

29 PDR

The following package consists of statements of work that was performed on equipment affected after the transient and prior to the hold in abeyance confirmatory action letter. This package includes the surveillance tests and Maintenance Work Orders, where applicable.

Given to W. D. Shafer:

Date
6/13/85
Date

Time
17:00
Time

Given to NRC Team:

SCW:nlf
6/13/85

8507300039 850613
PDR ADOCK 05000346
P PDR

On the morning of 9 June, 1985, I was called in to work by K. Brubaker at approximately 0300. Upon arriving, I was informed that the plant was in an emergency situation and there was a great need to get some essential instrumentation repaired.

After some discussion on general plant conditions, M. Dutkiewicz and I went to the Control Room to perform the Source Range Functional Test on NI-2. We obtained permission from the Shift Supervisor, Mr. T. Lehman, in the Control Room. After obtaining the keys for RPS Channel #1, we proceeded to open the cabinet doors. At this time, we were surprised to see that NI-2 was working and giving an indication on the Log Amp Meter.

We proceeded to run the Source Range Functional Test on NI-2 with all parameters reading within the allowed tolerances. After completing this test on NI-2, NI-1 (Channel 2 RPS) was tested in the same manner and was also found to be in tolerance. We turned the completed tests over to the Shift Supervisor after signing off the acceptance criteria and returned to the I&C Shop.

It was my understanding that prior to running the Source Range Functional Test on NI-2, this particular NI was not functioning at all. M. Dutkiewicz stated that before my arrival for work, he had checked NI-2 visually in the RPS cabinet and it was not indicating at all on the Log Amp Meter. The power supply was indicating proper supply voltage (approx. 2050 VDC), but the detector circuits themselves were not working.

I cannot say exactly when NI-2 began to function properly, but it was working and giving proper indication when we opened the RPS Channel #1 doors to test it.

6-11-85
Date

D.E. Sreptock
D.E. Sreptock

DES/er

DAVIS BESSE NUCLEAR POWER STATION

DATA COVER SHEET

E.D. 8823-2*

TEST NO.

ST.5091.01

REV. NO. USED

9

TITLE

SCURR RANGER FUNCTIONAL TEST

COMPLETED TEST

TEST PERSONNEL

TEST COMPLETED

6-9-85

DATE

BY

D. J. MHD

TEST PERSONNEL

SECTION

ALL

EQUIPMENT CODE (IF APPLICABLE)

NIA 1/2

☒ PERFORMED TO MEET SCHEDULE☐ PERFORMED TO ENSURE OPERABILITY AFTER MAINTENANCE

SHIFT SUPERVISOR

SHIFT SUPERVISOR ACKNOWLEDGEMENT THAT SURVEILLANCE REQUIREMENTS ARE SATISFIED AND THE EQUIPMENT IS DECLARED OPERABLE

SHIFT SUPERVISOR

T. Schuman DATE 6/9/85 TIME 0625

☐ P.T. NON-APPLICABLE. NO S.S. REVIEW REQUIRED.

FORWARDED TO SURVEILLANCE TEST ENGINEER

SURVEILLANCE TEST ENGINEER

CHECKLIST

- ☒
- DATA AND ENCLOSURES INCLUDED
-
- ☒
- SIGN-OFFS COMPLETED
-
- ☒
- DEFICIENCY LIST ATTACHED, IF NEEDED
-
- ☒
- COMPUTER TEST SCHEDULE UPDATED

REMARKS

FORWARDED TO

J. DeSando

ON

6-10-85

BY

C. W. H. L.

DESIGNATED REVIEWER

- ☒
- APPROVED
-
- ☐
- FURTHER REVIEW NECESSARY

REMARKS

FORWARDED TO

- ☐
- CENTRAL FILES (PERIODIC TESTS)
-
- ☒
- STE FOR FILING (SURVEILLANCE TESTS)
-
- ☐
- SECTION HEAD

SECTION HEAD

- ☐
- APPROVED
-
- ☐
- FURTHER REVIEW NECESSARY

REMARKS

FORWARDED TO

- ☐
- CENTRAL FILES (PERIODIC TESTS)
-
- ☐
- STE FOR FILING (SURVEILLANCE TESTS)
-
- ☐
- SRB FOR REVIEW ON _____ DATE _____ BY _____ SECTION HEAD

STATION REVIEW BOARD

- ☐
- APPROVED
-
- ☐
- OTHER RESOLUTION _____

FORWARDED TO

STE

ON

DATE

BY

SRB CHAIRMAN

SURVEILLANCE TEST ENGINEER

☐ DOCUMENT RECEIVED

ENGINEER

DATE

CENTRAL FILES

☐ DOCUMENT RECEIVED

BY

DATE

SUSPENDED TEST

SHIFT SUPERVISOR

TEST SUSPENDED

DATE

TIME

BY

SHIFT SUPERVISOR

REASON FOR SUSPENSION

WAS SIGNIFICANT CONDITION ADVERSE TO QUALITY OR NON-ROUTINE REPORTABLE OCCURRENCE INVOLVED?

☐ YES ☐ NO

IF YES, DEVIATION REPORT MUST BE INITIATED SUPT. OR TECH ENGR NOTIFIED

IF NO, ACTION TAKEN

- ☐
- WORK REQUEST MAINTENANCE WORK ORDER INITIATED
- ☐
- FCR INITIATED
-
- ☐
- PROCEDURE MODIFICATION REQUEST
- ☐
- OTHER
-
- ☐
- ACTION ITEM REQUEST INITIATED (EXPLAIN BELOW)

EXPLANATION OF OTHER ACTION

FORWARDED TO STE

DATE

BY

SHIFT SUPERVISOR

SURVEILLANCE TEST ENGINEER

☐ DELAY NOTED ON TEST SCHEDULE☐ YES ☐ NO SIGNIFICANT CONDITION ADVERSE TO QUALITY OR NON-ROUTINE REPORTABLE OCCURRENCE?

ACTION TAKEN, REMARKS

FORWARDED TO

DESIGNATED REVIEWER

ON

DATE

BY

ENGINEER

DESIGNATED REVIEWER

TEST LATE DATE

ENTERED BY STATION

REPORTABLE OCCURRENCE IF NOT RUN? ☐ YES ☐ NO

- ☐
- MALFUNCTIONS RESOLVED, RETURNED TO SHIFT SUPERVISOR FOR RETEST
-
- ☐
- MALFUNCTIONS WILL DELAY TEST BEYOND LATE DATE
-
- ☐
- OTHER - EXPLAIN

FORWARDED TO

☐ SHIFT SUPERVISOR☐

SECTION HEAD

ON

DATE

BY

REVIEWER

SECTION HEAD

- ☐
- TEST POSTPONED OVR INITIATED
-
- ☐
- OTHER ACTION

FORWARDED TO STE ON

DATE

BY

SECTION HEAD

SURVEILLANCE TEST ENGINEER

☐ DOCUMENT RECEIVED

ENGINEER

FURTHER ACTION TAKEN

CODES

STE - Surveillance Test Engineer

SRB - Station Review Board

FCR - Facility Change Request

DAVIS-BESSE NUCLEAR POWER STATION
TEST DEFICIENCY LIST
ED 6919-1

PAGE 1 of 1
DATE 6-9-85

PAGE 9	STEP 6.1.31	TEST NO. ST-5091.01	TITLE SOURCE RANGE FUNCT	DEFICIENCY COMPUTER PT. E-820 IS
--------	-------------	---------------------	--------------------------	----------------------------------

READING 2087 VDC AND SHOULD BE READING 2050 ± 36 VDC. THIS PUTS IT 2 VDC OUT OF TOLERANCE, BUT DOES NOT MAKE THE CHANNEL INOPERABLE.

WR/MWO _____	SUBMITTED _____	FCR _____	SUBMITTED _____
--------------	-----------------	-----------	-----------------

RESOLUTION OF DEFICIENCY

Computer points and recorder indications are for information only and do not affect channel operability

RESOLVED BY (NAME)

Joe Oliver

DATE 6/13/85

PAGE	STEP	DEFICIENCY
------	------	------------

WR/MWO _____	SUBMITTED _____	FCR _____	SUBMITTED _____
--------------	-----------------	-----------	-----------------

RESOLUTION OF DEFICIENCY

RESOLVED BY (NAME)

DATE

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19056

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SECTION 1

PROCEDURE TITLE AND NUMBER

ST 5091.01.09 Source Range Functional Test

REASON FOR CHANGE

To incorporate new Source Range detector
 power supply voltage setting for NI-01
 as per step 7.3.4 of IC 2002.04.06.

CHANGE

See attached.

IS PROCEDURE REVISION REQUIRED		Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	If no, this modification is valid until _____
PREPARED BY	<i>[Signature]</i>	DATE	3/28/85	
APPROVED BY	<i>[Signature]</i>	DATE	3-28-85	
APPROVED BY	<i>[Signature]</i>	DATE	3/28/85	
SUBMITTED BY (Section Head)	<i>[Signature]</i>	DATE	4-1-85	
RECOMMENDED BY (SRS Chairman)	<i>[Signature]</i>	DATE	APR 9 1985	
QA APPROVED BY (Manager of Quality Assurance)	N/A	DATE		
APPROVED BY (Station Superintendent)	<i>[Signature]</i>	DATE	APR 9 1985	

mut

T-9056

Change STEP 6.1.31 To Read as Follows:

6.1.31

Connect the DVM to the "Output + 1000" test jack on the Source Range Detector Power Supply and record the following: If Reactor Power is $>10^{-3}$ amps this steps function cannot be checked, record as N/A.

NI-1 DVM Reading (should be 2.050 ± 0.036 VDC) _____

Power Supply Meter (should be 20 ± 36 VDC) _____

Computer Point E820 (should be 20 ± 36 VDC) _____

NI-2 DVM Reading (should be 2.100 ± 0.036 VDC) _____

Power Supply Meter (should be 2100 ± 36 VDC) _____

Computer Point E814 (should be 2100 ± 36 VDC) _____

... ..

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MPG

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SECTION 1

PROCEDURE TITLE AND NUMBER

ST5091.01.09 Source Range Functional Test

REASON FOR CHANGE

To incorporate a new section to
 functionally check out the nimbin assembly
 to meet the T.S. requirement 4.9.2.

CHANGE

See attached section. 6.2.

IS PROCEDURE REVISION REQUIRED

Yes ☒No ☐

If no, this modification is valid until

PREPARED BY

Gugay A. Blunk

DATE

11-20-84

APPROVED BY

Gugay A. Blunk

DATE

11-20-84

APPROVED BY

[Signature]

DATE

11/20/84

SUBMITTED BY (Section Head)

DA Lee

DATE

11-25-84

RECOMMENDED BY (SRB Chairman)

[Signature]

DATE

DEC. 4 '84

QA APPROVED BY (Manager of Quality Assurance)

N/A

DATE

APPROVED BY (Station Superintendent)

[Signature]

DATE

DEC. 4 '84

T-8473

ST 5091.01

Section 6.2 This section is only to be performed to meet the functional check of the Nimbin Assembly. Mode 6 requirements (Core Alterations).

T.S. 4.9.2

NOTE: The trigger point shall be set at approximately 5-10 CPS above the present indication (background CPS) in the RPS Channel which is being used for the audible indication.

_____ CPS, Record Desired Trigger Point.

- _____ 6.2.1 Turn OFF Realistic Amplifier (Spkr to CTMT).
- _____ 6.2.2 Make sure volume on Nim Bin is at audible level.
- _____ 6.2.3 Obtain RPS CH#1 door key and place SRTM Test Selector switch in 1 Hz position.
- _____ 6.2.4 Nim Bin Meter should be at full scale (pegged) due to switching thru 100K Hz and 4K Hz switch positions on SRTM. Turn the CPS full scale switch on Rate Meter Module from 10^4 to 10^5 position in order to speed up the decay of the Rate Meter to 1 Hz as read on the Nim Bin.
- _____ 6.2.5 When meter has fully decayed, turn CPS full scale switch back to the 10^2 position.

NOTE: Prior to switching the SRTM Test Selector switch to the 4K Hz position, observe meter in the Nim Bin to see that triggering of audible howler occurs at \approx Desired Trigger Increasing, as the test operate switch is placed in the 4K Hz position. (Meter will increase rapidly to full scale when test OP Switch is placed in 4K Hz position.

- _____ 6.2.6 Place the SRTM Test Operate switch in the 4K Hz position (while observing Nim Bin Meter for howler to trigger at \approx Desired Trigger Increasing). If trigger set point is set properly, audible indication should be heard. If not, adjust trigger set point pot for audible howl at desired trigger.
- _____ 6.2.7 After a few seconds, place the SRTM Test Selector switch in the 1 Hz position.

- _____ 6.2.8 With the audible howl coming from the Nim Bin, allow the meter to decay on its own down to 1 Hz. This should take approximately 4-6 minutes. At the point the meter decays to ≈ 15 to 20 CPS on the Nim Bin, turn ON amplifier and speaker to Containment and check for audible noise in CTMT. Adjust master volume on ~~MEMOIN~~ ~~amp~~ either up or down as needed. When OK, TURN OFF amp to CTMT.
- _____ 6.2.9 Continue to watch meter decay down. At the desired trigger the audible howl should stop.
- _____ 6.2.10 Place SRTM Test Selector switch in OPERATE position. Reset Memory Lamp. Lock cabinet.
- _____ 6.2.11 Nim Bin Meter will again be pegged high due to switching from 1 Hz position to OPERATE on SRTM.
- _____ 6.2.12 Turn the CPS full scale switch from 10^2 to 10^5 position to speed up the decay of the Nim Bin meter.
- _____ 6.2.13 When meter has fully decayed, place CPS full scale switch in 10^2 position.
- _____ 6.2.14 Turn on Realistic Amp for SPKR in CTMT.

7. ACCEPTANCE CRITERIA

- _____ 7.3 Section 6.2 verified the audible indication in the Control Room and CTMT.

Verified _____ Date _____

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T-8409

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ED 6026

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SECTION 1

PROCEDURE TITLE AND NUMBER	ST 5091.01.09 Source Range Functional Test
REASON FOR CHANGE	

To incorporate reference to T.S. 4.3.1.1.2.

CHANGE	Add to Step 1.1.1
--------	-------------------

Note: Technical Specification 4.3.1.1.1 & 4.3.1.1.2 requires a functional test & a refueling period calibration. Since the method used to perform a functional test is the same as that used to perform a channel calibration, this test will be used to meet ~~the~~ requirements of both T.S. 4.3.1.1.1 & 4.3.1.1.2.

IS PROCEDURE REVISION REQUIRED		Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	If no, this modification is valid until
PREPARED BY	<i>Hugary A. Blunk</i>	DATE	10-25-84	
APPROVED BY	<i>Hugary A. Blunk</i>	DATE	10-25-84	
APPROVED BY	<i>H. Simon</i>	DATE	10/25/84	
SUBMITTED BY (Section Head)	<i>DD Lee</i>	DATE	10/26/84	
RECOMMENDED BY (SRB Chairman)	<i>[Signature]</i>	DATE	10/31/84	
QA APPROVED BY (Manager of Quality Assurance)	<i>N/A</i>	DATE		
APPROVED BY (Station Superintendent)	<i>[Signature]</i>	DATE	10/31/84	

Davis-Besse Nuclear Power Station

Unit No. 1

SURVEILLANCE TEST ST 5091.01

Source Range Functional Test

NUCLEAR SAFETY RELATED

Record of Approval and Changes

Prepared by	A. T. Russell	2/25/77
		Date
Submitted by	<i>Garry Stultz</i>	3/2/77
	Section Head	Date
Recommended by	<i>John Evers</i>	3/8/77
	SRB Chairman	Date
QA Approved	NA	
	Manager of Quality Assurance	Date
Approved by	<i>John Evers</i>	3/9/77
	Station Superintendent	Date

Revision No.	SRB Recommendation	Date	QA Approved	Date	Sta. Supt. Approved	Date
1	<i>BlBayer</i>	5/2/77	NA		<i>John Evers</i>	5/6/77
2	TO Munn	9/27/77	NA		<i>John Evers</i>	10/6/77
3	<i>BlBayer</i>	6/5/77	NA		TO Munn	6/7/77
4	<i>BlBayer</i>	4/27/80	NA		TO Munn/SRB	5/5/80
5	<i>BlBayer</i>	12/12/80	NA		TO Munn	2/20/81
6	<i>smooney</i>	9/25/81	NA		T.D. Munn	10/20/81
7	<i>smooney</i>	3/28/82	NA		TO Munn	10/16/82
8	<i>smooney</i>	1/31/84	NA		TO Munn	2/16/84
9	<i>smooney</i>	5/23/84	NA		TO Munn	6/9/84

1. OBJECTIVE

- (TS) 1.1 The objective of this test is to detail the tests to be conducted on the Source Range Instrumentation Strings (NI-1 and -2). Completion of this procedure as scheduled will satisfy the requirements of the following Technical Specifications:

1.1.1 Technical Specification 4.3.1.1.1 for the FUNCTIONAL UNIT of Source Range, Neutron Flux and Rate: When completed as scheduled, this procedure satisfies the Monthly CHANNEL FUNCTIONAL TEST and the Startup CHANNEL FUNCTIONAL TEST when in MODES 2, 3, 4 and 5.

1.1.2 Technical Specification 4.9.2: When completed as scheduled, this procedure satisfies the requirements for a CHANNEL FUNCTIONAL TEST for the Source Range during MODE 6.

- (TS) 1.2 This test must be scheduled as follows:

1.2.1 MODES 2, 3, 4 and 5: This test must be done monthly. It must also be done during each startup if not done in the previous seven (7) days.

1.2.2 Mode 6: This test must be performed at least once per seven (7) days during CORE ALTERATIONS and within eight (8) hours prior to the initial CORE ALTERATIONS.

2. REFERENCES

- (TS) 2.1 Technical Specifications, Section 3.9.2 and 4.9.2.
- 2.2 Station Limits and Precautions, PP 1101.01, Section 1.1.
- 2.3 AD 1838 Series pertaining to the Surveillance and Periodic Test Program.
- 2.4 NI/RPS Operating Procedure, SP 1105.02.
- 2.5 Bailey Meter Company, NI/RPS Technical Data and Product Instructions, Volume 1.
- 2.6 Bailey Meter Company, NI/RPS System Description, Volume 2.

3. REQUIRED EQUIPMENT

- 3.1 Digital Voltmeter (DVM) readable to 0.001 volts with an input impedance of at least 100 Meg ohms and accuracy of 0.01% or better.

Equipment No. I+C 3.1.8

DUC 7-6-85

4. PRECAUTIONS AND LIMITATIONS

- 4.1 No core alterations will be made during conduct of this test.
- 4.2 When the NI/RPS Cabinet doors are opened, an alarm to this effect will be annunciated in the Control Room.
- 4.3 If any readings are out-of-tolerance, re-align equipment per the applicable Maintenance Instruction and annotate in the equipment files. If re-alignment is unsatisfactory, contact the I&C Engineer or Designated Reviewer for corrective action. Computer points R796 and R805, and the recorder indications are for information only and do not affect channel operability.
- 4.4 NI/RPS module locations given throughout this procedure are interpreted as follows: A1-03-04 is subassembly A, Cabinet 1, Row 2, Position 4. NI-1 is associated with Subassembly B and NI-2 is associated with Subassembly A.
- 4.5 Before testing any module in the NI/RPS, it should be energized for at least 30 minutes.
- 4.6 The rotary test selector switch on the Source Range has a mechanical stop between the TEST/OPERATE and OPERATE positions. To move the switch from TEST/OPERATE to OPERATE, it is necessary to push the switch knob in and hold while turning the switch. It is not necessary to push the knob when switching between any other positions. The switch should be left in the TEST/OPERATE position for at least five seconds before going to the OPERATE position to allow transients to die out.
- 4.7 For purposes of checking the Rod Control Panel OUT INHIBIT indication the CRD Control System should be energized. The computer and annunciator panel are assumed energized for verification of HIGH SUR alarms.
- 4.8 When performing this surveillance test while in Mode 6, insure source range audible indication is connected to either NI-1 or NI-2 upon completion of testing.
- 4.9 The SUR ROD WITHDRAWAL INHIBIT isn't required during mode (1) one operation. Even though it is an integral part of the instrument string, it isn't required to be tested. Certain steps in this procedure will therefore be marked N/A as indicated in that step.

5. PREREQUISITES

- 7/1/72 5.1 Obtain the Shift Supervisor's permission to perform this surveillance

test and obtain the NI/RPS cabinet key for Cabinet's C5762E (NI-2) and C5755E (NI-1).

Time 0444 Shift Supervisor T LCHMAN

5.2 The NI/RPS cabinets are energized.

9 | Section 5 Complete: Verified M. Duthie Date 6-9-85

6. PROCEDURE

6.1 Channel Functional Test

9 | NOTE: A separate procedure will be filled out for each channel.

Channel being Tested 1

9 | M. D. 6.1.1 Unlock and open NI/RPS Cabinet C5755E (NI-1) and/or C5762E (NI-2). Verify proper annunciation in the Control Room.

- 9 | 1. If in Mode 6 disconnect source range audible indication from NI-1 or NI-2.

9 | M. D. 6.1.2 Place the Source Range Test Module (SRTM location A1-02-01/B1-02-01 (NI-2/NI-1) Test Selector Switch in the TEST/OPERATE position. Observe the ON TEST lamp to go from dim to bright.

9 | M. D. 6.1.3 Connect the DVM to the +10V test jack on the front plate of the SRTM. The DVM should indicate +10.000 \pm 0.010 VDC.

NI-1 DVM Reading 9.998

NI-2 DVM Reading 10.003

9 | M. D. 6.1.4 Place the SRTM Test Selector Switch in the 100 KHz position.

9 | M. D. 6.1.5 Disconnect DVM from SRTM and reconnect to the output test jack on the front plate of the Count Rate Amplifier Module (CRAM location A1-02-04/B1-02-04). Record DVM indication to three (3) decimal places (allow three minutes before reading DVM indication). The DVM should indicate 8.571 \pm 0.005 VDC.

NI-1 100 KHz DVM Reading 8.569

NI-2 100 KHz DVM Reading 8.570

MND 6.1.6

Record the meter indication on the front plate of the CRAM and corresponding Source Range Count Rate RY indicator in the Control Room, the computer point and recorder. Each should indicate $1.0 \times 10^5 \pm 0.5 \times 10^5$ counts per second (CPS).

NI-1 Computer Point (R805) Reading 500 ^{MND} 5.00
 CPS=₁₀(R805) CPS= 10000 ^{MND} 10000
 NI-1 CRAM Reading 10⁵
 NI-1 RY Indication 10⁵
 NI-1 Recorder Reading 10⁵

NI-2 Computer Point (R796) Reading 3 ^{MND} 5.00
 CPS=₁₀(R796) CPS= 10000
 NI-2 CRAM Reading 1x10⁵
 NI-2 RY Indication 1x10⁵
 NI-2 Recorder Reading 1x10⁵

MND 6.1.7

Place the SRTM Test Selector Switch in the 4 KHz position.

MND 6.1.8

Record DVM indication to three (3) decimal places (allow three minutes before reading).

NI-1 4 KHz DVM Reading 6.568

NI-2 4 KHz DVM Reading 6.570

MND 6.1.9

Subtract the DVM reading at 4 KHz from the DVM reading at 100KHz. The difference in readings should be 2.000 ± 0.002 VDC.

NI-1; 100 KHz - 4 KHz Difference 2.001

NI-2; 100 KHz - 4 KHz Difference 2.000

MND 6.1.10

Record the meter indications on the front plate of the CRAM and corresponding Source Range Count Rate RY indicator in the Control Room, the computer point and recorder. Each should indicate $4.0 \times 10^3 \pm 0.5 \times 10^3$ counts per second (CPS).

NI-1 Computer Point (R805) Reading 3.60
 CPS=₁₀(R805) CPS= 3981.07
 NI-1 CRAM Reading 4x10³
 NI-1 RY Indication 4x10³
 NI-1 Recorder Reading 4x10³

NI-2 Computer Point (R796) Reading 3.60
 CPS=₁₀(R796) CPS= 3981.071
 NI-2 CRAM Reading 4x10³

NI-2 RY Indication 4×10^3
 NI-2 Recorder Reading 4×10^3

MHB.1.11

Place the SRTM Test Selector Switch in the 1 Hz position.

MHB.1.12

Record the DVM indication to three decimal places (allow three minutes before reading). The DVM should indicate 1.423 ± 0.200 VDC.

NI-1 1 Hz DVM Reading 1.398

NI-2 1 Hz DVM Reading 1.400

MHB.1.13

Record the meter indication on the front plate of the CRAM and corresponding Source Range Count Rate RY indicator in the Control Room. Each meter should indicate 1 ± 0.2 CPS.

NI-1 Computer Point (R805) Reading -0.01
 CPS=₁₀(R805) CPS= 0.977
 NI-1 CRAM Reading 1×10^0
 NI-1 RY Indication 1×10^0
 NI-1 Recorder Reading 1×10^0

NI-2 Computer Point (R796) Reading -0.01
 CPS=₁₀(R796) CPS= 0.977
 NI-2 CRAM Reading 1×10^0
 NI-2 RY Indication 2×10^{-1}
 NI-2 Recorder Reading 2×10^{-1}

MHB.1.14

Place the SRTM Test Selector Switch in the 0 decades minute (DPM) position.

MHB.1.15

Disconnect the DVM from the CRAM and reconnect to the OUTPUT test jack on the front plate of the Rate-Of-Change Amplifier Module (ROCAM location A1-02-07/B1-02-07). Record the DVM reading to three (3) decimal places (allow three minutes before recording). The DVM should indicate 0.909 ± 0.005 VDC.

NI-1 0 DPM DVM Reading 0.910

NI-2 0 DPM DVM Reading 0.910

MHB.1.16

Record the meter indication on the front plate of the ROCAM and corresponding Start-Up-Rate (SUR) RY indicator in the Control Room, and the corresponding computer point. Each should indicate 0.0 ± 0.25 DPM.

NI-1 Computer Point (A859) Reading 0.00
 NI-1 SUR ROCAM Reading 0.0 ~~MHO~~ 0.00
 NI-1 SUR RY Indication 0.00

NI-2 Computer Point (A853) Reading -0.00
 NI-2 SUR ROCAM Reading 0.0
 NI-2 SUR RY Indication 0.0

MHO 6.1.17

Place the SRTM in the 10 DPM position

MHO 6.1.18

Observe a repetitive full scale response of the meter on the front plate of the ROCAM and corresponding full scale saturation (above 5 DPM) of the SUR RY indication in the Control Room.

NOTE: The 10 DPM test input signal is a ramp generator with an approximately 45 second period. Therefore, during every 45 seconds, the output voltage will fall to zero and rise again to the final value. Also, as the signal increases past approximately 2 DPM, the SUR Rod Withdrawal Inhibit Bistable (location A1-02-10/B2-02-10) will trip producing RPS SUR Rod Withdraw Inhibit - Q841 alarms in the Control Room and an OUT INHIBIT indication at the Rod Control Panel. These high SUR setpoints will be verified in later steps.

MHO 6.1.19

Record the maximum DVM indication to three decimal places. The DVM should indicate 10.000 ± 0.005 VDC.

NI-1 10 DPM DVM Reading 10.001

NI-2 10 DPM DVM Reading 10.005

MHO 6.1.20

Place the SRTM in the ROCAM CAL OUT position.

MHO 6.1.21

Rotate the CAL OUT pot on the SRTM counterclockwise until the DVM reads approximately 0 VDC. Observe the OUTPUT STATE lamp on the SUR Rod Withdrawal Inhibit Bistable to be dim and the OUTPUT MEMORY lamp to be bright. Manually, reset the OUTPUT MEMORY lamp using the corresponding reset toggle switch. Observe the OUTPUT MEMORY lamp to go dim. If Reactor Power is $>10^{-9}$ amps, this steps function cannot be checked, record as N/A.

NI-1 SUR RWI Bistable set

NI-2 SUR RWI Bistable MHO

MNOB.1.22

Verify the HIGH SUR annunciator in the Control Room is reset. Verify the OUT INHIBIT lamp at the Rod Control Panel in Control Room is out.

NI-1 RPS SUR ROD WITHDRAW - Q841 INHIBIT Alarms Reset

NI-2 RPS SUR ROD WITHDRAW - Q841 INHIBIT Alarms Reset

MNB.1.23

Slowly rotate the CAL OUT pot on the SRTM to provide an increasing signal (as indicated on the DVM) until the SUR RWI Bistable just trips (Output State and OUTPUT MEMORY lamp go bright). Record the DVM reading to three decimal places (allow three minutes before recording). The DVM reading should be 2.727 ± 0.020 VDC (corresponding to 2 ± 0.1 DPM). If Reactor Power is $>10^{-9}$ amps, this steps function cannot be checked, record as N/A. However, any desired test voltage signals called for in this step must be generated to complete the following step.

NI-1 SUR RWI B/S Lamp Status Verified YES
 NI-1 SUR RWI B/S Trip DVM Reading 2.714
 Mode 1 Only: Desired Voltage Generated N/A

NI-2 SUR RWI B/S Lamp Status Verified AND
 NI-2 SUR RWI B/S Trip DVM Reading 2.722
 Mode 1 Only: Desired Voltage Generated N/A

MNB.1.24

Record the meter indication on the front plate of the ROCAM and corresponding SUR RY indicator and computer point in the Control Room. Each should indicate 2.0 ± 0.25 DPM.

NI-1 Computer Point (A859) Reading 2.00
 NI-1 SUR ROCAM Reading 2.00
 NI-1 SUR RY Indication 2.00

NI-2 Computer Point (A853) Reading 2.00
 NI-2 SUR ROCAM Reading 2.0
 NI-2 SUR RY Indication 2.0

MNO.1.25

Verify a HIGH SUR alarm is annunciated in the Control Room and corresponding computer alarm printout (Q841). Verify also an OUT INHIBIT indication at the Rod Control Panel. If Reactor Power is $>10^{-9}$ amps this steps function cannot be checked, record as N/A.

NI-1 RPS SUR ROD WITHDRAW INHIBIT - Q841 Annunciator

NI-1 HIGH SUR Computer Alarm

NI-1 Rod Control Panel OUT INHIBIT

NI-2 RPS SUR ROD WITHDRAW INHIBIT - Q841 Annunciator

NI-2 HIGH SUR Computer Alarm

NI-2 Rod Control Panel OUT INHIBIT

MHB.1.26

Rotate the CAL OUT pot on the SRTM to increase the signal (as indicated on the DVM) to 5.454 ± 0.005 VDC. Record the meter reading on the front plate of the ROCAM and corresponding SUR RY indicator and computer point in the Control Room. Each should indicate 5.0 ± 0.25 DPM.

NI-1 Computer Point (A859) Reading 5.00
 NI-1 SUR ROCAM Reading 5.0
 NI-1 SUR RY Indication 5.0

NI-2 Computer Point (A853) Reading 5.00
 NI-2 SUR ROCAM Reading 5.0
 NI-2 SUR RY Indication 5.0

MHB.1.27

Slowly rotate the CAL OUT pot in the SRTM to provide a slowly decreasing signal until the SUR RWI Bistable just resets as indicated by the OUTPUT STATE lamp going from bright to dim. The DVM indication at reset should be 1.818 ± 0.070 VDC (1 ± 0.15 DPM). If Reactor Power is $>10^{-9}$ amps this steps function cannot be checked, record as N/A. However, any desired test voltage signals called for in this step must be generated in order to complete the following step.

NI-1 SUR RWI B/S Lamp Status Verified YES
 NI-1 SUR RWI B/S Reset DVM Reading 1.827
 Model 1 Only: Desired Voltage Generated N/A

NI-2 SUR RWI B/S Lamp Status Verified NO
 NI-2 SUR RWI B/S Reset DVM Reading 1.814
 Model 1 Only: Desired Voltage Generated N/A

MHB.1.28

Record the meter indication on the front plate of the ROCAM and corresponding SUR RY indicator and computer point in the Control Room. Each should indicate 1.0 ± 0.25 DPM.

NI-1 Computer Point (A859) Reading 1.00 AND 1.01
 NI-1 SUR ROCAM Reading 1.0 AND 1.0
 NI-1 SUR RY Indication 1.0

91

91

NI-2 Computer Point (A853) Reading 1.0
 NI-2 SUR ROCAM Reading 2.0
 NI-2 SUR RY Indication 1.0

MH3 1.1.29
DL

Manually reset the OUTPUT MEMORY lamp on the SUR RWI Bistable by actuating the corresponding reset toggle switch. Observe the OUTPUT MEMORY lamp to go dim. Reset the HIGH SUR ANNUNCIATOR in Control Room and verify that the OUT INHIBIT lamp on Control Rod Panel in Control Room is out. If Reactor Power is $>10^{-9}$ amps, this steps function cannot be checked, record as N/A.

NI-1 SUR RWI B/S Reset

NI-1 RPS SUR ROD WITHDRAW INHIBIT Alarm - Q841

NI-2 SUR RWI B/S Reset

RI-2 RPS SUR ROD WITHDRAW INHIBIT Alarm - Q841

MH3 1.1.30

Place the SRTM Test Selector switch in the OPERATE position. Observe the ON TEST lamp to go dim.

NI-1 SRTM Lamp Status

NI-2 SRTM Lamp Status

MH3 1.1.31

T9050

Connect the DVM to the "Output \div 1000" test jack on the Source Range Detector Power Supply and record the following: If Reactor Power is $>10^{-9}$ amps this steps function cannot be checked, record as N/A.

NI-1 DVM Reading (should be 2.100 ± 0.036 VDC) 2.049
 Power Supply Meter (should be 2100 ± 36 VDC) 2050
 Computer Point E820 (should be 2100 ± 36 VDC) 2087

— Defusing

NI-2 DVM Reading (should be 2.100 ± 0.036 VDC) 2.094
 Power Supply Meter (should be 2100 ± 36 VDC) 2090
 Computer Point E814 (should be 2100 ± 36 VDC) 2152

N/A 6.1.32

If in Mode 6 reconnect source range audible indication to NI-1 and NI-2.

MH3 1.1.33

Disconnect and remove the DVM. Close and relock the NI/RPS Cabinet door. Verify the NI/RPS Cabinet door open annunciator may be reset.

Section 6.1 complete. Verified M. D. Anthony Date 6-9-85

Add Sect 6.2 per T 8473

7. ACCEPTANCE CRITERIA

- 7.1 A Source Range channel functional check has been performed, and there is visual indication in the Control Room.

Verified D. Scepter Date 6-9-85

- 7.2 The Source Range channel functional check has been performed and setpoints are within specifications.

Verified D. Scepter Date 6-9-85

NOTE: Section 7.2 shall be N/A during Mode (1) operation.

END

WORK PERFORMED ON #1 MFP

A review of the chart recorders connected to the MFPT controls showed the LS-16 Limit Switch was the first indication of the trip. Because SV 12 was not energized, we eliminated all the protective trips except overspeed.

The information from the Technical Section review of the post trip data showed the pump increasing in speed just before the trip.

Because the chart recorder connected to TP 111 didn't show any change in speed reference signal, we determined the cause of the overspeed was probably in the speed feedback or valve position feedback circuits. We then took a set of readings on Number 1 Pump and compared them to Number 2 Pump. We could find no significant difference between the two control circuits.

The I&C mechanic suggested the problem could be a loose connection. I made the decision to wait for a GE field rep before going any further with troubleshooting.

When I talked to GE, they agreed that it appeared the pump tripped on overspeed. They had no one available to come to the site immediately.

6-11-85
Date

T.R. Isley
T.R. Isley

TRI/er

WORK DONE ON #1 MFP 6-9-85

On June 9, 1985, Ken Brubaker called me at approximately 0305 and told me to go to the plant as it had tripped and there were several problems. Upon arrival, Ken Brubaker told me #1 MFPT had tripped and to look for what may have caused the problem. Mike Dutkiewicz was on 3rd Shift and had removed the charts from the Gould Brush Recorders we had connected to different points on #1 MFP and in the MDT-20 cabinet. These recorders were connected to monitor a previous problem with #1 MFP and by studying the charts I determined the pump tripped from a different problem this time. Although the charts told us what the problem wasn't, it did not tell us what the problem was.

Later Tom Isley told me the Tech Section had determined the pump tripped on over speed. One of the Gould Recorders was connected to Board Position 2 between TP 110 (Gnd) and TP 111 to monitor the pump speed reference signal. At the time of the pump trip the chart did not show any change in the speed setpoint signal from ICS. In turn this eliminated the ICS System as the source of the problem. I proceeded to check the voltages in the MDT-20 cabinet which accepted the turbine speed feedback level signal from the feed pump. I checked the waveform from the shaft speed pick up probes (SSPU-1 and SSPU-2) to the MDT-20 cabinet, and also the voltages at 18 different test points on Board Positions 4, 5, and 6 in the MDT-20 cabinet. I compared these voltages and waveforms to those of #2 MFPT and could find no hard failure or anything conclusive as to why the pump tripped. I thought the problem could have possibly been a loose connection on either of the SSPU probes or on the LVDT located at the pump. It was decided not to probe around at the pump at this time as it was not known whether GE would come in to look at the problem. I did not pursue the problem any further. All work was done per MWO 1-85-1935-00.

6-11-85
Date

Edward W. Gensler
Edward W. Gensler

EWG/er

MAINTENANCE WORK ORDER ED 5665.3		<input type="checkbox"/> OUTAGE <input checked="" type="checkbox"/> SCHEDULING PRIORITY 4		SHEET 1 OF 1	
AREA: FUNCTIONAL ACCOUNT NUMBER 611 3312-1		EQUIPMENT FILE NUMBER SUB-036-02		SUS. SUBSYSTEM 036-02	
EQUIPMENT / INSTRUMENT NAME AND NUMBER MAIN FW PUMP TURBINES		MAINTENANCE WORK ORDER NUMBER 1 - 85 - 1935 - 00		RELATED PM NO. (S) SCHEDULED n/a	
TWO INITIATED BY: <input type="checkbox"/> WR ORIGINATOR EXT. <input type="checkbox"/> DVR <input type="checkbox"/> NCR <input type="checkbox"/> MWO <input type="checkbox"/> FCR NO.		DRAWING NUMBER		CO-ORDINATES	
DESCRIPTION OF PROBLEM / MALFUNCTION / WORK TO BE PERFORMED TROUBLESHOOT THE MAIN FEED PUMP TURBINE CONTROLS D DETERMINE THE CAUSE OF THE TRIP					
CONTINUATION SHEETS ATTACHED <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					
WORK CLASS <input checked="" type="checkbox"/> ROUTINE <input type="checkbox"/> NON-ROUTINE MODE REQUIRED 1 OUTAGE TYPE REQUIRED					
<input type="checkbox"/> NUCLEAR SAFETY RELATED <input checked="" type="checkbox"/> NON-NUCLEAR SAFETY RELATED <input type="checkbox"/> REFUELING <input type="checkbox"/> TURBINE/GENERATOR/CONDENSER					
<input type="checkbox"/> ASME <input type="checkbox"/> FPS <input type="checkbox"/> B31.1 <input type="checkbox"/> INTERRUPTIBLE <input type="checkbox"/> AUX. BOILER <input type="checkbox"/> OTHER					
INSPECTIONS AND/OR ENCLOSURES REQUIRED <input type="checkbox"/> CLEANLINESS <input type="checkbox"/> WELD TRAVELERS <input checked="" type="checkbox"/> ENCLOSURE 13 <input type="checkbox"/> CONFINED SPACE PERMIT <input type="checkbox"/> SPARE PARTS REQUIRED					
<input type="checkbox"/> REP REQUIRED <input type="checkbox"/> BURNING PERMIT <input type="checkbox"/> ENCLOSURE 14 <input type="checkbox"/> PAINTING PERMIT <input type="checkbox"/> YES <input type="checkbox"/> NO					
CONTACT C & HP <input type="checkbox"/> PRECAUTIONARY ACTION SHEET <input type="checkbox"/> TAGGING LIST <input type="checkbox"/> SPECIAL INSTRUCTIONS (LIST MIT OR P.O. ON BACK)					
PROCEDURE INSTRUCTIONS					
NO <u>n/a</u> REV NO REV NO REV					
TWO CREATED BY: TRISLE DATE 06/09/85 9 COGNIZANT INDIVIDUAL ACKNOWLEDGMENT					
LEAD SHOP / WORK GROUP RESPONSIBILITY AND SUPPORT GROUPS JMDESA T. Busley DATE 6-9-85					
IC 11 MAINTENANCE ENGINEER (OR DESIGNEE) APPROVAL T. Busley DATE 6-9-85					
VIEWED BY QC / CODE INSPECTION <u>n/a</u> DATE DESIGNATED INSPECTOR MIN LEVEL					
SPECIAL QC / CODE INSPECTION INSTRUCTIONS					
RECEIVED BY LEAD SHOP / WORK GROUP K.A. Brubaker DATE 6-9-85 15 PERMISSION TO COMMENCE WORK					
SHIFT SUPERVISOR / FOREMAN / SPECIAL INSTRUCTIONS / LIMITATIONS Scott Wise DATE 6/9/85					
WORK COMPLETE (DESCRIPTION ON BACK)					
INSPECTION / TESTING REQUIRED <input type="checkbox"/> YES <input type="checkbox"/> NO					
WORKS REMOVED OR CLEARED BY					
HOUSEKEEPING <input type="checkbox"/> ACCEPTABLE <input type="checkbox"/> NOT ACCEPTABLE					
MAINTENANCE COMPLETED AND INSPECTED PER REQUIREMENTS OF AD 1844.00					
TESTING TO BE PERFORMED / SPECIAL INSTRUCTIONS <u>n/a</u> WJD 6/9/85 22 INSPECTOR ACCEPTANCE OF TESTING					
RESPONSIBLE FOREMAN / INDIVIDUAL K.A. Brubaker KAB DATE 6-9-85 24 SHIFT SUPERVISOR					
ACTION ITEMS FOLLOW-UP <input type="checkbox"/> NOT REQUIRED					
<input checked="" type="checkbox"/> NPRO REPORTABLE - COMPLETE ENCLOSURE 10 <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> COMMENCE FCR CLOSEOUT					
<input type="checkbox"/> INITIATED FOLLOW-UP MWO NO <input type="checkbox"/> FCR DEFICIENCY / PUNCH LIST ATTACHED <input type="checkbox"/> YES <input type="checkbox"/> NA					
<input type="checkbox"/> INITIATED DVR, NCR, NO <input type="checkbox"/> OTHER					
COGNIZANT INDIVIDUAL APPROVAL DATE 27 MAINTENANCE ENGINEER APPROVAL DATE					
COPY ROUTING: WHITE - Routed To Be Completed / Procedure BLUE - Maintenance Planning YELLOW - Responsible Group To Maintenance Planning GREEN - Shift Supervisor / Foreman PINK - Work Completion To Maintenance Planning GOLDENROD - Foreman Completion Copy To Maintenance Planning					

[illegible][illegible]

MFP #2

Pos 4	TP 902	+0.062 VDC
	TP 901	+0.009 VDC
	TP 904	+9.149 VDC
	TP 908	+1.510 VDC
	TP 905	+0.815 VDC
	TP 906	-8.241 VDC

Pos 6	TP 307	-8.241 VDC
	TP 306	-2.022 VDC
	TP 312	+2.516 VDC
	TP 305	+3.107 VDC
	TP 304	+19.113 VDC
	TP 309	+6.461 VDC
	TP 308	+2.980 VDC

Pos 5	TP 709	+6.457 VDC
	TP 713	+0.328 VDC
	TP 714	+1.656 VDC
	TP 708	+2.976 VDC
	TP 703	+0.064 VDC
	TP 701	N/A VDC SHAFT SPEED PICK-UP #1
	TP 702	N/A VDC " " " " #2

MFP*1

Pos 4

TP902	+0.084 VDC
TP901	+0.004 VDC
TP904	+9.212 VDC
TP908	+1.692 VDC
TP905	+0.952 VDC
TP906	-9.559 VDC

TP907 GND

Pos 6

TP307	-9.559 VDC
TP306	-2.995 VDC
TP312	+2.566 VDC
TP305	+3.172 VDC
TP304	+18.979 VDC
TP309	+6.352 VDC
TP308	+3.620 VDC

TP310 GND

Pos 5

TP709	+6.348 VDC
TP713	+0.331 VDC
TP714	+1.566 VDC
TP708	+3.615 VDC
TP703	+0.083 VDC

TP710 GND

TP701	N/A	SHAFT SPEED PICK-UP*1
TP702	N/A	" " " " #2

WORK DONE ON #1 MFD 6-9-85

6-11-85

ON JUNE 9, 1985 KEN BRUBAKER CALLED ME AT APPROXIMATELY 0305 AND TOLD ME TO GO TO THE PLANT AS IT HAD TRIPPED AND THERE WERE SEVERAL PROBLEMS. UPON ARRIVAL KEN BRUBAKER TOLD ME #1 MFPT HAD TRIPPED AND TO LOOK FOR WHAT MAY HAVE CAUSED THE PROBLEM. MIKE DUTKIEWICZ WAS ON 3RD SHIFT AND HAD REMOVED THE CHARTS FROM THE GOULD BRUSH RECORDERS WE HAD CONNECTED TO DIFFERENT POINTS ON #1 MFP AND IN THE MDT-20 CABINET. THESE RECORDERS WERE CONNECTED TO MONITOR A PREVIOUS PROBLEM WITH #1 MFP AND BY STUDYING THE CHARTS I DETERMINED THE PUMP TRIPPED FROM A DIFFERENT PROBLEM THIS TIME. ALTHOUGH THE CHARTS TOLD US WHAT THE PROBLEM WASN'T IT DID NOT TELL US WHAT THE PROBLEM WAS.

LATER T.M. ISLEY TOLD ME THE TECH SECTION HAD DETERMINED THE PUMP TRIPPED ON OVER SPEED. ONE OF THE GOULD RECORDERS WAS CONNECTED TO BOARD POSITION 2 BETWEEN TP 110 (GND) AND TP 111 TO MONITOR THE PUMP SPEED REFERENCE SIGNAL. AT THE TIME OF THE PUMP TRIP THE CHART DID NOT SHOW ANY CHANGE IN THE SPEED SETPOINT SIGNAL FROM ICS. IN TURN THIS ELIMINATED THE ICS SYSTEM AS THE SOURCE OF THE PROBLEM. I PROCEEDED TO CHECK THE VOLTAGES IN THE MDT-20 CABINET WHICH ACCEPTED THE TURBINE SPEED FEEDBACK LEVEL SIGNAL FROM THE FEED PUMP.

(SEE PAGE 2)

(2)

I CHECKED THE WAVEFORM FROM THE SHAFT SPEED PICK UP PROBES (SSPU-1 AND SSPU-2) TO THE MDT-20 CABINET AND ALSO THE VOLTAGES AT 18 DIFFERENT TEST POINTS ON BOARD POSITIONS 4, 5, AND 6 IN THE MDT-20 CABINET. I COMPARED THESE VOLTAGES AND WAVEFORMS TO THOSE OF #2 REPT AND COULD FIND NO HARD FAILURE OR ANYTHING CONCLUSIVE AS TO WHY THE PUMP TRIPPED. I THOUGHT THE PROBLEM COULD HAVE POSSIBLY BEEN A LOOSE CONNECTION ON EITHER OF THE SSPU PROBES OR ON THE LVDT LOCATED AT THE PUMP. IT WAS DECIDED NOT TO PROBE AROUND AT THE PUMP AT THIS TIME AS IT WAS NOT KNOWN WHETHER GE WOULD COME IN TO LOOK AT THE PROBLEM. I DID NOT PURSUE THE PROBLEM ANY FURTHER. ALL WORK WAS DONE PER MWO 1-85-1935.00.

Edward W. Gexeler

DAVIS BESSE NUCLEAR POWER STATION DATA COVER SHEET

ED 8803-2

TEST NO.

ST 5071.02

REV. NO. USED

11

TITLE

AFW REFUELING TEST

COMPLETED TEST

SUSPENDED TEST

TEST PERSONNEL

TEST COMPLETED

6/9/85

BY

SH. [Signature]

TEST PERSONNEL

SECTION

6.1

EQUIPMENT CODE IF APPLICABLE

BOTH

☐ PERFORMED TO MEET SCHEDULE

☒ PERFORMED TO ENSURE OPERABILITY AFTER TRIP

SHIFT SUPERVISOR

SHIFT SUPERVISOR ACKNOWLEDGMENT THAT SURVEILLANCE REQUIREMENTS ARE SATISFIED AND THE EQUIPMENT IS DECLARED OPERABLE

SHIFT SUPERVISOR

[Signature]

DATE

6/9/85

TIME 1600

☐ P.T. NON-APPLICABLE, NO S.S. REVIEW REQUIRED

FORWARDED TO SURVEILLANCE TEST ENGINEER

SURVEILLANCE TEST ENGINEER

CHECKLIST

☒ DATA AND ENCLOSURES INCLUDED

☒ SIGN-OFFS COMPLETED

☒ DEFICIENCY LIST ATTACHED, IF NEEDED

☒ COMPUTER TEST SCHEDULE UPDATED

REMARKS

FORWARDED TO

Don Missig

ON

6-10-85

BY

Cathy Wylie

DESIGNATED REVIEWER

☒ APPROVED

☐ FURTHER REVIEW NECESSARY

REMARKS

FORWARDED TO

☐ CENTRAL FILES (PERIODIC TESTS)

☒ STE FOR FILING (SURVEILLANCE TESTS)

☐ SECTION HEAD

6/12/85

BY

[Signature]

SECTION HEAD

☐ APPROVED

☐ FURTHER REVIEW NECESSARY

REMARKS

FORWARDED TO

☐ CENTRAL FILES (PERIODIC TESTS)

☐ STE FOR FILING (SURVEILLANCE TESTS)

☐ SRB FOR REVIEW ON

DATE

BY

SECTION HEAD

STATION REVIEW BOARD

☐ APPROVED

☐ OTHER RESOLUTION

FORWARDED TO

TE

ON

DATE

BY

SRB CHAIRMAN

SURVEILLANCE TEST ENGINEER

☐ DOCUMENT RECEIVED

ENGINEER

DATE

CENTRAL FILES

☐ DOCUMENT RECEIVED

BY

DATE

SHIFT SUPERVISOR

TEST SUSPENDED

DATE

TIME

BY

SHIFT SUPERVISOR

REASON FOR SUSPENSION

WAS SIGNIFICANT CONDITION ADVERSE TO QUALITY OR NON ROUTINE REPORTABLE OCCURRENCE INVOLVED?

☐ YES

☐ NO

IF YES, DEVIATION REPORT MUST BE INITIATED. SUP. OR TECH. EN. NOTIFIED

IF NO, ACTION TAKEN

☐ WORK REQUEST, MAINTENANCE WORK ORDER INITIATED

☐ FOR INITIATED

☐ PROCEDURE MODIFICATION REQUEST

☐ OTHER

☐ ACTION ITEM REQUEST INITIATED

(EXPLAIN BELOW)

EXPLANATION OF OTHER ACTION

FORWARDED TO STE

DATE

BY

SHIFT SUPERVISOR

SURVEILLANCE TEST ENGINEER

☐ DELAY NOTED ON TEST SCHEDULE

☐ YES

☐ NO

SIGNIFICANT CONDITION ADVERSE TO QUALITY OR NON ROUTINE REPORTABLE OCCURRENCE?

ACTION TAKEN/REMARKS

FORWARDED TO

DESIGNATED REVIEWER

ON

DATE

BY

ENGINEER

DESIGNATED REVIEWER

TEST LATE DATE

(ENTERED BY STATION)

REPORTABLE OCCURRENCE IF NOT RUN?

☐ YES

☐ NO

☐

MALFUNCTIONS RESOLVED, RETURNED TO SK AT SUPERVISOR FOR RETEST

☐

MALFUNCTIONS WILL DELAY TEST BEYOND LATE DATE

☐

OTHER - EXPLAIN

FORWARDED TO

☐ SHIFT SUPERVISOR

SECTION HEAD

ON

DATE

BY

REVIEWER

SECTION HEAD

☐ TEST POSTPONED - DVR INITIATED

☐ OTHER ACTION

FORWARDED TO STE ON

DATE

BY

SECTION HEAD

SURVEILLANCE TEST ENGINEER

☐ DOCUMENT RECEIVED

ENGINEER

FURTHER ACTION TAKEN

CODES

STE - Surveillance Test Engineer

SRB - Station Review Board

FCR - Facility Change Request

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ED 6926

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1-OPS ENG

1-TIC

1-CTRM

2-CTRM FILES

1-MPG

SECTION 1

WORKING COPY

PROCEDURE TITLE AND NUMBER

AUX FEED WATER REFUELING TEST

ST 5071.02

REASON FOR CHANGE

TO CORRECT PROCEDURE FOR TESTING #1 AFT

CHANGE

SEE ATTACHED

IS PROCEDURE REVISION REQUIRED

Yes ☒No ☐

If no, this modification is valid until

PREPARED BY

S. Hill

DATE

6/9/85

APPROVED BY

S. Hill

DATE

6/9/85

APPROVED BY

J. Wise

DATE

6/9/85

SUBMITTED BY (Section Head)

DATE

RECOMMENDED BY (SRB Chairman)

DATE

QA APPROVED BY (Manager of Quality Assurance)

DATE

APPROVED BY (Station Superintendent)

DATE

should start to open when the Auxiliary Feedwater Pump speed increases to about 2800 RPM.

- 11 | 6.1.14 Announce three times over the Gai-tronics to: Stand clear of the South side of the Turbine Building at the AFPT exhaust, the AFPT is about to be started.
- 6.1.15 Perform the following:
1. Place the mode select switch^{HIS 520B} (HIS 521B) in manual.
2. Hold the manual speed switch^{HIS 520A} (HIS 521A) in the increase direction for (90) seconds.
- 11 | 3. Place the mode select switch^{HIS 520B} (HIS 521B) in Auto Essential.
- 6.1.16 Depress SFRCS manual actuation "Trip" pushbutton for loss of four RCP's to Auxiliary Feedwater Train 1 (2), HIS 4869E (HIS 4870E) on Panel C5721 in the Control Room, and ensure Auxiliary Feedwater Pump 1-1 (1-2) starts.
- 11 | 6.1.17 Record the time from actuation of SFRCS "Trip" from the prior step to a differential pressure of ≥ 1070 psid steady state.
- AFP 1-1 differential pressure = PI 505 - PI 503
 AFP 1-2 differential pressure = PI 509 - PI 507 18.7
 AFP 1-1 _____ sec.
 AFP 1-2 _____ sec.
 Stop Watch No. _____ Cal Due Date _____
- NOTE: Expected steady state response times for the AFP's at ≥ 1070 psid is approximately 20 seconds.
- 6.1.18 When the AFPT has been timed, place HIS 520B (HIS 521B) in manual.
- 6.1.19 Decrease AFPT speed to approximately 1500 RPM.
- 6.1.20 Depress the SFRCS actuation "OFF" pushbutton for loss of four RCP's to the Auxiliary Feedwater Train 1 (2), HIS 4869E (HIS 4870E) on Panel C5721 in the Control Room.
- 6.1.21 Close MS 106 (MS 107) with HIS 106A (HIS 107A) on Panel C5717 in the CTRM.

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SECTION 1

PROCEDURE TITLE AND NUMBER

ST 5071.02 Auxiliary Feedwater System Refueling Test

REASON FOR CHANGE

Due to AFPT 1 & 2 response questions/concerns post
 RX Trip on 6-9-85, it is desired to Response Test Both
 AFPT'S. AFPT 1-1 was declared inoperable
 at 0140 on 6-9-85. This T Mod is deleting prerequisite
 5.1.2 That requires AFPT not being tested
 to be operable. This is a one time T. Mod.

CHANGE

For Test of AFPT 1-2 on 6-9-85 ^{delete Step} ⁱⁿ 5.1.2

IS PROCEDURE REVISION REQUIRED

Yes ☐No ☒

If no, this modification is valid until

Test is complete to on
6-9-85

PREPARED BY

L. Simon

DATE

6-9-85

APPROVED BY

WJ Olsson

DATE

6-9-85

APPROVED BY

L. Simon

DATE

6-9-85

SUBMITTED BY (Section Head)

DATE

RECOMMENDED BY (SRB Chairman)

DATE

QA APPROVED BY (Manager of Quality Assurance)

DATE

APPROVED BY (Station Superintendent)

DATE

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1-CTRM FILES

1-MPG

SECTION 1

PROCEDURE TITLE AND NUMBER

ST 5071.02 AFW SYSTEM REFUELING TEST

REASON FOR CHANGE

IN STEP 6.1.17, PI 505 FOR AFP 1-1 IS
NOT AVAILABLE

CHANGE

IN STEP 6.1.17 CHANGE PI 505 TO PI 2659

IS PROCEDURE REVISION REQUIRED

Yes ☐No ☒If no, this modification is valid until ~~PI 505~~ 6/4/85

PREPARED BY

T. Seelman

DATE

6/3/85

APPROVED BY

T. Seelman

DATE

6/3/85

APPROVED BY

D. Auzel

DATE

6/3/85

SUBMITTED BY (Section Head)

DATE

RECOMMENDED BY (SRB Chairman)

DATE

QA APPROVED BY (Manager of Quality Assurance)

DATE

APPROVED BY (Station Superintendent)

DATE

Davis-Besse Nuclear Power Station

Unit No. 1

Surveillance Test ST 5071.02

AUXILIARY FEEDWATER SYSTEM REFUELING TEST

NUCLEAR SAFETY RELATED

Record of Approval and Changes

Prepared By	<u>Charles N. Alm</u>	<u>9/19/77</u>
		Date
Submitted By	<u>Rich Chesko for MUD</u>	<u>10/26/77</u>
	<u>Section Head</u>	Date
Recommended By	<u>T. D. Murray</u>	<u>11/1/77</u>
	<u>SRB Chairman</u>	Date
QA Approved	<u>N/A</u>	
	<u>Quality Assurance Director</u>	Date
Approved By	<u>T. D. Murray</u>	<u>11/8/77</u>
	<u>Plant Manager</u>	Date

Revision No.	SRB Recommendation	Date	QA Approved	Date	Plant Manager Approval	Date
10	<i>[Signature]</i>	SE 4 '84	NA		<i>[Signature]</i>	12/14/84
11	<i>[Signature]</i>	APR 3 1985	NA		<i>[Signature]</i>	5/16/85

1. OBJECTIVE

10| This test is to verify that two independent steam generator auxiliary feedwater pumps and associated flow paths are operable at least once per 18 months. This test is performed in five phases. Phase I is done during Modes 1, 2, or 3, Phase II, V and VI are done during Modes 5 or 6.

(TS 4.7. 1.2.B.1) Phase I - Verifies that each pump starts automatically upon receipt of an auxiliary feedwater actuation test signal.

(TS 4.7. 1.2.B.2) Phase II - Verifies that each automatic valve in the flow path actuates to its correct position on an auxiliary feedwater actuation test signal. Completes any valve testing required by to 4.0.5) Technical Specification 4.0.5 which has not been completed by ST 5071.01.

Phase III - Measures the minimum recirc flow at 3600 RPM in Modes 1, 2, or 3.

Phase IV - Verifies the AFPT speed changer motor and service water suction valves respond to signals from the Auxiliary Shutdown Panel in any mode.

10| Phase V and VI - Verifies that the check valves required to be tested by ASME code meet forward and reverse flow acceptance criteria.

2. REFERENCES

- (TS) 2.1 Technical Specification 3.7.1.2, Auxiliary Feedwater Systems, Limiting Conditions for Operation
- 2.2 Technical Specification 4.7.1.2, Auxiliary Feedwater Systems, Surveillance Requirements
- (TS) 2.3 Technical Specification 4.0.5, Surveillance Requirements of Inservice Inspection and Testing of ASME Code Class 1, 2, and 3 Components
- 2.4 SP 1106.06, Auxiliary Feedwater System
- 2.5 ST 5071.01, Auxiliary Feedwater System Monthly Test
- 2.6 AD 1838.00, Surveillance and Periodic Test Program
- 2.7 PP 1101.01, Plant Limits and Precautions, Section 1.3.2, Once Through Steam Generator
- 2.8 P&ID M-003, Main Steam and Reheat System

- 2.9 P&ID M-006A, Condensate System
- 2.10 P&ID M-006B, Feedwater System
- 2.11 P&ID M-007, Steam Generator Secondary System
- 2.12 P&ID M-041, Service Water Systems
- 2.13 P&ID M-050, SFRCS Logic
- 2.14 Schematic, E-44B, Sheet 4C
- 2.15 AD 1839.02, Operation and Control of Locked Valves
- 2.16 AD 1839.03, Operation and Control of Capped Valves

3. REQUIRED EQUIPMENT

- 11|
- 3.1 Stop watch (Phase I, II and V)
 - 3.2 Drain hoses
 - 3.3 Test gage (Phase VI)

4. PRECAUTIONS AND LIMITATIONS

- 4.1 Observe the limits and precautions of SP 1106.06, Auxiliary Feedwater System.
- 4.2 Auxiliary Feed Pumps bearing metal temperature maximum is 210°F. Turbine bearing metal temperature maximum is 220°F.
- (TS) 4.3 PHASE I ONLY: Steam Generator pressure is ≥ 800 psia, such that testing will be done at the conditions specified by Technical Specification 3.7.1.2.
- 4.4 DURING THE PERFORMANCE OF THIS ST, THE TRAIN FOR WHICH THE ST IS BEING PERFORMED WILL NOT PERFORM ITS SAFETY FUNCTION. IF THE SYSTEM IS NEEDED FOR SAFETY FUNCTIONS, IT IS THE RESPONSIBILITY OF THE OPERATOR PERFORMING THE ST TO RESTORE THE SYSTEM TO NORMAL.
- 4.5 During Phase I, an Operator by AF 3870 (AF 3872) or by D 107 (BF 1262) must be in direct communication with the Control Room when the breaker is open. This allows the Control Room to immediately direct the Operator to open the valve or close the breaker upon an SFRCS actuation. If the Operator is by the valve, he must have a headset or similar device with him at all times. The Gai-tronics loudspeaker is only acceptable if the Operator is at the breaker.

- 4.6 PHASE III ONLY: When AF 23 is open, an Operator by the AFP being tested must be in direction communication with the Control Room. This operator will close AF 21 (AF 22) when the Control Room notifies the operator of an SFRCS actuation or any other unusual event. The operator must have a headset or similar device with him at all times. The Gai-tronics loud-speaker is NOT acceptable. This applies only when AF 23 is open.

NOTE: It has been found that AF 21 (AF 22) is easier and faster to close than AF 23.

- 11 | 4.7 The pushbutton to light method for valve stroke timing will be used throughout this procedure. This means START the stop watch simultaneously when the pushbutton is depressed, STOP the stop watch when the valve indicator light illuminates.

5. PREREQUISITES

- 5.1 The following prerequisites are those required for Section 6.1 (Phase I).

SH 5.1.1 The plant is in Modes 1, 2, or 3, with main steam available at > 800 psia for the starting of the Auxiliary Feed Pumps.

SH 5.1.2 The auxiliary feedwater system not being tested is operable. During plant startup, this does not apply when first entering Mode 3.

V 5.1.3 A visual inspection of the redundant train must be performed according to AD 1839.00.

NOTE: Requirements of AD 1839.02, Operation and Control of Locked Valves, must be satisfied in the performance of this test.

SH 5.1.4 ART's is in test trip bypass on SFRCS. This will also require a MFPT to be reset.

SH 5.1.5 Security has been notified that door 363 must be guarded.

11 | SH 5.1.6 Nuclear Facility Engineering (NFE) and Quality Control (QC) have been notified that ST 5071.02 is going to be performed on AFP 1-1 (1-2). Do Not proceed with the test until a representative from NFE and QC are present.

SH 5.1.7 The Shift Supervisor has given his permission to

conduct the test on Auxiliary Feedwater Pump 1-1 (1-2).

Shift Supervisor S Wise Time 4:25

Section 5.1 completed by S Hillebrandt Date 6/9/85

5.2 The following prerequisites are those required for Section 6.2 (Phase II).

- 10 | 5.2.1 The unit is in Mode 5 or 6.
- 10 | 5.2.2 Security has been notified that door 363 must be guarded.
- 10 | 5.2.3 Record the present position of the valves listed in data sheets 1 and 2 of Enclosure 1.
- 5.2.4 The SFRCS is operable.

NOTE: Steps 5.2.5 and 5.2.6 may be deleted if they were already performed for Section 5 of ST 5031.18, SFRCS Integrated Test.

- 5.2.5 Simulate RC Pumps as running for SFRCS. Do this as follows:

SFRCS CH.	RELAY CAB.	RELAY	
1	RC 3601	X1	Jumper Contacts 1
2	RC 3602	X2	(N1) and 7 (N11) for
3	RC 3603	X3	each relay as shown.
4	RC 3604	X4	

- 5.2.6 Defeat interlock to MS 106 (107) and MS 106A (107A) for low steam pressure and defeat close signal.

1. For MS 106, in D135, jumper TR31 (38) and TR51 (6). Also in D135, lift CL2 (34).
2. For MS 106, in D135, jumper TR61 (31) and TR (5).
3. For MS 107, in BF1124, jumper TR31 (21) and TR51 (19). Also in BF1124, lift CL2 Blue (11).
4. For MS 107, in BF1124, jumper TR61 (20) and TR (16).
5. For MS 106A, in BE1271, jumper TR31 (19) and TR51 (21). Also in BE1271, lift CL Red (18).
6. For MS 107A, in BF1188, jumper TR31 (19) and TR51 (21). Also in BF1188, lift CL Red (18).

- 10 | 5.2.7 The following locked valves are logged so they can be repositioned during the test.

<u>Locked Valve</u>	<u>Positioned To</u>
AF 608	Closed
AF 599	Closed
AF 360	Closed
AF 388	Closed
FW 786	Closed
FW 790	Closed

- 5.2.8 At the following MCCs, close the designated breakers and ensure the associated disconnect switches are in the "Normal" position.

<u>MCC</u>	<u>BREAKER</u>	<u>NAME</u>	<u>VLV. NO.</u>	<u>DISCONNECT SWITCH CAB.</u>
<u>In the #2 Elect Pent Room</u>				
F-11-A	BF-1124	AFPT 1-2 Mn Stm In Iso Valve	MS-107	CDF-11-A

NOTE: The Reset Pushbutton for MS 107 (MS 107A) low pressure trip should be pressed at this time. There is one pushbutton and two lights next to F-11-A. Ensure both lights are out after resetting.

In the Fuel Handling Storage Room 405, East of the Equipment Hatch

F-11-B	BF-1188	SG 1-1 to AFPT 1-2 In Stm Vlv	MS-107A	CDF-11-B
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10 | In the #1 Elect. Pent. Room

E-11-E	BE-1146	AFP 1-1 Disch to SG 1-2 Vlv	AF-3869	CDE-11-E
--------	---------	-----------------------------	---------	----------

Between the #3 and #4 Mech Pent Rooms

The Reset Pushbutton for MS 106 and MS 106A low pressure trip should be pressed at this time. There is one pushbutton and two lights east of MCC E-11-C. Ensure both lights are out after resetting. The Disconnect switch for MS 106 (CDE-11-C) should be checked at this time to be in the "Normal" position.

In the South End of the Corridor from the MU Pump Room by the Hatch

The disconnect switch for AF 3870 should be checked at this time to be in the "Normal" position.

In the Low Voltage Switchgear Room #1

D1PA	D107	AFP 1-1 Disch to SG 1-1 Vlv	AF 3870	CDE-11-D
------	------	-----------------------------	---------	----------

<u>MCC</u>	<u>BREAKER</u>	<u>NAME</u>	<u>VLV. NO.</u>	<u>DISCONNECT SWITCH CAB.</u>
DLNA	D135	AFP 1-1 Mn Stm Inlet Iso Vlv	MS-106	CDE-11-C
<u>In the Low Voltage Switchgear Room #2</u>				
F-12-A	BF-1201	AFP 1-2 Disch to SG 1-1	AF-3871	CDF-12-A
<u>In Diesel Gen Room #1</u>				
E-12-B	BE-1271	SG 1-2 to AFPT 1-1 In Stm Vlv	MS-106A	CDE-12-B
<u>In Diesel Gen Room #2</u>				
F-12-B	BF-1262	AFP 1-2 Disch to SG 1-2	AF-3872	CDF-12-B

5.2.9 The Shift Supervisor has given his permission to conduct Section 6.2 of this test.

Shift Supervisor _____ Time _____

Section 5.2 completed by _____ Date _____

5.3 The following prerequisites are those required for Section 6.3 (Phase III).

5.3.1 Visual inspection of the redundant trains was performed according to AD 1839.00.

5.3.2 The plant is in Modes 1, 2, or 3.

5.3.3 Security has been notified that door 363 must be guarded.

5.3.4 The following locked valves are logged so they can be repositioned during the test.

<u>AFP 1-1</u>	<u>Positioned To</u>	<u>AFP 1-2</u>
AF 21	Open	AF 22
AF 23	Open	AF 23
AF 17	Closed	AF 18

5.3.5 Nuclear Facility Engineering (NFE) and Quality Control (QC) have been notified that ST 5071.02 is going to be performed on AFP 1-1 (1-2). Not proceed with the test until a representative from NFE and QC are present.

5.3.6 The Shift Supervisor has given his permission to conduct this test.

10

Shift Supervisor _____ Time _____

Section 5.3 completed by _____ Date _____

5.4 The following prerequisites are those required for Section 6.4 (Phase IV).

_____ 5.4.1 SW 1382 (SW 1383) has power. This can be verified by ensuring the closed light is on.

_____ 5.4.2 The AFPT Speed Changer motor is operable.

_____ 5.4.3 Security has been notified that door 363 must be guarded.

_____ 5.4.4 The following below locked valves are logged so they can be repositioned during the test.

<u>AFP 1-1</u>	<u>Positioned To</u>	<u>AFP 1-2</u>
SW 5	Closed	SW 6
SW 1382	Open	SW 1383

_____ 5.4.5 The Shift Supervisor has given his permission to conduct this test.

Shift Supervisor _____ Time _____

Section 5.4 completed by _____ Date _____

5.5 The following prerequisites are those required for Section 6.5 (Phase V).

_____ 5.5.1 Security has been notified that door 363 must be guarded.

_____ 5.5.2 The following locked valves are logged so they can be repositioned during the test.

- _____ 1. MS 733 Open
- _____ 2. MS 728 Open

_____ 5.5.3 The following capped valves are logged so they can be opened.

- _____ 1. MS 30
- _____ 2. MS 133
- _____ 3. MS 37
- _____ 4. MS 134
- _____ 5. MS 31

10

5.5.4 A hose is connected from the following valves to a floor drain.

- 1. MS 30
- 2. MS 133
- 3. MS 37
- 4. MS 134
- 5. MS 31
- 6. MS 32

5.5.5 Both OTSG's are drained below 400 inches AND no work is being performed on the secondary side of the OTSG or in the steam lines.

- 1. OTSG 1
- 2. OTSG 2

 5.5.6 The Auxiliary Boiler is in service supplying the 235 psi header.

 5.5.7 The Shift Supervisor has given his permission to conduct this test.

Shift Supervisor _____ Time _____

Section 5.5 completed by _____ Date _____

5.6 The following prerequisites are those required for Section 6.6 (Phase VI).

 5.6.1 Security has been notified that door 363 must be guarded.

 5.6.2 The Auxiliary Boiler is operating.

 5.6.3 At least 20 feet of water is in a Condensate Storage Tank.

 5.6.4 IL ICS-38B (IL ICS-38A) Aux Shutdown panel remote control lights are out.

 5.6.5 OTSG 1-1 (1-2) level is less than 400 inches.

 5.6.6 Verify no one is in the AFPT exhaust missile shield on the south side of the auxiliary building.

5.6.7 The following locked valves are logged so they can be repositioned.

10

	<u>AFPT 1-1</u>	<u>Positioned To</u>	<u>AFPT 1-2</u>
1.		Open	MS 733
2.		Open	MS 728
3.	AF 360	Electrically Closed	AF 388
4.	AF 608	Electrically Closed	AF 608
5.	AF 599	Electrically Closed	AF 599
6.	FW 790	Electrically Closed	FW 786

5.6.8 FI 4630 (FI 4631) is in service.

5.6.9 Simulate RCP's running for SFRCS by jumpering contacts 1 (N1) and 7 (N11) for each relay shown below:

	<u>SFRCS CH</u>	<u>Relay Cab</u>	<u>Relay</u>
1.	1	RC 3601	X1
2.	2	RC 3602	X2
3.	3	RC 3603	X3
4.	4	RC 3604	X4

5.6.10 The following breakers are closed.

1. BE 1146 (E11E) for AF 3869.
2. D107 (D1PA) for AF 3870.
3. BF 1201 (F12A) for AF 3871.
4. BF 1262 (F12B) for AF 3872.

5.6.11 A hose is installed on AF 77 (AF 82).

5.6.12 A 0-600 psig test gage is installed on AF 78 (AF 81).

5.6.12 A hose is installed on MS 108.

5.6.13 The Shift Supervisor has given permission to perform Phase VI.

Shift Supervisor _____ Time _____

Section 5.6 completed by _____ Date _____

6. PROCEDURE

6.1 PHASE I

cl 6.1.1 On the 585' level in the CST Room, ensure that CD 167 or CD 168 Cnds Strg Tk 1-1 (1-2) Supply to Auxiliary Startup Suction Header, is locked open (not both).

6.1.2 Ensure CD 163 and CD 164, Outlet from Cnds Strg Tk 1-1 and 1-2 are both locked open.

U CD 163 Open

U CD 164 Open

6.1.3 Check closed AF 50 and AF 51, Auxiliary Feed Pump Discharge and Deaerator Drain to the Condensate storage tanks.

U AF 50 Closed

U AF 51 Closed

U 6.1.4

Check AF 59 open.

U 6.1.5

By Main Feed Pump 1-1, verify CD 170, Cnds Strg Tks to FW Iso Vlv, is locked open.

U 6.1.6

Verify that the AFW pump vibration panel is energized and in operation.

U 6.1.7

Verify the pump to be tested has greater than 18 psig suction pressure on PI 503 (PI 507).

6.1.8

Verify the proper oil levels.

NOTE: While the AFPT is idle, the oil level may be above the normal level. However, while the AFPT is running the oil level must be in the normal area.

#1 #2

U U 1.

Governor oil level is above the level mark.

U U 2.

Governor gear box oil level is in the bulls eye.

U U 3.

The turbine end turbine bearing oil level is in or above the black area of the sight glass.

U U 4.

The pump end turbine bearing oil level is in or above the black area of the sight glass.

U U 5.

The turbine end pump bearing oil level is in or above the black area of the sight glass.


U U 6.

The pump end pump bearing oil level is in or above the black area of the sight glass.

6.1.9

Perform the following to drain the AFPT.

1. Check open the following AFPT casing drains.

U U MS 745 (MS 744) 

CP U MS 746 (MS 747)

2. Open the following AFPT drain valves.

U U MS 745A (MS 744A)

U U MS 746A (MS 747A)

U U MS 748 (MS 749)

U U MS 750 (MS 751)

3. After the valves stop draining liquid, close the following valves:

U U MS 745A (MS 744A)

U U MS 746A (MS 747A)

U U MS 748 (MS 749)

U U MS 750 (MS 751)

6.1.10 Verify the following valves are in the their correct position.

316 SH FW 786 (FW 790) Open
SH SH SW 1382 (SW 1383) Closed

SH 6.1.11 Verify at least 20 feet of water is available in the Condensate Storage Tanks.

6.1.12 Perform the following for the appropriate pump.

1. If testing AFP 1-1, perform the following lineup.

SH SH Check Closed AF 3869

SH SH Check Closed AF 3870

2. If testing AFP 1-2, perform the following lineup.

SH Check Closed AF 3871

SH Check Closed AF 3872

11 | #1 #2

RLP AF 6.1.13

Open Breaker D107 (BF 1262) at MCC D1PA (F12B) to de-energize AF 3870 (AF 3872).

NOTE: Upon system actuation, the Auxiliary Feedwater Pump should reach full speed in ≤ 40 seconds. The Auxiliary Feedwater Pump Discharge Valve

should start to open when the Auxiliary Feedwater Pump speed increases to about 2800 RPM.

#1 #2
11| RCP RCP 6.1.14

Announce three times over the Gai-tronics to: Stand clear of the South side of the Turbine Building at the AFPT exhaust, the AFPT is about to be started.

6.1.15

Perform the following:

HIS 520B

Place the mode select switch (HIS 521B) in manual.

HIS 520A

Hold the manual speed switch (HIS 521A) in the increase direction for (90) seconds.

25

HIS 520B

Place the mode select switch (HIS 521B) in Auto Essential.

Depress SFRCS manual actuation "Trip" pushbutton for loss of four RCP's to Auxiliary Feedwater Train 1 (2), HIS 4869E (HIS 4870E) on Panel C5721 in the Control Room, and ensure Auxiliary Feedwater Pump 1-1 (1-2) starts.

11| RCP 34 6.1.17

Record the time from actuation of SFRCS "Trip" from the prior step to a differential pressure of ≥ 1070 psid steady state.

AFP 1-1 differential pressure = PI 505 - PI 503

AFP 1-2 differential pressure = PI 509 - PI 507 18.7

AFP 1-1 26.9 sec.

AFP 1-2 18.9 sec.

Stop Watch No. 4.1.13 17.27 second test Cal Due Date 9/4/85

NOTE: Expected steady state response times for the AFP's at ≥ 1070 psid is approximately 20 seconds.

RCP RCP 6.1.18

When the AFPT has been timed, place HIS 520B (HIS 521B) in manual.

RCP RCP 6.1.19

Decrease AFPT speed to approximately 1500 RPM.

RCP RCP 6.1.20

Depress the SFRCS actuation "OFF" pushbutton for loss of four RCP's to the Auxiliary Feedwater Train 1 (2), HIS 4869E (HIS 4870E) on Panel C5721 in the Control Room.

AFRCP 6.1.21

Close MS 106 (MS 107) with HIS 106A (HIS 107A) on Panel C5717 in the CTRM.

- 11| P.B. D.H. 6.1.22 Using the AFPT Speed Changer HIS 520A (HIS 521A) position the AFPT governor to high speed limit by holding in the "RAISE" position for 25 (90) seconds. Note this should be done after the turbine has stopped.
- 11| 24 24 6.1.23 Another operator must verify HIS 520A (HIS 521A) was held in the raise position for 25 (90) seconds.
- P.B. D.H. 6.1.24 Place HIS 520B (HIS 521B) in the AUTO ESSENTIAL position.
- 24 24 6.1.25 Another Operator must verify HIS 520B (HIS 521B) is in AUTO ESSENTIAL.
- cl cl 6.1.26 Close Breaker D107 BF 1262 to energize AF 3870 (AF 3872). This must be Independently Verified.
- Independently Verified Thibault Thibault
- cl 6.1.27 Drain AFPT 1-1 and 1-2 Exhaust Lines and the Missile Shield by performing the following:
- cl 1. In CWRT Rm (Rm #123) open MS 54 (MS 52) AFPT 1-1, (1-2) Exh Line Drn Vlv. After the condensate has drained, close MS 54 (MS 52).
 - cl 2. In the BAAT Rm open MS 53 (MS 51) AFPT 1-1 (1-2) Exh Line Drn Vlv. After the condensate has drained close MS 53 (MS 51).
 - cl 3. In Waste Gas Compressor Rm 1-1 open MS 108 (Missile Shield Drain Line Iso Vlv) and drain the Missile Shield through a temporary drain line to a floor drain, then close MS 108.
- 6.1.28 Perform the following to drain the AFPT.
1. Check open the following AFPT casing drains.
 - cl cl MS 745 (MS 744)
 - cl cl MS 746 (MS 747)
 2. Open the following AFPT drain valves.
 - cl cl MS 745A (MS 744A)
 - cl cl MS 746A (MS 747A)
 - cl cl MS 748 (MS 749)

✓ ✓ MS 750 (MS 751)

3. After the valves stop draining liquid, close the following valves:

✓ ✓ MS 745A (MS 744A)

✓ ✓ MS 746A (MS 747A)

✓ ✓ MS 748 (MS 749)

✓ ✓ MS 750 (MS 751)

✓ 6.1.29 Complete the acceptance criteria signoff in Section 7.1 or 7.2.

Section 6.1 completed by Almudena Date 6/9/8

6.2 PHASE II

- ____ 6.2.1 Position the valves listed on data sheet 1 and 2 to the "Desired Position".
- ____ 6.2.2 Verify on data sheet 1 and 2 that the actual valve position and control room indicating lights agree.
- NOTE: The following step will stroke AF 608. The opening time is required for Step 6.2.4.
- ____ 6.2.3 Depress SFRCS manual actuation "TRIP" pushbutton for loss of four RCP's to Auxiliary Feedwater Train 1 HIS 4869E on Panel C5717 in the Control Room while timing AF 608.
- ____ 6.2.4 Record on data sheet 1 the open stroke time of AF 608.
- ____ 6.2.5 Verify by control room lights that the valves listed on data sheet 1 stroked to their loss of 4 RCP SFRCS trip position.
- ____ 6.2.6 Verify on data sheet 1 that the actual valve position and control room indicating lights agree.
- ____ 6.2.7 Depress the SFRCS actuation "OFF" pushbutton for loss of four reactor coolant pumps to the Auxiliary Feedwater Train 1 HIS 4869E on Panel C5721 in the Control Room.
- ____ 6.2.8 Close and stroke time AF 608.

- 11 |
- ____ 6.2.9 Record the stroke time for AF 608 on data sheet 1.
- NOTE: The following step will stroke AF 599. The opening time is required for Step 6.2.11.
- ____ 6.2.10 Depress SFRCS manual actuation "TRIP" pushbutton for loss of four RCP's to Auxiliary Feedwater Train 2, HIS 4870E on Panel C5721 in the Control Room while timing AF 599.
- ____ 6.2.11 Record on data sheet 2 the open stroke time of AF 599.
- ____ 6.2.12 Verify by control room lights that the valves listed on data sheet 2 stroked to their loss of 4 RCP SFRCS trip position.
- ____ 6.2.13 Verify on data sheet 2 that the actual valve position and control room indicating lights agree.
- ____ 6.2.14 Depress the SFRCS actuation "OFF" pushbutton for loss of four reactor coolant pumps to the Auxiliary Feedwater Train 2, HIS 4870E, on Panel C5721.
- ____ 6.2.15 Close and stroke time AF 599.
- ____ 6.2.16 Record the stroke time for AF 599 on data sheet 2.
- ____ 6.2.17 Return the valves moved on data sheets 1 and 2 to their "prior position".
- 6.2.18 Perform the following for the valves listed on data sheet 3.
- ____ 1. Cycle the valves through one full cycle.
 - ____ 2. Record the stroke times of FW 601.
 - ____ 3. Record the stroke times of FW 612.
 - ____ 4. Verify the actual open valve position and control room indicating light agrees.
 - ____ 5. Verify the actual closed valve position and control room indicating light agrees.
- ____ 6.2.19 Complete acceptance criteria signoff.
- ____ 6.2.20 Remove jumpers and return lifted wires which were used for Steps 5.2.6 and 5.2.7.
- 6.2.21 At the following MCCs, open the below listed breakers:

<u>MCC</u>	<u>BREAKER NO.</u>	<u>NAME</u>	<u>VLV. NO.</u>
_____ D1NA	D135	AFPT 1-1 Mn Stm Inlet Iso Vlv	MS-106
_____ E-11-E	BE-1146	AFP 1-1 Disch to SG 1-2 Vlv	AF-3869
_____ D1PA	D107	AFP 1-1 Disch to SG 1-1 Vlv	AF-3870
_____ E-12-B	BE-1271	SG 1-2 to AFPT 1-1 Inlet Stm Vlv	MS-106A
_____ F-11-A	BF-1124	AFPT 1-2 Mn Stm Inlet Iso Vlv	MS-107
_____ F-11-B	BF-1188	SG 1-1 to AFPT 1-2 Inlet Stm Vlv	MS-107A
_____ F-12-A	BF-1201	AFP 1-2 Disch to SG 1-1	AF-3871
_____ F-12-B	BF-1262	AFP 1-2 Disch to SG 1-2	AF-3872

11

6.2.22 Perform the following:

- _____ 1. Record stop watch no. on Data Sheets 1, 2 and 3.
- _____ 2. Record stop watch cal. due date on Data Sheets 1, 2 and 3.

Section 6.2 completed by _____ Date _____

6.3 PHASE III

- _____ 6.3.1 On the 585' level in the CST Room, ensure that CD 167 or CD 168, Cnds Strg Tk 1-1 (1-2) Supply to Auxiliary Startup Suction Header, is locked open.
- _____ 6.3.2 Ensure CD 163 and CD 164, Outlet from Cnds Strg Tk 1-1 and 1-2, are both locked open.
 - _____ CD 163 Open
 - _____ CD 164 Open
- _____ 6.3.3 Check closed AF 50 and AF 51, Auxiliary Feed Pump Discharge and Deaerator Drain to the condensate storage tanks.
 - _____ AF 50 Closed
 - _____ AF 51 Closed
- _____ 6.3.4 Check AF 59 open.
- _____ 6.3.5 By Main Feed Pump 1-1, verify CD 170, Cnds Strg Tks to FW Iso Vlv, is locked open.
- _____ 6.3.6 Verify the pump to be tested has greater than 18 psig suction pressure on PI 503 (PI 507).
- _____ 6.3.7 Verify the proper oil levels.

NOTE: While the AFPT is idle, the oil level may be above the normal level. However, while the AFPT is running the oil level must be in the normal area.

- ___ 1. Governor oil level is above the level mark.
- ___ 2. Governor gear box oil level is in the bulls eye.
- ___ 3. The turbine end turbine bearing oil level is in or above the black area of the sight glass.
- ___ 4. The pump end turbine bearing oil level is in or above the black area of the sight glass.
- ___ 5. The turbine end pump bearing oil level is in or above the black area of the sight glass.
- ___ 6. The pump end pump bearing oil level is in or above the black area of the sight glass.

6.3.8 Perform the following to drain AFPT casing drains.

1. Check open the following AFPT casing drains.

___ MS 745 (MS 744)

___ MS 746 (MS 747)

2. Open the following AFPT drain valves.

___ MS 745A (MS 744A)

___ MS 746A (MS 747A)

___ MS 748 (MS 749)

___ MS 750 (MS 751)

3. After the valves stop draining liquid, close the following valves:

___ MS 745A (MS 744A)

___ MS 746A (MS 747A)

___ MS 748 (MS 749)

___ MS 750 (MS 751)

- ___ 6.3.9 Unlock and open AF 21 (AF 22) Auxiliary Feed Pump 1-1 (1-2) Recirculation Line Stop Valve.

6.3.10 Perform the following for the appropriate pump.

1. If testing AFP 1-1.

____ Check Closed AF 3869
____ Check Closed AF 3870

2. If Testing AFP 1-2.

____ Check Closed AF 3871
____ Check Closed AF 3872

11| _____ 6.3.11 Verify at least 25 feet of water if available in the Condensate Storage Tanks.

_____ 6.3.12 Place the Auxiliary Feed Pump mode select switch HIS 520B (HIS 521B) in the manual mode.

11| _____ 6.3.13 Hold the Auxiliary Feed Pump manual speed changer HIS 520A (HIS 521A) in the lower position for approximately 25 (90) seconds.

_____ 6.3.14 Announce three times over the Gai-tronics to: stand clear of the south side of the Turbine Building at the AFPT exhaust, the AFPT is about to be started.

_____ 6.3.15 Start 1-1 (1-2) AFW Pump by opening MS 106 (MS 107), Main Steam Line 1-1 (1-2) to Auxiliary Feed Pump Turbine 1-1 (1-2) Inlet Header Isolation Valve with HIS 106A (HIS 107A).

CAUTION: Review Limitations and Precautions 4.6.

_____ 6.3.16 Unlock and slowly throttle open AF 23 until greater than 20 inches of water is indicated on PDI 2658.

_____ 6.3.17 Unlock and shut minimum recirc valve AF 17 (AF 18). The Handwheel should be approximately $\frac{1}{4}$ " above the yoke.

_____ 6.3.18 Increase turbine speed to the high speed stop.

_____ 6.3.19 Readjust flow to 144 to 156 in. H₂O (813 GPM) using AF 23.

_____ 6.3.20 Record the flow, _____ "H₂O.

_____ 6.3.21 Open and lock AF 17 (AF 18).

_____ 6.3.22 Record the new flow, _____ "H₂O.

- 11| _____ 6.3.23 Place HIS 520A (HIS 521A) in the lower position until the turbine is approximately 1500 RPM.
- _____ 6.3.24 Close MS 106 (MS 107).
- _____ 6.3.25 Close and lock AF 21 (AF 22).
- 11| _____ 6.3.26 Close and lock AF 23.
- 11| _____ 6.3.27 Place HIS 520A (HIS 521A) in the Raise Position for 25 (90) seconds.

NOTE: This must be independently verified.

Independently Verified _____

- _____ 6.3.28 Place HIS 520B (HIS 521B) in the Auto-Essential Position.

NOTE: This must be independently verified.

Independently Verified _____

- _____ 6.3.29 Independently verify all locked valves are returned to their proper position.
- _____ 6.3.30 Determine the AFP flow with AF 17 (AF 18) closed by multiplying the square root of the reading of step 6.3.20 by 66.408.

Flow = $66.408 \sqrt{\text{Reading of 6.3.20}}$ = _____ gpm

- _____ 6.3.31 Determine the AFP flow with AF 17 (AF 18) open by multiplying the square root of the reading of step 6.3.22 by 66.408.

Flow = $66.408 \sqrt{\text{Reading of 6.3.22}}$ = _____ gpm

- _____ 6.3.32 Subtract the flow of step 6.3.32 from the flow of step 6.3.31 to determine the minimum recirc flow.

Minimum Recirc Flow _____ gpm

- _____ 6.3.33 Drain AFPT 1-1 and 1-2 Exhaust Lines and the Missile Shield by performing the following:

- _____ 1. In CWRT Rm (Rm #123) open MS 54 and MS 52 AFPT 1-1 (1-2) Exh Line Drn Vlv. After the condensate has drained, close MS 54 (MS 52).

____ 2. In the BAAT Rm open MS 53 (MS 51) AFPT 1-1 (1-2) Exh Line Drn Vlv. After the condensate has drained close MS 53 (MS 51).

____ 3. In Waste Gas Compressor Rm 1-1 open MS 108 (Missile Shield Drain Line Iso Vlv) and drain the Missile Shield through a temporary drain line to a floor drain, then close MS 108.

10 | 6.3.34 Perform the following to drain the AFPT.

1. Check open the following AFPT casing drains.

____ MS 745 (MS 744)

____ MS 746 (MS 747)

2. Open the following AFPT drain valves.

____ MS 745A (MS 744A)

____ MS 746A (MS 747A)

____ MS 748 (MS 749)

____ MS 750 (MS 751)

3. After the valves stop draining liquid, close the following valves:

____ MS 745A (MS 744A)

____ MS 746A (MS 747A)

____ MS 748 (MS 749)

____ MS 750 (MS 751)

____ 6.3.35 Notify the Shift Supervisor that the test is complete and the Auxiliary Feedwater System is returned to normal.

10 | Section 6.3 completed by _____ Date _____

6.4 PHASE IV

10 | ____ 6.4.1 At the Auxiliary Shutdown Panel select Local on HS ICS 38B (HS ICS 38A) AFPT 1 (2) GOV CONT SELECT.

____ 6.4.2 Ensure the amber light above HS ICS 38B (HS ICS 38A) comes on.

____ 6.4.3 Ensure IL ICS 38B (IL ICS 38A) Aux Shutdown Panel light comes on in the Control Room.

11| ____ 6.4.4 At the Auxiliary Shutdown Panel hold HIS ICS 38B (HIS ICS 38A) AFPT 1 (2) GOV SPD CONT in the High Speed position for 25 (90) seconds.

11| ____ 6.4.5 While a man is stationed by the AFP governor, at the Auxiliary Shutdown Panel, place HIS ICS 38B (HIS ICS 38A) AFPT 1 (2) GOV SPD CONT in the low speed position, for 25 (90) seconds.

6.4.6 Verify the following for the appropriate governor.

____ 1. If testing AFP 1-1, verify the speed changer motor drove in the counterclockwise (decrease) direction.

____ 2. If testing AFP 1-2, verify the manual speed setting control knob rotated in the counterclockwise (decrease) direction.

11| ____ 6.4.7 Place HIS ICS 38B (HIS ICS 38A) in the High Speed position and hold for at least 25 (90) seconds.

NOTE: This must be independently verified by either observing HIS ICS 38B (HIS ICS 38A) is placed in the High Speed position for 25 (90) seconds, or independently holding the speed controller in the increase direction for 25 (90) seconds.

Independently Verified _____

6.4.8 Verify the following for the appropriate governor.

____ 1. If testing AFP 1-1, verify the speed charger motor drove in the clockwise (increase) direction.

____ 2. If testing AFP 1-2, verify the manual speed setting control knob rotated in the clockwise (increase) direction.

____ 6.4.9 Place HS ICS 38B (HS ICS 38A) in the Remote position.

NOTE: This must be independently verified.

Independently Verified _____

____ 6.4.10 Unlock and close SW 5 (SW 6).

- ____ 6.4.11 At the Auxilaury Shutdown Panel place HIS 1382B (HIS 1383B) SERVICE WTR ISO SELECT in the Local position.
- ____ 6.4.12 Ensure the amber light above HIS 1382B (HIS 1383B) comes on.
- ____ 6.4.13 At the Auxiliary Shutdown Panel press open on HIS 1382A (HIS 1383A) SERVICE WTR ISO VLV.
- ____ 6.4.14 Physically verify SW 1382 (SW 1383) is open.
- ____ 6.4.15 Press close on HIS 1382A (HIS 1383A).
- ____ 6.4.16 Physically verify SW 1382 (SW 1383) is closed.
- ____ 6.4.17 Place HIS 1382B (HIS 1383B) in the Remote position.

NOTE: This must be independently verified.

Independently Verified _____

- ____ 6.4.18 Open SW 1 (SW 2) to ensure SW 1382 (SW 1383) has completely shut off service water. (Observe for at least five minutes.)
- ____ 6.4.19 Close SW 1 (SW 2).
- ____ 6.4.20 Open and lock SW 5 (SW 6).

NOTE: This must be independently verified for AD 1839.02.

Independently Verified _____

- ____ 6.4.21 Independently verify SW 1382 (SW 1383) is closed.

Section 6.4 completed by _____ Date _____

6.5 PHASE V

- 6.5.1 Verify closed the following valves:

- ____ 1. MS 106 Closed.
- ____ 2. MS 107A Closed.
- ____ 3. MS 106A Closed.
- ____ 4. MS 107 Closed.
- ____ 5. AFPT 1-2 Trip Throttle Valve Closed.
- ____ 6. AFPT 1-1 Trip Throttle Valve Closed.

- 6.5.2 Open the following valves:

1. MS 728.
 2. MS 733.
 3. AS 178.
- 6.5.3 Crack open MS 32 to warm the line and drain condensate.
- 6.5.4 Close MS 32.
- 6.5.5 Slowly open AS 273 to pressurize both AFPT steam lines to greater than 200 psig on PI 2561.
- 6.5.6 Maintain this pressure for 30 minutes while periodically (5-10 minutes) opening the following drain valves to drain condensate.
1. MS 133.
 2. MS 30.
 3. MS 134.
 4. MS 137.
 5. MS 31.
- 6.5.7 Open the following valves:
1. MS 106.
 2. MS 107A.
 3. MS 106A.
 4. MS 107.
- 6.5.8 Perform the following steps as quickly as possible. One operator should be at AS 273 and one at AS 178.
1. Close AS 273 AND
 2. At the same time close AS 178.
 3. After both valves are closed, open MS 32 to reduce the pressure between the valves.
 4. After MS 32 is opened, start timing the pressure decrease on PI 2561 AFPT 1-1 steam pressure.
- 6.5.9 Verify that 30 seconds after MS 32 was opened, PI 2561 read greater than 100 psig.

Stop Watch No. _____ Cal Due Date _____

NOTE: If leakage is greater than acceptance criteria, individual leakage can be determined by opening MS 106, MS 106A, MS 107, and MS 107A individually and repeating the test.

___ 6.5.10 Close MS 32.

6.5.11 Close the following valves:

- ___ 1. MS 733.
- ___ 2. MS 728.
- ___ 3. MS 106.
- ___ 4. MS 107A.
- ___ 5. MS 106A.
- ___ 6. MS 107.

6.5.12 The following locked valves are independently verified closed.

- ___ 1. MS 733.
- ___ 2. MS 728.

6.5.13 The hoses have been removed from the following drain valves.

- ___ 1. MS 30.
- ___ 2. MS 133.
- ___ 3. MS 37.
- ___ 4. MS 134.
- ___ 5. MS 31.
- ___ 6. MS 32.

6.5.14 The following capped valves are restored and logged.

- ___ 1. MS 30.
- ___ 2. MS 133.
- ___ 3. MS 37.
- ___ 4. MS 134.
- ___ 5. MS 31.

Section 6.5 completed by _____ Date _____

6.6

___ 6.6.1 On the 585 ft level in the CST room, verify either CD 167 or CD 168 Cnds Strg Tk 1-1 (1-2) supply to auxiliary and startup feedpump suction header, is open. Circle the valve(s) that is (are) open.

CD 167
CD 168

6.6.2 Check closed the following valves:

- ___ 1. CD 50.
- ___ 2. CD 51.

- ___ 6.6.3 Check AF 59 open.
- ___ 6.6.4 By MFPT 1-1, verify CD 170 open.
- ___ 6.6.5 Verify the AFW vibration panel is energized and in operation.
- 6.6.6 Verify the following valves are open:
 - ___ 1. FW 786 (FW 790).
 - ___ 2. AF 503B (AF 507b).
 - ___ 3. AF 503C (AF 507C).
 - ___ 4. AF 505 (AF 509).
 - ___ 5. AF 9 (AF 10).
 - ___ 6. AF 17 (AF 18).
 - ___ 7. AF 13 (AF 14).
 - ___ 8. AF 64 (AF 67).
 - ___ 9. AF 3 (AF 4).
 - ___ 10. AF 65 (AF 66).
- ___ 6.6.7 Verify AF 7 (AF 8) is throttled.
- 6.6.8 Verify the following instruments are in service:
 - ___ PI 503 (PI 507) AFPT 1-1 (1-2) Suct.
 - ___ PI 2659 (PI 2660) AFP 1-1 (1-2) Disch.
- ___ 6.6.9 Verify AFPT 1-1 (1-2) suction pressure is greater than 18 psig on PI 503 (PI 507).
- 6.6.10 Verify the proper oil levels.

NOTE: While the AFPT is idle, the oil level may be above the normal level. However, while the AFPT is running the oil level must be in the normal area.

- ___ 1. Governor oil level is above the level mark.
- ___ 2. Governor gear box oil level is in the bulls eye.
- ___ 3. The turbine end turbine bearing oil level is in or above the black area of the sight glass.
- ___ 4. The pump end turbine bearing oil level is in or above the black area of the sight glass.
- ___ 5. The turbine end pump bearing oil level is in or above the black area of the sight glass.
- ___ 6. The pump end pump bearing oil level is in or above the black area of the sight glass.

6.6.11 Perform the following to drain the AFPT.

1. Check open the following AFPT casing drains.

____ MS 745 (MS 744)

____ MS 746 (MS 747)

2. Open the following AFPT drain valves.

____ MS 745A (MS 744A)

____ MS 746A (MS 747A)

____ MS 748 (MS 749)

____ MS 750 (MS 751)

3. After the valves stop draining liquid, close the following valves:

____ MS 745A (MS 744A)

____ MS 746A (MS 747A)

____ MS 748 (MS 749)

____ MS 750 (MS 751)

6.6.12 Perform the following to exercise the overspeed trip mechanism:

- ____ 1. Using the manual trip lever, manually trip the trip throttle valve.
- ____ 2. Turn the trip throttle valve handwheel clockwise until the sliding nut rises and engages the latch up lever to the trip hook.

NOTE: It may be necessary to pull on the trip throttle valve linkage to fully engage the latch up lever to the trip hook.

- ____ 3. Verify the latch up lever and the trip hook are fully energized.
- ____ 4. Turn the trip throttle valve handwheel counterclockwise until the trip throttle valve is fully open.
- ____ 5. Turn the trip throttle valve handwheel 1/4 turn clockwise.

____ 6. Seal the trip throttle valve handwheel.

Independently Verified _____

____ 7. Verify computer point Z001 (Z002) AFPT 1 (2) Stop Valve reads "OPEN".

____ 8. Verify the red IL ICS 38E (38J) AFPT 1 (2) Governor Valve fully open light is on.

6.6.13 Verify the following valves are closed.

____ 1. AF 3869 (AF 3871).

____ 2. AF 3870 (AF 3872).

____ 6.6.14 Verify that the CST lined up to the AFP that is identified in Step 6.6.1 has at least 20 feet of water.

____ 6.6.15 Ensure HIS 520B (HIS 521B) is in manual.

____ 6.6.16 Hold HIS 520A (HIS 521A) in the lower position for 25 (90) seconds.

____ 6.6.17 Announce three times over the Gai-tronics to stand clear of the south side of the turbine building while running the Auxiliary Feedpump Turbine.

6.6.18 Start the appropriate turbine by performing the following:

____ 1. To start AFPT 1-1, open AS 273 and AS 178.

2. To start AFPT 1-2, perform the following:

____ Verify closed AFPT 1-1 trip throttle valve.

____ Open MS 733.

____ Open MS 728.

____ Open AS 178.

____ Open AS 273.

6.6.19 Perform the following to verify the AFPT and AFP is operating properly.

____ 1. Visually observe the AFPT and AFP for abnormal vibration and noises.

____ 2. Check all AFPT and AFP bearings and seals.

____ 3. Check the local bearing vibration panel for abnormal symptoms.

- ____ 4. Check computer point P002 (P005) to ensure suction strainer ΔP is normal.
- ____ 6.6.20 Close AF 360 (AF 388).
- ____ 6.6.21 Verify open AF 608 (AF 599).
- ____ 6.6.22 Open AF 3870 (AF 3872).
- ____ 6.6.23 Increase AFPT speed until greater than 800 gpm is indicated on FI 4630 (FI 4631) AFW flow to OTSG 1-1 (1-2).
- ____ 6.6.24 Verify greater than 800 gpm was indicated on FI 4630 (FI 4631) AFW flow to OTSG 1-1 (1-2).
- ____ 6.6.25 Close AF 608 (AF 599).
- ____ 6.6.26 Close FW 790 (FW 786) the OPPOSITE AFP suction valve.
- ____ 6.6.27 Open AF 3871 (AF 3869).
- ____ 6.6.28 Record AFP 1-1 (1-2) discharge pressure.
PI 2659 (PI 2660) _____ psig
- ____ 6.6.29 Record the pressure on the test gage on AF 78 (AF 81) test gage _____ psig.
Test Gage No. _____ Cal. Due Date _____
- ____ 6.6.30 Calculate the pressure differential.
PI 2659 (PI 2660) Reading - Test Gage Reading =
Pressure Differential
_____ PSIG - _____ PSIG = _____ PSID
- 6.6.31 If the pressure differential is less than 25 psid, perform the following:
- ____ 1. Open AF 77 (AF 82) to decrease test gage pressure.
- ____ 2. Recalculate the pressure differential.
PI 2659 (PI 2660) Reading - Test Gage Reading =
Pressure Differential
_____ PSIG - _____ PSIG = _____ PSID
- ____ 3. Close AF 77 (AF 82).

- ___ 6.6.32 Verify pressure differential is greater than 25 psid.
- ___ 6.6.33 Close AF 3870 (AF 3872).
- ___ 6.6.34 Close AF 3871 (AF 3869).
- ___ 6.6.35 Verify open AF 599 (AF 608).
- ___ 6.6.36 Open AF 3869 (AF 3871).
- ___ 6.6.37 Verify greater than 800 gpm is indicated on FI 4631 (FI 4630).

NOTE: AFPT speed may be increased if necessary.

- ___ 6.6.38 Close AF 599 (AF 608) AFW flow to OTSG 1-2 (1-1).
- ___ 6.6.39 Open AF 3872 (AF 3870).
- ___ 6.6.40 Record AFP 1-1 (AFP 1-2) discharge pressure.

PI 2659 (PI 2660) _____ psig

- ___ 6.6.41 Record the pressure on the test gage on AF 78 (AF 81).

Test Gage _____ psig

- ___ 6.6.42 Calculate the pressure differential.

PI 2659 (PI 2660) Reading - Test Gage Reading =
Pressure Differential

_____ PSIG - _____ PSIG = _____ PSID

- 6.6.43 If the pressure differential is less than 25 psid, perform the following:

- ___ 1. Open AF 77 (AF 82) to decrease test gage pressure.
- ___ 2. Recalculate the pressure differential.

PI 2659 (PI 2660) Reading - Test Gage Reading =
Pressure Differential

_____ PSIG - _____ PSIG = _____ PSID

- ___ 3. Close AF 77 (AF 82).

- ___ 6.6.44 Verify pressure differential is greater than 25 psid.

- ___ 6.6.45 Close AF 3869 (AF 3871).
- ___ 6.6.46 Close AF 3872 (AF 3870).
- ___ 6.6.47 Adjust AFPT speed to 1500 rpm.
- ___ 6.6.48 Close AS 273.
- 6.6.49 If testing AFPT 1-2, close the following valves:
 - ___ MS 728
 - ___ MS 733
- ___ 6.6.50 Close the trip throttle valve MSICS 38B (MSICS 38A).
- 6.6.51 Perform the following to drain the AFPT.
 1. Check open the following AFPT casing drains.
 - ___ MS 745 (MS 744)
 - ___ MS 746 (MS 747)
 2. Open the following AFPT drain valves.
 - ___ MS 745A (MS 744A)
 - ___ MS 746A (MS 747A)
 - ___ MS 748 (MS 749)
 - ___ MS 750 (MS 751)
 3. After the valves stop draining liquid, close the following valves:
 - ___ MS 745A (MS 744A)
 - ___ MS 746A (MS 747A)
 - ___ MS 748 (MS 749)
 - ___ MS 750 (MS 751)
- 6.6.52 Drain the AFPT drain lines as follows:
 - ___ 1. In CWRT room, open MS 54 (MS 52).
 - ___ 2. After the condensate has drained, close MS 54 (MS 52).
 - ___ 3. In the BAAT Room, open MS 53 (MS 51).

- 11 |
- ___ 4. After the condensate has drained, close MS 53 (MS 51).
 - ___ 5. In WG compressor room 1-1, open MS 108.
 - ___ 6. After the condensate has drained, close MS 108.
 - ___ 6.6.53 Hold HIS 520A (HIS 521A) in the decrease direction for 25 (90) seconds.
 - 6.6.54 Open the following valves:
 - ___ AF 360 (AF 388).
 - ___ FW 790 (FW 786).
 - ___ AF 599 (AF 599).
 - ___ AF 608 (AF 608).
 - 6.6.55 The hose on the following valves have been removed.
 - ___ MS 108
 - ___ AF 77 (AF 82)
 - ___ 6.6.56 The test gage on AF 78 (AF 81) has been removed.
 - 6.6.57 The following locked valves are independently verified.

	<u>AFP 1-1</u>	<u>Normal Position</u>	<u>AFP 1-2</u>
___ 1.		Closed	MS 733
___ 2.		Closed	MS 728
___ 3.	AF 360	Open	AF 388
___ 4.	AF 608	Open	AF 608
___ 5.	AF 599	Open	AF 599
___ 6.	FW 790	Open	FW 786

- 6.6.58 Open the following breakers:

- ___ 1. BE 1146 (E11E) for AF 3869.
- ___ 2. D107 (D1PA) for AF 3870.
- ___ 3. BF 1201 (F12A) for AF 3871.
- ___ 4. BF 1262 (F12B) for AF 3872.

- 6.6.59 The jumpers on contacts 1 (N1) and 7 (N11) are removed.

	<u>SFRCS CH</u>	<u>Relay Cab</u>	<u>Relay</u>
___ 1.	1	RC 3601	X1
___ 2.	2	RC 3602	X2
___ 3.	3	RC 3603	X3
___ 4.	4	RC 3604	X4

Section 6.6 completed by William D. JonesDate 6/19/897. ACCEPTANCE CRITERIA7.1 Acceptance Criteria for Train 1, PHASE I

7.1.1 Aux Feed Pump 1-1 started.

Verified William D. Jones

7.1.2 The Aux Feed Pump Turbine attained a differential pressure greater than or equal to 1070 pounds per square inch steady state.

Verified William D. Jones7.2 Acceptance Criteria for Train 2, PHASE I

7.2.1 Aux Feed Pump 1-2 Started

Verified William D. Jones

7.2.2 The Aux Feed Pump Turbine attained a differential pressure greater than or equal to 1070 pounds per square inch steady state.

Verified William D. Jones7.3 Acceptance Criteria, PHASE II

7.3.1 Valves Listed in Data Sheet 1, 2 and 3 Actuated to their SFRCS Trip Position.

Verified _____

7.3.2 All Valve Indication Lighting of Position is Correct.

Verified _____

7.3.3 AF 608 open stroke time is less than 13.5 sec.

Verified _____

7.3.4 AF 599 open stroke time is less than 10.5 sec.

Verified _____

7.3.5 FW 601 closed stroke time is less than or equal to 16 seconds.

Verified _____

- 10 | 7.3.6 FW 612 closed stroke time is less than or equal to 16 seconds.

Verified _____

7.4 Acceptance Criteria, PHASE III

- 7.4.1 Flow through mini recirc greater than 15 GPM.

Verified _____

7.5 Acceptance Criteria, PHASE IV

- 7.5.1 The speed changer motor on the AFPT governor responds properly to commands from the Auxiliary Shutdown Panel.

Verified _____

- 7.5.2 SW 1382 (SW 1383) can be opened and closed from the Auxiliary Shutdown Panel.

Verified _____

7.6 Acceptance Criteria, PHASE V

- C 10 | 7.6.1 MS 726, MS 734, MS 735 and MS 727 prevented gross reverse leakage as indicated by maintaining greater than 100 psig for 30 seconds after steam was isolated.

Verified _____

7.7 Acceptance Criteria, PHASE VI

- 7.7.1 AF 72 and AF 39 (AF 75 and AF 43) opened as indicated by greater than 800 gpm on FI 4630 (FI 4631).

Verified _____

- 7.7.2 AF 73 (AF 74) opened as indicated by greater than 800 gpm on FI 4631 (FI 4630).

Verified _____

- 7.7.3 AF 74 (AF 73) closed on reverse flow by maintaining greater than 25 psid. (Step 6.6.32)

Verified _____

- 7.7.4 AF 75 (AF 72) closed on reverse flow by maintaining greater than 25 psid. (Step 6.6.44)

Verified _____

VALVE DATA SHEET NO. 1

ST 5071.02 REV. 11

Valve Number	Control Switch (Panel)	Present Position	Desired Position	SFRCS Trip Position	Valve Actuated to Trip Position	Indication Lighting Is Correct		Vlv Returned To "(Present Position)"	Stroke Time	
						Open	Closed		Open	Closed
AF608	(C5717)		Closed	Open						
MS106	(C5717) HIS 106A		Closed	Open						
MS106A	(C5717) HIS 106E		Open	Closed						
AF3870	(C5706) HIS 3870		Closed	Open						
AF3869	(C5706) HIS 3869		Open	Closed						

Comments _____

Stop Watch No. _____ Cal Due Date _____

VALVE DATA SHEET NO. 2

ST 5071.02 REV. 11

Valve Number	Control Switch (Panel)	Present Position	Desired Position	SFRCS Trip Position	Valve Actuated to Trip Position	Indication Lighting Is Correct		Vlv Returned To "(Present Position)"	Stroke Time	
						Open	Closed		Open	Closed
AF599	(C5717)		Closed	Open						
MS107	(C5717) HIS 107A		Closed	Open						
MS107A	(C5717) HIS 107E		Open	Closed						
AF3872	(C5709) HIS 3872		Closed	Open						
AF3871	(C5709) HIS 3871		Open	Closed						

Comments _____

11| Stop Watch No. _____ Cal Due Date _____

VALVE DATA SHEET NO. 3

ST 5071.02 REV. 11

NOTE: All spaces next to vlv no. must be filled with initial or N/A.

Valve No.	Control Switch (Panel)	Full Stroke (Cycle)	Stroke Time		Indication Lighting is Correct	
			Open	Close	Open	Closed
AF360	(C5709) HIS 360		N/A	N/A		
AF388	(C5709) HIS 388		N/A	N/A		
FW786	(C5709) HIS 786		N/A	N/A		
FW790	(C5709) HIS 790		N/A	N/A		
FW601	(C5717) HIS 601					
FW612	(C5717) HIS 612					

Comments _____

Stop Watch No. _____ Cal Due Date _____

END

Enclosure 1
Page 3 of 3

11

36

ST 5071.02.11

On the morning of 9 June, 1985, I was called in to work by K. Brubaker at approximately 0300. Upon arriving, I was informed that the plant was in an emergency situation and there was a great need to get some essential instrumentation repaired.

After some discussion on general plant conditions, M. Dutkiewicz and I went to the Control Room to perform the Source Range Functional Test on NI-2. We obtained permission from the Shift Supervisor, Mr. T. Lehman, in the Control Room. After obtaining the keys for RPS Channel #1, we proceeded to open the cabinet doors. At this time, we were surprised to see that NI-2 was working and giving an indication on the Log Amp Meter.

We proceeded to run the Source Range Functional Test on NI-2 with all parameters reading within the allowed tolerances. After completing this test on NI-2, NI-1 (Channel 2 RPS) was tested in the same manner and was also found to be in tolerance. We turned the completed tests over to the Shift Supervisor after signing off the acceptance criteria and returned to the I&C Shop.

It was my understanding that prior to running the Source Range Functional Test on NI-2, this particular NI was not functioning at all. M. Dutkiewicz stated that before my arrival for work, he had checked NI-2 visually in the RPS cabinet and it was not indicating at all on the Log Amp Meter. The power supply was indicating proper supply voltage (approx. 2050 VDC), but the detector circuits themselves were not working.

I cannot say exactly when NI-2 began to function properly, but it was working and giving proper indication when we opened the RPS Channel #1 doors to test it.

6-11-85
Date

D.E. Sreptock
D.E. Sreptock

DES/er

DAVIS BESSE NUCLEAR POWER STATION

DATA COVER SHEET

ED 6823-2

TEST NO.	REV. NO. USED	TITLE
ST. 5091.01	9	SCURCH RANGER FUNCTIONAL TEST
COMPLETED TEST		SUSPENDED TEST
TEST PERSONNEL TEST COMPLETED <u>6-9-85</u> BY <u>DES MHD</u> DATE TEST PERSONNEL		SHIFT SUPERVISOR TEST SUSPENDED _____ DATE _____ TIME _____ BY _____ SHIFT SUPERVISOR
SECTION <u>ALL</u>		REASON FOR SUSPENSION _____
EQUIPMENT CODE (IF APPLICABLE): <u>NT#172</u>		_____
<input checked="" type="checkbox"/> PERFORMED TO MEET SCHEDULE <input type="checkbox"/> PERFORMED TO ENSURE OPERABILITY AFTER MAINTENANCE		_____
SHIFT SUPERVISOR SHIFT SUPERVISOR ACKNOWLEDGEMENT THAT SURVEILLANCE REQUIREMENTS ARE SATISFIED AND THE EQUIPMENT IS DECLARED OPERABLE <u>T. Schuman</u> DATE <u>6/9/85</u> TIME <u>0625</u>		_____
<input type="checkbox"/> P.T. NON-APPLICABLE, NO S.S. REVIEW REQUIRED.		_____
FORWARDED TO SURVEILLANCE TEST ENGINEER		FORWARDED TO STE _____ DATE _____ BY _____ SHIFT SUPERVISOR
SURVEILLANCE TEST ENGINEER CHECKLIST <input checked="" type="checkbox"/> DATA AND ENCLOSURES INCLUDED <input checked="" type="checkbox"/> SIGN-OFFS COMPLETED <input checked="" type="checkbox"/> DEFICIENCY LIST ATTACHED, IF NEEDED <input checked="" type="checkbox"/> COMPUTER TEST SCHEDULE UPDATED		SURVEILLANCE TEST ENGINEER <input type="checkbox"/> DELAY NOTED ON TEST SCHEDULE <input type="checkbox"/> YES <input type="checkbox"/> NO: SIGNIFICANT CONDITION ADVERSE TO QUALITY OR NON-ROUTINE REPORTABLE OCCURRENCE? ACTION TAKEN/REMARKS _____
REMARKS _____		_____
FORWARDED TO <u>J DeSando</u> ON <u>6-10-85</u> BY <u>C. Wyle</u> DESIGNATED REVIEWER DATE ENGINEER		FORWARDED TO _____ ON _____ DATE _____ BY _____ ENGINEER
DESIGNATED REVIEWER <input checked="" type="checkbox"/> APPROVED <input type="checkbox"/> FURTHER REVIEW NECESSARY		DESIGNATED REVIEWER TEST LATE DATE _____ (ENTERED BY STATION) REPORTABLE OCCURRENCE IF NOT RUN? <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> MALFUNCTIONS RESOLVED - RETURNED TO SHIFT SUPERVISOR FOR RETEST <input type="checkbox"/> MALFUNCTIONS WILL DELAY TEST BEYOND LATE DATE <input type="checkbox"/> OTHER - EXPLAIN _____
REMARKS _____		_____
FORWARDED TO <input checked="" type="checkbox"/> CENTRAL FILES (PERIODIC TESTS) <input checked="" type="checkbox"/> STE FOR FILING (SURVEILLANCE TESTS) <input type="checkbox"/> SECTION HEAD <u>6/13/85</u> BY <u>COL</u> DATE REVIEWER		FORWARDED TO <input type="checkbox"/> SHIFT SUPERVISOR <input type="checkbox"/> _____ ON _____ DATE _____ BY _____ REVIEWER
SECTION HEAD <input type="checkbox"/> APPROVED <input type="checkbox"/> FURTHER REVIEW NECESSARY		SECTION HEAD <input type="checkbox"/> TEST POSTPONED - OVR INITIATED <input type="checkbox"/> OTHER ACTION _____
REMARKS _____		_____
FORWARDED TO <input type="checkbox"/> CENTRAL FILES (PERIODIC TESTS) <input type="checkbox"/> STE FOR FILING (SURVEILLANCE TESTS) <input type="checkbox"/> SRB FOR REVIEW ON _____ DATE _____ BY _____ SECTION HEAD		FORWARDED TO STE ON _____ DATE _____ BY _____ SECTION HEAD
STATION REVIEW BOARD <input type="checkbox"/> APPROVED <input type="checkbox"/> OTHER RESOLUTION _____		SURVEILLANCE TEST ENGINEER <input type="checkbox"/> DOCUMENT RECEIVED _____ ENGINEER
FORWARDED TO _____ ON _____ DATE _____ BY _____ SRB CHAIRMAN		FURTHER ACTION TAKEN _____
SURVEILLANCE TEST ENGINEER <input type="checkbox"/> DOCUMENT RECEIVED _____ ENGINEER DATE _____		_____
CENTRAL FILES <input type="checkbox"/> DOCUMENT RECEIVED _____ BY _____ DATE _____		CODES STE - Surveillance Test Engineer SRB - Station Review Board FCR - Facility Change Request

DAVIS-BESSE NUCLEAR POWER STATION
TEST DEFICIENCY LIST
ED 6919-1

PAGE

9

STEP

6.1.31

TEST NO.

ST.5091.01

TITLE

SOURCE RANGE. FUNCT

PAGE

1 of 1

DATE

6-9-85

DEFICIENCY

COMPUTER PT. E-820 IS

READING 2087 VDC AND SHOULD BE READING 2050 ± 36
VDC. THIS PUTS IT 2 VDC OUT OF TOLERANCE, BUT DOES
NOT MAKE THE CHANNEL UNRECOVERABLE.

WR/MWO

SUBMITTED

FCR

SUBMITTED

RESOLUTION OF DEFICIENCY

Computer points and recorder indications are for
information only and do not affect channel operability

RESOLVED BY (NAME)

Joe Ober

DATE

6/13/85

PAGE

STEP

DEFICIENCY

WR/MWO

SUBMITTED

FCR

SUBMITTED

RESOLUTION OF DEFICIENCY

RESOLVED BY (NAME)

DATE

LAST PAGE

☐ Yes

☐ No

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SECTION 1

PROCEDURE TITLE AND NUMBER

ST 5091.01.09 Source Range Functional Test

REASON FOR CHANGE

To incorporate new Source Range detector
 power supply voltage setting for NI-01
 as per step 7.3.4 of IC 2002.04.06.

CHANGE

See attached.

IS PROCEDURE REVISION REQUIRED

Yes ☒No ☐

If no, this modification is valid until _____

PREPARED BY

DATE

3/28/85

APPROVED BY

DATE

3-28-85

APPROVED BY

DATE

3/28/85

SUBMITTED BY (Section Head)

DATE

4-1-85

RECOMMENDED BY (SRS Chairman)

DATE

APR 9 1985

QA APPROVED BY (Manager of Quality Assurance)

DATE

APR 9 1985

APPROVED BY (Station Superintendent)

DATE

T-9056

Change STEP 6.1.31 TO Read as Follows:

6.1.31 Connect the DVM to the "Output + 1000" test jack on the Source Range Detector Power Supply and record the following: If Reactor Power is $>10^{-9}$ amps this steps function cannot be checked, record as N/A.

NI-1 DVM Reading (should be 2.050 ± 0.036 VDC) _____
Power Supply Meter (should be 2050 ± 36 VDC) _____
Computer Point E820 (should be 2050 ± 36 VDC) _____

NI-2 DVM Reading (should be 2.100 ± 0.036 VDC) _____
Power Supply Meter (should be 2100 ± 36 VDC) _____
Computer Point E814 (should be 2100 ± 36 VDC) _____

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SECTION 1

PROCEDURE TITLE AND NUMBER

ST5091.01.09 Source Range Functional Test

REASON FOR CHANGE

To incorporate a new section to
 functionally check out the minbin assembly
 to meet the T.S. requirement 4.9.2.

CHANGE

See attached section. 6.2.

IS PROCEDURE REVISION REQUIRED

Yes



No



If no, this modification is valid until

PREPARED BY

Gugay A. Blunk

DATE

11-20-84

APPROVED BY

Gugay A. Blunk

DATE

11-20-84

APPROVED BY

[Signature]

DATE

11/20/84

SUBMITTED BY (Section Head)

DA Lee

DATE

11-25-84

RECOMMENDED BY (SRB Chairman)

[Signature]

DATE

DEC. 4 '84

QA APPROVED BY (Manager of Quality Assurance)

N/A

DATE

APPROVED BY (Station Superintendent)

[Signature]

DATE

DEC. 4 '84

T-8473

ST 5091.01

Section 6.2 This section is only to be performed to meet the functional check of the Nimbin Assembly. Mode 6 requirements (Core Alterations).

T.S. 4.9.2

NOTE: The trigger point shall be set at approximately 5-10 CPS above the present indication (background CPS) in the RPS Channel which is being used for the audible indication.

_____ CPS, Record Desired Trigger Point.

- _____ 6.2.1 Turn OFF Realistic Amplifier (Spkr to CTMT).
 - _____ 6.2.2 Make sure volume on Nim Bin is at audible level.
 - _____ 6.2.3 Obtain RPS CH#1 ~~door~~ key and place SRTM Test Selector switch in 1 Hz position.
 - _____ 6.2.4 Nim Bin Meter should be at full scale (pegged) due to switching thru 100K Hz and 4K Hz switch positions on SRTM. Turn the CPS full scale switch on Rate Meter Module from 10^2 to 10^5 position in order to speed up the decay of the Rate Meter to 1 Hz as read on the Nim Bin.
 - _____ 6.2.5 When meter has fully decayed, turn CPS full scale switch back to the 10^2 position.
- NOTE: Prior to switching the SRTM Test Selector switch to the 4K Hz position, observe meter in the Nim Bin to see that triggering of audible howler occurs at = Desired Trigger Increasing, as the test operate switch is placed in the 4K Hz position. (Meter will increase rapidly to full scale when test OP Switch is placed in 4K Hz position.
- _____ 6.2.6 Place the SRTM Test Operate switch in the 4K Hz position (while observing Nim Bin Meter for howler to trigger at = Desired Trigger Increasing). If trigger set point is set properly, audible indication should be heard. If not, adjust trigger set point pot for audible howl at desired trigger.
 - _____ 6.2.7 After a few seconds, place the SRTM Test Selector switch in the 1 Hz position.

- _____ 6.2.8 With the audible howl coming from the Nim Bin, allow the meter to decay on its own down to 1 Hz. This should take approximately 4-6 minutes. At the point the meter decays to \approx 15 to 20 CPS on the Nim Bin, turn ON amplifier and speaker to Containment and check for audible noise in CTMT. Adjust master volume on ~~NIMBIN~~ amp either up or down as needed. When OK, TURN OFF amp to CTMT.
- _____ 6.2.9 Continue to watch meter decay down. At the desired trigger the audible howl should stop.
- _____ 6.2.10 Place SRTM Test Selector switch in OPERATE position. Reset Memory Lamp. Lock cabinet.
- _____ 6.2.11 Nim Bin Meter will again be pegged high due to switching from 1 Hz position to OPERATE on SRTM.
- _____ 6.2.12 Turn the CPS full scale switch from 10^2 to 10^5 position to speed up the decay of the Nim Bin meter.
- _____ 6.2.13 When meter has fully decayed, place CPS full scale switch in 10^2 position.
- _____ 6.2.14 Turn on Realistic Amp for SPKR in CTMT.

7. ACCEPTANCE CRITERIA

- _____ 7.3 Section 6.2 verified the audible indication in the Control Room and CTMT.

Verified _____ Date _____

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T-8409

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SECTION 1

PROCEDURE TITLE AND NUMBER	ST 5091.01.09	Source Range Functional Test
REASON FOR CHANGE		

To incorporate reference to T.S. 4.3.1.1.2.

CHANGE
Add to Step 1.1.1

Note: Technical Specification 4.3.1.1.1 & 4.3.1.1.2 requires a functional test & a refueling period calibration. Since the method used to perform a functional test is the same as that used to perform a channel calibration, this test will be used to meet ~~both~~ requirements of both T.S. 4.3.1.1.1 & 4.3.1.1.2.

IS PROCEDURE REVISION REQUIRED		Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	If no, this modification is valid until _____
PREPARED BY	<i>Jugay A. Blunk</i>	DATE	10-25-84	
APPROVED BY	<i>Jugay A. Blunk</i>	DATE	10-25-84	
APPROVED BY	<i>H. Brown</i>	DATE	10/25/84	
SUBMITTED BY (Section Head)	<i>Q. Lee</i>	DATE	10/26/84	
RECOMMENDED BY (SRB Chairman)	<i>[Signature]</i>	DATE	10/31/84	
QA APPROVED BY (Manager of Quality Assurance)	<i>[Signature]</i>	DATE	10/31/84	
APPROVED BY (Station Superintendent)	<i>[Signature]</i>	DATE	10/31/84	

Not

Davis-Besse Nuclear Power Station

Unit No. 1

SURVEILLANCE TEST ST 5091.01

Source Range Functional Test

NUCLEAR SAFETY RELATED

Record of Approval and Changes

Prepared by A. T. Russell 2/25/77
 Date

Submitted by *Garry Stultz* 3/2/77
 Section Head Date

Recommended by *John Evers* 3/8/77
 SRB Chairman Date

QA Approved *NA*
 Manager of Quality Assurance Date

Approved by *John Evers* 3/9/77
 Station Superintendent Date

Revision No.	SRB Recommendation	Date	QA Approved	Date	Sta. Supt. Approved	Date
1	<i>BlBayer</i>	5/2/77	NA		<i>John Evers</i>	5/6/77
2	TO Murray	9/27/77	NA		<i>John Evers</i>	10/6/77
3	<i>BlBayer</i>	6/5/77	NA		TO Murray	6/7/77
4	<i>BlBayer</i>	4/27/80	NA		TO Murray/SRB	5/5/80
5	<i>BlBayer</i>	12/12/80	NA		TO Murray	2/20/81
6	<i>sm dury</i>	9/25/81	NA		T.D. Murray SRB	10/20/81
7	<i>sm dury</i>	9/28/82	NA		TO Murray	10/16/82
8	<i>sm dury</i>	1/31/84	NA		TO Murray	2/16/84
9	<i>sm dury</i>	5/23/84	NA		TO Murray	6/9/84

1. OBJECTIVE

- (TS) 1.1 The objective of this test is to detail the tests to be conducted on the Source Range Instrumentation Strings (NI-1 and -2). Completion of this procedure as scheduled will satisfy the requirements of the following Technical Specifications:

~~1.1.1~~ 18409 Technical Specification 4.3.1.1.1 for the FUNCTIONAL UNIT of Source Range, Neutron Flux and Rate: When completed as scheduled, this procedure satisfies the Monthly CHANNEL FUNCTIONAL TEST and the Startup CHANNEL FUNCTIONAL TEST when in MODES 2, 3, 4 and 5.

1.1.2 Technical Specification 4.9.2: When completed as scheduled, this procedure satisfies the requirements for a CHANNEL FUNCTIONAL TEST for the Source Range during MODE 6.

- (TS) 1.2 This test must be scheduled as follows:

1.2.1 MODES 2, 3, 4 and 5: This test must be done monthly. It must also be done during each startup if not done in the previous seven (7) days.

1.2.2 Mode 6: This test must be performed at least once per seven (7) days during CORE ALTERATIONS and within eight (8) hours prior to the initial CORE ALTERATIONS.

2. REFERENCES

- (TS) 2.1 Technical Specifications, Section 3.9.2 and 4.9.2.
- 2.2 Station Limits and Precautions, PP 1101.01, Section 1.1.
- 2.3 AD 1838 Series pertaining to the Surveillance and Periodic Test Program.
- 2.4 NI/RPS Operating Procedure, SP 1105.02.
- 2.5 Bailey Meter Company, NI/RPS Technical Data and Product Instructions, Volume 1.
- 2.6 Bailey Meter Company, NI/RPS System Description, Volume 2.

3. REQUIRED EQUIPMENT

- 3.1 Digital Voltmeter (DVM) readable to 0.001 volts with an input impedance of at least 100 Meg ohms and accuracy of 0.01% or better.

Equipment No. I+C.3.1.8

DUE 7-6-85

4. PRECAUTIONS AND LIMITATIONS

- 4.1 No core alterations will be made during conduct of this test.
- 4.2 When the NI/RPS Cabinet doors are opened, an alarm to this effect will be annunciated in the Control Room.
- 4.3 If any readings are out-of-tolerance, re-align equipment per the applicable Maintenance Instruction and annotate in the equipment files. If re-alignment is unsatisfactory, contact the I&C Engineer or Designated Reviewer for corrective action. Computer points R796 and R805, and the recorder indications are for information only and do not affect channel operability.
- 4.4 NI/RPS module locations given throughout this procedure are interpreted as follows: A1-02-04 is subassembly A, Cabinet 1, Row 2, Position 4. NI-1 is associated with Subassembly B and NI-2 is associated with Subassembly A.
- 4.5 Before testing any module in the NI/RPS, it should be energized for at least 30 minutes.
- 4.6 The rotary test selector switch on the Source Range has a mechanical stop between the TEST/OPERATE and OPERATE positions. To move the switch from TEST/OPERATE to OPERATE, it is necessary to push the switch knob in and hold while turning the switch. It is not necessary to push the knob when switching between any other positions. The switch should be left in the TEST/OPERATE position for at least five seconds before going to the OPERATE position to allow transients to die out.
- 4.7 For purposes of checking the Rod Control Panel OUT INHIBIT indication the CRD Control System should be energized. The computer and annunciator panel are assumed energized for verification of HIGH SUR alarms.
- 4.8 When performing this surveillance test while in Mode 6, insure source range audible indication is connected to either NI-1 or NI-2 upon completion of testing.
- 4.9 The SUR ROD WITHDRAWAL INHIBIT isn't required during mode (1) one operation. Even though it is an integral part of the instrument string, it isn't required to be tested. Certain steps in this procedure will therefore be marked N/A as indicated in that step.

5. PREREQUISITES

- MND 5.1 Obtain the Shift Supervisor's permission to perform this surveillance

test and obtain the NI/RPS cabinet key for Cabinet's C5762E (NI-2) and C5755E (NI-1).

Time 0444 Shift Supervisor T LEHMANN

5.2 The NI/RPS cabinets are energized.

9 | Section 5 Complete: Verified M. Duthery Date 6-9-85

6. PROCEDURE

6.1 Channel Functional Test

9 | NOTE: A separate procedure will be filled out for each channel.

Channel being Tested 1

MWD 6.1.1 Unlock and open NI/RPS Cabinet C5755E (NI-1) and/or C5762E (NI-2). Verify proper annunciation in the Control Room.

9 | 1. If in Mode 6 disconnect source range audible indication from NI-1 or NI-2.

MWD 6.1.2 Place the Source Range Test Module (SRTM location A1-02-01/B1-02-01 (NI-2/NI-1) Test Selector Switch in the TEST/OPERATE position. Observe the ON TEST lamp to go from dim to bright.

9 | MWD 6.1.3 Connect the DVM to the +10V test jack on the front plate of the SRTM. The DVM should indicate +10.000 \pm 0.010 VDC.

NI-1 DVM Reading 9.998

NI-2 DVM Reading 10.003

MWD 6.1.4 Place the SRTM Test Selector Switch in the 100 KHz position.

9 | MWD 6.1.5 Disconnect DVM from SRTM and reconnect to the output test jack on the front plate of the Count Rate Amplifier Module (CRAM location A1-02-04/B1-02-04). Record DVM indication to three (3) decimal places (allow three minutes before reading DVM indication). The DVM should indicate 8.571 \pm 0.005 VDC.

NI-1 100 KHz DVM Reading 8.569

NI-2 100 KHz DVM Reading 8.570

MNO 6.1.6

Record the meter indication on the front plate of the CRAM and corresponding Source Range Count Rate RY indicator in the Control Room, the computer point and recorder. Each should indicate $1.0 \times 10^5 \pm 0.5 \times 10^5$ counts per second (CPS).

NI-1 Computer Point (R805) Reading 5.00 ^{MNO} 5.00
 CPS=₁₀(R805) CPS= 10000 ^{MNO} 10000
 NI-1 CRAM Reading 10⁵
 NI-1 RY Indication 10⁵
 NI-1 Recorder Reading 10⁵

NI-2 Computer Point (R796) Reading 3 ^{MNO} 5.00
 CPS=₁₀(R796) CPS= 10000
 NI-2 CRAM Reading 1x10⁵
 NI-2 RY Indication 1x10⁵
 NI-2 Recorder Reading 1x10⁵

MNO 6.1.7

Place the SRTM Test Selector Switch in the 4 KHz position.

91

MNO 6.1.8

Record DVM indication to three (3) decimal places (allow three minutes before reading).

NI-1 4 KHz DVM Reading 6.568

NI-2 4 KHz DVM Reading 6.570

MNO 6.1.9

Subtract the DVM reading at 4 KHz from the DVM reading at 100KHz. The difference in readings should be 2.000 ± 0.002 VDC.

NI-1; 100 KHz - 4 KHz Difference 2.001

NI-2; 100 KHz - 4 KHz Difference 2.000

MNO 6.1.10

Record the meter indications on the front plate of the CRAM and corresponding Source Range Count Rate RY indicator in the Control Room, the computer point and recorder. Each should indicate $4.0 \times 10^3 \pm 0.5 \times 10^3$ counts per second (CPS).

NI-1 Computer Point (R805) Reading 3.60
 CPS=₁₀(R805) CPS= 3981.07
 NI-1 CRAM Reading 4x10³
 NI-1 RY Indication 4x10³
 NI-1 Recorder Reading 4x10³

NI-2 Computer Point (R796) Reading 3.60
 CPS=₁₀(R796) CPS= 3981.071
 NI-2 CRAM Reading 4x10³

NI-2 RY Indication 4x10³
 NI-2 Recorder Reading 4x10³

MHB.1.11

Place the SRTM Test Selector Switch in the 1 Hz position.

MHB.1.12

Record the DVM indication to three decimal places (allow three minutes before reading). The DVM should indicate 1.428 ± 0.200 VDC.

NI-1 1 Hz DVM Reading 1.398

NI-2 1 Hz DVM Reading 1.400

MHB.1.13

Record the meter indication on the front plate of the CRAM and corresponding Source Range Count Rate RY indicator in the Control Room. Each meter should indicate 1 ± 0.2 CPS.

NI-1 Computer Point (R805) Reading -0.01
 CPS=₁₀(R805) CPS= 0.977
 NI-1 CRAM Reading 1x10⁰
 NI-1 RY Indication 1x10⁰
 NI-1 Recorder Reading 1x10⁰

NI-2 Computer Point (R796) Reading -0.01
 CPS=₁₀(R796) CPS= 0.977
 NI-2 CRAM Reading 1x10⁰
 NI-2 RY Indication 2x10⁻¹
 NI-2 Recorder Reading 2x10⁻¹

MHB.1.14

Place the SRTM Test Selector Switch in the 0 decades minute (DPM) position.

MHB.1.15

Disconnect the DVM from the CRAM and reconnect to the OUTPUT test jack on the front plate of the Rate-Of-Change Amplifier Module (ROCAM location A1-02-07/B1-02-07). Record the DVM reading to three (3) decimal places (allow three minutes before recording). The DVM should indicate 0.909 ± 0.005 VDC.

NI-1 0 DPM DVM Reading 0.910

NI-2 0 DPM DVM Reading 0.910

MHB.1.16

Record the meter indication on the front plate of the ROCAM and corresponding Start-Up-Rate (SUR) RY indicator in the Control Room, and the corresponding computer point. Each should indicate 0.0 ± 0.25 DPM.

NI-1 Computer Point (A859) Reading 0.00
 NI-1 SUR ROCAM Reading 0.0 MHD 0.00
 NI-1 SUR RY Indication 0.00

NI-2 Computer Point (A853) Reading -0.00
 NI-2 SUR ROCAM Reading 0.0
 NI-2 SUR RY Indication 0.0

MHD 6.1.17

Place the SRTM in the 10 DPM position

MHD 6.1.18

Observe a repetitive full scale response of the meter on the front plate of the ROCAM and corresponding full scale saturation (above 5 DPM) of the SUR RY indication in the Control Room.

NOTE: The 10 DPM test input signal is a ramp generator with an approximately 45 second period. Therefore, during every 45 seconds, the output voltage will fall to zero and rise again to the final value. Also, as the signal increases past approximately 2 DPM, the SUR Rod Withdrawal Inhibit Bistable (location A1-02-10/B2-02-10) will trip producing RPS SUR Rod Withdraw Inhibit - Q841 alarms in the Control Room and an OUT INHIBIT indication at the Rod Control Panel. These high SUR setpoints will be verified in later steps.

MHD 6.1.19

Record the maximum DVM indication to three decimal places. The DVM should indicate 10.000 ± 0.005 VDC.

NI-1 10 DPM DVM Reading 10.001

NI-2 10 DPM DVM Reading 10.005

MHD 6.1.20

Place the SRTM in the ROCAM CAL OUT position.

MHD 6.1.21

Rotate the CAL OUT pot on the SRTM counterclockwise until the DVM reads approximately 0 VDC. Observe the OUTPUT STATE lamp on the SUR Rod Withdrawal Inhibit Bistable to be dim and the OUTPUT MEMORY lamp to be bright. Manually, reset the OUTPUT MEMORY lamp using the corresponding reset toggle switch. Observe the OUTPUT MEMORY lamp to go dim. If Reactor Power is $>10^{-9}$ amps, this steps function cannot be checked, record as N/A.

NI-1 SUR RWI Bistable SCS

NI-2 SUR RWI Bistable MHD

MNOB.1.22

Verify the HIGH SUR annunciator in the Control Room is reset. Verify the OUT INHIBIT lamp at the Rod Control Panel in Control Room is out.

NI-1 RPS SUR ROD WITHDRAW - Q841 INHIBIT Alarms Reset

NI-2 RPS SUR ROD WITHDRAW - Q841 INHIBIT Alarms Reset

MNB.1.23

Slowly rotate the CAL OUT pot on the SRTM to provide an increasing signal (as indicated on the DVM) until the SUR RWI Bistable just trips (Output State and OUTPUT MEMORY lamp go bright). Record the DVM reading to three decimal places (allow three minutes before recording). The DVM reading should be 2.727 ± 0.020 VDC (corresponding to 2 ± 0.1 DPM). If Reactor Power is $>10^{-9}$ amps, this steps function cannot be checked, record as N/A. However, any desired test voltage signals called for in this step must be generated to complete the following step.

NI-1 SUR RWI B/S Lamp Status Verified OK
 NI-1 SUR RWI B/S Trip DVM Reading 2.714
 Mode 1 Only: Desired Voltage Generated N/A

NI-2 SUR RWI B/S Lamp Status Verified OK
 NI-2 SUR RWI B/S Trip DVM Reading 2.722
 Mode 1 Only: Desired Voltage Generated N/A

MNB.1.24

Record the meter indication on the front plate of the ROCAM and corresponding SUR RY indicator and computer point in the Control Room. Each should indicate 2.0 ± 0.25 DPM.

NI-1 Computer Point (A859) Reading 2.00
 NI-1 SUR ROCAM Reading 2.00
 NI-1 SUR RY Indication 2.00

NI-2 Computer Point (A853) Reading 2.00
 NI-2 SUR ROCAM Reading 2.0
 NI-2 SUR RY Indication 2.0

MNB.1.25

Verify a HIGH SUR alarm is annunciated in the Control Room and corresponding computer alarm printout (Q841). Verify also an OUT INHIBIT indication at the Rod Control Panel. If Reactor Power is $>10^{-9}$ amps this steps function cannot be checked, record as N/A.

NI-1 RPS SUR ROD WITHDRAW INHIBIT - Q841 Annunciator

NI-1 HIGH SUR Computer Alarm

NI-1 Rod Control Panel OUT INHIBIT

NI-2 RPS SUR ROD WITHDRAW INHIBIT - Q841 Annunciator

NI-2 HIGH SUR Computer Alarm

NI-2 Rod Control Panel OUT INHIBIT

MHB 1.26

Rotate the CAL OUT pot on the SRTM to increase the signal (as indicated on the DVM) to 5.454 ± 0.005 VDC. Record the meter reading on the front plate of the ROCAM and corresponding SUR RY indicator and computer point in the Control Room. Each should indicate 5.0 ± 0.25 DPM.

NI-1 Computer Point (A859) Reading 5.00
 NI-1 SUR ROCAM Reading 5.0
 NI-1 SUR RY Indication 5.0

NI-2 Computer Point (A853) Reading 5.00
 NI-2 SUR ROCAM Reading 5.0
 NI-2 SUR RY Indication 5.0

MHB 1.27

Slowly rotate the CAL OUT pot in the SRTM to provide a slowly decreasing signal until the SUR RWI Bistable just resets as indicated by the OUTPUT STATE lamp going from bright to dim. The DVM indication at reset should be 1.818 ± 0.070 VDC (1 ± 0.15 DPM). If Reactor Power is $>10^{-9}$ amps this steps function cannot be checked, record as N/A. However, any desired test voltage signals called for in this step must be generated in order to complete the following step.

NI-1 SUR RWI B/S Lamp Status Verified OK
 NI-1 SUR RWI B/S Reset DVM Reading 1.827
 Model 1 Only: Desired Voltage Generated N/A

NI-2 SUR RWI B/S Lamp Status Verified N/A
 NI-2 SUR RWI B/S Reset DVM Reading 1.814
 Model 1 Only: Desired Voltage Generated N/A

MHB 1.28

Record the meter indication on the front plate of the ROCAM and corresponding SUR RY indicator and computer point in the Control Room. Each should indicate 1.0 ± 0.25 DPM.

NI-1 Computer Point (A859) Reading 1.00 and 1.01
 NI-1 SUR ROCAM Reading 1.0 and 1.0
 NI-1 SUR RY Indication 1.0

NI-2 Computer Point (A853) Reading 1.0
 NI-2 SUR ROCAM Reading 2.0
 NI-2 SUR RY Indication 4.0

MHD 1.29
DL

Manually reset the OUTPUT MEMORY lamp on the SUR RWI Bistable by actuating the corresponding reset toggle switch. Observe the OUTPUT MEMORY lamp to go dim. Reset the HIGH SUR ANNUNCIATOR in Control Room and verify that the OUT INHIBIT lamp on Control Rod Panel in Control Room is out. If Reactor Power is $>10^{-9}$ amps, this steps function cannot be checked, record as N/A.

NI-1 SUR RWI B/S Reset

NI-1 RPS SUR ROD WITHDRAW INHIBIT Alarm - Q841

NI-2 SUR RWI B/S Reset

RI-2 RPS SUR ROD WITHDRAW INHIBIT Alarm - Q841

MHD 1.30

Place the SRTM Test Selector switch in the OPERATE position. Observe the ON TEST lamp to go dim.

NI-1 SRTM Lamp Status

NI-2 SRTM Lamp Status

MHD 1.31

Connect the DVM to the "Output + 1000" test jack on the Source Range Detector Power Supply and record the following: If Reactor Power is $>10^{-9}$ amps this steps function cannot be checked, record as N/A.

NI-1 DVM Reading (should be 2.100 ± 0.036 VDC) 2.049
 Power Supply Meter (should be 2100 ± 36 VDC) 2050
 Computer Point E820 (should be 2100 ± 36 VDC) 2087

NI-2 DVM Reading (should be 2.100 ± 0.036 VDC) 2.094
 Power Supply Meter (should be 2100 ± 36 VDC) 2090
 Computer Point E814 (should be 2100 ± 36 VDC) 2112

— Defusing

N/A 6.1.32

If in Mode 6 reconnect source range audible indication to NI-1 and NI-2.

MHD 1.33

Disconnect and remove the DVM. Close and relock the NI/RPS Cabinet door. Verify the NI/RPS Cabinet door open annunciator may be reset.

Section 6.1 complete. Verified M. D. Anthony Date 6-9-85

Add Sect 6.2 per T 8473

7. ACCEPTANCE CRITERIA

- 7.1 A Source Range channel functional check has been performed, and there is visual indication in the Control Room.

Verified D. Scepter Date 6-9-85

- 7.2 The Source Range channel functional check has been performed and setpoints are within specifications.

Verified D. Scepter Date 6-9-85

NOTE: Section 7.2 shall be N/A during Mode (1) operation.

END

WORK PERFORMED ON #1 MFP

A review of the chart recorders connected to the MFPT controls showed the LS-16 Limit Switch was the first indication of the trip. Because SV 12 was not energized, we eliminated all the protective trips except overspeed.

The information from the Technical Section review of the post trip data showed the pump increasing in speed just before the trip.

Because the chart recorder connected to TP 111 didn't show any change in speed reference signal, we determined the cause of the overspeed was probably in the speed feedback or valve position feedback circuits. We then took a set of readings on Number 1 Pump and compared them to Number 2 Pump. We could find no significant difference between the two control circuits.

The I&C mechanic suggested the problem could be a loose connection. I made the decision to wait for a GE field rep before going any further with troubleshooting.

When I talked to GE, they agreed that it appeared the pump tripped on overspeed. They had no one available to come to the site immediately.

6-11-85
Date

T.R. Isley
T.R. Isley

TRI/er

WORK DONE ON #1 MFP 6-9-85

On June 9, 1985, Ken Brubaker called me at approximately 0305 and told me to go to the plant as it had tripped and there were several problems. Upon arrival, Ken Brubaker told me #1 MFPT had tripped and to look for what may have caused the problem. Mike Dutkiewicz was on 3rd Shift and had removed the charts from the Gould Brush Recorders we had connected to different points on #1 MFP and in the MDT-20 cabinet. These recorders were connected to monitor a previous problem with #1 MFP and by studying the charts I determined the pump tripped from a different problem this time. Although the charts told us what the problem wasn't, it did not tell us what the problem was.

Later Tom Isley told me the Tech Section had determined the pump tripped on over speed. One of the Gould Recorders was connected to Board Position 2 between TP 110 (Gnd) and TP 111 to monitor the pump speed reference signal. At the time of the pump trip the chart did not show any change in the speed setpoint signal from ICS. In turn this eliminated the ICS System as the source of the problem. I proceeded to check the voltages in the MDT-20 cabinet which accepted the turbine speed feedback level signal from the feed pump. I checked the waveform from the shaft speed pick up probes (SSPU-1 and SSPU-2) to the MPT-20 cabinet, and also the voltages at 18 different test points on Board Positions 4, 5, and 6 in the MDT-20 cabinet. I compared these voltages and waveforms to those of #2 MFPT and could find no hard failure or anything conclusive as to why the pump tripped. I thought the problem could have possibly been a loose connection on either of the SSPU probes or on the LVDT located at the pump. It was decided not to probe around at the pump at this time as it was not known whether GE would come in to look at the problem. I did not pursue the problem any further. All work was done per MWO 1-85-1935-00.

6-11-85
Date

Edward W. Gensler
Edward W. Gensler

EWG/er

COPY ROUTING: WHITE - Routed To Be Completed / Procedure BLUE - Maintenance Planning YELLOW - Responsible Group To Maintenance Planning	GREEN - Shift Supervisor / Foreman PINK - Work Completion To Maintenance Planning GOLDENROD - Foreman Completion Copy To Maintenance Planning
---	---

ENT NO _____
 -OR- KED _____

MFP #2

Pos 4	TP 902	+0.062 VDC
	TP 901	+0.009 VDC
	TP 904	+9.149 VDC
	TP 908	+1.510 VDC
	TP 905	+0.815 VDC
	TP 906	-8.241 VDC

Pos 6	TP 307	-8.241 VDC
	TP 306	-2.022 VDC
	TP 312	+2.516 VDC
	TP 305	+3.107 VDC
	TP 304	+19.113 VDC
	TP 309	+6.461 VDC
	TP 308	+2.980 VDC

Pos 5	TP 709	+6.457 VDC
	TP 713	+0.328 VDC
	TP 714	+1.656 VDC
	TP 708	+2.976 VDC
	TP 703	+0.064 VDC
	TP 701	N/A VDC SHAFT SPEED PICK-UP #1
	TP 702	N/A VDC ' ' ' ' #2

MFP*1

Pos 4

TP902

+0.084 VDC

TP907 GND

TP901

+0.004 VDC

TP904

+9.212 VDC

TP908

+1.692 VDC

TP905

+0.952 VDC

TP906

-9.559 VDC

Pos 6

TP307

-9.559 VDC

TP310 GND

TP306

-2.995 VDC

TP312

+2.566 VDC

TP305

+3.172 VDC

TP304

+18.979 VDC

TP309

+6.352 VDC

TP308

+3.620 VDC

Pos 5

TP709

+6.348 VDC

TP710 GND

TP713

+0.331 VDC

TP714

+1.566 VDC

TP708

+3.615 VDC

TP703

+0.083 VDC

TP701

N/A SHAFT SPEED PICK-UP*1

TP702

N/A " " " " #2

WORK DONE ON #1 MFD 6-9-85

6-11-85

ON JUNE 9, 1985 KEN BRUBAKER CALLED ME AT APPROXIMATELY 0305 AND TOLD ME TO GO TO THE PLANT AS IT HAD TRIPPED AND THERE WERE SEVERAL PROBLEMS. UPON ARRIVAL KEN BRUBAKER TOLD ME #1 MFPT HAD TRIPPED AND TO LOOK FOR WHAT MAY HAVE CAUSED THE PROBLEM. MIKE DUTKIEWICZ WAS ON 3RD SHIFT AND HAD REMOVED THE CHARTS FROM THE GOULD BRUSH RECORDERS WE HAD CONNECTED TO DIFFERENT POINTS ON #1 MFP AND IN THE MDT-20 CABINET. THESE RECORDERS WERE CONNECTED TO MONITOR A PREVIOUS PROBLEM WITH #1 MFP AND BY STUDYING THE CHARTS I DETERMINED THE PUMP TRIPPED FROM A DIFFERENT PROBLEM THIS TIME. ALTHOUGH THE CHARTS TOLD US WHAT THE PROBLEM WASN'T IT DID NOT TELL US WHAT THE PROBLEM WAS.

LATER T.M. ISLEY TOLD ME THE TECH SECTION HAD DETERMINED THE PUMP TRIPPED ON OVER SPEED. ONE OF THE GOULD RECORDERS WAS CONNECTED TO BOARD POSITION 2 BETWEEN TP 110 (GND) AND TP 111 TO MONITOR THE PUMP SPEED REFERENCE SIGNAL. AT THE TIME OF THE PUMP TRIP THE CHART DID NOT SHOW ANY CHANGE IN THE SPEED SETPOINT SIGNAL FROM ICS. IN TURN THIS ELIMINATED THE ICS SYSTEM AS THE SOURCE OF THE PROBLEM. I PROCEEDED TO CHECK THE VOLTAGES IN THE MDT-20 CABINET WHICH ACCEPTED THE TURBINE SPEED FEEDBACK LEVEL SIGNAL FROM THE FEED PUMP.

(SEE PAGE 2)

(2)

I CHECKED THE WAVEFORM FROM THE SHAFT SPEED PICK UP PROBES (SSPU-1 AND SSPU-2) TO THE MDT-20 CABINET AND ALSO THE VOLTAGES AT 18 DIFFERENT TEST POINTS ON BOARD POSITIONS 4, 5, AND 6 IN THE MDT-20 CABINET. I COMPARED THESE VOLTAGES AND WAVEFORMS TO THOSE OF #2 MEPT AND COULD FIND NO HARD FAILURE OR ANYTHING CONCLUSIVE AS TO WHY THE PUMP TRIPPED. I THOUGHT THE PROBLEM COULD HAVE POSSIBLY BEEN A LOOSE CONNECTION ON EITHER OF THE SSPU PROBES OR ON THE LVDT LOCATED AT THE PUMP. IT WAS DECIDED NOT TO PROBE AROUND AT THE PUMP AT THIS TIME AS IT WAS NOT KNOWN WHETHER GE WOULD COME IN TO LOOK AT THE PROBLEM. I DID NOT PURSUE THE PROBLEM ANY FURTHER. ALL WORK WAS DONE PER MWO 1-85-1935.00.

Edward W. Gensler

DAVIS BESSIE NUCLEAR POWER STATION DATA COVER SHEET

BD 10010

TEST NO.

ST 5071.02

REV. NO. USED

11

TITLE

APW REFUELING TEST

COMPLETED TEST

SUSPENDED TEST

TEST PERSONNEL

TEST COMPLETED

6/9/85

BY

SH. G. Galt

TEST PERSONNEL

SECTION

6.1

EQUIPMENT (LIST IF APPLICABLE)

BOTH

☐ PERFORMED TO MEET SCHEDULE

☒ PERFORMED TO ENSURE OPERABILITY AFTER TRIP

SHIFT SUPERVISOR

SHIFT SUPERVISOR ACKNOWLEDGMENT THAT SURVEILLANCE REQUIREMENTS
WAS SATISFIED AND THE EQUIPMENT IS DECLARED OPERABLE

SHIFT SUPERVISOR

SH. G. Galt

DATE 6/9/85

TIME 1600

☐ P.T. NON-APPLICABLE, NO S.S. REVIEW REQUIRED.

FORWARDED TO SURVEILLANCE TEST ENGINEER

SURVEILLANCE TEST ENGINEER

CHECKLIST

☒ DATA AND ENCLOSURES INCLUDED

☒ SIGN-OFFS COMPLETED

☒ DEFICIENCY LIST ATTACHED, IF NEEDED

☒ COMPUTER TEST SCHEDULE UPDATED

REMARKS

FORWARDED TO

Don Missig

ON 6-10-85

BY Cathy Wylie

DESIGNATED REVIEWER

DATE

ENGINEER

DESIGNATED REVIEWER

☒ APPROVED

☐ FURTHER REVIEW NECESSARY

REMARKS

FORWARDED TO

☐ CENTRAL FILES (PERIODIC TESTS)

☒ STE FOR FILING (SURVEILLANCE TESTS)

☐ SECTION HEAD

6/12/85

BY Johnson

DATE

REVIEWER

SECTION HEAD

☐ APPROVED

☐ FURTHER REVIEW NECESSARY

REMARKS

FORWARDED TO

☐ CENTRAL FILES (PERIODIC TESTS)

☐ STE FOR FILING (SURVEILLANCE TESTS)

☐ SPB FOR REVIEW ON

DATE

BY SECTION HEAD

STATION REVIEW BOARD

☐ APPROVED

☐ OTHER RESOLUTION

FORWARDED TO

STE

ON

DATE

BY

SPB CHAIRMAN

SURVEILLANCE TEST ENGINEER

☐ DOCUMENT RECEIVED

ENGINEER

DATE

CENTRAL FILES

☐ DOCUMENT RECEIVED

BY

DATE

SHIFT SUPERVISOR

TEST SUSPENDED

DATE

TIME

BY

SHIFT SUPERVISOR

REASON FOR SUSPENSION

WAS SIGNIFICANT CONDITION ADVERSE TO QUALITY OR NON

☐ YES

☐ NO

ROUTINE REPORTABLE OCCURRENCE INVOLVED?

IF YES, DEVIATION REPORT MUST BE INITIATED SURT OR TECH EN. R NOTIFIED

IF NO, ACTION TAKEN

☐

WORK REQUEST, MAINTENANCE WORK ORDER INITIATED

☐

FOR INITIATED

☐

PROCEDURE MODIFICATION REQUEST

☐

OTHER

(EXPLAIN BELOW)

EXPLANATION OF OTHER ACTION

FORWARDED TO STE

DATE

BY

SHIFT SUPERVISOR

SURVEILLANCE TEST ENGINEER

☐

DELAY NOTED ON TEST SCHEDULE

☐

YES

☐

NO

SIGNIFICANT CONDITION ADVERSE TO QUALITY OR NON ROUTINE
REPORTABLE OCCURRENCE?

ACTION TAKEN/REMARKS

FORWARDED TO

DESIGNATED REVIEWER

ON

DATE

BY

ENGINEER

DESIGNATED REVIEWER

TEST LATE DATE

(ENTERED BY STATION)

REPORTABLE OCCURRENCE IF NOT RUN?

☐

YES

☐

NO

☐

MALFUNCTIONS RESOLVED, RETURNED TO SHIFT SUPERVISOR FOR RE-TEST

☐

MALFUNCTIONS WILL DELAY TEST BEYOND LATE DATE

☐

OTHER - EXPLAIN

FORWARDED TO

☐

SHIFT SUPERVISOR

☐

SECTION HEAD

ON

DATE

BY

REVIEWER

SECTION HEAD

☐

TEST POSTPONED - DVR INITIATED

☐

OTHER ACTION

FORWARDED TO STE ON

DATE

BY

SECTION HEAD

SURVEILLANCE TEST ENGINEER

☐

DOCUMENT RECEIVED

ENGINEER

FURTHER ACTION TAKEN

CODES

STE - Surveillance Test Engineer

SRB - Station Review Board

FCR - Facility Change Request

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TEMPORARY MODIFICATION REQUEST

ED 5926

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1-CTRM

3-CTRM FILES

1-MPG

SECTION 1

WORKING COPY

PROCEDURE TITLE AND NUMBER

AUX FEED WATER REFUELING TEST

ST 5071.02

REASON FOR CHANGE

TO CORRECT PROCEDURE FOR TESTING #1 ACP

CHANGE

SEE ATTACHED

IS PROCEDURE REVISION REQUIRED

Yes ☒No ☐

If no, this modification is valid until _____

PREPARED BY

S. Hill

DATE

6/9/85

APPROVED BY

S. Hill

DATE

6/9/85

APPROVED BY

S. Wise

DATE

6/9/85

SUBMITTED BY (Section Head)

DATE

RECOMMENDED BY (SRB Chairman)

DATE

QA APPROVED BY (Manager of Quality Assurance)

DATE

APPROVED BY (Station Superintendent)

DATE

should start to open when the Auxiliary Feedwater Pump speed increases to about 2800 RPM.

11|

6.1.14 Announce three times over the Gai-tronics to: Stand clear of the South side of the Turbine Building at the AFPT exhaust, the AFPT is about to be started.

6.1.15 Perform the following:

1. Place the mode select switch ^{HIS 520B} (HIS 521B) in manual.
2. Hold the manual speed switch ^{HIS 520A} (HIS 521A) in the increase direction for ²⁵ (90) seconds.
3. Place the mode select switch ^{HIS 520B} (HIS 521B) in Auto Essential.

11|

6.1.16 Depress SFRCS manual actuation "Trip" pushbutton for loss of four RCP's to Auxiliary Feedwater Train 1 (2), HIS 4869E (HIS 4870E) on Panel C5721 in the Control Room, and ensure Auxiliary Feedwater Pump 1-1 (1-2) starts.

11|

6.1.17 Record the time from actuation of SFRCS "Trip" from the prior step to a differential pressure of ≥ 1070 psid steady state.

AFP 1-1 differential pressure = PI 505 - PI 503
 AFP 1-2 differential pressure = PI 509 - PI 507 18.7
 AFP 1-1 _____ sec.
 AFP 1-2 _____ sec.
 Stop Watch No. _____ Cal Due Date _____

NOTE: Expected steady state response times for the AFP's at ≥ 1070 psid is approximately 20 seconds.

6.1.18 When the AFPT has been timed, place HIS 520B (HIS 521B) in manual.

6.1.19 Decrease AFPT speed to approximately 1500 RPM.

6.1.20 Depress the SFRCS actuation "OFF" pushbutton for loss of four RCP's to the Auxiliary Feedwater Train 1 (2), HIS 4869E (HIS 4870E) on Panel C5721 in the Control Room.

6.1.21 Close MS 106 (MS 107) with HIS 106A (HIS 107A) on Panel C5717 in the CTRM.

11|

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 SS COPY

SECTION 1

PROCEDURE TITLE AND NUMBER

ST 5071.02 Auxiliary Feedwater System Refueling Test

REASON FOR CHANGE

Due to AFPT 1 & 2 response questions/concerns post
 RX Trip on 6-9-85, it is desired to Response Test Both
 AFPT'S. AFPT 1-1 was declared inoperable
 at 0140 on 6-9-85. This T Mod is deleting prerequisite
 5.1.2 That requires AFPT not being tested
 to be operable. This is a one time T. Mod.

CHANGE

delete Step 10
 For Test of AFPT 1-2 on 6-9-85 delete 5.1.2

IS PROCEDURE REVISION REQUIRED

Yes ☐No ☒

If no, this modification is valid until

Test is complete on
6-9-85

PREPARED BY

L. Simon

DATE

6-9-85

APPROVED BY

WJ. O'Connor

DATE

6-9-85

APPROVED BY

L. Simon

DATE

6-9-85

SUBMITTED BY (Section Head)

DATE

RECOMMENDED BY (SRB Chairman)

DATE

QA APPROVED BY (Manager of Quality Assurance)

DATE

APPROVED BY (Station Superintendent)

DATE

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SECTION 1

PROCEDURE TITLE AND NUMBER

ST 5071.02 AFW SYSTEM REFUELING TEST

REASON FOR CHANGE

IN STEP 6.1.17, PI 505 FOR AFP 1-1 IS
NOT AVAILABLE

CHANGE

IN STEP 6.1.17 CHANGE PI 505 TO PI 2659

IS PROCEDURE REVISION REQUIRED

Yes

☐

No

☒

If no, this modification is valid until ~~PI 505~~ 6/4/85

PREPARED BY

T. Seelman

DATE

6/3/85

APPROVED BY

T. Seelman

DATE

6/3/85

APPROVED BY

D. Auzel

DATE

6/3/85

SUBMITTED BY (Section Head)

DATE

RECOMMENDED BY (SRB Chairman)

DATE

QA APPROVED BY (Manager of Quality Assurance)

DATE

APPROVED BY (Station Superintendent)

DATE

Davis-Besse Nuclear Power Station

Unit No. 1

Surveillance Test ST 5071.02

AUXILIARY FEEDWATER SYSTEM REFUELING TEST

NUCLEAR SAFETY RELATED

Record of Approval and Changes

Prepared By	<u>Charles N. Alm</u>	<u>9/19/77</u>
		Date
Submitted By	<u>Rich Chesko for MJD</u>	<u>10/26/77</u>
	Section Head	Date
Recommended By	<u>T. D. Murray</u>	<u>11/1/77</u>
	SRB Chairman	Date
QA Approved	<u>N/A</u>	
	Quality Assurance Director	Date
Approved By	<u>T. D. Murray</u>	<u>11/8/77</u>
	Plant Manager	Date

Revision No.	SRB Recommendation	Date	QA Approved	Date	Plant Manager Approval	Date
10	<i>[Signature]</i>	DEC 4 '84	NA		<i>[Signature]</i>	12/14/84
11	<i>[Signature]</i>	APR 3 1985	N/A		<i>[Signature]</i>	5/16/85

1. OBJECTIVE

10| This test is to verify that two independent steam generator auxiliary feedwater pumps and associated flow paths are operable at least once per 18 months. This test is performed in five phases. Phase I is done during Modes 1, 2, or 3, Phase II, V and VI are done during Modes 5 or 6.

(TS 4.7. 1.2.B.1) Phase I - Verifies that each pump starts automatically upon receipt of an auxiliary feedwater actuation test signal.

(TS 4.7. 1.2.B.2) Phase II - Verifies that each automatic valve in the flow path actuates to its correct position on an auxiliary feedwater actuation test signal. Completes any valve testing required by to 4.0.5) Technical Specification 4.0.5 which has not been completed by ST 5071.01.

Phase III - Measures the minimum recirc flow at 3600 RPM in Modes 1, 2, or 3.

Phase IV - Verifies the AFPT speed changer motor and service water suction valves respond to signals from the Auxiliary Shutdown Panel in any mode.

10| Phase V and VI - Verifies that the check valves required to be tested by ASME code meet forward and reverse flow acceptance criteria.

2. REFERENCES

- (TS) 2.1 Technical Specification 3.7.1.2, Auxiliary Feedwater Systems, Limiting Conditions for Operation
- 2.2 Technical Specification 4.7.1.2, Auxiliary Feedwater Systems, Surveillance Requirements
- (TS) 2.3 Technical Specification 4.0.5, Surveillance Requirements of Inservice Inspection and Testing of ASME Code Class 1, 2, and 3 Components
- 2.4 SP 1106.06, Auxiliary Feedwater System
- 2.5 ST 5071.01, Auxiliary Feedwater System Monthly Test
- 2.6 AD 1838.00, Surveillance and Periodic Test Program
- 2.7 PP 1101.01, Plant Limits and Precautions, Section 1.3.2, Once Through Steam Generator
- 2.8 P&ID M-003, Main Steam and Reheat System

- 2.9 P&ID M-006A, Condensate System
- 2.10 P&ID M-006B, Feedwater System
- 2.11 P&ID M-007, Steam Generator Secondary System
- 2.12 P&ID M-041, Service Water Systems
- 2.13 P&ID M-050, SFRCS Logic
- 2.14 Schematic, E-44B, Sheet 4C
- 2.15 AD 1839.02, Operation and Control of Locked Valves
- 2.16 AD 1839.03, Operation and Control of Capped Valves

3. REQUIRED EQUIPMENT

- 11|
- 3.1 Stop watch (Phase I, II and V)
 - 3.2 Drain hoses
 - 3.3 Test gage (Phase VI)

4. PRECAUTIONS AND LIMITATIONS

- 4.1 Observe the limits and precautions of SP 1106.06, Auxiliary Feedwater System.
- 4.2 Auxiliary Feed Pumps bearing metal temperature maximum is 210°F. Turbine bearing metal temperature maximum is 220°F.
- (TS) 4.3 PEASE I ONLY: Steam Generator pressure is ≥ 800 psia, such that testing will be done at the conditions specified by Technical Specification 3.7.1.2.
- 4.4 DURING THE PERFORMANCE OF THIS ST, THE TRAIN FOR WHICH THE ST IS BEING PERFORMED WILL NOT PERFORM ITS SAFETY FUNCTION. IF THE SYSTEM IS NEEDED FOR SAFETY FUNCTIONS, IT IS THE RESPONSIBILITY OF THE OPERATOR PERFORMING THE ST TO RESTORE THE SYSTEM TO NORMAL.
- 4.5 During Phase I, an Operator by AF 3870 (AF 3872) or by D 107 (BF 1262) must be in direct communication with the Control Room when the breaker is open. This allows the Control Room to immediately direct the Operator to open the valve or close the breaker upon an SFRCS actuation. If the Operator is by the valve, he must have a headset or similar device with him at all times. The Gai-tronics loudspeaker is only acceptable if the Operator is at the breaker.

- 4.6 PHASE III ONLY: When AF 23 is open, an Operator by the AFP being tested must be in direction communication with the Control Room. This operator will close AF 21 (AF 22) when the Control Room notifies the operator of an SFRCS actuation or any other unusual event. The operator must have a headset or similar device with him at all times. The Gai-tronics loud-speaker is NOT acceptable. This applies only when AF 23 is open.

NOTE: It has been found that AF 21 (AF 22) is easier and faster to close than AF 23.

- 11 | 4.7 The pushbutton to light method for valve stroke timing will be used throughout this procedure. This means START the stop watch simultaneously when the pushbutton is depressed, STOP the stop watch when the valve indicator light illuminates.

5. PREREQUISITES

- 5.1 The following prerequisites are those required for Section 6.1 (Phase I).

SH 5.1.1 The plant is in Modes 1, 2, or 3, with main steam available at > 800 psia for the starting of the Auxiliary Feed Pumps.

SH 5.1.2 The auxiliary feedwater system not being tested is operable. During plant startup, this does not apply when first entering Mode 3.

V 5.1.3 A visual inspection of the redundant train must be performed according to AD 1839.00.

NOTE: Requirements of AD 1839.02, Operation and Control of Locked Valves, must be satisfied in the performance of this test.

SH 5.1.4 ART's is in test trip bypass on SFRCS. This will also require a MFPT to be reset.

SH 5.1.5 Security has been notified that door 363 must be guarded.

11 | SH 5.1.6 Nuclear Facility Engineering (NFE) and Quality Control (QC) have been notified that ST 5071.02 is going to be performed on AFP 1-1 (1-2). Do Not proceed with the test until a representative from NFE and QC are present.

SH 5.1.7 The Shift Supervisor has given his permission to

conduct the test on Auxiliary Feedwater Pump 1-1 (1-2).

Shift Supervisor S Wise Time 1125

Section 5.1 completed by S Hillebrandt Date 6/9/85

5.2 The following prerequisites are those required for Section 6.2 (Phase II).

- 10 | 5.2.1 The unit is in Mode 5 or 6.
- 10 | 5.2.2 Security has been notified that door 363 must be guarded.
- 10 | 5.2.3 Record the present position of the valves listed in data sheets 1 and 2 of Enclosure 1.
- 5.2.4 The SFRCS is operable.

NOTE: Steps 5.2.5 and 5.2.6 may be deleted if they were already performed for Section 5 of ST 5031.18, SFRCS Integrated Test.

- 5.2.5 Simulate RC Pumps as running for SFRCS. Do this as follows:

SFRCS CH.	RELAY CAB.	RELAY	
1	RC 3601	X1	Jumper Contacts 1
2	RC 3602	X2	(N1) and 7 (N11) for
3	RC 3603	X3	each relay as shown.
4	RC 3604	X4	

- 5.2.6 Defeat interlock to MS 106 (107) and MS 106A (107A) for low steam pressure and defeat close signal.

1. For MS 106, in D135, jumper TR31 (38) and TR51 (6). Also in D135, lift CL2 (34).
2. For MS 106, in D135, jumper TR61 (31) and TR (5).
3. For MS 107, in BF1124, jumper TR31 (21) and TR51 (19). Also in BF1124, lift CL2 Blue (11).
4. For MS 107, in BF1124, jumper TR61 (20) and TR (16).
5. For MS 106A, in BE1271, jumper TR31 (19) and TR51 (21). Also in BE1271, lift CL Red (18).
6. For MS 107A, in BF1188, jumper TR31 (19) and TR51 (21). Also in BF1188, lift CL Red (18).

- 10 | 5.2.7 The following locked valves are logged so they can be repositioned during the test.

<u>Locked Valve</u>	<u>Positioned To</u>
AF 608	Closed
AF 599	Closed
AF 360	Closed
AF 388	Closed
FW 786	Closed
FW 790	Closed

- 5.2.8 At the following MCCs, close the designated breakers and ensure the associated disconnect switches are in the "Normal" position.

<u>MCC</u>	<u>BREAKER</u>	<u>NAME</u>	<u>VLV. NO.</u>	<u>DISCONNECT SWITCH CAB.</u>
<u>In the #2 Elect Pent Room</u>				
F-11-A	BF-1124	AFPT 1-2 Mn Stm In Iso Valve	MS-107	CDF-11-A

NOTE: The Reset Pushbutton for MS 107 (MS 107A) low pressure trip should be pressed at this time. There is one pushbutton and two lights next to F-11-A. Ensure both lights are out after resetting.

<u>In the Fuel Handling Storage Room 405, East of the Equipment Hatch</u>				
F-11-B	BF-1188	SG 1-1 to AFPT 1-2 In Stm Vlv	MS-107A	CDF-11-B

<u>In the #1 Elect. Pent. Room</u>				
E-11-E	BE-1146	AFP 1-1 Disch to SG 1-2 Vlv	AF-3869	CDE-11-E

Between the #3 and #4 Mech Pent Rooms

The Reset Pushbutton for MS 106 and MS 106A low pressure trip should be pressed at this time. There is one pushbutton and two lights east of MCC E-11-C. Ensure both lights are out after resetting. The Disconnect switch for MS 106 (CDE-11-C) should be checked at this time to be in the "Normal" position.

In the South End of the Corridor from the MU Pump Room by the Hatch

The disconnect switch for AF 3870 should be checked at this time to be in the "Normal" position.

<u>In the Low Voltage Switchgear Room #1</u>				
D1PA	D107	AFP 1-1 Disch to SG 1-1 Vlv	AF 3870	CDE-11-D

<u>MCC</u>	<u>BREAKER</u>	<u>NAME</u>	<u>VLV. NO.</u>	<u>DISCONNECT SWITCH CAB.</u>
DLNA	D135	AFP 1-1 Mn Stm Inlet Iso Vlv	MS-106	CDE-11-C
<u>In the Low Voltage Switchgear Room #2</u>				
F-12-A	BF-1201	AFP 1-2 Disch to SG 1-1	AF-3871	CDF-12-A
<u>In Diesel Gen Room #1</u>				
E-12-B	BE-1271	SG 1-2 to AFPT 1-1 In Stm Vlv	MS-106A	CDE-12-B
<u>In Diesel Gen Room #2</u>				
F-12-B	BF-1262	AFP 1-2 Disch to SG 1-2	AF-3872	CDF-12-B

5.2.9 The Shift Supervisor has given his permission to conduct Section 6.2 of this test.

Shift Supervisor _____ Time _____

Section 5.2 completed by _____ Date _____

5.3 The following prerequisites are those required for Section 6.3 (Phase III).

- 5.3.1 Visual inspection of the redundant trains was performed according to AD 1839.00.
- 5.3.2 The plant is in Modes 1, 2, or 3.
- 5.3.3 Security has been notified that door 363 must be guarded.
- 5.3.4 The following locked valves are logged so they can be repositioned during the test.

<u>AFP 1-1</u>	<u>Positioned To</u>	<u>AFP 1-2</u>
AF 21	Open	AF 22
AF 23	Open	AF 23
AF 17	Closed	AF 18

5.3.5 Nuclear Facility Engineering (NFE) and Quality Control (QC) have been notified that ST 5071.02 is going to be performed on AFP 1-1 (1-2). Do Not proceed with the test until a representative from NFE and QC are present.

5.3.6 The Shift Supervisor has given his permission to conduct this test.

10

Shift Supervisor _____ Time _____

Section 5.3 completed by _____ Date _____

5.4 The following prerequisites are those required for Section 6.4 (Phase IV).

_____ 5.4.1 SW 1382 (SW 1383) has power. This can be verified by ensuring the closed light is on.

_____ 5.4.2 The AFPT Speed Changer motor is operable.

_____ 5.4.3 Security has been notified that door 363 must be guarded.

_____ 5.4.4 The following below locked valves are logged so they can be repositioned during the test.

<u>AFP 1-1</u>	<u>Positioned To</u>	<u>AFP 1-2</u>
SW 5	Closed	SW 6
SW 1382	Open	SW 1383

_____ 5.4.5 The Shift Supervisor has given his permission to conduct this test.

Shift Supervisor _____ Time _____

Section 5.4 completed by _____ Date _____

5.5 The following prerequisites are those required for Section 6.5 (Phase V).

_____ 5.5.1 Security has been notified that door 363 must be guarded.

_____ 5.5.2 The following locked valves are logged so they can be repositioned during the test.

- _____ 1. MS 733 Open
- _____ 2. MS 728 Open

_____ 5.5.3 The following capped valves are logged so they can be opened.

- _____ 1. MS 30
- _____ 2. MS 133
- _____ 3. MS 37
- _____ 4. MS 134
- _____ 5. MS 31

10

5.5.4 A hose is connected from the following valves to a floor drain.

- 1. MS 30
- 2. MS 133
- 3. MS 37
- 4. MS 134
- 5. MS 31
- 6. MS 32

5.5.5 Both OTSG's are drained below 400 inches AND no work is being performed on the secondary side of the OTSG or in the steam lines.

- 1. OTSG 1
- 2. OTSG 2

 5.5.6 The Auxiliary Boiler is in service supplying the 235 psi header.

 5.5.7 The Shift Supervisor has given his permission to conduct this test.

Shift Supervisor _____ Time _____

Section 5.5 completed by _____ Date _____

5.6 The following prerequisites are those required for Section 6.6 (Phase VI).

 5.6.1 Security has been notified that door 363 must be guarded.

 5.6.2 The Auxiliary Boiler is operating.

 5.6.3 At least 20 feet of water is in a Condensate Storage Tank.

 5.6.4 IL ICS-38B (IL ICS-38A) Aux Shutdown panel remote control lights are out.

 5.6.5 OTSG 1-1 (1-2) level is less than 400 inches.

 5.6.6 Verify no one is in the AFPT exhaust missile shield on the south side of the auxiliary building.

5.6.7 The following locked valves are logged so they can be repositioned.

10

	<u>AFPT 1-1</u>	<u>Positioned To</u>	<u>AFPT 1-2</u>
1.		Open	MS 733
2.		Open	MS 728
3.	AF 360	Electrically Closed	AF 388
4.	AF 608	Electrically Closed	AF 608
5.	AF 599	Electrically Closed	AF 599
6.	FW 790	Electrically Closed	FW 786

5.6.8 FI 4630 (FI 4631) is in service.

5.6.9 Simulate RCP's running for SFRCS by jumpering contacts 1 (N1) and 7 (N11) for each relay shown below:

	<u>SFRCS CH</u>	<u>Relay Cab</u>	<u>Relay</u>
1.	1	RC 3601	X1
2.	2	RC 3602	X2
3.	3	RC 3603	X3
4.	4	RC 3604	X4

5.6.10 The following breakers are closed.

1. BE 1146 (E11E) for AF 3869.
2. D107 (D1PA) for AF 3870.
3. BF 1201 (F12A) for AF 3871.
4. BF 1262 (F12B) for AF 3872.

5.6.11 A hose is installed on AF 77 (AF 82).

5.6.12 A 0-600 psig test gage is installed on AF 78 (AF 81).

5.6.12 A hose is installed on MS 108.

5.6.13 The Shift Supervisor has given permission to perform Phase VI.

Shift Supervisor _____ Time _____

Section 5.6 completed by _____ Date _____

6. PROCEDURE

6.1 PHASE I

cl 6.1.1 On the 585' level in the CST Room, ensure that CD 167 or CD 168 Cnds Strg Tk 1-1 (1-2) Supply to Auxiliary Startup Suction Header, is locked open (not both).

6.1.2 Ensure CD 163 and CD 164, Outlet from Cnds Strg Tk 1-1 and 1-2 are both locked open.

U CD 163 Open

U CD 164 Open

6.1.3 Check closed AF 50 and AF 51, Auxiliary Feed Pump Discharge and Deaerator Drain to the Condensate storage tanks.

U AF 50 Closed

U AF 51 Closed

U 6.1.4

Check AF 59 open.

U 6.1.5

By Main Feed Pump 1-1, verify CD 170, Cnds Strg Tks to FW Iso Vlv, is locked open.

U 6.1.6

Verify that the AFW pump vibration panel is energized and in operation.

U 6.1.7

Verify the pump to be tested has greater than 18 psig suction pressure on PI 503 (PI 507).

6.1.8

Verify the proper oil levels.

#1

#2

NOTE: While the AFPT is idle, the oil level may be above the normal level. However, while the AFPT is running the oil level must be in the normal area.

U

U

1.

Governor oil level is above the level mark.

U

U

2.

Governor gear box oil level is in the bulls eye.

U

U

3.

The turbine end turbine bearing oil level is in or above the black area of the sight glass.

U

U

4.

The pump end turbine bearing oil level is in or above the black area of the sight glass.

U

U

5.

The turbine end pump bearing oil level is in or above the black area of the sight glass.

U

U

6.

The pump end pump bearing oil level is in or above the black area of the sight glass.

6.1.9

Perform the following to drain the AFPT.

1. Check open the following AFPT casing drains.

U U MS 745 (MS 744) U

CP U MS 746 (MS 747)

2. Open the following AFPT drain valves.

U U MS 745A (MS 744A)

U U MS 746A (MS 747A)

U U MS 748 (MS 749)

U U MS 750 (MS 751)

3. After the valves stop draining liquid, close the following valves:

CP U MS 745A (MS 744A)

U U MS 746A (MS 747A)

U U MS 748 (MS 749)

U U MS 750 (MS 751)

6.1.10 Verify the following valves are in the their correct position.

316 2H FW 786 (FW 790) Open

84 2H SW 1382 (SW 1383) Closed

2H 6.1.11 Verify at least 20 feet of water is available in the Condensate Storage Tanks.

6.1.12 Perform the following for the appropriate pump.

1. If testing AFP 1-1, perform the following lineup.

2H 2H Check Closed AF 3869

2H 2H Check Closed AF 3870

2. If testing AFP 1-2, perform the following lineup.

2H Check Closed AF 3871

2H Check Closed AF 3872

11 | #1 #2
2H 2H 6.1.13

Open Breaker D107 (BF 1262) at MCC D1PA (F12B) to de-energize AF 3870 (AF 3872).

NOTE: Upon system actuation, the Auxiliary Feedwater Pump should reach full speed in ≤ 40 seconds. The Auxiliary Feedwater Pump Discharge Valve

should start to open when the Auxiliary Feedwater Pump speed increases to about 2800 RPM.

11 | RCP RCP 6.1.14

Announce three times over the Gai-tronics to: Stand clear of the South side of the Turbine Building at the AFPT exhaust, the AFPT is about to be started.

6.1.15

Perform the following:

11 |

Place the mode select switch ^{HIS 520B} (HIS 521B) in manual.

Hold the manual speed switch ^{HIS 520A} (HIS 521A) in the increase direction for (90) seconds.

Place the mode select switch ^{HIS 520B} (HIS 521B) in Auto Essential.

Depress SFRCS manual actuation "Trip" pushbutton for loss of four RCP's to Auxiliary Feedwater Train 1 (2), HIS 4869E (HIS 4870E) on Panel C5721 in the Control Room, and ensure Auxiliary Feedwater Pump 1-1 (1-2) starts.

11 | RCP 34 6.1.17

Record the time from actuation of SFRCS "Trip" from the prior step to a differential pressure of ≥ 1070 psid steady state.

AFP 1-1 differential pressure = PI 505 - PI 503

AFP 1-2 differential pressure = PI 509 - PI 507 18.7

AFP 1-1 26.9 sec.

AFP 1-2 18.9 sec.

Stop Watch No. 4.1.13 Cal Due Date 9/4/85

NOTE: Expected steady state response times for the AFP's at ≥ 1070 psid is approximately 20 seconds.

RCP RCP 6.1.18

When the AFPT has been timed, place HIS 520B (HIS 521B) in manual.

RCP RCP 6.1.19

Decrease AFPT speed to approximately 1500 RPM.

RCP RCP 6.1.20

Depress the SFRCS actuation "OFF" pushbutton for loss of four RCP's to the Auxiliary Feedwater Train 1 (2), HIS 4869E (HIS 4870E) on Panel C5721 in the Control Room.

RCP RCP 6.1.21

Close MS 106 (MS 107) with HIS 106A (HIS 107A) on Panel C5717 in the CTRM.

11 |

11) DB DB 6.1.22 Using the AFPT Speed Changer HIS 520A (HIS 521A) position the AFPT governor to high speed limit by holding in the "RAISE" position for 25 (90) seconds. Note this should be done after the turbine has stopped.

11) DB DB 6.1.23 Another operator must verify HIS 520A (HIS 521A) was held in the raise position for 25 (90) seconds.

DB DB 6.1.24 Place HIS 520B (HIS 521B) in the AUTO ESSENTIAL position.

DB DB 6.1.25 Another Operator must verify HIS 520B (HIS 521B) is in AUTO ESSENTIAL.

cl cl 6.1.26 Close Breaker D107 (BF 1262) to energize AF 3870 (AF 3872). This must be Independently Verified.

Independently Verified Thibault Thibault

cl 6.1.27 Drain AFPT 1-1 and 1-2 Exhaust Lines and the Missile Shield by performing the following:

cl 1. In CWRT Rm (Rm #123) open MS 54 (MS 52) AFPT 1-1, (1-2) Exh Line Drn Vlv. After the condensate has drained, close MS 54 (MS 52).

cl 2. In the BAAT Rm open MS 53 (MS 51) AFPT 1-1 (1-2) Exh Line Drn Vlv. After the condensate has drained close MS 53 (MS 51).

cl 3. In Waste Gas Compressor Rm 1-1 open MS 108 (Missile Shield Drain Line Iso Vlv) and drain the Missile Shield through a temporary drain line to a floor drain, then close MS 108.

6.1.28 Perform the following to drain the AFPT.

1. Check open the following AFPT casing drains.

cl cl MS 745 (MS 744)

cl cl MS 746 (MS 747)

2. Open the following AFPT drain valves.

cl cl MS 745A (MS 744A)

cl cl MS 746A (MS 747A)

cl cl MS 748 (MS 749)

✓ ✓ MS 750 (MS 751)

3. After the valves stop draining liquid, close the following valves:

✓ ✓ MS 745A (MS 744A)

✓ ✓ MS 746A (MS 747A)

✓ ✓ MS 748 (MS 749)

✓ ✓ MS 750 (MS 751)

✓ 6.1.29 Complete the acceptance criteria signoff in Section 7.1 or 7.2.

Section 6.1 completed by Alma L. Lugo Date 6/1/8

6.2 PHASE II

- ____ 6.2.1 Position the valves listed on data sheet 1 and 2 to the "Desired Position".
- ____ 6.2.2 Verify on data sheet 1 and 2 that the actual valve position and control room indicating lights agree.
- NOTE: The following step will stroke AF 608. The opening time is required for Step 6.2.4.
- ____ 6.2.3 Depress SFRCS manual actuation "TRIP" pushbutton for loss of four RCP's to Auxiliary Feedwater Train 1 HIS 4869E on Panel C5717 in the Control Room while timing AF 608.
- ____ 6.2.4 Record on data sheet 1 the open stroke time of AF 608.
- ____ 6.2.5 Verify by control room lights that the valves listed on data sheet 1 stroked to their loss of 4 RCP SFRCS trip position.
- ____ 6.2.6 Verify on data sheet 1 that the actual valve position and control room indicating lights agree.
- ____ 6.2.7 Depress the SFRCS actuation "OFF" pushbutton for loss of four reactor coolant pumps to the Auxiliary Feedwater Train 1 HIS 4869E on Panel C5721 in the Control Room.
- ____ 6.2.8 Close and stroke time AF 608.

- ____ 6.2.9 Record the stroke time for AF 608 on data sheet 1.

11| NOTE: The following step will stroke AF 599. The opening time is required for Step 6.2.11.

- ____ 6.2.10 Depress SFRCS manual actuation "TRIP" pushbutton for loss of four RCP's to Auxiliary Feedwater Train 2, HIS 4870E on Panel C5721 in the Control Room while timing AF 599.

- ____ 6.2.11 Record on data sheet 2 the open stroke time of AF 599.

- ____ 6.2.12 Verify by control room lights that the valves listed on data sheet 2 stroked to their loss of 4 RCP SFRCS trip position.

- ____ 6.2.13 Verify on data sheet 2 that the actual valve position and control room indicating lights agree.

- ____ 6.2.14 Depress the SFRCS actuation "OFF" pushbutton for loss of four reactor coolant pumps to the Auxiliary Feedwater Train 2, HIS 4870E, on Panel C5721.

- ____ 6.2.15 Close and stroke time AF 599.

- ____ 6.2.16 Record the stroke time for AF 599 on data sheet 2.

- ____ 6.2.17 Return the valves moved on data sheets 1 and 2 to their "prior position".

- 6.2.18 Perform the following for the valves listed on data sheet 3.

- ____ 1. Cycle the valves through one full cycle.

- ____ 2. Record the stroke times of FW 601.

- ____ 3. Record the stroke times of FW 612.

- ____ 4. Verify the actual open valve position and control room indicating light agrees.

- ____ 5. Verify the actual closed valve position and control room indicating light agrees.

- ____ 6.2.19 Complete acceptance criteria signoff.

- ____ 6.2.20 Remove jumpers and return lifted wires which were used for Steps 5.2.6 and 5.2.7.

- 6.2.21 At the following MCCs, open the below listed breakers:

<u>MCC</u>	<u>BREAKER NO.</u>	<u>NAME</u>	<u>VLV. NO.</u>
<u>D1NA</u>	D135	AFPT 1-1 Mn Stm Inlet Iso Vlv	MS-106
<u>E-11-E</u>	BE-1146	AFP 1-1 Disch to SG 1-2 Vlv	AF-3869
<u>D1PA</u>	D107	AFP 1-1 Disch to SG 1-1 Vlv	AF-3870
<u>E-12-B</u>	BE-1271	SG 1-2 to AFPT 1-1 Inlet Stm Vlv	MS-106A
<u>F-11-A</u>	BF-1124	AFPT 1-2 Mn Stm Inlet Iso Vlv	MS-107
<u>F-11-B</u>	BF-1188	SG 1-1 to AFPT 1-2 Inlet Stm Vlv	MS-107A
<u>F-12-A</u>	BF-1201	AFP 1-2 Disch to SG 1-1	AF-3871
<u>F-12-B</u>	BF-1262	AFP 1-2 Disch to SG 1-2	AF-3872

11

6.2.22 Perform the following:

1. Record stop watch no. on Data Sheets 1, 2 and 3.
2. Record stop watch cal. due date on Data Sheets 1, 2 and 3.

Section 6.2 completed by _____ Date _____

6.3 PHASE III

- 6.3.1 On the 585' level in the CST Room, ensure that CD 167 or CD 168, Cnds Strg Tk 1-1 (1-2) Supply to Auxiliary Startup Suction Header, is locked open.
- 6.3.2 Ensure CD 163 and CD 164, Outlet from Cnds Strg Tk 1-1 and 1-2, are both locked open.
 - CD 163 Open
 - CD 164 Open
- 6.3.3 Check closed AF 50 and AF 51, Auxiliary Feed Pump Discharge and Deaerator Drain to the condensate storage tanks.
 - AF 50 Closed
 - AF 51 Closed
- 6.3.4 Check AF 59 open.
- 6.3.5 By Main Feed Pump 1-1, verify CD 170, Cnds Strg Tks to FW Iso Vlv, is locked open.
- 6.3.6 Verify the pump to be tested has greater than 18 psig suction pressure on PI 503 (PI 507).
- 6.3.7 Verify the proper oil levels.

NOTE: While the AFPT is idle, the oil level may be above the normal level. However, while the AFPT is running the oil level must be in the normal area.

- ___ 1. Governor oil level is above the level mark.
- ___ 2. Governor gear box oil level is in the bulls eye.
- ___ 3. The turbine end turbine bearing oil level is in or above the black area of the sight glass.
- ___ 4. The pump end turbine bearing oil level is in or above the black area of the sight glass.
- ___ 5. The turbine end pump bearing oil level is in or above the black area of the sight glass.
- ___ 6. The pump end pump bearing oil level is in or above the black area of the sight glass.

6.3.8 Perform the following to drain AFPT casing drains.

- 1. Check open the following AFPT casing drains.

___ MS 745 (MS 744)

___ MS 746 (MS 747)

- 2. Open the following AFPT drain valves.

___ MS 745A (MS 744A)

___ MS 746A (MS 747A)

___ MS 748 (MS 749)

___ MS 750 (MS 751)

- 3. After the valves stop draining liquid, close the following valves:

___ MS 745A (MS 744A)

___ MS 746A (MS 747A)

___ MS 748 (MS 749)

___ MS 750 (MS 751)

- ___ 6.3.9 Unlock and open AF 21 (AF 22) Auxiliary Feed Pump 1-1 (1-2) Recirculation Line Stop Valve.

6.3.10 Perform the following for the appropriate pump.

1. If testing AFP 1-1.

_____ Check Closed AF 3869

_____ Check Closed AF 3870

2. If Testing AFP 1-2.

_____ Check Closed AF 3871

_____ Check Closed AF 3872

11| _____ 6.3.11 Verify at least 25 feet of water if available in the Condensate Storage Tanks.

_____ 6.3.12 Place the Auxiliary Feed Pump mode select switch HIS 520B (HIS 521B) in the manual mode.

11| _____ 6.3.13 Hold the Auxiliary Feed Pump manual speed changer HIS 520A (HIS 521A) in the lower position for approximately 25 (90) seconds.

_____ 6.3.14 Announce three times over the Gai-tronics to: stand clear of the south side of the Turbine Building at the AFPT exhaust, the AFPT is about to be started.

_____ 6.3.15 Start 1-1 (1-2) AFW Pump by opening MS 106 (MS 107), Main Steam Line 1-1 (1-2) to Auxiliary Feed Pump Turbine 1-1 (1-2) Inlet Header Isolation Valve with HIS 106A (HIS 107A).

CAUTION: Review Limitations and Precautions 4.6.

_____ 6.3.16 Unlock and slowly throttle open AF 23 until greater than 20 inches of water is indicated on PDI 2658.

_____ 6.3.17 Unlock and shut minimum recirc valve AF 17 (AF 18). The Handwheel should be approximately $\frac{1}{4}$ " above the yoke.

_____ 6.3.18 Increase turbine speed to the high speed stop.

_____ 6.3.19 Readjust flow to 144 to 156 in. H₂O (813 GPM) using AF 23.

_____ 6.3.20 Record the flow, _____ "H₂O.

_____ 6.3.21 Open and lock AF 17 (AF 18).

_____ 6.3.22 Record the new flow, _____ "H₂O.

- 11| _____ 6.3.23 Place HIS 520A (HIS 521A) in the lower position until the turbine is approximately 1500 RPM.
- _____ 6.3.24 Close MS 106 (MS 107).
- _____ 6.3.25 Close and lock AF 21 (AF 22).
- 11| _____ 6.3.26 Close and lock AF 23.
- 11| _____ 6.3.27 Place HIS 520A (HIS 521A) in the Raise Position for 25 (90) seconds.

NOTE: This must be independently verified.

Independently Verified _____

- _____ 6.3.28 Place HIS 520B (HIS 521B) in the Auto-Essential Position.

NOTE: This must be independently verified.

Independently Verified _____

- _____ 6.3.29 Independently verify all locked valves are returned to their proper position.

- _____ 6.3.30 Determine the AFP flow with AF 17 (AF 18) closed by multiplying the square root of the reading of step 6.3.20 by 66.408.

Flow = $66.408 \sqrt{\text{Reading of 6.3.20}}$ = _____ gpm

- _____ 6.3.31 Determine the AFP flow with AF 17 (AF 18) open by multiplying the square root of the reading of step 6.3.22 by 66.408.

Flow = $66.408 \sqrt{\text{Reading of 6.3.22}}$ = _____ gpm

- _____ 6.3.32 Subtract the flow of step 6.3.31 from the flow of step 6.3.30 to determine the minimum recirc flow.

Minimum Recirc Flow _____ gpm

- _____ 6.3.33 Drain AFPT 1-1 and 1-2 Exhaust Lines and the Missile Shield by performing the following:

- _____ 1. In CWRT Rm (Rm #123) open MS 54 and MS 52 AFPT 1-1 (1-2) Exh Line Drn Vlv. After the condensate has drained, close MS 54 (MS 52).

- ____ 2. In the BAAT Rm open MS 53 (MS 51) AFPT 1-1 (1-2) Exh Line Drn Vlv. After the condensate has drained close MS 53 (MS 51).
- ____ 3. In Waste Gas Compressor Rm 1-1 open MS 108 (Missile Shield Drain Line Iso Vlv) and drain the Missile Shield through a temporary drain line to a floor drain, then close MS 108.

10 | 6.3.34 Perform the following to drain the AFPT.

1. Check open the following AFPT casing drains.

____ MS 745 (MS 744)

____ MS 746 (MS 747)

2. Open the following AFPT drain valves.

____ MS 745A (MS 744A)

____ MS 746A (MS 747A)

____ MS 748 (MS 749)

____ MS 750 (MS 751)

3. After the valves stop draining liquid, close the following valves:

____ MS 745A (MS 744A)

____ MS 746A (MS 747A)

____ MS 748 (MS 749)

____ MS 750 (MS 751)

- ____ 6.3.35 Notify the Shift Supervisor that the test is complete and the Auxiliary Feedwater System is returned to normal.

10 | Section 6.3 completed by _____ Date _____

10 | 6.4 PHASE IV

- ____ 6.4.1 At the Auxiliary Shutdown Panel select Local on HS ICS 38B (HS ICS 38A) AFPT 1 (2) GOV CONT SELECT.

- ____ 6.4.2 Ensure the amber light above HS ICS 38B (HS ICS 38A) comes on.

11| 6.4.3 Ensure IL ICS 38B (IL ICS 38A) Aux Shutdown Panel light comes on in the Control Room.

11| 6.4.4 At the Auxiliary Shutdown Panel hold HIS ICS 38B (HIS ICS 38A) AFPT 1 (2) GOV SPD CONT in the High Speed position for 25 (90) seconds.

11| 6.4.5 While a man is stationed by the AFP governor, at the Auxiliary Shutdown Panel, place HIS ICS 38B (HIS ICS 38A) AFPT 1 (2) GOV SPD CONT in the low speed position, for 25 (90) seconds.

6.4.6 Verify the following for the appropriate governor.

1. If testing AFP 1-1, verify the speed changer motor drove in the counterclockwise (decrease) direction.

2. If testing AFP 1-2, verify the manual speed setting control knob rotated in the counterclockwise (decrease) direction.

11| 6.4.7 Place HIS ICS 38B (HIS ICS 38A) in the High Speed position and hold for at least 25 (90) seconds.

11| NOTE: This must be independently verified by either observing HIS ICS 38B (HIS ICS 38A) is placed in the High Speed position for 25 (90) seconds, or independently holding the speed controller in the increase direction for 25 (90) seconds.

Independently Verified _____

6.4.8 Verify the following for the appropriate governor.

1. If testing AFP 1-1, verify the speed charger motor drove in the clockwise (increase) direction.

2. If testing AFP 1-2, verify the manual speed setting control knob rotated in the clockwise (increase) direction.

6.4.9 Place HS ICS 38B (HS ICS 38A) in the Remote position.

NOTE: This must be independently verified.

Independently Verified _____

6.4.10 Unlock and close SW 5 (SW 6).

- ____ 6.4.11 At the Auxilairy Shutdown Panel place HIS 1382B (HIS 1383B) SERVICE WTR ISO SELECT in the Local position.
- ____ 6.4.12 Ensure the amber light above HIS 1382B (HIS 1383B) comes on.
- ____ 6.4.13 At the Auxiliary Shutdown Panel press open on HIS 1382A (HIS 1383A) SERVICE WTR ISO VLV.
- ____ 6.4.14 Physically verify SW 1382 (SW 1383) is open.
- ____ 6.4.15 Press close on HIS 1382A (HIS 1383A).
- ____ 6.4.16 Physically verify SW 1382 (SW 1383) is closed.
- ____ 6.4.17 Place HIS 1382B (HIS 1383B) in the Remote position.

NOTE: This must be independently verified.

Independently Verified _____

- ____ 6.4.18 Open SW 1 (SW 2) to ensure SW 1382 (SW 1383) has completely shut off service water. (Observe for at least five minutes.)
- ____ 6.4.19 Close SW 1 (SW 2).
- ____ 6.4.20 Open and lock SW 5 (SW 6).

NOTE: This must be independently verified for AD 1839.02.

Independently Verified _____

- ____ 6.4.21 Independently verify SW 1382 (SW 1383) is closed.

Section 6.4 completed by _____ Date _____

6.5 PHASE V

- 6.5.1 Verify closed the following valves:

- ____ 1. MS 106 Closed.
- ____ 2. MS 107A Closed.
- ____ 3. MS 106A Closed.
- ____ 4. MS 107 Closed.
- ____ 5. AFPT 1-2 Trip Throttle Valve Closed.
- ____ 6. AFPT 1-1 Trip Throttle Valve Closed.

- 6.5.2 Open the following valves:

- ☐ 1. MS 728.
 - ☐ 2. MS 733.
 - ☐ 3. AS 178.
- ☐ 6.5.3 Crack open MS 32 to warm the line and drain condensate.
- ☐ 6.5.4 Close MS 32.
- ☐ 6.5.5 Slowly open AS 273 to pressurize both AFPT steam lines to greater than 200 psig on PI 2561.
- 6.5.6 Maintain this pressure for 30 minutes while periodically (5-10 minutes) opening the following drain valves to drain condensate.
- ☐ 1. MS 133.
 - ☐ 2. MS 30.
 - ☐ 3. MS 134.
 - ☐ 4. MS 137.
 - ☐ 5. MS 31.
- 6.5.7 Open the following valves:
- ☐ 1. MS 106.
 - ☐ 2. MS 107A.
 - ☐ 3. MS 106A.
 - ☐ 4. MS 107.
- 6.5.8 Perform the following steps as quickly as possible. One operator should be at AS 273 and one at AS 178.
- ☐ 1. Close AS 273 AND
 - ☐ 2. At the same time close AS 178.
 - ☐ 3. After both valves are closed, open MS 32 to reduce the pressure between the valves.
 - ☐ 4. After MS 32 is opened, start timing the pressure decrease on PI 2561 AFPT 1-1 steam pressure.
- ☐ 6.5.9 Verify that 30 seconds after MS 32 was opened, PI 2561 read greater than 100 psig.

Stop Watch No. _____ Cal Due Date _____

NOTE: If leakage is greater than acceptance criteria, individual leakage can be determined by opening MS 106, MS 106A, MS 107, and MS 107A individually and repeating the test.

___ 6.5.10 Close MS 32.

6.5.11 Close the following valves:

- ___ 1. MS 733.
- ___ 2. MS 728.
- ___ 3. MS 106.
- ___ 4. MS 107A.
- ___ 5. MS 106A.
- ___ 6. MS 107.

6.5.12 The following locked valves are independently verified closed.

- ___ 1. MS 733.
- ___ 2. MS 728.

6.5.13 The hoses have been removed from the following drain valves.

- ___ 1. MS 30.
- ___ 2. MS 133.
- ___ 3. MS 37.
- ___ 4. MS 134.
- ___ 5. MS 31.
- ___ 6. MS 32.

6.5.14 The following capped valves are restored and logged.

- ___ 1. MS 30.
- ___ 2. MS 133.
- ___ 3. MS 37.
- ___ 4. MS 134.
- ___ 5. MS 31.

Section 6.5 completed by _____ Date _____

6.6

___ 6.6.1 On the 585 ft level in the CST room, verify either CD 167 or CD 168 Cnds Strg Tk 1-1 (1-2) supply to auxiliary and startup feedpump suction header, is open. Circle the valve(s) that is (are) open.

CD 167
CD 168

6.6.2 Check closed the following valves:

- ___ 1. CD 50.
- ___ 2. CD 51.

- ___ 6.6.3 Check AF 59 open.
- ___ 6.6.4 By MFPT 1-1, verify CD 170 open.
- ___ 6.6.5 Verify the AFW vibration panel is energized and in operation.
- 6.6.6 Verify the following valves are open:
 - ___ 1. FW 786 (FW 790).
 - ___ 2. AF 503B (AF 507B).
 - ___ 3. AF 503C (AF 507C).
 - ___ 4. AF 505 (AF 509).
 - ___ 5. AF 9 (AF 10).
 - ___ 6. AF 17 (AF 18).
 - ___ 7. AF 13 (AF 14).
 - ___ 8. AF 64 (AF 67).
 - ___ 9. AF 3 (AF 4).
 - ___ 10. AF 65 (AF 66).
- ___ 6.6.7 Verify AF 7 (AF 8) is throttled.
- 6.6.8 Verify the following instruments are in service:
 - ___ PI 503 (PI 507) AFPT 1-1 (1-2) Suct.
 - ___ PI 2659 (PI 2660) AFP 1-1 (1-2) Disch.
- ___ 6.6.9 Verify AFPT 1-1 (1-2) suction pressure is greater than 18 psig on PI 503 (PI 507).
- 6.6.10 Verify the proper oil levels.

NOTE: While the AFPT is idle, the oil level may be above the normal level. However, while the AFPT is running the oil level must be in the normal area.

- ___ 1. Governor oil level is above the level mark.
- ___ 2. Governor gear box oil level is in the bulls eye.
- ___ 3. The turbine end turbine bearing oil level is in or above the black area of the sight glass.
- ___ 4. The pump end turbine bearing oil level is in or above the black area of the sight glass.
- ___ 5. The turbine end pump bearing oil level is in or above the black area of the sight glass.
- ___ 6. The pump end pump bearing oil level is in or above the black area of the sight glass.

6.6.11 Perform the following to drain the AFPT.

1. Check open the following AFPT casing drains.

_____ MS 745 (MS 744)

_____ MS 746 (MS 747)

2. Open the following AFPT drain valves.

_____ MS 745A (MS 744A)

_____ MS 746A (MS 747A)

_____ MS 748 (MS 749)

_____ MS 750 (MS 751)

3. After the valves stop draining liquid, close the following valves:

_____ MS 745A (MS 744A)

_____ MS 746A (MS 747A)

_____ MS 748 (MS 749)

_____ MS 750 (MS 751)

6.6.12 Perform the following to exercise the overspeed trip mechanism:

- _____ 1. Using the manual trip lever, manually trip the trip throttle valve.
- _____ 2. Turn the trip throttle valve handwheel clockwise until the sliding nut rises and engages the latch up lever to the trip hook.

NOTE: It may be necessary to pull on the trip throttle valve linkage to fully engage the latch up lever to the trip hook.

- _____ 3. Verify the latch up lever and the trip hook are fully energized.
- _____ 4. Turn the trip throttle valve handwheel counterclockwise until the trip throttle valve is fully open.
- _____ 5. Turn the trip throttle valve handwheel 1/4 turn clockwise.

- ___ 6. Seal the trip throttle valve handwheel.

Independently Verified _____

- ___ 7. Verify computer point Z001 (Z002) AFPT 1 (2) Stop Valve reads "OPEN".

- ___ 8. Verify the red IL ICS 38E (38J) AFPT 1 (2) Governor Valve fully open light is on.

- 6.6.13 Verify the following valves are closed.

- ___ 1. AF 3869 (AF 3871).

- ___ 2. AF 3870 (AF 3872).

- ___ 6.6.14 Verify that the CST lined up to the AFP that is identified in Step 6.6.1 has at least 20 feet of water.

- ___ 6.6.15 Ensure HIS 520B (HIS 521B) is in manual.

- ___ 6.6.16 Hold HIS 520A (HIS 521A) in the lower position for 25 (90) seconds.

- ___ 6.6.17 Announce three times over the Gai-tronics to stand clear of the south side of the turbine building while running the Auxiliary Feedpump Turbine.

- 6.6.18 Start the appropriate turbine by performing the following:

- ___ 1. To start AFPT 1-1, open AS 273 and AS 178.

2. To start AFPT 1-2, perform the following:

___ Verify closed AFPT 1-1 trip throttle valve.

___ Open MS 733.

___ Open MS 728.

___ Open AS 178.

___ Open AS 273.

- 6.6.19 Perform the following to verify the AFPT and AFP is operating properly.

- ___ 1. Visually observe the AFPT and AFP for abnormal vibration and noises.

- ___ 2. Check all AFPT and AFP bearings and seals.

- ___ 3. Check the local bearing vibration panel for abnormal symptoms.

- ____ 4. Check computer point P002 (P005) to ensure suction strainer ΔP is normal.
- ____ 6.6.20 Close AF 360 (AF 388).
- ____ 6.6.21 Verify open AF 608 (AF 599).
- ____ 6.6.22 Open AF 3870 (AF 3872).
- ____ 6.6.23 Increase AFPT speed until greater than 800 gpm is indicated on FI 4630 (FI 4631) AFW flow to OTSG 1-1 (1-2).
- ____ 6.6.24 Verify greater than 800 gpm was indicated on FI 4630 (FI 4631) AFW flow to OTSG 1-1 (1-2).
- ____ 6.6.25 Close AF 608 (AF 599).
- ____ 6.6.26 Close FW 790 (FW 786) the OPPOSITE AFP suction valve.
- ____ 6.6.27 Open AF 3871 (AF 3869).
- ____ 6.6.28 Record AFP 1-1 (1-2) discharge pressure.
PI 2659 (PI 2660) _____ psig
- ____ 6.6.29 Record the pressure on the test gage on AF 78 (AF 81) test gage _____ psig.
Test Gage No. _____ Cal. Due Date _____
- ____ 6.6.30 Calculate the pressure differential.
PI 2659 (PI 2660) Reading - Test Gage Reading = Pressure Differential
_____ PSIG - _____ PSIG = _____ PSID
- 6.6.31 If the pressure differential is less than 25 psid, perform the following:
- ____ 1. Open AF 77 (AF 82) to decrease test gage pressure.
- ____ 2. Recalculate the pressure differential.
PI 2659 (PI 2660) Reading - Test Gage Reading = Pressure Differential
_____ PSIG - _____ PSIG = _____ PSID
- ____ 3. Close AF 77 (AF 82).

- ___ 6.6.32 Verify pressure differential is greater than 25 psid.
- ___ 6.6.33 Close AF 3870 (AF 3872).
- ___ 6.6.34 Close AF 3871 (AF 3869).
- ___ 6.6.35 Verify open AF 599 (AF 608).
- ___ 6.6.36 Open AF 3869 (AF 3871).
- ___ 6.6.37 Verify greater than 800 gpm is indicated on FI 4631 (FI 4630).

NOTE: AFPT speed may be increased if necessary.

- ___ 6.6.38 Close AF 599 (AF 608) AFW flow to OTSG 1-2 (1-1).
- ___ 6.6.39 Open AF 3872 (AF 3870).
- ___ 6.6.40 Record AFP 1-1 (AFP 1-2) discharge pressure.
PI 2659 (PI 2660) _____ psig
- ___ 6.6.41 Record the pressure on the test gage on AF 78 (AF 81).
Test Gage _____ psig
- ___ 6.6.42 Calculate the pressure differential.

PI 2659 (PI 2660) Reading - Test Gage Reading =
Pressure Differential

_____ PSIG - _____ PSIG = _____ PSID

- 6.6.43 If the pressure differential is less than 25 psid, perform the following:

- ___ 1. Open AF 77 (AF 82) to decrease test gage pressure.
- ___ 2. Recalculate the pressure differential.

PI 2659 (PI 2660) Reading - Test Gage Reading =
Pressure Differential

_____ PSIG - _____ PSIG = _____ PSID

- ___ 3. Close AF 77 (AF 82).
- ___ 6.6.44 Verify pressure differential is greater than 25 psid.

- ___ 6.6.45 Close AF 3869 (AF 3871).
- ___ 6.6.46 Close AF 3872 (AF 3870).
- ___ 6.6.47 Adjust AFPT speed to 1500 rpm.
- ___ 6.6.48 Close AS 273.
- 6.6.49 If testing AFPT 1-2, close the following valves:
 - ___ MS 728
 - ___ MS 733
- ___ 6.6.50 Close the trip throttle valve MSICS 38B (MSICS 38A).
- 6.6.51 Perform the following to drain the AFPT.
 - 1. Check open the following AFPT casing drains.
 - ___ MS 745 (MS 744)
 - ___ MS 746 (MS 747)
 - 2. Open the following AFPT drain valves.
 - ___ MS 745A (MS 744A)
 - ___ MS 746A (MS 747A)
 - ___ MS 748 (MS 749)
 - ___ MS 750 (MS 751)
 - 3. After the valves stop draining liquid, close the following valves:
 - ___ MS 745A (MS 744A)
 - ___ MS 746A (MS 747A)
 - ___ MS 748 (MS 749)
 - ___ MS 750 (MS 751)
- 6.6.52 Drain the AFPT drain lines as follows:
 - ___ 1. In CWRT room, open MS 54 (MS 52).
 - ___ 2. After the condensate has drained, close MS 54 (MS 52).
 - ___ 3. In the BAAT Room, open MS 53 (MS 51).

- 11 |
- ___ 4. After the condensate has drained, close MS 53 (MS 51).
 - ___ 5. In WG compressor room 1-1, open MS 108.
 - ___ 6. After the condensate has drained, close MS 108.
 - ___ 6.6.53 Hold HIS 520A (HIS 521A) in the decrease direction for 25 (90) seconds.
 - 6.6.54 Open the following valves:
 - ___ AF 360 (AF 388).
 - ___ FW 790 (FW 786).
 - ___ AF 599 (AF 599).
 - ___ AF 608 (AF 608).
 - 6.6.55 The hose on the following valves have been removed.
 - ___ MS 108
 - ___ AF 77 (AF 82)
 - ___ 6.6.56 The test gage on AF 78 (AF 81) has been removed.
 - 6.6.57 The following locked valves are independently verified.

	<u>AFP 1-1</u>	<u>Normal Position</u>	<u>AFP 1-2</u>
___ 1.		Closed	MS 733
___ 2.		Closed	MS 728
___ 3.	AF 360	Open	AF 388
___ 4.	AF 608	Open	AF 608
___ 5.	AF 599	Open	AF 599
___ 6.	FW 790	Open	FW 786

6.6.58 Open the following breakers:

- ___ 1. BE 1146 (E11E) for AF 3869.
- ___ 2. D107 (D1PA) for AF 3870.
- ___ 3. BF 1201 (F12A) for AF 3871.
- ___ 4. BF 1262 (F12B) for AF 3872.

6.6.59 The jumpers on contacts 1 (N1) and 7 (N11) are removed.

	<u>SFRCS CH</u>	<u>Relay Cab</u>	<u>Relay</u>
___ 1.	1	RC 3601	X1
___ 2.	2	RC 3602	X2
___ 3.	3	RC 3603	X3
___ 4.	4	RC 3604	X4

Section 6.6 completed by *William D. [Signature]*Date *6/19/70*7. ACCEPTANCE CRITERIA7.1 Acceptance Criteria for Train 1, PHASE I

7.1.1 Aux Feed Pump 1-1 started.

Verified *William D. [Signature]*

7.1.2 The Aux Feed Pump Turbine attained a differential pressure greater than or equal to 1070 pounds per square inch steady state.

Verified *William D. [Signature]*7.2 Acceptance Criteria for Train 2, PHASE I

7.2.1 Aux Feed Pump 1-2 Started

Verified *William D. [Signature]*

7.2.2 The Aux Feed Pump Turbine attained a differential pressure greater than or equal to 1070 pounds per square inch steady state.

Verified *William D. [Signature]*7.3 Acceptance Criteria, PHASE II

7.3.1 Valves Listed in Data Sheet 1, 2 and 3 Actuated to their SFRCS Trip Position.

Verified _____

7.3.2 All Valve Indication Lighting of Position is Correct.

Verified _____

7.3.3 AF 608 open stroke time is less than 13.5 sec.

Verified _____

7.3.4 AF 599 open stroke time is less than 10.5 sec.

Verified _____

7.3.5 FW 601 closed stroke time is less than or equal to 16 seconds.

Verified _____

- 10 | 7.3.6 FW 612 closed stroke time is less than or equal to 16 seconds.

Verified _____

7.4 Acceptance Criteria, PHASE III

- 7.4.1 Flow through mini recirc greater than 15 GPM.

Verified _____

7.5 Acceptance Criteria, PHASE IV

- 7.5.1 The speed changer motor on the AFPT governor responds properly to commands from the Auxiliary Shutdown Panel.

Verified _____

- 7.5.2 SW 1382 (SW 1383) can be opened and closed from the Auxiliary Shutdown Panel.

Verified _____

7.6 Acceptance Criteria, PHASE V

- C 10 | 7.6.1 MS 726, MS 734, MS 735 and MS 727 prevented gross reverse leakage as indicated by maintaining greater than 100 psig for 30 seconds after steam was isolated.

Verified _____

7.7 Acceptance Criteria, PHASE VI

- 7.7.1 AF 72 and AF 39 (AF 75 and AF 43) opened as indicated by greater than 800 gpm on FI 4630 (FI 4631).

Verified _____

- 7.7.2 AF 73 (AF 74) opened as indicated by greater than 800 gpm on FI 4631 (FI 4630).

Verified _____

- 7.7.3 AF 74 (AF 73) closed on reverse flow by maintaining greater than 25 psid. (Step 6.6.32)

Verified _____

- 7.7.4 AF 75 (AF 72) closed on reverse flow by maintaining greater than 25 psid. (Step 6.6.44)

Verified _____

VALVE DATA SHEET NO. 1

ST 5071.02 REV. 11

Valve Number	Control Switch (Panel)	Present Position	Desired Position	SFRCS Trip Position	Valve Actuated to Trip Position	Indication Lighting Is Correct		Vlv Returned To "(Present Position)"	Stroke Time	
						Open	Closed		Open	Closed
AF608	(C5717)		Closed	Open						
MS106	(C5717) HIS 106A		Closed	Open						
MS106A	(C5717) HIS 106E		Open	Closed						
AF3870	(C5706) HIS 3870		Closed	Open						
AF3869	(C5706) HIS 3869		Open	Closed						

Comments _____

Stop Watch No. _____ Cal Due Date _____

VALVE DATA SHEET NO. 2

ST 5071.02 REV. 11

Valve Number	Control Switch (Panel)	Present Position	Desired Position	SFRCS Trip Position	Valve Actuated to Trip Position	Indication Lighting Is Correct		Vlv Returned To "(Present Position)"	Stroke Time	
						Open	Closed		Open	Closed
AF599	(C5717)		Closed	Open						
MS107	(C5717) HIS 107A		Closed	Open						
MS107A	(C5717) HIS 107E		Open	Closed						
AF3872	(C5709) HIS 3872		Closed	Open						
AF3871	(C5709) HIS 3871		Open	Closed						

Comments _____

11 | Stop Watch No. _____ Cal Due Date _____

VALVE DATA SHEET NO. 3

ST 5071.02 REV. 11

NOTE: All spaces next to vlv no. must be filled with initial or N/A.

Valve No.	Control Switch (Panel)	Full Stroke (Cycle)	Stroke Time		Indication Lighting is Correct	
			Open	Close	Open	Closed
AF360	(C5709) HIS 360		N/A	N/A		
AF388	(C5709) HIS 388		N/A	N/A		
FW786	(C5709) HIS 786		N/A	N/A		
FW790	(C5709) HIS 790		N/A	N/A		
FW601	(C5717) HIS 601					
FW612	(C5717) HIS 612					

Comments _____

Stop Watch No. _____ Cal Due Date _____

END

Enclosure 1
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ST 5071.02.11