-426(P)	YES			YES		
		FC-444(P)	YES			YES		
		FC-446(P)	YES			YES		
j		Release FC-425	NO	NO		NO	NO	
		FC-426	NO			NO		
		FC-444	NO			NO		
		FC-446	NO			NO		
k		Actuate Low Flow Sw. FC-435(P)	YES	YES		YES	YES	
		FC-436(P)	YES			YES		
		FC-445(P)	YES			YES		
		FC-446(P)	YES			YES		
l		Release FC-435	NO	NO		NO	NO	
		FC-436	NO			NO		
		FC-445	NO			NO		
		FC-446	NO			NO		
m		Rotate 1/N 41M and	①			①		
		1/N 42M to the left ②	①			①		

① Lamp will be on if Reactor Power is above 10%; off if reactor power is below 10%.
② If previously rotated to the right.

Table 13 (Continued)
Reactor Coolant Low Flow (2/4 Loops)

3.21

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
n		If Reactor Power Level is below 10% verify P-7 Block as follows:						
o		Actuate Low Flow Sw. FC-435(P)	YES	NO		YES	NO	
		FC-436(P)	YES			YES		
		FC-445(P)	YES			YES		
		FC-446(P)	YES			YES		
p		Release FC-435	NO	NO		NO	NO	
		FC-436	NO			NO		
		FC-445	NO			NO		
		FC-446	NO			NO		

3.22 Reactor Coolant Pump Breakers (Any Loop)

3.22.1 Record date this section was started.

_____ _____
Channel A Channel B

3.22.2 Verify all four reactor coolant pumps are in operation.

_____ _____
Channel A Channel B

3.22.3 Perform the operations indicated in Table 14.

.1 The P-8 permissive is to be unblocked by pushing in 1/N 41N and 1/N 42N if power is below 20% | R17

TABLE 14

Reactor Coolant Pump Breakers (Any Loop)

3.22

TRC 88-61T

Para	Permissive Actuation Sw. if ~~<60%~~ <20%	Action Initiated	Channel A Test Panel Trip Lamp ON	Channel A Trip Bus Volt. OFF	Channel A Re-marks	Channel B Test Panel Trip Lamp ON	Channel B Trip Bus Volt. OFF	Channel B Re-marks
a	1/N41N(P) 1/N42N(P)	Actuate RCP 1 Breaker Test Sw. (P)	YES	YES		YES	YES	
b	1/N41N(P) 1/N42N(P)	Release RCP 1 Breaker Test Sw.	NO	NO		NO	NO	
c	1/N41N(P) 1/N42N(P)	Actuate RCP 2 Breaker Test Sw. (P)	YES	YES		YES	YES	
d	1/N41N(P) 1/N42N(P)	Release RCP 2 Breaker Test Sw.	NO	NO		NO	NO	
e	1/N41N(P) 1/N42N(P)	Actuate RCP 3 Breaker Test Sw. (P)	YES	YES		YES	YES	
f	1/N41N(P) 1/N42N(P)	Release RCP 3 Breaker Test Sw.	NO	NO		NO	NO	
g	1/N41N(P) 1/N42N(P)	Actuate RCP 4 Breaker Test Sw. (P)	YES	YES		YES	YES	
h	1/N41N(P) 1/N42N(P)	Release RCP 4 Breaker Test Sw.	NO	NO		NO	NO	
i	----------	Rlease 1/N41N and 1/N42N	(1) (1)	----- -----		(1) (1)	----- -----	
j	---------- ---------- ---------- ---------- ---------- ----------	Perform this step if power ~~above~~ below P-8 Lmp is illumin. Actuate RCP 1 Breaker Test Sw.	---------- ---------- ---------- ---------- YES	----- ----- ----- ----- NO		---------- ---------- ---------- ---------- YES	----- ----- ----- ----- NO	
k	---------- ----------	Release RCP Breaker Test Sw.	NO	NO		NO	NO	

(1) Lamp will be illuminated if Reactor Power is above the P-8 Setpoint; Lamp will be extinguished if Reactor Power Level is below the P-8 Setpoint.

3.23 Reactor Coolant Pump Breakers (2/4 Loops)

	Channel A	Channel
1. Record date this section was started.		
a. Record reactor power level.		
2. Verify reactor power level is below the P-8 setpoint.		
3. This section should be performed with four reactor coolant pumps in operation. If conditions prohibit this, the test may be performed with three reactor coolant pumps in operation, however, a complete verification of the reactor trip matrix is not possible. Record the number of reactor coolant pumps in operation.		
4. If reactor power level is below 10%, position the P-7 permissive switches to unblock by rotating 1/N 41M and 1/N 42M to the right.		
5. Verify pressurizer level below 92%.		
6. Verify pressurizer pressure above 1800 psig.		
7. Verify turbine trip reset.		

8. Perform the operations in Table 15.

Ta[illegible] 15
Re[illegible]r Coolant Pump Breakers (2/4 Loops)

3.23

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remar
a		Actuate RCP 1 and (P)	YES	YES		YES	YES	
		RCP 2 Breaker Test Sw. (P)	YES			YES		
b		Release RCP 1 and	NO	NO		NO	NO	
		RCP 2 Breaker Test Sw.	NO			NO		
c		Actuate RCP 1 and (P)	YES	YES		YES	YES	
		RCP 3 Breaker Test Sw. (P)	YES			YES		
d		Release RCP 1 and	NO	NO		NO	NO	
		RCP 3 Breaker Test Sw.	NO			NO		
e		Actuate RCP 1 and (P)	YES	YES		YES	YES	
		RCP 4 Breaker Test Sw. (P)	YES			YES		
f		Release RCP 1 and	NO	NO		NO	NO	
		RCP 4 Breaker Test Sw.	NO			NO		
g		Actuate RCP 2 and (P)	YES	YES		YES	YES	
		RCP 3 Breaker Test Sw. (P)	YES			YES		
h		Release RCP 2 and	NO	NO		NO	NO	
		RCP 3 Breaker Test Sw.	NO			NO		
i		Actuate RCP 2 and (P)	YES	YES		YES	YES	
		RCP 4 Breaker Test Sw. (P)	YES			YES		
j		Release RCP 2 and	NO	NO		NO	NO	
		RCP 4 Breaker Test Sw.	NO			NO		
k		Actuate RCP 3 and (P)	YES	YES		YES	YES	
		RCP 4 Breaker Test Sw. (P)	YES			YES		
l		Release RCP 3 and	NO	NO		NO	NO	
		RCP 4 Breaker Test Sw.	NO			NO		
m		Rotate 1/N 41M and	①			①		
		1/N 42 M to the left 2	①			①		

① Lamp will be on if Reactor Power is above 10%; off if Reactor Power is below 10%
② If previously rotated to the right.

Tabl[illegible]5 (Continued)
Reac[illegible] Coolant Pump Breakers (2/4 Loops)

3.23

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
n		If Reactor Power Level is Below 10% verify P-7 Blocks as follows:						
o		Actuate RCP 1 and (P)	YES	NO		YES	NO	
		RCP 2 Breaker Test Sw. (P)	YES			YES		
p		Release RCP 1 and	NO	NO		NO	NO	
		RCP 2 Breaker Test Sw.	NO			NO		

3.24 6900 Volt Bus Undervoltage Trip

	Channel A	Channel
1. Record date this section was started.		
2. Verify at least three reactor coolant pumps are in operation.		
3. If reactor power level is below 10%, position the P-7 permissive switches to unblock by rotating 1/N 41M and 1/N 42M to the right.		
4. Verify turbine trip is reset.		
5. Verify pressurizer level below 92%.		
6. Verify pressurizer pressure above 1800 psig.		

7. Perform the operations indicated in Table 16.

Table
6900 Bus Undervoltage Trip

3.24

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
a		Actuate UV Test Sw. 27-1 (P) and 27-2 (P)	YES YES	YES		YES YES	YES	
b		Release 27-1 and 27-2	NO NO	NO		NO NO	NO	
c		Actuate UV Test Sw. 27-1 (P) and 27-3 (P)	YES YES	YES		YES YES	YES	
d		Release 27-1 and 27-3	NO NO	NO		NO NO	NO	
e		Actuate UV Test Sw. 27-1 (P) and 27-4 (P)	YES YES	YES		YES YES	YES	
f		Release 27-1 and 27-4	NO NO	NO		NO NO	NO	
g		Actuate UV Test Sw. 27-2 (P) and 27-3 (P)	YES YES	YES		YES YES	YES	
h		Release 27-2 and 27-3	NO NO	NO		NO NO	NO	
i		Actuate UV Test Sw. 27-2 (P) and 27-4 (P)	YES YES	YES		YES YES	YES	
j		Release 27-2 and 27-4	NO NO	NO		NO NO	NO	
k		Actuate UV Test Sw. 27-3 (P) and 27-4 (P)	YES YES	YES		YES YES	YES	
l		Release 27-3 and 27-4	NO NO	NO		NO NO	NO	
m		Rotate 1/N 41M and 1/N 42M to the left ②	① ①			① ①		

① Lamp will be on if Reactor Power is above 10%; off if Reactor Power is below 10%.
② If previously rotated to the right.

Tab[illegible]6 (Continued)
690[illegible]lt Bus Undervoltage Trip

3.24

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarl
n		If Reactor Power Level is below 10% verify P-7 blocks as follows:						
o		Actuate UV 27-1 and (P) 27-2 Test Sw. (P)	YES YES	NO		YES YES	NO	
p		Release UV 27-1 and 27-2 Test Sw.	NO NO	NO		NO NO	NO	

3.25 Turbine Auto Stop

3.25.1 Record date this section was started.

_____ _____
Channel A Channel B

3.25.1.A Record Reactor Power Level.

_____ _____
Channel A Channel B

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3.25.2 Verify at least four reactor coolant pumps are in operation.

_____ _____
Channel A Channel B

3.25.3 Verify turbine trips are reset.

_____ _____
Channel A Channel B

3.25.4 Verify pressurizer level is below 92%.

_____ _____
Channel A Channel B

3.25.5 Verify pressurizer pressure is above 1800 psig.

_____ _____
Channel A Channel B

3.25.6 If reactor power level is below 10%, position the P-7 permissive switches to unblock by rotating 1/N 41M and 1/N 42M to the right.

_____ _____
Channel A Channel B

3.25.7 If reactor power level is below 20%, position the P-8 permissive switches to unblock by pushing in 1/N 41N and 1/N 42N.

_____ _____
Channel A Channel B

3.25.8 Perform the operations indicated in Table 17.

Table 17
Turbine Auto Stop

3.25

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remark
a		Actuate Turbine Auto Stop Sw. AST-2 and (P)	YES	YES		YES	YES	
		AST-3 (P)	YES			YES		
b		Release AST-2 and	NO	NO		NO	NO	
		AST-3	NO			NO		
c		Actuate Turbine Auto Stop Sw. AST-2 and (P)	YES	YES		YES	YES	
		AST-4 (P)	YES			YES		
d		Release AST-2 and	NO	NO		NO	NO	
		AST-4	NO			NO		
e		Actuate Turbine Auto Stop Sw. AST-3 and (P)	YES	YES		YES	YES	
		AST-4 (P)	YES			YES		
f		Release AST-3 and	NO	NO		NO	NO	
		AST-4	NO			NO		
g		Rotate 1/N 41M and	①			①		
		1/N 42M to the left ②	①			①		
h		If Reactor Power Level is below 10% verify P-7 blocks as follows:						
		Actuate Turbine Auto Stop Sw. AST-3 and (P)	YES	NO		YES	NO	
		AST-4 (P)	YES			YES		
i		Release AST-3 and	NO	NO		NO	NO	
		AST-4	NO			NO		

① Lamp will be on if Reactor Power is above 10%; off if Reactor Power is below 10%.
② If previously rotated to the right.

3.26 Verification of Permissive Circuit P-7

1. This test can be performed only when reactor power level is below 10%.

2. All reactor trips except low pressurizer pressure must be cleared.

3. Actuate low pressurizer pressure trip by pushing in switches PC-455A and PC-456A. Verify associated indicating lamps illuminated.

Channel A	Channel

4. Perform the operations indicated in Table 18.

Ta[illegible]18
Ver[illegible]cation of P-7 Permissive

3.26

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
a	PC-455A (P) PC-456A (P)	Actuate Turbine Power Trip PC-412B (P)	YES	YES		YES	YES	
b	PC-455A (P) PC-456A (P)	Release PC-412B	NO	NO		NO	NO	
c	PC-455A (P) PC-456A (P)	Actuate Turbine Power Trip PC-412C (P)	YES	YES		YES	YES	
d	PC-455A (P) PC-456A (P)	Release PC-412C	NO	NO		NO	NO	
e	PC-455A (P) PC-456A (P)	Actuate High Flux Sw. 1/N41M (P) and 1/N 42M (P)	YES YES	YES		YES YES	YES	
f	PC-455A (P) PC-456A (P)	Release 1/N 41M and 1/N 42M	NO NO	NO		NO NO	NO	
g	PC-455A (P) PC-456A (P)	Actuate High Flux Sw. 1/N41M (P) and 1/N 43M (P)	YES YES	YES		YES YES	YES	
h	PC-455A (P) PC-456A (P)	Release 1/N 41M and 1/N 43M	NO NO	NO		NO NO	NO	
i	PC-455A (P) PC-456A (P)	Actuate High Flux Sw. 1/N41M (P) and 1/N 44M (P)	YES YES	YES		YES YES	YES	
j	PC-455A (P) PC-456A (P)	Release 1/N 41M and 1/N 44M	NO NO	NO		NO NO	NO	
k	PC-455A (P) PC-456A (P)	Actuate High Flux Sw. 1/N42M (P) and 1/N 43M (P)	YES YES	YES		YES YES	YES	
l	PC-455A (P) PC-456A (P)	Release 1/N 42 M and 1/N 43M	NO NO	NO		NO NO	NO	
m	PC-455A (P) PC-456A (P)	Actuate High Flux Sw. 1/N42M (P) and 1/N 44M (P)	YES YES	YES		YES YES	YES	
n	PC-455A (P) PC-456A (P)	Release 1/N 42M and and 1/N 44M	NO NO	NO		NO NO	NO	

Table 18 (Continued)

Verification of P-7 Permissive

3.26

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
o	PC-455A (P) PC-456A (P)	Actuate High Flux Sw. 1/N43M (P) and 1/N 44M (P)	YES YES	YES		YES YES	YES	
p	PC-455A (P) PC-456A (P)	Release 1/N 43M and 1/N 44M	NO NO	NO		NO NO	NO	
q		Release PC-455A and PC-456A	① ①	NO		① ①	NO	

① Lamp will be on if Pressurizer Pressure is below 1800 psig;
Lamp will be off if Pressurizer Pressure is above 1800psig.

3.27 Verification of Permissive Circuit P-8

1. Nuclear power must be less than the power above P-8 setpoint.

2. All reactor trips except reactor coolant low flow must be cleared.

3. Actuate low flow trip by pushing in FC-415 and FC-416 test switches. Verify associated indicating lamps are illuminated.

Channel A	Channel

4. Perform the operations indicated in Table 19.

PT-M14A
Table
Verification of Permissive Circuit P-8

3.27

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
a	FC-415 (P) FC-416 (P)	Actuate High Flux Sw. 1/N41N (P) and 1/N 42N (P)	YES YES	YES		YES YES	YES	
b	FC-415 (P) FC-416 (P)	Release 1/N 41N and 1/N 42N	NO NO	NO		NO NO	NO	
c	FC-415 (P) FC-416 (P)	Actuate High Flux Sw. 1/N41N (P) and 1/N 43N (P)	YES YES	YES		YES YES	YES	
d	FC-415 (P) FC-416 (P)	Release 1/N 41N and 1/N 43N	NO NO	NO		NO NO	NO	
e	FC-415 (P) FC-416 (P)	Actuate High Flux Sw. 1/N41N (P) and 1/N 44N (P)	YES YES	YES		YES YES	YES	
f	FC-415 (P) FC-416 (P)	Release 1/N 41N and 1/N 44N	NO NO	NO		NO NO	NO	
g	FC-415 (P) FC-416 (P)	Actuate High Flux Sw. 1/N42N (P) and 1/N 43N (P)	YES YES	YES		YES YES	YES	
h	FC-415 (P) FC-416 (P)	Release 1/N 42N and 1/N 43N	NO NO	NO		NO NO	NO	
i	FC-415 (P) FC-416 (P)	Actuate High Flux Sw. 1/N42N (P) and 1/N 44N (P)	YES YES	YES		YES YES	YES	
j	FC-415 (P) FC-416 (P)	Release 1/N 42N and 1/N 44N	NO NO	NO		NO NO	NO	
k	FC-415 (P) FC-416 (P)	Actuate High Flux Sw. 1/N43N (P) and 1/N 44N (P)	YES YES	YES		YES YES	YES	
l	FC-415 (P) FC-416 (P)	Release 1/N 43N and 1/N 44N	NO NO	NO		NO NO	NO	
m		Release FC-415 and FC-416	① ①	NO		① ①	NO	

① Lamp will be on if reactor coolant flow is below 90%, and off if reactor coolant flow is above 90%.

3.28 Verification of Permissive Circuit P-10

	Channel A	Channel
1. Record date this section was started.		
a. Record reactor power level.		
2. Rotate power range low range trip switch 1/N 41P and 1/N 42P to the right.		
Verify associated indicating lamps are illuminated.		
3. Rotate power range switches		
1/N 41M		
1/N 42M		
1/N 43M		
1/N 44M		
to the right and verify their associated indicating lamps are illuminated.		

4. Perform the operations indicated in Table 20.

Table 2[illegible]
Verifi[illegible]on of Permissive Circuit P-10

3.28

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remark
a		Actuate 1/N 41M (R/P)	NO	YES		NO	YES	
		1/N 42M (R/P)	NO			NO		
		1/N 43M (R/P)	NO			NO		
b		Release 1/N 41M	YES	YES		YES	YES	
		1/N 42M	YES			YES		
		1/N 43M	YES			YES		
c		Momentarily Actuate 1/N47A and 1/N 38A (R/P)	NO	NO		NO	NO	
			NO			NO		
d		Actuate 1/N 41M (R/P)	NO	YES		NO	YES	
		1/N 43M (R/P)	NO			NO		
		1/N 44M (R/P)	NO			NO		
e		Release 1/N 41M	YES	YES		YES	YES	
		1/N 43M	YES			YES		
		1/N 44M	YES			YES		
f		Momentarily Actuate 1/N47A and 1/N 38A (R/P)	NO	NO		NO	NO	
			NO			NO		
g		Actuate 1/N 41M (R/P)	NO	YES		NO	YES	
		1/N 42M (R/P)	NO			NO		
		1/N 44M (R/P)	NO			NO		
h		Release 1/N 41M	YES	YES		YES	YES	
		1/N 42M	YES			YES		
		1/N 44M	YES			YES		
i		Momentarily Actuate 1/N47A and 1/N 38A (R/P)	NO	NO		NO	NO	
			NO			NO		
j		Actuate 1/N 42M (R/P)	NO	YES		NO	YES	
		1/N 43M (R/P)	NO			NO		
		1/N 44M (R/P)	NO			NO		
k		Release 1/N 42M	YES	YES		YES	YES	
		1/N 43M	YES			YES		
		1/N 44M	YES			YES		

Table 3.28 (Continued)
Verification of Permissive Circuit P-10

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
1		Momentarily Actuate 1/N47A	NO	NO		NO	NO	
		and 1/N 38A (R/P)	NO			NO		
m		Return 1/N 41M (L)	①	NO		①	NO	
		1/N 42M (L)	①			①		
		1/N 43M (L)	①			①		
		1/N 44M (L)	①			①		
		1/N 41P (L)	②			②		
		and 1/N 42P (L)	②			②		
		to the left						

① Lamp will be on if reactor power is above 10%; off if reactor power is below 10%.

② Lamp will be on if reactor power is above 25%; off if reactor power is below 25%.

3.29 LoPar Temperature Protection Trip

1. Record the date this section was started.

Channel A	Channel B
_____	_____

2. Verify that the RCS Temperature is above 370°F. Record the temperature.

Temperature	Temperature
_____	_____

3. Perform the Operations in Table #21. Verify that the "Lo Par Temperature Trip"Alarm annunciate as each pair of pushbuttons is actuated. Verify that the alarm clears when the pushbuttons are released.

3.29

Table #21a

LO PAR TEMPERATURE PROTECTION TRIP

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A			
			Test Panel Test Lamp ON	Trip Bus Voltage OFF	Alarm	Remarks
a		Actuate Low Temperature Sw. TC-413A and TC-433A	YES YES	YES	ANNUNCIATES	
b		Release Low Temperature Sw. TC-413A and TC-433A	NO NO	NO	CLEARS	
c		Actuate Low Temperature Sw. TC-413A and TC-443A	YES YES	YES	ANNUNCIATES	
d		Release TC-413A and TC-443A	NO NO	NO	CLEARS	
e		Actuate Low Temperature Sw. TC-433A and TC-443A	YES YES	YES	ANNUNCIATES	
f		Release TC-433A and TC-443A	NO NO	NO	CLEARS	

3.29 Table #21b

LOPAR TEMPERATURE PROTECTION TRIP

ara.	Permissive Actuation Switches	Action Initiated	CHANNEL B Test Panel Test Lamp ON	Trip Bus Voltage OFF	ALARM	REMARKS
a		Actuate Low Temperature Switch TC-413A and TC-433A	YES YES	YES	ANNUNCIATES	
b		Release Low Temperature Switch TC-413A and TC-433A	NO NO	NO	CLEARS	
c		Actuate Low Temperature Switch TC-413A and 443A	YES YES	YES	ANNUNCIATES	
d		Release TC-413A and TC-443A	NO NO	NO	CLEARS	
e		Actuate Low Temperature Switch TC-433A and TC-443A	YES YES	YES	ANNUNCIATES	
f		Release TC-433A and TC-443A	NO NO	NO	CLEARS	

(Next page is 64A)

3.30 NBFD Relay Plunger Movement Test

1.a) If the plant is at a Power Level greater than 10%, the following jumpers must be placed to prevent energizing of Source Range H.V. Power Supplies when D.C. is removed from the Logic Rack. Should a Trip occur while the jumpers are placed, they must be removed immediately. Place jumpers on both Channel N31 and N32 while testing either Logic Channel A or B.

Channel N31: NIS Racks, TB 123, jumper placed from Terminal 1 to Terminal 2.

Channel A	Channel B
Initials	Initials

Channel N32: NIS Racks, TB 223, jumper placed from Terminal 1 to Terminal 2.

Channel A	Channel B
Initials	Initials

1.b) De-energize the Channel A (Channel B) DC Feed from the feed switch on front of the panel.

Channel A	Channel B
Initials	Initials

2. Verify that the DC Available Light extinguishes.

Channel A	Channel B
Initials	Initials

3. Physically move each relay plunger, included in the list below, in and out. Verify freedom of movement in each direction. Indicate satisfactory by a check (✓) and unsatisfactory by an (X).

Relay	Location	Channel A	Channel B
RT-1	F6-E6	_____	_____
RT-2	F6-E6	_____	_____
RT-3	F6-E6	_____	_____
RT-4	F6-E6	_____	_____
RT-5	F4-E4	_____	_____
RT-6	F4-E4	_____	_____
RT-7	F3-E3	_____	_____
RT-8	F3-E3	_____	_____
RT-9	F5-E5	_____	_____
RT-10	F5-E5	_____	_____

Relay	Location	Channel A	Channel B
RT-11	F3-E3		
RT-12	F3-E3		
RT-13	F4-E4		
RT-14	F4-E4		
RT-15	F5-E5		
RT-16	F5-E5		
RT-17	F5-E5		
RT-18	F5-E5		
1/MT1-X	F3-E3		
1/MT2-X	F3-E3		
15	F3-E3		
16	F3-E3		
17	F5-E5		
18	F5-E5		
21	F5-E5		
22	F5-E5		
P7-1	F3-E3		
P7-2	E3-E3		
P7-3	F3-E3		
P7-4	F3-E3		
P8-1	F3-E3		
P8-2	F3-E3		

RELAY	LOCATION	CHANNEL A	CHANNEL B
P10-1	F3-E3	_____	_____
P10-2	F3-E3	_____	_____
LF-1X	F3-E3	_____	_____
LF-2X	F3-E3	_____	_____
LF-3X	F3-E3	_____	_____
LF-4X	F3-E3	_____	_____
SIAM1X	F6-E6	_____	_____
SIAM2X	F5-E5	_____	_____
52/RCP-21X	F6-E6	_____	_____
52/RCP-22X	F5-E5	_____	_____
52/RCP-23X	F4-E4	_____	_____
52/RCP-24X	F3-E3	_____	_____
S166	F2-E2	_____	_____
S167	F2-E2	_____	_____

4. Re-energize the DC Feed:

INITIALS _____ INITIALS _____

5. Momentarily actuate 1N38A (R/P) and 1/N47A (R/P). Verify that Trip Voltage Status Light is off (No Trip).

CHANNEL A CHANNEL B

INITIALS _____ INITIALS _____

6. Remove the jumpers previously placed in Step 3.30.1a.

Channel N31: NIS Racks, TB 123,
Terminal 1 to Terminal 2.

Jumper Removed: (Double Verification)

Init/init _____ Init/Init _____

Channel N32: NIS Racks, TB 223,
Terminal 1 to Terminal 2.

Jumper Removed: (Double Verification)

Init/init _____ Init/Init _____

NOTE: If Preventive Maintenance, as allowed by Step 3.7e, has been performed on the Reactor Trip Breakers, that maintenance must be complete and the breakers have been returned to their cubicles in the Racked In and Open Position with DC power restored prior to proceeding with Step 3.31.

Breakers Racked In and Open:

Channel A:_____ Signature /Date

Channel B:_____ Signature /Date

Verify RTA (RTB) Turb. Trip Monitor Off.

Channel A:_____ Initials

Channel B:_____ Initials

R17

Verify BYA (BYB) Turb. Trip Monitor On.

Channel A:_____ Initials

Channel B:_____ Initials

D.C.V.M. Removed:

Channel A:_____ Signature /Date

Channel B:_____ Signature /Date

Verify that positioning lever stop is lodged behind positioning stop bracket and check for a visible clearance (1/16" Min.) between positioning lever trip arm and breaker trip bar.

Place a checkmark (✓) in the acceptable or not acceptable space as appropriate.

Stop Pin Position: RTA_____ _____ _____
Acceptable Not Acceptable Signature/Date

RTB_____ _____ _____
Acceptable Not Acceptable Signature/Date

Trip Bar Clearance: RTA_____ _____ _____
Acceptable Not Acceptable Signature/Date

RTB_____ _____ _____
Acceptable Not Acceptable Signature/Date

3.31 Reactor Trip Breaker and Bypass Breaker Trip Test

.1 Place Channel A (Channel B) Reactor Protection Logic Key Interlock Switch in "Normal" position. Verify that the red lamp on Unit 1 Upper (Unit 2 Upper) switchgear door extinguishes and that the "RTA and BYB Train A Defeat" (RTB and BYA Train B Defeat) alarm clears on SK panel.

Channel A_____ Initials Channel B_____ Initials

.2 Close 52 RTA (52RTB) and verify the breaker is closed by observing that the red indicating lamps at the test panel and flight panel are lit.

Channel A_____ Initials Channel B_____ Initials

Verify RTA (RTB) Turb. Trip Monitor Off

R17

Channel A_____ Initials Channel B_____ Initials

Verify BYA (BYB) Turb. Trip Monitor Off

Channel A_____ Initials Channel B_____ Initials

.3 Verify that Bypass Breaker 52BYA (52BYB) is closed by observing that the red indicating lamp is illuminated.

Channel A_____ Initials Channel B_____ Initials

.4 Install control fuses and rack in Bypass Breaker 52BYB (52BYA) to the Test Position then close it. Verify that the red indicating lamp illuminates. Breaker must be closed locally.

Channel A_____ Initials Channel B_____ Initials

.4A Determine that the plant computer (Proteus 2500) is operating and that the Trend Typewriter CCR is on line. This information can be obtained from the RO/SRO on watch. If for some reason the computer is not available, request it be made available for the short time needed to complete this part of PT-M14A. If the computer cannot be made available, disregard Steps 6.A and 7.F.

5. Depress the "Auto Shunt Trip Block" pushbutton and hold it depressed.

Channel A_____ Initials

Channel B_____ Initials

5.A Depress the "Auto Shunt Trip Test" pushbutton and verify that RTA (RTB) does not trip.

Channel A_____ Initials

Channel B_____ Initials

5.B Release the "Auto Shunt Trip Test" pushbutton only

Channel A_____ Initials

Channel B_____ Initials

5.C With the "Auto Shunt Trip Block" pushbutton depressed, trip the under voltage devices only by manually depressing pushbutton switch LC-437D and LC-437F.

Channel A_____ Initials

Channel B_____ Initials

6. Verify that Breakers 52RTA/52BYB (52RTB/52BYA) trip by observing that the green indicating lamps illuminate. Release the "Auto Shunt Trip Block pushbutton".

6.A From the Plant Computer Trend typewriter or its transferred replacement, obtain the "Sequence of Events" print out; determine the time required for "Reac. Aux. Tr Bkr B (A)" and Reac. Main Tr. Bkr A (B)" to open.

Channel A	Channel B
Reac. Aux. Tr. Bkr B_____ Milliseconds	Reac. Aux. Tr. Bkr A_____ Milliseconds
Reac. Main Tr. Bkr A_____ Milliseconds	Reac. Main Tr Bkr B_____ Milliseconds

ACTION:

1) If data obtained is $\leq$ 45 milliseconds perform a retest of Breaker Trip timing to verify the low data.

2) If data obtained is > 92 milliseconds initiate a PRIORITY ONE MWR to investigate the problem. Approval for PRIORITY ONE status was given at SNSC by the General Manager NPG on 11/22/83, SNSC Meeting No. 770.

- Action Continued -

3) If data obtained is > 150 milliseconds, Operability Criteria is not satisfied.

4) Remove data from typewriter and forward to J.P. Mooney - Systems Engineer, Electrical, Technical Engineering, for trending.

Channel A_____ Initials Channel B_____ Initials

7. Close Reactor Trip Breaker 52RTA (52RTB) and verify it is closed by observing that the red indicating lamps at the test panel are illuminated.

Channel A_____ Initials Channel B_____ Initials

7A. Momentarily depress, then release, the "Auto Shunt Trip Test" pushbutton.

Channel A_____ Initials Channel B_____ Initials

7B. Verify that Reactor Trip Breaker 52RTA (52RTB) trips by observing that the green indicating lamps illuminate.

Channel A_____ Initials Channel B_____ Initials

7C. Close Reactor Trip Breaker 52RTA (52RTB) and verify it is closed by observing that the red indicating lamp at the test panel is illuminated.

Channel A_____ Initials Channel B_____ Initials

7D. Trip the auto trip devices by manually depressing pushbutton switch LC-437D and LC-437F.

Channel A_____ Initials Channel B_____ Initials

7E. Verify that breaker 52 RTA (52RTB) tripped by observing that the green indicating lamps illuminated.

Channel A_____ Initials Channel B_____ Initials

7F. From the Plant Computer Trend Typewriter or its transferred replacement, obtain the "Sequence of Events" printout and determine the time required for "Reac. Main Tr. Bkr A (B)" to open.

Channel A Reac. Main Tr. Bkr A_____ Milliseconds

Channel B Reac. Main Tr. Bkr B_____ Milliseconds

ACTION:

1) If data obtained is ≤ 20 milliseconds perform a retest of Breaker Trip timing to verify the low data.

2) If data obtained is >88 milliseconds initiate a PRIORITY ONE MWR to investigate the problem. Approval for PRIORITY ONE status was given at SNSC by the General Manager NPG on 11/22/83, SNSC Meeting No. 770.

3) If data obtained is >150 milliseconds, Operability Criteria is not satisfied.

4) Remove data from typewriter and forward to J.P. Mooney - Systems Engineer, Electrical, Technical Engineering, for trending.

Channel A_____ Initials Channel B_____ Initials

7G. Close Reactor Trip Breaker 52 RTA (52RTB) and verify it is closed by observing that the red indicating lamps at the test panel and flight panel are illuminated.

Channel A_____ Initials Channel B_____ Initials

Verify RTA (RTB) Turb. Trip Monitor Off

Channel A_____ Initials Channel B_____ Initials

Verify BYA (BYB) Turb. Trip Monitor Off

R17

Channel A_____ Initials Channel B_____ Initials

NOTE: If both lamps are not Off, Do Not proceed with Step 3.31.8. A Turbine Trip could result if cause of non-compliance is not determined and corrected.

8. Trip Bypass Breaker 52BYA (52BYB). Place it in the racked out position and lock it in this position. SWS to verify breaker is locked.

Channel A_____ SWS Channel B_____ SWS

Verify RTA (RTB) Turb. Trip Monitor On.

Channel A_____ Initials Channel B_____ Initials

R17

Verify BYA (BYB) Turb. Trip Monitor Off.

Channel A_____ Initials Channel B_____ Initials

9. Remove the control fuses from Bypass Breaker 52 BYA (52BYB). SWS to verify control fuses are removed.

Channel A_____ SWS

Channel B_____ SWS

10. Remove control fuses from Bypass Breaker 52 BYB (52BYA) and lock the breaker in the racked out position. SWS to verify above actions.

Channel A_____ SWS

Channel B_____ SWS

11. Lock the panel door of the logic channel under test.

Channel A_____ Initials

Channel B_____ Initials

3.32 Repeat this procedure for the other logic channel.

3.0 COMMENTS: Include any MWR Numbers with description, if issued)

4.0 TEST RESULTS:

Based on the "As Found" data, circle the appropriate Actual Response in the Table below:

	REQUIRED	ACTUAL	
4.1 All Channel "A" Logic functions as required by the procedure.	YES	YES	NO
4.2 All Channel "B" Logic functions as required by the procedure.	YES	YES	NO
4.3 The Reactor Trip and Bypass Breakers function as required by the procedure.	YES	YES	NO
4.4 The Reactor Aux. Tr. Bkr. A opened in ≤ 150 msec.	YES*	YES*	NO
4.5 The Reactor Aux. Tr. Bkr. B opened in ≤ 150 msec.	YES*	YES*	NO
4.6 The Reactor Main Tr. Bkr. A opened in ≤ 150 msec.	YES*	YES*	NO
4.7 The Reactor Main Tr. Bkr. B opened in ≤ 150 msec.	YES*	YES*	NO

*If computer was available, otherwise N/A.

Any required value in the Table above that is not found satisfactory shall be brought to the attention of the duty Senior Watch Supervisor immediately. Record below the SWS that was notified.

_____
SWS

Test Performed By:

_____
Signature/Date

SRO Informed of Completion:

_____
SRO /Date

5.0 Supervisor Review

The test is complete and the Test Results Section is completed accurately. If any error was found in the Test Results Section that would cause a Required Value not to be satisfied, the SWS shall be notifed immediately.

_____
Cognizant Supervisor /Date
or Designee

6.0 EQUIPMENT OPERABILITY AND ACCEPTANCE CRITERIA

The reactor protection system logic shall be considered operable if the logic coincidence relays and the reactor trip and bypass circuit breakers operate as required in the Test Results.

6.1 Based on review of the Test Results, are the Operability Criteria satisfied:

YES NO

6.2 If Operability Criteria are not satisfied:

a) Take the required Technical Specification action.
b) An SOR shall be prepared. SOR # _____.

6.3 Comments: _____

_____

_____

_____
Senior Watch Supervisor/ Date

6.4 If Operability Criteria are not satisfied, COE Review required.

_____
COE Review /Date

RETURN COMPLETED TEST TO THE TEST ENGINEER.

7.0 OVERALL ACCEPTANCE CRITERIA

7.1 The Overall Acceptance Criteria is met when:

A) Indicating lamps function.

B) "As Left" Conditions are as required by the procedure.

C) The time for the "Reactor Aux. Trip Breaker B (A)" and "Reactor Main Trip Breaker A (B)" to open is >45 (>22 for Step 7.F) milliseconds and ≤ 92 (≤88 for Step 7.F) milliseconds. (Only applicable if computer is available).

7.2 Based on review, has the Overall Acceptance Criteria been met?

YES NO

7.3 If NO is circled, list corrective action taken.

_____

_____

_____

7.4 COMMENTS: _____

_____

_____

_____

_____
Test Engineer /Date

PROCEDURE REVIEW MEMORANDUM
DATE: 12-30-87

JOHN CURRY *

JOHN ODENDAHL

FROM: DAVID SZATKOWSKI (ACTING TEST ENGINEER)

PLEASE REVIEW TEST: PT-M14A REV.: 17

PLEASE INDICATE COMMENTS PERTINENT TO THIS REVISION ON THIS REVIEW SHEET AND USE ADDITIONAL PAGES FOR THOSE COMMENTS WHICH YOU FEEL SHOULD BE CONSIDERED IN FUTURE REVISIONS. THE CHANGES INCORPORATED INTO THIS REVISION ALONG WITH THEIR REASONS ARE LISTED BELOW.

CHANGE: 1) GENERAL STATEMENTS AND FORMAT REVISION. 2) NEW EQUIPMENT LIST.
ADD FUNCTIONAL TEST OF MONITORING TURBINE TRIP ON REACTOR TRIP CIRCUITRY AND INCORPORATE TRC-85-1441 AND TRC-86-751.

REASON FOR CHANGE: 1) SURVEILLANCE PROGRAM UPGRADE. 2) IMPROVED M&TE CONTROL. MOD MET-87-00813-87
MONITOR TURBINE TRIP ON REACTOR TRIP CIRCUITRY

THIS REVISION SHOULD BE REVIEWED AND RETURNED AS SOON AS POSSIBLE TO BE INCLUDED IN THE SNSC AGENDA FOR 12-31-87. IF NO RESPONSE IS RECEIVED BY 12-31-87, IT WILL BE ASSUMED THAT THERE ARE NO COMMENTS.

REVIEWER COMMENTS: No

REVIEWED BY / DATE 12/31/87

* NOTE: PLEASE PERFORM THE PRE-SNSC REVIEW PER SNSC AD-1. PLEASE RECORD THE SAFETY SIGNIFICANCE OF THIS PROCEDURE BELOW:

PROCEDURE REVIEW MEMORANDUM
DATE: 12-30-87

TO: H. MORRISON

[redacted]

JOHN ONEWDAHL

RECEIVED
DEC 30 1987
JOHN J. CURRY

FROM: DAVID SZATKOWSKI (ACTING TEST ENGINEER)

PLEASE REVIEW TEST: PT-M14A REV.: 17

PLEASE INDICATE COMMENTS PERTINENT TO THIS REVISION ON THIS REVIEW SHEET AND USE ADDITIONAL PAGES FOR THOSE COMMENTS WHICH YOU FEEL SHOULD BE CONSIDERED IN FUTURE REVISIONS. THE CHANGES INCORPORATED INTO THIS REVISION ALONG WITH THEIR REASONS ARE LISTED BELOW.

CHANGE: 1) GENERAL STATEMENTS AND FORMAT REVISION. 2) NEW EQUIPMENT LIST.
ADD FUNCTIONAL TEST OF MONITORING TURBINE TRIP ON REACTOR TRIP CIRCUITRY AND INCORPORATE TRC-85-149T AND TRC-86-75T.

REASON FOR CHANGE: 1) SURVEILLANCE PROGRAM UPGRADE. 2) IMPROVED M&TE CONTROL. MOD MFI-87-00813-87
MONITOR TURBINE TRIP ON REACTOR TRIP CIRCUITRY

THIS REVISION SHOULD BE REVIEWED AND RETURNED AS SOON AS POSSIBLE TO BE INCLUDED IN THE SNSC AGENDA FOR 12-31-87. IF NO RESPONSE IS RECEIVED BY 12-31-87, IT WILL BE ASSUMED THAT THERE ARE NO COMMENTS.

REVIEWER COMMENTS: This Test Change monitors the Rx Trip Turbine Trip status lights added by Project 00813-87. Test will ensure continuity of Rx Trip Turbine Trip Circuitry

J. Cameron 1/4/88
REVIEWED BY / DATE

* NOTE: PLEASE PERFORM THE PRE-SNSC REVIEW PER SNSC AD-1. PLEASE RECORD THE SAFETY SIGNIFICANCE OF THIS PROCEDURE BELOW:

February 10, 1989

Docket No. 50-247

DISTRIBUTION

Docket file	NRC PDR	Local PDR
PDI-1 Rdg	DLasher	EWenzinger, RI
MJohnson, EDO	ACRS (10)	RCapra
MSlosson	CVogan	SNewberry
PSwetland, RI	DLangford	

LICENSEE: Consolidated Edison Company of New York

FACILITY: Indian Point Nuclear Generating Unit No. 2

SUBJECT: SUMMARY OF MEETING HELD ON DECEMBER 12, 1988 TO DISCUSS STATUS OF TECHNICAL SPECIFICATIONS FOR REACTOR TRIP BREAKERS AND THEIR SHUNT AND UNDERVOLTAGE TRIP ATTACHMENTS AS RELATED TO COMPLIANCE WITH GENERIC LETTER 85-09 (TAC 55358)

Licensee representatives met with NRC staff on December 12, 1988 to discuss the status of Indian Point 2's Technical Specifications (TS) for reactor trip breakers and their shunt and undervoltage trip attachments as related to compliance with Generic Letter 85-09. Meeting attendance is shown in Enclosure 1.

The licensee described its breaker system and its related procedure for the Reactor Protection Channel Logic Functional Test. The test procedure is included in Enclosure 2. The licensee will supplement the Enclosure by providing drawings of the reactor protection system breaker logic scheme.

The licensee committed to the following breaker-related actions to ensure compliance with the applicable portions of Generic Letter 85-09:

1. Make the 4 trip breakers interchangeable so that bypass breakers can be used to replace the reactor trip breakers within 6 hours, if necessary, and procure an on-site spare breaker.

2. Test each train every 62 days on a staggered basis and try to test the undervoltage trip before testing the shunt trip.

8902170215

4pp.

3. By February 1, 1989, revise its August 18, 1986 TS amendment application proposed to allow 8 hours in bypass for surveillance testing (Allowable Out of Service Time) but to require hot shutdown within 6 hours for an inoperable breaker or inoperable undervoltage or shunt trip attachment.

The licensee expects to make the breaker modifications during the March 1989 refueling outage. At that time the licensee will switch to preventive maintenance of the breakers on an 18 month refueling outage interval, as recommended by the breaker manufacturer.

Marylee M. Slosson, Project Manager
Project Directorate I-1
Division of Reactor Projects I/II

Enclosures:
As stated

cc: See next page

OFC	PDI-1	PDI-1	PDI-1				
NAME	CVogan	MSlosson:vr	RCapra				
DATE	2/10/88	2/10/88	2/10/88				

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Michael Vasely	Consolidated Edison
Jim Mooney	Consolidated Edison
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Ed Wenzinger	NRC/Region 1
Robert Capra	NRC

ENCLOSURE 2

INDIAN POINT STATION

UNIT NO. 2

PT-M14A, REVISION 17

REACTOR PROTECTION LOGIC CHANNEL FUNCTIONAL TEST

12-30-87 ~~1-4-88~~ DAS 1/14/88
Written By /Date

JOHN CURRY 1-4-88
Reviewed By /Date
PER REVIEW SHEET DAS 1-10-88

HARRY MORRISON 12-31-87
Reviewed By /Date
PER REVIEW SHEET DAS - 1-10-88

John Curry 1/10/88
Concurrence By /Date

MEETING 1161 1-5-88
SNSC Review /Date

1/10/88
Approved By /Date

8901220613

Indian Point Station
Unit No. 2
Revision ~~16~~ 17

TEST EQUIPMENT

1. Procedure Number and Title: PT-M14A Reactor Protection Logic Channel Functional Test

2. Suggested Equipment:

Description	Serial No. Or M&TE No.	Next Cal. Due Date	Used By: Initial/Date
Breaker Interlock Key	N/A	N/A	N/A
Flashlight	N/A	N/A	N/A
DVM			

Gauge Selection:

The range of a pressure gauge should be about 2 times the measured value. However, the range shall not exceed 3 times the maximum measured value.

Indian Point Station
Unit #2
Revision ~~16~~ 17

PT-M14A

REACTOR PROTECTION LOGIC CHANNEL FUNCTIONAL TEST

1.0 OBJECTIVE

To demonstrate the operability of the Reactor Protection System Logic relays.

2.0 PRECAUTIONS AND LIMITATIONS:

2.1 This test may be performed regardless of the plant operating status EXCEPT as indicated below:

a) The source range high flux trips can be tested only when the reactor power level is below 10^5 CPS.

b) The following conditions shall be present in order to perform the functional tests described herein:

1. At least three (3) reactor coolant pumps must be in service.
2. The pressurizer pressure must be above 1800 psig.
3. The pressurizer water level must be below 92% of span.
4. The turbine trip must be reset.

Functional tests performed in accordance with 2.1b.

Location in Procedure	Description
1. Para. 3.8	Source Range High Flux Trips, Table 1, Para. HH
2. Para. 3.9	Intermediate Range High Flux Trips, Table 2, Para. R
3. Para. 3.10	Power Range Low Range High Flux Trips, Table 3, Para. N.
4. Para. 3.18	Pressurizer Low Pressure Trips
5. Para. 3.19	Pressurizer High Water Level Trips
6. Para. 3.21	Reactor Coolant Low Flow Trips (2/4 Loops)

.7	(Para. 3.23)	Reactor Coolant Pump Circuit Breaker Trips (2/4 Pumps).
.8	(Para. 3.24)	6.9 KV Bus Undervoltage Trips.
.9	(Para. 3.25)	Turbine Autostop trips.

C) Reactor Power must be below the P-8 setpoint to perform the following functional tests.

Location in Procedure		Description
.1	(Para. 3.21)	Reactor Coolant Low Flow Trips (2/4 Loops)
.2	(Para. 3.23)	Reactor Coolant Pump Circuit Breaker TRips (2/4 Pumps)
.3	(Para. 3.27)	Verification of P-8 setpoint.

D) Four (4) reactor coolant pumps must be in operation to perform the following functional tests.

Location in Procedure		Description
.1	(Para. 3.20)	Reactor Coolant Low Flow Trip (Any Loop)
.2	(Para 3.22)	Reactor Coolant Pump Circuit Breaker Trip (Any Pump)
.3	(Para. 3.25)	Turbine Auto Stop

R17

E) Reactor Power must be below the P-7 setpoint (10% of full power) to perform the functional test associated with verification of the P-7 permissive, Para. 3.26 in the Procedure.

F) The RCS temperature must be above 375°F. to test the LoPar Temperature Protection Trip as per Para. 3.29.

2.2 Only one logic train may be tested at a time except as specified in Para. 3.9.Z throught 3.9 EE.

2.3 Under no circumstances shall <u>both</u> reactor trip bypass breakers be racked in at the same time.

<u>NOTE</u>: Bypass Breaker BYA is controlled by Train B and Breaker BYB is controlled by Train A.

2.4 All reactor trips must be cleared on the logic channel being tested.

2.5 During logic channel functional testing, various channel trip alarms will annunciate and various trip status lights will illuminate. It is not necessary to verify these actions since this has already been done during the analog channel testing phase, except as noted in the procedure.

2.6 Do not push in the test switches when these switches are in the left (normal) position.

2.7 After <u>each</u> coincidence logic test is completed, notify the SRO to reset the "First Out' Annunciator.

2.8 Technicians performing this test are required to complete Sections 3.0 on Page PT-M14A-69 and 4.0 on Page PT-M14A-70.

2.9 If portions of the test cannot be performed because it would require reducing power, the Operability Criteria shall not apply to those portions.

2.10 House Maintenance shall be notified every 6 months to perform M/P 16.33, Reactor Trip and BYpass Breakers P/M Semi-Annual Inspection, coincident with the normal performance of PT-M14A. The Bypass Breakers should be done one or two days prior to PT-M14A and the Reactor Trip Breakers should be done during PT-M14A (Sections 3.8 through 3.29).

2.11 The cognizant supervisor or his designee shall review the test for completeness and that the Test Results Section was completed accurately. After review, the cognizant supervisor or his designee shall sign and date in Section 5.0.

2.12 This procedure may be performed on less than the total number of components included if noted by the Test Engineer.

3.0 PROCEDURE

3.1 Unless specified otherwise, all logic test switches and indicating lamps are located in panel RLTRA for Channel A and RLTRB for Channel B.

3.2 The tables in this procedure are to be used in the following manner:

A. Column 2 (Action Initiated) describes the particular action to be performed such as pushing or rotating switches.

B. Column 1 (Permisssive Actuation Switches) describes the various test switches that must be simultaneously pushed with the switches in Column 2.

C. Letter designation in either Column 1 or 2 refer to the following conditions.:

R - Switch rotated to the right
P - Switch pushed
R/P - Switch rotated to the right and then push
L - Switch rotated to the left

D. Column 3 (test panel trip lamp on) refers to the test lamp associated with the switch actuation in Column 2.

E. Column 4 (Trip Bus Voltage Off) indicated when voltage should <u>not</u> exist (tripped condition) on the trip bus.

F. Column 5 (Remarks) if conditions of Column 3 and 4 are met for the switch actuations of Column 1 and 2 write an "S". If they are not met write a "U" and the condition <u>not met</u>.

G. Except where indicated otherwise, it is <u>not</u> necessary to maintain switches in the pushed position between steps.

<u>NOTE</u>: If the Reactor Trip Breaker is removed from the cubicle for Maintenance (M/P 16.33) during this test, the "Test Panel Trip Lamp Status" described in Column 3 of test tables will not function normally. To determine Trip Bus Voltage status described in Column 4 of test tables, install a D.C.V.M. on the 150 V.D.C. or higher scale* between Terminal Block RTA-1 (Wire No. ~~RTA)~~ RTA-1 DAS 10/10/88 and Terminal Block RD (Wire No. R2).

For the purpose of completing test table information the following shall apply:

* A Neon Test Light may be used.

D.C.V.M. Reading	Test Panel Trip Lamp ON	Trip Bus Voltage OFF	Reactor Protection
Approx. 125 VDC	NO	NO	Reset
Approx. 0 VDC	YES	YES	Tripped

Remove the D.C.V.M. prior to performing Step 3.31.

3.3 Obtain permission from Senior Watch Supervisor (SWS)to commence the test. The SWS shall initial below indicating that his permission is granted. Inform the Senior Reactor Operator (SRO) that the test is going to be performed. The SRO shall initial below indicating that he has been informed. The SRO is to be informed when the test is completed. The SRO shall initial under Section 4.0 on Page PT-M14A-70 indicating that he has been informed of the completion of the test.

Permission to initiate test. _____ SWS / Date

SRO Informed. _____ SRO / Date

	CHANNEL A	CHANNEL B
3.4 Unlock and open the panel door for the logic channel under test.		
3.5 Verify test panel power available indicating lights are illuminated.		
3.6 Verify all logic trip indicating lamps illuminate when depressed.		

NOTE: If preventive maintenance has been performed on the Bypass Breakers 52BYA or 52BYB, the maintenance must be complete and the breakers returned to their respective cubicles in the racked out and locked open position prior to proceeding with Step 3.7.

Breakers racked out and locked open: CH. A: _____ Signature / DATE

CH. B: _____ Signature / DATE

3.7 Prepare the Reactor Trip Breakers for logic channel testing as follows. Designations in parenthesis indicate Logic Channel B.

A) Verify RTA (RTB) Turb. Trip Monitor On.

Channel A_____ Initials Channel B_____ Initials

Verify BYA (BYB) Turb. Trip Monitor Off.

Channel A_____ Initials Channel B_____ Initials

B) Unlock, install control fuses and rack to the Test Position Bypass Breaker 52BYA (52BYB).

Channel A_____ Initials Channel B_____ Initials

C) Verify RTA (RTB) Turb. Trip Monitor On.

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Channel A_____ Initials Channel B_____ Initials

Verify BYA (BYB) Turb. Trip Monitor Off.

Channel A_____ Initials Channel B_____ Initials

D) In the Test Position close Bypass Breaker 52BYA (52BYB) from the local pushbutton at the Breaker.

Channel A_____ Initials Channel B_____ Initials

E) Verify Bypass Breaker 52BYA (52BYB) is closed by local observation of Breaker position.

Channel A_____ Initials Channel B_____ Initials

F) Verify RTA (RTB) Turb. Trip Monitor On.

Channel A_____ Initials Channel B_____ Initials

Verify BYA (BYB) Turb. Trip Monitor Off.

Channel A_____ Initials Channel B_____ Initials

G) Trip Bypass Breaker 52BYA (52BYB) via local pushbutton at the Breaker to validate its operability prior to placing the Breaker in service. Verify the Breaker is open by local observation of Breaker position.

Channel A_____ Initials Channel B_____ Initials

H) Verify RTA (RTB) Turb. Trip Monitor On.

Channel A_____ Initials Channel B_____ Initials

Verify BYA (BYB) Turb. Trip Monitor Off.

Channel A_____ Initials Channel B_____ Initials

I) Rack full into the Operate position Bypass Breaker 52BYA (52 BYB).

R17

Channel A_____ Initials Channel B_____ Initials

J) Verify RTA (RTB) Turb. Trip Monitor On.

Channel A_____ Initials Channel B_____ Initials

Verify BYA (BYB) Turb. Trip Monitor Off.

Channel A_____ Initials Channel B_____ Initials

K) Close Bypass Breaker 52BYA (52BYB) via pushbutton at the test panel.

Channel A_____ Initials Channel B_____ Initials

L) Verify RTA (RTB) Turb. Trip Monitor ~~On.~~ OFF / TPC-88-44T DRS 1/21/88

Channel A_____ Initials Channel B_____ Initials

Verify BYA (BYB) Turb. Trip Monitor Off.

Channel A_____ Initials Channel B_____ Initials

M) Verify Bypass Breaker 52BYA (52BYB) is closed by observing that the red indicating lamp is illuminated.

Channel A_____ Initials Channel B_____ Initials

N) Trip and reclose Bypass Breaker 52BYA (52BYB) at the test panel to validate its operability. Red indicating lamp is illuminated.

Channel A_____ Initials Channel B_____ Initials

O) Trip Reactor Trip Breaker RTA (52RTB) via pushbutton at the test panel and verify the breaker is open by observing that the green indicating lamp is illuminated.

Channel A_____ Initials Channel B_____ Initials

Verify RTA (RTB) Turb. Trip Monitor Off.

Channel A_____ Initials Channel B_____ Initials

Verify BYA (BYB) Turb. Trip Monitor On.

Channel A_____ Initials Channel B_____ Initials

RT7

52RTA (52RTB) can be racked out and removed from the cubicle for Preventive Maintenance. The maintenance must be completed and the Breakers returned to their cubicles in the racked in and open position prior to performance of Section 3.31.

Were Breakers racked out and removed for PM?

Channel A: YES NO _____ Signature /Date

Channel B: YES NO _____ Signature /Date

If answer to Channels A & B above is YES, then verify the following:

Verify RTA (RTB) Turb. Trip Monitor Off.

Channel A_____ Initials Channel B_____ Initials

Verify BYA (BYB) Turb. Trip Monitor On.

Channel A_____ Initials Channel B_____ Initials

Was D.C.V.M. installed?

Channel A: YES NO _____ Signature /Date

Channel B: YES NO _____ Signature /Date

P) Place Channel A (Channel B) Reactor Protection Logic Key Interlock switch in the "Defeat" position. Verify that the red lamp on Unit 1 upper (Unit 2 upper) switchgear door illuminates and that "RTA & BYB Train A Defeat" (RTB & BYA Train B Defeat) alarm annunciates on SK panel.

Channel A_____ Initials

Channel B_____ Initials

TPL 38-1977

NOTE: If breaker 52 RTA(RTB) is racked out and fuses are removed for preventive maintenance, then red light will not be lit but alarm will actuate.

	Channel A	Channel B

3.8 High Flux Source Range

1. Record date when this seciton is started.

	Date	Date

2. This section is to be performed only when reactor power level is below 10^5 CPS. Verify reactor power level is below 10^5 CPS. _____ _____

3. On the logic test panel, rotate the Source Range Bypass Test switches 1/N 31B and 1/N 32B to the right and verify that their respective indicating lamps are illuminated. The source range high flux trips are now in the unbypassed mode. _____ _____

4. Verify tha the P-10 Permissive is in the unblocking condition by observing that the "Power Above P-10" lamp on the Flight Panel is extinguished. _____ _____

5. Perform the operations indicated in Table 1.

NOTE:

a) Steps 5Z through 5EE requires actuating switches in both logic trains A and B.

b) Prior to performing HH of Table 1 verify the following conditions are met:

1. At least three reactor coolant pumps in operation. _____ _____

2. Pressurizer water level is below 92%. _____ _____

3. Pressurizer pressure above 1800 psig. _____ _____

4. Turbine trip is reset. _____ _____

PT-M14A
Tab[illegible]
Source Range High Flux

3.8

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
a		Actuate SR High Flux Trip Sw. 1/N 31D (P)	YES	YES		YES	YES	
b		Release SR High Flux Trip Sw. 1/N 31D	NO	NO		NO	NO	
c		Actuate SR High Flux Trip Sw. 1/N 32D (P)	YES	YES		YES	YES	
d		Release SR High Flux Trip SW. 1/N 32D	NO	NO		NO	NO	
e		Energize SR Bypass Relay 31B by pushing sw. 1/N 31B (R/P)	NO	NO		NO	NO	
f	1/N 31B (R/P)	Actuate SR High Flux Trip Sw. 1/N 31D (P)	YES	NO		YES	NO	
g	1/N 31B (R)	Release SR High Flux Trip Sw. 1/N 31D	NO	NO		NO	NO	
h	1/N 31B (R/P)	Actuate SR High Flux Trip Sw. 1/N 32D (P)	YES	YES		YES	YES	
i	1/N 31B (R)	Release SR High Flux 1/N 32D and	NO	NO		NO	NO	
		SR Bypass Sw. 1/N 31B	YES	NO		YES	NO	
j		Energize SR Bypass Relay 32B by pushing Sw. 1/N 32B (R/P)	NO	NO		NO	NO	
k	1/N 32B (R/P)	Actuate SR High Flux Trip Sw. 1/N 31D (P)	YES	YES		YES	YES	
l	1/N 32B (R)	Release SR High Flux Trip Sw. 1/N 31D	NO	NO		NO	NO	
m	1/N 32B (R/P)	Actuate SR High Flux Trip Sw. 1/N 32 D (P)	YES	NO		YES	NO	
n	1/N 32B (R)	Release SR High Flux Trip Sw. 1/N 32D and	NO	NO		NO	NO	
		SR Bypass SW. 1/N 32B	YES	NO		YES	NO	

PT-M14A
Table (Continued)
Source Range High Flux

3.8

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
o		Actuate P-6 and Manual SR Block as Follows						
p		Rotate Switch 1/N 35D to right, depress and maintain depressed	NO	NO		NO	NO	
q	1/N 35D (R/P)	Momentarily Position right and press SR Block Test Sw. 1/N 33A or 1/N 33B as applicable (R/P)	NO			NO		
r		Maintain 1/N 35D depressed until step s is completed. If this switch is released the source range permissive will return to the unblocked state and it will be necessary to repeat Steps o-q						
s	1/N 35D (R/P)	Actuate SR High Flux Trip 31D and (P)	YES	NO		YES	NO	
		SR High Flux Trip 32D (P)	YES	NO		YES	NO	
t	1/N 31D (P) 1/N 32D (P)	De-activate SR Manual Block by releasing 1/N 35D (Return Left)	YES	YES		YES	YES	
u	Release 1/N 31D and 32D	Re-activate P-6 and Manual Block as Follows						
v		Rotate 1/N 36D Switch to Right, depress and Maintain depressed (R/P)	NO	NO		NO	NO	

Table 1 (Continued)
Source Range High Flux

3.8

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
w	1/N 36D (R/P)	Momentarily Position Right and press SR Block Test Switch 1/N 33A or 1/N 33B as applicable (R/P)	NO			NO		
x		Maintain 1/N 36D depressed until step DD is completed. If this switch is released the source range permissive will return to the unblocked state and it will be necessary to repeat steps u-w.						
y	1/N 36D (R/P)	Actuate SR High Flux Trip 1/N 31D and (P)	YES	NO		YES	NO	
		SR High Flux Trip 1/N 32D (P)	YES	NO		YES	NO	
z	1/N 31D (P)	Actuate IR Defeat Sw. Channel A on Flight Panel (P)	YES	NO		YES	NO	
AA	1/N 32D (P) 1/N 36D (R/P)	Release IR Defeat Sw.	NO	NO		NO	NO	
BB		Activate IR Defeat Sw. for Channel B on Flight Panel (P)	YES	NO		YES	NO	
CC		Release IR Defeat Sw.	NO	NO		NO	NO	
DD		Simultaneously Actuate Channel A and Channel B IR Defeat Sw. on Flight Panel (P)	YES	YES		YES	YES	
EE		Release IR Defeat Sw.	NO	YES		NO	YES	

3.8

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
FF	1/N 36D R/P 1/N 31D (P) 1/N 32D (P)	Attempt to restore SR block by momentarily positioning 1/N 33A or 1/N 33B (as applicable) SR Block switch to the right and pushing. (R/P)	NO	NO		NO	NO	
GG	1/N 31D (P) 1/N 36D (R/P) 1/N 32D (P)	Release 1/N 33A or 1/N 33B (as applicable) and 1/N 36D (Return Left)	YES YES	YES		YES YES	YES YES	
HH	1/N 31D (P) 1/N 32D (P)	See Note 5b Actuate P-10 to block by positioning switches 1/N 42M and (R) 1/N 43M to the right (R)	YES YES	NO		YES YES	NO	
II		Release 1/N 31D and 1/N 32D and Return 1/N 42M and 1/N 43M to the left (L)	NO NO	NO		NO NO	NO	
JJ		Position SR Bypass Sw. 1/N 31B to the left (L)	YES*	NO		YES*	NO	
KK		Position SR Bypass Sw. 1/N 32B to the left (L)	YES*	NO		YES*	NO	

* If SR Bypass Switch on the NIS Racks is in the Bypass position, the Logic Panel Test Lamps will be extinguished.

3.9 High Flux Intermediate Range

1. Record reactor power level and date when this section was started

Channel A		Channel B	
% Power	Date	%Power	Da

2. On the logic test panel, rotate the intermediate range bypass test switches 1/N 35A and 1/N 36A to the right and verify their respective indicating lamps are illuminated. The intermediate range high flux trips are now in the unbypassed position.

Channel A	Channel

3. If reactor power is above 10% verify that the indicating lamps associated with IR switches 1/N 35D and 1/N 36D are not both illuminated and the lamp associated with 1/N 39A or 1/N 39B (as applicable) is not illuminated.

4. Position P-10 to unblock intermediate range trips by using either 4.a or 4.b, as applicable

   a) With Reactor Power Level Above 10%

      1) Rotate switches 1/N 41M, 1/N 42M and 1/N 43M to the right.

      2) Simultaneous push, then release the above switches.

      3) Reset the power range low range high flux trip by rotating to the right and pushing switch 1/N 47A.

      4) Release and rotate 1/N 47A to the left.

      5) Rotate 1/N 41M, 1/N 42M and 1/N 43M to the left.

   b) With Reactor Power Level Below 10%

      The P-10 permissive will be automatically unblocked. This may be verified by observing that the power above P-10 lamp on the flight panel is extinguished.

5. Perform the operations indicated in Table 2.

Note:

a) If reactor power level is above 25%, the intermediate range high flux trip bistables will be de-energized causing a reactor trip signal to occur. To test the channel under this condition, the Intermediate range High Flux trip relay test switches 1/N 35F and 1/N 36F must be positioned to the right and depressed to simulate an untripped condition. Column 1 is divided into two sections to specify permissive conditions required when above or below the 25% reactor power level.

b) "Reset" means to position the specified switch either to the left, when power level is less than 25%, or to the right and push when power level is greater than 25%. The indicating lamp associated with the test switch must be extinguished.

c) Prior to performing section r of Table 2 verify the following conditions:

	Channel A	Channel
1) At least three reactor coolant pumps are in operation.		
2) Pressurizer water level is below 92%		
3) Pressurizer pressure is above 1800 psig.		
4) Turbine trip reset		

F. 414A
Ta[illegible]2
Int[illegible]ediate Range High Flux Trip

3.9

Para.	Permissive Actuation Switches		Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Rema
	> 25%	<25%							
a	1/N36F(R/P)		Actuate I.R.High Flux Trip 1/N35F(R)	YES	YES		YES	YES	
b	1/N36F(R/P)		Reset 1/N 35F	NO	NO		NO	NO	
c	1/N35F(R/P)		Actuate IR High Flux Trip 1/N 36F (R)	YES	YES		YES	YES	
d	1/N35F(R/P)		Reset 1/N 36F	NO	NO		NO	NO	
e	1/N35F(R/P) 1/N36F(R/P)		Actuate I.R.Bypass 1/N 35A (R/P)	NO	NO		NO	NO	
f	1/N36F(R/P) 1/N35A(R/P)	1/N35A(R/P)	Actuate I.R.High Flux Trip 1/N 35F(R)	YES	NO		YES	NO	
g	1/N36F(R/P) 1/N35A(R/P)	1/N35A(R/P)	Reset 1/N 35F	NO	NO		NO	NO	
h	1/N35F(R/P) 1/N35A(R/P)	1/N35A(R/P)	Actuate I.R.High Flux Trip 1/N36F(R)	YES	YES		YES	YES	
i	1/N35F(R/P) 1/N35A(R/P)	1/N35A(R/P)	Reset 1/N 36F	NO	NO		NO	NO	
j	1/N35F(R/P) 1/N36F(R/P)		Release I.R.Bypass 1/N35A and maintain in right position(R)	YES	NO		YES	NO	
k	1/N35F(R/P) 1/N36F(R/P)		Actuate I.R.Bypass 1/N 36A (R/P)	NO	NO		NO	NO	
l	1/N36F(R/P) 1/N36A(R/P)	1/N36A(R/P)	Actuate I.R.HighFlux Trip 1/N 35F (R)	YES	YES		YES	YES	
m	1/N36F(R/P) 1/N36A(R/P)	1/N36A(R/P)	Reset 1/N 35F	NO	NO		NO	NO	
n	1/N35F(R/P) 1/N36A(R/P)	1/N36A(R/P)	Actuate I.R.High Flux Trip 1/N 36F (R)	YES	NO		YES	NO	
o	1/N35F(R/P) 1/N36A(R/P)	1/N36A(R/P)	Reset 1/N 36F	NO	NO		NO	NO	

Table 2 (Continued)
Intermediate Range High Flux Trip

3.9

Para.	Permissive Actuation Switches		Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remar
	> 25%	< 25%							
p	1/N35F(R/P) 1/N36F(R/P)		Release IR Bypass 1/N 36A and maintain in right position (R)	YES	NO		YES	NO	
q			Actuate 1/N35F(R) and 1/N 36F (R)	YES YES	YES		YES YES	YES	
r			(See Note 5c) Actuate 1/N41M(R) and 1/N 42M (R)	YES YES	YES		YES YES	YES	
s			Momentarily Actuate 1/N38A (R/P)	NO	NO		NO	NO	
t	1/N41P(R/P) 1/N42P(R/P) 1/N43P(R/P)		Simultaneously Actuate 1/N 41M (R/P) 1/N 42M (R/P) & 1/N 43M (R/P)	NO NO NO	YES		NO NO NO	YES	
u	1/N41P(R/P) 1/N42P(R/P) 1/N43P(R/P)		Release 1/N 41M (R) 1/N 42M (R) & 1/N 43M (R)	YES YES YES	YES		YES YES YES	YES	
v			Momentarily Actuate 1/N 38A(R/P)& 1/N 47A (R/P)	NO NO	NO		NO NO	NO	
w			Rotate 1/N 41M(L) 1/N 42M (L) and 1/N 43M to the left (L)	1 1 1			1 1 1		

Table (Continued)
Inter ate Range High Flux Trip

3.9

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remar
x		Rotate 1/N35A to the left (L)	YES ②			YES ②		
y		Rotate 1/N36A to the left (L)	YES ②			YES ②		
z		Rotate 1/N 35F to the left (L)	③			③		
aa		Rotate 1/N 36F to the left (L)	③			③		
bb		Rotate 1/N 38A to the left	YES			YES		
cc		Rotate 1/N 47A to the left	YES			YES		
dd		Position 1/N41P to the left	③			③		
ee		Position 1/N42P to the left	③			③		
ff		Position 1/N43P to the left	③			③		

① Lamp will be on if power > 10%; off if power < 10%
② Lamp will be off if bypass switch on IR NIS Drawer is in Bypass
③ Lamp will be on if power > 25%; off if power < 25%

3.10 High Flux Power Range Low Range

1. Record reactor power level and date this section was started.

Channel A		Channel B	
% Power	Date	% Power	Date

2. If reactor power is above 10% verify that indicating lamps associated with Intermediate range switches 1/N 35D and 1/N 36D are not both illuminated and the lamp associated with 1/N 39A or 1/N 39B (as applicable) is not illuminated.

Channel A	Channel

3. Position P-10 to unblock power range trips by using 3.a or 3.b, as applicable.

a) With Reactor Power Above 10%

1) Rotate switches 1/N 41M, 1/N 42M and 1/N 43M to the right.

2) Simultaneously push then release the above switches.

3) Reset the intermediate range permissive high flux trip by rotating to the right and pushing switch 1/N 38A.

4) Release and rotate 1/N 38A to the left.

5) Rotate 1/N 41M, 1/N 42M, 1/N 43M to the left.

b) With Reactor Power Level Below 10%

The P-10 permissive will be automatically unblocked. This may be verified by observing that the power above P-10 lamp on the flight panel is extinguished.

4. Perform the operations indicated in Table 3.

a) If reactor power level is above 25%, the power range high flux trip bistables will be de-energized causing a reactor trip signal to occur. To test the channel under this condition, the power range high flux trip relay test switches 1/N 41P, 1/N 42P, 1/N 43P and 1/N 44P must be positioned to the right and depressed to simulate an untripped condition. Column 1 is divided into two sections to specify permissive conditions required when above or below 25% reactor power.

b) "Reset" means to position the specified switch either to the left when power level is less than 25% or to the right and push when power level is greater than 25%. The indicating lamp associated with the test switch must be extinguished.

c) Prior to performing section n of Table 3, verify the following conditions.

	Channel A	Channel
1. At least three reactor coolant pumps are in operation.		
2. Pressurizer water level below 92%		
3. Pressurizer pressure above 1800 psig		
4. Turbine trip reset		

Table 3
Power Range Low Range High Flux

3.10

Para.	Permissive Actuation Switches		Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remar
	> 25%	< 25%							
a	1/N43P(R/P) 1/N44P(R/P)		Actuate L.R.High Flux Trip 1/N41P(R) and 1/N 42P (R)	YES YES	YES		YES YES	YES	
b	1/N43P(R/P) 1/N44P(R/P)		Reset High Flux Trip 1/N41P and 1/N 42P	NO	NO		NO	NO	
c	1/N42P(R/P) 1/N44P(R/P)		Actuate L.R.High Flux Trip 1/N41P(R) 1/N 43P (R)	YES YES	YES		YES YES	YES	
d	1/N42P(R/P) 1/N44P(R/P)		Reset 1/N 41P and 1/N 43P	NO	NO		NO	NO	
e	1/N42P(R/P) 1/N43P(R/P)		Actuate L.R.High Flux Trip 1/N41P (R) and 1/N44P (R)	YES YES	YES		YES YES	YES	
f	1/N42P(R/P) 1/N43P(R/P)		Reset 1/N44P and 1/N41P	NO	NO		NO	NO	
g	1/N41P(R/P) 1/N44P(R/P)		Actuate LR High Flux Trip 1/N42P and(R) 1/N 43P (R)	YES YES	YES		YES YES	YES	
h	1/N41P(R/P) 1/N44P(R/P)		Reset 1/N42P and 1/N43P	NO	NO		NO	NO	
i	1/N41P(R/P) 1/N43P(R/P)		Actuate LR High Flux Trip 1/N42P and (R) 1/N44P (R)	YES YES	YES.		YES YES	YES	
j	1/N41P(R/P) 1/N43P(R/P)		Reset 1/N42P and 1/N44P	NO	NO		NO	NO	
k	1/N41P(R/P) 1/N42P(R/P)		Actuate LR High Flux Trip 1/N43P and (R) 1/N44P (R)	YES YES	YES		YES YES	YES	

Table 3 (Continued)
Power Range Low Range High Flux

3.10

Para	Permissive Actuation Switches > 25%	Permissive Actuation Switches < 25%	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
l	1/N41P(R/P) 1/N42P(R/P)		Reset 1/N43P and 1/N44P	NO	NO		NO	NO	
m			Actuate LR High Flux Trips 1/N41P, 1/N42P, 1/N43P and 1/N44P (R)	YES	YES		YES	YES	
n			(See Note 4c) Actuate 1/N43M(R) and 1/N42M (R)	YES YES	YES		YES YES	YES	
o			Momentarily Actuate 1/N47A to put P-10 in Blocked Condition (R/P)	NO	NO		NO	NO	
p	1/N35F(R/P) 1/N36F(R/P)		Simultaneously Actuate 1/N42M(R/P) 1/N43M(R/P) and 1/N44M(R/P)	NO NO NO	YES		NO NO NO	YES	
q	1/N35F(R/P) 1/N36F(R/P)		Release 1/N42M(R) 1/N43M(R) and 1/N44M(R)	YES YES YES	YES		YES YES YES	YES	
r			Momentarily Actuate 1/N38A (R/P) and 1/N47A (R/P)	NO NO	NO		NO NO	NO	
s			Rotate 1/N42M 1/N43M and 1/N44M to the left (L)	① ① ①			① ① ①		
t			Rotate 1/N35F to the left (L)	②			②		

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Table (Continued)
Power Range Low Range High Flux

3.10

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remar
u		Rotate 1/N36F (L) to the left	②			②		
v		Rotate 1/N38A (L) to the left	YES			YES		
w		Rotate 1/N47A to the left (L)	YES			YES		
x		Rotate 1/N41P to the left (L)	②			②		
y		Rotate 1/N42P to the left (L)	②			②		
z		Rotate 1/N43P to the left (L)	②			②		
aa		Rotate 1/N44P to the left (L)	②			②		

① Lamp will be on if power > 10%; off if Power < 10%.
② Lamp will be on if power level is > 25%; off if power level < 25%.

3.11 Power Range High Range High Flux Trip

1. Record power level and date this section was started

Channel A		Channel B	
%Power	Date	%Power	Date

2. Perform the operations indicated in Table 4.

Tab[illegible]4
Pow[illegible]ange High Range High Flux

3.11

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
a		Actuate High Flux Power Range 1/N41R(P) and 1/N42R (P)	YES YES	YES		YES YES	YES	
b		Release 1/N41R and 1/N42R	NO NO	NO		NO NO	NO	
c		Actuate High Flux Pwr.Range 1/N41R(P) and 1/N43R (P)	YES YES	YES		YES YES	YES	
d		Release 1/N41R and 1/N43R	NO NO	NO		NO NO	NO	
e		Actuate High Flux Pwr.Range 1/N41R(P) and 1/N44R (P)	YES YES	YES		YES YES	YES	
f		Release 1/N41R and 1/N44R	NO NO	NO		NO NO	NO	
g		Actuate High Flux Pwr.Range 1/N42R (P) and 1/N43R (P)	YES YES	YES		YES YES	YES	
h		Release 1/N42R and 1/N43R	NO NO	NO		NO NO	NO	
i		Actuate High Flux Pwr.Range 1/N42R(P) and 1/N44R (P)	YES YES	YES		YES YES	YES	
j		Release 1/N42R and 1/N44R	NO NO	NO		NO NO	NO	
k		Actuate High Flux Pwr.Range 1/N43R and 1/N44R	YES YES	YES		YES YES	YES	
l		Release 1/N43R and 1/N44R	NO NO	NO		NO NO	NO	

3.12 Overpower ΔT

	Channel A	Channel
1. Record date this section was started.	Date	Date
2. Perform operations indicated in Table 5.		

3.13 Overtemperature ΔT

1. Record date this section was started.	Date	Date
2. Perform the operations indicated in Table 6.		

3.14 Safety Injection

1. Record date this section was started.	Date	Date
2. Push SIAM-1 switch and verify associated indicating lamp illuminates and trip bus voltage is off.		
3. Release SIAM-1 and verify associated indicating lamp extinguishes.		
4. Push SIAM-2 switch and verify associated indicating lamp illuminates and trip bus voltage is off.		
5. Release SIAM-2 and verify associated indicating lamp extinguishes.		

3.15 Low S.G. Water Level and SF/FWF Mismatch

1. Record date test was started.	Date	Date
2. Perform the operations indicated in Table 7.		

3.16 Low-Low Steam Generator Water Level

1. Record date test was started.	Date	Dat
2. Perform operations indicated in Table 8.		

Table
Over r ΔT

3.12

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remar
a		Actuate Overpower ΔT Sw. 1/N411C (P) and 1/N421C (P)	YES / YES	YES		YES / YES	YES	
b		Release 1/N411C and 1/N421C	NO / NO	NO		NO / NO	NO	
c		Actuate Overpower ΔT Sw. 1/N411C (P) and 1/N431C (P)	YES / YES	YES		YES / YES	YES	
d		Release 1/N411C and 1/N431C	NO / NO	NO		NO / NO	NO	
e		Actuate Overpower ΔT Sw. 1/N411C (P) and 1/N441C (P)	YES / YES	YES		YES / YES	YES	
f		Release 1/N411C and 1/N441C	NO / NO	NO		NO / NO	NO	
g		Actuate Overpower ΔT Sw. 1/N421C (P) and 1/N431C (P)	YES / YES	YES		YES / YES	YES	
h		Release 1/N421C and 1/N431C	NO / NO	NO		NO / NO	NO	
i		Actuate Overpower ΔT Sw. 1/N421C (P) and 1/N441C (P)	YES / YES	YES		YES / YES	YES	
j		Release 1/N421C and 1/N441C	NO / NO	NO		NO / NO	NO	
k		Actuate Overpower ΔT Sw. 1/N431C (P) and 1/N441C (P)	YES / YES	YES		YES / YES	YES	
l		Release 1/N431C 1/N441C	NO / NO	NO		NO / NO	NO	

Table 6
Overtemperature ΔT

3.13

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
a		Actuate Overtemp ΔT Switch 1/N 411A (P) and 1/N 421A (P)	YES YES	YES		YES YES	YES	
b		Release 1/N411A and 1/N 421A	NO NO	NO		NO NO	NO	
c		Actuate Overtemp ΔT Switch 1/N 411A (P) and 1/N 431A (P)	YES YES	YES		YES YES	YES	
d		Release 1/N 411A and 1/N 431A	NO NO	NO		NO NO	NO	
e		Actuate Overtemp ΔT Switch 1/N 411A (P) and 1/N 441A (P)	YES YES	YES		YES YES	YES	
f		Release 1/N 411A and 1/N 441A	NO NO	NO		NO NO	NO	
g		Actuate Overtemp ΔT Switch 1/N 421A (P) and 1/N 431A (P)	YES YES	YES		YES YES	YES	
h		Release 1/N 421A and 1/N 431A	NO NO	NO		NO NO	NO	
i		Actuate Overtemp ΔT Switch 1/N 421A and (P) 1/N 441A (P)	YES YES	YES		YES YES	YES	
j		Release 1/N 421A and 1/N 441A	NO NO	NO		NO NO	NO	
k		Actuate Overtemp ΔT Switch 1/N 431A and (P) 1/N 441A (P)	YES YES	YES		YES YES	YES	
l		Release 1/N 431A and 1/N 441A	NO NO	NO		NO NO	NO	

Table 3
Low S[illegible] Water Level and S/F / FWF Mismatch

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3.15

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remar
a		Actuate Low Level Sw. LC-417K (P) and Mismatch Sw. FC-418D (P)	YES YES	YES		YES YES	YES	
b		Release LC-417K and FC-418D	NO NO	NO		NO NO	NO	
c		Actuate Low Level Sw. LC-417G (P) and Mismatch Sw. FC-418F (P)	YES YES	YES		YES YES	YES	
d		Release LC-417G and FC-418F	NO NO	NO		NO NO	NO	
e		Actuate Low Level Sw. LC-427K (P) and Mismatch Sw. FC-428F (P)	YES YES	YES		YES YES	YES	
f		Release LC-427K and FC-428F	NO NO	NO		NO NO	NO	
g		Actuate Low Level Sw. LC-427G (P) and Mismatch Sw. FC-428D (P)	YES YES	YES		YES YES	YES	
h		Release LC-427G and FC-428D	NO NO	NO		NO NO	NO	
i		Actuate Low Level Sw. LC-437K and Mismatch Sw. FC-438F	YES YES	YES		YES YES	YES	
j		Release LC-437K and FC-438F	NO NO	NO		NO NO	NO	
k		Actuate Low Level Sw. LC-437G (P) and Mismatch Sw. FC-438D (P)	YES YES	YES		YES YES	YES	
l		Release LC-437G and FC-438D	NO NO	NO		NO NO	NO	
m		Actuate Low Level Sw. LC-447K (P) and Mismatch Sw. FC-448D (P)	YES YES	YES		YES YES	YES	
n		Release LC-447K and FC-448D	NO NO	NO		NO NO	NO	
o		Actuate Low Level Sw. LC-447G and Mismatch Sw. FC-448F	YES YES	YES		YES YES	YES	
p		Release LC-447G and FC-448F	NO NO	NO		NO NO	NO	

Table [illegible]8
Low [illegible] Steam Generator Water Level

3.16

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remar
a		Actuate Low Level Sw. LC-417B (P) and LC-417D (P) *	YES YES	YES		YES YES	YES	
b		Release LC-417B and LC-417D	NO NO	NO		NO NO	NO	
c		Actuate Low Level Sw. LC-417B (P) and LC-417F (P) *	YES YES	YES		YES YES	YES	
d		Release LC-417B and LC-417F	NO NO	NO		NO NO	NO	
e		Actuate Low Level Sw. LC-417D (P) and LC-417F (P) *	YES YES	YES		YES YES	YES	
f		Release LC-417D and LC-417F	NO NO	NO		NO NO	NO	
g		Actuate Low Level Sw. LC-427B (P) and LC-427D (P) *	YES YES	YES		YES YES	YES	
h		Release LC-427B and LC-427D	NO NO	NO		NO NO	NO	
i		Actuate Low Level Sw. LC-427B (P) and LC-427F (P) *	YES YES	YES		YES YES	YES	
j		Release LC-427B and LC-427F	NO NO	NO		NO NO	NO	
k		Actuate Low Level Sw. LC-427D (P) and LC-427F * (P)	YES YES	YES		YES YES	YES	
l		Release LC-427D and LC-427F	NO NO	NO		NO NO	NO	
m		Actuate Low Level Sw. LC-437B (P) and LC-437D (P) *	YES YES	YES		YES YES	YES	
n		Release LC-437B and LC-437D	NO NO	NO		NO NO	NO	
o		Actuate Low Level Sw. LC-437B (P) and LC-437F (P) *	YES YES	YES		YES YES	YES	
p		Release LC-437B and LC-437F	NO NO	NO		NO NO	NO	

* SEE NOTE ON NEXT PAGE.

Table [illegible]
Low-L[illegible]team Generator Water Level

3.16

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remar
q		Actuate Low Level Sw. LC-437D (P) and LC-437F (P) *	YES YES	YES		YES YES	YES	
r		Release LC-437D and LC-437F	NO NO	NO		NO NO	NO	
s		Actuate Low Level Sw. LC-447B (P) and LC-447D (P) *	YES YES	YES		YES YES	YES	
t		Release LC-447B and LC-447D	NO NO	NO		NO NO	NO	
u		Actuate Low Level Sw. LC-447B (P) and LC-447F * (P)	YES YES	YES		YES YES	YES	
v		Release LC-447B and LC-447F	NO NO	NO		NO NO	NO	
w		Actuate Low Level Sw. LC-447D (P) and LC-447F (P) *	YES YES	YES		YES YES	YES	
x		Release LC-447D and LC-447F	NO NO	NO		NO NO	NO	

* WHEN ACTUATING LOW LEVEL SWITCHES, VERIFY THAT APPROX. 125 VDC EXISTS BETWEEN THE INDICATED POINTS. RECORD RESULTS ON PAGE PT-M14A-29A.

Table 8 (Continued)

Low-Low Steam Generator Water Level

3.16 (Continued)

When actuating Low-Low Level Switches, verify that approximately 125 VDC exists between the indicated points. (Ref. Print 9231-LL-3118-20)

	Test Points	125 VDC Exists
Train A		
SG 21	417 F-Y 6 to 417 B-Y 2	_____
SG 22	427 F-Y 6 to 427 B-Y 2	_____
SG 23	437 F-Y 6 to 437 B-Y 2	_____
SG 24	447 F-Y 6 to 447 B-Y 1	_____
Train B		
SG 21	417 F-Y 6 to 417 B-Y 2	_____
SG 22	427 F-Y 6 to 427 B-Y 2	_____
SG 23	437 F-Y 6 to 437 B-Y 2	_____
SG 24	447 F-Y 6 to 447 B-Y 2	_____

(Next page is PT-M14A-30)

3.17 Pressurizer High Pressure

	Channel A	Channel
1. Record date this section started.	Date	Date
2. Perform the operations indicated in Table 9.		

3.18 Pressurizer Low Pressure

1. Record date this section was started.		
a. Record reactor power level.		
2. If reactor power is less than 10% rotate 1/N 41M and 1/N 42M to the right to unblock the P-7 permissive.		
3. Pressurizer pressure must be above 1800 psig to test low pressure logic relays. Verify pressurizer pressure is above 1800 psig.		
4. Verify at least three reactor coolant pumps are in operation.		
5. Verify turbine trip is reset.		
6. Verify pressurizer level below 92%		
7. Perform operations indicated in Table 10.		

Tab[illegible]
Pre[illegible]izer High Pressure Trip

3.17

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Test Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Test Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remar
a		Actuate High Press Sw. PC-455B (P) and PC-456B (P)	YES YES	YES		YES YES	YES	
b		Release PC-455B and PC-456B	NO NO	NO		NO NO	NO	
c		Actuate High Press Sw. PC-455B (P) and PC-457B (P)	YES YES	YES		YES YES	YES	
d		Release PC-455B and PC-457B	NO NO	NO		NO NO	NO	
e		Actuate High Press Sw. PC-456B (P) and PC-457B (P)	YES YES	YES		YES YES	YES	
f		Release PC-456B and PC-457B	NO NO	NO		NO NO	NO	

Table [illegible]
Press[illegible]er Low Pressure Trip

3.18

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
a		Actuate Low Press Sw. PC-455A (P) and PC-456A (P)	YES YES	YES		YES YES	YES	
b		Release PC-455A and PC-456A	NO NO	NO		NO NO	NO	
c		Actuate Low Press Sw. PC-455A (P) and PC-457A (P)	YES YES	YES		YES YES	YES	
d		Release PC-455A and PC-457A	NO NO	NO		NO NO	NO	
e		Actuate Low Press Sw. PC-455A (P) and PC-474A (P)	YES YES	YES		YES YES	YES	
f		Release PC-455A and PC-474A	NO NO	NO		NO NO	NO	
g		Actuate Low Press Sw. PC-456A (P) and PC-457A (P)	YES YES	YES		YES YES	YES	
h		Release PC-456A and PC-457A	NO NO	NO		NO NO	NO	
i		Actuate Low Press Sw. PC-456A (P) and PC-474A (P)	YES YES	YES		YES YES	YES	
j		Release PC-456A and PC-474A	NO NO	NO		NO NO	NO	
k		Actuate Low Press Sw. PC-457A (P) and PC-474A (P)	YES YES	YES		YES YES	YES	
l		Release PC-457A and PC-474A	NO NO	NO		NO NO	NO	
m		Position 1/N41M and 1/N42M to the left if previously actuated (1)	NO NO			NO NO		

(1) If previously rotated to the right.

3.19 Pressurizer High Water Level

	Channel A	Channel
1. Pressurizer water level must be below 92% to test the high water level logic relays. Verify pressure level is below 92%.		
2. Record date this section was started		
a. Record reactor power level		
3. If reactor power is less than 10% rotate 1/N 41M and 1/N 42M to the right to unblock the P-7 permissive.		
4. Verify at least three reactor coolant pumps must be in operation.		
5. Verify Turbine Trip reset.		
6. Verify pressurizer pressure above 1800 psig.		

7. Perform the operations indicated in Table 11.

Table 11
Pressu[illegible]r High Water Level

3.19

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
a		Actuate Press Hi Water Level Sw. LC-459A and (P) LC-460A (P)	YES YES	YES		YES YES	YES	
b		Release LC-459A and LC-460A	NO NO	NO		NO NO	NO	
c		Actuate Press Hi Water Level Sw. LC-459A and (P) LC-461A (P)	YES YES	YES		YES YES	YES	
d		Release LC-459A and LC-461A	NO NO	NO		NO NO	NO	
e		Actuate Hi Water Level Sw. LC-460A (P) and LC-461A (P)	YES YES	YES		YES YES	YES	
f		Release LC-460A and LC-461A	NO NO	NO		NO NO	NO	
g		Rotate 1/N 41M and 1/N 42M to the left if previously rotated to the right	NO NO			NO NO		

3.20 Reactor Coolant Low Flow (Any Loop)

3.20.1 Record date this section was started.

_____ _____
Channel A Channel B

3.20.1.A Record reactor power level.

_____ _____
Channel A Channel B

3.20.2 Verify all four reactor coolant pumps are in operation.

_____ _____
Channel A Channel B

3.20.3 Perform the operations indicated in Table 12.

3.20.3.A The P-8 permissive is to be unblocked by pushing in 1/N 41N and 1/N 42N if power is below 20%. 1R17

_____ _____
Channel A Channel B

Table 12
Reactor Coolant Low Flow Loop 21

3.20

Para.	Perm. Actr. Sw. if < 50%	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
a	1/N41N(P) 1/N42N(P)	Actuate Low Flow Sw. FC-414(P) and FC-415(P)	YES YES	YES		YES YES	YES	
b	1/N41N(P) 1/N42N(P)	Release FC-414 and FC-415	NO NO	NO		NO NO	NO	
c	1/N41N(P) 1/N42N(P)	Actuate Low Flow Sw. FC-414(P) and FC-416(P)	YES YES	YES		YES YES	YES	
d	1/N41N(P) 1/N42N(P)	Release FC-414 and FC-416	NO NO	NO		NO NO	NO	
e	1/N41N(P) 1/N42N(P)	Actuate Low Flow Sw. FC-415(P) and FC-416(P)	YES YES	YES		YES YES	YES	
f	1/N41N(P) 1/N42N(P)	Release FC-415 and FC-416	NO NO	NO		NO NO	NO	
g		Release 1/N 41N and 1/N 42N	① ①			① ①		
h		Perform this step if Power below P-8 lamp on Flight Panel is illuminated.						
		Actuate Low Flow Sw. FC-415(P) and FC-416(P)	YES YES	NO		YES YES	NO	
i		Release FC-415 and FC-416	NO NO	NO		NO NO	NO	

① Lamp will be illuminated if Reactor Power Level is above the P-8 Setpoint, Lamp will be extinguished if Reactor Power Level is below the P-8 Setpoint.

Table 12 (Continued)
Reactor Coolant Low Flow Loop 22

3.20

Para.	Perm. Act. Sw. if < 50%	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
a	1/N41N(P)	Actuate Low Flow Sw. FC-424(P)	YES	YES		YES	YES	
	1/N42N(P)	and FC-425(P)	YES			YES		
b	1/N41N(P)	Release FC-424 and	NO	NO		NO	NO	
	1/N42N(P)	FC-425	NO			NO		
c	1/N41N(P)	Actuate Low Flow Sw. FC-424(P)	YES	YES		YES	YES	
	1/N42N(P)	and FC-426(P)	YES			YES		
d	1/N41N(P)	Release FC-424 and	NO	NO		NO	NO	
	1/N42N(P)	FC-426	NO			NO		
e	1/N41N(P)	Actuate Low Flow Sw. FC-425(P)	YES	YES		YES	YES	
	1/N42N(P)	and FC-426(P)	YES			YES		
f	1/N41N(P)	Release FC-425 and	NO	NO		NO	NO	
	1/N42N(P)	FC-426	NO			NO		
g		Release 1/N 41N and	①			①		
		and 1/N 42N	①			①		
h		Perform this step if Power below P-8 lamp is ILLUMINATED						
		Actuate Low Flow Sw. FC-425(P)	YES	NO		YES	NO	
		and FC-426(P)	YES			YES		
i		Release FC-425 and	NO	NO		NO	NO	
		FC-426	NO			NO		

① Lamp will be illuminated if Reactor Power Level is above the P-8 Setpoint; Lamp will be extinguished if Reactor Power Level is below the P-8 Setpoint.

Table 12 (Continued)
Reac[illegible] Coolant Low Flow Loop 23

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3.20

Para.	Perm: Act. Sw. if < 50%	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarl
a	1/N41N(P) 1/N42N(P)	Actuate Low Flow Sw. FC-434(P) and FC-435(P)	YES YES	YES		YES YES	YES	
b	1/N41N(P) 1/N42N(P)	Release FC-434 and FC-435	NO NO	NO		NO NO	NO	
c	1/N41N(P) 1/N42N(P)	Actuate Low Flow Sw. FC-434(P) and FC-436(P)	YES YES	YES		YES YES	YES	
d	1/N41N(P) 1/N42N(P)	Release FC-434 and FC-436	NO NO	NO		NO NO	NO	
e	1/N41N(P) 1/N42N(P)	Actuate Low Flow Sw. FC-435(P) and FC-436(P)	YES YES	YES		YES YES	YES	
f	1/N41N(P) 1/N42N(P)	Release FC-435 and FC-436	NO NO	NO		NO NO	NO	
g		Release 1/N 41N and 1/N 42N	① ①			① ①		
h		Perform this step if Power below P-8 lamp is illuminated Actuate Low Flow Sw. FC-435(P) and FC-436(P)	YES YES	NO		YES YES	NO	
i		Release FC-435 and FC-436	NO NO	NO		NO NO	NO	

① Lamp will be illuminated if Reactor Power Level is above the P-8 Setpoint; Lamp will be extinguished if Reactor Power Level is below the P-8 Setpoint.

Table 12 (Continued)
Reac[illegible] Coolant Low Flow Loop 24

3.20

Para.	Perm. Act. Sw. if < 50%	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remar
a	1/N41N(P) 1/N42N(P)	Actuate Low Flow Sw. FC-444(P) and FC-445(P)	YES YES	YES		YES YES	YES	
b	1/N41N(P) 1/N42N(P)	Release FC-444 and FC-445	NO NO	NO		NO NO	NO	
c	1/N41N(P) 1/N42N(P)	Actuate Low Flow Sw. FC-444(P) and FC-446(P)	YES YES	YES		YES YES	YES	
d	1/N41N(P) 1/N42N(P)	Release FC-444 and FC-446	NO NO	NO		NO NO	NO	
e	1/N41N(P) 1/N42N(P)	Actuate Low Flow Sw. FC-445(P) and FC-446(P)	YES YES	YES		YES YES	YES	
f	1/N41N(P) 1/N42N(P)	Release FC-445 and FC-446	NO NO	NO		NO NO	NO	
g		Release 1/N 41N and 1/N 42N	① ①			① ①		
h		Perform this step if Power below P-8 lamp is illuminated Actuate Low Flow Sw. FC-445 and FC-446	YES YES	NO		YES YES	NO	
i		Release FC-445 and FC-446	NO NO	NO		NO NO	NO	

① Lamp will be illuminated if Reactor Power Level is above the P-8 Setpoint; Lamp will be extinguished if Reactor Power Level is below the P-8 Setpoint;

3.21 Reactor Coolant Low Flow (2/4 Loops)

	Channel A	Channel
1. Record date this section was started.		
a. Record reactor power level.		
2. Verify reactor power level is below the P-8 setpoint.		
3. This section should be performed with four reactor coolant pumps in operation. If operating conditions prohibit this, the test may be performed with three (3) reactor coolant pumps in operation. However, a complete verification of the reactor trip matrix is not possible. Record the number of reactor coolant pumps in operation.		
4. If the reactor power level is below 10%, position P-7 permissive switches to unblock by rotating 1/N 41M and 1/N 42M to the right.		
5. Verify pressurizer level is below 92%.		
6. Verify pressurizer pressure is above 1800 psig.		
7. Verify turbine trip is reset.		
8. Perform operations listed in Table 13.		

Table 13
Reactor Coolant Low Flow (2/4 Loops)

3.21

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
a		Actuate Low Flow Sw. FC-414 (P)	YES	YES		YES	YES	
		FC-415 (P)	YES			YES		
		FC-424 (P)	YES			YES		
		FC-425 (P)	YES			YES		
b		Release FC-414	NO	NO		NO	NO	
		FC-415	NO			NO		
		FC-424	NO			NO		
		FC-425	NO			NO		
c		Actuate Low Flow Sw. FC-414 (P)	YES	YES		YES	YES	
		FC-415 (P)	YES			YES		
		FC-434 (P)	YES			YES		
		FC-435 (P)	YES			YES		
d		Release FC-414	NO	NO		NO	NO	
		FC-415	NO			NO		
		FC-434	NO			NO		
		FC-435	NO			NO		
e		Actuate Low Flow Sw. FC-415 (P)	YES	YES		YES	YES	
		FC-416 (P)	YES			YES		
		FC-444 (P)	YES			YES		
		FC-445 (P)	YES			YES		
f		Release FC-415	NO	NO		NO	NO	
		FC-416	NO			NO		
		FC-444	NO			NO		
		FC-445	NO			NO		
g		Actuate Low Flow Sw. FC-424 (P)	YES	YES		YES	YES	
		FC-426 (P)	YES			YES		
		FC-434 (P)	YES			YES		
		FC-436 (P)	YES			YES		
h		Release FC-424	NO	NO		NO	NO	
		FC-426	NO			NO		
		FC-434	NO			NO		
		FC-436	NO			NO		

Table 13 (Continued)
Reactor Coolant Low Flow (2/4 Loops)

3.21

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
i		Actuate Low Flow Sw. FC-425(P)	YES	YES		YES	YES	
		FC-426(P)	YES			YES		
		FC-444(P)	YES			YES		
		FC-446(P)	YES			YES		
j		Release FC-425	NO	NO		NO	NO	
		FC-426	NO			NO		
		FC-444	NO			NO		
		FC-446	NO			NO		
k		Actuate Low Flow Sw. FC-435(P)	YES	YES		YES	YES	
		FC-436(P)	YES			YES		
		FC-445(P)	YES			YES		
		FC-446(P)	YES			YES		
l		Release FC-435	NO	NO		NO	NO	
		FC-436	NO			NO		
		FC-445	NO			NO		
		FC-446	NO			NO		
m		Rotate 1/N 41M and	①			①		
		1/N 42M to the left ②	①			①		

① Lamp will be on if Reactor Power is above 10%; off if reactor power is below 10%.
② If previously rotated to the right.

Table 13 (Continued)
Reactor Coolant Low Flow (2/4 Loops)

3.21

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
n		If Reactor Power Level is below 10% verify P-7 Block as follows:						
o		Actuate Low Flow Sw. FC-435(P)	YES	NO		YES	NO	
		FC-436(P)	YES			YES		
		FC-445(P)	YES			YES		
		FC-446(P)	YES			YES		
p		Release FC-435	NO	NO		NO	NO	
		FC-436	NO			NO		
		FC-445	NO			NO		
		FC-446	NO			NO		

3.22 Reactor Coolant Pump Breakers (Any Loop)

3.22.1 Record date this section was started.

_____ _____
Channel A Channel B

3.22.2 Verify all four reactor coolant pumps are in operation.

_____ _____
Channel A Channel B

3.22.3 Perform the operations indicated in Table 14.

.1 The P-8 permissive is to be unblocked by pushing in 1/N 41N and 1/N 42N if power is below 20% | R17

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CJA 3/31/88

TABLE 14

Reactor Coolant Pump Breakers (Any Loop)

3.22

Para	Permissive Actuation Sw. if ~~<60%~~ <20%	Action Initiated	Channel A Test Panel Trip Lamp ON	Channel A Trip Bus Volt. OFF	Channel A Re-marks	Channel B Test Panel Trip Lamp ON	Channel B Trip Bus Volt. OFF	Channel B Re-marks
a	1/N41N(P) 1/N42N(P)	Actuate RCP 1 Breaker Test Sw. (P)	YES	YES		YES	YES	
b	1/N41N(P) 1/N42N(P)	Release RCP 1 Breaker Test Sw.	NO	NO		NO	NO	
c	1/N41N(P) 1/N42N(P)	Actuate RCP 2 Breaker Test Sw. (P)	YES	YES		YES	YES	
d	1/N41N(P) 1/N42N(P)	Release RCP 2 Breaker Test Sw.	NO	NO		NO	NO	
e	1/N41N(P) 1/N42N(P)	Actuate RCP 3 Breaker Test Sw. (P)	YES	YES		YES	YES	
f	1/N41N(P) 1/N42N(P)	Release RCP 3 Breaker Test Sw.	NO	NO		NO	NO	
g	1/N41N(P) 1/N42N(P)	Actuate RCP 4 Breaker Test Sw. (P)	YES	YES		YES	YES	
h	1/N41N(P) 1/N42N(P)	Release RCP 4 Breaker Test Sw.	NO	NO		NO	NO	
i	----------	Rlease 1/N41N and 1/N42N	(1) (1)	----- -----		(1) (1)	----- -----	
j	---------- ---------- ---------- ---------- ----------	Perform this step if power ~~above~~ below P-8 Lmp is illumin. Actuate RCP 1 Breaker Test Sw.	--------- --------- --------- --------- YES	----- ----- ----- ----- NO		--------- --------- --------- --------- YES	----- ----- ----- ----- NO	
k	---------- ----------	Release RCP Breaker Test Sw.	NO	NO		NO	NO	

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(1) Lamp will be illuminated if Reactor Power is above the P-8 Setpoint; Lamp will be extinguished if Reactor Power Level is below the P-8 Setpoint.

3.23 Reactor Coolant Pump Breakers (2/4 Loops)

	Channel A	Channel
1. Record date this section was started.		
a. Record reactor power level.		
2. Verify reactor power level is below the P-8 setpoint.		
3. This section should be performed with four reactor coolant pumps in operation. If conditions prohibit this, the test may be performed with three reactor coolant pumps in operation, however, a complete verification of the reactor trip matrix is not possible. Record the number of reactor coolant pumps in operation.		
4. If reactor power level is below 10%, position the P-7 permissive switches to unblock by rotating 1/N 41M and 1/N 42M to the right.		
5. Verify pressurizer level below 92%.		
6. Verify pressurizer pressure above 1800 psig.		
7. Verify turbine trip reset.		

8. Perform the operations in Table 15.

Table [illegible]
Reactor Coolant Pump Breakers (2/4 Loops)

3.23

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remar
a		Actuate RCP 1 and (P)	YES	YES		YES	YES	
		RCP 2 Breaker Test Sw. (P)	YES			YES		
b		Release RCP 1 and	NO	NO		NO	NO	
		RCP 2 Breaker Test Sw.	NO			NO		
c		Actuate RCP 1 and (P)	YES	YES		YES	YES	
		RCP 3 Breaker Test Sw. (P)	YES			YES		
d		Release RCP 1 and	NO	NO		NO	NO	
		RCP 3 Breaker Test Sw.	NO			NO		
e		Actuate RCP 1 and (P)	YES	YES		YES	YES	
		RCP 4 Breaker Test Sw. (P)	YES			YES		
f		Release RCP 1 and	NO	NO		NO	NO	
		RCP 4 Breaker Test Sw.	NO			NO		
g		Actuate RCP 2 and (P)	YES	YES		YES	YES	
		RCP 3 Breaker Test Sw. (P)	YES			YES		
h		Release RCP 2 and	NO	NO		NO	NO	
		RCP 3 Breaker Test Sw.	NO			NO		
i		Actuate RCP 2 and (P)	YES	YES		YES	YES	
		RCP 4 Breaker Test Sw. (P)	YES			YES		
j		Release RCP 2 and	NO	NO		NO	NO	
		RCP 4 Breaker Test Sw.	NO			NO		
k		Actuate RCP 3 and (P)	YES	YES		YES	YES	
		RCP 4 Breaker Test Sw. (P)	YES			YES		
l		Release RCP 3 and	NO	NO		NO	NO	
		RCP 4 Breaker Test Sw.	NO			NO		
m		Rotate 1/N 41M and	①			①		
		1/N 42 M to the left 2	①			①		

① Lamp will be on if Reactor Power is above 10%; off if Reactor Power is below 10%
② If previously rotated to the right.

Tabl[illegible]5 (Continued)
Reac[illegible] Coolant Pump Breakers (2/4 Loops)

3.23

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarl
n		If Reactor Power Level is Below 10% verify P-7 Blocks as follows:						
o		Actuate RCP 1 and (P) RCP 2 Breaker Test Sw. (P)	YES YES	NO		YES YES	NO	
p		Release RCP 1 and RCP 2 Breaker Test Sw.	NO NO	NO		NO NO	NO	

3.24 6900 Volt Bus Undervoltage Trip

	Channel A	Channel
1. Record date this section was started.		
2. Verify at least three reactor coolant pumps are in operation.		
3. If reactor power level is below 10%, position the P-7 permissive switches to unblock by rotating 1/N 41M and 1/N 42M to the right.		
4. Verify turbine trip is reset.		
5. Verify pressurizer level below 92%.		
6. Verify pressurizer pressure above 1800 psig.		

7. Perform the operations indicated in Table 16.

Ta[illegible]16
690[illegible]lt Bus Undervoltage Trip

3.24

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
a		Actuate UV Test Sw. 27-1 (P) and 27-2 (P)	YES YES	YES		YES YES	YES	
b		Release 27-1 and 27-2	NO NO	NO		NO NO	NO	
c		Actuate UV Test Sw. 27-1 (P) and 27-3 (P)	YES YES	YES		YES YES	YES	
d		Release 27-1 and 27-3	NO NO	NO		NO NO	NO	
e		Actuate UV Test Sw. 27-1 (P) and 27-4 (P)	YES YES	YES		YES YES	YES	
f		Release 27-1 and 27-4	NO NO	NO		NO NO	NO	
g		Actuate UV Test Sw. 27-2 (P) and 27-3 (P)	YES YES	YES		YES YES	YES	
h		Release 27-2 and 27-3	NO NO	NO		NO NO	NO	
i		Actuate UV Test Sw. 27-2 (P) and 27-4 (P)	YES YES	YES		YES YES	YES	
j		Release 27-2 and 27-4	NO NO	NO		NO NO	NO	
k		Actuate UV Test Sw. 27-3 (P) and 27-4 (P)	YES YES	YES		YES YES	YES	
l		Release 27-3 and 27-4	NO NO	NO		NO NO	NO	
m		Rotate 1/N 41M and 1/N 42M to the left ②	① ①			① ①		

① Lamp will be on if Reactor Power is above 10%; off if Reactor Power is below 10%.
② If previously rotated to the right.

Ta[illegible]16 (Continued)
690[illegible]lt Bus Undervoltage Trip

3.24

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remar[illegible]
n		If Reactor Power Level is below 10% verify P-7 blocks as follows:						
o		Actuate UV 27-1 and (P)	YES	NO		YES	NO	
		27-2 Test Sw. (P)	YES			YES		
p		Release UV 27-1 and	NO	NO		NO	NO	
		27-2 Test Sw.	NO			NO		

3.25 Turbine Auto Stop

3.25.1 Record date this section was started.

_____ Channel A _____ Channel B

3.25.1.A Record Reactor Power Level.

_____ Channel A _____ Channel B

R17 3.25.2 Verify at least four reactor coolant pumps are in operation.

_____ Channel A _____ Channel B

3.25.3 Verify turbine trips are reset.

_____ Channel A _____ Channel B

3.25.4 Verify pressurizer level is below 92%.

_____ Channel A _____ Channel B

3.25.5 Verify pressurizer pressure is above 1800 psig.

_____ Channel A _____ Channel B

3.25.6 If reactor power level is below 10%, position the P-7 permissive switches to unblock by rotating 1/N 41M and 1/N 42M to the right.

_____ Channel A _____ Channel B

3.25.7 If reactor power level is below 20%, position the P-8 permissive switches to unblock by pushing in 1/N 41N and 1/N 42N.

_____ Channel A _____ Channel B

3.25.8 Perform the operations indicated in Table 17.

Table 7
Turbine Auto Stop

3.25

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
a		Actuate Turbine Auto Stop Sw. AST-2 and (P)	YES	YES		YES	YES	
		AST-3 (P)	YES			YES		
b		Release AST-2 and	NO	NO		NO	NO	
		AST-3	NO			NO		
c		Actuate Turbine Auto Stop Sw. AST-2 and (P)	YES	YES		YES	YES	
		AST-4 (P)	YES			YES		
d		Release AST-2 and	NO	NO		NO	NO	
		AST-4	NO			NO		
e		Actuate Turbine Auto Stop Sw. AST-3 and (P)	YES	YES		YES	YES	
		AST-4 (P)	YES			YES		
f		Release AST-3 and	NO	NO		NO	NO	
		AST-4	NO			NO		
g		Rotate 1/N 41M and	①			①		
		1/N 42M to the left ②	①			①		
h		If Reactor Power Level is below 10% verify P-7 blocks as follows:						
		Actuate Turbine Auto Stop Sw. AST-3 and (P)	YES	NO		YES	NO	
		AST-4 (P)	YES			YES		
i		Release AST-3 and	NO	NO		NO	NO	
		AST-4	NO			NO		

① Lamp will be on if Reactor Power is above 10%; off if Reactor Power is below 10%.
② If previously rotated to the right.

3.26 Verification of Permissive Circuit P-7

1. This test can be performed only when reactor power level is below 10%.

2. All reactor trips except low pressurizer pressure must be cleared.

3. Actuate low pressurizer pressure trip by pushing in switches PC-455A and PC-456A. Verify associated indicating lamps illuminated.

Channel A	Channel

4. Perform the operations indicated in Table 18.

Table
Verifi ion of P-7 Permissive

3.26

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarl
a	PC-455A (P) PC-456A (P)	Actuate Turbine Power Trip PC-412B (P)	YES	YES		YES	YES	
b	PC-455A (P) PC-456A (P)	Release PC-412B	NO	NO		NO	NO	
c	PC-455A (P) PC-456A (P)	Actuate Turbine Power Trip PC-412C (P)	YES	YES		YES	YES	
d	PC-455A (P) PC-456A (P)	Release PC-412C	NO	NO		NO	NO	
e	PC-455A (P) PC-456A (P)	Actuate High Flux Sw.1/N41M(P) and 1/N 42M (P)	YES YES	YES		YES YES	YES	
f	PC-455A (P) PC-456A (P)	Release 1/N 41M and 1/N 42M	NO NO	NO		NO NO	NO	
g	PC-455A (P) PC-456A (P)	Actuate High Flux Sw.1/N41M(P) and 1/N 43M (P)	YES YES	YES		YES YES	YES	
h	PC-455A (P) PC-456A (P)	Release 1/N 41M and 1/N 43M	NO NO	NO		NO NO	NO	
i	PC-455A (P) PC-456A (P)	Actuate High Flux Sw.1/N41M(P) and 1/N 44M (P)	YES YES	YES		YES YES	YES	
j	PC-455A (P) PC-456A (P)	Release 1/N 41M and 1/N 44M	NO NO	NO		NO NO	NO	
k	PC-455A (P) PC-456A (P)	Actuate High Flux Sw.1/N42M(P) and 1/N 43M (P)	YES YES	YES		YES YES	YES	
l	PC-455A (P) PC-456A (P)	Release 1/N 42 M and 1/N 43M	NO NO	NO		NO NO	NO	
m	PC-455A (P) PC-456A (P)	Actuate High Flux Sw.1/N42M(P) and 1/N 44M (P)	YES YES	YES		YES YES	YES	
n	PC-455A (P) PC-456A (P)	Release 1/N 42M and and 1/N 44M	NO NO	NO		NO NO	NO	

Table 18 (Continued)
Verification of P-7 Permissive

3.26

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
o	PC-455A (P) PC-456A (P)	Actuate High Flux Sw. 1/N43M (P) and 1/N 44M (P)	YES YES	YES		YES YES	YES	
p	PC-455A (P) PC-456A (P)	Release 1/N 43M and 1/N 44M	NO NO	NO		NO NO	NO	
q		Release PC-455A and PC-456A	① ①	NO		① ①	NO	

① Lamp will be on if Pressurizer Pressure is below 1800 psig;
Lamp will be off if Pressurizer Pressure is above 1800psig.

3.27 Verification of Permissive Circuit P-8

1. Nuclear power must be less than the power above P-8 setpoint.

2. All reactor trips except reactor coolant low flow must be cleared.

3. Actuate low flow trip by pushing in FC-415 and FC-416 test switches. Verify associated indicating lamps are illuminated.

Channel A	Channel

4. Perform the operations indicated in Table 19.

PT-M14A
Table 1
Verification of Permissive Circuit P-8

3.27

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
a	FC-415 (P) FC-416 (P)	Actuate High Flux Sw. 1/N41N (P) and 1/N 42N (P)	YES YES	YES		YES YES	YES	
b	FC-415 (P) FC-416 (P)	Release 1/N 41N and 1/N 42N	NO NO	NO		NO NO	NO	
c	FC-415 (P) FC-416 (P)	Actuate High Flux Sw. 1/N41N (P) and 1/N 43N (P)	YES YES	YES		YES YES	YES	
d	FC-415 (P) FC-416 (P)	Release 1/N 41N and 1/N 43N	NO NO	NO		NO NO	NO	
e	FC-415 (P) FC-416 (P)	Actuate High Flux Sw. 1/N41N (P) and 1/N 44N (P)	YES YES	YES		YES YES	YES	
f	FC-415 (P) FC-416 (P)	Release 1/N 41N and 1/N 44N	NO NO	NO		NO NO	NO	
g	FC-415 (P) FC-416 (P)	Actuate High Flux Sw. 1/N42N (P) and 1/N 43N (P)	YES YES	YES		YES YES	YES	
h	FC-415 (P) FC-416 (P)	Release 1/N 42N and 1/N 43N	NO NO	NO		NO NO	NO	
i	FC-415 (P) FC-416 (P)	Actuate High Flux Sw. 1/N42N (P) and 1/N 44N (P)	YES YES	YES		YES YES	YES	
j	FC-415 (P) FC-416 (P)	Release 1/N 42N and 1/N 44N	NO NO	NO		NO NO	NO	
k	FC-415 (P) FC-416 (P)	Actuate High Flux Sw. 1/N43N (P) and 1/N 44N (P)	YES YES	YES		YES YES	YES	
l	FC-415 (P) FC-416 (P)	Release 1/N 43N and 1/N 44N	NO NO	NO		NO NO	NO	
m		Release FC-415 and FC-416	① ①	NO		① ①	NO	

① Lamp will be on if reactor coolant flow is below 90%, and off if reactor coolant flow is above 90%.

3.28 Verification of Permissive Circuit P-10

	Channel A	Channel
1. Record date this section was started.		
a. Record reactor power level.		
2. Rotate power range low range trip switch 1/N 41P and 1/N 42P to the right.		
Verify associated indicating lamps are illuminated.		
3. Rotate power range switches		
1/N 41M		
1/N 42M		
1/N 43M		
1/N 44M		
to the right and verify their associated indicating lamps are illuminated.		

4. Perform the operations indicated in Table 20.

Table 20
Verification of Permissive Circuit P-10

3.28

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remark
a		Actuate 1/N 41M (R/P)	NO	YES		NO	YES	
		1/N 42M (R/P)	NO			NO		
		1/N 43M (R/P)	NO			NO		
b		Release 1/N 41M	YES	YES		YES	YES	
		1/N 42M	YES			YES		
		1/N 43M	YES			YES		
c		Momentarily Actuate 1/N47A and 1/N 38A (R/P)	NO	NO		NO	NO	
			NO			NO		
d		Actuate 1/N 41M (R/P)	NO	YES		NO	YES	
		1/N 43M (R/P)	NO			NO		
		1/N 44M (R/P)	NO			NO		
e		Release 1/N 41M	YES	YES		YES	YES	
		1/N 43M	YES			YES		
		1/N 44M	YES			YES		
f		Momentarily Actuate 1/N47A and 1/N 38A (R/P)	NO	NO		NO	NO	
			NO			NO		
g		Actuate 1/N 41M (R/P)	NO	YES		NO	YES	
		1/N 42M (R/P)	NO			NO		
		1/N 44M (R/P)	NO			NO		
h		Release 1/N 41M	YES	YES		YES	YES	
		1/N 42M	YES			YES		
		1/N 44M	YES			YES		
i		Momentarily Actuate 1/N47A and 1/N 38A (R/P)	NO	NO		NO	NO	
			NO			NO		
j		Actuate 1/N 42M (R/P)	NO	YES		NO	YES	
		1/N 43M (R/P)	NO			NO		
		1/N 44M (R/P)	NO			NO		
k		Release 1/N 42M	YES	YES		YES	YES	
		1/N 43M	YES			YES		
		1/N 44M	YES			YES		

Table [illegible] (Continued)
Veri[illegible]tion of Permissive Circuit P-10

3.28

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A Test Panel Trip Lamp ON	CHANNEL A Trip Bus Voltage OFF	CHANNEL A Remarks	CHANNEL B Test Panel Trip Lamp ON	CHANNEL B Trip Bus Voltage OFF	CHANNEL B Remarks
l		Momentarily Actuate 1/N47A	NO	NO		NO	NO	
		and 1/N 38A (R/P)	NO			NO		
m		Return 1/N 41M (L)	①	NO		①	NO	
		1/N 42M (L)	①			①		
		1/N 43M (L)	①			①		
		1/N 44M (L)	①			①		
		1/N 41P (L)	②			②		
		and 1/N 42P (L)	②			②		
		to the left						

① Lamp will be on if reactor power is above 10%; off if reactor power is below 10%.

② Lamp will be on if reactor power is above 25%; off if reactor power is below 25%.

3.29 LoPar Temperature Protection Trip

1. Record the date this section was started.

Channel A	Channel B
_____	_____

2. Verify that the RCS Temperature is above 370°F. Record the temperature.

Temperature	Temperature
_____	_____

3. Perform the Operations in Table #21. Verify that the "Lo Par Temperature Trip"Alarm annunciate as each pair of pushbuttons is actuated. Verify that the alarm clears when the pushbuttons are released.

3.29

Table #21a

LO PAR TEMPERATURE PROTECTION TRIP

Para.	Permissive Actuation Switches	Action Initiated	CHANNEL A			
			Test Panel Test Lamp ON	Trip Bus Voltage OFF	Alarm	Remarks
a		Actuate Low Temperature Sw. TC-413A and TC-433A	YES YES	YES	ANNUNCIATES	
b		Release Low Temperature Sw. TC-413A and TC-433A	NO NO	NO	CLEARS	
c		Actuate Low Temperature Sw. TC-413A and TC-443A	YES YES	YES	ANNUNCIATES	
d		Release TC-413A and TC-443A	NO NO	NO	CLEARS	
e		Actuate Low Temperature Sw. TC-433A and TC-443A	YES YES	YES	ANNUNCIATES	
f		Release TC-433A and TC-443A	NO NO	NO	CLEARS	

3.29 Table #21b

LOPAR TEMPERATURE PROTECTION TRIP

ra.	Permissive Actuation Switches	Action Initiated	CHANNEL B Test Panel Test Lamp ON	Trip Bus Voltage OFF	ALARM	REMARKS
		Actuate Low Temperature Switch TC-413A and TC-433A	YES YES	YES	ANNUNCIATES	
		Release Low Temperature Switch TC-413A and TC-433A	NO NO	NO	CLEARS	
		Actuate Low Temperature Switch TC-413A and 443A	YES YES	YES	ANNUNCIATES	
		Release TC-413A and TC-443A	NO NO	NO	CLEARS	
		Actuate Low Temperature Switch TC-433A and TC-443A	YES YES	YES	ANNUNCIATES	
		Release TC-433A and TC-443A	NO NO	NO	CLEARS	

(Next page is 64A)

3.30 NBFD Relay Plunger Movement Test

1.a) If the plant is at a Power Level greater than 10%, the following jumpers must be placed to prevent energizing of Source Range H.V. Power Supplies when D.C. is removed from the Logic Rack. Should a Trip occur while the jumpers are placed, they must be removed immediately. Place jumpers on both Channel N31 and N32 while testing either Logic Channel A or B.

Channel N31: NIS Racks, TB 123, jumper placed from Terminal 1 to Terminal 2.

Channel A	Channel B
Initials	Initials

Channel N32: NIS Racks, TB 223, jumper placed from Terminal 1 to Terminal 2.

Channel A	Channel B
Initials	Initials

1.b) De-energize the Channel A (Channel B) DC Feed from the feed switch on front of the panel.

Channel A	Channel B
Initials	Initials

2. Verify that the DC Available Light extinguishes.

Channel A	Channel B
Initials	Initials

3. Physically move each relay plunger, included in the list below, in and out. Verify freedom of movement in each direction. Indicate satisfactory by a check (✓) and unsatisfactory by an (X).

Relay	Location	Channel A	Channel B
RT-1	F6-E6	_____	_____
RT-2	F6-E6	_____	_____
RT-3	F6-E6	_____	_____
RT-4	F6-E6	_____	_____
RT-5	F4-E4	_____	_____
RT-6	F4-E4	_____	_____
RT-7	F3-E3	_____	_____
RT-8	F3-E3	_____	_____
RT-9	F5-E5	_____	_____
RT-10	F5-E5	_____	_____

Relay	Location	Channel A	Channel B
RT-11	F3-E3		
RT-12	F3-E3		
RT-13	F4-E4		
RT-14	F4-E4		
RT-15	F5-E5		
RT-16	F5-E5		
RT-17	F5-E5		
RT-18	F5-E5		
1/MT1-X	F3-E3		
1/MT2-X	F3-E3		
15	F3-E3		
16	F3-E3		
17	F5-E5		
18	F5-E5		
21	F5-E5		
22	F5-E5		
P7-1	F3-E3		
P7-2	E3-E3		
P7-3	F3-E3		
P7-4	F3-E3		
P8-1	F3-E3		
P8-2	F3-E3		

RELAY	LOCATION	CHANNEL A	CHANNEL B
P10-1	F3-E3	_____	_____
P10-2	F3-E3	_____	_____
LF-1X	F3-E3	_____	_____
LF-2X	F3-E3	_____	_____
LF-3X	F3-E3	_____	_____
LF-4X	F3-E3	_____	_____
SIAM1X	F6-E6	_____	_____
SIAM2X	F5-E5	_____	_____
52/RCP-21X	F6-E6	_____	_____
52/RCP-22X	F5-E5	_____	_____
52/RCP-23X	F4-E4	_____	_____
52/RCP-24X	F3-E3	_____	_____
S166	F2-E2	_____	_____
S167	F2-E2	_____	_____

4. Re-energize the DC Feed:

INITIALS _____ INITIALS _____

5. Momentarily actuate 1N38A (R/P) and 1/N47A (R/P). Verify that Trip Voltage Status Light is off (No Trip).

CHANNEL A CHANNEL B

INITIALS _____ INITIALS _____

6. Remove the jumpers previously placed in Step 3.30.1a.

Channel N31: NIS Racks, TB 123,
Terminal 1 to Terminal 2.

Jumper Removed: (Double Verification)

Init/init _____ Init/Init _____

Channel N32: NIS Racks, TB 223,
Terminal 1 to Terminal 2.

Jumper Removed: (Double Verification)

Init/init _____ Init/Init _____

NOTE: If Preventive Maintenance, as allowed by Step 3.7e, has been performed on the Reactor Trip Breakers, that maintenance must be complete and the breakers have been returned to their cubicles in the Racked In and Open Position with DC power restored prior to proceeding with Step 3.31.

Breakers Racked In and Open:

Channel A:_____ Signature /Date

Channel B:_____ Signature /Date

Verify RTA (RTB) Turb. Trip Monitor Off.

Channel A:_____ Initials

Channel B:_____ Initials

R17

Verify BYA (BYB) Turb. Trip Monitor On.

Channel A:_____ Initials

Channel B:_____ Initials

D.C.V.M. Removed:

Channel A:_____ Signature /Date

Channel B:_____ Signature /Date

Verify that positioning lever stop is lodged behind positioning stop bracket and check for a visible clearance (1/16" Min.) between positioning lever trip arm and breaker trip bar.

Place a checkmark (✓) in the acceptable or not acceptable space as appropriate.

Stop Pin Position: RTA_____ _____ _____
Acceptable Not Acceptable Signature/Date

RTB_____ _____ _____
Acceptable Not Acceptable Signature/Date

Trip Bar Clearance: RTA_____ _____ _____
Acceptable Not Acceptable Signature/Date

RTB_____ _____ _____
Acceptable Not Acceptable Signature/Date

(Next Page is 65A)

3.31 Reactor Trip Breaker and Bypass Breaker Trip Test

.1 Place Channel A (Channel B) Reactor Protection Logic Key Interlock Switch in "Normal" position. Verify that the red lamp on Unit 1 Upper (Unit 2 Upper) switchgear door extinguishes and that the "RTA and BYB Train A Defeat" (RTB and BYA Train B Defeat) alarm clears on SK panel.

Channel A_____ Initials Channel B_____ Initials

.2 Close 52 RTA (52RTB) and verify the breaker is closed by observing that the red indicating lamps at the test panel and flight panel are lit.

Channel A_____ Initials Channel B_____ Initials

Verify RTA (RTB) Turb. Trip Monitor Off

R17

Channel A_____ Initials Channel B_____ Initials

Verify BYA (BYB) Turb. Trip Monitor Off

Channel A_____ Initials Channel B_____ Initials

.3 Verify that Bypass Breaker 52BYA (52BYB) is closed by observing that the red indicating lamp is illuminated.

Channel A_____ Initials Channel B_____ Initials

.4 Install control fuses and rack in Bypass Breaker 52BYB (52BYA) to the Test Position then close it. Verify that the red indicating lamp illuminates. Breaker must be closed locally.

Channel A_____ Initials Channel B_____ Initials

.4A Determine that the plant computer (Proteus 2500) is operating and that the Trend Typewriter CCR is on line. This information can be obtained from the RO/SRO on watch. If for some reason the computer is not available, request it be made available for the short time needed to complete this part of PT-M14A. If the computer cannot be made available, disregard Steps 6.A and 7.F.

5. Depress the "Auto Shunt Trip Block" pushbutton and hold it depressed.

Channel A_____ Initials

Channel B_____ Initials

5.A Depress the "Auto Shunt Trip Test" pushbutton and verify that RTA (RTB) does not trip.

Channel A_____ Initials

Channel B_____ Initials

5.B Release the "Auto Shunt Trip Test" pushbutton only

Channel A_____ Initials

Channel B_____ Initials

5.C With the "Auto Shunt Trip Block" pushbutton depressed, trip the under voltage devices only by manually depressing pushbutton switch LC-437D and LC-437F.

Channel A_____ Initials

Channel B_____ Initials

6. Verify that Breakers 52RTA/52BYB (52RTB/52BYA) trip by observing that the green indicating lamps illuminate. Release the "Auto Shunt Trip Block pushbutton".

6.A From the Plant Computer Trend typewriter or its transferred replacement, obtain the "Sequence of Events" print out; determine the time required for "Reac. Aux. Tr Bkr B (A)" and Reac. Main Tr. Bkr A (B)" to open.

Channel A	Channel B
Reac. Aux. Tr. Bkr B_____ Milliseconds	Reac. Aux. Tr. Bkr A_____ Milliseconds
Reac. Main Tr. Bkr A_____ Milliseconds	Reac. Main Tr Bkr B_____ Milliseconds

ACTION:

1) If data obtained is ≤ 45 milliseconds perform a retest of Breaker Trip timing to verify the low data.

2) If data obtained is > 92 milliseconds initiate a PRIORITY ONE MWR to investigate the problem. Approval for PRIORITY ONE status was given at SNSC by the General Manager NPG on 11/22/83, SNSC Meeting No. 770.

- Action Continued -

3) If data obtained is > 150 milliseconds, Operability Criteria is not satisfied.

4) Remove data from typewriter and forward to J.P. Mooney - Systems Engineer, Electrical, Technical Engineering, for trending.

Channel A_____ Initials Channel B_____ Initials

7. Close Reactor Trip Breaker 52RTA (52RTB) and verify it is closed by observing that the red indicating lamps at the test panel are illuminated.

Channel A_____ Initials Channel B_____ Initials

7A. Momentarily depress, then release, the "Auto Shunt Trip Test" pushbutton.

Channel A_____ Initials Channel B_____ Initials

7B. Verify that Reactor Trip Breaker 52RTA (52RTB) trips by observing that the green indicating lamps illuminate.

Channel A_____ Initials Channel B_____ Initials

7C. Close Reactor Trip Breaker 52RTA (52RTB) and verify it is closed by observing that the red indicating lamp at the test panel is illuminated.

Channel A_____ Initials Channel B_____ Initials

7D. Trip the auto trip devices by manually depressing pushbutton switch LC-437D and LC-437F.

Channel A_____ Initials Channel B_____ Initials

7E. Verify that breaker 52 RTA (52RTB) tripped by observing that the green indicating lamps illuminated.

Channel A_____ Initials Channel B_____ Initials

7F. From the Plant Computer Trend Typewriter or its transferred replacement, obtain the "Sequence of Events" printout and determine the time required for "Reac. Main Tr. Bkr A (B)" to open.

Channel A Reac. Main Tr. Bkr A_____ Milliseconds

Channel B Reac. Main Tr. Bkr B_____ Milliseconds

ACTION:

1) If data obtained is ≤ 20 milliseconds perform a retest of Breaker Trip timing to verify the low data.

2) If data obtained is >88 milliseconds initiate a PRIORITY ONE MWR to investigate the problem. Approval for PRIORITY ONE status was given at SNSC by the General Manager NPG on 11/22/83, SNSC Meeting No. 770.

3) If data obtained is >150 milliseconds, Operability Criteria is not satisfied.

4) Remove data from typewriter and forward to J.P. Mooney - Systems Engineer, Electrical, Technical Engineering, for trending.

Channel A_____ Initials Channel B_____ Initials

7G. Close Reactor Trip Breaker 52 RTA (52RTB) and verify it is closed by observing that the red indicating lamps at the test panel and flight panel are illuminated.

Channel A_____ Initials Channel B_____ Initials

Verify RTA (RTB) Turb. Trip Monitor Off

Channel A_____ Initials Channel B_____ Initials

Verify BYA (BYB) Turb. Trip Monitor Off

R17

Channel A_____ Initials Channel B_____ Initials

NOTE: If both lamps are not Off, Do Not proceed with Step 3.31.8. A Turbine Trip could result if cause of non-compliance is not determined and corrected.

8. Trip Bypass Breaker 52BYA (52BYB). Place it in the racked out position and lock it in this position. SWS to verify breaker is locked.

Channel A_____ SWS Channel B_____ SWS

Verify RTA (RTB) Turb. Trip Monitor On.

Channel A_____ Initials Channel B_____ Initials

R17

Verify BYA (BYB) Turb. Trip Monitor Off.

Channel A_____ Initials Channel B_____ Initials

9. Remove the control fuses from Bypass Breaker 52 BYA (52BYB). SWS to verify control fuses are removed.

Channel A_____ SWS

Channel B_____ SWS

10. Remove control fuses from Bypass Breaker 52 BYB (52BYA) and lock the breaker in the racked out position. SWS to verify above actions.

Channel A_____ SWS

Channel B_____ SWS

11. Lock the panel door of the logic channel under test.

Channel A_____ Initials

Channel B_____ Initials

3.32 Repeat this procedure for the other logic channel.

3.0 COMMENTS: Include any MWR Numbers with description, if issued)

4.0 TEST RESULTS:

Based on the "As Found" data, circle the appropriate Actual Response in the Table below:

	REQUIRED	ACTUAL	
4.1 All Channel "A" Logic functions as required by the procedure.	YES	YES	NO
4.2 All Channel "B" Logic functions as required by the procedure.	YES	YES	NO
4.3 The Reactor Trip and Bypass Breakers function as required by the procedure.	YES	YES	NO
4.4 The Reactor Aux. Tr. Bkr. A opened in ≤ 150 msec.	YES*	YES*	NO
4.5 The Reactor Aux. Tr. Bkr. B opened in ≤ 150 msec.	YES*	YES*	NO
4.6 The Reactor Main Tr. Bkr. A opened in ≤ 150 msec.	YES*	YES*	NO
4.7 The Reactor Main Tr. Bkr. B opened in ≤ 150 msec.	YES*	YES*	NO

*If computer was available, otherwise N/A.

Any required value in the Table above that is not found satisfactory shall be brought to the attention of the duty Senior Watch Supervisor immediately. Record below the SWS that was notified.

_____
SWS

Test Performed By:

_____
Signature/Date

SRO Informed of Completion:

_____
SRO /Date

5.0 Supervisor Review

The test is complete and the Test Results Section is completed accurately. If any error was found in the Test Results Section that would cause a Required Value not to be satisfied, the SWS shall be notifed immediately.

_____
Cognizant Supervisor /Date
or Designee

6.0 EQUIPMENT OPERABILITY AND ACCEPTANCE CRITERIA

The reactor protection system logic shall be considered operable if the logic coincidence relays and the reactor trip and bypass circuit breakers operate as required in the Test Results.

6.1 Based on review of the Test Results, are the Operability Criteria satisfied:

YES NO

6.2 If Operability Criteria are not satisfied:

a) Take the required Technical Specification action.
b) An SOR shall be prepared. SOR # _____.

6.3 Comments: _____

_____

_____

_____
Senior Watch Supervisor/ Date

6.4 If Operability Criteria are not satisfied, COE Review required.

_____
COE Review /Date

RETURN COMPLETED TEST TO THE TEST ENGINEER.

7.0 OVERALL ACCEPTANCE CRITERIA

7.1 The Overall Acceptance Criteria is met when:

A) Indicating lamps function.

B) "As Left" Conditions are as required by the procedure.

C) The time for the "Reactor Aux. Trip Breaker B (A)" and "Reactor Main Trip Breaker A (B)" to open is >45 (>22 for Step 7.F) milliseconds and ≤ 92 (≤88 for Step 7.F) milliseconds. (Only applicable if computer is available).

7.2 Based on review, has the Overall Acceptance Criteria been met?

YES NO

7.3 If NO is circled, list corrective action taken.

_____

_____

_____

7.4 COMMENTS: _____

_____

_____

_____

_____
Test Engineer /Date

PROCEDURE REVIEW MEMORANDUM
DATE: 12-30-87

[redacted]

JOHN CURRY *

JOHN ODENDAHL

FROM: DAVID SZATKOWSKI (ACTING TEST ENGINEER)

PLEASE REVIEW TEST: PT-M14A REV.: 17

PLEASE INDICATE COMMENTS PERTINENT TO THIS REVISION ON THIS REVIEW SHEET AND USE ADDITIONAL PAGES FOR THOSE COMMENTS WHICH YOU FEEL SHOULD BE CONSIDERED IN FUTURE REVISIONS. THE CHANGES INCORPORATED INTO THIS REVISION ALONG WITH THEIR REASONS ARE LISTED BELOW.

CHANGE: 1) GENERAL STATEMENTS AND FORMAT REVISION. 2) NEW EQUIPMENT LIST.
ADD FUNCTIONAL TEST OF MONITORING TURBINE TRIP ON REACTOR TRIP CIRCUITRY AND INCORPORATE TRC-85-149T AND TRC-86-75T.

REASON FOR CHANGE: 1) SURVEILLANCE PROGRAM UPGRADE. 2) IMPROVED M&TE CONTROL. MOD MET-87-00813-87
MONITOR TURBINE TRIP ON REACTOR TRIP CIRCUITRY

THIS REVISION SHOULD BE REVIEWED AND RETURNED AS SOON AS POSSIBLE TO BE INCLUDED IN THE SNSC AGENDA FOR 12-31-87. IF NO RESPONSE IS RECEIVED BY 12-31-87, IT WILL BE ASSUMED THAT THERE ARE NO COMMENTS.

REVIEWER COMMENTS: None

REVIEWED BY / DATE 12/31/87

* NOTE: PLEASE PERFORM THE PRE-SNSC REVIEW PER SNSC AD-1. PLEASE RECORD THE SAFETY SIGNIFICANCE OF THIS PROCEDURE BELOW:

PROCEDURE REVIEW MEMORANDUM
DATE: 12-30-87

TO: H. MORRISON

[redacted]

JOHN ODEWDAHL

RECEIVED
DEC 30 1987
JOHN J. CURRY

FROM: DAVID SZATKOWSKI (ACTING TEST ENGINEER)

PLEASE REVIEW TEST: PT-M14A REV.: 17

PLEASE INDICATE COMMENTS PERTINENT TO THIS REVISION ON THIS REVIEW SHEET AND USE ADDITIONAL PAGES FOR THOSE COMMENTS WHICH YOU FEEL SHOULD BE CONSIDERED IN FUTURE REVISIONS. THE CHANGES INCORPORATED INTO THIS REVISION ALONG WITH THEIR REASONS ARE LISTED BELOW.

CHANGE: 1) GENERAL STATEMENTS AND FORMAT REVISION. 2) NEW EQUIPMENT LIST.
ADD FUNCTIONAL TEST OF MONITORING TURBINE TRIP ON REACTOR TRIP CIRCUITRY AND INCORPORATE TRC-85-149-T AND TRC-86-75T.

REASON FOR CHANGE: 1) SURVEILLANCE PROGRAM UPGRADE. 2) IMPROVED M&TE CONTROL. MOD MET-87-00813-87
MONITOR TURBINE TRIP ON REACTOR TRIP CIRCUITRY

THIS REVISION SHOULD BE REVIEWED AND RETURNED AS SOON AS POSSIBLE TO BE INCLUDED IN THE SNSC AGENDA FOR 12-31-87. IF NO RESPONSE IS RECEIVED BY 12-31-87, IT WILL BE ASSUMED THAT THERE ARE NO COMMENTS.

REVIEWER COMMENTS: This Test Change monitors the Rx Trip Turbine Trip Status Lights added by Project 00813-87. Test will ensure continuity of Rx Trip Turbine Trip Circuitry

J. Curry 1/4/88
REVIEWED BY / DATE

* NOTE: PLEASE PERFORM THE PRE-SNSC REVIEW PER SNSC AD-1. PLEASE RECORD THE SAFETY SIGNIFICANCE OF THIS PROCEDURE BELOW: