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NIAGARA MOHAWK POWER CORPORATION

NINE MILE POINT NUCLEAR STATION UNIT 2

OPERATING PROCEDURES

N2-OP-101A

REVISION 09

PLANT START-UP

Approved By:
M. J. McCormick, Jr. Plant Manager, Unit 2

FOR INFORMATION ONLY

4/3/91
Date

THIS REVISION IS A GENERAL REWRITE

THIS REVISION SUPERSEDES TCN-105 THROUGH 117

Effective Date: 4/3/91

NOT TO BE USED AFTER APRIL 1993
SUBJECT TO PERIODIC REVIEW

5/4/23

LIST OF EFFECTIVE PAGES

Page No.	Change No.	Page No.	Change No.	Page No.	Change No.
Coversheet	*2				
i	16502,16695	23		48	
ii		24	15717	49	
iii		25		50	
1		26		51	
2		27		52	
3		28		53	
4		29	15717	54	
5	TCN-1	30		55	
6		31		56	
7		32		57	16695
8		33	*1	58	
9		34		59	
10	16502	35	*1	60	
11	16502	36		61	
12	TCN-2	37		62	
13		38		63	
14		39		64	
15		40		65	
16		41		66	
17		42		67	
18	*2	43		68	
19		44		69	
20		45		70	
21		46		71	
22		47		72	

LIST OF EFFECTIVE PAGES (Cont)

Page No.	Change No.	Page No.	Change No.	Page No.	Change No.
73					
74					
75					
76					
77					
78					
79					
80					
81					
82					

TABLE OF CONTENTS

A. REFERENCES AND COMMITMENTS

1.0 Technical Specification

Consult individual operating procedures as necessary.

2.0 Licensee Documentation

Consult individual operating procedures as necessary.

3.0 Standards, Regulations, and Codes

Consult individual operating procedures as necessary.

4.0 Policies, Programs, and Procedures

Consult individual operating procedures as necessary.

5.0 Technical Information

Consult individual operating procedures as necessary.

6.0 Supplemental References

6.1 SGO 89-07.

6.2 Consult individual operating procedures as necessary.

7.0 Commitments

Sequence Number	NCTS Number	Description
1	502568-00	2CNM-LV137 Capacity
2	700138-00	APRM Calibration During Plant Startup
3	003772-01	Actions for low load and high back pressure (low vacuum) conditions

B. SYSTEM DESCRIPTION

Plant startup requires support by all plant systems, therefore, System Description is contained in applicable individual system operating procedures.

C. OPERATING REQUIREMENTS

1.0 All systems must be in operation or standby readiness in accordance with applicable operating procedures to support plant startup.

C. OPERATING REQUIREMENTS (Cont)

2.0 IF required to discontinue the startup THEN exit this procedure and refer to N2-OP-101B, Hot Standby Operation or N2-OP-101C, Plant Shutdown as applicable.

D. PRECAUTIONS AND LIMITATIONS

1.0 Authorization for Reactor startup must be obtained from EITHER Plant Manager OR his designated alternate.

2.0 All modes of operation shall be in compliance with Unit 2 Technical Specifications.

3.0 Applicable radiological precautions shall be observed as follows:

3.1 Radiation Protection shall be contacted for guidance as required.

3.2 All ALARA practices shall be observed to minimize personnel exposure and spread of contamination.

3.3 All effluent from system are to be treated as contaminated.

3.4 Provisions to contain leakage in restricted areas shall be made when breaking connections, venting or draining lines, as required by Radiation Protection.

4.0 Precautions in each specific procedure referenced in this procedure are to be adhered to.

5.0 Because of many possible plant conditions, deviation from suggested sequence of operations is permitted as directed by Station Shift Supervisor (SSS).

6.0 CSO shall direct operation of major equipment and log time and status.

7.0 All evolutions described in this procedure shall be performed in accordance with applicable operating procedures.

8.0 All system checkoff sheets must be completed and signed by the SSS indicating his knowledge of plant status.

9.0 Prior to startup a walkdown of safety-related areas must be performed in accordance with S-MAI-5.5-002, Administrative Control of Scaffolding.

10.0 All control rod motion shall be performed in strict compliance with approved control rod sequence or Reactor Engineering instructions.

11.0 Conservative action is required whenever an unexpected situation arises while positioning control rods.

D. PRECAUTIONS AND LIMITATIONS (Cont)

12.0 Following precautions are applicable when withdrawing control rods:

12.1 Critical predictions should be used only as a gross estimate of the critical rod pattern since there are many calculational uncertainties in the prediction process.

12.2 Criticality should be expected whenever control rods are being withdrawn.

12.3 Extra caution shall be used when pulling control rods in the region of criticality to avoid short periods.

12.4 Single Notch Withdrawal mode shall be used when approaching criticality.

13.0 Following reactor conditions and characteristics influence point of criticality and rate at which it is approached:

13.1 Xenon Concentration

Xenon, up to three days following reactor shutdown tends to suppress flux in previously high-powered regions of core (generally bottom and center). Since control rod worth is a function of flux to which it is exposed, rod worth is diminished in high Xenon concentration regions and enhanced in other regions.

13.2 Moderator Temperature

At higher temperatures, neutrons travel further in slowing down process; and therefore, have a greater probability of reaching and being absorbed in a control rod. This results in increased control rod worth at higher temperatures.

13.3 Control Rod Position

Control rod worth depends on its axial position as follows:

Position	Worth
0-4	Low
4-8	High
8-12	Highest
12-16	High
16-24	Low
24-48	Minimal

13.4 Order of Withdrawal

Control rods shall be withdrawn in accordance with approved Startup Control Rod Sequences.

D. PRECAUTIONS AND LIMITATIONS (Cont)

14.0 WHEN reactor thermal power is greater than 25%, Reactor Engineering notification is required prior to raising power. The only exception to this is when raising power in accordance with Reactor Operation Instructions.

15.0 WHEN reactor thermal power is greater than 25% and power is raised by more than 15%, perform Core Power Distribution Limits in accordance with N2-RESP-1.

16.0 WHEN reactor thermal power changes in one hour by more than 15% THEN Radiochemistry Technician shall perform Isotopic Analysis for Iodine (TS 4.4.5-1.4b).

17.0 All applicable evolutions described in this procedure shall be monitored and controlled in accordance with Radiation Protection procedures.

18.0 Recirculation pump upshift or start must be performed below 80% rodline.

19.0 (NCTS 3) Main turbine operation with load less than 30% (345 MWE) and condenser vacuum below the Low Vacuum Alarm Point (24.6" Hg) is prohibited.

20.0 Condenser vacuum should be established prior to placing fresh condensate demineralizers in service.

E. STARTUP

NOTES:
1. Because of many possible plant conditions deviation from suggested sequence is permitted as directed by the Station Shift Supervisor (SSS).
2. Steps not required to be performed due to plant conditions should be marked N/A with a short explanation. These steps must also be initialed and dated.

1.0 Prerequisites

1.1 Verify one of the following startup checklists is completed and attached.

Initials/Date

E. STARTUP (Cont)

1.1.1 Attachment 2, Master Startup Checklist (__)

1.1.2 Attachment 1, Short Form Startup Checklist (__) _____/_____

1.2 Verify walkdown complete of all safety-related areas to comply with S-MAI-5.4-002, Administrative Control of Scaffolding. _____/_____

TCN-1

1.2.1 Notify OPS Support Dept. to verify that the plant consumables inventory are adequate to support plant startup.

_____ _____/_____
Person Notified

NOTE: Condenser vacuum should be established prior to placing fresh condensate demineralizers in service.

1.3 Verify Condensate and Feedwater System long cycle flush commenced at least four hours prior to startup in accordance with N2-OP-3. _____/_____

1.4 Obtain approved Startup Control Rod Sequences from Reactor Engineering Department. _____/_____

1.5 IF starting up following reactor scram, verify Unit Scram Review is completed in accordance with N2-RAP-6. _____/_____

1.6 Verify all IRMs are fully inserted. _____/_____

1.7 Verify all IRM range switches are on position 1. _____/_____

1.8 Verify the following recorder select switches are placed in the IRM position:

1.8.1 All IRM/APRM _____/_____

1.8.2 Both IRM/RBM _____/_____

1.9 Verify all SRMs are fully inserted. _____/_____

1.10 Verify the SRM indicated count rate is greater than 3 count per second (TS 4.3.7.6.c). Record SRM readings below.

SRM A _____, SRM B _____

SRM C _____, SRM D _____ _____/_____

Initials/Date

E. STARTUP (Cont)

1.11 Verify the SRM recorder channel selection switches are positioned to record two highest SRM indicators.

Channel _____

Channel _____ ____/____

1.12 Verify the Narrow Range Reactor Water Level Instruments indicate normal operating range (178.3" to 187.3"). ____/____

1.13 Verify the following Reactor Head Vents open:

1.13.1 2MSS*MOV118 ____/____

1.13.2 2MSS*MOV119 ____/____

1.14 Verify the Residual Heat Removal System, (RHS) secured from shutdown cooling mode and in the standby mode in accordance with N2-OP-31, Residual Heat Removal System. ____/____

1.15 Prior to reactor water temperature reaching 180°F, secure long cycle flush in accordance with N2-OP-3. ____/____

1.16 Prior to reactor water temperature reaching 180°F ensure water makeup capacity to reactor vessel by verifying the following components are operating in accordance with N2-OP-3, Condensate/Feedwater System:

1.16.1 At least one Condensate Pump ____/____

1.16.2 At least one Condensate Booster Pump ____/____

1.16.3 2 to 4 demineralizers through 2CNM-LV137 ____/____

1.17 IF required verify the turbine is on turning gear in accordance with N2-OP-21, Main Turbine. ____/____

1.18 Verify the Reactor Recirculation System is in operation on LFMG set with Flow Control Valve(s) fully open in accordance with N2-OP-29, Reactor Recirculation System. ____/____

1.19 Verify N2-OSP-LOG-D001, Appendix C, Recirc Loop Flow Mismatch Surveillance is complete. ____/____

Initials/Date

E. STARTUP (Cont)

1.20 Verify the following steam drain valves are open at Panel P824:

1.20.1 Group I ____/____

1.20.2 Group II ____/____

1.20.3 Group III ____/____

1.21 Verify both Condenser Low Vacuum Bypass Switches are in the Bypass position at Panel P609. ____/____

1.22 Verify both Condenser Low Vacuum Bypass Switches are in the Bypass position at Panel P611. ____/____

1.23 IF directed by the SSS, verify the following WCS FT filled and vented for proper operation:

1.23.1 2WCS*FT67X

1.23.2 2WCS*FT67Y

1.23.3 2WCS*FT68X

1.23.4 2WCS*FT68Y

1.23.5 2WCS*FT69X

1.23.6 2WCS*FT69Y ____/____

1.24 IF required, verify compliance with N2-OP-29, Section H.7.0 for startup with one recirc loop out of service. ____/____

1.25 Start Drywell H_2/O_2 Analyzers in accordance with N2-OP-82, Section E. ____/____

1.26 Verify Redundant Reactivity Control System (RRCS) is in standby in accordance with N2-OP-36B, Redundant Reactivity Control System. ____/____

1.27 Verify shift staffing is in accordance with Technical Specification (T.S. 6.2). ____/____

1.28 Obtain authorization for Reactor startup from the Unit 2 Plant Manager or his designated alternate. ____/____

Initials/Date

E. STARTUP (Cont)

1.29 Announce on the gaitronics the following:

"Attention all personnel, Reactor startup is about to commence, Primary and Secondary Containment is in effect." _____/_____

1.30 Notify load dispatcher of impending startup. _____/_____

2.0 Approach to Criticality, Heatup and Vessel Pressurization

NOTE: During approach to criticality the following Control Room conduct shall be practiced to ensure distractions are minimized.

a. Operator responsible for withdrawing control rods shall have no other concurrent duties.

b. WHILE ranging IRMs to establish a controlled heatup rate, operator(s) directly involved in control rod withdrawal shall be relieved of shift turnover participation.

c. Control Room activities such as surveillance testing shall be minimized.

2.1 Perform the following surveillances within 8 hours prior to withdrawal of control rods for purpose of making reactor critical:

2.1.1 N2-OSP-RMC-@003, Rod Worth Minimizer operability _____/_____

2.1.2 N2-OSP-RMC-@004, Rod Sequence Control System Operability, Self Test Section 7.2 _____/_____

2.2 Within 15 minutes prior to control rod withdrawal, verify and log the following reactor coolant parameters are to the right of the critical line in accordance with N2-OSP-RCS-@001, Pressure/Temperature Verification (TS Fig. 3.4.6.1-4).

2.2.1 Reactor coolant pressure _____/_____

2.2.2 Reactor coolant temperature _____/_____

Initials/Date

E. STARTUP (Cont)

2.3 IF starting up with one recirc loop out of service THEN prior to commencing rod withdrawal AND every 15 minutes until thermal power is greater than 30% power OR the operating loop flow is greater than 50% of rated loop flow, initiate N2-OSP-LOG-@001, @ Checks Log to record recirc loop differential temperatures. (TS 4.4.1.1.2) _____/_____

2.4 IF primary containment purge or vent is in progress, THEN prior to entering Operational Condition 2, perform N2-OSP-CPS-@001, Containment Purge System Vent & Purge Log. _____/_____

2.5 Place Reactor Mode Switch in START/HOT STANDBY position. _____/_____

2.6 Update Safety Parameter Display System (SPDS), in accordance with N2-OP-91B. _____/_____

2.7 Verify Rod Worth Minimizer is in service in accordance with N2-OP-95A, Rod Worth Minimizer. _____/_____

2.8 Verify annunciator 603442, CONTROL ROD OUT BLOCK is clear. _____/_____

2.9 Place SRM recorder speed selection switch in the FAST position. _____/_____

2.10 Place speed selection switch for at least one IRM recorder in each Reactor Protection System in the FAST position. _____/_____

2.11 Record IRM readings per N2-OSP-NMS-SU001, SRM/IRM Overlap. _____/_____

NOTE: After Group 1 and Group 2 control rods have been pulled to position 48, use of Continuous Withdraw for control rod withdrawals between positions 00 and 30 is prohibited unless otherwise instructed by Reactor Engineer.

2.12 AFTER withdrawal of first in-sequence control rod perform N2-OSP-RMC-@004, Rod Sequence Control System operability. _____/_____

E. STARTUP (Cont)

2.13 WHEN any control rod is moved in accordance with the Startup Control Rod Sequence, verify the following conditions and limitations are satisfied.

2.13.1 Each startup shall use a verified copy of Master Startup Control Rod Sequence.

2.13.2 All reactivity changes shall be directly supervised by a Senior Reactor Operator. In order to provide this oversight the SRO will be stationed at the Controls Area of the Control Room. 16502

2.13.3 During control rod motion the following indications shall be monitored:

a. Neutron Flux

b. Control rod position

c. Reactor period

2.13.4 Shift Technical Advisors (STA) or Reactor Engineer should monitor control rod motion.

2.13.5 WHEN control rod movement specified in each Startup Control Rod Sequence or Rod Worth Minimizer group has been completed a licensed reactor operator or other technically qualified member of the technical staff shall independently verify correct control rod position by selecting each rod in the group moved and compare four rod display indication to Startup Control Rod Sequence.

2.13.6 WHEN below the Low Power Setpoint, Banked Position Withdrawal Sequence (BPWS) shall be adhered to.

2.13.7 WHEN above the Low Power Setpoint, BPWS should be followed as far as practical until local peaking or other factors require deviation.

2.13.8 AFTER a control rod is withdrawn to position 48 verify its coupling integrity by applying a continuous withdraw signal and perform the following:

E. STARTUP (Cont)

2.13.8 (Cont)

a. Observe Annunciator 603444, ROD OVERTRAVEL remains clear.

b. Observe control rod FULL OUT indicating light illuminated on Full Core Display.

c. Observe position 48 indication remain illuminated on the Four Rod Display.

d. Record coupling integrity check performed by initialing the appropriate block on the Startup Control Rod Sequence OR in accordance with applicable Operating Surveillance Procedures.

2.13.9 Deviation to control rod sequence is permitted IF both SRO AND the Reactor Engineer concur, initial all changes on working copy and the reason is documented in Reactor Engineer Log Book. |16502

2.13.10 IF a control rod is withdrawn to the bank withdraw limit and the SRO and Reactor Engineer desire to insert it THEN use the Insert column. |16502

2.13.11 IF a control rod is inserted to the bank insert limit and the SRO and Reactor Engineer desire to withdraw it THEN use the Withdraw column. |16502

NOTE: WHEN 100% Rod Line is achieved as determined by the Reactor Engineer, THEN significant deviations from the Startup Control Rod Sequence are required. Use of the Startup Sequence Sheets will be discontinued and rod movements will be controlled by approved Control Rod Movement Sheets.

2.13.12 IF Single Rod Scram Timing or other testing requires deviations from the Startup Control Rod Sequence THEN the Reactor Engineer OR STA shall ensure all control rods are in sequence before resuming startup.

Initials/Date

E. STARTUP (Cont)

2.13.13 IF commencing a shutdown prior to completing Startup Sequence THEN insert control rods in reverse order using the Shutdown column.

2.14 Commence Control Rod withdrawal in accordance with the verified copy of the approved Startup Control Rod Sequence until reactor criticality is indicated by the following:

2.14.1 Rising neutron count rate

2.14.2 No control rod motion

2.14.3 Constant positive period _____/_____

2.15 WHEN reactor criticality is indicated, announce on the gaitronics the following:

"Attention all personnel the Reactor is critical." _____/_____

2.16 Record the following reactor criticality information in the CSO Log and below:

2.16.1 Time Criticality was achieved _____

2.16.2 Rod Number _____

2.16.3 RWM Step _____ TCN-2

2.16.4 Rod Position _____

2.16.5 Reactor Period (1.44 x Doubling Time) _____

2.16.6 Reactor Water Temperature (Operating Recirc Pump Suction Temperature) _____

2.16.7 Person Pulling Critical _____ _____/_____

2.17 Establish a stable positive period greater than 60 seconds using control rods as required. _____/_____

2.18 IF reactor startup is following operating cycle outage, request Reactor Engineering perform N2-RESP-10, Cold Critical Comparison. _____/_____

Initials/Date

E. STARTUP (Cont)

2.19 Verify SRM/IRM overlap of one-half decade in accordance with N2-OSP-NMS-SU001, SRM/IRM Overlap. ____/____

2.20 Maintain a count rate between 10^2 and 10^5 CPS by withdrawing SRMs as required. ____/____

2.21 Maintain IRM indications between 25 and 75 on 0-125% scale by ranging IRM range switches, individually, as required. ____/____

2.22 WHEN IRMs are on Range 3 or above and downscale alarms are clear fully withdraw SRMs. ____/____

2.23 Place the SRM recorder speed selection switch in the Slow position. ____/____

2.24 Every 30 minutes during heatup until reactor is fully pressurized with pressure being controlled by turbine bypass valves, verify and log reactor coolant temperature and pressure are at right of criticality limit in accordance with N2-OSP-RCS-@001, RCS Pressure/Temperature Verification. ____/____

2.25 WHEN heating range is reached, (evidenced by reduction in IRM indication) position control rods, to maintain a heatup rate less than 100°F in any one hour period. ____/____

2.26 Prior to reactor water temperature reaching 200°F verify the Reactor Water Cleanup System (WCS) is lined up to permit full reject in accordance with N2-OP-37, Reactor Water Cleanup System. ____/____

2.27 Maintain Reactor Water Level between 178.3" and 187.3" by rejecting water as necessary using WCS system in accordance with N2-OP-37, Reactor Water Cleanup System. ____/____

E. STARTUP (Cont)

* *

CAUTIONS

1. Reactor level "A" at P603 should be selected for Reactor water level control, use Reactor level "B" channel as backup only (due to noise on"B").

2. If any steam line paths (including drains) are open before the Condensate and Condensate Booster Pumps are on line at 212°F or above, the steam flow may exceed CRD cooling flow which could result in a low level reactor SCRAM.

* *

2.28 During reactor heatup maintain drywell average temperature less than 150°F by performing the following:

2.28.1 Monitor temperature frequently.

2.28.2 Start additional drywell cooling units as required in accordance with N2-OP-60, Drywell Cooling. _____/____

2.29 During reactor heatup maintain the drywell pressure between -0.5 and +0.75 psig by performing the following:

2.29.1 Monitor drywell pressure frequently.

2.29.2 IF drywell pressure cannot be maintained within specification, refer to N2-OP-61A, Primary Containment Ventilation/Purge & Nitrogen System for drywell venting. _____/____

* *

CAUTION

Prior to placing steam on turbine seals or admitting steam to turbine, turbine turning gear must be in service to prevent rotor bowing due to uneven heating.

* *

2.30 Establish main turbine seals by placing in service the clean steam reboiler in accordance with N2-OP-25, Auxiliary Steam; Auxiliary Condensate and Gland Seal System. _____/____

Initials/Date

E. STARTUP (Cont)

2.31 Verify per Feedwater Heater Startup Vents in accordance with N2-OP-8, Feedwater Heaters and Extraction Steam System. _____/_____

2.32 Draw condenser vacuum using condenser air removal pumps in accordance with N2-OP-9, Condenser Air Removal. _____/_____

2.33 Verify off-gas preheater is warmed up and ready for service in accordance with N2-OP-42, Off-Gas System. _____/_____

2.34 WHEN reactor pressure reaches 5 psig, close the following Reactor Head Vents.

2.34.1 2MSS*MOV118 _____/_____

2.34.2 2MSS*MOV119 _____/_____

2.35 Open 2MSS*MOV108, Reactor Head Vent to Main Steam Line. _____/_____

2.36 Verify MSIVs are open in accordance with N2-OP-1, Main Steam System. _____/_____

2.37 Verify open the following valves in accordance with N2-OP-1, Main Steam System:

2.37.1 MSS-AOV87A, MSL Low Pt Drain Isol _____/_____

2.37.2 MSS-AOV87B, MSL Low Pt Drain Isol _____/_____

2.37.3 MSS-AOV87C, MSL Low Pt Drain Isol _____/_____

2.37.4 MSS-AOV87D, MSL Low Pt Drain Isol _____/_____

2.37.5 MSS-AOV88A, MSL Header Drain _____/_____

2.37.6 MSS-AOV88B, MSL Header Drain _____/_____

NOTE: Prior to exceeding 150 psig RCIC shall be lined up in the standby condition in accordance with N2-OP-35, Reactor Core Isolation Cooling.

2.38 WHEN reactor pressure reaches approximately 75 psia place RCIC in standby in accordance with N2-OP-35, Reactor Core Isolation Cooling. _____/_____

Initials/Date

E. STARTUP (Cont)

2.39 Prior to reaching 150 psig perform N2-OSP-ICS-M001, RCIC System Operability Verification Test. _____/____

2.40 Review the following to determine if performance of N2-OSP-ICS-R002, RCIC System Flow Test is required as a PMT.

2.40.1 Equipment Status Log, ESL

2.40.2 Work Tracking System, WTS

NOTES:
1. N2-OSP-ICS-R002, RCIC System Flow Test is required if plant startup is subsequent to end of operating cycle outage or as PMT.

2. Reactor pressure between 150 and 165 psig will be maintained during performance of N2-OSP-ICS-R002, RCIC System Flow Test.

2.41 IF required THEN within 12 hours of reaching approximately 150 psig, perform N2-OSP-ICS-R002, RCIC System Flow Test. _____/____

NOTE: WHEN shell warming a sudden spike in shell pressure could result in a reactor SCRAM. (A pressure spike could make it appear as if thermal power is greater than 30% and turbine stop valves are less than 95% open.).

* *

CAUTION

During shell warming exceeding 100 PSIA first stage pressure may result in a Reactor SCRAM. Particular attention is required if shell warming is being performed in conjunction with raising Reactor pressure.

* *

2.42 WHEN Reactor pressure is approximately 100 psig commence turbine shell/chest warming in accordance with N2-OP-21, Main Turbine System. _____/____

Initials/Date

E. STARTUP (Cont)

NOTES: 1. Prior to exceeding 5% power as indicated by APRM, Condenser vacuum shall be established and maintained by SJAEs and condenser air removal pumps secured.

2. Following an operating cycle outage, the surveillance in Step 2.43 below must be performed within 12 Hrs of reaching Reactor pressure of 100 psig OR an LCO will exist.

2.43 WHEN Reactor pressure reaches 950 psig and prior to exceeding 976 psig, perform the following surveillance:

2.43.1 N2-OSP-ADS-R001, ADS Valve Operability and Position Indication Test _____/____

2.43.2 N2-OSP-MSS-R@001, Main Steam Safety/ Relief Valve Exercise, Failsafe and Position Indication Operability Test _____/____

NOTE: Performing Step 2.44 below will cause 2CNM-MOV126, Condenser Neck Spray Valve to open.

2.44 WHEN reactor pressure is approximately 150 psig, verify a turbine bypass valve opens to regulate reactor pressure. _____/____

2.45 WHEN turbine bypass valve opens verify Condenser Neck Spray is in operation. _____/____

2.46 WHEN raising reactor pressure, maintain EHC Pressure Setpoint approximately 10 PSIG greater than reactor pressure until EHC pressure setpoint is 935 PSIG. _____/____

2.47 IF reactor pressure begins to oscillate, take manual control of EHC using Turbine Bypass Valve opening jack to maintain stable reactor pressure. _____/____

Initials/Date

E. STARTUP (Cont)

NOTE: At power levels less than 5% EHC, pressure setpoint may be set at 950 psig to facilitate Control Rod Scram Testing.

(NCTS 1) 2.48 WHEN controlling RPV water level using 2CNM-LV137 valve position, monitored steam loads and water level to ensure capacity of 2CNM-LV137 is not exceeded. _____/_____

2.49 WHEN reactor pressure is equal to or greater than 500 psig start FWS-P1B, Reactor Feed Pump P1B in accordance with N2-OP-3, Condensate and Feedwater System. _____/_____ *

2.50 Control reactor water level in accordance with N2-OP-3, Condensate and Feedwater System. _____/_____

* *

CAUTION

Failure to place the Reactor Mode Switch in RUN position before exceeding 12% on APRM will cause control rod block. Exceeding 15% will cause reactor SCRAM.

* *

2.51 Verify APRMs come on scale during power rise. _____/_____

2.52 WHEN reactor pressure is greater than 766 psig, verify the following annunciators are clear:

2.52.1 603127, "DIVISION I MN STEAM LINE LOW PRESSURE" _____/_____

2.52.2 603427, "DIVISION II MN STEAM LINE LOW PRESSURE" _____/_____

2.53 WHEN reactor pressure reaches 935 psig, verify turbine bypass valves open to maintain reactor pressure. _____/_____

2.54 WHEN reactor pressure is approximately 935 psig, open one turbine bypass valve 20% or greater. _____/_____

Initials/Date

E. STARTUP (Cont)

NOTE: WHEN Reactor pressure is greater than 630 psig Reboiler Steam supply may be changed to Main Steam supply provided that Reactor pressure control is established with a Turbine Bypass Valve open 20% or greater.

2.55 Change the reboiler steam supply to main steam in accordance with N2-OP-25, Auxiliary Steam, Auxiliary Condensate and Gland Seal System. ____/____

2.56 Place Steam Jet Ejector in service in accordance with N2-OP-9, Condenser Air Removal. ____/____

2.57 Start Off-gas in accordance with N2-OP-42, Off-gas System. ____/____

2.58 IF VT2 leak inspection is required adjust EHC pressure regulator until desired reactor steam dome pressure is achieved. ____/____

2.59 Verify reactor pressure is 935 psig. ____/____

2.60 WHEN main condenser vacuum is greater than 25" Hg. perform following:

2.60.1 Place both Condenser Low Vacuum Bypass Switches in the NORMAL position at Panel P609. ____/____

2.60.2 Place both Condenser Low Vacuum Bypass Switches in the NORMAL position at Panel P611. ____/____

2.60.3 Verify annunciator 603128 DIVISION I CONDENSER VACUUM LOW remains clear. ____/____

2.60.4 Verify annunciator 603428, DIVISION II CONDENSER VACUUM LOW remains clear. ____/____

2.61 Reset HPCS reactor high water level at Panel P601. ____/____

2.62 Observe HPCS reactor high level seal-in white light extinguishes. ____/____

2.63 IF Primary Containment is not inerted, perform final Drywell Inspection. ____/____

Initials/Date

E. STARTUP (Cont)

2.64 Verify the Primary Containment AC Circuits are de-energized in accordance with N2-OSP-LOG-D001, Daily Checks. ____/____

2.65 Verify the Drywell instrument air is supplied by Nitrogen in accordance with N2-OP-61A, Primary Containment Ventilation/Purge & Nitrogen System. ____/____

2.66 Verify closed the following Appendix R valves:

VALVE NUMBER	M.C.C NUMBER		DESCRIPTION	
2RHS*MOV32A	2EHS*MCC103C	18A	RHR HX A to RCIC	____/____
2RHS*MOV32B	2EHS*MCC303D	15A	RHR HX B to RCIC	____/____
2RHS*MOV37A	2EHS*MCC103C	18C	RHR HX A Drain to Supp. Pool	____/____
2RHS*MOV37B	2EHS*MCC303D	15C	RHR HX B Drain to Supp. Pool	____/____
2RHS*MOV22A	2EHS*MCC103C	17A	RHR HX A Steam Supply Isolation	____/____
2RHS*MOV22B	2EHS*MCC303D	14A	RHR HX B Steam Supply Isolation	____/____
2RHS*MOV80A	2EHS*MCC103C	23A	RHR HX A Steam Supply Bypass	____/____
2RHS*MOV80B	2EHS*MCC303D	22A	RHR HX B Steam Supply Bypass	____/____
2RHS*MOV67A	2EHS*MCC103C	22A	RHR A Shutdown Cooling Return Check Bypass	____/____
2RHS*MOV67B	2EHS*MCC303D	21C	RHR B Shutdown Cooling Return Check Bypass	____/____
2WCS-MOV106	2NHS-MCC008	2C	RWCU Reject to Waste Collect Tank	____/____
2WCS-MOV107	2NHS-MCC008	2E	RWCU Reject to Main Condenser	____/____
2MSS*MOV112	2EHS*MCC102	7A	Main Steam Drain Outbd Isolation	____/____
2RHS*MOV113	2EHS*MCC103C	21A	RHR Shutdown Cooling Suction Outbd Isolation	____/____
2DER*MOV128	2NHS-MCC012	7B	RPV Bottom Head Drain	____/____
2CSH*MOV110	2EHS*MCC201	6B	HPCS Test Bypass to CST	____/____

Initials/Date

E. STARTUP (Cont)

2.66 (Cont)

Remark: List reason for any exceptions to the above Appendix "R" valve positions.
(Example: Valve required for service.)

EXCEPTIONS:

_____ _____ _____ _____ _____ _____/

NOTES:
1. Steps 2.67 and 2.68 below may be performed concurrently.
2. Breakers for 2WCS-MOV106, 2WCS-MOV107 and 2DER*MOV128 will be positioned at the direction of the SSS.

2.67 Clear associated alarms for valve breakers listed below by clearing Yellow Hold-Out on ALARM CIRCUIT control switches and place ALARM CIRCUIT control switches in the DISABLE position at MCC breaker cubicles.

VALVE NUMBER	M.C.C NUMBER	DESCRIPTION	
2RHS*MOV32A	2EHS*MCC103C 18A	RHR HX A to RCIC	_____/
2RHS*MOV32B	2EHS*MCC303D 15A	RHR HX B to RCIC	_____/
2RHS*MOV37A	2EHS*MCC103C 18C	RHR HX A Drain to Supp. Pool	_____/
2RHS*MOV37B	2EHS*MCC303D 15C	RHR HX B Drain to Supp. Pool	_____/
2RHS*MOV22A	2EHS*MCC103C 17A	RHR HX A Steam Supply Isolation	_____/
2RHS*MOV22B	2EHS*MCC303D 14A	RHR HX B Steam Supply Isolation	_____/
2RHS*MOV80A	2EHS*MCC103C 23A	RHR HX A Steam Supply Bypass	_____/
2RHS*MOV80B	2EHS*MCC303D 22A	RHR HX B Steam Supply Bypass	_____/

E. STARTUP (Cont)

2.67.2 (Cont)

VALVE NUMBER	M.C.C NUMBER		DESCRIPTION	Initials/Date
2RHS*MOV67A	2EHS*MCC103C	22A	RHR A Shutdown Cooling Return Check Bypass	____/____
2RHS*MOV67B	2EHS*MCC303D	21C	RHR B Shutdown Cooling Return Check Bypass	____/____
2WCS-MOV106	2NHS-MCC008	2C	RWCU Reject to Waste Collect Tank	____/____
2WCS-MOV107	2NHS-MCC008	2E	RWCU Reject to Main Condenser	____/____
2MSS*MOV112	2EHS*MCC102	7A	Main Steam Drain Outbd Isolation	____/____
2RHS*MOV113	2EHS*MCC103C	21A	RHR Shutdown Cooling Suction Outbd Isolation	____/____
2DER*MOV128	2NHS-MCC012	7B	RPV Bottom Head Drain	____/____
2CSH*MOV110	2EHS*MCC201	6B	HPCS Test Bypass to CST	____/____

Remark: List reason for any exceptions to the above Appendix "R" valve positions.
(Example: Valve required for service.)

EXCEPTIONS:

_____

_____

_____

_____

_____ ____/____

NOTE: Each plant startup requires clearing the previous Holdout Sheet and issuing new Holdout Sheet.

Initials/Date

E. STARTUP (Cont)

2.68 Verify open AND Yellow Hold-Out issued for the following Appendix R valve MCC breakers.

VALVE NUMBER	M.C.C NUMBER	DESCRIPTION	
2RHS*MOV32A	2EHS*MCC103C 18A	RHR HX A to RCIC	____/____
2RHS*MOV32B	2EHS*MCC303D 15A	RHR HX B to RCIC	____/____
2RHS*MOV37A	2EHS*MCC103C 18C	RHR HX A Drain to Supp. Pool	____/____
2RHS*MOV37B	2EHS*MCC303D 15C	RHR HX B Drain to Supp. Pool	____/____
2RHS*MOV22A	2EHS*MCC103C 17A	RHR HX A Steam Supply Isolation	____/____
2RHS*MOV22B	2EHS*MCC303D 14A	RHR HX B Steam Supply Isolation	____/____
2RHS*MOV80A	2EHS*MCC103C 23A	RHR HX A Steam Supply Bypass	____/____
2RHS*MOV80B	2EHS*MCC303D 22A	RHR HX B Steam Supply Bypass	____/____
2RHS*MOV67A	2EHS*MCC103C 22A	RHR A Shutdown Cooling Return Check Bypass	____/____
2RHS*MOV67B	2EHS*MCC303D 21C	RHR B Shutdown Cooling Return Check Bypass	____/____
2WCS-MOV106	2NHS-MCC008 2C	RWCU Reject to Waste Collect Tank	____/____
2WCS-MOV107	2NHS-MCC008 2E	RWCU Reject to Main Condenser	____/____
2MSS*MOV112	2EHS*MCC102 7A	Main Steam Drain Outbd Isolation	____/____
2RHS*MOV113	2EHS*MCC103C 21A	RHR Shutdown Cooling Suction Outbd Isolation	____/____
2DER*MOV128	2NHS-MCC012 7B	RPV Bottom Head Drain	____/____
2CSH*MOV110	2EHS*MCC201 6B	HPCS Test Bypass to CST	____/____

Remark: List reason for any exceptions to the above Appendix "R" valve positions.
(Example: Valve required for service.)

EXCEPTIONS:

_____

_____

_____

_____ ____/____

Initials/Date

E. STARTUP (Cont)

3.0 Transfer of Mode Switch to "Run"

3.1 Place Condensate demineralizers in service as required in the order recommended by Chemistry and attempt to maintain individual demineralizer flows between 2000 and 3000 gpm and a system delta P between 45 and 55 psid. ____/____

3.2 Verify the EHC pressure regulator set at 935 psig and bypass valves open to regulate pressure as required. ____/____

NOTE: At power levels less than 5%, EHC pressure may be set equal to or less than 950 psig to facilitate control rod scram testing.

3.3 Prior to entering Mode 1 verify N2-OSP-LOG-D001, Daily Checks item #60, Core Flow vs. APRM Flow is Sat. ____/____

3.4 Continue to withdraw control rods until APRM downscale lights have cleared. ____/____

3.5 Verify APRMs reading greater than 5% by placing IRM/APRM recorder select switch to APRM. ____/____

3.6 In each Reactor Protection Division leave one IRM/APRM recorder select switch placed in the APRM position. ____/____

3.7 Ensure Reactor coolant chemistry is within Technical Specification limit for operational condition 1 in accordance with Table 3.4.4-1. ____/____

3.8 Perform APRM gain adjustments in accordance with N2-OSP-NMS-@004, APRM Gain Adjustment. ____/____ | 15717

3.9 Verify the following:

3.9.1 Steamline pressure greater than 766 psig. ____/____

3.9.2 Annunciator 603127 "DIVISION I MN STEAM LINE LOW PRESSURE" is clear. ____/____

3.9.3 Annunciator 603427 "DIVISION II MN STEAM LINE LOW PRESSURE" is clear. ____/____

Initials/Date

E. STARTUP (Cont)

3.9.4 APRM on scale between 5% and 12%. ____/____

3.9.5 MSIVs are open. ____/____

3.9.6 Condenser vacuum greater than 25" Hg. ____/____

3.9.7 Review the following for impact on entering Mode 1.

a. Equipment Status Log entries

b. Temporary Procedures ____/____

3.9.8 Steps of this procedure listed below have been completed and any exceptions listed:

- Step E.2.62 ____/____
- Step E.2.63 ____/____
- Step E.2.64 ____/____

3.9.9 Override Switches are placed in reset position at Panel P873:

a. Unit Cooler Fans GR1 LOCA ____/____

b. Unit Cooler Fans GR2 LOCA ____/____

c. Drywell Unit Cooler Wtr. DIV I LOCA ____/____

d. Drywell Unit Cooler Wtr. DIV II LOCA ____/____

e. DIV I Purge Outbd. Valves ____/____

f. DIV I HCS LOCA ____/____

g. DIV I CMS ISOL Vlv ____/____

3.9.10 Override Switches are placed in reset position at Panel P875:

a. DIV II Purge Inboard Valves ____/____

b. DIV II HCS LOCA ____/____

c. DIV II CMS ISOL Vlv ____/____

Initials/Date

E. STARTUP (Cont)

3.10 Verify HPCS INJ LEVEL 8 Bypass Test Switch is placed in the normal position at Panel P625. ____/____

3.11 Place reactor mode switch in RUN position. ____/____

3.12 Update SPDS in accordance with N2-OP-91B. ____/____

3.13 Select APRM position on all IRM/APRM recorders. ____/____

3.14 Select RBM position on both IRM/RBM recorders. ____/____

3.15 Fully withdraw IRMs from core. ____/____

3.16 Review the following to determine if N2-OSP-ICS-Q002, RCIC Pump & Valve Operability Test and System Integrity Test performance required.

3.16.1 Equipment Status Log, ESL ____/____

3.16.2 Work Tracking System, WTS ____/____

3.16.3 Post Maintenance Test, PMT ____/____

3.16.4 Surveillance Schedule ____/____

3.17 IF required by Step 3.16 above THEN within 12 hours after reactor pressure is adequate, perform N2-OSP-ICS-Q002, RCIC Pump & Valve Operability test and System Integrity Test. ____/____

3.18 Verify open discharge MOV associated with operating feedwatering. ____/____

NOTE: Within 24 hours after thermal power exceeds 15% Drywell and Suppression Chamber atmosphere oxygen concentration must be less than 4% by volume, based on noncondensable gases.

3.19 Continue to raise power by withdrawing control rods. ____/____

3.20 Close Main Steam Line Drains in accordance with N2-OP-01, Main Steam System. ____/____

3.21 Verify the following valves de-energized:

3.21.1 2MSS*SOV97A ____/____

3.21.2 2MSS*SOV97B ____/____

Initials/Date

E. STARTUP (Cont)

3.21.3 2MSS*SOV97C ____/____

3.21.4 2MSS*SOV97D ____/____

3.22 Place a Yellow Hold Out on Ckt. No. 23 at Panel 2SCI-PNLA101 in the OFF position. ____/____

3.23 Transfer level control valve in accordance with EITHER Section E.4.0 OR Section H.5.0 of N2-OP-03, Condensate and Feedwater System Single Feedwater Pump Operation. Refer to Section H.6 if required. ____/____

4.0 Turbine Startup

4.1 Verify shell/chest warming has been completed in accordance with N2-OP-21, Main Turbine. ____/____

4.2 Continue to raise power until 1-1/2 to 2 turbine bypass valves are open. ____/____

4.3 Verify turbine reset and roll main turbine in accordance with N2-OP-21, Main Turbine. ____/____

4.4 Secure condenser neck spray by closing 2CNM-MOV126 at Panel 2CEC-PNL851. ____/____

4.5 Open Feedwater Heater Extraction Steam MOVs in accordance with N2-OP-21, Main Turbine. ____/____

4.6 Notify Regional Power Control at least one hour prior to 345 KV yard switch operation to allow time for traveling operator to reach yard. ____/____

4.7 Synchronize Main Generator to grid in accordance with N2-OP-68, Main Generator, Exciter Main Transformer, 345 KV Yard & GE/Unit Protection. ____/____

4.8 Immediately load main generator between 50 and 70 MWE by adjusting LOAD LIMIT SET at EHC. ____/____

4.9 Slowly raise LOAD LIMIT SET on EHC until all turbine bypass valves are closed. ____/____

4.10 Raise LOAD LIMIT SET to 1215MWe. ____/____

4.11 Transfer house load from Reserve to Normal in accordance with N2-OP-71, 13.8KV/4160V/600V A.C. Power Distribution. ____/____

Initials/Date

E. STARTUP (Cont)

4.12 Verify positive interlock switch is made up for the following breakers:

4.12.1 2NPS-SWG-1-1 _____/____

4.12.2 2NPS-SWG-3-1 _____/____

4.13 Close Group I steam drain valves using Master Control Switch at Panel P824. _____/____

4.14 Verify Group I aux steam drain valves are closed. _____/____

5.0 Raise Power to 45% Rated

NOTES: 1. The Reactor Scrams and Containment Isolates at 1.68 psig in Drywell.

2. The % power is interpreted to be % of Rated Thermal power.

5.1 Perform the following:

5.1.1 Supply Nitrogen gas to instrument Nitrogen system in accordance with N2-OP-61A, Primary Containment Ventilation/Purge & Nitrogen System. _____/____

5.1.2 Commence inerting Primary Containment in accordance with N2-OP-61A, Primary Containment Ventilation/Purge & Nitrogen System until Oxygen concentration is less then 4% by volume. _____/____

NOTE: Seven demineralizers are required for 100% power.

5.2 Place Condensate Demineralizers in service as required in the order recommended by Chemistry and attempt to maintain individual demineralizer flows between 2000 and 3000 gpm and a system delta P between 45 and 55 psid. _____/____

5.3 Raise reactor power by withdrawing control rods in accordance with Startup Control Rod Sequence. _____/____

5.4 WHEN power is between 10 and 15% close all feedwater heater shell side startup vents in accordance with N2-OP-08, Feedwater Heaters and Extraction Steam System. _____/____

Initials/Date

E. STARTUP (Cont)

NOTE: Within 24 hours after thermal power exceeds 15% Drywell and Suppression Chamber atmosphere oxygen concentration must be less than 4% by volume, based on noncondensable gases.

5.5 WHEN power is approximately 15% close Group II steam drain valves using Master Control Switch at Panel P824. ____/____

5.6 Verify Group II steam drain valves closed. ____/____

5.7 Close non-group valves in accordance with N2-OP-01, Main Steam. ____/____

5.8 WHEN power is approximately 15% transfer Feedwater Level Control to Master Auto in accordance with N2-OP-03, Condensate and Feedwater System. ____/____

5.9 WHEN power is between 15% and 19% power, place reheaters in service in accordance with N2-OP-02, Moisture Separator Reheater System. ____/____

5.10 Verify Rod Worth Minimizer auto bypasses above LPSP at Panel P603. ____/____

5.11 When reactor power is between 20-25%, lineup WCS flow return to Feedwater in accordance with N2-OP-37, Reactor Water Cleanup System. ____/____

(NCTS 2) 5.12 AFTER WCS flow is returned to feedwater AND prior to 25% power perform N2-OSP-NMS-@004, APRM Gain Adjustment. ____/____ 15717

5.13 Verify Appendix "R" valve positions in accordance with Section E.2.0 of this procedure and close exceptions, if possible. ____/____

5.14 WHEN power is approximately 20%, perform Step E.3.2 of N2-OP-02, Moisture Separator Reheater System. ____/____

5.15 WHEN power is approximately 25% place Feedwater Control System in 3 element control and transfer Feedwater level control in accordance with N2-OP-03, Condensate and Feedwater System. ____/____

Initials/Date

E. STARTUP (Cont)

5.16 Within 12 hours AFTER exceeding 25% of RATED THERMAL POWER and at completion of raising THERMAL POWER at least 15%, verify thermal limits in accordance with N2-RESP-1. ____/____

5.17 Within 24 hours after exceeding 25% of RATED THERMAL POWER perform N2-OSP-LOG-D001, Daily Checks, Jet Pump Operability (TS 3.4.1.2). ____/____

5.18 Continue raising power using control rod withdrawal. ____/____

5.19 WHEN power is approximately 30% close Group III steam drain valves using Master Control Switch at Panel P824.

5.20 Verify the Group III steam line drain valves closed. ____/____

5.21 Verify Rod Sequence Control System auto bypass (above LPSP) at Panel P603. ____/____

5.22 Verify annunciator 603210, RBM Downscale is clear at Panel P603. ____/____

5.23 Verify annunciator 603112, RPS A CONT & STOP V CLOSURE BYPASSED is clear at Panel P603. ____/____

5.24 Verify annunciator 603412, RPS B CONT & STOP V CLOSURE BYPASSED is clear at Panel P603. ____/____

5.25 WHEN power is approximately 35% perform Section E.3.3 of N2-OP-02, Moisture Separator Reheater System. ____/____

* *

CAUTION

When total core flow is less than 45%, the reactor power shall be out of the restricted zone of Technical Specification Figure 3.4.1.1-1, if restricted zone is entered refer to Section H.2.0 of N2-OP-101D, Power Changes.

* *

5.26 WHEN power is between 35 and 40% transfer Reactor Recirculation Pumps to high speed in accordance with N2-OP-29, Reactor Recirculation System. ____/____

Initials/Date

E. STARTUP (Cont)

5.27 Continue to raise power in accordance with Reactor Engineer instruction. _____/_____

5.28 WHEN power is approximately 45% start fourth point heater drain pumps on minimum flow to clean their water volume prior to valving them into feedwater in accordance with N2-OP-08, Feedwater Heaters and Extraction Steam System. _____/_____

5.29 Place the second feedwater pump in service in accordance with Section H.5.0 of N2-OP-03, Condensate and Feedwater System. _____/_____

5.30 Continue power ascension in accordance with N2-OP-101D, Power Changes. _____/_____

F. NORMAL OPERATIONS

None

G. SHUTDOWN

Shutdown procedure will be covered in N2-OP-101C, Plant Shutdown and N2-OP-101D, Power Changes.

H. OFF-NORMAL OPERATIONS

END-OF-CYCLE RECIRCULATION PUMP TRIP OR MAIN STEAM BYPASS INOP

IF EITHER end-of-cycle recirculation pump trip system OR main steam bypass system is found inoperable AND reactor power is greater than 25%, THEN within one hour, contact Reactor Engineer and determine MCPR is greater than MCPR limit shown on Engineering Core Operating Limits Report, Figure 3.9 times kf shown on Figure 3.6.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS

N/A

ATTACHMENT 1
NINE MILE POINT - UNIT 2
SHORT FORM STARTUP CHECKLIST

Date/Time
Completed_____/_____

Reviewed By_____
CSO

Approved By_____
SSS

The Short Form Startup Checklist is to be used for plant startup following outage or shutdown that required only minor maintenance. The Master startup checklist is to be completed for plant startups following major outages (end of cycle refueling OR long involved inspections/maintenance).

Items that cannot be satisfied shall be noted in Section G.9. Entry into Operational Condition Two (Startup) shall not be made unless the surveillance requirements associated with the Limiting Conditions for Operation have been performed within the required surveillance interval.

For a system/component to be considered as operable, the following must have been accomplished:

a. The required mechanical/electrical checklists have been performed on that applicable system/subsystem/component which were marked up for maintenance during shutdown.

b. All periodic surveillances satisfactorily completed on that system/subsystem/component.

The SHORT FORM STARTUP CHECKLIST shall be conducted by a licensed Reactor Operator and Reviewed by the Chief Shift Operator. The Shift Supervisor shall approve the checklist after he has verified that items in G.9 are not required for startup.

The conditions are satisfied as listed in A through G.

A. SCRAM IDENTIFICATION

		Initials/Date
1. Post Scram Analysis completed in accordance with N2-RAP-6 if startup follows a scram.	CSO	____/____

B. REACTOR AND EMERGENCY SYSTEMS

1. As required in accordance with Tech Spec 4.1.1, Shutdown Margin has been determined to be adequate in accordance with N2-RESP-2.	____/____
2. Low Pressure Core Spray system is in standby in accordance with N2-OP-32.	____/____
3. Three independent Low Pressure Coolant Injection subsystems operable in accordance with N2-OP-31.	____/____
4. High Pressure Core Spray system is in standby in accordance with N2-OP-33.	____/____
5. The A.D.S. Nitrogen supply Lined up in accordance with N2-OP-61A.	____/____
6. The S.R.V. Pneumatic supply Lined up in accordance with N2-OP-34, (Inst. Air Supply) OR N2-OP-61A, Section E, (Nitrogen Supply).	____/____
6.a. Drain MSL 2MSS-006-119-4 in accordance with N2-OP-1.	____/____
7. Standby Liquid Control System is in standby in accordance with N2-OP-36A.	____/____
8. Redundant Reactivity Control System is in standby in accordance with N2-OP-36B.	____/____
9. Verify that the locked valves on Attachment 3 are current; reposition and lock any valves that may have been moved from their required position during the shutdown.	____/____ *
10. If the Primary Containment has been entered, perform section H (Primary Containment Pre-Startup Check) of the Master Startup Checklist and attach it to this checklist.	____/____

C. ELECTRICAL

	Initials/Date
1. Two physically independent circuits between the Off-Site Transmission Network and the On-Site Class 1E Distribution system operable in accordance with N2-OP-70.	____/____
2. VERIFY Main Transformer (2MTX-XM1A, 1B and 1C), Reserve Station Service Transformer (2RTX-SXR1A, 1B) and Auxiliary Boiler Transformer (2ABS-X1) are operable in accordance with N2-OP-68 and N2-OP-70.	____/____
3. A separate fuel storage tank for each Diesel Generator containing a minimum of:	
a. 52,644 gal. each of fuel for EDG-1 (Div. I) and EDG-3 (Div. II).	
b. 36,173 gal. of fuel for EDG-2 (Div. III).	____/____
4. The following Power Distribution System division shall be energized with the breakers open between redundant busses within the unit.	
a. Standby & Emergency A.C. Power Distribution System in accordance with N2-OP-72.	
b. Emergency D.C. Power Distribution System in accordance with N2-OP-74A.	
c. HPCS 125V D.C. Power Distribution System in accordance with N2-OP-74B.	____/____
5. The normal electrical distribution system is energized in accordance with N2-OP-71.	____/____
6. The Normal D.C. Distribution is energized in accordance with N2-OP-73A.	____/____
7. The 24 volt D.C. Distribution System is energized in accordance with N2-OP-73B.	____/____
8. The EDG-1 (Div. I) Diesel Generator is in standby in accordance with N2-OP-100A.	____/____
9. The EDG-3 (Div. II) Diesel Generator is in standby in accordance with N2-OP-100A.	____/____
10. The EDG-2 (Div. III) Diesel Generator is in standby in accordance with N2-OP-100B.	____/____

D. CONDENSER AND FEEDWATER SYSTEM

		Initials/Date
1.	Circulating Water System and cooling tower are operating in accordance with N2-OP-10A, 10B with a minimum of one circulating water pump running in each condenser section.	____/____ |*
2.	Main condenser vacuum breakers 2ARC-MOV5A, B and C closed (P851).	____/____
3.	Mechanical vacuum pumps are available.	____/____
4.	Off Gas System lined up in accordance with N2-OP-42 and commence off-gas preheater warm up using auxiliary boiler steam, if available.	____/____
5.	Steam packing exhausters are available.	____/____
6.	The Condensate/Feedwater System in Long Cycle Cleanup in accordance with N2-OP-3, unless it is being used for make-up to the reactor.	____/____
7.	Condenser hotwell level is approximately 12 inches, with hotwell level control in auto, and makeup and reject stations in service.	____/____
8.	Feedwater Heaters and Extraction Steam are lineup in accordance with N2-OP-8 valve lineup.	____/____
9.	Verify the Feedwater Heaters level controllers are lined up in accordance with N2-OP-8 Controller Lineup.	____/____

E. TURBINE GENERATOR AND AUXILIARIES

1.	Generator Stator & Exciter Rectifier Cooling System in operation in accordance with N2-OP-26.	____/____
2.	Generator hydrogen coolers in operation.	____/____
3.	Main Steam aux. supply steam stop valves 2MSS-MOV19A and MOV19B are open if blanket steam is in operation.	____/____
4.	Moisture Separator Reheater System ready for operation in accordance with N2-OP-2.	____/____
5.	Main Turbine Bypass Valves closed (P851), unless they are being used for pressure control.	____/____

E. TURBINE GENERATOR AND AUXILIARIES (Cont)

		Initials/Date
6.	Bypass opening jack at 0% (closed) (P851).	____/____
7.	Chest Warming selector set in OFF position (P851).	____/____
8.	Main Stop Valves, Control Valves, and Combined Intermediate Valves closed (P851).	____/____
9.	ALL VALVES CLOSED speed set selected (P851).	____/____
10.	Pressure Regulator setpoint at 150 psig (P851), unless it is controlling reactor pressure through the bypass valves and the main condenser.	____/____
11.	Maximum Combined Flow limit potentiometer set at 115% (P851). (Set potentiometer at 6.5 to achieve Maximum Combined Flow Setting of 115%.)	____/____
12.	Load Limit set at 100% (P851).	____/____
13.	Load Set selector at 0 (P851).	____/____
14.	Turbine Supervisory Instruments in service.	____/____
15.	Isolated Phase Bus Duct Coolers operable (N2-OP-24).	____/____
16.	Steam Seal System operable (N2-OP-25).	____/____
17.	Generator H_2 Seal Oil System is in operation in accordance with N2-OP-22D.	____/____
18.	Turbine Generator Lube Oil is in operation in accordance with N2-OP-22A.	____/____
19.	Turbine Generator Lube Oil Conditioner Storage and Waste Oil operable in accordance with N2-OP-22B.	____/____
20.	Start the Off-Gas refrigeration units 2OFG-REF1A, 1B, 1C, 2A, 2B, 2C in accordance with N2-OP-42 at least 4 hours prior to planned startup of Off-Gas System.	____/____
21.	Off-Gas hydrogen analyzers require at least 24 hours for startup. Off-Gas system flow is required for proper hydrogen analyzer operation. Contact Chemistry Department to perform required hydrogen analyses until hydrogen analyzers are operational. Notify I&C of imminent off-gas system operation.	____/____

F. INSTRUMENTATION & CONTROL

Initials/Date

1. Verify the following unit surveillances are completed within 24 hours of startup unless completed within the previous seven days

   a. SRM channel functional test (N2-ISP-NMS-W@008).

   b. IRM flux high channel functional test (N2-ISP-NMS-W@009).

   c. APRM channel functional test (N2-ISP-NMS-W@007).

   d. RBM channel functional (N2-ISP-RMC-M@001).

   e. Rx recirc flow channel functional test (N2-ISP-RCS-M@001). _____/_____

2. List any bypassed SRM channels, and enter these channels in the CSO log. _____/_____

3. List any bypassed IRM channels, and enter these channels in the CSO log. _____/_____

4. List any bypassed APRM or flow unit channels, and enter these channels in the CSO log. _____/_____

5. Process Computer available. _____/_____

6. Reactor Pressure Vessel metal temperature recorder on panel P614 is in service and inking properly. _____/_____

7. Recirculation Pump suction temperature recorder B35-R650 on control room panel P602 is in service and inking properly. _____/_____

G. FINAL CHECKS

1. CHECK the Equipment Status Log to make sure no equipment is inoperative which would prevent plant startup. _____/_____

NOTE: Reactor Coolant System Chemistry analysis results must be from within the last 72 hours (T.S.4.4.4 and T.S.4.4.5). Gross activity determination should be made from the most recent data.

G. FINAL CHECKS (Cont)

Initials/Date

2. Obtain current rad/chem daily chemistry analysis results of the Reactor Coolant System. Verify the following:

   a. Conductivity less than or equal to 2 umhos. ____/____

   b. Chlorides less than or equal to 0.1 ppm. ____/____

   c. pH between 5.6 and 8.6. ____/____

   d. Gross activity less than or equal to 0.2 µCi/gram DOSE EQUIVALENT I-131. ____/____

   e. Name of person/time contacted (for items a-d above):

      _____ ____/____

3. Reactor Protection System is reset.

   Channel A ____/____

   Channel B ____/____

4. Check the SSS Temporary Modification Log to verify that all unnecessary jumpers and blocks have been removed and required equipment is not out of service. ____/____

5. REVIEW the Mark Ups for entries which may adversely impact unit startup. ____/____

6. VERIFY technical specification surveillances are current. ____/____
   Station Shift Supervisor (SSS)

7. List the systems that were marked up during the outage and attach the applicable system valve and electrical lineup checklist. Double verification is required for the safety related systems.

   _____

   _____

   _____ ____/____
   Station Shift Supervisor (SSS)

G. FINAL CHECKS (Cont)

Initials/Date

8. List all inoperable or out of service control rods and accumulators.

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

9. Note any items on this checklist that could not be satisfied: (Add additional page if required.)

_____

_____

_____

_____

10. Review Temporary Procedures for impact on mode change. _____/_____

ATTACHMENT 2
NINE MILE POINT - UNIT 2
MASTER STARTUP CHECKLIST

Date/Time
Completed_____/_____

Reviewed By_____
CSO

Approved By_____
SSS

The Master startup checklist is to be completed for plant startups following major outages, i.e, major maintenance or refueling outage. Startup following outage of a lesser nature are accomplished using Attachment I, SHORT STARTUP CHECKLIST.

Items that cannot be satisfied shall be noted in Section I.10. Entry into Operational Condition Two (Startup) shall not be made unless the surveillance requirements associated with the Limiting Conditions for Operation have been performed within the required surveillance interval.

For a system/component to be considered as operable, the following must have been accomplished:

a. The required valve/electrical lineups have been performed on that applicable system/subsystem/component.

b. All periodic surveillances satisfactorily completed on that system/subsystem/component.

The MASTER STARTUP CHECKLIST shall be conducted/verified by a licensed Reactor Operator and Reviewed by the Chief Shift Operator. The Shift Supervisor shall approve the checklist after he has verified that items in I.10 are not required for startup.

The conditions are satisfied as listed in A through I.

A. SYSTEM VALVE AND ELECTRICAL LINEUP

The following system check-off lists must be completed in accordance with the operating procedure valve and electrical checklist or the system is in operation. Record all valves or breakers that are not positioned in accordance with System Checklists in Step I.10 of this attachment. The General Supervisor Operations will indicate systems lineups that can be designated as system operating (i.e. lineup not required).

NOTE: *System which requires independent verification of the lineup.

Procedure No.	Title	Checked by or System Operating	Date
N2-OP-1	Main Steam		
N2-OP-2	Moisture Separator Reheater		
N2-OP-3	Condensate and Feedwater		
N2-OP-4	Condensate Storage and Transfer		
N2-OP-5	Condensate Demineralizers and Resin Regeneration System		
N2-OP-8	Feedwater Heaters and Extraction Steam		
N2-OP-9	Condenser Air Removal		
N2-OP-10A	Circulating Water		
N2-OP-10B	Acid Treatment and Hypochloride		
*N2-OP-11	Service Water	/	
N2-OP-12	Traveling Water Screens Wash and Disposal		
N2-OP-13	Reactor Building closed Loop Cooling Water		
N2-OP-14	Turbine Building Closed Loop Cooling Water		
N2-OP-17	Process Sampling		
N2-OP-19	Instrument and Service Air		
N2-OP-22A	Turbine Generator Lube Oil		

Procedure No.	Title	Checked by	System Operating or	Date
N2-OP-22D	Generator Hydrogen Seal Oil			
N2-OP-23	Turbine Electrohydraulic Control			
N2-OP-25	Aux Steam, Aux. Condensate and Seal Steam			
N2-OP-27	Generator Hydrogen and CO_2			
N2-OP-29	Reactor Recirculation			
*N2-OP-30	Control Rod Drive	/		
*N2-OP-31	Residual Heat Removal	/	N/A	
*N2-OP-32	Low Pressure Core Spray	/	N/A	
*N2-OP-33	High Pressure Core Spray	/	N/A	
*N2-OP-34	Nuclear Boiler, ADS and Safety Relief Valve	/	N/A	
*N2-OP-35	Reactor Core Isolation Cooling	/	N/A	
*N2-OP-36A	Standby Liquid Control	/	N/A	
*N2-OP-36B	Redundant Reactivity Control System	/	N/A	
N2-OP-37	Reactor Water Cleanup			
*N2-OP-38	Spent Fuel Pool			
N2-OP-40	Liquid Radwaste			
N2-OP-42	Off-Gas			
N2-OP-48	Auxiliary Boiler Steam			
N2-OP-49	Hot Water and Glycol Heating			
*N2-OP-52	Reactor Building Ventilation	/		
*N2-OP-53A	Control Building Ventilation System	/		

Procedure No.	Title	Checked by	or System Operating	Date
*N2-OP-53E	Standby Switchgear/Battery Room Ventilation	/		
N2-OP-54A	Normal Switchgear Building Ventilation			
N2-OP-54B	Ventilation-Chilled Water			
N2-OP-55	Turbine Building Ventilation			
N2-OP-56	Radwaste Building Ventilation			
*N2-OP-57	Diesel Generator Building Ventilation	/		
N2-OP-58	Screenwell Building and Fire Pump Room Ventilation			
N2-OP-59A	Control Building/Reactor Building Electrical Tunnel Ventilation			
N2-OP-59B	Auxiliary Building South Air Cond. CO_2 Tank Room Ventilation System			
N2-OP-59C.5	Chiller Building Ventilation			
N2-OP-60	Drywell Cooling			
N2-OP-61A	Primary Containment Vent, Purge and Nitrogen System			
*N2-OP-61B	Standby Gas Treatment	/	N/A	
*N2-OP-62	DBA Recombiner	/	N/A	
N2-OP-63	Reactor Building Drains			
N2-OP-67	Drywell Equipment and Floor Drains			
N2-OP-70	Station Electrical Feed and 115 Kv Switchyard			
N2-OP-71	13.8 Kv/4160/600V AC Distribution			

ATTACHMENT 2 (Cont)

Procedure No.	Title	Checked by or System Operating	Date
*N2-OP-72	Standby and Emergency AC Distribution	/ N/A	
N2-OP-73A	Normal DC Distribution		
N2-OP-73B	24V DC Distribution		
*N2-OP-74A	Emergency DC Distribution	/ N/A	
*N2-OP-74B	HPCS 125VDC Distribution	/ N/A	
N2-OP-75	Station Lighting		
N2-OP-76	Plant Communication		
*N2-OP-78	Remote Shutdown	/ N/A	
N2-OP-79	Radiation Monitoring		
N2-OP-81	Containment Leakage Monitor		
*N2-OP-82	Containment Atmosphere Monitor	/ N/A	
N2-OP-86	Loose Points and Vibration Monitoring		
N2-OP-90	Seismic Monitoring		
*N2-OP-92	Neutron Monitoring	/ N/A	
N2-OP-94	Traversing In-core Probe		
N2-OP-95A	Rod Worth Minimizer		
N2-OP-95B	Rod Sequence Control		
N2-OP-96	Reactor Manual Control and Rod Position Indication		
N2-OP-97	Reactor Protection		
*N2-OP-100A	Standby Diesel Generator	/ N/A	
*N2-OP-100B	HPCS Diesel Generator	/ N/A	

Procedure No.	Title	Checked by or System Operating	Date
N2-IMP-GEN-@029	Instrument Valve Lineup	(Instrument and Control Check Completed) /	
N2-PM-M2	Misc. Loop Seal Fill PM	_____	N/A _____

B. NUCLEAR STEAM SUPPLY SYSTEM AND AUXILIARY	Initials/Date
1. Reactor vessel head in place and bolts tensioned.	____/____
2. Shutdown Margin has been determined to be adequate in accordance with N2-RESP-2.	____/____
3. Low Pressure Core Spray is in standby in accordance with N2-OP-32.	____/____
4. Three independent Low Pressure Core Injection subsystems operable in accordance with N2-OP-31.	____/____
5. High Pressure Core Spray is in standby in accordance with N2-OP-33.	____/____
6. All 18 Safety Relief Valves operable in accordance with N2-OP-34.	____/____
7. Control Rod coupling integrity has been demonstrated in accordance with N2-OSP-RMC-@002.	____/____
8. Control Rod Drive Hydraulic System is operating in accordance with N2-OP-30. Check for CRD Accumulator Inop lights.	____/____
9. Reactor Water Cleanup System in operation and capable of rejecting water to Radwaste or main condenser in accordance with N2-OP-37.	____/____
10. Main Steam lines drained.	____/____
11. Drain MSL 2MSS-006-119-4 in accordance with N2-OP-1.	____/____
12. Standby Liquid Control System is in standby in accordance with N2-OP-36A.	____/____
13. Fuel Pool Cooling System is operating in accordance with N2-OP-38, in spent fuel pool cooling. Open the following drain valves to verify the lines are drained and shut these valves.	
a. 2SFC*V154 Reactor Cavity Drain	____/____
b. 2SFC*V155 Rx Internal Storage Pit Drain	____/____
c. 2SFC*V265	____/____
d. 2SFC*V204	____/____
e. 2SFC*V203	____/____
f. 2SFC-V395	____/____

B. NUCLEAR STEAM SUPPLY SYSTEM AND AUXILIARY (Cont) Initials/Date

14. Process Computer is available. ____/____

15. Reactor Recirculation Pumps are operating or ready for service in accordance with N2-OP-29. ____/____

C. CONDENSATE AND FEEDWATER

1. Condensate demineralizers are ready for service. ____/____

2. Condenser hotwell level is approximately 12 inches, with hotwell level control in AUTO, condenser makeup and reject stations in service in accordance with N2-OP-4. ____/____

3. Condensate Booster pumps and auxiliary oil pumps are available. ____/____

4. Reactor Feedwater Pumps and auxiliary oil pumps are available. ____/____

5. Startup the Condensate System in Long Cycle cleanup in accordance with N2-OP-3. ____/____

6. Condensate demineralizer resin regeneration system ready for service. ____/____

7. Extraction Steam and Heater Drain System controllers are lined up in accordance with N2-OP-8 Table III. ____/____

D. CIRCULATING WATER AND CONDENSER

1. Main Condenser manways closed and secured. ____/____

2. Circulating Water System and cooling tower are operating in accordance with N2-OP-10A and 10B. ____/____

3. Main Condenser vacuum breakers closed.

- 2ARC-MOV5A
- 2ARC-MOV5B
- 2ARC-MOV5C ____/____

4. Mechanical Vacuum Pumps are available. ____/____

5. Commence Off-Gas recombiner warming in accordance with N2-OP-42 at least 3 days prior to planned start up of the Off-Gas System. ____/____

D. CIRCULATING WATER AND CONDENSER (Cont)

		Initials/Date
6.	Steam Packing Exhausters are available in accordance with N2-OP-25.	____/____
7.	Start the Off-Gas refrigeration Units 2OFG-REF1A, 1B, 1C, 2A, 2B, 2C in accordance with N2-OP-42 at least 4 hours prior to planned startup of the Off-Gas system.	____/____
8.	Off-gas hydrogen analyzers require at least 24 hours to start up. Off-gas system flow is required for proper hydrogen analyzer operation. Contact Chemistry Department to perform required hydrogen analysis until hydrogen analyzers are operational. Notify I&C of imminent off-gas system operation.	____/____

E. ELECTRICAL

			Initials/Date
1.	Two physical independent circuits between the Off-Site Transmission Network and the On-Site Class 1E Distribution System Operable in accordance with N2-OP-70.		____/____
2.	Verify Main Transformer (2MTX-XM1A, 1B and 1C), Reserve Station Service Transformers (2RTX-XSR1A, 1B) and Auxiliary Boiler Transformer (2ABS-X1) are energized for normal operation in accordance with N2-OP-68 and N2-OP-70.		____/____
3.	Standby and Emergency A.C. Power Distribution are energized in accordance with N2-OP-72.		
	a. 4160 Volt A.C. bus	DIV I	____/____
		DIV II	____/____
		DIV III	____/____
	b. 600 Volt AC, M.C.C	DIV I	____/____
		DIV II	____/____
		DIV III	____/____
	c. 240/120 volt and 208/120 volt	DIV I	____/____
		DIV II	____/____
		DIV III	____/____

E. ELECTRICAL (Cont)

		Initials/Date
4.	Emergency DC Power Distribution are energized in accordance with N2-OP-74A. DIV I	____/____
	DIV II	____/____
5.	HPCS 125V DC Power Distribution is energized in accordance with N2-OP-74B.	____/____
6.	Normal DC Distribution System is energized in accordance with N2-OP-73A.	____/____
7.	24 Volt DC Distribution System is energized in accordance with N2-OP-73B.	____/____
8.	DIV I and II Diesel Generator is lined up for standby operation in accordance with N2-OP-100A. DIV I	____/____
	DIV II	____/____
9.	DIV III Diesel Generator is lined up for standby operation in accordance with N2-OP-100B.	____/____
10.	Station Lighting System is in operation in accordance with N2-OP-75.	____/____
11.	Plant Communication System is in operation in accordance with N2-OP-76.	____/____
12.	Verify that the Main Generator and Metering Potential Transformer fuses are installed and the cabinet doors are locked.	____/____

F. TURBINE GENERATOR AND AUXILIARY

1.	Low Pressure Turbine Hood Sprays are available.	____/____
2.	Generator is filled with hydrogen, hydrogen pressure is maintained at about 75 psig and purity is greater than 94%.	____/____
3.	Generator Hydrogen Seal Oil System is in operation in accordance with N2-OP-22D.	____/____
4.	Generator Stator and Exciter Rectifier Cooling System is in operation in accordance with N2-OP-26.	____/____

F. TURBINE GENERATOR AND AUXILIARY (Cont)

		Initials/Date
5.	Generator Hydrogen Coolers in operation in accordance with N2-OP-14.	____/____
6.	Generator Core Monitor is available.	____/____
7.	Main Turbine Oil Tank level is normal, vapor extractor operating in accordance with N2-OP-22B.	____/____
8.	Turning Gear Oil Pump, Motor Suction Oil Pump and Bearing Lift Oil Pumps operating in accordance with N2-OP-22A.	____/____
9.	Turbine is on Turning Gear.	____/____
10.	Emergency Bearing Oil Pump is available and control switch is in AUTO on P851.	____/____
11.	Verify the following steam drains are open:	
11.1	Main Steam Lines	
1.	Low Point drains:	
•	2MSS-AOV87A	____/____
•	2MSS-AOV87B	____/____
•	2MSS*MOV87C	____/____
•	2MSS*MOV87D	____/____
2.	Main Steam Header drains:	
•	2MSS-AOV88A	____/____
•	2MSS*MOV88B	____/____
3.	Main Steam line drains:	
•	2MSS*MOV111	____/____
•	2MSS*MOV112	____/____
•	2MSS*MOV208	____/____
•	2MSS*MOV207	____/____
4.	Between MSIVs drains 2MSS*SOV97A, B, C, D at P824.	____/____

F. TURBINE GENERATOR AND AUXILIARY (Cont)

Initials/Date

11.1 (Cont)

5. Main Steam drains to condenser:

- 2MSS-AOV191 ____/____
- 2MSS-AOV203 ____/____
- 2MSS-AOV194 ____/____
- 2MSS-AOV205 ____/____
- 2MSS-AOV201 ____/____
- 2MSS-AOV209 ____/____

11.2 Main Turbine Drain at P824

1. Main Stop Valve before seat Drains

- 2MSS*MOV21A ____/____
- 2MSS*MOV21B ____/____
- 2MSS*MOV21C ____/____
- 2MSS*MOV21D ____/____

2. 2MSS-MOV147 Combined Control valve before seat drain. ____/____

3. High Pressure Steam line drain valves:

- 2MSS-MOV10A ____/____
- 2MSS-MOV10C ____/____
- 2MSS-AOV10B ____/____
- 2MSS-AOV10D ____/____

12. Verify the following heater extraction steam non-return valves closed:

- 2ESS-NRV34A ____/____
- 2ESS-NRV34B ____/____
- 2ESS-NRV34C ____/____

F. TURBINE GENERATOR AND AUXILIARY (Cont)

Initials/Date

12. (Cont)

- 2ESS-NRV28A ____/____
- 2ESS-NRV28B ____/____
- 2ESS-NRV28D ____/____
- 2ESS-NRV28C ____/____
- 2ESS-NRV23A ____/____
- 2ESS-NRV23B ____/____
- 2ESS-NRV23C ____/____
- 2ESS-NRV23D ____/____
- 2ESS-NRV16A ____/____
- 2ESS-NRV16B ____/____
- 2ESS-NRV16C ____/____
- 2ESS-NRV16D ____/____

13. Verify Moisture Separator Reheater extraction drains to main condenser 2DSR-MOV86A, B are open if blanketing steam is not in service. ____/____

14. Moisture Separator Cold Reheat drains are open if blanketing steam is not in service.

2CRS-MOV18A, B. ____/____
2CRS-MOV7A, B. ____/____
2CRS-MOV8A, B. ____/____
2CRS-MOV9A, B ____/____

15. Main Turbine bypass valves closed and Bypass Opening Jack is set at 0% (P851). ____/____

16. Chest Warming Selector set in OFF position (P851). ____/____

17. Pressure Regulator Setpoint set at 150 psig (P851). ____/____

18. Main Stop Valves, Control Valves, Combined Intermediate Valves closed (P851). ____/____

19. ALL VALVES CLOSED speed set selected (P851). ____/____

F. TURBINE GENERATOR AND AUXILIARY (Cont)

		Initials/Date
20.	Maximum Combined Flow limit potentiometer set at 115%. (Set potentiometer at 6.5 to achieve Maximum Combined Flow Setting of 115%.)	____/____
21.	Load Limit Selector set at 100%.	____/____
22.	Cooling fans on the MAIN and AUXILIARY TRANSFORMER available.	____/____
23.	Isolated Phase Bus Duct Cooling is available.	____/____
24.	Load Set selector at (0) zero MW.	____/____

G. STATION AUXILIARY SYSTEMS

1.	Service Water System operating in accordance with N2-OP-11.	____/____
2.	Traveling Water Screens and Wash Disposal System is in operation in accordance with N2-OP-12.	____/____
3.	Turbine Building Closed Loop Cooling Water in operation in accordance with N2-OP-14.	____/____
4.	Reactor Building Closed Loop Cooling Water in operation in accordance with N2-OP-13.	____/____
5.	Process Sampling System is in operation in accordance with N2-OP-17.	____/____
6.	Instrument/Service Air System operating in accordance with N2-OP-19.	____/____
7.	Breathing Air is in operation in accordance with N2-OP-20.	____/____
8.	Turbine Building Ventilation System operating in accordance with N2-OP-55.	____/____
9.	Reactor Building Ventilation System operating in accordance with N2-OP-52.	____/____
10.	Radwaste Building Ventilation System operating in accordance with N2-OP-56.	____/____
11.	Control and Relay Room Ventilation Systems, operating in accordance with N2-OP-53A.	____/____
12.	Control Building Special Filter Train System operable in accordance with N2-OP-53A.	____/____

G. STATION AUXILIARY SYSTEMS (Cont)

		Initials/Date
13.	Liquid Radwaste System is available and capable of receiving water from reactor startup (N2-OP-40).	____/____
14.	Solid Radwaste available as required to support the Liquid Radwaste System in accordance with N2-OP-41.	____/____
15.	Standby Switchgear/Battery Room Ventilation and Normal Switchgear Building Ventilation operating in accordance with N2-OP-53E and N2-OP-54A.	____/____
16.	Makeup Water Treatment and Makeup Water Storage and Transfer available in accordance with N2-OP-15 and N2-OP-16.	____/____
17.	Auxiliary Boiler Steam System in operation to support reactor startup in accordance with N2-OP-48.	____/____
18.	Hot Water and Glycol Heating System available in accordance with N2-OP-49.	____/____
19.	Screenwell Building & Fire Pump Room Ventilation System in operation in accordance with N2-OP-58.	____/____
20.	Control Building - Reactor Building electrical tunnels ventilation in operation in accordance with N2-OP-59A.	____/____
21.	Auxiliary Building South Air Conditioning/Carbon Dioxide Tank Room Ventilation System in operation in accordance with N2-OP-59B.	____/____
22.	Auxiliary Boiler Room Ventilation System in operation in accordance with N2-OP-59.C.1.	____/____
23.	Condensate Storage Tank Building Ventilation System in operation in accordance with N2-OP.59.C.2.	____/____
24.	Demineralized Storage Tank Building Ventilation System in operation N2-OP-59.C.3.	____/____
25.	Electrical Bay Ventilation Systems in operation in accordance with N2-OP-59.C.4.	____/____
26.	Chiller Building Ventilation System in operation in accordance with N2-OP-59.C.5.	____/____
27.	Service Building Ventilation System in operation in accordance with N2-OP-59.C.6.	____/____

G. STATION AUXILIARY SYSTEMS (Cont)

		Initials/Date
28.	Reactor Building Drains in operation in accordance with N2-OP-63.	____/____
29.	Turbine Building Drains in operation in accordance with N2-OP-64.	____/____
30.	Radwaste Building Drains in operation in accordance with N2-OP-65.	____/____
31.	Miscellaneous Building Drains in operation in accordance with N2-OP-66.	____/____
32.	Reactor Building Crane stored in accordance with N2-OP-84.	____/____

H. PRIMARY CONTAINMENT PRE-STARTUP CHECK

Complete the following checklist prior to plant startup if drywell entry has been made.

1.	Control rod drive position probe cables connected.	____/____
2.	SRM detector cables connected.	____/____
3.	IRM detector cables connected.	____/____
4.	LPRM detector cables connected.	____/____
5.	Equipment hatch secured.	____/____
6.	Undervessel service platform is locked in place, grating hole cover plates are removed, and no interference with SRM and IRM drive cables.	____/____
7.	Control rod drive housing support in place in accordance with Tech Spec 4.1.3.8.	____/____
8.	Drywell head is on and secured.	____/____
9.	Blow-by manholes removed and ventilation ducts installed.	____/____

H. PRIMARY CONTAINMENT PRE-STARTUP CHECK (Cont)

	Initials/Date
10. Recirculation pump high and lower bearing oil levels are checked at their normal level.	____/____
a. Visually check the recirculation pump and motor to verify that instrumentation and equipment are properly installed and fittings tight. <SIL 361>	____/____
b. Instruct Maintenance Department to verify the upper and lower recirculation pump motor bearing oil level alarm switch housing vent holes are clear by inserting a wire, or equivalent (approximately 1/8" diameter). <SIL 361>	____/____
11. The vacuum breakers on each safety relief valve discharge to the suppression pool visually inspected shut.	____/____
12. The vacuum breakers on each safety relief valve bonnet vent to the suppression pool visually inspected shut.	____/____
13. Monorail Hoists are secured in their storage location: a. SRV Hoist (MHR Crane 65) b. CRD Hoist (MHR Crane 66) c. MSIV Hoist ((MHR Crane 67)	____/____
14. N2-OSP-CNT-CS001 is complete, if required.	____/____
15a. Blind flange installed on Fire Protection Supply to Drywell at RB 240' elevation and Type B Leak Test if was removed during shutdown.	____/____
b. Fire hose reels (10 stations) inside Drywell are removed and piping drained in accordance with N2-OP-43.	____/____
16. Paging System Portable Stations removed.	____/____
17. Drywell housekeeping satisfactory.	____/____
18. Drywell emergency airlock doors closed.	____/____
19. Drywell personnel airlock door closed.	____/____

H. PRIMARY CONTAINMENT PRE-STARTUP CHECK (Cont)

Initials/Date

20. Containment AC circuits are de-energized in accordance with N2-OSP-LOG-D001. ____/____

21. Verify Operator Aid #88-047 Emergency Procedure for Defeating Personnel Door Interlocks is in place inside airlock, or next to interlock panel when exiting the drywell. ____/____

22. Verify the following Instrument Air Valves to testable check valves are closed and perform independent verification:

Valve No.	Description	Required Position	Initial/Date	Indi Verif Initial/Date
2IAS*V1005	Inst Air To 2CSL*AOV101	CLOSED		
2IAS*V1008	Inst Air To 2CSH*AOV108	CLOSED		
2IAS*V1006	Inst Air To 2RHS*AOV16A	CLOSED		
2IAS*V1007	Inst Air To 2RHS*AOV16B	CLOSED		
2IAS*V1001	Inst Air To 2RHS*AOV16C	CLOSED		
2IAS*V1010	Inst Air To 2RHS*AOV39A	CLOSED		
2IAS*V1011	Inst Air To 2RHS*AOV39B	CLOSED		
2IAS*V1002	Inst Air To 2ICS*AOV157	CLOSED		

16695

Remarks: _____

I. FINAL CHECKS

1. Check the Equipment Status Log to make sure no equipment is inoperative which would prevent plant startup. ____/____

2. Verify Rod Worth Minimizer is in service. ____/____

3. Verify Rod Sequence Control System is in service. ____/____

NOTE: Reactor Coolant System Chemistry analysis result must be from within the last 72 hours. Gross activity determination should be made from the most recent data.

4. Obtain current rad/chem daily chemistry analysis results of the Reactor Coolant System. Verify the following:

   a. Conductivity less than or equal to 2 umho. ____/____

   b. Chloride less than or equal to 0.1 ppm. ____/____

   c. pH is between 5.6 and 8.6. ____/____

   d. Gross activity less than or equal to 0.2 µCi/gram DOSE EQUIVALENT I-131. ____/____

   e. Name of person/time contacted. ____/____

5. Reactor Protection System is reset. ____/____

6. Check the Temporary Modification Log to verify that all unnecessary jumpers and blocks have been removed and required equipment is not out of service. ____/____

7. Review the Markups for entries which may adversely impact unit startup. ____/____

I. FINAL CHECKS (Cont)

Initials/Date

8. Verify Technical Specification surveillances are current and verify the following unit surveillances are completed within 24 hours of startup unless completed within the previous seven days.

   a. SRM channel functional test (N2-ISP-NMS-W@008).

   b. IRM flux high channel functional test (N2-ISP-NMS-W@009).

   c. RBM channel functional (N2-ISP-RMC-M@001).

   d. APRM channel functional test (N2-ISP-NMS-W@007).

   e. Rx recirc. flow channel functional test (N2-ISP-RCS-M@001). _____/_____

9. List all inoperable or out of service control rods and accumulators.

   _____ _____ _____

   _____ _____ _____

   _____ _____ _____

10. Note any items on this checklist that could not be satisfied: (Add additional page if required.)

    _____

    _____

    _____

11. Review Temporary Procedures for impact on mode change. _____/_____

ATTACHMENT 3
LOCKED VALVE LIST

Valve Number	Valve Description	Open	Closed	OP Number	Date	Initials
2SWP*V8	CCP Alternate Disch BV		X	11		
2SWP*V10A	2SWP*P1A Suct. B.V.	X		11		
2SWP*V10B	2SWP*P1B Suct. B.V.	X		11		
2SWP*V10C	2SWP*P1C Suct. B.V.	X		11		
2SWP*V10D	2SWP*P1D Suct. B.V.	X		11		
2SWP*V10E	2SWP*P1E Suct. B.V.	X		11		
2SWP*V10F	2SWP*P1F Suct. B.V.	X		11		
2SWP*V17	CCP Alternate Supply B.V.		X	11		
2SWP*V32	DIV II T/B Supply HDR's Cross-Tie		X	11		
2SWP*V959A	Service Water to Disch Bay	X		11		
2SWP*V959B	Service Water to Disch Bay	X		11		
2WCS-V27A	WCS P1A Suction Isolation	X		37		
2WCS-V27B	WCS P1B Suction Isolation	X		37		
2WCS-V28A	WCS P1A Suction Isolation	X		37		
2WCS-V28B	WCS P1B Suction Isolation	X		37		
2WCS-V30A	WCS P1A Discharge Isolation	X		37		
2WCS-V30B	WCS P1B Discharge Isolation	X		37		
2RDS*AOV124	SCRAM Disch Vol Vent	Open & Manual Operator Locked in Neutral		30		
2RDS*AOV132	SCRAM Disch Vol Vent	Open & Manual Operator Locked in Neutral		30		

Valve Number	Valve Description	Open	Closed	OP Number	Date	Initials
2SWP*V911	Cooling Tower Drain		X	11		
2SWP*V920	Cooling Tower Drain		X	11		
2SWP*V124A	Inlet Isolation to RCS*P1A		X	11		
2SWP*V125A	Outlet Isolation From RCS*P1A		X	11		
2SWP*V124B	Inlet Isolation to RCS*P1B		X	11		
2SWP*V125B	Outlet Isolation to RCS*P1B		X	11		
2SAS*HCV160	Service Air to Drywell OTBD I.V.		X	19		
2SAS*HCV161	Service Air to Drywell OTBD I.V.		X	19		
2SAS*HCV162	Service Air to Drywell INBD I.V.		X	19		
2SAS*HCV163	Service Air to Drywell INBD I.V.		X	19		
2AAS*HCV134	Breathing Air to Drywell OUTBD I.V.		X	20		
2AAS*HCV135	Breathing Air to Drywell OUTBD I.V.		X	20		
2AAS*HCV136	Breathing Air to Drywell INBD I.V.		X	20		
2AAS*HCV137	Breathing Air to Drywell INBD I.V.		X	20		
2RDS-V89	Exh Water Equal RV 15A Isol.	X		30		

Valve Number	Valve Description	Open	Closed	OP Number	Date	Initials
2RDS-V90	Exh Water Equal RV 15A Isol.	X		30		
2RDS-V91	Exh Water Equal RV 15B Isol.	X		30		
2RDS-V92	Exh Water Equal RV 15B Isol.	X		30		
2RDS*V129A	SDV LSY-11A Root Isol	X		30		
2RDS*V130A	SDV LSY-11A Inst Test Conn		X	30		
2RDS*V131A	SDV LSY-11A Inst Test Conn		X	30		
2RDS*V132A	SDV LSY-11A Inst Root Isol	X		30		
2RDS*V129B	SDV LSX-11A Inst Root Isol	X		30		
2RDS*V130B	SDV LSX-11A Inst Test Conn		X	30		
2RDS*V131B	SDV LSX-11A Inst Test Conn		X	30		
2RDS*V132B	SDV LSX-11A Inst Root Isol	X		30		
2RDS*V129C	SDV LSY-11B Inst Root Isol	X		30		
2RDS*V130C	SDV LSY-11B Inst Test Conn		X	30		

Valve Number	Valve Description	Open	Closed	OP Number	Date	Initials
2RDS*V131C	SDV LSY-11B Inst Test Conn		X	30		
2RDS*V132C	SDV LSY-11B Inst Root Isol	X		30		
2RDS*V129D	SDV LSX-11B Inst Root Isol	X		30		
2RDS*V130D	SDV LSX-11B Inst Test Conn		X	30		
2RDS*V131D	SDV LSX-11B Inst Test Conn		X	30		
2RDS*V132D	SDV LSX-11B Inst Root Isol	X		30		
2RDS*V133A	SDV 2RDS*LS125 Inst Root Isol	X		30		
2RDS*V134A	SDV 2RDS*LS125 Inst Test Conn		X	30		
2RDS*V133B	SDV 2RDS*LS127 Inst Root Isol	X		30		
2RDS*V134B	SDV 2RDS*LS127 Inst Test Conn		X	30		
2RDS*V135A	SDV 2RDS*LS126 Inst Test Conn		X	30		
2RDS*V70A	SDV 2RDS*LS126 Inst Root Isol	X		30		
2RDS*V70B	SDV 2RDS*LS129 Inst Root Isol	X		30		

Valve Number	Valve Description	Open	Closed	OP Number	Date	Initials
2RDS*V135B	SDV 2RDS*LS129 Inst Test Conn		X	30		
2RDS*V138A	SDV LTY-12B Inst Root Isol	X		30		
2RDS*V139A	SDV LTY-12B Inst Test Conn		X	30		
2RDS*V140A	SDV LTY-12B Inst Test Conn		X	30		
2RDS*V141A	SDV LTY-12B Inst Root Isol	X		30		
2RDS*V138B	SDV LTX-12B Inst Root Isol	X		30		
2RDS*V139B	SDV LTX-12B Inst Test Conn		X	30		
2RDS*V140B	SDV LTX-12B Inst Test Conn		X	30		
2RDS*V141B	SDV LTX-12B Inst Root Isol	X		30		
2RDS*V138C	SDV LTY-12A Inst Root Isol	X		30		
2RDS*V139C	SDV LTY-12A Inst Test Conn		X	30		
2RDS*V140C	SDV LTY-12A Inst Test Conn		X	30		

Valve Number	Valve Description	Open	Closed	OP Number	Date	Initials
2RDS*V141C	SDV LTY-12A Inst Root Isol	X		30		
2RDS*V138D	SDV LTX-12A Inst Root Isol	X		30		
2RDS*V139D	SDV LTX-12A Inst Test Conn		X	30		
2RDS*V140D	SDV LTX-12A Inst Test Conn		X	30		
2RDS*V141D	SDV LSX-12A Inst Root Isol	X		30		
2RDS*V559A	SOV154 Air Supply	Locked Throttled		30		
2RDS*V559B	SOV155 Bleed Off	Locked Throttled		30		
2RDS*AOV130	SDV Drain to RB Equip Drains	Open & Manual Operator Locked in Neutral		30		
2RDS*AOV123	SDV Drain to RB Equip Drains	Open & Manual Operator Locked in Neutral		30		
2RDS-V594	Scram Disch Vol Vent SOV Air Isol	X (Lead Seal)		30		
2RDS-V595	Scram Pilot Air Hdr Isol	X (Lead Seal)		30		
2RDS-V589A	SDV Vent/Drain SOV Air Isol	X		30		

Valve Number	Valve Description	Open	Closed	OP Number	Date	Initials
2RDS-V589B	SDV Vent/Drain SOV Air Isol	X		30		
2RHS*V4	2RHS*P1A Disch Manual Isol	X		31		
2RHS*V5	2RHS*P1B Disch Manual Isol	X		31		
2RHS*V6	2RHS*P1C Disch Manual Isol	X		31		
2RHS*V10	2RHS*P1A Min Flow Manual Isol	X		31		
2RHS*V11	2RHS*P1B Min Flow Manual Isol	X		31		
2RHS*V12	2RHS*P1C Min Flow Manual Isol	X		31		
2RHS*V16	2RHS*P2 Suct Isol	X		31		
2RHS*V21	Condensate Flush Supply to C LPCI		X	31		
2RHS*V22	Condensate Flush Supply to B SDC Return Header		X	31		
2RHS*V38	Condensate Flush Supply To SDC Header		X	31		
2RHS*V39	2RHS*P1A Disch Header Drain to Radwaste		X	31		

Valve Number	Valve Description	Open	Closed	OP Number	Date	Initials
2RHS*V41	2RHS*P1A Disch Hdr Drn to Radwaste		X	31		
2RHS*V42	2RHS*P1B Disch Hdr Drn to Radwaste		X	31		
2RHS*HCV53A	Inside Isol for RHR A LPCI Loop	X		31		
2RHS*HCV53B	Inside Isol for RHR B LPCI Loop	X		31		
2RHS*HCV53C	Inside Isol for RHR C LPCI Loop	X		31		
2RHS*HCV54A	Inside Isol for A SDC Return	X		31		
2RHS*HCV54B	Inside Isol for B SDC Return	X		31		
2RHS*V70	Condensate Flush Supply to A Contmt Spray Hdr		X	31		
2RHS*V71	Condensate Flush Supply to A SDC Return Hdr		X	31		
2RHS*V79	Condensate Flush to Head Spray HDR		X	31		
2RHS*V87	2RHS*P1C Disch HDR Drain to Radwaste		X	31		
2RHS*V89	2RHS*P1B Disch HDR Drain to Radwaste		X	31		

Valve Number	Valve Description	Open	Closed	OP Number	Date	Initials
2RHS*V57	RHR C Suct Isol From SDC Suction Header		X	31		
2RHS*HCV131	Manual Isol from Rx to SDC Suction Hdr	X		31		
2RHS*V224	Manual Isol for MOV 67A	X		31		
2RHS*V227	Manual Isol for MOV 67B	X		31		
2RHS*V261	2RHS*P2 Disch to RHR Loop "C"	X		31		
2RHS*V262	2RHS*P2 Disch to RHR Loop "B"	X		31		
2RHS*V263	2RHS*P2 Min Flow Disch I.V.	X		31		
2RHS*V264	2CSL*P2 Min Flow Disch I.V.	X		31		
2RHS*V265	CSL Press Supply to RHR A Loop Isol	X		31		
2RHS*V315	A Loop Supply to Supp Pool Spray Header	X		31		
2RHS*V316	B Loop Supply to Supp Pool Spray Header	X		31		
2RHS*V319	Hx B shell side vent Isol	X		31		

Valve Number	Valve Description	Open	Closed	OP Number	Date	Initials
2RHS*V320	Hx A shell side vent Isol	X		31		
2RHS*V376	Pump 1A Suction From Suppression Pool Manual Isol	X		31		
2RHS*V377	Pump 1B Suction From Suppression Pool Manual Isol	X		31		
2RHS*V378	Pump 1C Suction from Suppression Pool Manual Isol	X		31		
2RHS*V192	ICS Drain Pot to Suppression Pool		X	31		
2RHS*V379	Suppression Pool Spray Supply Manual Isol	X		31		
2RHS*V380	Suppression Pool Spray Supply Manual Isol	X		31		
2RHS*V381	Supp Pool Return Line Manual Isol	X		31		
2RHS*V382	Supp Pool Return Line Manual Isol	X		31		
2CSL*V1	CSL Waterleg Pump Suction	X		32		
2CSL*V12	Waterleg Pump Recirc Isol	X		32		
2CSL*V50	Waterleg Pump Recirc Isol	X		32		

Valve Number	Valve Description	Open	Closed	OP Number	Date	Initials
2CSL*V16	LPCS Inj HDR Flush Count. I.V.		X	32		
2CSL*V17	Waterleg Pump Disch Isol	X		32		
2CSL*V121	LPCS Pump Suction Isol	X		32		
2CSL*HV115	CSL Pump 1 Min Flow Throttled	X (Throttled)		32		
2CSL*HCV117	CSL Inbd Injection Isol	X		32		
2CSL*HCV118	RHR Suct. Supply to CSL		X	32		
2CSL*HCV119	LPCS Suct. from RHR A		X	32		
2CSH*V37	2CNS-TK1B Outlet	X		33		
2CSH*V38	2CNS-TK1B Return	X		33		
2CSH*V39	2CNS-TK1A Return	X		33		
2CSH*V96	CSH*P2 Recirc. Line	X (Throttled)		33		
2CSH*V54	CSH*P2 Recirc Line Throttle	X (Throttled)		33		
2CSH*V30	Condensate Makeup Isol		X	33		
2CSH*V31	Condensate Makeup Isol		X	33		
2CSH*HCV116	Recirc. Line Throttle	X (Throttled)		33		

Valve Number	Valve Description	Open	Closed	OP Number	Date	Initials
2CSH*HCV133	Test Bypass to Suppression Pool	X (Throttled)		33		
2CSH*HCV120	Injection HDR Isol	X		33		
2ICS*V187	Condensate Storage TK Manual Isol	X		35		
2ICS*V34	2ICS*P2A Suction from CST A	X		35		
2ICS*V202	2ICS*P2A Suction from Suppression Pool	X		35		
2ICS*V97	2ICS*P2 Min Flow	X		35		
2ICS*V184	2ICS*P2 Min Flow	X		35		
2ICS*V35	2ICS*P2 Disch Isolation	X		35		
2ICS*V83	2ICS*P1 Suction B.V.	X		35		
2ICS*V9	2ICS*P1 Disch Isol	X		35		
2ICS-V13	2ICS-TRP1 Inlet B.V.	X		35		
2ICS-V14	Drain Pot Drain Line Outlet Isol	X		35		
2ICS*V203	2ICS*MOV159 Isolation	X		35		
2ICS*V204	2ICS*MOV159 Isolation	X		35		

Valve Number	Valve Description	Open	Closed	OP Number	Date	Initials
2ICS*V238	ICS Turbine Exh Line Vac Bkr Isol	X		35		
2ICS*V211	ICS Turbine Exh Line Vac Bkr Isol	X		35		
2ICS*V144	2ICS*MOV128 Manual Bypass Isol	X		35		
2SLS*V2	Instr. Air Supply Isol		X	36A		
2SLS*V4	Storage Tank Demin Water Supply		X	36A		
2SLS*V8	2SLS*P1A Suct Isol	X		36A		
2SLS*V9	2SLS*P1B Suct Isol	X		36A		
2SLS*V13	2SLS*P1A Disch Isol	X		36A		
2SLS*V15	2SLS*P1B Disch Isol	X		36A		
2SLS*HCV116	SLS Pump Flow Test Throttle		X	36A		
2SLS*V16	2SLS*P1B Suction Header Drain		X	36A		
2SLS*V21	2SLS*P1A Suction Header Drain		X	36A		
2SLS*V5	Test Tank Demin Water Supply		X	36A		

Valve Number	Valve Description	Open	Closed	OP Number	Date	Initials
2SLS*HCV111	Test Tank Suction/Fill B.V.		X	36A		
2SLS*V23	2SLS*P1A Disch Header Drain B.V.		X	36A		
2SLS*V24	2SLS*P1B Disch Header Drain		X	36A		
2SLS*V25	SLS Pump Disch Header Common Drain		X	36A		
2SLS*V28	SLS Pump 1A Suction Header Cross Tie	X		36A		
2SLS*V29	SLS Pump 1B Suction Header Cross Tie	X		36A		
2SLS*V45	Storage Tank Header A Outlet Isol	X		36A		
2SLS*V46	Storage Tank Header B Outlet Isol	X		36A		
2SLS*V52	SLS Pump 1A Disch Header Cross Tie	X		36A		
2SLS*V53	SLS Pump 1B Disch Header Cross Tie	X		36A		
2SLS*V50	SLS Pump 1A Disch Isolation	X		36A		
2SLS*V51	SLS Pump 1B Disch Isolation	X		36A		

Valve Number	Valve Description	Open	Closed	OP Number	Date	Initials
2SLS*HCV114	Injection Header Isol	X		36A		
2SFC*V101A	Rx Refuel Cavity Sparger Supply Isol		X	38		
2SFC*V101B	Rx Refuel Cavity Sparger Supply Isol		X	38		
2SFC*V64	Rx Internals Storage Pit Sparger Supply Isol		X	38		
2SFC*V203	Refueling Cavity Inner Seal Leakage Detection Isol		X	38		
2SFC*V204	Refueling Cavity Inner Seal Leakage Detection Isol		X	38		
2HVK*V7	2HVK*CHL1A Makeup I.V.	X		53A		
2HVK*V30	2HVK*CHL1B Makeup I.V.	X		53A		
2CPS-V19	N_2 make up HDR Vent I.V.		X	61A		
2CPS-V15	N_2 make up HDR Vent I.V.		X	61A		
2CPS-V1	Suppression Chamber Purge Line B.V.	X		61A		
2CPS-V6	Drywell Purge Line B.V.	(Throttled)		61A		

Valve Number	Valve Description	Open	Closed	OP Number	Date	Initials
2CPS*AOV104	Drywell Purge Line Outboard I.V. Operator		Locked CCW	61A		
2CPS*AOV105	Suppression Chamber Purge Line I.V. Operator		Locked CCW	61A		
2HVR*DMP21	Emerg. Recirc. Air to SFC Pump Rooms Backdraft (R.B. 306' El. Above 2CES-RAK112)	X		52		
2CPS*AOV106	Drywell Purge Line INBD. I.V. Operator		Locked CCW	61A		
2CPS*AOV107	Suppression Chamber Purge Line INBD. I.V. Operator		Locked CCW	61A		
2CPS*AOV108	Drywell Vent Line INBD. I.V. Operator		Locked CCW	61A		
2CPS*AOV109	Suppression Chamber Vent INBD. I.V. Operator		Locked CCW	61A		
2CPS*AOV110	Drywell Vent Line OUTBD I.V. Operator		Locked CCW	61A		
2CPS*AOV111	Suppression Chamber Vent Line OUTBD I.V. Operator		Locked CCW	61A		
2GTS*V38	CPS Inlet Isol to SBGTS	X		61B		
2GTS*V31	Fan 1A Inlet Isol	X		61B		

Valve Number	Valve Description	Open	Closed	OP Number	Date	Initials
2GTS*V34	SBGT Disch Header Isol	X		61B		
2GTS*V16	Fan 1B Inlet Isol	X		61B		
2GTS*V35	SBGT Disch Header Isol	X		61B		
2GTS*AOV101	SBGT Inlet from CPS		Lock In Normal	61B		
2DFR-V61	Drywell Floor Drain Tank drain I.V.		X	67		
2DFR-V66	Drywell Floor Drain Tank drain I.V.		X	67		
2DFR-V62	Drywell Floor Drain Tank drain I.V.		X	67		
2DER-V51	Header Isol	X		63		
2DFR-V127	I.V. for drains from Track Bay		X	63		
2EGA*V46A	2EGA*PI14A I.V.		X	100.A		
2EGA*V6A	2EGA*TK1A Outlet Isol	X		100.A		
2EGA*V49A	Moisture Separator SP1A Discharge	X		100.A		
2EGA*V46B	2EGA*PI13A I.V.		X	100.A		

Valve Number	Valve Description	Open	Closed	OP Number	Date	Initials
2EGA*V6B	2EGA*TK2A outlet Isol	X		100.A		
2EGA*V49B	2EGA*SP2A outlet	X		100.A		
2EGA*V47A	2EGA*PI14B I.V.		X	100.A		
2EGA*V20A	2EGA*TK1B Outlet Isol	X		100.A		
2EGA*V52A	2EGA*SP1B Outlet Isol	X		100.A		
2EGA*V47B	2EGA*PI13B I.V.		X	100.A		
2EGA*V20B	2EGA*TK2B Outlet Isol	X		100.A		
2EGA*V52B	2EGA*SP2B Outlet Isol	X		100.A		
2EGF*V7	2EGF*P1C Disch Isol	X		100.A		
2EGF*V1	2EGF*STR1A Outlet Isol	X		100.A		
2EGF*V8	2EGF*P1A Disch Isol	X		100.A		
2EGF*V2	2EGF*STR1A Outlet Isol	X		100.A		
2EGF*V73	2EGF*TK3A Normal Disch	X		100.A		
2EGF*V94	2EGF*TK3A Drain to 2EGF*TK1A		X	100.A		
2EGF-V64	2EGF*TK1A Fill B.V.		X	100.A		

Valve Number	Valve Description	Open	Closed	OP Number	Date	Initials
2EGF*V27	2EGF*P1D Disch Isol	X		100.A		
2EGF*V21	2EGF*STR1D Outlet	X		100.A		
2EGF*V28	2EGF*P1B Disch Isol	X		100.A		
2EGF*V22	2EGF*STR1B Isol	X		100.A		
2EGF*V74	2EGF*TK3B Normal Disch	X		100.A		
2EGF*V95	2EGF*TK3B Drain to 2EGF*TK1B		X	100.A		
2EGF-V65	2EGF*TK1B Fill B.V.		X	100.A		
2EGA*V33A	2EGA*TK3 Disch B.V.	X		100.B		
2EGA*V48B	2EGA*PI114 I.V.		X	100.B		
2EGA*V33B	2EGA*TK4 Disch B.V.	X		100.B		
2EGA*V48A	2EGA*PI113 I.V.		X	100.B		
2EGF*V47	2EGF*P2B Disch Isol	X		100.B		
2EGF*V41	2EGF*STR2A Outlet Isol	X		100.B		
2EGF*V48	2EGF*P2A Disch Isol	X		100.B		

Valve Number	Valve Description	Open	Closed	OP Number	Date	Initials
2EGF*V42	2EGF*STR2B Outlet Isol	X		100.B		
2EGF*V75	2EGF*TK4 Outlet to DC Driven Fuel Pump	X		100.B		
2EGF*V76	2EGF*TK4 Outlet to Engine Driven Fuel Pump	X		100.B		
2EGF*V96	2EGF*TK4 Drain to 2EGF*TK2		X	100.B		
2EGF-V66	2EGF*TK2 fill B.V.		X	100.B		
2IAS-V147	ADS compressor Disch Isol		X	34		
2IAS*V137	ADS Receiver *TK4 Outlet Isol	X		34		
2IAS*V138	ADS*TK5 Outlet Isol	X		34		
2IAS*V174	ADS Receiver TK4 Outlet Header Isol	X		34		
2IAS*V175	ADS Receiver TK5 Outlet Header Isol	X		34		
2IAS*V179	ADS Accumulator Supply Header Check	X		34		
2IAS*V180	ADS Accumulator Supply Header Isol	X		34		

Valve Number	Valve Description	Open	Closed	OP Number	Date	Initials
**2IAS-V176	IAS to Various AOV's Inside Containment		X	19		
**2IAS-V177	IAS to Vac Brkrs/AOV's Isol		X	19		
*2IAS-V173	SRV Accumulator Inst Air Supply Isol		X	34		
2IAS*V178	SRV Accumulator Inst Air Supply Isol	X		34		
2GSN*V71A	N2 Supply Header to ADS Isol	X		61A		
2GSN*V71B	N2 Supply Header to ADS Isol	X		61A		
2FWS*HCV54A	FW to Reactor Isol	X		3		
2FWS*HCV54B	FW to Reactor Isol	X		3		
2CNM-V2A	2CNM*PT46A, B Instr. Isol.	X		3		
2CNM-V2B	2CNM*PT46C, D Instr. Isol.	X		3		
2CNS-V47	CST-A Return from CRD	X		4		
2CNS-V48	CST-B Return from CRD	X		4		

* Valve may be open during plant start-up until final drywell inspection is completed.

** Valves may be open until drywell is inerted. Control provided in OP 61A.

Valve Number	Valve Description	Open	Closed	OP Number	Date Initials
2RHS*V304	Isol On Line To SFC System		X	31	
2RHS*V309	Isol On Line To SFC System		X	31	
2RHS*V248	Isol On Line To SFC System		X	31	
RHS*V249	Isol On Line To SFC System		X	31	
2RHS*V254	Isol On Line To SFC System		X	31	
2RHS*V255	Isol On Line To SFC System		X	31	
2HVK*V41	Service Wtr Supply Isol To B Loop		X	53A	
2HVK*V26	B Loop Service Wtr Return Isol		X	53A	
2HVK*V51	A Loop Service Wtr Return Isol		X	53A	
2HVK*V18	Service Wtr Supply Isol To A Loop		X	53A	
2FOF-V1	Fuel Oil Tank 1 Outlet Isol	X		43	

ATTACHMENT 4
EXAMPLE STARTUP CONTROL ROD SEQUENCE PAGE

PAGE - 4

RWM GROUP - 2

RSCS GROUP - 2

STARTUP CONTROL ROD SEQUENCE

NINE MILE POINT UNIT TWO

SEQUENCE 2-A-2

BANK INSERT LIMIT - 00

BANK WITHDRAW LIMIT - 48

STARTUP					INSERT		WITHDRAW			SHUTDOWN		
58-31	00	48										
02-31	00	48										
34-55	00	48										
26-55	00	48										
26-07	00	48										
34-07	00	48										
50-39	00	48										
10-39	00	48										
10-23	00	48										
50-23	00	48										

Example Only

PREPARED BY _____ APPROVED BY _____ DATE __/__/__

NOTE: This is only an example of a page from a Startup Control Rod Sequence. Actual sheets may vary slightly from this example and will be obtained from Reactor Engineering.