NIAGARA MOHAWK POWER CORPORATION

NINE MILE POINT NUCLEAR STATION

Preoperational Test Procedure No. POT-1-2

MAIN STEAM ISOLATION VALVES

Revision No. 0
Consists of pages 54

This certifies that the attached procedure has been reviewed for implementation at the Nine Mile Point Nuclear Station. The test should produce sufficient pertinent data to demonstrate to the extent practical that the system will perform in accordance with its design requirements.

_____ Project/Site Engineer Date_____
_____ Station Superintendent Date_____
_____ Manager, QA Nuclear Date_____
_____ Chairman Date_____
Site Operations Review Committee

Safety evaluation reviewed by SRAB.
_____ SORC Secretary Date_____

Modification Control No. N2 Y86 Mx 1 1 8 LR _ _ _
Logged. Site Planning_____ Date_____

The above Preoperational Test Procedure has been completed and the system tested appears to perform in a satisfactory manner. The data derived from the test are attached for review by the Site Operations Review Committee. Any unusual occurrences or conditions observed during the test which could affect the result of the review are noted.

_____ Project/Site Engineer Date_____
_____ Station Superintendent Date_____

This certifies that the attached test has been witnessed and/or audited and that all quality related requirements have been satisfied.

_____ Quality Assurance Date_____

The Preoperational test data has been reviewed and it is concluded that the system can reasonably be expected to perform in accordance with its design requirements under the intended Plant operating conditions.

_____ Project/Site Engineer Date_____
_____ Chairman Date_____
Site Operations Review Committee

Completed. Site Planning_____ Date_____

This certifies receipt of satisfactory comments from SRAB on the attached test results.

_____ Station Superintendent Date_____

Closed. Site Planning_____ Date_____

PROCEDURE TITLE MAIN ~~AND AUXILIARY STEAM~~ STEAM ISOLATION VALVES

PROCEDURE NUMBER N2-POT-1-2

0.0 INTRODUCTION

0.1 Purpose

The purpose of this test is to demonstrate the reliable operation of the system and its components, instrumentation controls alarms and its ability to perform its design functions under normal and off-normal conditions. This test also provides baseline data for future operations and testing and to determine the operational readiness of the MSIV's.

0.2 Test Conditions

The normal electrical power sources will be used to perform the test.

0.3 Scope

This test will insure the proper operability and interlocks of the main steam isolation valves.

0.4 General Acceptance Criteria

This test will prove that the main steam isolation valves will perform per their design logic during plant operation.

1.0 REFERENCES

1.1 Stone and Webster and GE Drawings

FSK-3-1A	Rev. 13	Main Steam Flow Diagram
FSK-3-1B	Rev. 11	Main Steam Flow Diagram
LSK-3-1A	Rev. 07	Main Steam Logic Diagram ECN-MSS 609
LSK-3-1P	Rev. 0	Main Steam Logic Diagram ECN-MSS 608, 609
LSK-3-1Q	Rev. 0	Main Steam Logic Diagram ECN-MSS 608, 609
LSK-3-1R	Rev. 0	Main Steam Logic Diagram ECN-MSS 608, 609
LSK-3-1S	Rev. 0	Main Steam Logic Diagram ECN-MSS 608, 609
LSK-3-1T	Rev. 0	Main Steam Logic Diagram ECN-MSS 608, 609
LSK-3-1U	Rev. 0	Main Steam Logic Diagram ECN-MSS 609
2MSS-31	Rev. 4	Main Steam Loop Diagram ECN-MSS 608
2MSS-32	Rev. 5	Main Steam Loop Diagram ECN-MSS 608
2MSS-60	Rev. 0	Main Steam Loop Diagram ECN-MSS 608
2MSS-61	Rev. 0	Main Steam Loop Diagram ECN-MSS 608
2MSS-62	Rev. 0	Main Steam Loop Diagram ECN-MSS 608
2MSS-63	Rev. 0	Main Steam Loop Diagram ECN-MSS 608
ESK-6MSS21	Rev. 2	AC Elem Diag-600V MCC Ckt MSIV Hydraulic Pumps ECN-MSS 609
ESK-6MSS22	Rev. 2	AC Elem Diag-600V MCC Ckt MSIV Hydraulic Pumps ECN-MSS 609
ESK-7MSS13	Rev. 5	AC Elem Diag-Misc AC Ckts MSIV 2MSS*HYV6A ECN-MSS 608

1.1 Stone and Webster and GE Drawings (Continued)

ESK-7MSS14	Rev. 5	AC Elem Diag-Misc AC Ckts MSIV 2MSS*HYV6B ECN-MSS-608
ESK-7MSS15	Rev. 5	AC Elem Diag-Misc AC Ckts MSIV 2MSS*HYV6C ECN-MSS-608
ESK-7MSS16	Rev. 5	AC Elem Diag-Misc AC Ckts MSIV 2MSS*HYV6D ECN-MSS-608
ESK-7MSS17	Rev. 5	AC Elem Diag-Misc AC Ckts MSIV 2MSS*HYV7A ECN-MSS-608
ESK-7MSS18	Rev. 5	AC Elem Diag-Misc AC Ckts MSIV 2MSS*HYV7B ECN-MSS-608
ESK-7MSS19	Rev. 5	AC Elem Diag-Misc AC Ckts MSIV 2MSS*HYV7C ECN-MSS-608
ESK-7MSS20	Rev. 5	AC Elem Diag-Misc AC Ckts MSIV 2MSS*HYV7D ECN-MSS-608
ESK-7MSS22	Rev. 5	AC Elem Diag Misc AC Ckts Main Steam ECN-MSS-609
ESK-7MSS23	Rev. 5	AC Elem Diag-Misc AC Ckts Main Steam ECN-MSS-609
ESK-7M5525	Rev. 0	AC Elem Diag-Misc AC Ckts Main Steam ECN-MSS-608
ESK-7M5526	Rev. 0	AC Elem Diag-Misc AC Ckts Main Steam ECN-MSS-608
ESK-7M5527	Rev. 0	AC Elem Diag-Misc AC Ckts-MSIV Main Hydr Pmps Aux Cont. ECN-MSS-609

1.2 Equipment Specifications

NMP2-P303D	Rev.	Main Steam Isolation Valves
G. E. Spec. 22A2877	Rev. 4	Main Control Room Panels
G. E. Spec. 22A2887A	Rev. 12	Nuclear Boiler System
G. E. Spec. 22A3752	Rev. 3	Nuclear Steam Supply Shutoff System

1.3 FSAR Sections

Chapter 10.3 Main Steam Supply System, Amendment 25
Table 14.2-25 Test Abstract, Amendment 25
Table 6-2-56, Amendment 25

1.4 Manufacturers Drawings

1.4.1 5.360.180.170K Inboard MSIV Elementary
1.4.2 5.360.180.182K Outboard MSIV Elementary

1.5 Regulatory Guides

1.5.1 1.68 Initial Test Programs for Water-Cooled Nuclear Power Plants

1.6 Other Reference Material

1.6.1 Interim Operating Procedure N2-IOP-1 Rev. 0
1.6.2 G.E. Test Spec. 22A2271BA App. B Rev. #4
1.6.3 5.360-5015E MSIV Inst. Manual

2.0 SPECIAL SAFETY PRECAUTIONS/LIMITATIONS

2.1 Adhere to the NMPC Accident Prevention Rules.

2.2 Monitor the MSIV actuators for leakage of hydraulic fluid.

2.3 Verify before stroking the MSIV's that the areas around the moving parts are free of obstructions.

2.4 Observe the MSIV's, while they are being opened or closed, for excessive binding.

2.5 Keep personnel away from the MSIV actuators while the valves are being stroked.

2.6 Keep the ball of the MSIV wet while stroking the valve.

2.7 Stroke time for MSIV required is 3 to 5 sec. for optimum performance 3.5 to 4.5 is preferred.

3.0 SPECIAL TEST EQUIPMENT

3.1 Calibrated stop watch

3.2 Misc. Electrical jumpers

3.3 Multimeter for MSIV Hydraulic pump motor current.

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3.4 Jodice Electronic timer or equivalent.

3.5 Pressure tester with 0-200 psig gauge.

4.0 TEST PROCEDURE

4.1 Prerequisites

NOTE: ALARA Personnel shall be notified in advance of the conduct of this test and shall be furnished with a copy of this procedure and the schedule for testing.

4.1.1 Tests

4.1.1.1 Verify that preliminary testing is complete for the equipment listed on the Test Matrix for BIP 1.001, as noted (Attachment 9.10).

4.1.2 There are no special environmental conditions required.

4.1.3 Related Systems Status

4.1.3.1 The following power supplies are energized:

4.1.3.2.3	2NHS-MCC012	_____/_____
4.1.3.2.4	2SCI-PNLA102	_____/_____
4.1.3.2.5	2NHS-MCC011	_____/_____
4.1.3.2.8	2SCA-PNL406	_____/_____
4.1.3.2.15	2VBS*PNLA106	_____/_____
4.1.3.2.16	2VBS*PNLB105	_____/_____
4.1.3.2.17	2VBS*PNLB106	_____/_____
4.1.3.2.18	2VBS*PNLA105	_____/_____
4.1.3.2.19	2SCA-PNL200	_____/_____
4.1.3.2.20	2SCA-PNL201	_____/_____
4.1.3.2.23	2VBS*PNLA103	_____/_____

4.1.4 System Status

4.1.4.1 The following boundary identification packages, BIP's, have been turned over in accordance with SAP-107, "System Turnover":

4.1.4.1.1 BIP 1.001 _____/_____

4.1.4.2 The deficiency lists for the following systems have been reviewed and none of the open items affect the validity of the test.

4.1.4.2.1 Main Steam (BIP 1.001) _____/_____

4.1.4.3 Verify that the system instrumentation listed on the Installed Instrument Calibration List (Attachment 9.1) is within current calibration.

_____/_____

4.1.4.4 Verify that the annunciators listed on the Annunciator List (Attachment 9.4) as required for this test are in service.

_____/_____

4.1.4.5 Verify that the computer points identified on the Computer Point List (Attachment 9.5) as required for this test are in service.

_____/_____

4.1.4.6 Verify that any temporary conditions on the system as listed in the Temporary Modification Log will not affect the validity of the test. Attach a copy of the applicable sections to this procedure.

_____/_____

4.1.4.7 Verify that the initial valve lineup is completed in accordance with Attachment 9.2.

_____/_____

4.1.4.8 Verify that the initial electrical lineup is completed in accordance with Attachment 9.3.

_____/_____

4.1.4.9 Verify that the instrumentation and controls are lined up in accordance with Attachment 9.6.

_____/_____

4.1.4.10 Install the following jumpers to simulate no trips on either logic channel of the MSIV's

4.1.4.10.1 In 2MSS*IPNL90A install the following jumpers:

4.1.4.10.1.1--1-25 (Req. for 4.2.1) _____/_____

4.1.4.10.1.2--68-73 (Req. for 4.2.1) _____/_____

4.1.4.10.2 In 2MSS*IPNL90B install the following jumpers:

4.1.4.10.2.1--1-25 (Req. for 4.2.2) _____/_____

4.1.4.10.2.2--68-73 (Req. for 4.2.2) _____/_____

4.1.4.10.3 In 2MSS*IPNL90C install the following jumpers:

4.1.4.10.3.1--1-25 (Req. for 4.2.3) _____/_____

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4.1.4.10.3.2--68-73 (Req. for 4.2.3) _____ / _____

4.1.4.10.4 In 2MSS*IPNL90D install the following jumpers:

4.1.4.10.4.1--1-25 (Req. for 4.2.4) _____ / _____

4.1.4.10.4.2--68-73 (Req. for 4.2.4) _____ / _____

4.1.4.10.5 In 2MSS*IPNL91A install the following jumpers:

4.1.4.10.5.1--1-25 (Req. for 4.2.5) _____ / _____

4.1.4.10.5.2--68-73 (Req. for 4.2.5) _____ / _____

4.1.4.10.6 In 2MSS*IPNL91B install the following jumpers:

4.1.4.10.6.1--1-25 (Req. for 4.2.6) _____ / _____

4.1.4.10.6.2--68-73 (Req. for 4.2.6) _____ / _____

4.1.4.10.7 In 2MSS*IPNL91C install the following jumpers:

4.1.4.10.7.1--1-25 (Req. for 4.2.7) _____ / _____

4.1.4.10.7.2--68-73 (Req. for 4.2.7) _____ / _____

4.1.4.10.8 In 2MSS*IPNL91D install the following jumpers:

4.1.4.10.8.1--1-25 (Req. for 4.2.8) _____ / _____

4.1.4.10.8.2--68-73 (Req. for 4.2.8) _____ / _____

4.1.5 Other Prerequisites

4.1.5.1 Notify Quality Assurance-Nuclear of the scheduled start of this test.

_____ _____ _____ /

Individual Notified Time / Date

4.1.5.2 Conduct a pretest briefing of the personnel involved in the performance of the test.

_____ /

4.1.5.3 Evaluate the need for any markups not already called for in this procedure. Note in the Test Summary if any markups were required. Attach a copy to this procedure.

_____ (Test Summary Note Number) _____ /

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4.1.5.4 SSS Review of plant status and permission to perform the test.

_____ _____ _____/_____.
SSS Signature Date

4.1.5.5 Verify that the Hydraulic System for each MSIV is filled to normal level with Hydraulic Fluid.

4.1.5.5.1 2MSS*HYV6A (Reg. for 4.2.1) _____/_____

4.1.5.5.2 2MSS*HYV6B (Reg. for 4.2.2) _____/_____

4.1.5.5.3 2MSS*HYV6C (Reg. for 4.2.3) _____/_____

4.1.5.5.4 2MSS*HYV6D (Reg. for 4.2.4) _____/_____

4.1.5.5.5 2MSS*HYV7A (Reg. for 4.2.5) _____/_____

4.1.5.5.6 2MSS*HYV7B (Reg. for 4.2.6) _____/_____

4.1.5.5.7 2MSS*HYV7C (Reg. for 4.2.7) _____/_____

4.1.5.5.8 2MSS*HYV7D (Reg. for 4.2.8) _____/_____

4.2 Procedure

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4.2.1 2MSS*HYV6A

4.2.1.1 At 2CEC*PNL602 open HYV6A by placing its control switch in the open position. Simultaneously start a stopwatch. Verify that HYV6A starts opening.

Stopwatch #_____ Cal. Due _____ _____/_____

4.2.1.2 While HYV6A is opening, record data on Data Sheet 5.1.

_____/_____

4.2.1.3 When HYV6A is fully open stop the stopwatch. Record below the opening time.

_____ _____/_____

4.2.1.4 Using the HYV6A switch, close the valve. Simultaneously start a stopwatch. Record below the closing time.

Stopwatch #_____ Cal. Due _____

Closing Time _____ _____/_____

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4.2.1.5 Open HYV6A using the switch on 2CEC*PNL602. _____/_____

4.2.1.6 Depress on 2CEC*PNL602 the Emergency Trip A pushbutton and verify that HYV6A remains open.
_____/_____

4.2.1.7 Connect a timer to the HYV6A open-close lights as described on Attachment 9.7.
Timer #_____ Cal. Due _____
_____/_____

4.2.1.8 Simultaneously depress both Emergency Trip pushbuttons and verify that HYV6A closes in 3 to 5 seconds.
_____sec _____/_____

4.2.1.9 Open HYV6A using the switch. _____/_____

4.2.1.10 On 2CEC*PNL602 depress the Emergency Trip B pushbutton and verify that HYV6A remains open.
_____/_____

4.2.1.11 Simultaneously depress both Emergency Trip pushbuttons and verify that HYV6A closes in 3 to 5 seconds.
_____sec _____/_____

4.2.1.12 Open HYV6A using its switch. _____/_____

4.2.1.13 Depress the RPS test pushbutton for HYV6A
_____/_____

4.2.1.14 Depress both Emergency Trip pushbuttons and verify the following:

4.2.1.14.1 HYV6A is going partially closed. _____/_____

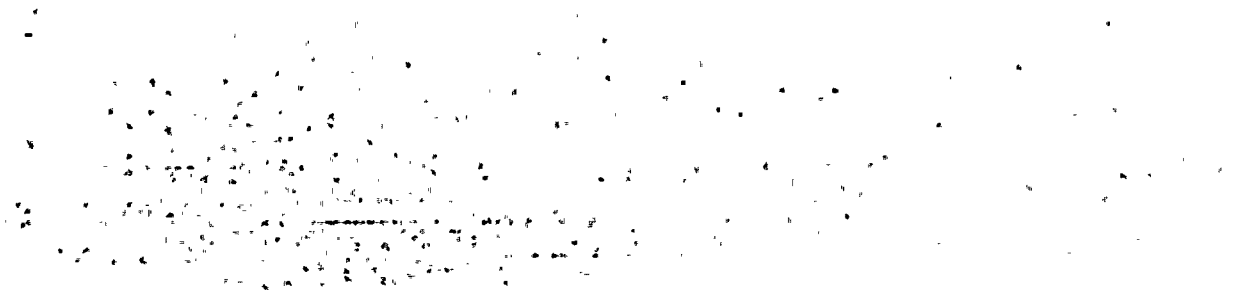
4.2.1.14.2 HYV6A is driven back open. _____/_____

4.2.1.14.3 RPS Test completed, light comes on. _____/_____

4.2.1.15 Depress and hold A Emergency Trip pushbutton, hold for approximately 30 seconds and then depress B pushbutton. Verify that HYV6A closes in 3 to 5 seconds.
_____sec. _____/_____

4.2.1.16 Open HYV6A using its switch. _____/_____

4.2.1.17 Verify that ERF Computer Point MSSZC100 indicates HYV6A open.
_____/_____



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4.2.1.18 Depress the HYV6A in-service test pushbutton. _____/_____

4.2.1.19 At 2MSS*IPNL90A verify that contact M2-T2 of K14B is open. If not, lift the wire from T2.

Contact Open _____/_____ or wire lifted _____/_____

4.2.1.20 At 2MSS*IPNL90A verify that contact M2-T2 of K51B is open. If not, lift the wire from T2.

Contact Open _____/_____ or wire lifted _____/_____

4.2.1.21 At 2MSS*IPNL90A lift jumper from terminal 1. _____/_____

4.2.1.22 At 2MSS*IPNL90A lift jumper from terminal 68 and verify that:

4.2.1.22.1 HYV6A closes in 3 to 5 seconds _____sec. _____/_____

4.2.1.22.2 MSSZC100 indicates HYV6A closed. _____/_____

4.2.1.23 Land jumper at terminal 1. _____/_____

4.2.1.24 Land jumper at terminal 68. _____/_____

4.2.1.25 Land the wires to T2 of K14B and K51B if lifted. _____/_____

4.2.1.26 Disconnect the timer. _____/_____

4.2.2 2MSS*HYV6B

4.2.2.1 At 2CEC*PNL602 open HYV6B by placing its control switch in the open position. Simultaneously start a stopwatch. Verify that HYV6B starts opening.

Stopwatch #_____ Cal. Due _____ _____/_____

4.2.2.2 While HYV6B is opening record data on Data Sheet 5.2. _____/_____

4.2.2.3 When HYV6B is fully open stop the stopwatch. Record below the opening time.

_____ _____/_____

4.2.2.4 Using the HYV6B switch. Close the valve. Simultaneously start a stopwatch. Record below the closing time.

Stopwatch #_____ Cal. Due _____

Closing Time _____ _____/_____

		INITIALS/DATE
4.2.2.5	Open HYV6B using the switch on 2CEC*PNL602.	_____/_____
4.2.2.6	Depress on 2CEC*PNL602 the Emergency Trip A pushbutton and verify that HYV6B remains open.	_____/_____
4.2.2.7	Connect a timer to the HYV6B open-close lights as described on Attachment 9.7. Timer #_____ Cal. Due _____	_____/_____
4.2.2.8	Simultaneously depress both Emergency Trip pushbuttons and verify that HYV6B closes in 3 to 5 seconds. _____sec. _____/_____	
4.2.2.9	Open HYV6B using the switch.	_____/_____
4.2.2.10	On 2CEC*PNL602 depress the Emergency Trip B pushbutton and verify that HYV6B remains open.	_____/_____
4.2.2.11	Simultaneously depress both Emergency Trip pushbuttons and verify that HYV6B closes in 3 to 5 seconds. _____sec. _____/_____	
4.2.2.12	Open HYV6B using its switch.	_____/_____
4.2.2.13	Depress the RPS test pushbutton for HYV6B. Verify that SVE - A & B close.	_____/_____
4.2.2.14	Depress both Emergency Trip pushbuttons and verify the following:	
4.2.2.14.1	HYV6B is going partially closed.	_____/_____
4.2.2.14.2	HYV6B is driven back open.	_____/_____
4.2.2.14.3	RPS Test completed, light comes on.	_____/_____
4.2.2.15	Depress and hold A Emergency Trip pushbutton, hold for approximately 30 seconds and then depress B pushbutton. Verify that HYV6B closes in 3 to 5 seconds. _____sec. _____/_____	
4.2.2.16	Open HYV6B using its switch.	_____/_____
4.2.2.17	Verify that ERF computer point MSSZC101 indicates HYV6B open.	_____/_____
4.2.2.18	Depress the HYV6B RPS test, push button.	_____/_____

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4.2.2.19 At 2MSS*IPNL90B verify that contact M4-T4 of K14B is open. If not lift the wire from T4.

Contact open _____/_____ Or wire lifted _____/_____

4.2.2.20 At 2MSS*IPNL90B verify that contact M4-T4 of K51B is open. If not lift the wire from T4.

Contact open _____/_____ Or wire lifted _____/_____

4.2.2.21 At 2MSS*IPNL90B lift jumper from terminal 1. _____/_____

4.2.2.22 At 2MSS*IPNL90B lift jumper from terminal 68 and verify that:

4.2.2.22.1 HYV6B closes in 3 to 5 seconds. _____/_____
_____ sec.

4.2.2.22.2 MSSZC101 indicates HYV6B closed. _____/_____

4.2.2.23 Land jumper at terminal 1. _____/_____

4.2.2.24 Land jumper at terminal 68. _____/_____

4.2.2.25 Land the wire to T4 of K14B & K51B if lifted. _____/_____

4.2.2.26 Disconnect the timer _____/_____

4.2.3 2MSS*HYV6C

4.2.3.1 At 2CEC*PNL602 open HYV6C by placing its control switch in the open position. Simultaneously start a stopwatch. Verify that HYV6C starts opening.

Stopwatch #_____ Cal. Due _____ _____/_____

4.2.3.2 While HYV6C is opening record data on Data Sheet 5.3.
_____/_____

4.2.3.3 When HYV6C is fully open stop the stopwatch. Record below the opening time.

_____ _____/_____

4.2.3.4 Using the HYV6C switch close the valve. Simultaneously start a stopwatch. Record below the closing time.

Stopwatch #_____ Cal. Due _____

Closing Time _____ _____/_____

		INITIALS/DATE
4.2.3.5	Open HYV6C using the switch on 2CEC*PNL602.	____/____
4.2.3.6	Depress on 2CEC*PNL602 the Emergency Trip A pushbutton and verify that HYV6C remains open.	____/____
4.2.3.7	Connect a timer to the HYV6C open-close lights as described on Attachment 9.7. Timer #_____ Cal. Due _____	____/____
4.2.3.8	Simultaneously depress both Emergency Trip pushbuttons and verify that HYV6C closes in 3 to 5 seconds. _____sec.	____/____
4.2.3.9	Open HYV6C using the switch.	____/____
4.2.3.10	On 2CEC*PNL602 depress the Emergency Trip B pushbutton and verify that HYV6C remains open.	____/____
4.2.3.11	Simultaneously depress both Emergency Trip pushbuttons and verify that HYV6C closes in 3 to 5 seconds. _____sec.	____/____
4.2.3.12	Open HYV6C using its switch.	____/____
4.2.3.13	Depress the RPS test pushbutton for HYV6C. Verify that SVE - A & B close.	____/____
4.2.3.14	Depress both Emergency Trip pushbuttons and verify the following:	
4.2.3.14.1	HYV6C is going partially closed.	____/____
4.2.3.14.2	HYV6C is driven back open.	____/____
4.2.3.14.3	RPS test completed, light comes on.	____/____
4.2.3.15	Depress and hold A Emergency Trip pushbutton, hold for approximately 30 seconds and then depress B pushbutton. Verify that HYV6C closes in 3 to 5 seconds. _____sec.	____/____
4.2.3.16	Open HYV6C using its switch.	____/____
4.2.3.17	Verify that ERF computer point MSSZC102 indicates HYV open.	____/____
4.2.3.18	Depress the HYV6C in-service test pushbutton.	____/____

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4.2.3.19 At 2MSS*IPNL90C verify that contact M2-T2 of K131B is open. If not lift the wire from T2.

Contact Open _____/_____ or wire lifted _____/_____

4.2.3.20 At 2MSS*IPNL90C verify that contact M2-T2 of K127B is open. If not lift the wire from T2.

Contact Open _____/_____ or wire lifted _____/_____

4.2.3.21 At 2MSS*IPNL90C lift jumper from terminal 1. _____/_____

4.2.3.22 At 2MSS*IPNL90C lift jumper from terminal 68 and verify that:

4.2.3.22.1 HYV6C closes in 3 to 5 seconds. _____/_____

4.2.3.22.2 MSSZC102 indicates HYV6C closed. _____/_____

4.2.3.23 Land jumper at terminal 1. _____/_____

4.2.3.24 Land jumper at terminal 68. _____/_____

4.2.3.25 Land the wires to T2 of K131B and K127B if lifted.

_____/_____

4.2.3.26 Disconnect the timer. _____/_____

4.2.4 2MSS*HYV6D

4.2.4.1 At 2CEC*PNL602 open HYV6D by placing its control switch in the open position. Simultaneously start a stopwatch. Verify that HYV6D starts opening.

Stopwatch #_____ Cal. Due _____ _____/_____

4.2.4.2 While HYV6D opening record data on Data Sheet 5.4.

_____/_____

4.2.4.3 When HYV6D is fully open stop the stopwatch. Record below the opening time.

_____ _____/_____

4.2.4.4 Using the HYV6D switch close the valve. Simultaneously start a stopwatch. Record below the closing time.

Stopwatch #_____ Cal. Due _____

Closing Time _____ _____/_____

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4.2.4.5	Open HYV6D using the switch on 2CEC*PNL602.	/
4.2.4.6	Depress on 2CEC*PNL602 the Emergency Trip A pushbutton and verify that HYV6D remains open.	/
4.2.4.7	Connect a timer to the HYV6D open-close lights as described on Attachment 9.7. Timer #_____ Cal. Due _____	/
4.2.4.8	Simultaneously depress both Emergency Trip pushbuttons and verify that HYV6D closes in 3 to 5 seconds. _____sec.	/
4.2.4.9	Open HYV6D using the switch.	/
4.2.4.10	On 2CEC*PNL602 depress the Emergency Trip B pushbutton and verify that HYV6D remains open.	/
4.2.4.11	Simultaneously depress both Emergency Trip pushbuttons and verify that HYV6D closes in 3 to 5 seconds. _____sec.	/
4.2.4.12	Open HYV6D using its switch.	/
4.2.4.13	Depress the RPS test pushbutton for HYV6D. Verify that SVE - A & B close.	/
4.2.4.14	Depress both Emergency Trip pushbuttons and verify the following:	
4.2.4.14.1	HYV6D is going partially closed.	/
4.2.4.14.2	HYV6D is driven back open.	/
4.2.4.14.3	RPS Test completed, light comes on.	/
4.2.4.15	Depress and hold A Emergency Trip pushbutton, hold for approximately 30 seconds and then depress B pushbutton. Verify that HYV6D closes in 3 to 5 seconds. _____sec.	/
4.2.4.16	Open HYV6D using its switch.	/
4.2.4.17	Verify that ERF computer point MSSZC103 indicates HYV6D open.	/

INITIALS/DATE

4.2.4.18 Depress the HYV6D in-service Test Pushbutton. _____/_____

4.2.4.19 At 2MSS*IPNL90D verify that contact M4-T4 of K131B is open. If not lift the wire from T4.

Contact Open _____/_____ or wire lifted _____/_____

4.2.4.20 At 2MSS*IPNL90D verify that contact M4-T4 of K127B is open. If not lift the wire from T.

Contact Open _____/_____ or wire lifted _____/_____

4.2.4.21 At 2MSS*IPNL90D lift jumper from terminal 1.

_____/_____

4.2.4.22 At 2MSS*IPNL90D lift jumper from terminal 68 and verify that:

4.2.4.22.1 HYV6D closes in 3 to 5 seconds. _____/_____
_____ sec.

4.2.4.22.2 MSSZC102 indicates HYV6D closed. _____/_____

4.2.4.23 Land jumper at terminal 1. _____/_____

4.2.4.24 Land jumper at terminal 68. _____/_____

4.2.4.25 Land the wires to T4 of K131B and K127B if lifted.

_____/_____

4.2.4.26 Disconnect the timer. _____/_____

4.2.5 2MSS*HYV7A

4.2.5.1 At 2CEC*PNL602 open HYV7A by placing its control switch in the open position. Simultaneously start a stopwatch. Verify that HYV7A starts opening.

Stopwatch #_____ Cal. Due _____ _____/_____

4.2.5.2 While HYV7A opening record data on Data Sheet 5.5.

_____/_____

4.2.5.3 When HYV7A is fully open stop the stopwatch. Record below the opening time.

_____ _____/_____

INITIALS/DATE

4.2.5.4 Using the HYV7A switch close the valve. Simultaneously start a stopwatch. Record below the closing time.

Stopwatch #_____ Cal. Due _____

Closing Time _____ _____/_____

4.2.5.5 Open HYV7A using the switch on 2CEC*PNL602. _____/_____

4.2.5.6 Depress on 2CEC*PNL602 the Emergency Trip A pushbutton and verify that HYV7A remains open.

_____/_____

4.2.5.7 Connect a timer to the HYV7A open-close lights as described on Attachment 9.7.
Timer #_____ Cal. Due _____ _____/_____

4.2.5.8 Simultaneously depress both Emergency Trip pushbuttons and verify that HYV7A closes in 3 to 5 seconds.
_____sec. _____/_____

4.2.5.9 Open HYV7A using the switch. _____/_____

4.2.5.10 On 2CEC*PNL602 depress the Emergency Trip B pushbutton and verify that HYV7A remains open.

_____/_____

4.2.5.11 Simultaneously depress both Emergency Trip pushbuttons and verify that HYV7A closes in 3 to 5 seconds.
_____sec. _____/_____

4.2.5.12 Open HYV7A using its switch. _____/_____

4.2.5.13 Depress the RPS test pushbutton for HYV7A. Verify that SVE - A & B close.

_____/_____

4.2.5.14 Depress both Emergency Trip pushbuttons and verify the following:

4.2.5.14.1 HYV7A is going partially closed. _____/_____

4.2.5.14.2 HYV7A is driven back open. _____/_____

4.2.5.14.3 RPS Test completed, light comes on. _____/_____

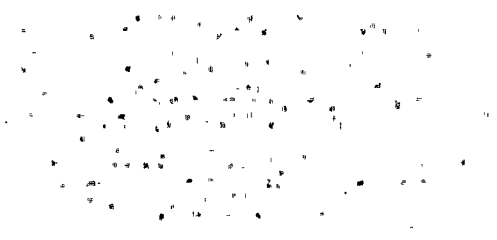
4.2.5.15 Depress and hold A Emergency Trip pushbutton, hold for approximately 30 seconds and then depress B pushbutton. Verify that HYV7A closes in 3 to 5 seconds.
_____sec. _____/_____

		INITIALS/DATE
4.2.5.16	Open HYV7A using its switch.	_____/_____
4.2.5.17	Verify that ERF computer point MSSZC104 indicates HYV7A open.	_____/_____
4.2.5.18	Depress the HYV7A RPS Test Pushbutton.	_____/_____
4.2.5.19	At 2MSS*IPNL91A verify that contact M2-T2 of K14A is open. If not lift the wire from T2.	_____/_____
4.2.5.20	At 2MSS*IPNL91A verify that contact M2-T2 of K51A is open if not lift the wire from T2.	
	Contact open _____/_____ or wire lifted	_____/_____
4.2.5.21	At 2MSS*IPNL91A lift jumper from terminal 1.	_____/_____
4.2.5.22	At 2MSS*IPNL91A lift jumper from terminal 68 and verify that:	
4.2.5.22.1	HYV7A closes in 3 to 5 seconds. _____ sec.	_____/_____
4.2.5.22.2	MSSZC104 indicates HYV7A closed.	_____/_____
4.2.5.23	Land jumper at terminal 1.	_____/_____
4.2.5.24	Land jumper at terminal 68.	_____/_____
4.2.5.25	Land the wires to T2 of K14A and K51A if lifted.	_____/_____
4.2.5.26	Disconnect the timer.	_____/_____
4.2.6	2MSS*HYV7B	
4.2.6.1	At 2CEC*PNL602 open HYV7B by placing its control switch in the open position. Simultaneously start a stopwatch. Verify that HYV7B starts opening.	
	Stopwatch #_____ Cal. Due _____	_____/_____
4.2.6.2	While HYV7B opening record data on Data Sheet 5.6.	_____/_____
4.2.6.3	When HYV7B is fully open stop the stopwatch. Record below the opening time.	
	_____	_____/_____

		INITIALS/DATE
4.2.6.4	Using the HYV7B switch. Close the valve. Simultaneously start a stopwatch. Record below the closing time. Stopwatch #_____ Cal. Due _____ Closing Time _____	_____/_____
4.2.6.5	Open HYV7B using the switch on 2CEC*PNL602.	_____/_____
4.2.6.6	Depress on 2CEC*PNL602 the Emergency Trip A pushbutton and verify that HYV7B remains open.	_____/_____
4.2.6.7	Connect a timer to the HYV7B open-close lights as described on Attachment 9.7. Timer #_____ Cal. Due _____	_____/_____
4.2.6.8	Simultaneously depress both Emergency Trip pushbuttons and verify that HYV7B closes in 3 to 5 seconds. _____sec.	_____/_____
4.2.6.9	Open HYV7B using the switch.	_____/_____
4.2.6.10	On 2CEC*PNL602 depress the Emergency Trip B pushbutton and verify that HYV7B remains open.	_____/_____
4.2.6.11	Simultaneously depress both Emergency Trip pushbuttons and verify that HYV7B closes in 3 to 5 seconds. Attach data on Data Sheets 5.6. _____sec.	_____/_____
4.2.6.12	Open HYV7B using its switch.	_____/_____
4.2.6.13	Depress the RPS test pushbutton for HYV7B. Verify that SVE - A & B close.	_____/_____
4.2.6.14	Depress both Emergency Trip pushbuttons and verify the following:	
4.2.6.14.1	HYV7B is going partially closed.	_____/_____
4.2.6.14.2	HYV7B is driven back open.	_____/_____
4.2.6.14.3	RPS Test completed, light comes on.	_____/_____

INITIALS/DATE

4.2.6.15	Depress and hold A Emergency Trip pushbutton, hold for approximately 30 seconds and then depress B pushbutton. Verify that HYV7B closes in 3 to 5 sec. _____sec.	_____/_____
4.2.6.16	Open HYV7B using its switch.	_____/_____
4.2.6.17	Verify that ERF computer point MSSZC105 indicates HYV7B open.	_____/_____
4.2.6.18	Depress the HYV7B in-service Test Pushbutton.	_____/_____
4.2.6.19	At 2MSS*IPNL91B verify that contact M4-T4 of K14A is open. If not lift the wire from T4.	
	Contact Open _____/_____ or wire lifted	_____/_____
4.2.6.20	At 2MSS*IPNL91B verify that contact M4-T4 of K51A is open. If not lift the wire from T4.	
	Contact Open _____/_____ or wire lifted	_____/_____
4.2.6.21	At 2MSS*IPNL91B lift jumper from terminal 1.	_____/_____
4.2.6.22	At 2MSS*IPNL91B lift jumper from terminal 68 and verify that:	
4.2.6.22.1	HYV7B closes in 3 to 5 seconds. _____ sec.	_____/_____
4.2.6.22.2	MSSZC105 indicates HYV7B closed.	_____/_____
4.2.6.23	Land jumper at terminal 1.	_____/_____
4.2.6.24	Land jumper at terminal 68.	_____/_____
4.2.6.25	Land the wire to T4 of K14A & K51A if lifted.	_____/_____
4.2.6.26	Disconnect the timer.	_____/_____
4.2.7	2MSS*HYV7C	
4.2.7.1	At 2CEC*PNL602 open HYV7C by placing its control switch in the open position. Simultaneously start a stopwatch. Verify that HYV7C starts opening.	
	Stopwatch #_____ Cal. Due _____	_____/_____



INITIALS/DATE

4.2.7.2 While HYV7C opening record data on Data Sheet 5.7. _____/_____

4.2.7.3 When HYV7C is fully open stop the stopwatch. Record below the opening time.

_____ _____/_____

4.2.7.4 Using the HYV7C switch. Close the valve. Simultaneously start a stopwatch. Record below the closing time.

Stopwatch #_____ Cal. Due _____

Closing Time _____ _____/_____

4.2.7.5 Open HYV7C using the switch on 2CEC*PNL602. _____/_____

4.2.7.6 Depress on 2CEC*PNL602 the Emergency Trip A pushbutton and verify that HYV7C remains open.

_____/_____

4.2.7.7 Connect a timer to the HYV7C open-close lights as described on Attachment 9.7.
Timer #_____ Cal. Due _____ _____/_____

4.2.7.8 Simultaneously depress both Emergency Trip pushbuttons and verify that HYV7C closes in 3 to 5 seconds.
_____sec. _____/_____

4.2.7.9 Open HYV7C using the switch. _____/_____

4.2.7.10 On 2CEC*PNL602 depress the Emergency Trip B pushbutton and verify that HYV7C remains open.

_____/_____

4.2.7.11 Simultaneously depress both Emergency Trip pushbuttons and verify that HYV7C closes in 3 to 5 seconds.
_____sec. _____/_____

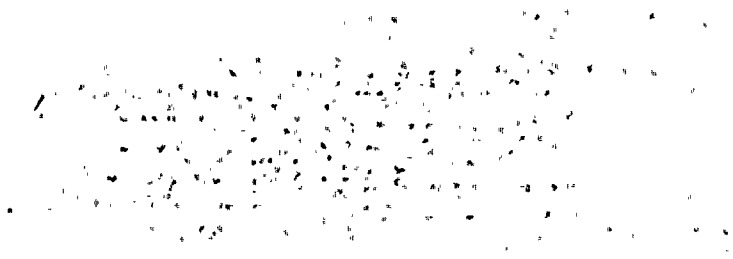
4.2.7.12 Open HYV7C using its switch. _____/_____

4.2.7.13 Depress the RPS test pushbutton for HYV7C. Verify that SVE - A & B close.

_____/_____

4.2.7.14 Depress both Emergency Trip pushbuttons and verify the following:

4.2.7.14.1 HYV7C is going partially closed. _____/_____



		INITIALS/DATE
4.2.7.14.2	HYV7C is driven back open.	/
4.2.7.14.3	RPS Test completed, light comes on.	/
4.2.7.15	Depress and hold A Emergency Trip pushbutton, hold for approximately 30 seconds and then depress B pushbutton. Verify that HYV7C closes in 3 to 5 seconds. _____sec.	/
4.2.7.16	Open HYV7C using its switch.	/
4.2.7.17	Verify that ERF computer point MSSZC108 indicates HYV7C open.	/
4.2.7.18	Depress the HYV7C RPS Test pushbutton.	/
4.2.7.19	If 2MSS*IPNL91C verify that contact M2-T2 of K127A is open. If not lift the wire from T2.	
	Contact Open ___/___ or wire lifted	/
4.2.7.20	At 2MSS*IPNL91C verify that contact M2-T2 of K131A is open. If not lift the wire from T2.	
	Contact Open ___/___ or wire lifted.	/
4.2.7.21	At 2MSS*IPNL91C lift jumper from terminal 1.	/
4.2.7.22	At 2MSS*IPNL91C lift jumper from terminal 68 and verify that:	
4.2.7.22.1	HYV7C closes in 3 to 5 seconds. _____ sec.	/
4.2.7.22.2	MSSZC106 indicates HYV7C closed.	/
4.2.7.23	Land jumper at terminal 1.	/
4.2.7.24	Land jumper at terminal 68.	/
4.2.7.25	Land the wire to T2 of K127A and K131A if lifted.	/
4.2.7.26	Disconnect the timer.	/
4.2.8	2MSS*HYV7D	

INITIALS/DATE

4.2.8.1 At 2CEC*PNL602 open HYV7D by placing its control switch in the open position. Simultaneously start a stopwatch. Verify that HYV7D starts opening..

Stopwatch #_____ Cal. Due _____ _____/_____

4.2.8.2 While HYV7D opening record data on Data Sheet 5.8. _____/_____

4.2.8.3 When HYV7D is fully open stop the stopwatch. Record below the opening time.

_____ _____/_____

4.2.8.4 Using the HYV7D switch close the valve. Simultaneously start a stopwatch. Record below the closing time.

Stopwatch #_____ Cal. Due _____

Closing Time _____ _____/_____

4.2.8.5 Open HYV7D using the switch on 2CEC*PNL602. _____/_____

4.2.8.6 Depress on 2CEC*PNL602 the Emergency Trip A pushbutton and verify that HYV7D remains open. _____/_____

4.2.8.7 Connect a timer to the HYV7D open-close lights as described on Attachment 9.7.
Timer #_____ Cal. Due _____ _____/_____

4.2.8.8 Simultaneously depress both Emergency Trip pushbuttons and verify that HYV7D closes in 3 to 5 seconds.
_____sec. _____/_____

4.2.8.9 Open HYV7D using the switch. _____/_____

4.2.8.10 On 2CEC*PNL602 depress the Emergency Trip B pushbutton and verify that HYV7D remains open. _____/_____

4.2.8.11 Simultaneously depress both Emergency Trip pushbuttons and verify that HYV7D closes in 3 to 5 seconds.
_____sec. _____/_____

4.2.8.12 Open HYV7D using its switch. _____/_____

		INITIALS/DATE
4.2.8.13	Depress the RPS test pushbutton for HYV7D.	_____/_____
4.2.8.14	Depress both Emergency Trip pushbuttons and verify the following:	
4.2.8.14.1	HYV7D is going partially closed.	_____/_____
4.2.8.14.2	HYV7D is driven back open.	_____/_____
4.2.8.14.3	RPS test completed, light comes on.	_____/_____
4.2.8.15	Depress and hold A Emergency Trip pushbutton, hold for approximately 30 seconds and then depress B pushbutton. Verify that HYV7D closes in 3 to 5 sec. _____sec.	_____/_____
4.2.8.16	Open HYV7D using its switch.	_____/_____
4.2.8.17	Verify that ERF computer point MSSZC107 indicates HYV7D open.	_____/_____
4.2.8.18	Depress the HYV7D in-service Test Pushbutton.	_____/_____
4.2.8.19	At 2MSS*IPNL91D verify that contact M4-T4 of K131A is open. If not lift the wire from T4.	
	Contact Open _____/_____ or wire lifted	_____/_____
4.2.8.20	At 2MSS*IPNL91D verify that contact M4-T4 of K127A is open. If not lift the wire from T4.	
	Contact Open _____/_____ of wire lifted	_____/_____
4.2.8.21	At 2MSS*IPNL91D lift jumper from terminal 1.	_____/_____
4.2.8.22	At 2MSS*IPNL91D lift jumper from terminal 68 and verify that:	
4.2.8.22.1	HYV7D closes in 3 to 5 seconds. _____ sec.	_____/_____
4.2.8.22.2	MSSZC107 indicates HYV7D closed.	_____/_____
4.2.8.23	Land jumper at terminal 1.	_____/_____
4.2.8.24	Land jumper at terminal 68.	_____/_____
4.2.8.25	Land the wire to T4 of K127A & K131A if lifted.	_____/_____
4.2.8.26	Disconnect the timer.	_____/_____

INITIALS/DATE

4.2.9 MSIV Manual Isolation

4.2.9.1 Open the MSIV's

	INITIALS/DATE		INITIALS/DATE
2MSS*HYV6A	_____/____	2MSS*HYV7A	_____/____
2MSS*HYV6B	_____/____	2MSS*HYV7B	_____/____
2MSS*HYV6C	_____/____	2MSS*HYV7C	_____/____
2MSS*HYV6D	_____/____	2MSS*HYV7D	_____/____

4.2.9.2 Place the MSIV and Drain V manual isolation buttons B22H-525A and B (PNL602) in the armed position. _____/____

4.2.9.3 Depress and release push button B22H-525A. _____/____

4.2.9.4 Depress and release push button B22H-525B. _____/____

4.2.9.5 Verify that all the MSIV's go close. _____/____

4.2.9.6 Return B22H-525A and B to the disarmed position. _____/____

4.2.9.7 Depress and release the isolation reset button B22H-532 and 533 (PNL 602). _____/____

4.2.9.8 Open the MSIV's. _____/____

4.2.9.9 Place B22H-525A and D PNL602 in the armed position. _____/____

4.2.9.10 Depress and release pushbutton B22H-525A. _____/____

4.2.9.11 Depress and release pushbutton B22H-525D. _____/____

4.2.9.12 Verify that all the MSIV's go close. _____/____

4.2.9.13 Return B22H-525A and D to the disarmed position. _____/____

4.2.9.14 Depress and release the isolation reset buttons B22H-532 and 533 (PNL 602). _____/____

4.2.9.15 Open the MSIV's. _____/____

4.2.9.16 Place B22H-525B and C (PNL602) in the armed position. _____/____

4.2.9.17 Depress and release pushbutton B22H-525B. _____/____

4.2.9.18 Depress and release pushbutton B22H-525C. _____/____

		INITIALS/DATE
4.2.9.19	Verify that all the MSIV's go close.	_____/____
4.2.9.20	Return B22H-525B and C to the disarmed position.	_____/____
4.2.9.21	Depress and release the isolation reset button B22H-532 and 533 (PNL602).	_____/____
4.2.9.22	Open the MSIV's	_____/____
4.2.9.23	Place B22H-525C and D (PNL602) in the armed position.	_____/____
4.2.9.24	Depress and release push button B22H-525C.	_____/____
4.2.9.25	Depress and release push button B22H-525D.	_____/____
4.2.9.26	Verify that all the MSIV's go close.	_____/____
4.2.9.27	Return B22H-525C and D to the disarmed position.	_____/____
4.2.9.28	Depress and release the isolation reset buttons B22H-532 and 533 (PNL602).	_____/____
4.2.10	With the system in a normal mode walkdown, the system and key a two-way radio in the vicinity of the system's electrical control components outside of the control room. Observe and record in the test summary the results of the walkdown and/or any equipment operation due to the RF signal. This keying should be done at what would be normal operating/maintenance positions and not by placing the radio directly on or adjacent to the equipment or component.	_____/____

DATA SHEET 5.1
OPENING DATA

2MSS*HYV6A

AMPS READ WITH CLAMP-ON AMMETER ON HYDRAULIC PUMP

_____ AMPS

PROBE # _____ CAL DUE _____

HYDRAULIC PRESSURE READ ON COMPUTER

MSSPA08 _____ PSIG

_____/_____

DATA SHEET 5.2

2MSS*HYV6B OPENING DATA

AMPS READ WITH CLAMP-ON AMMETER ON HYDRAULIC PUMP

_____ AMPS

PROBE # _____ CAL DUE _____

HYDRAULIC PRESSURE READ ON COMPUTER

MSSPA09 _____ PSIG

_____/_____

DATA SHEET 5.3

	OPENING DATA
2MSS*HYV6C	

AMPS READ WITH CLAMP-ON AMMETER ON HYDRAULIC PUMP

_____ AMPS

PROBE # _____ CAL DUE _____

HYDRAULIC PRESSURE READ ON COMPUTER

MSSPA010 _____ PSIG

_____/_____

DATA SHEET 5.4

2MSS*HYV6D	OPENING DATA

AMPS READ WITH CLAMP-ON AMMETER ON HYDRAULIC PUMP

_____ AMPS

PROBE # _____ CAL DUE _____

HYDRAULIC PRESSURE READ ON COMPUTER

MSSPA011 _____ PSIG

_____/_____

DATA SHEET 5.5

2MSS*HYV7A	OPENING DATA

AMPS READ WITH CLAMP-ON AMMETER ON HYDRAULIC PUMP

_____ AMPS

PROBE # _____ CAL DUE _____

HYDRAULIC PRESSURE READ ON COMPUTER

MSSPA012 _____ PSIG

_____/_____

DATA SHEET 5.6

2MSS*HYV7B	OPENING DATA

AMPS READ WITH CLAMP-ON AMMETER ON HYDRAULIC PUMP

_____ AMPS

PROBE # _____ CAL DUE _____

HYDRAULIC PRESSURE READ ON COMPUTER

MSSPA013 _____ PSIG

_____/_____

DATA SHEET 5.7

2MSS*HYV7C OPENING DATA

AMPS READ WITH CLAMP-ON AMMETER ON HYDRAULIC PUMP

_____ AMPS

PROBE # _____ CAL DUE _____

HYDRAULIC PRESSURE READ ON COMPUTER

MSSPA014 _____ PSIG

_____/_____

DATA SHEET 5.8

	OPENING DATA
2MSS*HYV7D	

AMPS READ WITH CLAMP-ON AMMETER ON HYDRAULIC PUMP

_____ AMPS

PROBE # _____ CAL DUE _____

HYDRAULIC PRESSURE READ ON COMPUTER

MSSPA015 _____ PSIG

_____/_____

Section 6.0

Procedure Title: Main an Auxiliary Steam Pre-op
Procedure Number N2-POT-1

Page _____ of _____

EXCEPTION SHEET

EXCEPT. NO.	PROC. STEP	DESCRIPTION	REASON AND DISPOSITION	AUTHORIZATION LEVEL III/DATE	AUTHORIZATION SSS/DATE (IF POSSIBLE)

7.0 Acceptance Criteria

7.1 The MSIV's will fast close in 3 to 5 seconds: (Ref: FSAR Table 6-2-56)

7.1.1 HYV6A (4.2.1.8, 11, 15)

7.1.2 HYV6B (4.2.2.8, 11, 15)

7.1.3 HYV6C (4.2.3.8, 11, 15)

7.1.4 HYV6D (4.2.4.8, 11, 15)

7.1.5 HYV7A (4.2.5.8, 11, 15)

7.1.6 HYV7B (4.2.6.8, 11, 15)

7.1.7 HYV7C (4.2.7.8, 11, 15)

7.1.8 HYV7D (4.2.8.8, 11, 15)

7.2 One emergency trip pushbutton depressed will not trip the MSIV: (Ref: 5.360.5015E)

7.2.1 HYV6A (4.2.5.1.6, 10)

7.2.2 HYV6B (4.2.5.2.6, 10)

7.2.3 HYV6C (4.2.5.3.6, 10)

7.2.4 HYV6D (4.2.5.4.6, 10)

7.2.5 HYV7A (4.2.5.5.6, 10)

7.2.6 HYV7B (4.2.5.6.6, 10)

7.2.7 HYV7C (4.2.5.7.6, 10)

7.2.8 HYV7D (4.2.5.8.6, 10)

7.3 Each MSIV can be tested in RPS test without tripping: (Ref: 5.360.5015E)

7.3.1 HYV6A (4.2.5.1.14, 19)

7.3.2 HYV6B (4.2.5.2.14, 19)

7.3.3 HYV6C (4.2.6.3.14, 19)

7.3.4 HYV6D (4.2.5.4.14, 19)

7.3.5 HYV7A (4.2.5.5.14, 19)

7.3.6 HYV7B (4.2.5.6.14, 19)

7.3.7 HYV7C (4.2.5.7.14, 19)

7.3.8 HYV7D (4.2.5.8.14, 19)

7.4 The MSIV's will fast close in 3 to 5 seconds if during a RPS or in Service Test a Containment Isolation Signal is received: (Ref., VI/Inst 5.360-5015C)

7.4.1 2MSS*HYV6A (4.2.5.1-27.1, 33)
7.4.2 2MSS*HYV6B (4.2.5.2-27.1, 33)
7.4.3 2MSS*HYV6C (4.2.5.3-27.1, 33)
7.4.4 2MSS*HYV6D (4.2.5.4-27.1, 33)
7.4.5 2MSS*HYV7A (4.2.5.5-27.1, 33)
7.4.6 2MSS*HYV7B (4.2.5.6-27.1, 33)
7.4.7 2MSS*HYV7C (4.2.5.7-27.1, 33)
7.4.8 2MSS*HYV7D (4.2.5.8-27.1, 33)

Initials/Date

8.0 System Restoration

8.1 Verify that the LS14 & LS15 limit switches for each MSIV have been set in accordance with EE. GENE.006 and vendor's information. Attach data to POT Package:

8.1.1 HYV6A _____/_____

8.1.2 HYV6B _____/_____

8.1.3 HYV6C _____/_____

8.1.4 HYV6D _____/_____

8.1.5 HYV7A _____/_____

8.1.6 HYV7B _____/_____

8.1.7 HYV7C _____/_____

8.1.8 HYV7D _____/_____

8.2 Restore the system as directed by the test engineer and concurred by the SSS to support testing and/or operation.

_____/_____

Attachment 9.1
Page 1 of 1
Procedure Step 4.1.4.3

INSTALLED INSTRUMENT CALIBRATION LIST

Device Number	Latest Cal. Date	Calibration Interval	Verified by Initials/Date
LOOP 2MSS-31A		18 mo.	
2MSS-31B		18 mo.	
2MSS-31C		18 mo.	
2MSS-31D		18 mo.	
2MSS-32A		18 mo.	
2MSS-32B		18 mo.	
2MSS-32C		18 mo.	
2MSS-32D		18 mo.	
2MSS-60A		18 mo.	
2MSS-60B		18 mo.	
2MSS-60C		18 mo.	
2MSS-60D		18 mo.	
2MSS-61A		18 mo.	
2MSS-61B		18 mo.	
2MSS-61C		18 mo.	
2MSS-61D		18 mo.	
2MSS-62A		18 mo.	
2MSS-62B		18 mo.	
2MSS-62C		18 mo.	
2MSS-62D		18 mo.	
2MSS-63A		18 mo.	
2MSS-63B		18 mo.	
2MSS-63C		18 mo.	
2MSS-63D		18 mo.	

Attachment 9.2
Page 1 of 1

Procedure Step 4.1.4.7

Position codes:
O = Open
C = Closed
V= Throttled
L = Locked
T = Tagged (Danger)

VALVE LINE-UP SHEET

Valve No.	Description	Required Position	Actual Position	Initial & Date	Remarks
2MSS*HYV6A	Inboard Isol. Vlv	C			
2MSS*HYV6B	Inboard Isol. Vlv	C			
2MSS*HYV6C	Inboard Isol. Vlv	C			
2MSS*HYV6D	Inboard Isol. Vlv	C			
2MSS*HYV7A	Outboard Isol. Vlv	C			
2MSS*HYV7B	Outboard Isol. Vlv	C			
2MSS*HYV7C	Outboard Isol. Vlv	C			
2MSS*HYV7D	Outboard Isol. Vlv	C			

Attachment 9.3
Page 2 of 6

Procedure Step 4.1.4.8

Position codes:
O = Open
C = Closed
T = Tagged (Danger)
L = Locked
R = Removed
RO = Racked-Out
RI = Racked-In

ELECTRICAL LINE-UP SHEET

Component Number	Component Description	Power Supply Bus Number	Power Supply Cubicle/ Breaker	Location	Required Position	Actual Position	Initials & Date	Remarks
2MSS*HYV6A	Ch. 1 Control Circuit	2VBS*PNLB106	1	ABS 240'	C			
2MSS*HYV6B	Ch. 1 Control Circuit	2VBS*PNLB106	2	ABS 240'	C			
2MSS*HYV6C	Ch. 1 Control Circuit	2VBS*PNLB106	3	ABS 240'	C			
2MSS*HYV6D	Ch. 1 Control Circuit	2VBS*PNLB106	4	ABS 240'	C			
2MSS*HYV7A	Ch. 1 Control Circuit	2VBS*PNLA105	1	ABM 240'	C			
2MSS*HYV7B	Ch. 1 Control Circuit	2VBS*PNLA105	2	ABM 240'	C			
2MSS*HYV7C	Ch. 1 Control Circuit	2VBS*PNLA105	3	ABM 240'	C			
2MSS*HYV7D	Ch. 1 Control Circuit	2VBS*PNLA105	4	ABM 240'	C			
2MSS*HYV6A	Non-Divisional Solenoid Supply	2SCA-PNL200	27	RB 240'	C			

Attachment 9.3
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Procedure Step 4.1.4.8

Position codes:
O = Open
C = Closed
T = Tagged (Danger)
L = Locked
R = Removed
RO = Racked-Out
RI = Racked-In

ELECTRICAL LINE-UP SHEET

Component Number	Component Description	Power Supply Bus Number	Power Supply Cubicle/ Breaker	Location	Required Position	Actual Position	Initials & Date	Remarks
2MSS*HYV6B	Non-Divisional Solenoid Supply	2SCA-PNL200	2	RB 240'	C			
2MSS*HYV6C	Non-Divisional Solenoid Supply	2SCA-PNL200	29	RB 240'	C			
2MSS*HYV6D	Non-Divisional Solenoid Supply	2SCA-PNL200	30	RB 240'	C			
2MSS*HYV7A	Non-Divisional Solenoid Supply	2SCA-PNL201	22	RB 289'	C			
2MSS*HYV7B	Non-Divisional Solenoid Supply	2SCA-PNL201	23	RB 289'	C			
2MSS*HYV7C	Non-Divisional Solenoid Supply	2SCA-PNL201	24	RB 289'	C			
2MSS*HYV7D	Non-Divisional Solenoid Supply	2SCA-PNL201	25	RB 289'	C			

Attachment 9.3
Page 4 of 6

Procedure Step 4.1.4.8

Position codes:
O = Open
C = Closed
T = Tagged (Danger)
L = Locked
R = Removed
RO = Racked-Out
RI = Racked-In

ELECTRICAL LINE-UP SHEET

Component Number	Component Description	Power Supply Bus Number	Power Supply Cubicle/ Breaker	Required Location	Actual Position	Initials & Date	Remarks
2MSS*HYV6A	Hydr. Pump P1A	2NHS-MCC012	2D	RB 261'	C		
2MSS*HYV6B	Hydr. Pump P1B	2NHS-MCC012	3C	RB 261'	C		
2MSS*HYV6C	Hydr. Pump P1C	2NHS-MCC012	3D	RB 261'	C		
2MSS*HYV6D	Hydr. Pump P1D	2NHS-MCC012	4B	RB 261'	C		
2MSS*HYV7A	Hydr. Pump P2A	2NHS-MCC011	4D	RB 261'	C		
2MSS*HYV7B	Hydr. Pump P2B	2NHS-MCC011	5C	RB 261'	C		
2MSS*HYV7C	Hydr. Pump P2C	2NHS-MCC011	5D	RB 261'	C		
2MSS*HYV7D	Hydr. Pump P2D	2NHS-MCC011	5E	RB 261'	C		
2MSS*HYV7A-D	Off Normal Status	2VBS*PNLA105	7	ABN 240'	C		

Attachment 9.3
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Procedure Step 4.1.4.8

Position codes:
O = Open
C = Closed
T = Tagged (Danger)
L = Locked
R = Removed
RO = Racked-Out
RI = Racked-In

ELECTRICAL LINE-UP SHEET

Component Number	Component Description	Power Supply Bus Number	Power Supply Cubicle/ Breaker	Location	Required Position	Actual Position	Initials & Date	Remarks
2MSS*HYV6A,7A	CKT 2RPSB06	2VBS*PNLB105	6	ABN 240'	C			
2MSS*HYV6B,7B	CKT 2RPSA06	2VBS*PNLA106	6	ABS 240'	C			
2MSS*HYV6C,7C	CKT 2RPSD06	2VBS*PNLB110	1	Control Bldg. EL. 237'	C			
2MSS*HYV6D,7D	CKT 2RPSC06	2VBS*PNLA110	1	Control Bldg. EL. 237'	C			
2MSS*HYV6A,7A	CKT 2RPSA01	2VBS*PNLA103	14	Control Rm. Div. I Area EL. 306'	C			
2MSS*HYV6B,7B	CKT 2RPSB01	2VBS*PNLB103	14	Control Rm. Div. II Area EL. 306'	C			
2MSS*HYV6C,7C	CKT 2RPSC01	2VBS*PNLA104	13	Control Rm. Div. II EL. 306'	C			
2MSS*HYV6D,7D	CKT 2RPSD01	2VBS*PNLB104	13	Control Rm. Div. I Area EL. 306'	C			
2MSS*HYV6A-D	Off Normal Status	2VBS*PNLB106	7	ABS 240'	C			

Attachment 9.4
Page 1 of 1

Procedure Step 4.1.4.4

ANNUNCIATOR LIST

Location/ Number	Description (Name)	Checkout Procedure (Note 1)
602215	Main Steam Isol Valves trouble	EE.GENE.006 2MSSN49
602224	MSIV 6A-D Motor Overload	EE.GENE.006 2MSS*HYV6A,B,C,D
602218	MSIV 7 A - D Motor Overload	EE.GENE.006 2MSS*HYV7A,B,C,D

NOTE: 1 Record Generic Procedure or Loop Calibration Report Number

* Indicates those that are verified in this procedure and which have their checkout complete.

Attachment 9.5
Page 1 of 4

Procedure Step 4.1.4.5

COMPUTER POINT LIST

CP Ident. Number	Description (Name)	Calibration/Checkout Procedure (Note 1)
MSSPA08*	MSIV 6A Actr Hyd Pres	IL2MSS-043
MSSPA09*	MSIV 6B Actr Hydr Pres	IL2MSS-044
MSSPA10*	MSIV 6C Actr Hydr Pres	IL2MSS-045
MSSPA11*	MSIV 6D Actr Hydr Pres	IL2MSS-046
MSSPA12*	MSIV 7A Actr Hydr Pres	IL2MSS-047
MSSPA13*	MSIV 7B Actr Hydr Pres	IL2MSS-048
MSSPA14*	MSIV 7C Actr Hydr Pres	IL2MSS-049
MSSPA15*	MSIV 7D Actr Hydr Pres	IL2MSS-050
MSSPL01*	L-L 6A Actr Hydr Pres	EE.GENE.006 2MSSN49
MSSPL02*	L-L 6B Actr Hydr Press	EE.GENE.006 2MSSN49
MSSPL03*	L-L 6C Actr Hydr Press	EE.GENE.006 2MSSN49

Procedure Step 4.1.4.5

COMPUTER POINT LIST

CP Ident. Number	Description (Name)	Calibration/Checkout Procedure (Note 1)
MSSPL04*	L-L 6D Actr Hydr Press	EE.GENE.006 2MSSN49
~~MSSPL04*~~	~~L-L 6D Actr Hydr Press~~	~~EE.GENE.006 2MSSN49~~
MSSPL05*	L-L 7A Actr Hydr Press	EE.GENE.006 2MSSN49
MSSPL06*	L-L 7B Actr Hyar Press	EE.GENE.006 2MSSN49
MSSPL07*	L-L 7C Actr Hydr Press	EE.GENE.006 2MSSN49
MSSPL08*	L-L 7D Actr Hydr Press	EE.GENE.006 2MSSN49

NOTE: 1 Record Generic Procedure or Loop Calibration Report Number.

* Indicates those points which are verified in this procedure and which must have their cal/checkout complete.

Procedure Step 4.1.4.5

COMPUTER POINT LIST

CP Ident. Number	Description (Name)	Calibration/Checkout Procedure (Note 1)
MSSTC10	MSIV Motor Overload 6A-D	EE.GENE.006 2MSS*HYV6A,B,C,D
MSSTC11	MSIV Motor Overload 7A-D	EE.GENE.006 2MSS*HYV7A,B,C,D
MSSZC100*	MN ST L-A-INBD MSIV	EE.GENE.006 2MSS*HYV6A
MSSZC101*	MN ST L-B-INBD MSIV	EE.GENE.006 2MSS*HYV6B
MSSZC102*	MN ST L-C-INBD MSIV	EE.GENE.006 2MSS*HYV6C

NOTE: 1 Record Generic Procedure or Loop Calibration Report Number.

* Indicates those points which are verified in this procedure and which must have their cal/checkout complete.

Procedure Step 4.1.4.5

COMPUTER POINT LIST

CP Ident. Number	Description (Name)	Calibration/Checkout Procedure (Note 1)
MSSZC103*	MN ST L-D-INBD MSIV	EE.GENE.006 2MSS*HYV6D
MSSZC104*	MN ST L-A-OUTBD MSIV	EE.GENE.006 2MSS*HYV7A
MSSZC105*	MN ST L-B-OUTBD MSIV	EE.GENE.006 2MSS*HYV7B
MSSZC106*	MN ST L-C-OUTBD MSIV	EE.GENE.006 2MSS*HYV7C
MSSZC107*	MN ST L-D-OUTBD MSIV	EE.GENE.006 2MSS*HYV7D

NOTE: 1 Record Generic Procedure or Loop Calibration Report Number.

* Indicates those points which are verified in this procedure and which must have their cal/checkout complete.

TEMPORARY MODIFICATIONS

These instructions pertain to the timer that will be connected to the MSIV Green and Red Lights so that the closing cycle can be timed. The start pair of wires will be connected to the green light to start the timer when the green light energizes which is right after the MSIV comes off the open position. The stop pair of wires will be connected to the red light to stop the timer when the red light de-energizes which is right before the valve is completely closed. All connections are in 2CEC*PNL602. Connect the start and stop wires as indicated below:

Procedure Step	Instructions	Initial/Date
4.2.1.7	Start: CC-27 + CC-29	
	Stop : CC-27 + CC-28	
4.2.2.7	Start: CC-69 + CC-71	
	Stop : CC-69 + CC-70	
4.2.3.7	Start: CC-48 + CC-50	
	Stop : CC-48 + CC-49	
4.2.4.7	Start: CC-90 + CC-92	
	Stop : CC-90 + CC-91	
4.2.5.7	Start: JJJ-5 + JJJ-7	
	Stop : JJJ-5 + JJJ-6	
4.2.6.7	Start: JJJ-17 + JJJ-19	
	Stop : JJJ-17 + JJJ-18	

Attachment 9.7

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Procedure Step	Instructions	Initial/Date
4.2.7.7	Start: JJJ-29 + JJJ-31	
	Stop : JJJ-29 + JJJ-30	
4.2.8.7	Start: JJJ-41 + JJJ-43	
	Stop : JJJ-41 + JJJ-42	

Attachment 9.8

Page 1 of 1

SIGNATURE/INITIALS SHEET

PRINTED NAME	SIGNATURE	INITIALS

NIAGARA MOHAWK POWER CORP.

TEST SUMMARY

MAIN STEAM ISOLATION VALVES
N2-POT-1-2

Page _____
of _____

Date _____
Project NMP2

REMARKS

Attachment 9.3
Page 1 of 6

Procedure Step 4.1.4.8

Position codes:
O = Open
C = Closed
T = Tagged (Danger)
L = Locked
R = Removed
RO = Racked-Out
RI = Racked-In

ELECTRICAL LINE-UP SHEET

Component Number	Component Description	Power Supply Bus Number	Power Supply Cubicle/ Breaker	Location	Required Position	Actual Position	Initials & Date	Remarks
2MSS*N49	MSIV Hydr PP Aux Cont Ckt	2SCI-PNLA102	4	Cont. Rm Div. II Area	C			
2MSS*HYV6A	Ch. 2 Control Circuit	2VBS*PNLA106	1	ABS 240'	C			
2MSS*HYV6B	Ch. 2 Contorl Circuit	2VBS*PNLA106	2	ABS 240'	C			
2MSS*HYV6C	Ch. 2 Control Circuit	2VBS*PNLA106	3	ABS 240'	C			
2MSS*HYV6D	Ch. 2 Control Circuit	2VBS*PNLA106	4	ABS 240'	C			
2MSS*HYV7A	Ch. 2 Control Circuit	2VBS*PNLB105	1	ABN 240'	C			
2MSS*HYV7B	Ch. 2 Control Circuit	2VBS*PNLB105	2	ABN 240'	C			
2MSS*HYV7C	Ch. 2 Control Circuit	2VBS*PNLB105	3	ABN 240'	C			
2MSS*HYV7D	Ch. 2 Control Circuit	2VBS*PNLB105	4	ABN 240'	C			

Attachment 9.3
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Procedure Step 4.1.4.8

Position codes:
O = Open
C = Closed
T = Tagged (Danger)
L = Locked
R = Removed
RO = Racked-Out
RI = Racked-In

ELECTRICAL LINE-UP SHEET

Component Number	Component Description	Power Supply: Bus Number	Power Supply: Cubicle/ Breaker	Required Position	Actual Position	Initials & Date	Remarks
2MSS*HYV6A	Jockey Pump ~~P-3A~~ P-3A	2SCA-PNL406	32	C			
2MSS*HYV6B	Jockey Pump P-3B	2SCA-PNL406	33	C			
2MSS*HYV6C	Jockey Pump P-3C	2SCA-PNL406	34	C			
2MSS*HYV6D	Jockey Pump P-3D	2SCA-PNL406	35	C			
2MSS*HYV7A	Jockey Pump P-4A	2SCA-PNL406	36	C			
2MSS*HYV7B	Jockey Pump P-4B	2SCA-PNL406	37	C			
2MSS*HYV7C	Jockey Pump P-4C	2SCA-PNL406	38	C			
2MSS*HYV7D	Jockey Pump P-4D	2SCA-PNL406	39	C			

Procedure S[illegible].1.4.9

Codes:
O = Open
C = Closed
T = Tagged (Danger)
L = Locked
R = Removed
RO = Racked-Out
RI = Racked-In
NAC= Normal After Close

INSTRUMENTATION/CONTROLS LINE-UP SHEET

Device No.	Description/Function	Contr. SW/ Controlled Required	Setting Act.	Instrument Valve Positions Required	Actual	Initial & Date
S				Is/H L B TT	Is/H L B TT	
2MSS-P560A	MSIV 6A P.P. CONT.	N/A	N/A	O		
2MSS-P560B	MSIV 6B P.P. CONT.	N/A	N/A	O		
2MSS-P560C	MSIV 6C P.P. CONT.	N/A	N/A	O		
2MSS-P560D	MSIV 6D P.P. CONT.	N/A	N/A	O		
2MSS-P561A	MSIV 7A P.P. CONT.	N/A	N/A	O		
2MSS-P561B	MSIV 7B P.P. CONT.	N/A	N/A	O		
2MSS-P561C	MSIV 7C P.P. CONT.	N/A	N/A	O		
2MSS-P561D	MSIV 7D P.P. CONT.	N/A	N/A	O		
2MSS-P562A	MSIV 6A P.P. CONT.	N/A	N/A	O		
2MSS-P562B	MSIV 6B P.P. CONT.	N/A	N/A	O		
2MSS-P562C	MSIV 6C P.P. CONT.	N/A	N/A	O		
2MSS-P562D	MSIV 6D P.P. CONT.	N/A	N/A	O		
2MSS-P563A	MSIV 7A P.P. CONT.	N/A	N/A	O		
2MSS-P563B	MSIV 7B P.P. CONT.	N/A	N/A	O		
2MSS-P563C	MSIV 7C P.P. CONT.	N/A	N/A	O		
2MSS-P563D	MSIV 7D P.P. CONT.	N/A	N/A	O		

S

TABLE 14.2-227

MAIN STEAM ISOLATION VALVES FUNCTIONAL TESTS

Startup Test (SUT-25A)

Test Objectives

1. To functionally check the MSIVs for proper operation at selected power levels.

2. To determine isolation valve closure time at rated conditions.

3. To determine maximum power at which a single valve closure can be made without scram.

Prerequisites

The preoperational tests have been completed, and the SORC has reviewed and approved the test procedures and initiation of testing. Instrumentation has been checked or calibrated as appropriate.

Test Procedure

At 5 percent and greater power levels, individual fast closure of each MSIV will be performed to verify their functional performance and to determine closure times. The times to be determined are: a) the time from the initiation signal to deenergize the solenoids until the valve is stroked from the open position to completely closed (valve stroke complete) (t_{SOL}), and b) the valve stroke time (t_S). Time t_S equals the interval from when the valve starts to move from full open until it is 100 percent closed (valve stroke complete). 28

To determine the maximum power level at which full individual closures can be performed without a scram, the first MSIV actuations will be performed between 40- and 55-percent power. The results of the tests at 40- to 55-percent power will be used to extrapolate to the next power test point, which will be between 60- and 85-percent power. The test results will ultimately be used to determine the maximum power test condition that has ample margin to scram.

TABLE 14.2-227 (Cont)

The following tests are performed:

Action	Test Conditions
1. Individually close each MSIV, fast mode.	a. Heatup and between TC-1 and -3, close each MSIV to measure valve timing only. b. Recirculation system in POS mode; other systems in NORM mode.
2. Close fastest MSIV, fast mode.	a. Close one valve between 40 and 55 percent power (TC-2 or 3) and again between 60 and 85 percent power (TC-3 or 5). Perform third test at chosen maximum power condition for all subsequent surveillance tests. b. Recirculation system in POS mode at TC-2 and 3 and FLX mode at TC-5. Other systems in NORM mode.

Acceptance Criteria

Level 1:

The MSIV stroke time (t_s) shall be no faster than 3.0 seconds (average of the fastest valve in each steam line), and for any individual valve 2.5 seconds $\leq t \leq 5$ seconds. Total effective closure time for any individual MSIV shall be t_{sol} plus the maximum instrumentation delay time and shall be $\leq$ 5.5 seconds. 25 | | 28

TABLE 14.2-227 (Cont)

Level 2:

1. The reactor shall not scram. The peak neutron flux must be at least 7.5 percent below the trip setting. The peak vessel pressure must remain at least 10 percent psi below the high-pressure scam setting. The peak simulated heat flux must be 5 percent less than its trip point.

2. The reactor shall not isolate. The peak-steam flow on each line must remain 10 percent below the high-steam flow isolation trip setting. 22

TABLE 14.2-228

FULL REACTOR ISOLATION

Startup Test (SUT-25B)

Test Objective

To determine the reactor transient behavior that results from the simultaneous full closure of all MSIVs.

Prerequisites

The preoperational tests have been completed; the SORC has reviewed and approved the test procedures and initiation of testing. Instrumentation has been checked or calibrated as appropriate.

Test Procedure

A test of the simultaneous full closure of all MSIVs is performed at ≥95 percent of rated thermal power. Correct performance of the RCIC, HPCS, and relief valves is shown. Reactor process variables are monitored to determine the transient behavior of the system during and following main steam line isolation.

The following test is performed:

Action	Test Conditions
Close all MSIVs (SUT-77 and SUT-5 are to be done in conjunction with this test).	a. Perform at TC-6. b. All systems in NORM mode.

28

Acceptance Criteria

Level 1:

1. Reactor must scram to limit the severity of the neutron flux and simulated fuel surface heat flux transient.

2. Feedwater system settings must prevent flooding of the steam lines.

3. The recorded MSIV full closure times must meet the previously stated timing specifications (SUT-25A).

TABLE 14.2-228 (Cont)

4. The positive change in vessel dome pressure occurring within the first 30 sec after a closure of all MSIV valves must not exceed the Level 2 criteria by more than 25 psi. The positive change in simulated heat flux must not exceed the Level 2 criteria by more than 2 percent of the rated value.

22

Level 2:

1. The positive change in vessel dome pressure and simulated flux occurring within the first 30 sec after the closure of all MSIV valves must not exceed the BOL predicted values. Predicted values will be referenced to actual test conditions of initial power level and dome pressure and will use BOL nuclear data.

2. Initial action of the RCIC and HPCS are automatic when Level 2 is reached, and system performance is within specifications.

3. Recirculation pump trip shall be initiated if low water level (L2) is reached. Recirculation pump power will shift to the low frequency motor generators if low water level (L3) is reached.

4. The temperature measured by thermocouples on the discharge side of the safety/relief valves must return to within 10°F of the temperature recorded before the valve was opened.

NMP2 MSIV HYDRAULIC ACTUATOR QUALIFICATION

The MSIV actuator as designed with a mechanical latch was qualified by a combination of dynamic testing and supplemental analysis and testing. Attachment 1 lists the applicable reports which support actuator qualification.

As a result of the problems encountered with the mechanical latch on the actuator, it was decided to remove the latch mechanism and use the existing hydraulic system to perform the additional function of holding the MSIV open and initiating MSIV closure. This required qualification of the modified actuator. Attachment 2 lists the applicable reports which support the modified actuator qualification.

The qualification of the modified actuator consisted of three steps. First, the overall adequacy of the actuator assembly is established. The previous dynamic testing at Wyle (Reference 6, Attachment 1) is applicable, since the modifications do not result in changing the previously defined seismic/dynamic requirements (Reference 13, Attachment 1) nor did they appreciably effect the stiffness/mass characteristics of the operator (Reference 13, Attachment 1).

The second step consisted of evaluating the structural integrity of the added non safety related components; jockey pump and accumulator. This was accomplished by analysis demonstrating structural integrity during a seismic/dynamic event.

The peak accelerations used in this analysis (Reference 3, Attachment 2) were derived from the Required Response Spetra used for the actuator qualification.

The third step in the qualification of the actuator involves the 2 inch diameter solenoid operated valves (SOV's), which were part of the actuator dynamic testing performed at Wyle labs in 1983. These SOV's were not required to function during the tests performed at Wyle. In the modified actuator design, the additional function of the hydraulic system requires that the SOV's remain in a closed position and open upon demand to enable the MSIV to close within 3 to 5 seconds.

Demonstration of operability of these SOV's during and after a seismic/dynamic event is required. To accomplish this, the acceleration levels and equivalent static loadings on the SOV's were developed (Reference 1, Attachment 2) based on a combination of the data available from the accelerometers that were mounted at the base of an SOV during the dynamic testing performed at Wyle (Reference 6, Attachment 1) and a finite element analysis of the actuator assembly (Reference 1, Attachment 2). The SOV's are then qualified for the required accelerations and loads resulting from seismic/hydrodynamic events. A combination of analysis, dynamic testing of a similar SOV and a static operability pull test was performed on an identical SOV (Reference 2, Attachment 2). The static operability testing identified the need to install a spring spacer in the SOV assembly to assure valve operability. This spacer has been installed in the SOV's that are part of the actuator assemblies on site and in the SOV's in the test actuator at Crosby's facilities.

Testing to demonstrate performance of the modified MSIV actuator was conducted at Crosby Valve and Gage Company. This testing was done on the same actuator which underwent seismic/dynamic operability testing on a shake table at Wyle Labs (Reference 6). The following is a brief description of the testing performed.

On August 29, 1986 it was decided to modify the hydraulic system to perform the additional functions of holding the MSIV open and initiating MSIV closure. At this time, a small accumulator tank, jockey pump, flow control valve and pressure switch were added to the test actuator and testing of the "hydraulic latch" was begun.

The test actuator was held in the open position for 3 days. During this time it was identified that the hydraulic pressure dropped quickly, which required frequent cycling of the jockey pump.

On September 2, 1986 the actuator was tripped and a delay was identified between trip signal initiation and SOV opening. At this time the hydraulic cylinder end cap was replaced with one which included a mechanical travel stop to control the MSIV open position. Further testing continued to show delays in SOV opening and frequent jockey pump cycling.

On September 11, 1986 the SOV was disassembled and the cause of SOV trip opening delay was suspected to be sticking of the

SOV O-ring. On September 15, 1986 representatives of the SOV manufacturer (Target Rock Corporation) examined the valves and testing with alternate ring materials was initiated.

On September 17, 1986 the cause of the hydraulic system pressure drops and the resultant frequent jockey pump cycle times was identified as fluid leakage through the hydraulic cylinder. To alleviate this problem, a new piston with EP rubber lip seal was ordered.

On September 23, 1986 actuator testing began with SOV's equipped with the current EP rubber O-ring/graphite filled teflon (TFE) backing ring combination.

On October 10, 1986 the lip seal piston was installed in the hydraulic cylinder on the test actuator, and on October 27, 1986 spring spacers were installed in the SOV's and testing continued.

All of the testing at Crosby discussed in the preceding paragraphs was done on the full size actuator. With the exception of the enhanced hydraulic cylinder and the previously discussed equipment which was added to facilitate the hydraulic latch, all of the equipment on the test actuator, including the SOV's is the same equipment which was seismically and dynamically qualified by the shake table testing conducted at Wyle Labs in 1983 and was reviewed by the NRC during the Pump and Valve Operability Review

Team audit in 1985 and subsequently accepted with follow-up responses. The only changes from the previously qualified configuration is elimination of the mechanical latch/spring plunger components and expansion of the hydraulic system equipment and function.

The testing done at Crosby has verified the capability of the SOV's to open and the MSIV to close as required. Since testing of the modified hydraulic system was initiated on August 29, 1986, in excess of 70 actuator trip tests were run. Eleven actuator trip tests were run using the EP rubber O-ring/TFE backing ring material combination which is being installed in the SOV's on the actuators at NMP2. The results of these eleven tests, summarized in Table 1, verify that <u>every time</u> this combination of SOV ring material was tested the actuator successfully closed within the required 3 to 5 seconds. There were <u>no</u> unsuccessful test results using this combination of O-ring materials (Reference 4 Attachment 2). Based on the above analysis and testing, the modified MSIV actuator is qualified.

ATTACHMENT I

NMP2 - MSIV ACTUATOR ASSEMBLY

REFERENCES

SEISMIC/DYNAMIC QUALIFICATION/OPERABILITY OF MSIV ACTUATOR MECHANICAL LATCH

1. "ARS calculation for Main Steam Isolation Valve", SWEC calculation no. 12177-MS-1732, dated June 1983.

2. "Main Steam Isolation Valves" ASME Code, Section III, Class 1, SWEC Specification No. NMP2-P303D.

3. "Seismic Test Procedures", Wyle Report No. 5N/3197A, Revision A, dated July, 1983, SWEC File No. Test 05.360-5007C.

4. "ASME Class 1 Stress Report", G&W FSD, Document No. BC-1185, Revision 0, dated November 1985, SWEC File No. STRS 05.360--5058A.

5A. "MSIV Actuator Dynamic Analysis Mode/Frequency", G&W FSD, Document No. ER-81-28, Revision 0, dated February 1983, SWEC RSTD, dated October 1981.

5B. "Frequency and Stress Analysis of Hydraulic Piping System", G&W FSD, Document No. ER-81-34, Revision 0, dated September 1981, SWEC RSTD, dated October, 1981.

6. "Seismic Simulation Test Program on Series 600 Valve Actuator", Wyle Test Report No. 46912-2, dated November 1983, SWEC File No. STRS 05.360-5013B.

7. "Design Report for Modified Blocking Lever Top Pivot Support/Actuator Deck", Crosby Calc. No. EC-1068, dated May 1984, SWEC File No. STRS 05.360-5016B.

8. "Report on the Applied Force to the Series 600 Actuator Roller Bearing", Crosby Report No. 4188, Revision 0, dated December 1984, SWEC File No. TEST 05.360-5038A.

9. "Qualification Test of Blocking Roller Design for Series 600 Actuators", Crosby Test Report No. 4204, Revision 0, dated September 1985, SWEC File No. TEST 05.360-5042A.

10. "Estimation of Blocking Lever Bearing Load for MSIV Actuator", SWEC Calc. No. 12177-MS-1956, dated September 1985.

11. "Interim Test Report for Series 600 Actuator Latching Mechanism Life Cycle Proof Test", Crosby test Report No. 4259, dated November 1985, SWEC File No. TEST 05.360-5048A.

12. "Pump and Valve Operability Review Team (PVORT), Summary Report", SWEC 2MSS-HVY6A, P303D, NRC Audit Item BOP-PVORT No. 9, dated July 1985.

13. "Generation of ARS for Main steam Safety Relief Valves", SWEC Calc. No. 12177-MS-2006, Revision 0, dated January 1986.

14. "Operability and Fatigue Evaluation for MSIV Actuator", SWEC Calc. No. 12177-MS-2054, Revision 0, dated January 1986.

15. "NMP2 Docket No. 50-410, Response to NRC Audit Open Items", NMPC Letter No. NMP2-0646, dated March 3, 1986.

16. "Summary of Results", FSAR Section 3.9.3.2.3A and Table 3.9A-4, dated July, 1986.

17. "SER, Supplement No. 4 Section 3.10.2 and Table 3.2", NRC NUREG 1047, dated September 1986.

ATTACHMENT II

NMP2 - MSIV ACTUATOR ASSEMBLY

REFERENCES

SEISMIC/DYNAMIC QUALIFICATION/OPERABILITY OF MODIFIED MSIV ACTUATOR ASSEMBLY - HYDRAULIC LATCH

1. "Qualification of the Modified MSIV Actuator, Spec. P303D", SWEC Calc. No. 12177-MS-2126, Revision 0, dated October, 1986.

2. "Design Report and Seismic Analysis of Solenoid Operated Valve", Target Rock Report No. 2252, Revision C, dated October, 1986, SWEC File No. STRS 05.360-5067A.

3. "Verfication of Structural Integrity of the Modified MSIV Actuator", SWEC Code No. 12177-MS-2122, Revision 0, dated October, 1986.

4. "Crosby Test Report 4330, Revision 2, dated November 10, 1986".

Description of Reference 1 - Attachment 2

"Qualification of the Modified MSIV Actuator, Spec P303D", SWEC Calculation No. 12177-MS-2126, Revision 0, dated October 1986.

The objective of this calculation is two-fold. First, to generate the seismic/dynamic requirements for the SOV operability test and determine that the modification had insignificant effects on the original RRS specified; second, to demonstrate that the modification did not jeopardize the seismic/dynamic testing of the actuator assembly as presented in Reference 6 Attachment 1; and that the previous qualifications established is still applicable to the modified MSIV actuator assembly.