07.232.91

NINE MILE POINT NUCLEAR STATION UNIT 2

OPERATING PROCEDURE

PROCEDURE NO. N2-OP-3

CONDENSATE AND FEEDWATER SYSTEM

FOR INFORMATION ONLY

DATE AND INITIALS

APPROVALS	SIGNATURES	REVISION 4	REVISION 5	REVISION 6
Operations Superintendent NMPNS Unit 2 R. G. Smith	R G Smith	2/17/89 RGS		
Station Superintendent NMPNS Unit 2 R. B. Abbott	R B Abbott	2/17/89 RBA		
General Superintendent Nuclear Generation J. L. Willis	J L Willis	JLW 2/17/89		

Summary of Pages (Cont'd on Cover Sheet 2)

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NIAGARA MOHAWK POWER CORPORATION

THIS PROCEDURE NOT TO BE
USED AFTER February 1993
SUBJECT TO PERIODIC REVIEW.

*Changes per Section 11.5, AP-2.0 R G Smith 4/24/89
Signed Date

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NINE MILE POINT NUCLEAR STATION UNIT 2

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CONDENSATE AND FEEDWATER SYSTEM

Cover Sheet Continuation (Page 2)

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CONDENSATE AND FEEDWATER SYSTEM

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4.0 Instruction Manual

Byron Jackson Feed Pump Instruction Manual P.O. No. P222V
Feed Pump Motor and Step Up Gear Instruction Manual GEK-38232
Feed Pump Motor Instruction Manual GEK-42681
Condensate Booster Pump Motor Siemens-Allis
Instruction Manual P.O. No. P222V
Condensate Pump Motor Allis Chalmers Instruction
Manual P.O. No. P222V
Byron Jackson Horizontal Double Bearing Pump
P.O. No. P222V
Feedwater Control GEK-83315A
GE Design Specification 23A5517 GEZIP System
GE FDDR KG1-6200, 2FWS-LV10B INSTRUCTION MANUAL 4

5.0 Nine Mile Point 2 Licensing Reference
FSAR Table 13.5-6

6.0 Others

6.1 SWEC Memo 9M2-18838 Apr. 18, 1986, response to NRC IE Information Notice 85-76

6.2 Modification No. PN2Y87MX259, Replace Hydraulic Actuator with Limitorque Motor Actuator on 2FWS-LV10A (B,C). |*8

6.3 Modification No. PN2Y88-037, Add a Condenser Neck Spray System.

6.4 Temporary Modification No. 89-13 (for 2FWS-MOV47C), 89-14 (for 2FWS-MOV47B) and 89-15 (for 2FWS-MOV47A), Change close limit switch setting to 2% open in accordance with the temporary disposition of Problem Report No. 08323.

CONDENSATE AND FEEDWATER SYSTEM

A. TECHNICAL SPECIFICATIONS

None

B. SYSTEM DESCRIPTION

The Condensate System transports condensate in sufficient quantities from the main condenser hotwell to the Reactor Feed Pump Suction Header. The Feedwater System provides make-up water at sufficient pressure and flow to the Nuclear Boiler System and Reactor water level is maintained by the Feedwater Control System.

The Condensate System also serves as a source of cooling water to the Steam Packing Exhausters and Steam Jet Air Ejector Inter-Condenser. During normal operation, Condensate Pumps take condensate from the collection box located beneath the condenser hotwell and discharge to the common header. The condensate flow through the piping to the Condensate/Demineralizer System where it is purified and filtered before being returned to the condensate system. Lines connect to the condensate header for the Condensate Storage and Transfer System to tap off excess condensate and for the exhaust hood sprays supply. The condensate then passes through the air ejector intercondenser, and the steam packing exhauster condenser. The condensate flows from the steam packing exhauster to the condensate booster pump suction header. Condensate flow rate is measured and condensate is recirculated to the condenser via a flow control valve to ensure there is sufficient condensate flow for the number of condensate pumps running. The Condensate Booster Pump Suction Header also provides the sealing water for the condensate pumps and the water supply for the clean steam reboiler. The condensate then flows to the condensate booster pump suction lines, where individual Condensate Booster Pump flows are measured.

Normally, two Condensate Booster Pumps are operating. A recirculation valve at the discharge of each pump receives a signal from the pump flow element and recirculates condensate to the condenser to maintain minimum required flow for the operating pumps The condensate booster pumps discharge to a common discharge header. The condensate then flows through three branch lines and through three AC motor-operated valves (one in each branch line) to the low pressure heater strings. Each string is sized to pass half of the rated condensate system flow (150% of string design flow) but will only provide design heating for 33% of the rated condensate system flow. Each string contains, in order, a second point drain cooler, a third point drain cooler, a first point heater, a second point heater, a third point heater, a fourth point heater and a fifth point heater. A connection between the fourth and fifth point heater receives the discharge of the fourth point heater drain pump. The condensate then flows through an AC motor-operated discharge isolation valve in each line to the feed pump suction header. A low pressure heater string bypass line is provided from the condensate booster pump discharge header to the feed pump suction header. The condensate is supplied to the feedwater system from the feed pump suction header.

During normal operation, three 4th Point Heater Drain Pumps are operating to provide about 35% of remaining condensate feed to the Feedwater Pump Suction Header. Two of the three 50%, 13.8KV motor driven Feedwater Pumps are operating to deliver designed 14.9×10^6 lb/hr of feedwater at 1055 psig and 424°F to the reactor vessel.

The main condenser is a triple shell, single pass, condenser with two tube bundles per shell, located directly under the main turbine low pressure exhaust hoods in the Turbine Building. The main condenser is designed to receive steam and drains from the Steam Bypass Valve System, at a maximum of 25% steam flow without raising the pressure and temperature at the low pressure turbine exhaust above 5 inches Hg absolute or 225°F. The condenser also receives miscellaneous vents and drains from throughout the steam plant. The condenser is mounted to the turbine exhaust hood through a flexible connection.

The condenser is constructed of carbon steel plates with copper-nickel and Admiralty tubes. Each shell contains two tube bundles. The periphery tubes (70-30 Cu-Ni) are located around the outside of the bundle where there is a potential for impingement of water and flashing steam. An air cooler section (70-30 Cu-Ni tubes) is located in the center of the bundle. The remainder of the tubes are Admiralty tubes.

A divider on the condenser false bottom above the hotwell separates the drains from each bundle and collection trays are provided under each tube bundle. These areas are sampled to detect any condenser tube leaks.

The area below each condenser false bottom is separated from the false bottom by a screen is called the condenser hotwell. The baffled condenser hotwells are interconnected. The hotwells drain to the condensate collection box under condenser 1A from which each condensate pump takes a suction via individual suction lines. The three shells connected by equalizing piping in the condenser necks and in the condenser hotwells.

Retention baffles are installed in the condenser hotwells to provide a 5 minute minimum retention time. This allows radioactive decay of most short lived nuclides in the condensers.

Circulating water is passed through the condensing tubes in each condenser shell. This circulating water is used to remove the latent heat of condensation from the incoming turbine exhausts. The turbine exhausts enter the condenser as steam. This steam, passing around the condenser tubes, gives up heat to the circulating water and becomes condensate.

In the main condenser, the condensate falls to the false bottom of its respective condenser section, CNM-CND1A, B, or C. The condensate then drains to the hotwell located under the condenser through a screen in the false bottom. The three hotwells drain to a common collection box under condenser CND1A.

The main condenser is maintained at a negative pressure to derive greater work from the exiting steam of the turbines. The air removal system is used to maintain this negative pressure by the removal of the non-condensable gases in the steam and condensate. These gases are separated from the steam and condensate by the design of the condenser tube bundle. Steam enters the tube bundles from the top, sides and bottom. The steam travels toward the center of the tube bundle condensing as it travels around the tube until it reaches a common area near the center of the tube bundle. The steam is condensed and the non-condensable gases are cooled and become more dense. They are then transported from the center section of each tube bundle by a 10 inch air vapor exhaust duct to the Condenser Air Removal System.

The condensate pumps are A.C. electric motor driven centrifugal pumps. The condensate pump motors contain an internal lube oil cooler for cooling the lube oil which lubricates the thrust bearing. The cooling medium is supplied from the Turbine Building Closed Loop Cooling Water System.

The condensate booster pumps are electric motor driven. The pump shaft and impeller is supported radially by a sleeve bearing and laterally by a Kingsbury thrust bearing. The bearings are lubricated by an attached oil pump during normal operation, and a motor driven auxiliary lube oil pump during startup and emergencies. The pump shaft is sealed by mechanical seals and throat bushings with seal water supplied from the pump suction. The motor is mounted on sleeve type bearings with individual sling type oil pumps.

A condenser neck spray line off the condensate booster pump suction header provides a tempering spray of condensate (552 GPM/ea.) to the neck area of each condenser section. The spray is operated via isolation valve 4
2CNM-MOV126 when steam is being bypassed to the condenser during plant start-up or after a Main Turbine trip.

The Feedwater System piping between the second isolation valve (FWS*MOV21A, B) outboard of the containment to the reactor vessel is safety related and is designed to withstand operational stresses (including safe shutdown earthquake) without a failure which could result in a radioactive release in excess of 10CFR100 limits. It is also designed to permit in service inspections and withstand the effects of a pipe break.

The system is sized with sufficient capacity to provide makeup water to the reactor to compensate for at least 115.5 percent of nuclear boiler rated steam flow.

The three, sixth point high pressure feedwater heaters in conjunction with the low pressure heaters of the condensate system, are designed to provide the rated final feedwater temperature of 420° at unit rated power output.

The feedwater system takes condensate from the low pressure feedwater heater strings, increases its pressure and temperature, and then delivers the feedwater to the reactor vessel.

Three, 50% capacity, 13.8KV motor driven reactor feed pumps take suction from the low pressure feedwater heater string outlet header, through motor-operated suction valves (2CNM-MOV84A, B, C). The system is designed to deliver 14.9×10^6 lb/hr of feedwater at 1055 psig and 420° to the reactor vessel with two reactor feed pumps in operation. The reactor feed pumps can each deliver 18,700 gpm at 1415 psig and are designed for a one pump condition of at least 68 percent of full rated power. Each pump discharge line is provided with its own 10 inch minimum flow recirculation line and minimum flow control valve 2FWS FV2A, B, C. Flow transmitter 2CNM-FT68A, B, C monitors pump suction flow and modulates FV2A, B, C to maintain flow at a minimum of 8500 gpm. Each pump discharge line is provided with a feedwater level control valve (LV10A, B, C).

In addition to Feedwater Level Control Valves LV10A, B, C, Feedwater Pumps 1A and 1B are provided with 6" high pressure low flow control valves LV55A and B. Each low flow control valve is designed to pass 7.5% nuclear boiler rated flow. A low pressure low flow control valve (LV137) is provided for controlling the flow while bypassing the feedpumps.

The high pressure heater string discharge header branches into three lines. Two of these lines provide normal feedwater flow to the reactor, and the third is the 20 inch feedwater cycle cleanup line which discharges into the main condenser.

The feedwater cleanup line is provided with flow transmitter FT109 and divides into two 16 inch , high-energy and low-energy cleanup lines. The low energy cleanup line is provided with MOV112 and flow control valves HVX113 and HVY113 and is used for flushing the system with no reactor feed pumps running.

During normal plant operation all the feedwater flows through the two 24 inch feedwater lines to the reactor. The two feedwater lines are provided with flow transmitters FT1A, B discharge check valves 104A and B, motor operated containment isolation valves MOV21A and B (outside containment), air testable containment isolation check valve AOV23A and B (outside containment), containment isolation check valve 12A and B (inside containment), and manual isolation valve HCV54A and B (inside containment). After HCV54A and B, each feedwater line splits into three 12 inch risers and connects to the reactor at elevation 309. The six feedwater nozzles are located at 60 degree intervals around the vessel.

Each reactor feed pump has a separate lube oil system which contains an oil reservoir and two lube oil pumps taking suction on the reservoir. The main lube oil pump is driven by an extension of the step up gear lo speed shaft and supplies oil to the reactor feedpump, feed pump motor and stepup gear assemblies. TCN-102

The auxiliary lube oil pump is motor driven and provides an automatic backup for the main lube oil pump. The system is equipped with a relief valve set at 60 psig to protect the system from overpressurization when both pumps are running. The lube oil system is cooled by turbine building closed loop cooling water and normally provides 67 gpm during reactor feed pump operation.

Each reactor feed pump is supplied with approximately 5 gpm of seal water to the pump mechanical seals from the condensate booster pump discharge. The seal water minimizes pump mechanical seal leakage and cools the pump seals to minimize seal degradation. Leakoff from the pump seals is directed to the turbine building equipment drains system.

During normal reactor operation, the level of the water in the reactor is controlled by a feedwater controller which receives inputs from reactor vessel water level, steam mass flow rate, and feedwater mass flow rate transmitters in three element control. At low power level, the controller receives input from reactor level (single element control). The feedwater control system generates signals which regulate the opening or closing of level control valves to control the feedwater flow to maintain desired reactor water level.

The feedwater control system may be operated in manual or automatic. In manual, the output signal is set by the operator using the controller manual control buttons. In automatic, the controller can operate in either single element or three element control. In single element control the controller output is proportional to the difference between the reactor level signal and the desired level setpoint as set on the controller. In three element control, the summed steam and feedwater flow signals are compared and the mismatch or error signal is then compared to the vessel water level signal.

The three element control signal is then supplied to the master controllers (high and low flow) where it is compared with the thumbwheel setting of the controller. This error signal then causes the feedwater flow regulating valve to open/close or stay as is.

The feedwater control system regulates flow by adjusting the position of three sets of feedwater control valves, low pressure low flow control valve (2CNM-LV137), high pressure, low flow control valves (LV55A, B) and high pressure, high flow control valves (LV10A, B, C).

The low pressure low flow control valve (2CNM-LV137) is used when the reactor is shutdown and at low pressure and temperature. This allows condensate booster pump discharge to be used to raise water level in the reactor. The high pressure low flow control valves (LV55A, B) are used during plant startup and low power operation. Only reactor feedwater pumps 1A and 1B have an associated high pressure low flow control valve and, therefore, would be used during startup. The high pressure high flow control valves are used during normal plant operation.

Feedwater level control valve LV10A(B,C) uses a variable frequency limitorque motor. When the valve position deviation error is 5% or greater, the motor operates at 100% speed (60 HZ and 18 seconds nominal full stroke time). When the valve position deviation error is 2.5% or less, the motor operates at 10% motor speed (6 HZ and 180 seconds nominal full stroke time). Motor speed and valve stroke time are variable between these values of deviation error. The position feedback mechanism is driven from the actuator motor, not the valve stem. As such, at approximately 2% indicated valve position LV10A(B,C) is shut but not seated. The actuator motor will continue to run until 0% indicated position to achieve the required seating force (by compression of Belleville washers), and torque out the motor.

The feedwater control valves LV10A, B, C will lock as is on loss of control signal, the interlock must be manually reset after the alarm condition has cleared.

During ATWS, the Redundant Reactivity Control System will command the Feedwater Control System to close the flow control valves. The close signals will apply to all control valve actuators and will override the "loss of control signals". Manual control of the feedwater control valves is available after 25 seconds RRCS feedwater runback signal initiated.

The feedwater control system is also provided with a Set Point Set Down (SPSD) function which helps prevent a high level trip of the reactor feed pumps following a scram of the reactor. The SPSD accomplishes this by automatically lowering the level set point in the control units following a scram to maintain an essentially constant inventory in the reactor vessel. This prevents an excessively high vessel level when the high pressure condition following a scram is corrected and core void content is re-established. The SPSD function must be manually reset by the operator after initiation. System annunciators and their responses are covered in Section I.

The feedwater control system also provides interlock and control functions to other systems. If the feedwater flow rate decreases to less than 30% of rated flow, the reactor recirc pumps will automatically transfer to low speed. The recirc flow control system also uses the feedwater flow signal as a low power interlock in pump start and transfer permissive circuits. Feedwater control system contacts are utilized to actuate high and low steam flow interlocks with the Rod Worth Minimizer and the Reactor Manual Control System.

Another protective feature of the Feedwater Control System is the feedpump flow limiter logic. This feature serves to minimize the possibility of feedpump cavitation anytime a low low feedpump suction pressure is present concurrent with a main turbine trip. With this logic engaged, flow is limited through the feedpump thus restoring NPSH at the pump suction. The logic is automatically bypassed when either initiating condition is clear. TCN-104

The Zinc Injection Passivation System is used to minimize the deposition of CO-60 on stainless steel piping by establishing a stable Zinc oxide film on the piping.

C. OPERATING REQUIREMENTS

1.0 Systems

1.1 Instrument Air System in operation, N2-OP-19.

1.2 13.8KV/4160V/600V A.C. Power Distribution, N2-OP-71.

1.3 Normal D.C. Distribution, N2-OP-73A.

1.4 Turbine building closed loop cooling system, N2-OP-14.

1.5 Circulating Water, N2-OP-10A.

1.6 Condensate transfer and storage, N2-OP-4.

1.7 Condensate demineralizer system, N2-OP-5.

1.8 Standby and Emergency A.C. Distribution, N2-OP-72.

1.9 Emergency DC Distribution, N2-OP-74A.

D. PRECAUTIONS/LIMITATIONS

1.0 All three Condensate Booster Pump and Feedwater Pump Auxiliary Lube Oil Pumps shall be in operation prior to starting any condensate pump (in order to supply lube oil protection to each pump in case it should unintentionally be windmilled).

2.0 Observe the following start limitations for the Condensate Pumps:

a. Motor initially at ambient temperature = three starts in succession.

b. Motor initially at operating temperature = two starts in succession.

3.0 Observe the following start limitations for the Condensate Booster Pumps:

a. Motor initially at ambient temperature = two starts in succession.

b. Motor initially at operating temperature = one start. Allow 30 minutes run time or idle time between additional start.

4.0 Observe the following start limitations for the Feedwater Pumps:

a. Motor initially at ambient temperature = two starts in succession.

b. Motor initially at operating temperature = one start. Allow 30 minutes run time or 60 minutes idle time.

5.0 Reactor Feedpump shall not be started with lube oil temperature below 50°F and shall not be loaded until lube oil temperature in the tank is greater than 130°F.

6.0 If Condensate flow is lost, close all Condensate Demineralizer Inlet and Outlet Valves as soon as possible to preclude demineralizer resin getting into the system.

7.0 Observe the allowable maximum differential pressure across the Feedwater Control Valves

a. 2FWS-LV10A, B, C 1250 psid

b. 2FWS-LV55A, B 1250 psid during normal operation but not to exceed 1500 psid during plant startup or a shutdown process

8.0 Following recovery of loss of offsite power, start the condensate system per section E 1.0 of this Procedure for venting the system to preclude the water hammer.

9.0 Condensate and Condensate Booster Pump Control switches shall be placed in Pull-To-Lock to prevent inadvertent auto starts, unless directed by the specific steps of this procedure.

10.0 When "C" Condensate booster pump is running, the control switch for the feed breaker NOT feeding the pump motor should be kept in PTL to allow proper lube oil pump operation (allows the aux oil pump to shut down on normal oil pressure).

11.0 This step has been deleted.

12.0 The Reactor Feedwater Pump discharge Isolation Valves, 2FWS-MOV47A,B,C can be operated with the control switch at P851 from full open to 98% closed only. The final 1/4" or 2% of stroke to seat the valve must be accomplished manually at the valves with the handwheel and declutch lever. Approximately 50 lbs. of rim pull force is sufficient to seat the valve properly, DO NOT APPLY EXCESSIVE FORCE TO CLOSE/SEAT THE VALVE.

13.0 This step has been deleted.

14.0 The fast detent of the valve 2FWS-LV10A(B,C) position MA station has a response of about 22%/sec., where as the valve response is about 6%/sec. only. Therefore, the fast detent operation of the valve position MA station will overdrive the valve. If using this speed the valve movement must be monitored until the valve position indication and position demand are approximately the same.

15.0 The "RRCS FW RUNBACK DISABLE" switch (C33A-S6) shall only be used to inhibit the RRCS Auto FW runback signal during surveillance testing of the RRCS system, when spurious ATWS trip signals may occur. Refer to N2-OP-36B, Section H.7.0 to operate this switch.

16.0 This step has been deleted.

17.0 The "C" Booster Pump has no min flow protection until 2CNM-FV38C is repaired refer to WR193559. 2CNM-P2C is to only be used in emergencies.

18.0 If for any reason, Condensate supply to Control Rod Drive system is secured, total system inventory will increase by approximately 70GPM. (CST to RDS suction) This in turn will cause Hotwell Level to rise and control approximately 22" indicated on 2CNS-LI101 at 2CEC-PNL851. (i.e. 2CNS-LV105 set to open at approximately 9.5" above Normal Level). Level Control may be supplemented by using Section I.10.3.c and I.10.3.d of N2-OP-4. TCN 110

17.0 The following bearing oil temperatures should not be exceeded for the reactor feed pumps. *8

Normal Operating	160°F
Alarm	180°F
Shutdown Required	185°F

E. STARTUP PROCEDURE

1.0 CONDENSATE PUMP STARTUP/CLEANUP OPERATION

1.1 Verify the system valve lineup Table I has been completed.

1.2 Verify the System Power lineup is completed per Table II, and control switches for Condensate and Condensate Booster Pumps are in Pull-To-Lock on P851.

1.3 Shut the following valves at panel P603:

a. 2FWS*MOV21A Feedwater to vessel isolation.

b. 2FWS*MOV21B Feedwater to vessel isolation.

1.4 Shut the following Reactor Feedwater Level Control Valves on panel P603 by placing the level controllers in MANUAL and the controllers output signal.

a. 2FWS-LV55A High Pressure Low Flow Valve position to 0%.

b. 2FWS-LV55B High Pressure Low Flow Valve position to 0%.

c. 2FWS-LV10A Feedpump A Level Control Valve position to 0%.

d. 2FWS-LV10B Feedpump B Level Control Valve position to 0%.

e. 2FWS-LV10C Feedpump C Level Control Valve position to 0%.

f. LV10A-LV10B-LV10C-Controller R600 is in MANUAL and the output is at 0%.

1.5 Shut 2CNM-LV137 low press low flow control valve on panel P603 by placing the level controller in MANUAL and the controller output to 0%.

1.6 Shut the low pressure heaters inlet valves 2CNM-MOV33A, B, C on panel P851.

1.7 Shut the discharge valve of the condensate pumps 2CNM-MOV3A (B, C) at the pump.

1.8 Verify cooling water valves 2CCS-V29A (B, C) and 2CCS-V30A (B, C) to the condensate pump 2CNM-P1A (B, C) are positioned per N2-OP-14, Att. 1. | TCN-102

1.9 Vent the condensate pump 2CNM-P1A (B, C) through suction strainer vent valve 2CNM-V169A (B, C) until air is no longer observed then shut the valve.

1.10 Verify hotwell level is at normal level.

1.11 Open low pressure low flow bypass valve 2CNM-MOV122 on panel P851.

1.12 Place two or more Condensate Demineralizers in service per N2-OP-5. Verify locally 2CNM-AOV109 Condensate Demineralizer Bypass Valve, is shut.

CAUTION

THE CONDENSATE BOOSTER PUMP AUXILIARY LUBE OIL PUMP MUST BE IN OPERATION ANYTIME A CONDENSATE PUMP IS RUNNING TO PROVIDE BEARING LUBRICATION WHEN FREE WHEELING OF PUMP OCCURS. ISOLATE THE PUMP IF ASSOCIATED AUXILIARY LUBE OIL PUMP IS NOT AVAILABLE.

1.13 Verify the lube oil cooling water valves 2CCS-V201A, B, C and 2CCS-V202A, B, C are positioned per N2-OP-14 Att. 1. Start condensate booster pump lube oil pumps 2CNO-P2A, B, C at local control panel by placing the control switch to START. | TCN-102

1.14 Verify the lube oil cooling water valves 2CCS-V207A, B, C, 2CCS-V206A, B, C, and 2CCS-V208A, B, C are positioned per N2-OP-14 Att. 1. Start feedwater pump lube oil pumps 2FWL-P1A, B, C at local control panel by placing the control switch to START. TCN-102

1.15 Verify condensate pump recirculation valve controller 2CNM-FV114 is in AUTO and flow set at 4800 gpm on panel P851.

<u>NOTE</u>: If 2CNM-P1C is selected to start, the preferable power supply is 2NNS-SWG011. (Until 2CNM-P1C discharge valve operator can be returned to operable, do not use 2CNM-P1C for initial fill of system.)

1.16 Start the condensate pump 2CNM-P1A (B) by placing the control switch from pull-to-lock to NORMAL then momentarily to START on P851.

1.17 Slowly throttle open the condensate pump discharge valve 2CNM-MOV3A (B) at the pump to fully open.

1.18 Verify the steady state condensate motor current is less than the full load rating of 218 AMPS.

1.19 Verify the condensate flow indicates about 4800 gpm on 2CNM-FI114.

1.20 Verify locally the condensate pump seal water pressure indication 2CNM-PI75A (B, C) is greater than 100 psig.

1.21 Vent the condensate pump discharge through valves 2CNM-V12A, B, C, 2CNM-V176 and 2CNM-V177.

1.22 At the condensate demineralizer panel, verify the dp across the Condensate Demineralizers are less than 50 psid.

1.23 Vent the system through the following vent valves until air is no longer observed:

<u>NOTE</u>: Remove the cap as required during venting and then reinstall the pipe cap. (Direct water to floor drain)

a. 2CNM-V152A, B, Air Ejector Inlet Vent

b. 2CNM-V168A, B, Air Ejector Outlet Vent

c. 2CNM-V153A, B, Steam Packing Exhaust Vent

d. 2CNM-V178, 2CNM-FE114 Inlet Vent

e. 2CNM-V195A, B, C, 2CNM-FE38A, B, C Upstream

f. 2CNM-V196A, B, C, 2CNM-FE38A, B, C Downstream

g. 2CNM-V181A, B, C, Condensate Booster Pumps Vent

h. 2CNM-V194A, B, C, Condensate Booster Pumps Vent

1.24 Throttle open low pressure heater inlet valves 2CNM-MOV33A, B, C control switch for about 5 seconds on panel P851.

1.25 Vent the heater streams and feedwater piping through high point vents:

NOTE: Remove the cap as required during venting and then reinstall the pipe cap. (Direct water to floor drain.)

a. 2CNM-HV51A, B, C, 2nd Point Drain Cooler Inlet Vent

b. 2CNM-HV52A, B, C, 3rd Point Drain Cooler Inlet Vent

c. 2CNM-V207A, B, C, Drain Cooler 3A, B, C Outlet Vent

d. 2CNM-V208A, B, C, 1st Point Heater Inlet Vent

e. 2CNM-HV55A, B, C, 2nd Point Heater Inlet Vent

f. 2CNM-HV56A, B, C, 3rd Point Heater Inlet Vent

g. 2CNM-HV57A, B, C, 4th Point Heater Inlet Vent

h. 2CNM-HV58A, B, C, 4th Point Heater Outlet Vent

i. 2CNM-V210A, B, C, 5th Point Heater Inlet Vent

j. 2CNM-V211A, B, C, 5th Point Heater Outlet Vent

k. 2CNM-HV119 Feedwater Suction Header Vent, open 2CNM-V366 TCN-64

l. 2CNM-HV60A, B, C, Feedwater Suction Valves 2CNM-MOV84A, B, C Vent

m. 2CNM-V212A, B, C, Feedwater Pumps Suction Vent

n. 2CNM-V213, Feedpump Bypass Line Vent

o. 2FWS-V83 and V98, Feedwater Pumps Bypass Vent

p. 2FWS-V67A and V97A, Feedwater Pump 2FWS-P1A Discharge Vent

q. 2FWS-V136A and V137A, 2FWS-LV55A Inlet Vent

r. 2FWS-HV42A, Feedwater Discharge 2FWS-MOV47A Vent

s. 2FWS-V67B and V97B, Feedwater Pump 2FWS-P1B Discharge Vent

t. 2FWS-V136B and V137B, 2FWS-LV55B Inlet Vent

u. 2FWS-HV42B, Feedwater Discharge 2FWS-MOV47B Vent

1.25 (Cont'd)

v. 2FWS-V67C and V97C, Feedwater Pump 2FWS-P1C Discharge Vent

w. 2FWS-HV42C, Feedwater Discharge 2FWS-MOV47C Vent

x. 2FWS-HV43A, B, C, 6th Point Heater Outlet

y. 2FWS-HV105, Feedwater Discharge Header

z. 2FWS-V132A and V133A, Feedwater 'A' to RPV

aa. 2FWS-V132B and V133B, Feedwater 'B' to RPV

ab. 2FWS-V112 and V113, Low Energy Feedwater Cycle Vent

ac. 2FWR-V2A and V3A, Feedwater Pump 2FWS-P1A Minimum Flow Inlet

ad. 2FWR-V2B and V3B, Feedwater Pump 2FWS-P1B Minimum Flow Inlet

ae. 2FWR-V2C and V3C, Feedwater Pump 2FWS-P1C Minimum Flow Inlet

af. 2FWS-V157 and 2FWS-V158, 2FWS-LV10A Bonnet Vent

ag. 2FWS-V155 and 2FWS-V156, 2FWS-LV10B Bonnet Vent

ah. 2FWS-V153 and 2FWS-V154, 2FWS-LV10C Bonnet Vent

ai. 2FWS-V2000A and 2FWS-V2001A, Feedwater Pump A Seal Vent

aj. 2FWS-V2000B and 2FWS-V2001B, Feedwater Pump B Seal Vent

ak. 2FWS-V2000C and 2FWS-V2001C, Feedwater Pump C Seal Vent TCN-64

al. 2CNM-V209, Low Pressure Heater String Bypass Vent TCN-63

1.26 Once the system has been vented, fully open 2CNM-MOV33A, B, C, low pressure heater inlet valves.

<u>NOTE</u>: Step 1.27 will provide a continuous vent to the condenser.

1.27 Close vent valve 2CNM-V366, open 2CNM-HV119. Throttle open 2CNM-V366 approximately 1/2 turn. TCN-64

1.28 Open 2FWS-MOV112 at P851, low energy feedwater cycle cleanup block valve.

1.29 Throttle open 2FWS-HVX113 at P851, by increasing controller tap setting until system flow indicates about 6000 gpm on 2FWS-FI109.

1.30 Verify the condensate pump recycle valve 2CNM-FV114 is fully closed.

<u>NOTE</u>: The Condensate System is operating in the cleanup mode.

1.31 Monitor the main condensate conductivity level at Condensate Demineralizer Panel for influent and effluent conductivity level. Change the Condensate Demineralizer as required per N2-OP-5.

1.32 Maintain this mode of operation until the main condensate purity is within the acceptable levels.

2.0 Condensate Booster Pump Startup

2.1 Throttle shut 2FWS-HVX113 by decreasing controller tape setting.

2.2 Verify the condensate recycle valve 2CNM-FV114 opens automatically when the system flow is reduced below 4800 gpm.

2.3 Shut 2FWS-HVX113 and 2FWS-MOV112 low energy feedwater cleanup valves.

2.4 Shut low pressure low flow bypass valve 2CNM-MOV122.

2.5 Locally verify that condensate booster pump suction pressure (2CNM-PI39A, B, C) is greater than 150 psig.

2.6 Locally verify condensate booster pump lube oil pressure 2CNO-PI5A (B, C) is at 6 psig and oil flow through each bearing at flow sight glasses.

2.7 Locally verify 2CCS-V201A(B,C) and 2CCS-V202A(B,C) cooling water to condensate booster pump A (B,C) are positioned per N2-OP-14 Att. 1. TCN-102

2.8 Verify condensate booster pump lube oil filter differential pressure is less than 15 psid on 2CNO-PDIS3A (B, C) at the pump.

2.8.1 Shut 2CNM-V140, feed pump seal water isolation:

2.8.2 Shut 2CNM-MOV84A, 2CNM-MOV84B, and 2CNM-MOV84C.

NOTE: If 2CNM-P2C is selected to start, the preferable power supply is from 2NPS-SWG001.

CAUTION:

2CNM-P2A,B,C SHALL BE STARTED WITH CNM-V201A,B,C (DISCHARGE STOP CHECK) OPEN TO PREVENT EXCESSIVE dp ACROSS THE VALVE.

2.9 Start condensate booster pump 2CNM-P2A (B,C) by placing the control switch from pull-to-lock to NORMAL then momentarily to START on P851.

2.10 Verify that the condensate booster pump minimum flow valve 2CNM-FV38A (B,C) opens and condensate booster pump suction flow indicates about 4400 gpm on 2CNM-FI-38A (B,C).

2.11 Locally place the condensate booster pump auxiliary lube oil pump control switch to AUTO and verify the lube oil pump stops.

2.11.1 Open 2CNM-HV59A (B,C) pump suction valve bypass.

2.11.2 Throttle open 2CNM-V367A (B,C) pump suction valve bypass manual isolation to slowly pressurize 2FWS-P1A (B,C).

2.11.3 Open 2CNM-V212A (B,C) and vent the 2FWS-P1A (B,C) suction line until no air is present.

2.11.4 Shut 2CNM-V212A (B,C) upon completion of venting.

2.11.5 Open 2CNM-MOV84A (B,C), FW pump A (B,C) suction isolation motor operated valve as required. |TCN-89

2.11.6 Shut 2CNM-V367A (B,C), FW pump A (B,C) suction valve bypass manual isolation.

2.11.7 Shut 2CNM-HV59A (B,C), FW pump A (B,C) suction valve bypass.

2.11.8 Open 2CNM-V140 feed pump seal water isolation.

2.12 Lineup the Condensate Feed to the Reactor as Follows:.

NOTE: Condensate and Feedwater System startup shall be performed in conjunction with N2-OP-101A.

NOTE: 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").

2.12 (Cont'd)

NOTE: Perform the following steps on P603 and locally at the component if specified.

a. Verify the reactor high water level (L-8) is reset.
b. Verify the reactor water level is in single element control.

NOTE: The handwheel gear ratio is approximately 770:1 with an efficiency of 21-1/4%, and a rim pull force of only 50 lbs. is sufficient to produce a valve seating force of 250,000 lbs. as required. Do not apply excessive force to close the valve.

c. Shut or verify shut 2FWS-MOV47A,B and C at P851 and at the valves physically.
d. Reactor level setdown logic is reset.
e. Verify the low pressure low flow control valve 2CNM-LV137 is in MANUAL and controller output is 0%.
f. Open the feedwater isolation valves 2FWS*MOV21A and B on panel P603.
g. Depress the OPEN pushbutton on 2CNM-LV137 to maintain desired reactor level.
h. Continue to control reactor water level with 2CNM-LV137 in MANUAL until a stable level can be maintained with valve position indication is greater than 5% on P603 at 2CNM-LV137 controller.
i. Adjust the LV55A-LV55B-137 controller tape setting to desired reactor water level.
j. Depress the 2CNM-LV137 controller OPEN/CLOSE pushbutton and verify the indicating arrow is in green band shown on LV55A-LV55B-137 controller.
k. Depress AUTO pushbutton on 2CNM-LV137 controller.
l. Verify that reactor water level is being maintained at the desired setpoint.

3.0 REACTOR FEEDWATER PUMP STARTUP

NOTE: a. First feedwater pump will be started at approximately 500 psig reactor pressure.
b. Only A and B feedwater pumps are supplied with high pressure low flow control valve, either A or B feedwater pump shall be used for initial feedpump start.

3.1 Start the Second Condensate Pump as Follows:

NOTE: If 2CNM-P1C is selected to start, the preferable power supply is from 2NNS-SWG011.

a. Verify cooling water valves 2CCS-V29B (C, A) and 2CCS-V30B (C, A) to the Condensate Pump 2CNM-P1B (A, C) are positioned per N2-OP-14 Att. 1. TCN-102

3.1 (Cont'd)

b. Start the 2CNM-P1B (A, C) by placing the control switch from pull-to-lock to NORMAL then momentarily to START on P851.

c. Place additional Condensate Demineralizer into service per N2-OP-5, (at least 4 Condensate Demineralizers).

3.2 Start the second Condensate Booster Pump as follows:

<u>NOTE</u>: If 2CNM-P2C is selected to start, the preferable power supply is from 2NPS-SWG001.

<u>CAUTION</u>:

2CNM-P2A,B,C SHALL BE STARTED WITH 2CNM-V201A,B,C (DISCHARGE STOP CHECK) OPEN TO PREVENT EXCESSIVE DP ACROSS THE VALVE

a. Locally verify condensate booster pump lube oil pressure 2CNO-PI5B(A,C) is at 6 psig and oil flow through each bearing at flow sight glasses.

b. Locally verify condensate booster pump lube oil filter differential pressure is less than 15 psid on 2CNO-PDIS3B (A, C).

c. Verify 2CCS-V201B (A,C) and 2CCS-V202B(A,C) cooling water to condensate booster pump B(A,C) are positioned per N2-OP-14 Att. 1. TCN-102

d. Start condensate booster pump 2CNM-P2B(A,C) by placing the control switch from pull-to-lock to NORMAL then momentarily to START on P851.

e. Verify that the condensate booster pump minimum flow valve 2CNM-FV38B(A,C) opens and condensate booster pump suction flow indicates about 4400 GPM on 2CNM-FI38B(A,C)

f. Locally place the condensate booster pump auxiliary lube oil pump control switch to AUTO and verify that lube oil pump stops.

3.3 Start the first feedwater pump as follows: TCN-102

a. Verify the local Automatic Circuit Breaker is ON and control switches at 2FWS-PNL10A(B,C) are set to the REMOTE/AUTO operation.

b. Verify annunciator 603143 "FD WTR CONT V 10A/10B/10C ACTUATOR TROUBLE" alarm is clear.

c. Verify the feedwater control valves 2FWS-LV10A,B,C are in MANUAL and the valve positions are at 0% open.

3.3 (Cont'd)

d. Verify the high/pressure low flow control valves 2FWS-LV55A,B are in MANUAL and the controllers output at 0%.

e. Verify the feedwater pump 2FWS-P1A(B) suction pressure is greater than 500 psig on 2CNM-PI70A (B) on P851.

f. Locally verify 2CCS-V207A(B), 2CCS-V208A(B) and 2CCS-V206A(B) cooling water to feedwater pump A(B) are open.

g. Verify locally that the feedwater pump seal water manual control valve 2FWP-V35A,(B,C) is full open, and adjust seal water pressure using Manual Seal Water Control Valve 2FWP-V35A, (B,C), to obtain approximately 25 - 30 psid on 2FWP-PDT5A,(5B,5C) when Feed Water Pump A,(B,C) is started.

h. Verify locally that the lube oil pressure is about 20 psig on 2FWL-PI1A(B) and oil flow through each pump and motor bearing sight glasses.

i. Verify locally that feedwater lube oil filter differential pressure is less than 6 psid on 2FWL-PDIS3A(B).

<u>NOTE</u>: The handwheel gear ratio is approximately 770:1 with an efficiency of 21-1/4%, and a rim pull force of only 50 lbs. is sufficient to produce a valve seating force of 250,000 lbs. as required. Do not apply excessive force to close the valve.

j. Verify 2FWS-MOV47A(B) is closed at P851.

k. Start the feedwater pump 2FWS-P1A(B) by placing the control switch momentarily to START on P851.

ℓ. Verify the feedwater pump minimum flow 2FWR-FV2A(B) opens on P851.

m. Verify feedwater pump 2FWS-P1A (B) starts

n. Verify feedwater pump 2FWS-P1A (B) suction flow indicates about 8500 gpm on 2CNM-FI68A(B)

o. Locally place the feedwater auxiliary lube oil pump control switch to AUTO and verify the lube oil pump stops.

p. Open high pressure low flow control valve by depressing OPEN pushbutton on 2FWS-LV55A(B) controller on P603 to maintain reactor water level and monitor 2CNM-LV137 closes.

q. Place low pressure low flow control valve 2CNM-LV137 controller on P603 in MANUAL and shut 2CNM-LV137 using the CLOSE pushbutton on the controller.

3.3 (Cont'd)

r. When 2FWS-LV55A(B) valve position indicates about 5% open on P603, adjust the 55A-55B-137 controller tape setpoint to obtain equal signals as read in the input (vertical), and output (horizontal) signal on 2FWS-LV55A(B) controller.

s. Verify LV55A-LV55B-137 indicator is in the green band.

t. Depress AUTO pushbutton on 2FWS-LV55A(B) controller.

u. Verify that reactor water level is maintained at desired setpoint.

NOTE: The Discharge MOV (2FWS-MOV47A,B,C) will be opened as directed in N2-OP-101A Section E.3.18 after the Reactor Mode Switch is placed in RUN.

4.0 STARTUP OF SECOND FEEDWATER PUMP

NOTE a: During startup, the second feedwater pump will be normally started at approximately 7% reactor power after reactor mode switch in RUN. Refer to H.5.0 Single Feedwater Pump Operation if second Feedwater Pump not available or reactor power is not expected to exceed 60%.

NOTE b: If 2FWS-P1C is selected to start, the preferable power supply is from 2NPS-SWG003 if 2FWS-P1A is running, or 2NPS-SWG001 if 2FWS-P1B is running.

4.1 Verify the local Automatic Circuit Breaker is ON and control switches are set to the REMOTE/AUTO operation at 2FWS-PNL10A(B,C).

4.2 Verify the feedwater control valve 2FWS-LV10B(A,C) is in MANUAL and the valve position is at 0% open.

4.3 Verify the high pressure low flow control valve for feed pump to be started, 2FWS-LV55B(A) is in MANUAL at controller and output at 0%.

4.4 Verify the feedwater pump 2FWS-P1B(A,C) suction pressure is greater than 500 psig on 2CNM-PI70B(A,C) on P851. If required SU the 3rd Condensate and Condensate Booster Pump.

4.5 Locally verify 2CCS-V207B(A,C), 2CCS-V208B(A,C) and 2CCS-V206B(A,C), cooling water to feedwater pump B(A,C) are positioned per N2-OP-14 Att. 1.

4.6 Locally verify that the feedwater pump seal water pressure indicates approximately 25 - 30 psid on 2FWP-PDT 5B (C,A). Adjust seal water pressure using manual seal water control valve 2FWP-V35B (C,A).

4.6.1 Monitor seal water flows and differential pressure closely during pump start to stable conditions. 16052

4.7 Verify locally that the lube oil pressure is about 20 psig on 2FWL-PI1B(A,C)and oil flow through each pump and motor bearing sight glasses.

4.8 Verify locally that feedwater lube oil filter differential pressure is less than 6 psid on 2FWL-PDIS3B(A,C).

4.9 Place two or more Condensate Demineralizers into service per N2-OP-5.

4.10 Start the feedwater pump 2FWS-P1B(C,A) by placing the control switch momentarily to START on P851.

4.11 Verify the feedwater pump minimum flow 2FWR-FV2B(A,C) opens on P851.

4.12 Verify that feedwater pump 2FWS-P1B(A,C) starts.

4.13 Verify feedwater pump 2FWS-P1B(A,C) suction flow indicates about 8500 gpm on 2CNM-FI68B(A,C).

4.14 Locally place the feedwater auxiliary lube oil pump control switch to AUTO and verify the lube oil pump stops.

NOTE: Monitor Reactor Vessel Level.

4.15 Open 2FWS-MOV47B(A,C) at P851.

4.16 Manually open feedwater level control valve 2FWS-LV10B (A,C) slowly by depressing OPEN pushbutton on the controller. Monitor High Pressure Low Flow valve, 2FWS-55A(B), shuts gradually as 2FWS-LV10B(A,C) opens.

4.17 Open 2FWS-MOV47A(B) and C at P851.

4.18 Continue to open 2FWS-LV10B(A,C) level control valve as required until 2FWS-LV55A(B) is about 10% open.

4.19 During the power increase, manually open feedwater level control valve 2FWS-LV10B(A,C) as required to maintain the reactor water level, and 2FWS-LV55A(B) at about 10% open.

4.20 When reactor power is increased to about 15%, (verify the bias tape setting is at 0% if LV10A or LV10C is used) adjust the master level controller LV10A-LV10B-LV10C output signal by depressing OPEN/CLOSE pushbutton until equal signals are read in the input (vertical) and output (horizontal) signal indicator on 2FWS-LV10B(A,C).

4.21 Place 2FWS-LV10B(A,C) controller in master manual control by depressing AUTO pushbutton on 2FWS-LV10B(A,C) controller.

4.22 Depress MANUAL pushbutton on 2FWS-LV55A(B) controller at P603.

4.23 Adjust master level controller LV10A-LV10B-LV10C tape setpoint to actual reactor level and verify the indicating arrow is in green band shown on LV10A-LV10B-LV10C controller and then depress AUTO pushbutton on the controller.

4.24 Shut 2FWS-LV55A(B) by depressing CLOSE pushbutton until 2FWS-LV55A(B) is fully shut.

4.25 Verify the reactor level is maintained at desired setpoint, adjust LV10A-LV10B-LV10C tape setting if required.

5.0 Place Feedwater Control In Automatic

NOTE: Refer to H.5.0 Single Feedwater Pump Operation if only one Feedwater Pump is operating.

5.1 At about 25% reactor power, verify the feedwater flow and steam flow indicates approximately the same on recorder R607 at P603.

5.2 At P603, place feedwater control to 3 element.

5.3 Place the standby feedwater level control valve 2FWS-LV10A(B) into service as follows:

a. Verify 2FWS-LV10A bias tape setting is at 0%.

b. Manually open 2FWS-LV10A(B) by depressing OPEN pushbutton on the controller. Verify that 2FWS-LV10B(A,C) Responds shut.

c. Continue to open 2FWS-LV10A(B,C) slowly until the input signal (vertical) and output signal (horizontal) signal read the same on 2FWS-LV10A(B,C).

d. Depress AUTO pushbutton on 2FWS-LV10A(B,C) controller.

e. Verify the reactor water level remains at the desired setpoint.

NOTE: If desired to operate with equal FWS-LV10A(B,C) positions perform step f, if not, skip f and perform step g.

f. Verify that the valve positions of the two operating LV10 valves are the same, adjust the bias tape setting on LV10A or/and LV10C slowly until the valve positions are equal.

g. If desired to operate with unequal FWS-LV10 positions slowly adjust negative bias tape setting on FWS-LV10A or C until desired valve position obtained.

6.0 ZINC INJECTION SYSTEM STARTUP

NOTE: a. Injection of zinc oxide into the feedwater may begin after feedwater heating is established F.W. Temp. greater than 283°F and zinc concentration in the reactor water is less than 15ppb.

NOTE: b. The zinc oxide suspension storage tank has a capacity of 14 days supply at a normal flow rate of 10 ml/min.

6.1 Perform the following to prepare the zinc suspension supply tank.

a. Verify the Zinc Injection valve lineup is per Table I.

b. Open 2Z1P-V1 to drain the supply tank and then shut 2Z1P-V1.

c. Place System Power switch to ON at the GEZIP skid control panel.

d. Fill the tank by placing control switch for F012 and F013 to TANK FILL position and verify the F012 opens and F013 shuts, tank level increases.

e. F012 fill valve automatic closes when the tank is filled.

f. Return F012 and F013 control switch to NORMAL.

g. Place selected mixer switch to START and verify mixer RUN red light comes on. Place the standby mixer control switch to AUTO.

h. Pour a prepackaged amount of zinc oxide into the tank, and allow the mixer to run for five minutes prior to initiating injection.

6.2 Zinc Oxide Injection Startup

a. Contact chemistry department to place Zinc Analyzer into service.

b. Set the metering pump stroke adjustment per chemistry department instruction.

c. Verify the following alarms are clear on GEZ1P skid.

1. Feedwater Bypass Low Temp
2. Feedwater Bypass Flow Low
3. Supply Tank Level Low Low
4. Tank Mixer Off

NOTE: Pumps normally will be run for approximately 3 months at a time, after which Chemistry will notify Maintenance to perform N2-MPM-ZIP-V030.

d. Place injection pump select switch to A selected or B selected position, as determined by Chemistry.

e. Place the injection pump control switch to START to injection zinc oxide into the feedwater system.

7.0 Place the Third Condensate and Condensate Booster Pump in Standby

NOTE: a. Condensate and Condensate Booster Pump will auto start on either of the following:

1. Less than two heater drain pumps running and condensate flow is greater than 11,000 gpm-standby condensate and condensate booster pumps start.

2 Condensate Booster Pump operating and low booster pump suction pressure - Standby Condensate Pump starts.

3. Reactor Feedwater Pump operating and low feedwater pump suction pressure - standby Condensate Booster Pump starts.

4. 2CNM-P2C has no min flow protection, refer to Annunciator Response Procedure I.13.0 for auto start of the "C" Booster Pump. TCN-108

b. In order to establish Condensate and Condensate Booster Pump in standby, one of the control switches for the C pump shall be placed in pull-to-lock position.

7.1 Verify cooling water valves 2CCS-V29C(A,B) and 2CCS-V30C(A,B) to the condensate pump 2CNM-P1C(A,B) are positioned per N2-OP-14 Att. 1.

7.2 Verify lube oil cooling water valves 2CCS-V201C(A,B) and 2CCS-V202C(A,B) are positioned per N2-OP-14 Att. 1.

7.3 Verify the condensate and condensate pump seal water pressure are normal.

7.4 Verify the condensate booster pump lube oil pressure is greater than 6 psig and oil flow through each bearing at flow sight glasses.

7.5 Verify more than two of three heater drain pumps are operating.

NOTE: a. The preferable power supply for 2CNM-P1C is from 2NNS-SWG011.

NOTE: b. The preferable power supply for 2CNM-P2C is from 2NPS-SWG001.

7.6 Verify the control switch (2NNS-SWG013) for 2CNM-P1C is in Pull-To-Lock.

7.7 Verify the control switch (2NPS-SWG003) for 2CNM-P2C is in Pull-To-Lock.

7.8 Place the standby Condensate Pump control switch to normal.

7.9 Place the standby Condensate Booster pump control switch to normal.

8.0 Third Condensate and Condensate Booster Pump Startup

NOTE: As required, the following steps shall be performed at about 80% power.

8.1 Perform Section E steps 7.1 to 7.4 prior to starting the pump.

8.2 Start the standby condensate pump 2CNM-P1C(A,B) by placing control switch momentarily to START.

8.3 Locally verify the condensate booster pump suction pressure is greater than 150 psig.

8.4 Start the standby condensate booster pump 2CNM-P2C(A,B) by placing control switch momentarily to START.

8.5 Locally place the auxiliary lube oil pump 2CNO-P1C(A,B) control switch in AUTO and verify the auxiliary lube oil pump trips.

9.0 Condenser Neck Spray Operation

9.1 Verify that the Condenser Neck Spray is lined up for operation per Table I-Valve Line-Up.

NOTE: If the control switch for 2CNM-MOV126 at panel 2CEC-PNL851 is in the AUTO position, the valve will open automatically upon actuation of any one or more of the Turbine Steam Bypass Valves, (2MSS-PSV89A-E). An AUTO initiation of MOV126 will open it to a preset throttled position of approximately 15% open as indicated by illumination of the red open light. MOV126 must be manually closed using the control switch to secure the condenser neck spray, and can be opened further than 15% or without actuation of the Turbine Bypass Valves by placing the control switch to the open position.

9.2 Initiate the Condenser Neck Spray by placing the control switch for 2CNM-MOV126 at panel 2CEC-PNL851 to the AUTO position, or to the open position until valve is 15% open, then place back into AUTO. TCN-52

F. NORMAL OPERATION

1.0 Periodic System Performance Check

1.1 Verify the condensate pump motor current is less than 218 amps at P851. *

1.2 Verify the condensate pump seal water pressure is maintained greater than 100 psig. (2CNM-PI75A, B, C)

1.3 Verify the condensate booster pump motor current is less than 115 amps at P851.

1.4 Verify the condensate booster pump lube oil cooler outlet temperature is at about 120°F. (2CNO-TI10A, B, C)

1.5 Verify the condensate booster pump lube oil pressure is at 6 psig at cooler outlet. (2CNO-PI5A, B, C)

1.6 Verify that the condensate lube oil filter shows a differential pressure of less than 15 psid. (2CNO-PDIS3A, B, C). If filter differential is >15 psid, swap to the Standby filter in accordance with F.2.0.

1.7 Verify the feedpump seal water pressure is maintained above 25 psid but less than 30 psid. A nominal pressure of 28 psid should be maintained.

1.8 Verify the feedpump lube oil pressure is at about 20 psig at cooler outlet. (2FWL-PI5A, B, C)

1.9 Verify the feedpump lube oil cooler outlet temperature is at 120°F. (2FWL-TI12A, B, C)

1.10 Verify that the feedwater pump motor current is less than 532 amps at P851.

1.11 Verify GEZ1P panel annunciators are clear, refer to appropriate alarm response to maintain system normal operation locally at GEZ1P panel.

1.12 Verify feedwater pump suction header is continuously venting through HV119 and V366.

2.0 <u>Condensate Booster Pump Lube Oil Filter Changeover</u>

2.1 Swap lube oil filters 2CNO-FLT1A/2A (1B/2B, 1C/2C) as follows:

2.2.1 Open out of service filter inlet valve 2CNO-V26A (V26B, V26C) or 2CNO-V28A (V28B, V28C).

2.2.2 Open out of service filter vent valve 2CNO-V29A (V29B, V29C) or 2CNO-V30A (V30B, V30C) until a steady stream of oil issues from the vent, directed to a container.

2.2.3 Shut out of service filter vent valve 2CNO-V29A (V29B, V29C) or 2CNO-V30A (V30B, V30C).

2.2.4 Open out of service filter outlet valve 2 CNO-V25A (V25B, V25C) or 2CNO-V27A (V27B, V27C).

2.2.5 Shut inservice filter outlet valve 2CNO-V25A (V25B, V25C) or 2CNO-V27A (V27B, V27C).

2.2.6 Shut inservice filter inlet valve 2CNO-V26A (V26B, V26C) or 2CNO-V28A (V28B, V28C).

2.3 Verify ΔP across filter is <15 psid. Initiate a WR to clean the filter removed from service.

3.0 <u>Feedwater Pump Lube Oil Filter Changeover</u>

3.1 Throttle open 2FWL-V24A(B,C) to fill the standby filter.

3.2 Remove pipe cap from the standby filter vent line.

3.3 Crack open the standby filter vent valve, 2FWL-V21A(B,C) or 2FWL-V22A (B,C) until a steady stream of oil issues from the vent, directed to a container.

3.4 Shut 2FWL-V21A(B,C) or 2FWL-V22A(B,C) and replace the pipe cap removed in Step 3.2

3.5 Place the standby filter in service by slowly transferring the inlet and outlet valve gang control handle to the opposite position.

3.6 Shut 2FWL-V24A(B,C), filter fill valve.

G. SHUTDOWN PROCEDURE

1.0 Condensate and Feedwater System Shutdown

NOTES: 1. The Condensate and Feedwater System shutdown shall be performed in conjunction with N2-OP-101C.

2. The 2CNM-P2C has no min flow protection. Min flow capability is available by manual operation only. TCN-108

1.1 At approximately 75% power, remove one of the three operating condensate and condensate booster pumps as follows:

1.1.1 Verify at least two of the three heater drain pumps are operating.

1.1.2 Verify an adequate amount of condensate demineralizers are in service to support the removal of a condensate booster pump. (Condensate flow will increase ~4400 gpm)

NOTE: For 2CNM-P2C perform Steps 1.1.3.d and 1.1.3.e to shutdown the pump. TCN-108

1.1.3 Manually close 2CNM-V201A(B,C), booster pump discharge stop check valve for the booster pump to be removed from service.

a. Verify that the running booster pumps increase flow as 2CNM-V201A(B,C) is closed.

b. When flow decreases to ~4400 gpm through the booster pump being removed from service, verify the minimum flow valve, 2CNM-FV38A(B,C) begins to open.

c. When 2CNM-V201A(B,C) is full closed, verify flow through the minimum flow valve for the booster pump to be removed from service is ~4400 gpm.

NOTE: Shutdown of 2CNM-P2C w/manual min flow, perform Steps 1.1.3.d and 1.1.3.e simultaneously. TCN-108

d. Manually close 2CNM-V201C, Booster Pump "C" discharge stop check valve.

e. Throttle open 2CNM-V165C Booster Pump "C" min flow isolation valve.

1.1.4 Trip 2CNM-P2A(B,C) by placing its control switch to pull-to-lock on P851.

a. After verifying that the auxiliary lube oil pump, 2CNO-P2A(B,C) auto starts, place its control switch to start locally.

b. For 2CNM-P2C, close 2CNM-V165C min flow isolation valve. TCN-108

1.1.5 Return 2CNM-V201A(B,C) to the open position.

1.1.6 If necessary, return the control switch for the booster pump removed from service to normal after stop at P851.

1.1.7 Manually trip condensate pump 2CNM-P1A(B,C) by placing the control switch momentarily to STOP on P851.

1.2 At approximately 45% power, perform the following:

a. Place the standby condensate and condensate booster pump control switch to pull-to-lock to prevent inadvertent pump auto start during heater drain pumps shutdown.

b. Remove the heater drain pumps from service per N2-OP-8.

1.3 At approximately 25% power, perform the following:

1.3.1 Place Feedwater Control to Single Element on P603.

1.3.2 Shutdown Zinc Injection System per Section G.2.0 of this procedure.

<u>NOTE</u>: Only A and B Feedwater Pumps are supplied with a high pressure low flow control valve, either 2FWS-LV10A or B shall remain in service.

1.3.3 Perform the feedwater controller for the pump to be tripped as follows:

a. Depress 2FWS-LV10B(C,A) controller manual pushbutton.

b. Slowly shut 2FWS-LV10B(C,A) to 2% valve position by depressing CLOSE pushbutton, verify that 2FWS-LV10A (B,C) maintains desired water level.

c. Depress CLOSE 2FWS-LV10B(C,A) until valve position reads about 0%.

1.3.4 Trip the Feedwater Pump 2FWS-P1B(C,A) by placing the control switch momentarily to STOP at P851. Verify:

a. Auxiliary Lube Oil Pump 2FWL-P1B(C,A) starts automatically.

b. Minimum flow valve 2FWR-FV2B(C,A) shuts immediately.

c. Locally place the Auxiliary Lube Oil Pump control switch to START.

d. Remove additional Condensate Demineralizer from service per N2-OP-5.

1.4 At approximately 5 to 10% power, perform the following to transfer controller to 2FWS-LV55A(B).

a. Slowly open 2FWS-LV55A(B) by depressing controller OPEN pushbutton on P603 and verify that 2FWS-LV10A(B) response shut.

b. Verify that LV55A-LV55B-137 controller tape setpoint is at actual reactor water level.

c. Verify 2FWS-LV55A(B) controller input (vertical) and output (horizontal) signals are the same, adjust LV55A-LV55B-137 tape setting if required.

d. Place 2FWS-LV55A(B) in auto by depressing AUTO pushbutton on the controller.

e. Depress LV10A-LV10B-LV10C controller MANUAL pushbutton.

f. Depress 2FWS-LV10A(B) controller MANUAL pushbutton.

g. Slowly shut 2FWS-LV10A(B) to 2% valve position by depressing CLOSE pushbutton on the controller and verify 2FWS-LV55A(B) opens to control the reactor level.

h. Depress CLOSE on 2FWS-LV10A(B) controller until valve indicates 0% open. *9

<u>NOTE</u>: The handwheel gear ratio is approximately 770:1 with an efficiency of 21-1/4%, and a rim pull force of only 50 lbs. is sufficient to produce a valve seating force of 250,000 lbs. as required. Do not apply excessive force to close the valve.

i. Shut 2FWS-MOV47A, B, and C Feedwater Discharge Isol. using the control switches at P851, and physically at the valves.

1.5 When 2FWS-LV55A(B) closes to about 5% open as indicated on P603, depress MANUAL pushbutton on 2FWS-LV55A(B) controller.

1.6 Manually adjust 2FWS-LV55A(B) by depressing OPEN/CLOSE pushbutton on the controller as required to control reactor water level.

1.7 At about 500 psig reactor pressure, perform the following:

a. Place 2FWS-LV55A(B) in MANUAL and slowly raise reactor water level approximately 1 inch above setpoint as indicated on the low flow controller.

b. Place 2CNM-LV137 in AUTO.

c. Manually trip 2FWS-P1A(B) by placing its control switch momentarily to stop.

1.7 (Cont'd)

d. Slowly close 2FWS-LV55A(B) and verify 2CNM-LV137 opens to maintain reactor water level as level lowers to the setpoint of the low flow controller.

e. Verify feedwater auxiliary lube oil pump 2FWL-P2A(B) starts automatically. Locally place the appropriate auxiliary lube oil control switch to START. |*4

f. Verify minimum flow valve 2FWR-FV2A(B) shuts immediately after the pump trips.

1.8 Manually trip condensate booster pump 2CNM-P2B (C,A) by placing control switch to Pull-To-Lock on P851 and verify auxiliary lube oil pump 2CNO-P1B(C,A) automatically starts. Locally place auxiliary lube oil control switch to START.

1.9 Manually trip condensate pump 2CNM-P1B(C,A) by placing control switch to Pull-To-Lock on P851.

1.10 Remove condensate demineralizers from service per N2-OP-5.

1.11 When 2CNM-LV137 indicates about 5% open, depress 2CNM-LV137 controller MANUAL pushbutton. Manual close 2CNM-LV137 as required during reactor cooldown.

1.12 When reactor is cooled down and reactor feed is not required, perform the following:

a. Manual trip the condensate booster pump 2CNM-P2C(A,B) by placing control switch to Pull-To-Lock on P851 and verify auxiliary lube oil pump 2CNO-P1C (A,B) automatically starts.

b. Locally place the auxiliary lube oil pump control switch to START.

<u>NOTE</u>: If required to place condensate on low energy cleanup, refer to Section E.1.0 and perform Steps 1.3, 1.11, 1.27, 1.28, and 1.29.

<u>NOTE</u>: During reactor shutdown, the condensate flow shall be maintained whenever clean steam reboiler is in operation.

1.13 Prior to tripping the remaining Condensate Pump, perform the following:

a. Check open 2CND-AOV2A to 2J, Condensate Demineralizer Inlet at Condensate Demineralizer Panel 2CES-IPNL287.

b. Open Condensate Demineralizer Bypass Valve 2CNM-AOV109 locally.

1.13 (Cont'd)

c. Shut the Condensate Demineralizer Outlet Valves 2CND-AOV7A to 7J at 2CES-IPNL287.

d. Shut 2CND-AOV2A to 2J, Condensate Demineralizer Inlet Valves at 2CES-IPNL287.

e. Trip the remaining Condensate Pump by placing the control switch to Pull-To-Lock on P851.

f. Locally shut Condensate Demineralizer Bypass Valve 2CNM-AOV109.

1.14 As necessary, shut feedwater to Rx Outboard Isolation Valves, 2FWS-MOV21A and MOV21B at 2CEC*PNL603. TCN-95

2.0 <u>Zinc Injection System Shutdown</u>

<u>NOTE</u>: Chemistry should be notified whenever the GE ZIP System is to be shutdown, so they can perform required system/pump flushing.

2.1 At GEZ1P panel, place inject pump 2Z1P-P1A(B) control switch to OFF.

2.2 Stop mixer 2Z1P-MIX1,2 by placing control switch to OFF.

2.3 If Zinc Injection is no longer required, shut 2Z1P-V11 and then 2Z1P-V10.

2.4 If supply tank is to be filled, refer to Zinc System startup in Section E of this procedure.

2.5 For long term shutdown, drain the zinc supply tank and flush the tank. Shut 2ZIP-V17, Condensate supply to 2ZIP-TK1.

3.0 <u>Condenser Neck Spray Shutdown</u>

3.1 Isolate the Condenser Neck Spray by placing the control switch for 2CNM-MOV126 at panel 2CEC-PNL851 to the CLOSE position.

H. <u>OFF NORMAL PROCEDURE</u>

1.0 <u>Loss of Feedwater or Feedwater System Failure</u>

1.1 Loss of One Feedwater Pump

a. Verify recirculation flow control valve partial closure initiated if reactor level dropped to 178.3 inches. Refer to N2-OP-101D Section H.2.0 for corrective actions.

b. If recirculation flow control valve fails to runback, reduce core flow by closing recirculation flow control valve on P602 per N2-OP-101D Section H.1.0.

c. Monitor reactor level is maintained at lower power level.

d. Determine the cause of feedwater pump trip.

1.2 Loss of Feedwater Flow

a. If reactor scram occurs, refer to N2-OP-101C for scram recovery.

b. Verify reactor recirculation pumps auto transferred to LFMG sets.

c. Refer to Emergency Operating Procedure.

d. Determine the cause of feedwater pump trip.

2.0 <u>Intrusion of Demineralizer Resin Into Primary System</u> *1

<u>NOTE</u>: Intrusion of demineralizer resin into the reactor will cause high reactor water conductivity and possible main steam line high radiation.

2.1 Isolate the source of resin leakage by isolating the leaking demineralizer.

2.2 Notify Radiation Protection to perform surveys in Condensate/Feedwater equipment, piping areas to verify adequacy of radiation control.

2.3 Notify chemistry department to sample and analyze the reactor coolant system.

2.4 Refer to Technical Specification for limiting condition of operation and required actions.

2.5 Maintain RWCU filter demineralizers operation to restore the water chemistry.

2.6 If main steam line high radiation occurs, perform the following:

a. Verify reactor scrams and refer to N2-OP-101C for scram recovery.

b. Verify MSIVs are isolated and mechanical vacuum pump tripped.

c. Refer to Emergency Operating Procedure.

3.0 <u>Condensate and Feedwater Off Normal Operation</u>

3.1 Level Setpoint Setdown reset

NOTE: Setpoint Setdown logic is initiated whenever reactor level reached 159.3 inches. The controller level setpoint will be automatically lowered to about 164.3 inches to prevent feedwater pump trip on high level after scram.

a. Verify the amber indication light for level setpoint setdown is lit on P603.

b. Depress level setpoint setdown pushbutton, controller nulling is not required.

3.2 Restore Condensate system after main turbine trip at high power.

NOTE: Condensate Demin. Bypass 2CNM-AOV109 and Low Pressure Heater Bypass 2CNM-AOV101 will auto open when main turbine trips at or above 80% power.

a. After transient is over, manually shut the bypass valve 2CNM-AOV101 at P851 and 2CNM-AOV109 locally.

b. Remove one of the feedwater, condensate booster and condensate pump from service after transient is over.

c. Maintain the reactor water level by 2FWS-LV55A(B) as required.

4.0 Shifting FWS Pumps At Power When Two Pumps Are In Service

NOTE: Shifting FWS Pumps can be performed either by starting the third pump and taking off the desired pump or by shutting down one pump and starting the standby.

4.1 Perform Section 4.2 if it is desired to take off a pump then start the standby FWS Pump. Perform Section 4.3 if it is desired to start up the third FWS Pump then take off the desired pump.

4.2 Shifting pumps by taking one off then starting the standby pump.

4.2.1 Reduce reactor power to about 55% using N2-OP-101D to be within the capacity of one FWS Pump.

4.2.2 Operate the feedwater controller for the pump to be tripped as follows:

a. Depress 2FWS-LV10B (C, A) controller manual pushbutton.

b. Slowly shut 2FWS-LV10B (C, A) to 2% valve position by depressing CLOSE pushbutton, verify that 2FWS-LV10A (B) maintains desired water level. TCN-92

c. Depress CLOSE 2FWS-LV10B. (C, A) until valve position reads about 0%.

4.2.3 Trip the Feedwater Pump 2FWS-P1B (C, A) by placing the control switch momentarily to STOP at P851. Verify:

a. Auxiliary Lube Oil Pump 2FWL-P1B (C, A) starts automatically.

b. Minimum flow valve 2FWR-FV2B (C, A) shuts immediately.

c. Locally place the Auxiliary Lube Oil Pump control switch to START.

d. Remove additional Condensate Demineralizer from service per N2-OP-5.

e. Close 2FWS-MOV47A(B,C) on secured feedpump.

4.2.4 Perform the startup of the second FWS Pump using Section H.5.3 of this procedure.

4.3 Shifting FWS Pumps by starting the third and then taking off the desired pump.

<u>NOTE</u>: The following steps shall be performed for third Feedwater Pump start with heater drain pumps in service.

<u>NOTE</u>: If 2FWS-P1C is to be started, the preferred power supply is the bus for the pump being removed from service.

4.3.1 Reduce reactor power to less than 70% per N2-OP-101D Section | 16052
G.1.0.

4.3.2 Start the standby condensate and condensate booster pump, put additional condensate demineralizer in service if required per N2-OP-5.

4.3.3 Verify the standby feedwater pump warmup valve 2FWS-V25A (B, C)
is open and start the Standby Feedwater Pump per Section E.4.1 | 16052
to E.4.14 of this procedure.

<u>NOTE</u>: To open 2FWS-LV10A(B,C) from fully closed, the first 1.5% to 2% of the valve stroke, as indicated by the position indicator, is used to release the seating force held by the compression of the SB spring. Therefore, the valve stem will not be lifted to establish the flow at this specific range.

<u>NOTE</u>: Monitor reactor vessel water level closely during this | 16052
evolution.

4.3.4 Open 2FWS-MOV47A(B,C) on the pump just started.

4.3.5 Place the Standby Feedwater Pump level control valve into service by depressing the OPEN pushbutton on 2FWS-LV10A (B, C) or 2FWS-LV55A (B) controller on P603.

<u>NOTE</u>: 2FWS-LV10A(B,C) should always be closed from 2% to 0% in one step.

4.3.6 Place the feedwater level control valve for the pump to be removed from service in manual by depressing MANUAL pushbutton and shut the valve slowly.

4.3.7 Open the standby level control valve and shut the level control valve for the pump to be removed from service at P603 until the valve is fully shut.

4.3.8 Null the controller and place the standby level control valve in AUTO per Section E.5.3 of this procedure. 16502

4.3.9 Trip the feedwater pump to be removed from service by placing the control switch momentarily to STOP.

4.3.10 Verify the feedwater auxiliary lube oil pump 2FWL-P1A (B, C) automatically start. Locally place the auxiliary lube oil control switch to START.

4.3.11 Close 2FWS-MOV47A(B,C) on secured feedpump.

4.3.12 Secure the third condensate booster pump in accordance with Section G.1.1.1 to G.1.1.6 of this procedure. 16052

5.0 <u>Plant Startup With Single Feedwater Pump Operation and Second Pump Start</u>

<u>NOTE</u>: Operation above 65% reactor power with single feedwater pump in operation should be minimized.

5.1 Perform the following to transfer 2FWS-LV55A(B) to 2FWS-LV10A(B):

a. Open 2FWS-MOV47A, B and C, Feedwater Disch. Isol, at P851.

<u>NOTE</u>: To open 2FWS-LV10A(B,C) from fully closed, the first 1.5% to 2% of the valve stroke, as indicated by the position indicator, is used to release the seating force held by the compression of the SB spring. Therefore, the valve stem will not be lifted to establish the flow at this specific range.

b. Manually open feedwater level control valve 2FWS-LV10A(B) slowly by depressing OPEN pushbutton on the controller. Verify 2FWS-LV55A(B), High Pressure Low Flow Valve, shuts gradually as 2FWS-LV10A(B) opens.

c. Continue to open 2FWS-LV10A(B) level control valve as required until 2FWS-LV55A(B) is about 10% open.

d. During power increase, manually open 2FWS-LV10A(B) as required to maintain 2FWS-LV55A(B) at about 10% open.

e. When reactor power increases to about 15%, (verify the bias tape setting is at 0% if LV10A is used), adjust the master level controller LV10A-LV10B-LV10C output signal by depressing OPEN/CLOSE pushbutton until equal signals are read in the input (vertical) and output (horizontal) signal indicator on 2FWS-LV10A(B).

5.1 (Cont'd)

f. Place 2FWS-LV10A(B) controller in master manual control by depressing AUTO pushbutton on 2FWS-LV10A(B).

g. Depress MANUAL pushbutton on 2FWS-LV55A(B) controller on P603.

h. Adjust master level controller LV10A-LV10B-10C tape setpoint to actual reactor level and verify the indicating arrow is in green band shown on LV10A-LV10B-LV10C controller and then depress AUTO pushbutton on the controller.

i. Shut 2FWS-LV55A(B) by depressing CLOSE pushbutton until 2FWS-LV55A(B) is fully shut.

j. Verify the reactor level is maintained at desired setpoint, adjust LV10A-LV10B-LV10C tape setting if required.

5.2 At about 25% reactor power, verify the feedwater flow and steam flow indicates approximately the same at P603 and then place feedwater control to 3 element.

5.3 If second Feedwater Pump is to be started, perform the following:

a. Reduce or verify reactor power is approximately 55% per N2-OP-101D Section G.1.0.

b. If desired, S/U the third condensate and booster pump using Section E.8.

c. Verify at least 8 condensate demineralizers are in service per N2-OP-5.

d. Verify all 3 heater drain pumps are in service per N2-OP-8.

<u>NOTE</u>: If 2FWS-P1C is selected to start, the preferable power supply is from 2NPS-SWG003 if 2FWS-P1A is running, or 2NPS-SWG001 if 2FWS-P1B is running. If only 2 heater drain pumps are in service, reduce reactor power to approximately 50%.

e. Verify the feedwater control valves for the pump to be started are in MANUAL and valve positions are at 0% open.

f. Verify 2CCS-V207B(A,C), 2CCS-V208B(A,C) and 2CCS-V206B(A,C) cooling water to feedwater pump are positioned per N2-OP-14 Att. 1. TCN-102

g. Locally verify that the feedwater pump seal water pressure indicates approximately 25 - 30 psid on 2FWP-PDT5B(C,A). Adjust seal water pressure using manual seal water control valve 2FWP-V35B(C,A).

h. Verify locally that the lube oil pressure is about 20 psig on 2FWL-PI1B(C,A) and oil flow through each pump and motor bearing sight glasses.

5.3. (Cont'd)

i. Verify locally that feedwater lube oil filter differential pressure is less than 6 psid on 2FWL-PDI3B(C,A).

j. Verify feedwater pump warmup valve 2FWS-V25B(C,A) is open.

k. Start the feedwater pump 2FWS-P1B(C,A) by placing control switch momentarily to START.

l. Verify the feedwater pump minimum flow 2FWR-FV2B(A,C) opens on P851.

m. Verify 2FWS-P1B(C,A) starts.

n. Locally place the feedwater auxiliary lube oil control switch to AUTO and verify the lube oil pump stops.

o. Open 2FWS-MOV47A(B,C) on feedpump just started. Manually open 2FWS-LV10B(C,A) slowly by depressing OPEN pushbutton on the controller. Verify 2FWS-LV10A(C,B) responds shut. TCN-103

p. Continue to open 2FWS-LV10B(C,A) slowly until the input signal (vertical) and output signal (horizontal) reads the same on 2FWS-LV10B(C,A) controller.

q. Depress AUTO pushbutton on 2FWS-LV10B(C,A) controller.

<u>NOTE</u>: If desired to operate with equal FWS-LV10A(B,C) positions perform step r; if not, skip r and perform step s.

r. Verify that the valve positions of the two operating LV10 valves are the same, adjust the bias tape setting on LV10A or/and LV10C slowly until the valve positions are equal.

s. If desired to operate with unequal FWS-LV10 positions slowly adjust <u>negative</u> bias tape setting on FWS-LV10A or C until desired valve position obtained.

6.0 <u>Fill and Vent Feedpump after Maintenance</u>

<u>NOTES</u>: 1. Where vent and drain paths are not piped directly to floor or equipment drains, use hoses to route water to the appropriate drains.

CAUTION:

MINIMIZE TIME SPENT IN THE FEEDWATER HEATER BAYS. DOSE RATES CAN EXCEED 500MR/HR.

6.0 Fill Vent Feedwater Pumps Following Maintenance (Con't)

CAUTION:

AT NO TIME SHALL SEAL WATER FLOW AND WARM UP FLOW BE ALIGNED AT THE SAME TIME TO AN ISOLATED PUMP.

NOTE: This section of the procedure assumes that the Feedwater Pump is drained and vented, "A" Feedwater Pump is being returned to standby and the boundary valves are closed.

6.1 Remove pipe cap on 2CNM-V220A (B,C) and connect a temporary hose to condensate transfer or condensate to system water to fill the pump. It is permissible to connect a temporary hose to 2CNM-220A (B,C) to speed up the fill process. Seal injection water may also be used to fill the feed pump per Step 6.11.1 and 6.11.2.

6.2 Shut or verify shut the following valves:

a. 2FWP-V14A (B,C)
b. 2DTM-V305A (B,C)
c. 2CNM V367A (B,C)
d. 2CNM-V220A (B,C), if not being used to fill pump.
e. 2CNM-V212A (B,C)
f. 2FWS-V24A (B,C)
g. 2FWS-V160A (B,C)
h. 2FWS-V25A (B,C)
i. 2FWR-V1A (B,C)
j. 2FWR-V130 (A Pump only)
k. 2FWS-V103A (B)
ℓ. 2FWS-V134A (B)
m. 2FWS-V135A (B)
n. 2FWS-V110A (B)
o. 2FWS-V111A (B)
p. 2FWS-V136A (B)
q. 2FWS-V137A (B)
r. 2FWS-HV42A (B,C)
s. 2FWS-MOV47A (B,C)
t. 2CNM-MOV84A (B,C)
u. 2CNM-HV59A (B,C)
v. 2CNM-HV60A (B,C)
w. 2FWR-V2A (B,C)
x. 2FWR-V3A (B,C)
y. 2FWS-V5A (B,C)
z. 2FWS-V60A (B,C) *11

6.3 At P603, open 2FWS-LV10A (B,C) to 50% controller output by depressing open pushbutton on the controller.

6.3.1 If 2FWS-LV10A(B,C) cannot be operated from P603, de-energize 2FWS-LV10A(B,C) and open valve to 50% using MOV handwheel.

6.4 Open vent valve 2CNM-HV60A (B,C).

6.5 Open vent valve 2DTM-V303A (B,C).

6.6 Open vent valve 2DTM-V304A (B,C).

6.7 Open or verify open 2FWS-V91A (B,C).

6.8 Open vent valve 2FWS-V161A (B,C).

6.9 Open vent valve 2FWS-V162A (B,C). Direct water to equipment or floor drains.

6.10 This step has been deleted.

6.11 Open 2CNM-V220A (B,C) to fill pump.

6.11.1 Align Feedwater Pump Seal water valves per Table I.

6.11.2 Verify FWS-V25A, (B,C) shut.

6.12 Open 2CNM-V212A (B,C) and shut the valve when air is no longer observed.

6.13 Open 2FWS-V136A (B) and 2FWS-V137A (B) and shut the valves, when air is no longer observed. Direct water to the equipment or floor drains.

6.14 Open vent valves to vent bonnets of 2FWS-LV10A (B,C). Close vent valves when air is no longer observed.

a. 2FWS-LV10A: 2FWS-V157 and 2FWS-V158
b. 2FWS-LV10B: 2FWS-V155 and 2FWS-V156
c. 2FWS-LV10C: 2FWS-V153 and 2FWS-V154

6.15 Align Feedwater Pump Seal water valves per Table I unless already performed per Step 6.11.1. Vent the Feedwater pump seals by opening valves 2FWS-V2000A (B,C) and V2001A (B,C). Install caps when venting is complete.

6.16 Close 2FWS-V162A (B,C) when air is no longer observed.

6.17 Close 2FWS-V161A (B,C).

6.18 Close 2DTM-V304A (B,C) when air is no longer observed.

6.19 Close 2DTM-V303A (B,C).

6.20 This step deleted. TCN-106

6.21 Shut 2CNM-V220A (B,C).

6.22 Open 2CNM-HV119 unless already opened.

6.23 Throttle open 2CNM-V366 approximately 1/2 open. This will allow a continuous vent path for the feedwater pumps suction header, unless already opened.

6.24 At P603 close 2FWS-LV10A (B,C) to 0% indicated.

6.25 At P603 close or verify closed 2FWS-LV55A (B).

6.26 Open 2FWS-V103A (B).

CAUTION:

AT NO TIME SHALL SEAL WATER FLOW AND WARM UP FLOW BE ALIGNED AT THE SAME TIME TO AN ISOLATED PUMP.

6.27 Throttle open 2DTM-V305A (B,C) to control heat up. Note that this will establish a flow path to the main condenser. 2 turns open produces 30 deg. heat up rate per hour.

CAUTION:

THE FOLLOWING HEAT UP RATE SHOULD NOT BE EXCEEDED 50 DEG. F/HR. PUMP TEMPERATURE MUST BE WITHIN 100 DEG. F. OF FLUID TEMPERATURE. PRIOR TO PUMP START, USE A HAND HELD PYROMETER TO MEASURE PUMP CASING TEMPERATURE.

6.27.1 Slowly open 2FWS-V25A (B,C) to warm up the pump.

6.27.2 To ensure warmup pressure does not exceed seal water pressure, monitor Feedpump seal pressures locally (2FWP-PI4A, B, or C) and Feedpump casing pressure locally (2FWS-PI8A, B, or C) and adjust warm up flow/pressure as required.

6.27.3 Monitor and maintain pump heat up within specified limits.

6.27.4 When pump casing temperature and the piping down stream of 2CNM-HV60A (B,C) is within 100 deg. of 5th point heater outlet temperatures (CNM TA 70,71,72), begin to throttle close 2DTM-V305A (B,C) to pressurize this feed pump casing.

6.27.5 When feed pump suction pressure (2CNM-PI70A,B,C) is approximately equal to condensate booster pump discharge press (2CNM-PI104) on P851, open 2CNM-MOV84A (B,C).

6.28 Close or verify close 2DTM-V305A (B,C).

6.29 Close 2CNM-HV60A (B,C).

6.30 Open 2FWS-HV42A (B,C) for about 1 minute. TCN-111

6.31 Close 2FWS-HV42A (B,C).

6.32 Deleted.

6.33 Deleted.

6.34 Deleted.

6.35 Deleted.

6.36 For FP-1A only, open FWS-V130 to pressurize between FWR-V1A and FWR-FV2A. |TCN-11|

6.37 Slowly open FWR-V1A (B,C) while monitoring pump suction pressure.

6.37.1 Remove pipe cap and open 2FWR-V2A(B,C).

6.37.2 Open 2FWR-V3A(B,C).

6.37.3 Shut 2FWR-V3A(B,C) and 2FWR-V2A(B,C) when air is no longer observed.

6.37.4 Replace pipe cap removed in Step 6.37.1.

6.38 Monitor pump heat up rate and maintain within limits.

NOTE: If heat up becomes excessive, this could be due to FWS-FV2A (B,C) leak by. Throttle FWR-V1A (B,C) to control heat up.

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TCN-64

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TCN-64

7.0 Change FWS-MOV47A (B or C) to Throttle Valve.

NOTE: The following steps may be performed when the associated Level Control Valve LV10 malfunction.

NOTE: The handwheel gear ratio is approximately 770:1 with an efficiency of 21-1/4%, and a rim pull force of only 50 lbs. is sufficient to produce a valve seating force of 250,000 lbs. as required. Do not apply excessive force to close the valve.

7.1 De-energize desired valve(s):
a. 2NHS-MCC003 Cub. 5C for FWS-MOV47A
b. 2NHS-MCC003 Cub. 23C for FWS-MOV47B
c. 2NHS-MCC003 Cub. 11C for FWS-MOV47C

NOTE: Issuing yellow holdout on lifted leads provides for SSS notification, documentation, and Independent Verification to satisfy AP-6.1 Exclusion requirements of Step 1.3.1.

7.2 Issue yellow holdout to SSS for lifted leads. Independent Verification of tag placement is required. SSS shall sign holdout sheet authorizing placement of tags. TCN-105

7.3 Lift the following leads in cubicle at 2NHS-MCC003 for respective valve:
a. Lead #7 (eliminates seal-in for closed direction)
b. Lead #4 (eliminates seal-in for open direction)

NOTE: Leads located on terminal strip upper portion of cubicle.

7.4 Tape leads lifted and re-energize valve(s). The valve(s) can be used as throttle valve(s).

7.5 Restore lifted leads as follows:

7.5.1 De-energize 2FWS-MOV47A(B,C) by opening breaker in Step 7.1.

7.5.2 Clear yellow holdout. Independent Verification of tag removal and restoration is required. SSS shall sign holdout sheet authorizing restoration. TCN-105

7.5.3 Land leads lifted in Step 7.3.

7.5.4 Close breaker opened in Step 7.5.1.

7.5.5 If plant conditions allow, then stroke test valve.

H. 8.0 Restoration Following a Feedwater Runback

NOTE: A Feedwater Runback will be initiated from RRCS if Reactor Pressure exceeds 1050 psig, APRMs are not downscale or inop after 25 seconds and the "RRCS Feedwater Auto Initiation Runback Disable" Switch on P603 is not "ON". The Runback Signal is "sealed in" for 25 seconds. TCN-79

8.1 Verify the following automatic plant responses have occurred:

8.1.1 All Feedwater level control valves (2FWS-LV137, LV55A, LV55B, LV10A, LV10B, LV10C) are in manual and closed.

8.1.2 All Feedwater pump minimum flow valves (2FWR-FV2A, FV2B, FV2C) are open.

8.2 After 25 seconds (from time of initiation), take manual control of 2FWS-LV55A (LV55B) or 2FWS-LV10A (LV10B, LV10C) and Control Rx level as directed by the SSS. TCN-79

H.9.0 Filling and venting of a feedwater pump during cold shutdown utilizing the condensate system via the feedpump suction valve bypass line. This method may also be used during plant operating conditions when condensate temperature is $\leq$ 125°F.

<u>NOTE</u>: This section of the procedure assumes that the Feedwater Pump is drained and vented, "A" (B,C) Feedwater Pump is being returned to standby and the boundary valves are closed.

9.1 Shut or verify shut the following valves:

a. 2FWP-V14A (B,C)
b. 2DTM-V305A (B,C)
c. 2CNM-V367A (B,C)
d. 2CNM-V220A (B,C)
e. 2CNM-212A (B,C)
f. 2FWS-V24A (B,C) TCN-93
g. 2FWS-V160A (B,C)
h. 2FWS-V25A (B,C)
i. 2FWS-103A (B)
j. 2FWS-V134A (B)
k. 2FWS-V135A (B)
ℓ. 2FWS-V110A (B)
m. 2FWS-V111A (B)
n. 2FWS-V136A (B)
o. 2FWS-V137A (B)
p. 2FWS-HV42A (B,C)
q. 2FWS-MOV47A (B,C)
r. 2CNM-MOV84A (B,C)
s. 2CNM-HV59A (B,C)
t. 2CNM-HV60A (B,C)
u. 2FWR-V2A (B,C)
v. 2FWR-V3A (B,C)
w. 2FWS-V5A (B,C)
x. 2FWS-V60A (B,C)

9.2 At P603, open 2FWS-LV10A (B,C) to 50% controller output by depressing open pushbutton on the controller. TCN-93

9.2.1 If 2FWS-LV10A(B,C) cannot be operated from P603, de-energize 2FWS-LV10A(B,C) and open valve to 50% using MOV handwheel. TCN-93

9.3 Open vent valve 2CNM-HV60A (B,C).

9.4 Open vent valve DTM-V303A (B,C).

9.5 Open vent valve 2DTM-V304A (B,C).

9.6 Open or verify open 2FWS-V91A (B,C).

9.7 Open vent valve 2FWS-V161A (B,C).

9.8 Open vent valve 2FWS-V162A (B,C). Direct water to equipment or floor drains.

9.9 Open 2CNM-HV59A (B,C).

9.10 Throttle open 2CNM-V367A (B,C) to start filling system.

9.11 Open 2CNM-V212A (B,C) and shut the valve when air is no longer observed.

TCN-67

9.12 Open 2FWS-V136A (B) and 2FWS-V137A (B) and shut the valve, when air is no longer observed. Direct water to the equipment or floor drains.

9.13.1 Open vent valves to vent bonnets of 2FWS-LV10A, (B,C). Close vent valves when air is no longer observed. TCN-69

9.13.2 Open vent valves 2FWR-V2A (B,C) and V3A (B,C), then shut when no air is observed.

a. 2FWS-LV10A: 2FWS-V157 and 2FWS-V158
b. 2FWS-LV10B: 2FWS-V155 and 2FWS-V156
c. 2FWS-LV10C: 2FWS-V153 and 2FWS-V154

9.14 Open 2FWP-V31A (B,C), shut the valve when air is no longer observed.

9.15 Align Feedwater Pump Seal Seal water valves per Table I. Vent the Feedwater pump seals by opening valves 2FWS-V2000A (B,C) and V2001A (B,C). Install caps when venting in complete.

9.16 Close 2FWS-V162A (B,C) when air is no longer observed.

9.17 Close 2FWS-V161A (B,C).

9.18 Close DTM-V304A (B,C) when air is no longer observed.

9.19 Close DTM-V303A (B,C).

9.20.1 When water starts venting out of 2DTM-V304A (B,C) 2FWS-V162A (B,C), shut 2CNM-HV59A (B,C) and 2CNM-V367A (B,C).

9.20.2 Close 2CNM-HV60A (B,C).

9.21 At P603 close 2FWS-LV10A (B,C) to 0% indicated.

10.0 FLOODING THE REACTOR HEAD CAVITY USING CNM/FWS

10.1 Verify the spent fuel pool cooling system is in operation in accordance with N2-OP-38.

10.2 Verify all reactor Refueling Cavity and Internal Storage Pit drain valves are aligned in accordance with N2-OP-38 Table 1.

10.3 Verify the following maintenance activities have been accomplished:

10.3.1 Reactor Steam Dryer removal

10.3.2 Main Steam Line Plugs installed

10.3.3 Head Cavity to Drywell Ventilation Penetrations sealed

10.3.4 Shutdown Range Level Instrument Column installed

10.3.5 Reactor Vessel Flange and Head Bolt protectors installed

10.3.6 Verify closed 2HVR-V23 Reactor Head Evac Isol TCN-85

10.3.7 Verify flange installed in Rx Cavity for Rx Head Evac Filter

10.4 Verify the area between the fuel transfer gates has been flooded in accordance with N2-OP-38.

10.5 Verify the Spent Fuel Pool and Internal Storage Pit leak detection system is in service in accordance with N2-OP-38. TCN-86

10.6 Place the Reactor Cavity Inner and Outer Seal Leak Detection in service in accordance with N2-OP-38. TCN-86

10.7 Verify the condensate system is in operation and capable of delivering condensate to the reactor vessel.

10.8 Verify N2-OSP-LOG-@001 is in progress to monitor reactor coolant and metal temperatures while flooding the cavity.

10.9 Commence filling the reactor vessel/head cavity, the fill rate will be based upon reactor coolant/metal temperatures and the CNM/FWS temperature to the reactor vessel.

10.10 When the reactor head cavity level is approximately 2" below the cavity wier gates, secure CNM/FWS flow to the reactor vessel.

10.11 Establish Spent Fuel Cooling flow to the reactor head cavity in accordance with N2-OP-38.

H. 11.0 <u>Isolating Condensate Demineralizer Bypass Valve</u>

<u>NOTE</u>: Condensate Demineralizer Bypass Flow Path shall be available when turbine first stage pressure is greater than 566 psig (or approx. 85% reactor power).

11.1 Verify turbine first stage pressure is less than 566 psig by computer point MSSPA07.

11.2 Enter in ESL that 2CNM-V223 is closed, Condensate Demineralizer Bypass flow path is not available.

11.3 Close 2CNM-V223 and place yellow hold out on the valve handle. TCN-99

11.4 Open 2CNM-V177 and verify after the line is depressurized that water stops venting. This will verify no water leaking by either 2CNM-AOV109 or/and 2CNM-V223.

11.5 Close 2CNM-V177.

11.6 If there is no water leakage observed in Step 11.4, then re-open 2CNM-V223 and clear ESL and yellow hold out. If water leakage is observed, continue with this procedure.

11.7 Notify Chemistry that Condensate Demineralizer Bypass is isolated.

11.8 Continue power increase and monitor turbine first stage pressure indication using computer point MSSPA07 once per 8 hours using N2-OSP-LOG-@001 until Reactor power reaches 75%, then once per 30 minutes until reaching 566 psig. TCN-100

11.9 When turbine first stage pressure reaches 566 psig:

11.9.1 Clear yellow hold out placed on Step 11.3.

11.9.2 Open 2CNM-V223.

11.9.3 Clear ESL entry made in Step 11.2.

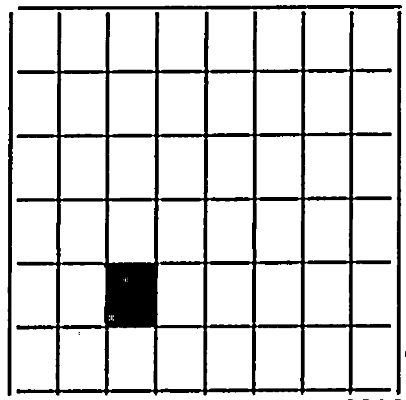
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS

1.0 603135 Feedwater Shut-Off Valve MOV21A/21B Bypass/Inoperable

Reflash: Yes

FEEDWATER
SHUTOFF VALVE
MOV21A/21B
BYPASS/INOP

603135



603135

1.1

Computer Points	Computer Printout	Source	
FWSBC07	FW SHUTOFF VLV MOV21A	Valve not fully closed	*7
FWSBC08	FW SHUTOFF VLV MOV21B	and loss of control power	*7

1.2 Auto Response

NONE

1.3 Corrective Action

a. If 2FWS-MOV21A (B) is open, check the blown control power fuse in MCC-2EHS*MCC102A (C).

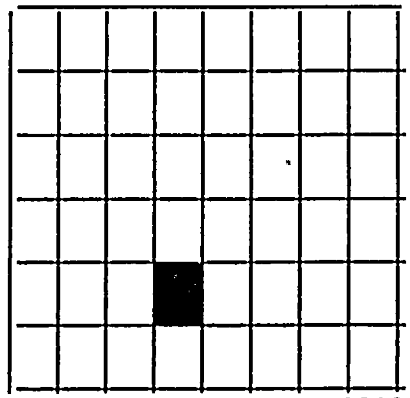
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

2.0 603136 Feedwater Inlet Shut-Off Valve MOV21A/21B Motor Overload

Reflash: Yes

FEEDWATER
SHUTOFF VALVE
MOV21A/21B
MOT OVERLOAD

603136



603136

2.1

Computer Points	Computer Printout	Source	
FWSTC05	FW SHUTOFF V MOV21A MOT	49X overload	*7
FWSTC06	FW SHUTOFF V MOV21B MOT		

2.2 Auto Response

NONE

2.3 Corrective Action

a. Determine the cause of the motor overload.
b. Refer to technical specification for limiting condition of operation and required action.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

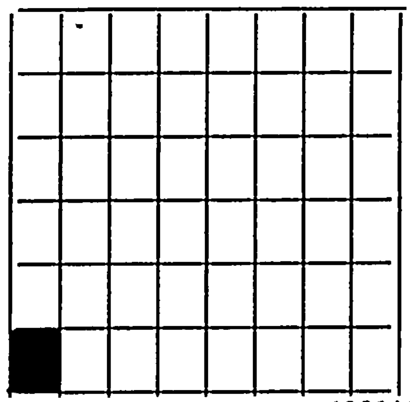
3.0 603141 Feedwater System Reactor Water Level High Trip

Reflash: No

TCN-77

FD WTR SYSTEM
REACTOR
WATER LEVEL
HIGH

603141



603141

3.1

Computer Point	Computer Printout	Source
FWSUC09	FDW RX WTR LVL HIGH TRIP	2ISC-PDT-14A 2ISC-PDT-14B 2ISC-PDT-14C (202.3 in.)

3.2 Auto Response

NOTE: Two out of three high reactor water level will trip the following:

a. Main turbine.

b. Feedwater pumps.

c. Feedwater startup level control valve transfer to MANUAL (LV137).

d. Feedwater high pressure/low flow control valves transfer to MANUAL (LV55A,B).

3.3 Corrective Action

a. If the reactor has scrammed, follow the procedure N2-OP-101C.

b. Determine the cause of reactor high level.

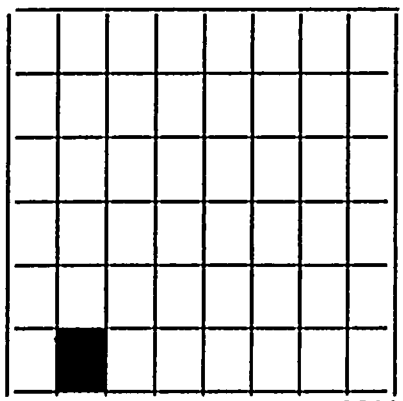
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

4.0 603142 Feedwater System Control Signal Failure

Reflash: No

FEEDWATER
SYSTEM
CONTROL
SIGNAL FAILURE

603142



603142

4.1

Computer Point	Computer Printout	Source	
FWSBC06	FW SYS CONT SIGNAL FAIL	MODUTRONIC 100 in 2FWS-PNLA(B,C)	TCN-92 *7

4.2 Auto Response

Feedwater level control valves 2FWS-LV10A/B/C lock as is.

4.3 Corrective Action

NOTES:

1. If actuator controller, Modutronic 100, signal input from feedwater control system drops below 0.63 volt, a loss of control signal will result. TCN-92

2. If power is lost to 2FWS-PNL10A(B,C), a loss of control signal will result.

3. When annunciator 603142 is in alarm, it will block annunciator 603143, FEEDWATER CONTROL VALVE ACTUATOR TROUBLE, for that affected level control valve. Section I.5.0 covers 603143 should it alarm when 603142 clears.

a. Verify which level control valve signal loss by amber light indication on panel 603.

b. Monitor the reactor water level, lower the core flow per N2-OP-101D Section H.1.0 if required to maintain reactor water level.

4.3 (Cont'd)

c. Verify 2NHS-MCC003A-7C (LV10A), 2NHS-MCC003B-21B (LV10B), AND 2NHS-MCC003C-14A (LV10C) not tripped/open. Reset and/or close if required.

d. In panel 2FWS-PNL10A(B,C), verify the following:

   1. Power supply circuit breaker closed. TCN-92

   2. Local/Remote switch in REMOTE.

e. If malfunction cannot be cleared and valve needs to be shut, operate valve locally as follows at 2FWS-PNL10A(B,C):

   1. Place AUTO/MANUAL switch (S1) to MANUAL.

   2. Set SPEED adjustment knob (R10) to 10% as indicated on the FREQUENCY DEMAND meter.

   3. Depress CLOSE pushbutton (S3) until valve is closed.

f. If level control valve cannot be operated by local controls, then de-energize valve and close valve using valve handwheel.

g. If required start standby feedpump.

h. Investigate the cause of the malfunction.

i. When malfunction is cleared, restore 2FWS-LV10A(B,C) to service as follows:

   1. Verify actual valve position.

   2. Verify associated controller is in manual at P603.

   3. Set associated controller output to equal valve position.

   4. Reset the associated CONTROL SIGNAL RESET knob at P603.

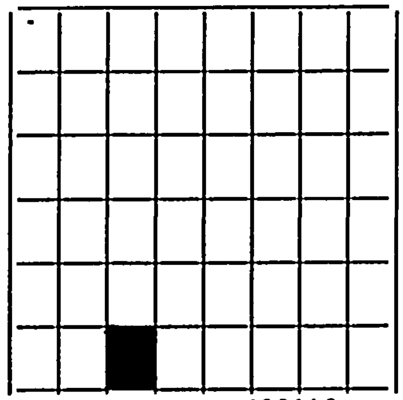
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

5.0 603143 Feedwater Control Valve 10A/10B/10C Actuator Trouble

Reflash: Yes

FD WTR CONT V
10A/10B/10C
ACTUATOR
TROUBLE

603143



603143

5.1

Computer Point	Computer Printout	Source	
FWSBC09	FW CONT VLV 10A ACTUATOR		TCN-92 *7
FWSBC10	FW CONT VLV 10B ACTUATOR	abnormal condition at 2FWS-PNL10A(B,C) -AUTO/MAN SW in MANUAL. -LOCAL/REM SW in LOCAL. -MOV Thermal Overload. -Variable Freq. Controller In Fault condition. Command signal vs. indicated valve position is outside 0.25% allowable deadband.	TCN-92
FWSBC11	FW CONT VLV 10C ACTUATOR		*7

5.2 Auto Response

a. This step has been deleted. TCN-92

b. 2FWS-LV10A(B,C) fails as is.

5.3 Corrective Action

a. Verify which level control valve actuator is alarmed by amber light indication on panel P603, and computer point on process computer.

NOTE: If MOV trips on thermal overload, it will take approximately 15 to 20 seconds to reset. The associated CONTROL SIGNAL RESET knob will need to be reset at P603.

b. If malfunction cannot be cleared and valve needs to be shut, operate valve locally as follows at 2FWS-PNL10A(B,C): TCN-92

1. Place AUTO/MANUAL switch (S1) to MANUAL.

2. Set SPEED adjustment knob (R10) to 10% as indicated on the FREQUENCY DEMAND meter.

3. Depress CLOSE pushbutton (S3) until valve is closed.

c. If level control valve cannot be operated by local controls, then de-energize valve and close valve using valve handwheel.

d. If required start standby feedpump.

e. Investigate the cause of the malfunction.

f. When malfunction is cleared, restore 2FWS-LV10A(B,C) to service as follows:

1. Verify actual valve position.

2. Verify associated controller is in manual at P603.

3. Set associated controller output to equal valve position.

4. Reset the associated CONTROL SIGNAL RESET knob at P603.

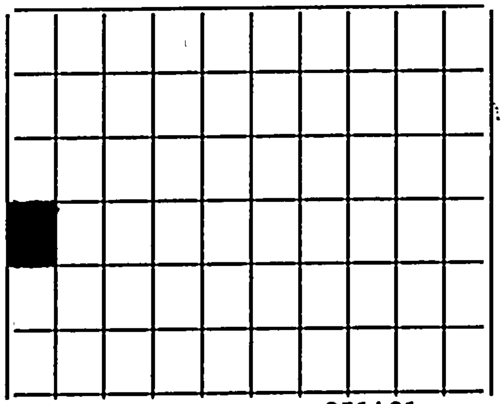
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS

6.0 851431 Reactor Feed Pump 1A-1B-1C Thrust/Radial Bearing Vibration High

Reflash: Yes

REAC FEED PUMP
1A/1B/1C
THRST/RDL BRG
VIBRATION HI

851431



851431

6.1

Computer Point	Computer Printout	Source
a. FWSNC01	RFP P1A THRUST BRG V1B	2FWS-NBS36A (4 mils)
b. FWSNC02	RFP P1B THRUST BRG V1B	2FWS-NBS36B (4 mils)
c. FWSNC03	RFP P1C THRUST BRG V1B	2FWS-NBS36C (4 mils)
d. FWSNC04	RFP P1A RADIAL BRG V1B	2FWS-NBS46A (7 mils)
e. FWSNC05	RFP P1B RADIAL BRG V1B	2FWS-NBS46B (4 mils)
f. FWSNC06	RFP P1C RADIAL BRG V1B	2FWS-NBS46C (4 mils) 16500

NOTE: Per Temp. Mod 90-017, the setpoints for 2FWS-NBYY46A and NBYX46A have been raised 20% over its baseline data.

6.2 Auto Response

NONE

6.3 Corrective Action

a. Check the computer printout to determine which pump is annunciated.

6.3 (Cont'd)

b. Verify the lube oil temperature indicates about 120°F on 2FWS-TI12A (B, C). Adjust lube oil cooling water valves 2CCS-V206A (B, C) and 2CCS-V208A (B, C) as required to return lube oil temperature to its normal operating range.

c. Locally verify proper lube oil flows and pressures to the alarming Feedwater Pump.

d. Verify the vibration level and check any abnormal noise. Check vibration meters in the Relay Room at 2CEC-PNL893. TCN-107

e. Consider starting the standby feedwater pump and removing the alarmed pump from service per section H of this procedure. If pump vibration exceeds 8 mils, the pump should be removed from service. TCN-107

f. To clear the alarm, use the Red Reset button at 2CEC-PNL893 in the Relay Room.

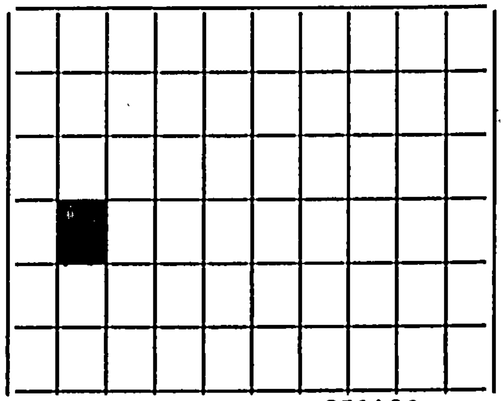
I. <u>PROCEDURE FOR CORRECTING ALARM CONDITIONS</u> (Cont.)

7.0 <u>851432</u> Reactor Feed Pump Step Up Gear 1A/1B/1C Vibration High

<u>Reflash: Yes</u>

REAC FEED PUMP
STEP UP GEAR
1A/1B/1C
VIBRATION HI

851432



851432

7.1

Computer Point	Computer Printout	Source	
FWSNC07	RFP SUG 1A PIN BRG 1 VIB	2FWS-NBS60A (4 mils)	*7
FWSNC08	RFP SUG 1B PIN BRG 1 VIB	2FWS-NBS60B (4 mils)	*7
FWSNC09	RFP SUG 1C PIN BRG 1 VIB	2FWS-NBS60C (4 mils)	*7
FWSNC10	RFP SUG 1A PIN BRG 2 VIB	2FWS-NBS61A (4 mils)	*7
FWSNC11	RFP SUG 1B PIN BRG 2 VIB	2FWS-NBS61B (4 mils)	*7
FWSNC12	RFP SUG 1C PIN BRG 2 VIB	2FWS-NBS61C (4 mils)	*7
FWSNC13	RFP SUG 1A PIN BRG 3 VIB	2FWS-NBS62A (4 mils)	*7
FWSNC14	RFP SUG 1B PIN BRG 3 VIB	2FWS-NBS62B (4 mils)	*7
FWSNC15	RFP SUG 1C PIN BRG 3 VIB	2FWS-NBS62C (4 mils)	*7

7.1 (Cont'd)

FWSNC16	RFP SUG 1A PIN BRG 4 VIB	2FWS-NBS63A (4 mils)	|*7
FWSNC17	RFP SUG 1B PIN BRG 4 VIB	2FWS-NBS63B (4 mils)	|*7
FWSNC18	RFP SUG 1C PIN BRG 4 VIB	2FWS-NBS63C (4 mils)	|*7

7.2 Auto Response

NONE

7.3 Corrective Action

a) Check the computer printout to determine which pump is annunciated.

b) Verify the lube oil temperature indicates about 120°F on 2FWS-TI12A (B, C). Adjust lube oil cooling water valves 2CCS-V206A (B, C) and 2CCS-V208A (B, C) as required to return lube oil temperature to its normal operating range.

c) Locally verify proper lube oil flows and pressures to the alarming Feedwater Pump.

d) Verify the vibration level and check any abnormal noise

e) Consider starting the standby feedwater pump and remove the alarmed pump from service per Section H of this procedure.

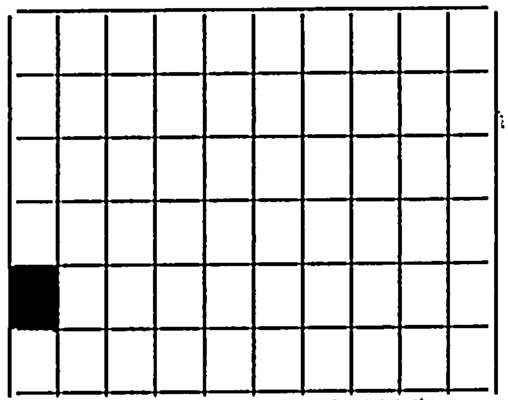
I. <u>PROCEDURE FOR CORRECTING ALARM CONDITIONS</u> (Cont.)

8.0 <u>851441</u> Low Energy Feedwater Cycle Cleanup System Trouble

<u>Reflash: No</u>

LOW ENERGY
FD WTR CYCLE
CLEANUP SYS
TROUBLE

851441



851441

8.1

Computer Point	Computer Printout	Source	
FWSBC05	LO ENERGY FW CYC CU SYS	Any Feedwater pumps running and low energy valve 2FWS-MOV112 not closed	*7

8.2 <u>Auto Response</u>

NONE

8.3 <u>Corrective Action</u>

NOTE: 2FWS-MOV112 will automatic close when feedwater header pressure is greater than 800 psig.

1. Manual close 2FWS-MOV112 low energy cleanup cycle valve as required.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

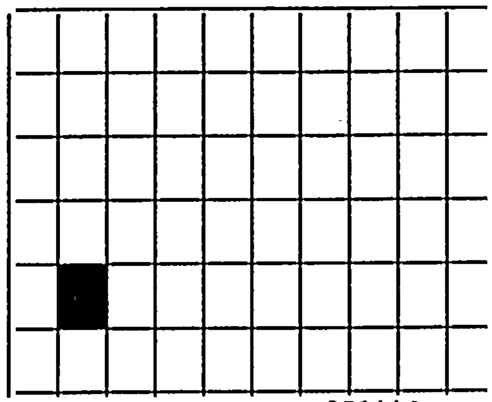
9.0 851442 Reactor Feed Pump Step Up Gear 1A/1B/1C Temperature High

TCN-77

Reflash: Yes

REAC FEED PMP
STEP UP GEAR
1A/1B/1C
TEMP HIGH

851442



851442

9.1

Computer Point	Computer Printout	Source
a. FWSTA39	FWP1A GEAR BRG-3 TEMP	2FWS-TE58A
b. FWSTA40	FWP1B GEAR BRG-3 TEMP	2FWS-TE58B
c. FWSTA41	FWP1C GEAR BRG-3 TEMP	2FWS-TE58C
d. FWSTA42	FWP1A PINION BRG-1 TEMP	2FWS-TE56A
e. FWSTA43	FWP1B PINION BRG-1 TEMP	2FWS-TE56B
f. FWSTA44	FWP1C PINION BRG-1 TEMP	2FWS-TE56C
g. FWSTA45	FWP1A PINION BRG-2 TEMP	2FWS-TE57A
h. FWSTA46	FWP1B PINION BRG-2 TEMP	2FWS-TE57B
i. FWSTA47	FWP1C PINION BRG-2 TEMP	2FWS-TE57C

9.1 (Cont'd)

j. FWSTA49	FWP1A GEAR BRG-4 TEMP	2FWS-TE59A
k. FWSTA50	FWP1B GEAR BRG-4 TEMP	2FWS-TE59B
l. FWSTA51	FWP1C GEAR BRG-4 TEMP	2FWS-TE59C

9.2 Auto Response

NONE

9.3 Corrective Action

a. Check the computer CRT to determine which pump is annunciated.

b. Monitor the trend of bearing temperature rise using the computer CRT.

c. Verify the lube oil cooler discharge temperature indicates about 120°F on 2FWL-TI12A (B, C).

d. Consider starting the standby feedwater pump and remove the alarmed pump from service per section H of this procedure.

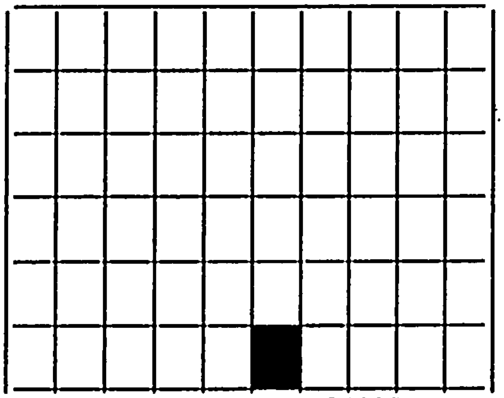
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

10.0 851456 Condensate System Trouble/No Backup Pump Available

Reflash: Yes

CNST SYSTEM
TROUBLE/
NO BACKUP
AVAILABLE

851456



851456

10.1

Computer Points	Computer Printout	Source
a. CNMBC09	2CNM-P1A ELC FAULT/ NO BU	86X-2CNMA01
b. CNMBC10	2CNM-P1B ELC FAULT/ NO BU	86X-2CNMB01
c. CNMBC11	P1C (ACB 11-8) FAULT/ NO BU	86X-2CNMC11
d. CNMBC12	P1C (ACB 13-2) FAULT/ NO BU	86X-2CNMC31
e. CNMBC13	2CNM-P1A UV TR/ NO BU	3B-2CNMA01
f. CNMBC14	2CNM-P1B UV TR/ NO BU	3B-2CNMC11
g. CNMBC15	P1C (ACB 11-8) UV TR/NO BU P1A & P1B	3B-2CNMB01
h. CNMBC16	P1C (ACB 13-2) UV TR/NO BU P1A & P1B	3B-2CNMC31
i. CNMBC17	2/3 HTR PMPS & CNST P1B,C	80A-2CNMN06
j. CNMBC18	NO CNST PP & BSTR SUC PR L	63A-2CNMN06

*7

10.2 Auto Response

Standby Condensate Pump starts.

10.3 Corrective Action

a. Verify the condensate pump control switches lineup.

b. Verify the standby condensate pump auto starts.

c. Determine the cause of the condensate pump breaker trip.

[illegible]

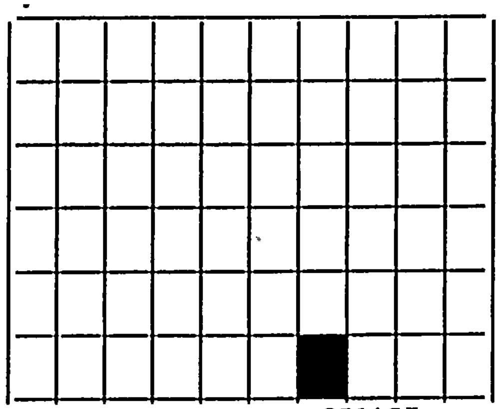
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

11.0 851457 Condensate Booster Pump System Trouble/No Backup Pump

Reflash: Yes

CNST BSTR PMP
SYS TROUBLE/
NO BACKUP PMP
AVAILABLE

851457



851457

11.1

Computer Points	Computer Printout	Source
a. CNMBC27	2CNM-P2A ELC FAULT/ NO BU	86X-2CNMA02
b. CNMBC28	2CNM-P2B ELC FAULT/ NO BU	86X-2CNMB02
c. CNMBC29	P2C (ACB 1-12) FAULT/ NO BU	86X-2CNMC12
d. CNMBC30	P2C (ACB 3-11) FAULT/ NO BU	86X-2CNMC32
e. CNMBC31	2CNM-P2A UV TR/ NO BU	3B-2CNMA02
f. CNMBC32	2CNM-P2B UV TR/ NO BU	3B-2CNMC02
g. CNMBC33	P2C (ACB 1-12) UV TR/NO BU	3B-2CNMB02
h. CNMBC34	P2C (ACB 3-11) UV TR/NO BU	3B-2CNMC32
i. CNMBC35	2/3 HTR PMPS & CNST P2A,C	80B-2CNMN06
j. CNMBC36	FW PP SUC LO & NO BSTR PP	63B-2CNMN06

*7

11.2 Auto Response

Standby Condensate Booster Pump starts.

11.3 Corrective Action

a. Verify the condensate booster pump control switches lineup.

b. Verify the standby condensate booster pump auto starts.

c. Determine the cause of the condensate booster pump breaker trip.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

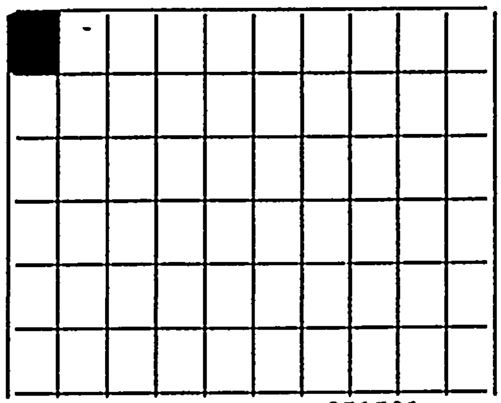
12.0 851501 Condensate Pump 1A/1B/1C Auto Start

TCN-77

Reflash: No

CONDENSATE
PUMP 1A/1B/1C
AUTO START

851501



851501

12.1

Computer Point	Computer Printout	Source
CNMBC01	CND P1A, B, C AUTO START	Breaker closed and control switch position not in START

12.2 Auto Response

NONE

12.3 Corrective Action

NOTE: Condensate Pump auto starts on either of the following:

1. Less than two heater drain pumps running and condensate flow is greater than 11,000 gpm.

2. Condensate booster pump running and low condensate booster pump suction pressure.

a. Information alarm the standby condensate pump automatically started.

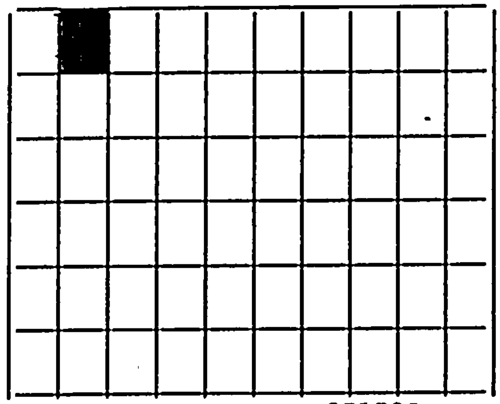
b. Determine the cause of standby pump auto start.

13.0 851502 Condensate Booster Pump 2A/2B/2C Auto Start

Reflash: No

CONDENSATE
BOOSTER PUMP
2A/2B/2C
AUTO START

851502



851502

13.1

Computer Point	Computer Printout	Source
1) CNMBC19	CNST BSTR PMP A/START	Breaker closed and control switch not in START

13.2 Auto Response

NONE

13.3 Corrective Action

NOTE: Condensate booster pump auto starts on either of the following:

1. Less than two heater drain pumps running and condensate flow is greater than 11,000 gpm.

2. Feedwater pump running and low feedwater pump suction pressure.

a. Information alarm-the standby condensate booster pump auto starts.

b. Determine the cause of standby condensate booster pump auto start.

NOTE: 2CNM-P2C has no min flow protection, until WR 193559 is completed and 2CNM-FV38C is repaired.

TCN- 108

c. If the "C" Booster exhibits any signs of cavitation immediately shut down 2CNM-P2C.

d. If 2CNM-P2C, auto starts immediately verify that suction flow is greater than 4400 GPM.

e. If flow is not greater than 4400 GPM verify 2CNM-V201C is open. Open if required.

f. If necessary, throttle open 2CNM-V165C min flow isolation valve.

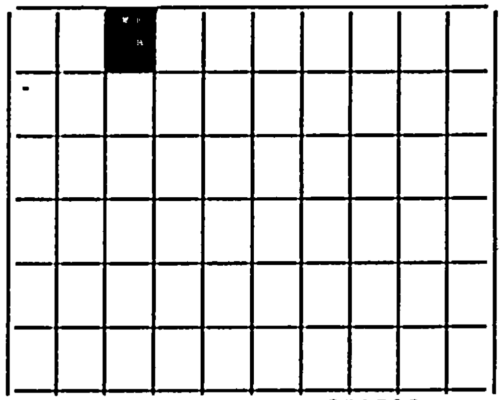
. I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

14.0 851503 Condensate Booster Pump 2A/2B/2C Suction Pressure Low

Reflash: Yes

CNST BSTR PMP
2A/2B/2C
SUCTION PRESS
LOW

851503



851503

14.1	Computer Point	Computer Printout	Source	
	a. CNMPC01	CND BST P2A SUC PR PS42A	2CNM-PS42A (48 psig)	*7
	b. CNMPC02	CND BST P2B SUC PR PS42B	2CNM-PS42B (48 psig)	
	c. CNMPC03	CND BST P2C SUC PR PS42C	2CNM-PS42C (48 psig)	

14.2 Auto Response

a. Block the condensate booster pump start permissive.

b. Auto trip of condensate booster pump after 10 second time delay.

c. Auto start of condensate pump.

14.3 Corrective Action

NOTE: The operating condensate booster pump will trip at 38 psig suction pressure.

a. Verify the standby condensate pump starts.

b. Verify the condensate discharge header pressure indication 2CNM-PI105 on panel P851.

c. Locally verify 2CNM-PI115 for low pressure condition.

d. Verify the system valve lineup for possible excessive system flow path:

1. Condensate recirculation valve 2CNM-FV114 failed to open.

2. Condensate booster pump minimum flow valve 2CNM-FV38A,B or C failed open.

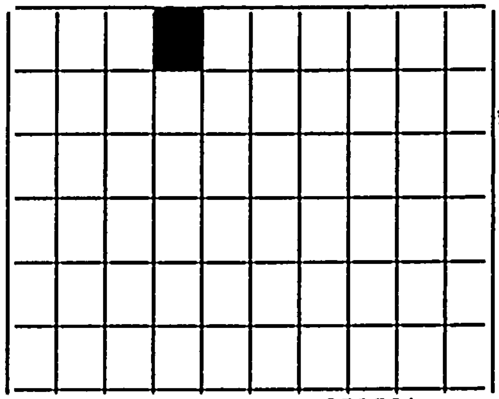
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

15.0 851504 Condensate Booster Pump 2C Blown Fuse

Reflash: No

CNST BOOSTER
PUMP 2C
POTENTIAL
FUSE BLOWN

851504



851504

15.1

Computer Point	Computer Printout	Source
a. CNMEC01	CNST BSTR P2C POT FUSES	74-1 & 2 - 2CNMC01 *7

15.2 Auto Response

NONE

15.3 Corrective Action

NOTE: This alarm indicates 2CNM-P2C lost its preferred power supply.

a. Information alarm, blow fuse on step down transformer 13.8KV ACB1-12 on bus 2NPS-SWG001.

b. Investigate and replace the blown fuse.

c. Place the control switch from 2NPS-SWG001 to pull-to-lock on P851.

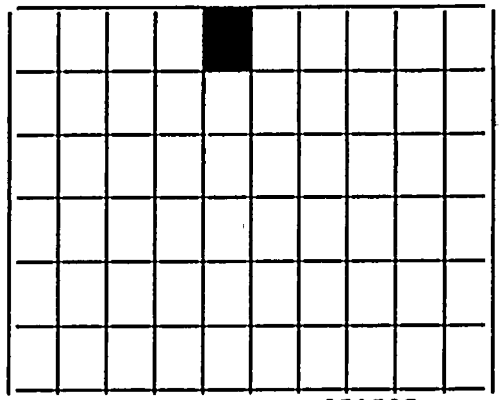
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

16.0 851505 Condensate Pump 1C Blown Fuse

Reflash: No

CONDENSATE
PUMP 1C
POTENTIAL
FUSE BLOWN

851505



851505

16.1 Computer Point / Computer Printout / Source

Computer Point	Computer Printout	Source
1) CNMEC03	CNST P1C POT FUSES	74-1 & 2 - CNMC02 *7

16.2 Auto Response

NONE

16.3 Corrective Action

NOTE: This alarm indicates 2CNM-P1C lost its preferred power supply.

a. Information alarm-blown fuse on step down transformer 4.16KV ACB11-8 on 2NNS-SWG011.

b. Investigate and replace the blown fuse.

c. Place the control switch for 2NNS-SWG011 to pull-to-lock on P851.

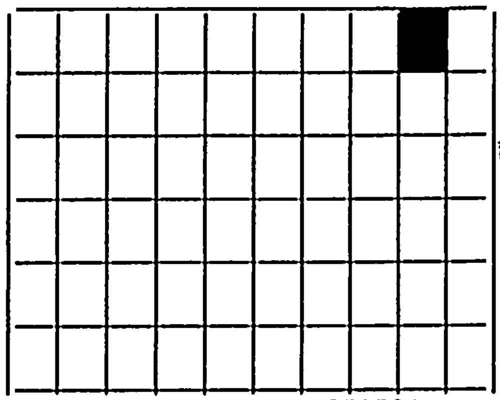
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

17.0 851509 Reactor Feed Pump 1A/1B/1C Auto Trip

Reflash: No

REACTOR
FEED PUMP
1A/1B/1C
AUTO TRIP

851509



851509

17.1

Computer Point	Computer Printout	Source
FWSUC01	RFP 1A/1B/1C AUTO TRIP	Feedpump motor breaker auto trip or fail to start *7

17.2 Auto Response

NONE

17.3 Corrective Action

a. If the alarm received during the feedpump start, investigate any pump trip signal that exists.

b. Reset the alarm by placing feedwater pump control switch to Pull To Lock, then release.

c. If feedwater pump trips, monitor reactor water level.

d. Verify recirculation flow control valve runback to about 65% core flow. Refer to N2-OP-101D Section H.2.0 for corrective actions.

e. If reactor scram occurred, refer to N2-OP-101C for scram recovery.

f. Refer to Emergency Operating Procedure.

g. Investigate the cause of the feedwater pump trip.

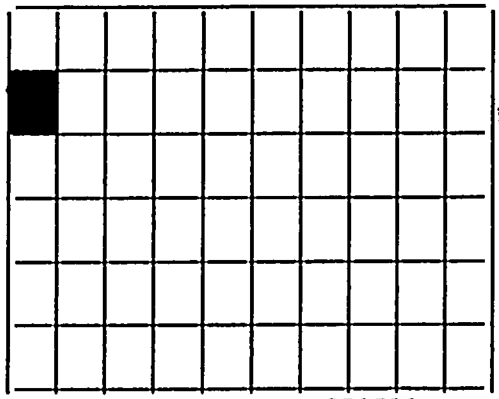
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

18.0 851511 Condensate Pump 1A/1B/1C Auto Trip/Fail to Start

Reflash: No

CONDENSATE
PUMP 1A/1B/1C
AUTO TRIP/
FAIL TO START

851511



851511

18.1

Computer Point	Computer Printout	Source
1) CNMUC01	CNST PMP 1A/1B/1C AT/FTS	Condensate motor breaker auto trip or fail to close *7

18.2 Auto Response

NONE

18.3 Corrective Action

a. If the alarm is received during the condensate pump start, investigate any pump trip signal that exists.

b. Reset the alarm by placing the condensate pump control switch to PULL-TO-LOCK, then release.

c. Verify the standby condensate pump auto starts if running pump was tripped.

d. If the feedwater pump trips on low suction pressure and reactor scram occurs, refer to N2-OP-101C for scram recovery.

e. Refer to Emergency Operating Procedure.

f. Investigate the cause of the condensate pump trip.

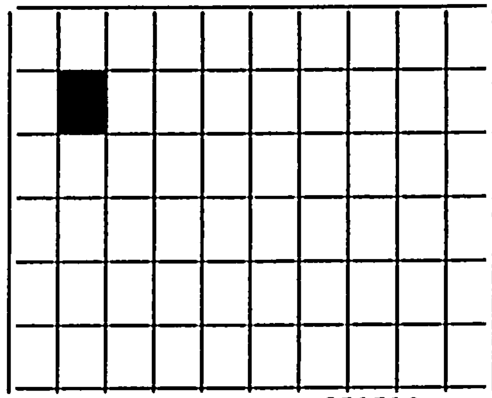
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

19.0 851512 Condensate Booster Pump 2A/2B/2C Auto Trip/Fail to Start

Reflash: No

CND BSTR PMP
2A/2B/2C
AUTO TRIP/
FAIL TO START

851512



851512

19.1

Computer Point	Computer Printout	Source
1) CNMUC09	CNST BSTR P2A/B/C AT/FTS	Condensate booster motor breaker auto trip or fail to start *7

19.2 Auto Response

NONE

19.3 Corrective Action

a. If the alarm is received during the condensate booster pump start, investigate any pump trip signal that exists.

b. Reset the alarm by placing the condensate booster pump control switch to PULL-TO-LOCK, then release.

c. Verify the standby condensate booster pump auto starts if running pump was tripped.

d. If the feedwater pump trips on low suction pressure and reactor scram occurs, refer to N2-OP-101C for scram recovery.

e. Refer to Emergency Operating Procedure.

f. Investigate the cause of the condensate booster pump trip.

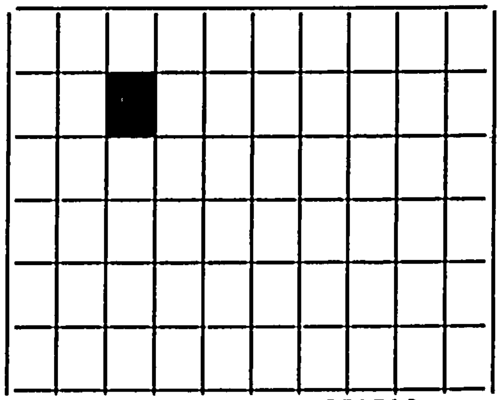
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

20.0 851513 Condensate Booster Pump 2A/2B/2C Suction Press Low/Low

Reflash: Yes

CND BSTR PMP
2A/2B/2C
SUCTION PRESS
LO/LO

851513



851513

20.1

Computer Point	Computer Printout	Source	
a. CNMPC04	CND BST P2A SUC PR PS39A	2CNM-PS39A (38 psig)	*7
b. CNMPC05	CND BST P2B SUC PR PS39B	2CNM-PS39B (38 psig)	
c. CNMPC06	CND BST P2C SUC PR PS39C	2CNM-PS39C (38 psig)	

20.2 Auto Response

Condensate booster pump auto trips.

20.3 Corrective Action

a. Verify the condensate booster pumps auto trip.

b. Refer to N2-OP-101C for scram recovery, if a scram occurs.

c. Refer to Emergency Operating Procedure, if required.

d. Determine the cause of condensate booster pump low suction pressure.

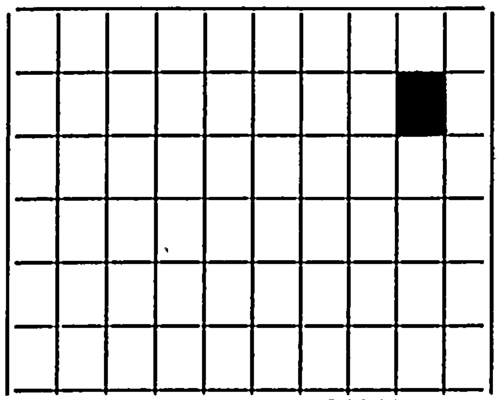
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

21.0 851519 Reactor Feedwater Pump 1A/1B/1C Motor Electrical Fault

Reflash: Yes

REAC FEED PMP
1A/1B/1C
MOTOR
ELEC FAULT

851519



851519

21.1	Computer Point	Computer Printout	Source
	FWSUC05	RFP1A RX FEED PMP P1A MOT ELEC	86-2FWSA01
	FWSUC06	RX FEED PMP P1B MOT ELEC	86-2FWSB01
	FWSUC07	RFP P1C MOT ELEC ACB 1-13	86-2FWSC11
	FWSUC08	RFP P1C MOT ELEC ACB 3-12	86-2FWSC31

*7

21.2 Auto Response

Affected reactor feed pump trips.

21.3 Corrective Action

a. Monitor reactor water level.

b. Verify reactor recirculation flow control valve runback to about 65% core flow. Refer to N2-OP-101D Section H.2.0 for corrective actions.

c. Start the standby feed water pump as required.

d. If a reactor scram occurs, refer to N2-OP-101C for scram recovery.

e. Refer to the Emergency Operating Procedures as required.

f. Investigate the cause of the feed pump breaker trip.

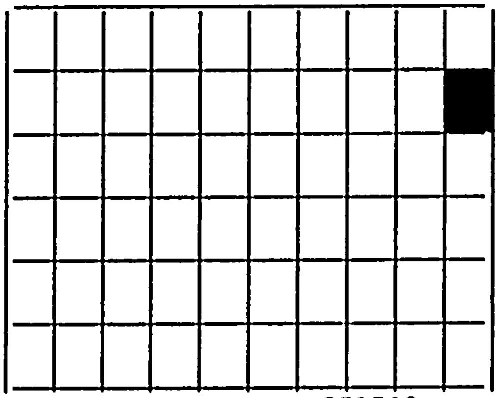
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

22.0 851520 Reactor Feed Pump Auxiliary Lube Oil Pump 2A/2B/2C Motor Overload

Reflash: Yes

RX FEED PMP
AUX LUBE OIL
PMP 2A/2B/2C
MOT OVERLOAD

851520



851520

22.1

Computer Point	Computer Printout	Source
FWLTC01	RFP AUX LUBE OIL P2A MOT	49X-2FWLA01
FWLTC02	RFP AUX LUBE OIL P2B MOT	49X-2FWLB01
FWLTC03	RFP AUX LUBE OIL P2C MOT	49X-2FWLC01

*7

22.2 Auto Response

None.

22.3 Corrective Action

a. Check the computer to determine which pump is alarmed.

NOTE: The handwheel gear ratio is approximately 770:1 with an efficiency of 21-1/4%, and a rim pull force of only 50 lbs. is sufficient to produce a valve seating force of 250,000 lbs. as required. Do not apply excessive force to close the valve.

b. Shut the alarmed feed pump suction and discharge valve 2CNM-MOV84A (B, C) and 2FWS-MOV47A (B, C) until the lube oil pump motor overload problem is corrected.

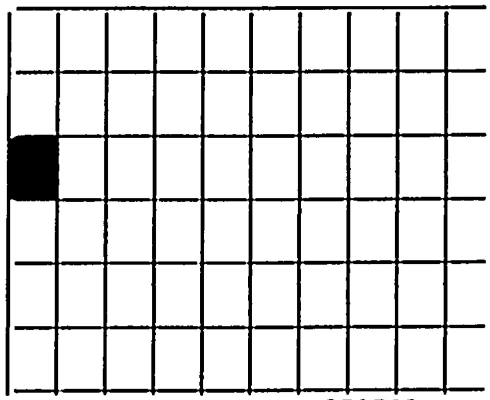
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

23.0 851521 Condensate 1A/1B/1C Motor Electrical Fault

Reflash: Yes

CONDENSATE
PUMP 1A/1B/1C
MOTOR
ELEC FAULT

851521



851521

23.1

Computer Point	Computer Printout	Source	
a. CNMUC05	CNST P1A MOT ELECTRICAL	86-2CNMA01	
b. CNMUC06	CNST P1B MOT ELECTRICAL	86-2CNMB01	*7
c. CNMUC07	CNST P1C (ACB 11-8) MOT ELC	86-2CNMC11	
d. CNMUC08	CNST P1C (ACB 13-2) MOT ELC	86-2CNMC31	

23.2 Auto Response

Affected condensate pump trips.

23.3 Corrective Action

a. Determine which Condensate Pump trips by computer printout and pump indication on P851.

b. Verify the standby condensate pump auto starts.

c. Investigate the cause of the condensate motor electrical fault.

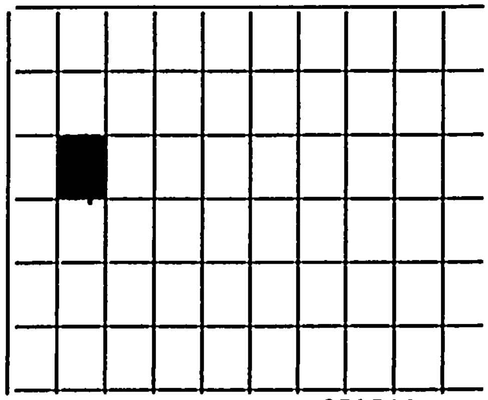
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

24.0 851522 Condensate Booster Pump 2A/2B/2C Motor Electrical Fault

Reflash: Yes

CNST BSTR PMP
2A/2B/2C
MOTOR
ELEC FAULT

851522



851522

24.1

	Computer Point	Computer Printout	Source
	a. CNMUC13	CNST BSTR P2A MOT ELEC	86-2CNMA02
	b. CNMUC14	CNST BSTR P2B MOT ELEC	86-2CNMB02
	c. CNMUC15	P2C (ACB 1-12) MOT ELEC	86-2CNMC12
	d. CNMUC16	P2C (ACB 3-11) MOT ELEC	86-2CNMC32

*7

24.2 Auto Response

Affected condensate booster pump trips.

24.3 Corrective Action

a. Determine which pump trips by computer printout and pump indication light on P851.

b. Verify the standby condensate booster pump auto starts.

c. Investigate the cause of the condensate booster pump electrical fault.

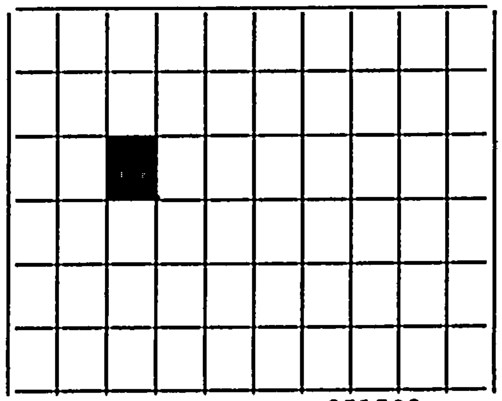
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

25.0 851523 Condensate Booster Pump 2A/2B/2C Suction Flow Low

Reflash: Yes

CNST BSTR PMP
2A/2B/2C
SUCTION FLOW
LOW

851523



851523

25.1

Computer Point	Computer Printout	Source	
a. CNMFC01	CNST BSTR P2A SUCT FLOW	2CNM-FSL38A (4000 gpm)	*7
b. CNMFC02	CNST BSTR P2B SUCT FLOW	2CNM-FSL38B (4000 gpm)	
c. CNMFC03	CNST BSTR P2C SUCT FLOW	2CNM-FSL38C (4000 gpm)	

25.2 Auto Response

2CNM-FV38A, B, C opens.

25.3 Corrective Action

a. Information alarm-when condensate booster pump is operating with suction flow less than 4000 gpm.

b. Verify the minimum flow valve 2CNM-FV38A (B, C) is open modulating the system flow at 4400 gpm on 2CNM-FI38A (B, C).

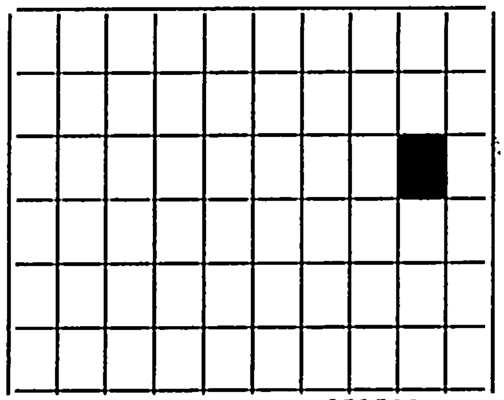
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

26.0 851529 Reactor Feed Pump 1A-1B-1C Motor Overload

Reflash: Yes

REACTOR
FEED PUMP
1A/1B/1C
MOT OVERLOAD

851529



851529

26.1

Computer Point	Computer Printout	Source	
FWSTC01	RX FEED PUMP P1A MOTOR	51X-2FWSA01	*7
FWSTC02	RX FEED PUMP P1B MOTOR	51X-2FWSB01	*7
FWSTC03	RFP P1C MOT ACB 1-13	51X-2FWSC11	*7
FWSTC04	RFP P1C MOT ACB 3-12	51X-2FWSC31	

26.2 Auto Response

2FWS-P1A or P1B or P1C trips.

26.3 Corrective Action

a. Monitor reactor water level.

b. Verify recirculation flow control valve runback to about 65% core flow. Refer to N2-OP-101D Section H.2.0 for corrective actions.

c. Start the standby feedwater pump as desired.

d. If a reactor scram occurs, refer to N2-OP-101C for scram recovery.

e. Refer to the Emergency Operating Procedures as required.

f. Investigate the cause of motor overload.

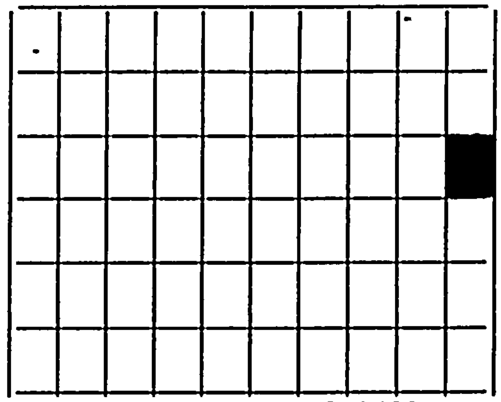
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

27.0 851530 Reactor Feed Pump 1A/1B/1C Lube Oil Reservoir Level High

Reflash: Yes

REAC FEED PMP
1A/1B/1C
LUBE OIL RSVR
LEVEL HIGH

851530



851530

27.1

Computer Point	Computer Printout	Source
FWLLC01	RFP P1A LUBE OIL RSV LVL	2FWL-LS8A
FWLLC02	RFP P1B LUBE OIL RSV LVL	2FWL-LS8B
FWLLC03	RFP P1C LUBE OIL RSV LVL	2FWL-LS8C

Setpoint - 2" below top of Tank

27.2 Auto Response

NONE

27.3 Corrective Action

a. Check the computer to determine which pump annunciated.

b. Start the standby feedpump and remove the alarmed feedpump from service (or as directed by SSS). TCN-101

c. Investigate the source of lube oil reservoir in leakage.

d. As directed by SSS, drain lube oil to clear high LVL condition:

1) Obtain collection container for oil

2) Uncap and open 2FWL-V25A(B,C) TCN-101

3) Close and cap 2FWL-V25A(B,C) when desired level is reached.

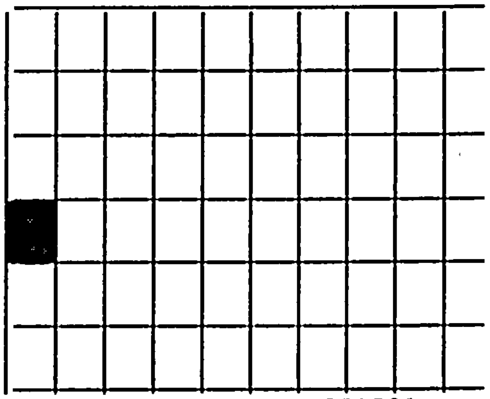
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

28.0 851531 Condensate Pump 1A/1B/1C Motor Overload

Reflash: Yes

CONDENSATE
PUMP 1A/1B/1C
MOTOR
OVERLOAD

851531



851531

28.1

Computer Point	Computer Printout	Source
a. CNMTC01	CNST PMP 2CNM-P1A MOT	51X-2CNMA01
b. CNMTC02	CNST PMP 2CNM-P1B MOT	51X-2CNMB01
c. CNMTC03	CNST PP P1C (ACB 11-8) MOT	51X-2CNMC11
d. CNMTC04	CNST PP P1C (ACB 13-2) MOT	51X-2CNMC31

*7

28.2 Auto Response

a. Affected condensate pump trips and lockout.

b. Standby condensate pump auto starts.

28.3 Corrective Action

a. Determine which pump trips by computer printout and pump indication light on P851.

b. Verify the standby condensate pump auto starts.

c. Determine the cause of the condensate pump motor overload.

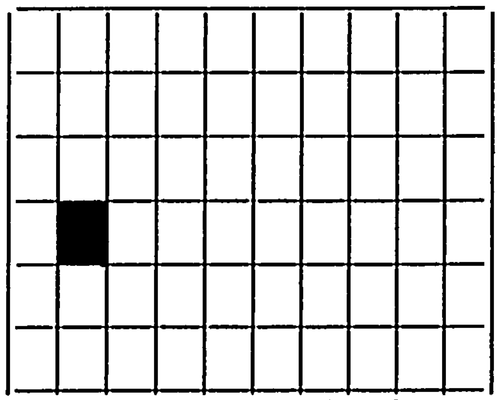
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

29.0 851532 Condensate Booster Pump 2A/2B/2C Motor Overload

Reflash: Yes

CNST BSTR PMP
2A/2B/2C
MOT OVERLOAD

851532



851532

29.1

Computer	Computer Printout	Source
a. CNMTC05	CNST BSTR P2A MOT	51X-2CNMA02
b. CNMTC06	CNST BSTR P2B MOT	51X-2CNMB02
c. CNMTC07	2CNM-P2C (ACB 1-12) MOT	51X-2CNMC12
d. CNMTC08	2CNM-P2C (ACB 3-11) MOT	51X-2CNMC32

*7

29.2 Auto Response

a. Affected condensate booster pump trips and lockout.

b. Standby condensate booster pump auto starts.

29.3 Corrective Action

a. Determine which pump trips by computer printout and pump indication light on P851.

b. Verify the standby condensate booster pump auto starts.

c. Determine the cause of the condensate booster pump motor overload.

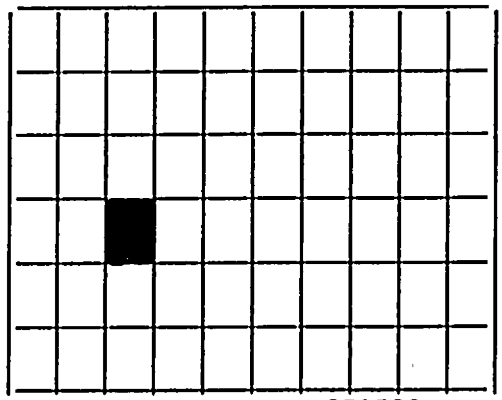
I. <u>PROCEDURE FOR CORRECTING ALARM CONDITIONS</u> (Cont.)

30.0 <u>851533</u> Condensate Booster Pumps Suction Header Pressure Low

<u>Reflash: No</u>

CONDENSATE
BOOSTER PUMPS
SUCTION HDR PRESS
LOW

851533



851533

30.1

Computer Point	Computer Printout	Source	
a. CNMPC13	CNST BSTR PMP SUC HDR PR	2CNM-PS115 (127 psig)	*7

30.2 <u>Auto Response</u>

NONE

30.3 <u>Corrective Action</u>

a. Check the computer CRT to determine the trend of pressure decreasing.

b. Verify the condensate pump discharge header pressure indication on 2CNM-PI105.

c. Start standby condensate pump as required.

d. Investigate the cause of excessive pressure drop on condensate booster pump suction header.

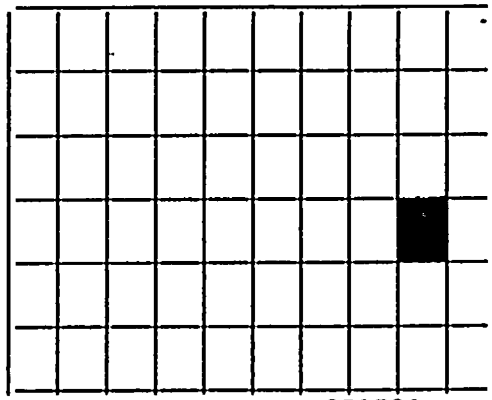
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

31.0 851539 Reactor Feed Pump 1A/1B/1C Suction Pressure Low/Low-Low

Reflash: Yes

REAC FEED PMP
1A/1B/1C
SUCTION PRESS
LOW/LO/LO

851539



851539

31.1

Computer Point	Computer Printout	Source
CNMPC07	2FWS-P1A SUC PR PS74A	2CNM-PS74A (210 psig)
CNMPC08	2FWS-P1B SUC PR PS74B	2CNM-PS74B (210 psig)
CNMPC09	2FWS-P1C SUC PR PS74C	2CNM-PS74C (210 psig)
CNMPC10	2FWS-P1A SUC PR PS73A	2CNM-PS73A (190 psig)
CNMPC11	2FWS-P1B SUC PR PS73B	2CNM-PS73B (190 psig)
CNMPC12	2FWS-P1C SUC PR PS73C	2CNM-PS73C (190 psig)

31.2 Auto Response

a. Reactor Feedpump 2FWS-P1A (B, C) trips.

b. Auto start standby condensate booster pump.

c. Feedwater flow limiter logic engaged if turbine trip signal is present. TCN-104

31.3 Corrective Action

NOTE:

1. The feedwater pump will trip after 45 seconds time delay if the suction pressure is between 190 psig and 210 psig.

2. The feedwater pump will trip after 18 seconds time delay if the suction pressure is below 190 psig.

3. If feedwater pump suction low pressure occurs after main turbine trip, the feedwater level control valves 2FWS-LV10A,B (C) will be automatically shut to 48% flow (70% open). TCN-104

a. Verify the feedwater pump suction pressure indication 2CNM-PI70A (B, C). Start the standby condensate and condensate booster pump as required to prevent feedwater pump from tripping.

b. Investigate the possible causes:

1. The feedwater pump minimum flow valve 2FWR-FV2A (B, C) failed open.

2. Condensate booster pump minimum flow valve 2CNM-FV38A (B, C) failed open.

3. 4the point heater drain pumps tripped.

4. Abnormal high heater levels.

c. If the reactor scram occurs, refer to N2-OP-101C for scram recovery.

d. Refer to Emergency Operating Procedure.

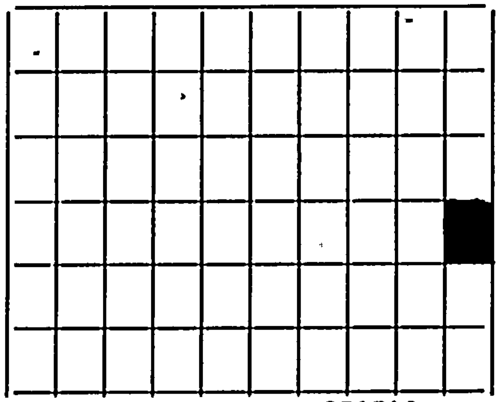
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

32.0 851540 Reactor Feed Pump 1A/1B/1C Lube Oil Reservoir Level Low

Reflash: Yes

REAC FEED PMP
1A/1B/1C
LUBE OIL RSVR
LEVEL LOW

851540



851540

32.1	Computer Point	Computer Printout	Source
	FWLLC04	RFP P1A LUBE OIL RSV LVL	2FWL-LS8A
	FWLLC05	RFP P1B LUBE OIL RSV LVL	2FWL-LS8B
	FWLLC06	RFP P1C LUBE OIL RSV LVL	2FWL-LS8C

(11" below top of the tank)

32.2 Auto Response

NONE

32.3 Corrective Action

a. Check the computer printout to determine which pump is annunciated.

b. Start the standby feedwater pump and remove the alarmed pump from service (or as directed by SSS). TCN-101

c. Investigate the lube oil leakage.

d. Add oil (as directed by SSS) to clear Low Level. (Use N2-PM-W-1 as a guide). TCN-101

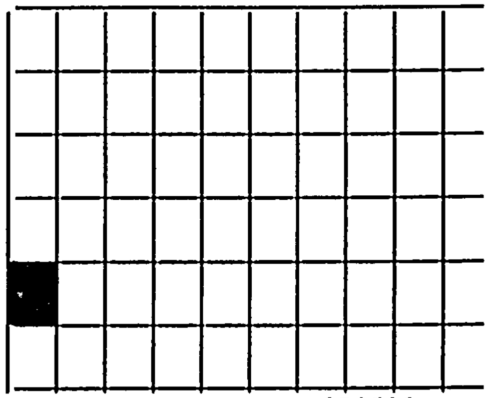
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

33.0 851541 Condensate Pump Discharge Header Pressure High

Reflash: No

CNST PUMP
DISCH HEADER
PRESSURE
HIGH

851541



851541

33.1

Computer Point	Computer Printout	Source
a. CNMPC14	CNST PMPS DISCH HDR PR	2CNM-PT105 (284 psig) | *7

33.2 Auto Response

NONE

33.3 Corrective Action

a. Check the computer CRT to determine the trend of pressure increasing.

b. Verify the condensate recirculating valve 2CNM-FV114 modulates.

c. Check the condensate header flow on 2CNM-FI114.

d. Verify the system valve lineup is correct.

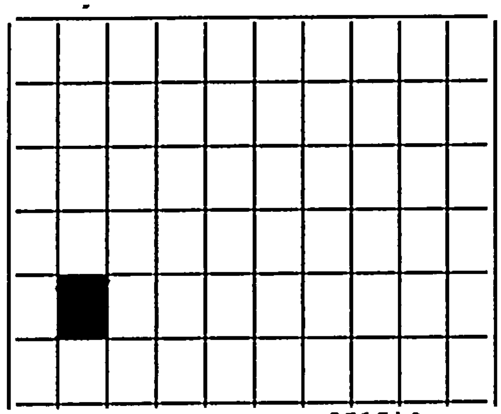
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

34.0 851542 Condensate Pump 1A/1B/1C Bearing/Winding Temperature High

Reflash: Yes | TCN-77

CNST PUMP
1A/1B/1C
BRG/WINDING TEMP
HIGH

851542



851542

34.1	Computer Points	Computer Printout	Source
	CNMTA04	CNDS P1A MTR THR BRG T	2CNM-TE76A
	CNMTA05	CNDS P1B MTR THR BRG T	2CNM-TE76B
	CNMTA06	CNDS P1C MTR THR BRG T	2CNM-TE76C
	CNMTA07	CNDS P1A MTR THR BRG T	2CNM-TE77A
	CNMTA08	CNDS P1B MTR THR BRG T	2CNM-TE77B
	CNMTA09	CNDS P1C MTR THR BRG T	2CNM-TE77C
	CNMTA10	CNDS P1A MTR STTR PH1 T	2CNM-TE78/81A
	CNMTA11	CNDS P1B MTR STTR PH1 T	2CNM-TE78/81B
	CNMTA12	CNDS P1C MTR STTR PH1 T	2CNM-TE78/81C

34.1 (Cont'd)

CNMTA13	CNDS P1A MTR STTR PH2 T	2CNM-TE79/82A
CNMTA14	CNDS P1B MTR STTR PH2 T	2CNM-TE79/82B
CNMTA15	CNDS P1C MTR STTR PH2 T	2CNM-TE79/82C
CNMTA16	CNDS P1A MTR STTR PH3 T	2CNM-TE80/83A
CNMTA17	CNDS P1B MTR STTR PH3 T	2CNM-TE80/83B
CNMTA18	CNDS P1C MTR STTR PH3 T	2CNM-TE80/83B

34.2 Auto Response

NONE

34.3 Corrective Action

a. Check the computer CRT to determine which pump is annunciated.

b. Verify the motor bearing oil cooling water valve lineup is correct.

c. Check the motor ventilation filter is not clogged.

d. Monitor the trend of temperature rise using process computer CRT.

e. Start the standby condensate pump and remove the alarmed pump from service.

f. If no standby condensate pump is available, consider reducing reactor power and removing the alarmed pump from service.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

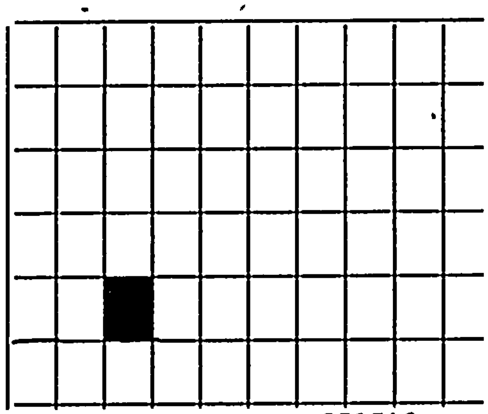
35.0 851543 Condensate Booster Pump 2A/2B/2C Bearing/Winding Temperature High

TCN-77

Reflash: Yes

CNST BSTR PMP
2A/2B/2C
BRG/WDG TEMP
HIGH

851543



851543

35.1

Computer Points	Computer Printout	Source
CNMTA21	BSTR P2A MTR IN BRG T	2CNM-TE43A
CNMTA22	BSTR P2B MTR IN BRG T	2CNM-TE43B
CNMTA23	BSTR P2C MTR IN BRG T	2CNM-TE43C
CNMTA24	BSTR P2A MTR OUT BRG T	2CNM-TE44A
CNMTA25	BSTR P2B MTR OUT BRG T	2CNM-TE44B
CNMTA26	BSTR P2C MTR OUT BRG T	2CNM-TE44C
CNMTA27	CND BSTR P2A P1 MT WD T	2CNM-TE94/97A
CNMTA28	CND BSTR P2B P1 MT WD T	2CNM-TE94/97B
CNMTA29	CND BSTR P2C P1 MT WD T	2CNM-TE94/97C

35.1 (Con't)

CNMTA30	CND BSTR P2A P2 MT WD T	2CNM-TE95/98A
CNMTA31	CND BSTR P2B P2 MT WD T	2CNM-TE95/98B
CNMTA32	CND BSTR P2C P2 MT WD T	2CNM-TE95/98C
CNMTA33	CND BSTR P2A P3 MT WD T	2CNM-TE96/99A
CNMTA34	CND BSTR P2B P3 MT WD T	2CNM-TE96/99B
CNMTA35	CND BSTR P2C P3 MT WD T	2CNM-TE96/99C
CNMTA36	CND BSTR P2A IN BRG T	2CNM-TE91A
CNMTA37	CND BSTR P2B IN BRG T	2CNM-TE91B
CNMTA38	CND BSTR P2C IN BRG T	2CNM-TE91C
CNMTA39	CND BSTR P2A OUT BRG T	2CNM-TE92A
CNMTA40	CND BSTR P2B OUT BRG T	2CNM-TE92B
CNMTA41	CND BSTR P2C OUT BRG T	2CNM-TE92C
CNMTA42	CND BSTR P2A THR BRG T	2CNM-TE93A
CNMTA43	CND BSTR P2B THR BRG T	2CNM-TE93B
CNMTA44	CND BSTR P2C THR BRG T	2CNM-TE93C

35.2 Auto Response

NONE

35.3 <u>Corrective Action</u>

a. Check the computer CRT to determine which pump is annunciated.

b. Monitor the temperature rise trend using the computer CRT.

c. Check the lube oil cooler discharge temperature indicates about 120^{o}F on 2CNO-TI10A (B, C).

d. Verify the motor ventilation filter is not clogged.

e. Start the standby condensate booster pump and remove the alarmed pump from service.

f. If no standby pump is available, consider reducing power and removing the alarmed pump from service.

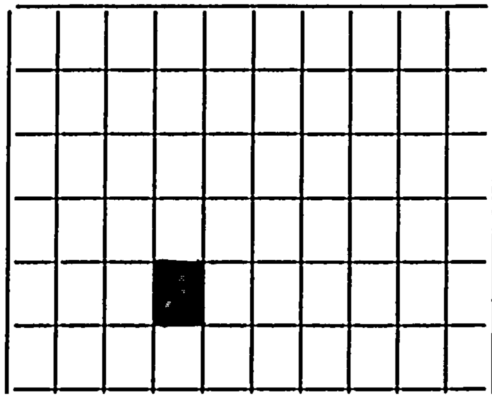
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

36.0 851544 Condensate Booster Pump 2A/2B/2C Inboard Shaft Vibration High

Reflash: Yes

CNST BSTR PMP
2A/2B/2C
INBD SFT V1B
HIGH

851544



851544

36.1

Computer Points	Computer Printout	Source
CNMNC01	CNST BSTR P2A IB SFT V1B	2CNM-NBS1A (4 mils)
CNMNC02	CNST BSTR P2B IB SFT V1B	2CNM-NBS1B (4 mils)
CNMNC03	CNST BSTR P2C IB SFT V1B	2CNM-NBS1C (4 mils)

*7

36.2 Auto Response

NONE

36.3 Corrective Action

a. Check the computer printout to determine which pump is annunciated.

b. Verify the vibration level and check for any abnormal noise.

c. Start the standby condensate booster pump and remove the alarmed pump from service.

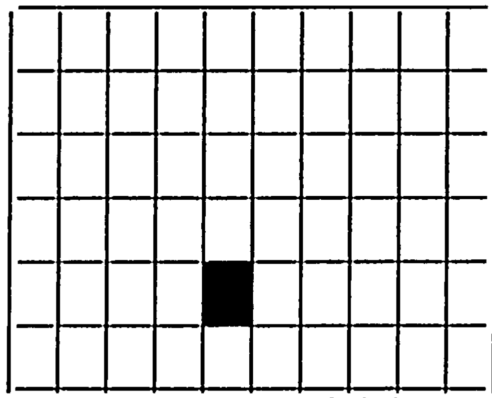
d. If no standby pump is available, consider reducing power and removing the alarmed pump from service.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

37.0 851545 Condensate Booster Pump 2A/2B/2C Outboard Shaft Vibration High

Reflash: Yes

CNST BSTR PMP 2A/2B/2C OUTBD SFT V1B HIGH 851545



851545

37.1

Computer Points	Computer Printout	Source	
CNMNC04	CNST BSTR P2A OB SFT V1B	2CNM-NBS2A (4 mils)	
CNMNC05	CNST BSTR P2B OB SFT V1B	2CNM-NBS2B (4 mils)	*7
CNMNC06	CNST BSTR P2C OB SFT V1B	2CNM-NBS2C (4 mils)	

37.2 Auto Response

NONE

37.3 Corrective Action

a. Check the computer printout to determine which pump is annunciated.

b. Verify the vibration level and check any abnormal noise.

c. Start the standby condensate booster pump and remove the alarmed pump from service.

d. If no standby pump is available, consider reducing power and removing the alarmed pump from service.

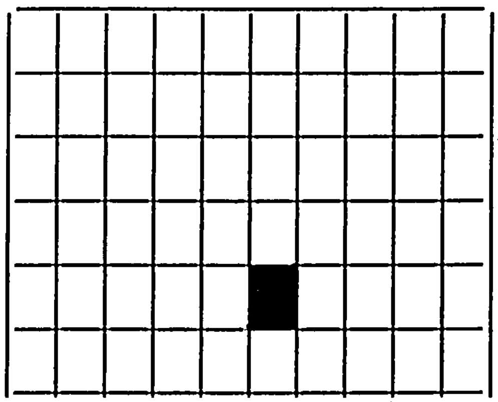
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

38.0 851546 Condensate Pump Discharge Header Flow Low

Reflash: No

CNST PUMP
DISCH HEADER
FLOW
LOW

851546



851546

38.1

Computer Points	Computer Printout	Source	
CNMFC08	CNST PUMP DISCH HDR FLOW	2CNM-FSLX114 (14,400 gpm)	*7

38.2 Auto Response

NONE

38.3 Corrective Action

a. Information alarm - Verify the condensate recirculation valve 2CNM-FV114 modulates.

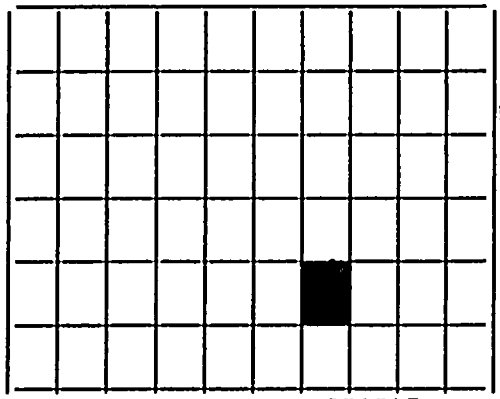
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

39.0 851547 Condensate Booster Auxiliary Lube Oil Pump 2A/2B/2C Motor Overload

Reflash: Yes

CNST PUMP
AUX LUBE OIL
PUMP 2A/2B/2C
MOT OVERLOAD

851547



851547

39.1

Computer Points	Computer Printout	Source	
CNOTC01	2CNO-P2A MOTOR	49X-2CNOA01	*7
CNOTC02	2CNO-P2B MOTOR	49X-2CNOB01	*7
CNOTC03	2CNO-P2C MOTOR	49X-2CNOC01	*7

39.2 Auto Response

2CNO-P2A/P2B/P2C trips.

39.3 Corrective Action

a. Check the computer printout to determine which pump is tripped.

b. Locally shut the alarmed condensate booster pump suction valve 2CNM-MOV7A (B, C) and discharge stop check 2CNM-V201A(B,C) until the lube oil pump motor overload problem is corrected.

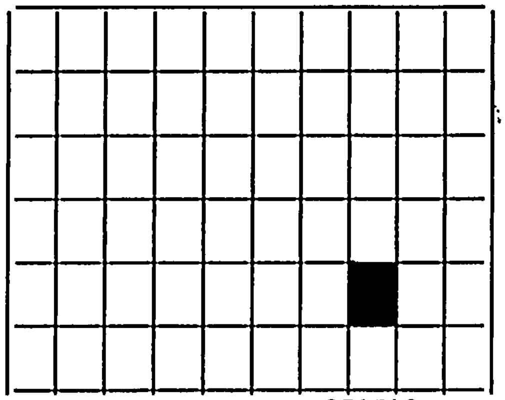
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

40.0 851548 Reactor Feed Pump 1A/1B/1C Seal Water Differential Pressure Low

Reflash: Yes

REAC FEED PMP
1A/1B/1C
SEAL WATER
DIFF PRESS LO

851548



851548

40.1

Computer Points	Computer Printout	Source	
FWPPC01	RFP 2FWS-P1A SL WTR D/P	2FWP-PDIS5A (4 psid)	
FWPPC02	RFP 2FWS-P1B SL WTR D/P	2FWP-PDIS5B (4 psid)	*7
FWPPC03	RFP 2FWS-P1C SL WTR D/P	2FWP-PDIS5C (4 psid)	

40.2 Auto Response

NONE

40.3 Corrective Action

a. Check the computer printout to determine which pump is annunciated.
b. Check the seal water pressure indicators 2FWP-PI3A (B, C) and 2FWP-PI4A (B, C).
c. Throttle 2FWP-V35A (B, C) to maintain seal water pressure at approximately 25 - 30 psid. If needed, open strainer bypass valve 2FWP-V16A (B, C) to control pressure.
d. Consider starting the standby feedwater pump and remove the alarmed pump from service per Section H of this procedure.

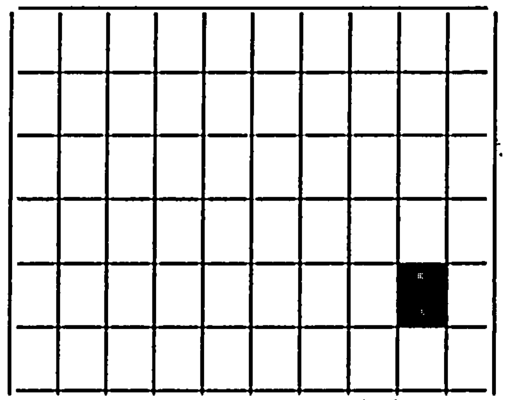
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

41.0 851549 Reactor Feed Pumps Suction Flow Low

Reflash: Yes

REACTOR
FEED PUMPS
SUCTION FLOW
LOW

851549



851549

41.1

Computer Points	Computer Printout	Source	
CNMFC05	RFP 2FWS-P1A SUCT FLOW	2CNM-FSL68A (5400 gpm)	
CNMFC06	RFP 2FWS-P1B SUCT FLOW	2CNM-FSL68B (5400 gpm)	*7
CNMFC07	RFP 2FWS-P1C SUCT FLOW	2CNM-FSL68C (5400 gpm)	

41.2 Auto Response

Open the feedwater pump minimum flow valve 2FWR-FV2A (B, C).

41.3 Corrective Action

a. Information alarm, when feedpump is operating with suction flow less than 5400 gpm.

b. Verify the minimum flow valve 2FWR-FV2A (B, C) is open modulating the system flow at 8500 gpm on 2CNM-FI68A (B, C).

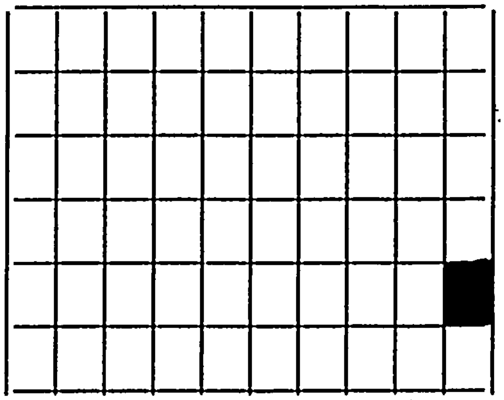
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

42.0 851550 Reactor Feed Pump 1A/1B/1C Lube Oil Filter Differential Pressure High

Reflash: Yes

REAC FEED PMP
1A/1B/1C
LUBE OIL FLTR
DIFF PRESS HI

851550



851550

42.1

Computer Point	Computer Printout	Source	
FWLPC01	RFP P1A LUBE OIL FLT D/P	2FWL-PDIS3A(6 psid)	*7
FWLPC02	RFP P1B LUBE OIL FLT D/P	2FWL-PDIS3B(6 psid)	
FWLPC03	RFP P1C LUBE OIL FLT D/P	2FWL-PDIS3C(6 psid)	

42.2 Auto Response

NONE

42.3 Corrective Action

a. Check the computer printout to determine which pump is alarmed.

b. Verify the differential pressure indicator on in service filter 2FWL-PDI17A (B, C) or 18A (B, C).

c. Switch standby filter into service.

d. Replace the spent filter.

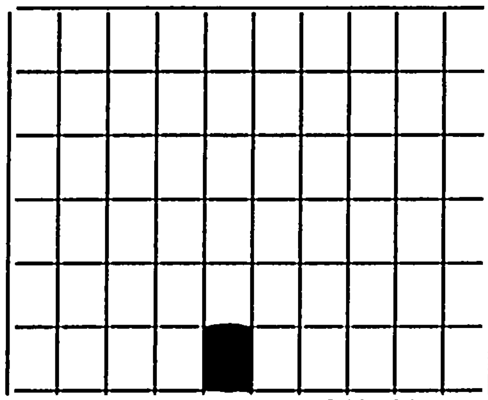
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

43.0 851555 Cnst Booster Main Lube Oil Pump 1A/1B/1C Suct Press HI

Reflash: Yes

CNST BOOSTER
MAIN LUBE OIL
PUMP 1A/1B/1C
SUCT PRESS HI

851555



851555

43.1

Computer Points	Computer Printout	Source	
CNOPC01	2CNO-P1A SUCT PR	2CNO-PS9A (35 psig)	
CNOPC02	2CNO-P1B SUCT PR	2CNO-PS9B (35 psig)	
CNOPC07	2CNO-P1C SUCT PR	2CNO-PS9C (35 psig)	*7

43.2 Auto Response

Auxiliary oil pump auto starts.

NOTE: The probable cause of this situation is reverse rotation of the idle Condensate Booster Pump due to a leaky discharge check valve. Reverse rotation of the Booster pump causes reverse rotation of the associated Main Lube Oil Pump and subsequent pressurization of the suction path.

43.3 Corrective Action

a. Check the computer printout to determine which pump alarmed.

b. Verify the auxiliary oil pump 2CNO-P2A (B, C) auto starts.

c. Place the alarming Condensate Booster Pumps Control Switch on P851 in "Pull-To-Lock".

d. Close the alarming Condensate Booster Pump's suction valve 2CNM-MOV7A(B,C) to prevent/terminate the reverse rotation.

e. Repair the leaky discharge check valve when plant status allows.

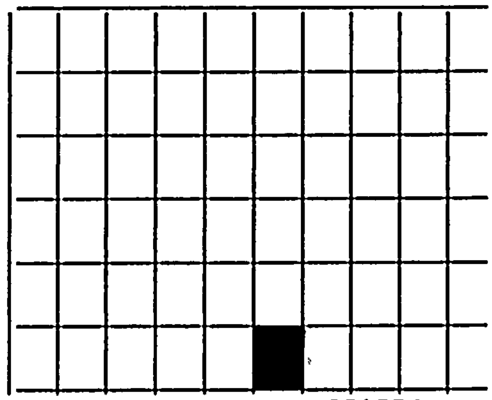
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

44.0 851556 Cnst Bstr Pmp 2A/2B/2C Lube Oil Sys Sply Press LO

Reflash: Yes

CNST BSTR PMP
2A/2B/2C
LUBE OIL SYS
SPLY PRESS LO

851556



851556

44.1

Computer Points	Computer Printout	Source
CNOPC03	2CNM-P2A OIL SYS SPLY PR	2CNO-PS2A (4 psig)
CNOPC04	2CNM-P2B OIL SYS SPLY PR	2CNO-PS2B (4 psig)
CNOPC08	2CNM-P2C OIL SYS SPLY PR	2CNO-PS2C (4 psig)

*7

44.2 Auto Response

Auxiliary oil pump auto starts.

44.3 Corrective Action

a. Check the computer printout to determine which pump alarmed.

b. Verify the auxiliary oil pump 2CNO-P2A (B, C) auto starts.

c. Verify 2CNO-PI5A (B, C) indicates about 10 psig.

d. Start the standby condensate pump and take the alarmed pump from service.

e. If the lube oil pressure cannot be established, locally shut the condensate booster pump suction valve 2CNM-MOV7A (B, C) and 2CNM-V201 A(B,C) discharge stop check until the problem is corrected.

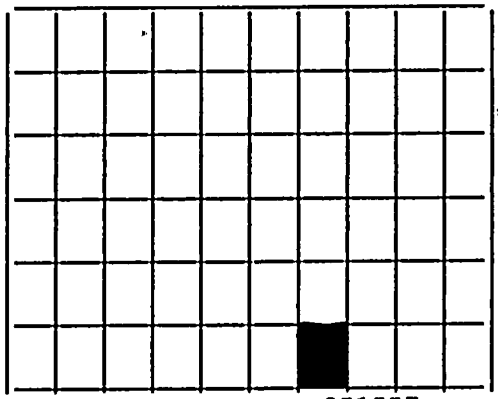
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

45.0 851557 Condensate Booster Pump 2A/2B/2C Lube Oil Filter Differential Pressure High

Reflash: Yes

CNST BSTR PMP
2A/2B/2C
LUBE OIL FLTR
DIFF PRESS HI

851557



851557

45.1

Computer Points	Computer Printout	Source	
CNOPC05	2CNM-P2A OIL FLT D/P	2CNO-PDIS3A (17 psid)	
CNOPC06	2CNM-P2B OIL FLT D/P	2CNO-PDIS3B (17 psid)	*7
CNOPC09	2CNM-P2C OIL FLT D/P	2CNO-PDIS3C (17 psid)	

45.2 Auto Response

NONE

45.3 Corrective Action

a. Check the computer printout to determine which pump alarmed.

b. Check the 2CNO-PDIS3A (B, C) differential pressure reading.

c. Change the lube oil filter to the standby unit.

d. Replace the spent filter.

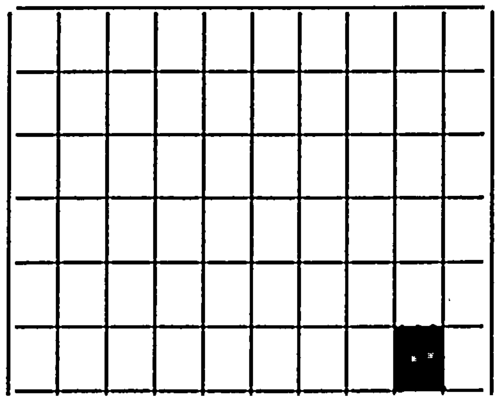
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

46.0 851559 Reactor Feed Pump 1A/1B/1C Bearing/Winding Temperature High

Reflash: Yes TCN-77

REAC FEED PMP
1A/1B/1C
BRG/WDG TEMP
HIGH

851559



851559

46.1

Computer Point	Computer Printout	Source
FWSTA07	P1A PUMP OUTBO BRG TEMP	2FWS-TE37A
FWSTA08	P1B PUMP OUTBO BRG TEMP	2FWS-TE37B
FWSTA09	P1C PUMP OUTBO BRG TEMP	2FWS-TE37C
FWSTA10	P1A PUMP INBO BRG TEMP	2FWS-TE38A
FWSTA11	P1B PUMP INBO BRG TEMP	2FWS-TE38B
FWSTA12	P1C PUMP INBO BRG TEMP	2FWS-TE38C
FWSTA13	P1A PUMP THRUST BRG TEMP	2FWS-TE45A
FWSTA14	P1B PUMP THRUST BRG TEMP	2FWS-TE45B
FWSTA15	P1C PUMP THRUST BRG TEMP	2FWS-TE45C

46.1 (Cont'd)

FWSTA16	P1A MTR WDG PH1 TEMP	2FWS-TE48A
FWSTA17	P1B MTR WDG PH1 TEMP	2FWS-TE48B
FWSTA18	P1C MTR WDG PH1 TEMP	2FWS-TE48C
FWSTA19	P1A MTR WDG PH2 TEMP	2FWS-TE49A
FWSTA20	P1B MTR WDG PH2 TEMP	2FWS-TE49B
FWSTA21	P1C MTR WDG PH2 TEMP	2FWS-TE49C
FWSTA22	P1A MTR WDG PH3 TEMP	2FWS-TE50A
FWSTA23	P1B MTR WDG PH3 TEMP	2FWS-TE50B
FWSTA24	P1C MTR WDG PH3 TEMP	2FWS-TE50C
FWSTA25	P1A MTR OUTBO BRG TEMP	2FWS-TE51A
FWSTA26	P1B MTR OUTBO BRG TEMP	2FWS-TE51B
FWSTA27	P1C MTR OUTBO BRG TEMP	2FWS-TE51C
FWSTA28	P1A MTR INBO BRG TEMP	2FWS-TE52A
FWSTA29	P1B MTR INBO BRG TEMP	2FWS-TE52B
FWSTA30	P1C MTR INBO BRG TEMP	2FWS-TE52C

46.2 Auto Response

NONE

46.3 Corrective Action

a. Check the computer CRT to determine which pump is annunciated.

b. Monitor the temperature rise trend using the computer CRT.

c. Verify the lube oil flow from the flow glass at the pump and motor bearings. *8

d. Verify that the motor cooling water discharge temperature on 2CCS-TI-38A (B, C) is less than 150°F.

e. Verify the lube oil cooler discharge temperature indicates about 120°F on 2FWL-TI12A (B, C).

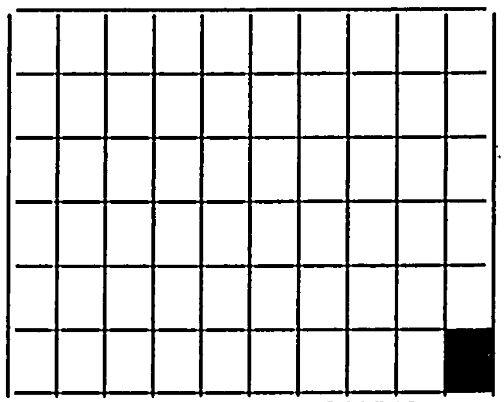
f. Start the standby feedwater pump and remove the alarmed pump from service if the problem cannot be corrected.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

47.0 851560 Reactor Feed Pump 1A/1B/1C Main Lube Oil Pump Discharge Pressure Low

REAC FEED PMP
1A/1B/1C
MN LUBE OIL P
DISCH PRESS LO

851560



851560

Reflash: Yes

47.1

Computer Point	Computer Printout	Source	
FWLPC04	RFP1A MN LUBE OIL DIS PR	2FWL-PS19A (15 psig)	
FWLPC05	RFP1B MN LUBE OIL DIS PR	2FWL-PS19B (15 psig)	*7
FWLPC06	RFP1C MN LUBE OIL DIS PR	2FWL-PS19C (15 psig)	

47.2 Auto Response

Auxiliary lube oil pump auto starts.

47.3 Corrective Action

NOTE: The feedwater lube oil pump discharge pressure is normally at 60 psig.

a. Check the computer printout to determine which pump is annunciated.

b. Verify the auxiliary lube oil pump automatically started.

c. Verify 2FWL-PI1A (B, C) pressure indicates about 20 psig. If the pressure is not maintained, start the standby feedwater pump and remove the alarm pump from service.

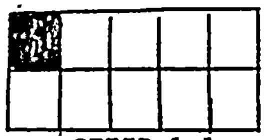
d. Investigate the possibility that 2FWL-RV11A (B, C) has malfunctioned.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

48.0 GEZIP 1-1 Metering Pump Off

METERING
PUMP
OFF

GEZIP 1-1



GEZIP 1-1

48.1

Computer Points	Computer Printout	Source
NONE	NONE	Both 2ZIP-P1A and P1B are off

48.2 Auto Response

NONE

48.3 Corrective Action

NOTE: the metering pump automatic trips on following:

1. Feedwater Pump Bypass Temp Low
2. Feedwater Pump Bypass Flow Low
3. Zinc Supply Tank Low-Low Level
4. Zinc Supply Tank Mixer Off

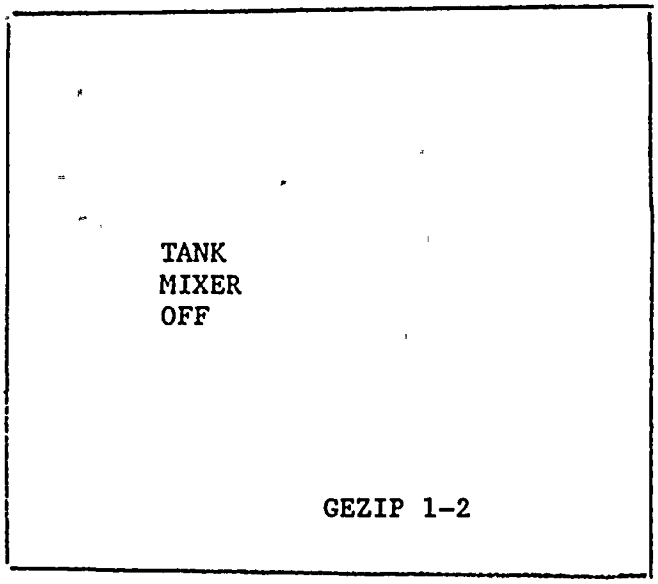
a. Information alarm during zinc system shutdown.

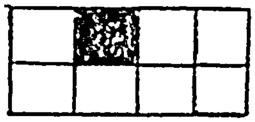
b. Determine the cause of metering pump trip.

c. If required, restore the system into operation per Section E of this procedure.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

49.0 GEZIP 1-2 Tank Mixer Off





GEZIP 1-2

49.1	Computer Points	Computer Printout	Source
	NONE	NONE	Both 2ZIP-MIX1 and MIX2 are off

49.2 Auto Response

2ZIP-P1A(B) auto trips if operating.

49.3 Corrective Action

a. Information alarm during zinc system shutdown.

b. Determine the cause of mixer trip.

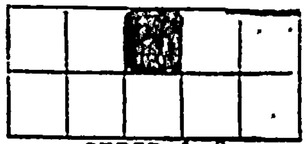
c. If required, restore the system into operation per section E of this procedure.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

50.0 GEZIP 1-3 Zinc Analyzer Concentration High

ZINC ANALYZER
CONCENTRATION
HIGH

GEZIP 1-3



GEZIP 1-3

50.1	Computer Points	Computer Printout	Source
	NONE	NONE	Reactor Water Zinc Concentration greater than 9 ppb. (13 ppb for initial startup)

50.2 Auto Response

NONE

50.3 Corrective Action

a. Verify the feedwater and reactor water zinc concentration at zinc analyzers.

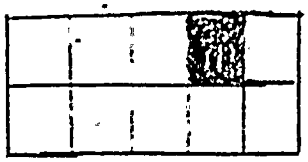
b. Contact chemistry department for corrective action, adjust the metering pump stroke as required or shutdown the zinc system.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

51.0 GEZIP 1-4 Zinc Analyzer Concentration Low

ZINC ANALYZER
CONCENTRATION
LOW

GEZIP 1-4



GEZIP 1-4

51.1	Computer Points	Computer Printout	Source
	NONE	NONE	Reactor Water Zinc Concentration less than 6 ppb.

51.2 Auto Response

NONE

51.3 Corrective Action

a. Verify the feedwater and reactor water zinc concentration at zinc analyzers.

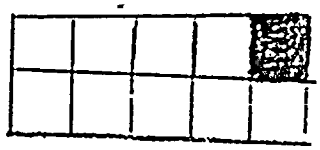
b. Contact chemistry department for corrective action, adjust the metering pump stroke as required or shutdown the zinc system.

I. <u>PROCEDURE FOR CORRECTING ALARM CONDITIONS</u> (Cont.)

52.0 <u>GEZIP 1-5</u> Feed Bypass Flow Low

FEEDWATER
BYPASS
LOW FLOW

GEZIP 1-5



GEZIP 1-5

52.1

Computer Points	Computer Printout	Source
NONE	NONE	Feedwater Flow less than 25 gpm

52.2 <u>Auto Response</u>

Metering Pump trips if operating.

52.3 <u>Corrective Action</u>

a. Verify the metering pump 2ZIP-P1A(B) auto trips.

b. Verify the valve lineup is normal.

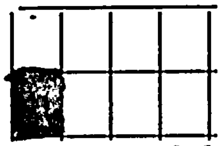
c. If required, restore the zinc system into operation per section E of this procedure.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

53.0 GEZIP 2-1 Feedwater Bypass Low Temperature

FEEDWATER
BYPASS
LOW TEMP

GEZIP 2-1



GEZIP 2-1

53.1

Computer Points	Computer Printout	Source
NONE	NONE	283°F

53.2 Auto Response

Metering Pump trips if operating.

53.3 Corrective Action

a. Verify the metering pump 2ZIP-P1A(B) auto trips.

b. Verify the valve lineup is normal and determine the cause of low temperature.

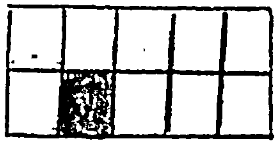
c. If required, restore the zinc system into operation per section E of this procedure.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

54.0 GEZIP 2-2 Supply Tank Level Low Low

SUPPLY TANK
LEVEL
LOW-LOW

GEZIP 2-2



GEZIP 2-2

54.1

Computer Points	Computer Printout	Source
NONE	NONE	Level less than 20%

54.2 Auto Response

Metering Pump auto trips.

54.3 Corrective Action

a. Verify the metering pump 2ZIP-P1A(B) auto trips.

b. Verify the valve lineup is normal.

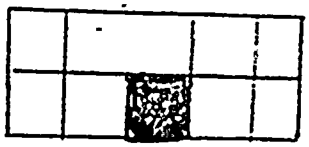
c. If required, restore the zinc system into operation per section E of this procedure.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

55.0 GEZIP 2-3 Supply Tank Level High High

SUPPLY TANK
LEVEL
HIGH-HIGH

GEZIP 2-3



GEZIP 2-3

55.1

Computer Points	Computer Printout	Source
NONE	NONE	Level greater than 90%

55.2 Auto Response

NONE

55.3 Corrective Action

a. Verify the Supply Tank Level on 2ZIP-LR402.

NOTE: The supply tank fill valve 2ZIP-F012 will auto shut when tank is filled to about 80%.

b. If the tank level high high occurs during fill, place the supply tank fill control switch to OFF.

c. Shut tank fill valve 2ZIP-V17 as required.

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VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNM-V90A	Condenser 1A test connection	Shut & Capped			
2CNM-V90B	condenser 1B test connection	Shut & Capped			
2CNM-V90C	Condenser 1C test connection	Shut & Capped			
2CNM-V1C	Condenser 1C test connection	Shut & Capped			
2CNM-V120C	PT45C Inst. Root Isol.	Open			
2CNM-V2B	PT46C, D Instrument Root Isol.	Locked Open			
2CNM-V1B	Condenser 1B test connection	Shut & Capped			
2CNM-V120B	PT45B Inst. Root Isol.	Open			
2CNM-V1A	Condenser 1A test connection	Shut & Capped			
2CNM-V120A	PT45A Inst. Root Isol	Open			
2CNM-V2A	PT46A, B Instrument Root Isol.	Locked Open			

TABLE I

VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNM-V5A	Condensate pump 1A vent return at condenser 1A	Open			
2CNM-V5B	Condensate pump 1B vent return at condenser 1A	Open			
2CNM-V5C	Condensate pump 1C vent return at condenser 1A	Open			
2CNM-V6A	MOV3A Vent Line Isol. at condenser 1A	Open			
2CNM-V6B	MOV3B Vent Line Isol. at condenser 1A	Open			
2CNM-V6C	MOV3C Vent Line Isol. at condenser 1A	Open			
2CNM-V15A	Condenser 1A drain	Shut & Blank Flanged			
2CNM-V15B	Condenser 1B drain	Shut & Blank Flanged			
2CNM-V15C	Condenser 1C drain	Shut & Blank Flanged			
2CNM-V58	Condenser 1A test connection	Shut & Capped			
2CNM-V320	Condenser Hotwell Drain	Shut & Capped			

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TABLE I

VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNM-MOV 63A	A condensate pump suction Isol.	Open			
2CNM-V215A	Condensate P1A suction piping continuous vent	Open			
2CNM-V151A	Condensate P1A suction strainer 1A continuous vent	Open			
2CNM-V22A	Condensate P1A suction strainer 1A drain	Shut & Capped			
2CNM-V18A	Condensate P1A suction strainer D.P. instr. root	Open			
2CNM-V19A	Condensate P1A suction strainer D.P. instr. root	Open			
2CNM-V169A	Condensate P1A suction strainer vent to atmo	Shut & Capped			
2CNM-RV47A	Condensate P1A suction piping relief	Not Gagged			
2CNM-V170A	Condensate P1A suction test connection	Shut & Capped			
2CNM-V11A	Condensate P1A continuous vent	Open			
2CNM-V13A	Seal water to Condensate P1A - Isol.	Open			

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VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNM-V340A	Seal water to Condensate P1A Vent	Shut & Capped			
2CNM-V173A	Seal water to Condensate P1A Isol.	Open			
2CNM-V174A	Seal water strainer 2A Blow down Isol.	Shut & Capped			
2CNM-V96A	PI75A Inst. Root Isol.	Open			
2CNM-V171A	Condensate P1A discharge test connection	Shut & Capped			
2CNM-V23A	PI34A Inst. Root Valve	Open			
2CNM-V12A	MOV3A Vent	Shut			
2CNM-MOV3A	Condensate P1A discharge Isol.	Open			
2CNM-V326	Drain After MOV3A	Shut & Capped			
2CNM-MOV 63B	Condensate P1B suction Isolation	Open			
2CNM-V215B	Condensate P1B suction piping continuous vent	Open			
2CNM-V151B	Condensate P1B suction strainer continuous vent	Open			

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VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNM-V22B	Condensate P1B suction strainer drain	Shut & Capped			
2CNM-V18B	Condensate P1B suction strainer D.P. instr. root	Open			
2CNM-V19B	Condensate P1B suction strainer D.P. instr. root	Open			
2CNM-V169B	Condensate P1B suction strainer vent to atmosphere	Shut & Capped			
2CNM-RV47B	Condensate P1B suction piping relief	Not Gagged			
2CNM-V170B	Condensate P1B suction test connection	Shut & Capped			
2CNM-V11B	Condensate P1B continuous vent	Open			
2CNM-V13B	Seal water to Condensate P1B	Open			
2CNM-V173B	Seal water to Condensate P1B	Open			
2CNM-V174B	Seal water strainer 2B blow down	Shut & Capped			
2CNM-V340B	Seal water to Condensate P1B Vent	Shut & Capped			

TABLE I

VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNM-V96B	PI75B Inst. Root Isol.	Open			
2CNM-V171B	Condensate P1B discharge test connection	Shut & Capped			
2CNM-V23B	PI34B Inst. Root Isol.	Open			
2CNM-V12B	MOV3B Vent	Shut			
2CNM-MOV3B	Condensate P1B discharge valve	Open			
2CNM-V325	Drain After MOV3B	Shut & Capped			
2CNM-MOV 63C	Condensate P1C suction valve	Open			
2CNM-V215C	Condensate P1C suction piping continuous vent	Open			
2CNM-V151C	Condensate P1C suction strainer continuous vent	Open			
2CNM-V22C	Condensate P1C suction strainer drain	Shut & Capped			
2CNM-V18C	Condensate P1C suction strainer D.P. instr. root	Open			
2CNM-V19C	Condensate P1C suction strainer D.P. instr. root	Open			

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VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNM-V340C	Seal water to Condensate P1C Vent	Shut & Capped			
2CNM-V169C	Condensate P1C suction strainer vent to atmosphere	Shut & Capped			
2CNM-RV47C	Condensate P1C suction piping relief	Not Gagged			
2CNM-V170C	Condensate P1C suction test connection	Shut & Capped			
2CNM-V11C	Condensate P1C continuous vent Isol.	Open			
2CNM-V13C	Seal water to Condensate P1C	Open			
2CNM-V173C	Seal water to Condensate P1C	Open			
2CNM-V174C	Seal water strainer 2C blow down	Shut & Capped			
2CNM-V96C	PI75C Inst. Root Isol.	Open			
2CNM-V171C	Condensate P1C discharge test connection	Shut & Capped			
2CNM-V23C	PI34C Inst. Root Isol.	Open			
2CNM-V12C	MOV3C Vent	Shut			

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TABLE I

VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNM-V324	Drain Valve After MOV 3C	Shut & Capped			
2CNM-MOV3C	Condensate P1C discharge Isol.	Open			
2CNM-V97	Condensate to turbine plant sampling Isol.	Open			
2CNM-V30	PT105 Inst. Root Isol	Open			
2CNM-V176	Condensate demin. bypass vent	Shut			
2CNM-AOV 109	Condensate demin. bypass Isol.	Shut			
2CNM-V177	Condensate demin. bypass vent	Shut			
2CNM-V223	Condensate demin. bypass Manual Isol.	Locked Open			
2CNM-V33	Condensate Demin. Inlet Isol.	Open			
2CNM-V128	Bypass Isol. around V33	Shut			
2CNM-V34	Condensate Demin. Outlet	Open			
2CNM-V37	Condensate to makeup and spill Isol.	Open			

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VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNM-V126	Condensate to turbine plant sampling Isol.	Open			
2CNM-MOV 64A	Air Ejector Intercondenser 3A Inlet Isol.	*Open/ Shut			
2CNM-V152A	Air Ejector Intercondenser 3A Inlet Vent	Shut			
2CNM-V168A	Air Ejector Intercondenser 3B Outlet Vent	Shut			
2CNM-MOV 65A	Air Ejector Intercondenser 3A Outlet Isol.	Open			
2CNM-MOV 64B	Air Ejector Intercondenser 3B Inlet Isol.	*Shut/ Open			
2CNM-V152B	Air Ejector Intercondenser 3B Inlet Vent	Shut			
2CNM-V168B	Air Ejector Intercondenser 3B Outlet Vent	Shut			
2CNM-MOV 65B	Air Ejector Intercondenser 3B Outlet Isol.	Open			
2CNM-V178	Steam Pack Exhauster Outlet HDR Vent	Shut			
2CNM-V50	FT114 Inst. Root Isol.	Open			

*NOTE: As per SJAE Train in use.

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VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNM-V51	FT114 Inst. Root Isol.	Open			
2CNM-V179	Steam Pack Exhauster Outlet HDR Vent	Shut			
2CNM-MOV 66A	Steam Packing Exhauster 2A Inlet Isol.	Open			
2CNM-RV37A	Steam Pack Exhauster 2A relief	Not Gagged			
2CNM-V200A	Steam Pack Exhauster 2A Inlet drain	Shut & Capped			
2CNM-V153A	Steam Pack Exhauster 2A Outlet Vent	Shut			
2CNM-MOV 67A	Steam Pack exhauster 2A Outlet Isol.	Open			
2CNM-MOV 66B	Steam Packing Exhauster 2B Inlet Isol.	Open			
2CNM-RV37B	Steam Pack Exhauster 2B relief	Not Gagged			
2CNM-V200B	Steam pack Exhauster 2B Inlet Drain	Shut & Capped			
2CNM-V153B	Steam Pack Exhauster 2B Outlet Vent	Shut			

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VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNM-MOV 67B	Steam Pack Exhauster 2B Outlet Isol.	Open			
2CNM-RV36A	Air Ejector Intercondenser 3A relief	Not Gagged			
2CNM-V40A	Air Ejector Intercondenser 3A drain	Shut & Capped			
2CNM-RV36B	Air Ejector Intercondenser 3B relief valve	Not Gagged			
2CNM-V40B	Air Ejector Intercondenser 3B drain	Shut & Capped			
2CNM-V199	Condensate to clean steam reboilers Isol.	Open			
2CNM-V124	Condensate pumps minimum flow Isol.	Open			
2CNM-FV114	Condensate pumps minimum flow control valve	Shut Manual Operator in Fully CCW			
2CNM-V35	Condensate to Exhaust Hood Spray	Open			
2CNM-TV121	Exhaust Hood Spray Temp. control valve	Shut			
2CNM-MOV 120	Exhaust Hood Spray TCV by-pass Isol.	Shut			

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VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNM-V54	PT115 Inst. Root Isol.	Open			
2CNM-V202	Condensate pumps seal water supply Isol.	Open			
2CNM-V311	Seal Water Supply Line Drain	Shut & Capped			
2CNM-MOV7A	Condensate Booster P2A suction valve	Open			
2CNM-V100A	Bypass Isol. around MOV7A	Shut			
2CNM-V195A	Vent Upstr of FE 38A	Shut			
2CNM-V60A	FT38A Inst. Root Isol.	Open			
2CNM-V61A	FT38A Inst. Root Isol.	Open			
2CNM-V196A	Vent Dnstr of FE 38A	Shut			
2CNM-RV48A	A condensate booster pump suction piping relief valve	Not Gagged			
2CNM-V62A	Condensate Booster P2A suction test connection	Shut & Capped			
2CNM-V224A	Condensate Booster P2A suction strainer drain	Shut & Capped			
2CNM-V65A	PS39A, 42A, & PI 39A, 42A Inst. Root Isol.	Open			

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VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNM-V216A	Condensate Booster P2A suction drain	Open			
2CNM-V180A	Condensate Booster P2A suction test connection	Open			
2CNM-V181A	Condensate Booster P2A vent	Shut			
2CNM-V183A	Condensate Booster P2A discharge test connection	Shut & Capped			
2CNM-V217A	Condensate Booster P2A discharge drain	Shut & Capped			
2CNM-V156A	PI27A Inst. Root Isol.	Open			
2CNM-V165A	Condensate Booster P2A minimum flow Isol.	Open			
2CNM-FV38A	Condensate Booster P2A minimum flow control valve	Shut			
2CNM-V201A	Condensate Booster P2A discharge stop check	Open			
2CNM-V194A	Condensate Booster P2A discharge header vent	Shut			
2CNM-V69	PT104 Inst. Root Isol.	Open			
2CNM-MOV7B	Condensate Booster P2B suction Isol.	Open			

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VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNM-V342A	Cond. Booster Pump P2A Suction Drain	Shut & Capped			
2CNM-V341A	Cond. Booster Pump P2A Suction Test	Shut & Capped			
2CNM-V100B	Bypass Isol. around MOV 7B	Shut			
2CNM-V195B	Vent Upstr of FE 38B	Shut			
2CNM-V60B	FT38B Inst. Root Isol.	Open			
2CNM-V61B	PT38B Inst. Root Isol.	Open			
2CNM-V196B	Vent Dnstr of FE 38B	Shut			
2CNM-RV48B	Condensate Booster P2B suction relief	Not Gagged			
2CNM-V62B	Condensate Booster P2B suction test connection	Shut & Capped			
2CNM-V224B	Condensate Booster P2B suction strainer drain	Shut & Capped			
2CNM-V65B	PS 39B, 42B & PI 37B, 42B Inst. Root Isol.	Open			
2CNM-V216B	Condensate Booster P2B suction drain	Open			
2CNM-V180B	Condensate Booster P2B test connection	Open			

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VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNM-V181B	Condensate Booster P2B vent	Shut			
2CNM-V342B	Cond. Booster Pump P2B Suction Drain	Shut & Capped			
2CNM-V341B	Cond. Booster Pump P2B Suction Test	Shut & Capped			
2CNM-V183B	Condensate Booster P2B discharge test connection	Shut & Capped			
2CNM-V217B	Condensate Booster P2B discharge drain	Shut & Capped			
2CNM-V156B	PI27B Inst. Root Isol.	Open			
2CNM-V165B	Condensate Booster P2B minimum flow Isol.	Open			
2CNM-FV38B	Condensate Booster P2B minimum flow control valve	Shut			
2CNM-V201B	Condensate Booster P2B discharge stop check	Open			
2CNM-V194B	Condensate Booster P2B discharge header vent	Shut			
2CNM-MOV7C	Condenser Booster P2C suction	Open			
2CNM-V100C	Bypass around MOV 7C	Shut			

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VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNM-V195C	Vent upstr of FE 38C	Shut			
2CNM-V60C	FT38C Inst. Root Isol.	Open			
2CNM-V61C	FT38C Inst Root Isol.	Open			
2CNM-V196C	Vent Dnstr of FE 38C	Shut			
2CNM-RV48C	Condensate Booster P2C suction piping relief	Not Gagged			
2CNM-V62C	Condensate Booster P2C suction test connection	Shut & Capped			
2CNM-V224C	Condensate Booster P2C suction strainer drain	Shut & Capped			
2CNM-V65C	PS 39C, 42C & PI 39C, 42C Inst. Root Isol.	Open			
2CNM-V216C	Condensate Booster P2C suction drain	Open			
2CNM-V180C	Condensate Booster P2C suction test connection	Open			
2CNM-V181C	Condensate Booster P2C vent	Shut			
2CNM-V183C	Condensate Booster P2C discharge test connection	Shut & Capped			
2CNM-V217C	Condensate Booster P2C discharge drain	Shut & Capped			

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VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNM-V344A	Booster P2A Seal Supply Isol.	Open			
2CNM-V345A	Booster P2A Inbd. Seal Isol.	Open			
2CNM-V346A	Booster P2A Outbd. Seal Isol.	Open			
2CNM-V344B	Booster P2B Seal Supply Isol.	Open			
2CNM-V345B	Booster P2B Inbd. Seal Isol.	Open			
2CNM-V346B	Booster P2B Outbd. Seal Isol.	Open			
2CNM-V344C	Booster P2C Seal Supply Isol.	Open			
2CNM-V345C	Booster P2C Inbd. Seal Isol.	Open			
2CNM-V346C	Booster P2C Outbd. Seal Isol.	Open			

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VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNM-V342C	Cond. Booster Pump P2C Suction Drain	Shut & Capped			
2CNM-V341C	Cond. Booster Pump P2C Suction Test	Shut & Capped			
2CNM-V156C	PI27C Inst. Root Isol.	Open			
2CNM-V165C	Condensate Booster P2C minimum flow Isol.	Open			
2CNM-FV38C	Condensate Booster P2C minimum flow control valve.	Shut			
2CNM-V201C	Condensate Booster P2C discharge stop check	Open			
2CNM-V194C	Condensate Booster P2C discharge header vent	Shut			
2CNM-V140	Feedwater pump seal supply Isol.	Open			
2CNM-V184	Low pressure heater string inlet header drain	Shut & Blank Flanged			
2CNM-HV51A	Low Pressure Heater String A inlet vent	Shut			
2CNM-MOV 33A	Low Pressure Heater String A Inlet Isol.	Open			
2CNM-V186A	Drain cooler 2A inlet drain	Shut & Blank Flanged			

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VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNM-V104A	Drain cooler 2A inlet test connection	Shut & Capped			
2CNM-V103A	Drain cooler 2A outlet test connection	Shut & Capped			
2CNM-HV52A	Drain cooler 2A outlet vent	Shut			
2CNM-V187A	Drain cooler 3A inlet drain	Shut & Capped			
2CNM-V102A	Drain cooler 3A inlet test connection	Shut & Capped			
2CNM-V101A	Drain cooler 3A outlet test connection	Shut & Capped			
2CNM-V207A	Drain cooler 3A outlet vent	Shut			
2CNM-V188A	Drain cooler 3A outlet drain	Shut & Blank Flanged			
2CNM-HV56A	Second Point Heater 2A outlet vent	Shut			
2CNM-RV12A	Low Pressure Heater String A relief valve.	Not Gagged			
2CNM-V191A	Third Point Heater 3A inlet drain	Shut & Blank Flanged			
2CNM-V112A	Third Point Heater 3A inlet test connection	Shut & Capped			

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VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNM-V113A	PI50A Inst. Root Isol.	Open			
2CNM-HV57A	Third Point Heater 3A outlet vent	Shut			
2CNM-V116A	Fourth Point Heater 4A inlet test connection	Shut & Capped			
2CNM-V117A	Fourth Point Heater 4A outlet test connection	Shut & Capped			
2CNM-V192A	Fourth Point Heater 4A outlet drain	Shut & Blank Flanged			
2CNM-HV58A	Fourth Point Heater 4A outlet vent	Shut			
2CNM-V321	Low Pressure Heater String sample Isol.	Open			
2CNM-V210A	heater Drain Pump A Disch. to Heater String A Vent	Shut			
2CNM-V193A	Fifth Point Heater 5A inlet drain	Shut & Blank Flanged			
2CNM-V118A	Fifth Point Heater 5A inlet test connection	Shut & Capped			
2CNM-V119A	Fifth Point Heater 5A outlet test connection	Shut & Capped			
2CNM-V211A	Fifth Point Heater 5A outlet vent	Shut			

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VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNM-MOV 32A	Low Pressure Heater string outlet Isol.	Open			
2CNM-HV51B	Low Pressure Heater string B inlet vent	Shut			
2CNM-MOV 33B	Low Pressure Heater string B inlet	Open			
2CNM-V186B	Drain cooler 2B inlet drain	Shut & Blank Flanged			
2CNM-V104B	Drain cooler 2B inlet test connection	Shut & Capped			
2CNM-V103B	Drain cooler 2B outlet test connection	Shut & Capped			
2CNM-HV52B	Drain cooler 2B outlet vent	Shut			
2CNM-V187B	Drain cooler 3B inlet drain	Shut & Capped			
2CNM-V102B	Drain cooler 3B inlet test connection	Shut & Capped			
2CNM-V101B	Drain cooler 3B outlet test connection	Shut & Capped			
2CNM-V207B	Drain cooler 3B outlet vent	Shut			

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VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNM-V188B	Drain cooler 3B outlet drain	Shut & Capped			
2CNM-HV56B	Second Point Heater 2B outlet vent	Shut			
2CNM-RV12B	Low Pressure Heater string B relief	Not Gagged			
2CNM-V191B	Third Point Heater 3B inlet drain	Shut & Blank Flanged			
2CNM-V112B	Third Point Heater 3B inlet test connection	Shut & Capped			
2CNM-V113B	PI50B Inst. Root Isol.	Open			
2CNM-HV57B	Third Point Heater 3B outlet vent.	Shut			
2CNM-V116B	Fourth Point Heater 4B inlet test connection	Shut & Capped			
2CNM-V117B	Fourth Point Heater 4B outlet test connection	Shut & Capped			
2CNM-V192B	Fourth Point Heater 4B outlet drain	Shut & Blank Flanged			
2CNM-HV58B	Fourth Point Heater 4B outlet vent	Shut			

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VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNM-V203B	Low Pressure Heater B string sample Isol.	Open			
2CNM-V210B	Heater Drain Pump B Disch. to Heater string B vent	Shut			
2CNM-V193B	Fifth Point Heater 5B inlet drain	Shut & Blank Flanged			
2CNM-V118B	Fifth Point Heater 5B inlet test connection	Shut & Capped			
2CNM-V119B	Fifth Point Heater 5B outlet test connection	Shut & Capped			
2CNM-V211B	Fifth Point Heater 5B outlet vent	Shut			
2CNM-MOV 32B	Low Pressure Heater string B outlet Isol.	Open			
2CNM-V214	Moisture Separator drain tank quench spray Isol.	Shut			
2CNM-V209	Low pressure heater string bypass vent	Shut			
2CNM-AOV 101	Low pressure heater string bypass Isol.	Shut			

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VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNM-V70	Low pressure heater string bypass drain	Shut & Capped			
2CNM-FLS101	Low Pressure Heater String Flange	Not Blocked			
2CNM-V73	Feed pump bypass Isol.	Open			
2CNM-V213	Feed pump bypass line vent	Shut			
2CNM-V204	FT138 Inst. Root Isol.	Open			
2CNM-V205	FT138 Inst. Root Isol.	Open			
2CNM-LV 137	Feed pump bypass start up level control valve	Shut Manual Operator in Neutral			
2CNM-MOV 122	Feed pump bypass Isol.	Shut			
2CNM-V150	Feed pump bypass line check	Installed			
2CNM-HV 51C	Low Pressure heater string C inlet vent	Shut			
2CNM-MOV 33C	Low Pressure Heater string C inlet Isol.	Open			
2CNM-V301	Low Pressure Heater Stream Bypass drain	Shut & Capped			
2CNM-V186C	Drain cooler 2C inlet drain	Shut & Blank Flanged			
2CNM-V104C	Drain cooler 2C inlet test connection	Shut & Capped			

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VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNM-V103C	Drain cooler 2C outlet test connection	Shut & Capped			
2CNM-HV52C	Drain cooler 2C outlet vent	Shut			
2CNM-V187C	Drain cooler 3C inlet drain	Shut & Capped			
2CNM-V102C	Drain cooler 3C inlet test connection	Shut & Capped			
2CNM-V101C	Drain cooler 3C outlet test connection	Shut & Capped			
2CNM-V207C	Drain cooler 3C outlet vent	Shut			
2CNM-V188C	Drain cooler 3C outlet drain	Shut & Blank Flanged			
2CNM-HV 56C	Second Point Heater 2C outlet vent	Shut			
2CNM-RV 12C	Low Pressure Heater String C relief	Not Gagged			
2CNM-V 191C	Third Point Heater 3C inlet drain	Shut & Blank Flanged			
2CNM-V 112C	Third Point Heater 3C inlet test connection	Shut & Capped			
2CNM-V113C	PI50C Inst. Root Isol.	Open			

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VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNM-HV 57C	Third Point Heater 3C outlet vent	Shut			
2CNM-V 116C	Fourth Point Heater 4C inlet test connection	Shut & Capped			
2CNM-V 117C	Fourth Point Heater 4C outlet test connection	Shut & Capped			
2CNM-V 192C	Fourth Point Heater 4C outlet drain	Shut & Blank Flanged			
2CNM-HV 58C	Fourth Point Heater 4C outlet vent	Shut			
2CNM-V322	Low Pressure Heater String C Sample Isol.	Open			
2CNM-V 210C	Heater Drain Pump C Disch. to Heater String C Vent	Shut			
2CNM-V 193C	Fifth Point Heater 5C inlet drain	Shut & Blank Flanged			
2CNM-V 118C	Fifth point heater 5C inlet Test Connection	Shut & Capped			
2CNM-V 119C	Fifth Point Heater 5C outlet test connection	Shut & Capped			
2CNM-V 211C	Fifth Point Heater 5C outlet vent	Shut			

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VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNM-MOV 32C	Low Pressure Heater string C outlet	Open			
2CNM-HV 119	Low pressure heater string discharge header continuous vent	Open			
2CNM-V366	2CNM-HV119 Vent Isolation	Throttled approx. 1/2 turn open			
2CNM-V323	Low pressure heater string discharge header sample	Open			
2CNM-V208A	First Point Heater 1A Inlet vent	Shut			
2CNM-V189A	First Point Heater 1A Inlet drain	Shut & Blank Flanged			
2CNM-V 108A	First Point Heater 1A inlet test connection	Shut & Capped			
2CNM-V 109A	First Point Heater 1A outlet test connection	Shut & Capped			
2CNM-HV 55A	First Point Heater 1A outlet vent	Shut			
2CNM-V 190A	Second Point Heater 2A inlet drain	Shut & Blank Flanged			
2CNM-V 110A	Second Point Heater 2A inlet test connection	Shut & Capped			
2CNM-V 111A	Second point heater 2A outlet test connection	Shut & Capped			

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VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNM-RV 61A	Low Pressure Heater string A relief	Not Gagged			
2CNM-V208B	First Point Heater 1B Inlet vent	Shut			
2CNM-V189B	First Point Heater 1B Inlet drain	Shut & Capped			
2CNM-V 108B	First Point Heater 1B inlet test connection	Shut & Capped			
2CNM-V 109B	First Point Heater 1B outlet test connection	Shut & Capped			
2CNM-HV 55B	First Point Heater 1B outlet vent	Shut			
2CNM-V 190B	Second Point Heater 2B inlet drain	Shut & Blank Flanged			
2CNM-V 110B	Second Point Heater 2B inlet test connection	Shut & Capped			
2CNM-V 111B	Second Point Heater 2B outlet test connection	Shut & Capped			
2CNM-RV 61B	Low Pressure Heater String B relief valve	Not Gagged			
2CNM-V208C	First Point Heater 1C Inlet vent	Shut			

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VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNM-V189C	First Point Heater 1C Inlet drain	Shut & Blank Flanged			
2CNM-V 108C	First point heater 1C inlet test connection	Shut & Capped			
2CNM-V 109C	First point heater 1C outlet test connection	Shut & Capped			
2CNM-HV 55C	First point heater 1C outlet vent	Shut			
2CNM-V 190C	Second Point Heater 2C inlet drain	Shut & Blank Flanged			
2CNM-V 110C	Second Point Heater 2C inlet test connection	Shut & Capped			
2CNM-V 111C	Second Point Heater 2C outlet test connection	Shut & Capped			
2CNM-RV 61C	Low Pressure Heater 2C string C relief	Not Gagged			
2CNO-V2A	Aux. Lube Oil Pump 2A Disch. Check	Installed			

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VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNO-V6A	PDIS3A Inst. Root Isol.	Open			
2CNO-V7A	PDIS3A Inst. Root Isol.	Open			
2CNO-V8A	PS2A Inst. Root Isol.	Open			
2CNO-V9A	PS2A Inst. Drain.	Shut			
2CNO-V3A	Check to RV11A	Installed			
2CNO-V10A	CBP Motor Inlet Check	Installed			
2CNO-V11A	CBP Motor Inlet Check	Installed			
2CNO-V21A	PSIA Inst. Root Isol.	Open			
2CNO-V22A	PS9A Inst. Root Isol.	Open			
2CNO-RV11A	Lube Oil Pump 1A Suction Relief	Not Gagged			
2CNO-RV4A	Condensate P2A Lube Oil Relief	Not Gagged			
2CNO-V2B	Aux. Lube Oil Pump 2B Disch. Check	Installed			

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VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNO-V6B	PDIS3B Inst. Root Isol.	Open			
2CNO-V7B	PDIS3B Inst. Root Isol.	Open			
2CNO-V8B	PS2B Inst. Root Isol.	Open			
2CNO-V9B	PS2B Inst. Drain	Shut			
2CNO-V3B	Check to RV11B	Installed			
2CNO-V10B	CBP Motor Inlet Check	Installed			
2CNO-V11B	CBP Motor Inlet Check	Installed			
2CNO-V21B	PSIB Inst. Root Isol.	Open			
2CNO-V22B	PS9B Inst. Root Isol.	Open			
2CNO-RV11B	Lube Oil Pump 1B Suction Relief	Not Gagged			
2CNO-RV4B	Condensate Booster P2B Lube Oil Relief	Not Gagged			
2CNO-V2C	Aux. Lube Oil Pump 2C Disch. Check	Installed			

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VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNO-V6C	PDIS3C Inst. Root Isol.	Open			
2CNO-V7C	PDIS3C Inst. Root Isol.	Open			
2CNO-V8C	PS2C Inst. Root Isol.	Open			
2CNO-V9C	PS2C Inst. Drain	Shut			
2CNO-V3C	Check to RV11C	Installed			
2CNO-V10C	CBP Motor Inlet Check	Installed			
2CNO-V11C	CBP Motor Inlet Check	Installed			
2CNO-V21C	PS1C Inst. Root Isol.	Open			
2CNO-V22C	PS9C Inst. Root Isol.	Open			
2CNO-RV11C	Lube Oil Pump 1C Suction Relief	Not Gagged			
2CNO-RV4C	Condensate Booster P2C Lube Oil Relief	Not Gagged			

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VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNO-V26A	Condensate Booster P1A Lube Oil Filter 1A Inlet Valve	Open			
2CNO-V26B	Condensate Booster P1B Lube Oil Filter 1B Inlet Valve	Open			
2CNO-V26C	Condensate Booster P1C Lube Oil Filter 1C Inlet Valve	Open			
2CNO-V25A	Condensate Booster P1A Lube Oil Filter 1A Outlet Valve	Open			
2CNO-V25B	Condensate Booster P1B Lube Oil Filter 1B Outlet Valve	Open			
2CNO-V25C	Condensate Booster P1C Lube Oil Filter 1C Outlet Valve	Open			
2CNO-V28A	Condensate Booster P1A Lube Oil Filter 2A Inlet Valve	Shut			
2CNO-V28B	Condensate Booster P1B Lube Oil Filter 2B Inlet Valve	Shut			
2CNO-V28C	Condensate Booster P1C Lube Oil Filter 2C Inlet Valve	Shut			
2CNO-V27A	Condensate Booster P1A Lube Oil Filter 2A Outlet Valve	Shut			
2CNO-V27B	Condensate Booster P1B Lube Oil Filter 2B Outlet Valve .	Shut			

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VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNO-V27C	Condensate Booster P1C Lube Oil Filter 2C Outlet Valve	Shut			
2CNO-V29A	Condensate Booster P1A Lube Oil Filter 1A Vent	Closed			
2CNO-V29B	Condensate Booster P1B Lube Oil Filter 1B Vent	Closed			
2CNO-V29C	Condensate Booster P1C Lube Oil Filter 1C Vent	Closed			
2CNO-V30A	Condensate Booster P1A Lube Oil Filter 2A Vent	Closed			
2CNO-V30B	Condensate Booster P1B Lube Oil Filter 2B Vent	Closed			
2CNO-V30C	Condensate Booster P1C Lube Oil Filter 2C Vent	Closed			
2CNO-V31A	Condensate Booster P1A Lube Oil Filter 1A Drain	Closed			
2CNO-V31B	Condensate Booster P1B Lube Oil Filter 1B Drain	Closed			
2CNO-V31C	Condensate Booster P1C Lube Oil Filter 1C Drain	Closed			
2CNO-V32A	Condensate Booster P1A Lube Oil Filter 2A Drain	Closed			

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TABLE I

VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNO-V32B	Condensate Booster P1B Lube Oil Filter 2B Drain	Closed			
2CNO-V32C	Condensate Booster P1C Lube Oil Filter 2C Drain	Closed			
2CNO-RV14A	Condensate Booster P1A Lube Oil Filter 1A and 2A Relief	Installed			|*9
2CNO-RV14B	Condensate Booster P1B Lube Oil Filter 1B and 2B Relief	Installed			
2CNO-RV14C	Condensate Booster P1C Lube Oil Filter 1C and 2C Relief	Installed			
2CNO-V33A	Condensate Booster P1A Lube Oil Reservoir Drain	Closed			
2CNO-V33B	Condensate Booster P1B Lube Oil Reservoir Drain	Closed			
2CNO-V33C	Condensate Booster P1C Lube Oil Reservoir Drain	Closed			

TABLE I

VALVE LINEUP

FEEDWATER

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
	CONTROL ROOM EL. 306'				
2CNM-MOV84A	Feedwater Pump A Suction Isol.	Open			
2CNM-MOV84B	Feedwater Pump B Suction Isol.	Open			
2CNM-MOV84C	Feedwater Pump C Suction Isol.	Open			
2FWS-MOV47A	Feedwater Pump 1A Disch. Isol.	Open			
2FWS-MOV47B	Feedwater Pump 1B Disch. Isol.	Open			
2FWS-MOV47C	Feedwater Pump 1C Disch. Isol.	Open			
2FWS-MOV17A	6th Point Heater 6A Inlet Isol.	Open			
2FWS-MOV17B	6th Point Heater 6B Inlet Isol.	Open			
2FWS-MOV17C	6th Point Heater 6C Inlet Isol.	Open			
2FWS-MOV22A	6th Point Heater 6A Outlet Isol.	Open			
2FWS-MOV22B	6th Point Heater 6B Outlet Isol.	Open			

TABLE I

VALVE LINEUP

FEEDWATER

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2FWS-MOV22C	6th Point Heater 6C Outlet Isol.	Open			
2FWS-MOV102	6th Point Heater Bypass Isol.	Shut			
2FWS-MOV112	Feedwater to Low Energy FW Cycle Cleanup Isol.	Shut			
2FWS-MOV110	Feedwater to High Energy FW Cycle Cleanup Isol.	Shut			
2FWS*MOV21A	Feedwater to RPV Inlet Isol.	Open			
2FWS*MOV21B	Feedwater to RPV Inlet Isol.	Open			
2FWS*AOV23A	F.W. HDR. 'A' TESTABLE CHECK	Installed			
2FWS*AOV23B	F.W. HDR. 'B' TESTABLE CHECK	Installed			
2FWS-LV10A	Feedwater Pump 1A Level Control Valve	Shut			
2FWS-LV10B	Feedwater Pump 1B Level Control Valve	Shut			
2FWS-LV10C	Feedwater Pump 1C Level Control Valve	Shut			
2FWS-LV55A	Feedwater Pump 1A Low Flow Control Valve	Shut			
2FWS-LV55B	Feedwater Pump 1B Low Flow Control Valve	Shut			

TABLE I

VALVE LINEUP

FEEDWATER

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2FWS-V3C	Feedwater Pump 1C Disch. Check	Installed			
	FEEDWATER PUMP P1A				
	TURBINE BLDG. EL. 250'				
2CNM-V222A	PI72A Inst. Root Isol.	Open			
2CNM-V78A	PI73A & 74A, PS73A & PS74A, PT70A Inst. Root Isol.	Open			
2CNM-RV71A	Feedwater Pump 1A Suction Relief	Not Gagged			
2CNM-V212A	Feedwater Pump 1A Suction Vent	Shut			
2CNM-V370A	Feedwater Pump 1A Suction Vent	Open*			
2FWS-V157	LV10A Bonnet Leakoff Root	Shut			
2FWS-V158	LV10A Bonnet Leakoff Root	Shut & Capped			
2FWS-V1A	PI 8A Inst. Root Isol.	Open			
2FWS-V130	B.V. TO F.W.P. RECIRC	Open			

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*It is permissible to shut this valve if V212A leaks through.

TABLE I

VALVE LINEUP

FEEDWATER

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2FWS-V2A	PT9A Inst. Root Isol.	Open			
2FWS-V3A	Feedwater Pump 1A Disch. Check	Installed			
2FWS-V5A	2FWS-PT2A Test Conn.	Shut			
2FWS-V60A	2FWS-PT2A Test Conn.	Shut & Capped			
2FWS-V134A	Feedwater Pump 1A Low Flow Line Drain	Shut			
2FWS-V135A	Feedwater Pump 1A Low Flow Line Drain	Shut & Capped			
2FWS-V136A	Feedwater Pump 1A Low Flow Line Vent	Shut			
2FWS-V137A	Feedwater Pump 1A Low Flow Line Vent	Shut & Capped			
2FWS-V129A	Feedwater Pump 1A Low Flow Line Check	Installed			
2FWS-V110A	Feedwater Pump 1A Low Flow Line Drain	Shut			
2FWS-V111A	Feedwater Pump 1A Low Flow Line Drain	Shut & Capped			
2FWS-V103A	Feedwater Pump 1A Low Flow Line Isol.	Open			

TABLE I

VALVE LINEUP

FEEDWATER

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2FWS-V24A	Feedwater Pump 1A Casing Drain	Shut			
2FWS-V160A	Feedwater Pump 1A Casing Drain	Shut			
2FWS-V140A	Feedwater Pump 1A Warmup Line Check	Installed			
2FWS-V25A	Feedwater Pump 1A Warmup Line Isol.	Open			
	HEATER BAY 'A' EL. 250'				
2CNM-V220A	Feedwater Pump 1A Suction Header Drain	Shut & Capped			
2CNM-V75A	FT-68A Inst. Root Isol.	Open			
2CNM-V74A	FT-68A Inst. Root Isol.	Open			
2FWS-V73A	MOV17A Drain	Shut			
2FWS-V74A	MOV17A Drain	Shut & Capped			
2FWS-V59A	MOV17A Equalize Isol.	Shut			
2FWS-V31A	PI 41A Inst. Root Isol.	Open			
2FWS-V6A	6th Point Heater 6A Outlet Test Connection	Shut			
2FWS-V64A	6th Point Heater 6A Outlet Test Connection	Shut & Capped			
2FWS-V71A	6th Point Heater 6A Outlet Header Drain	Shut			

TABLE I

VALVE LINEUP

FEEDWATER

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2FWS-V72A	6th Point Heater 6A Outlet Header Drain	Shut & Capped			
	HEATER BAY 'A' EL. 277'				
2DTM-V305A	MOV84A Manual Vent to Condenser	Shut			
2CNM-HV60A	MOV84A Vent	Shut			
2DTM-V303A	MOV84A Manual Vent	Shut			
2DTM-V304A	MOV84A Manual Vent	Shut			
2CNM-HV59A	MOV84A Bypass Isol.	Shut			
2CNM-V367A	MOV84A Bypass Manual Isolation	Shut			
2FWS-RV11A	6th Point Heater 6A Outlet Relief	Not Gagged			
2FWS-HV43A	6th Point Heater 6A Disch. Header Vent	Shut			
2FWS-V70A	HV43A Isol.	Open			
2FWS-V91A	HV42A Isol.	Open			
2FWS-HV42A	MOV47A Vent	Shut			
2FWS-V161A	MOV47A Manual Vent	Shut			
2FWS-V162A	MOV47A Manual Vent	Shut			
2FWS-V67A	Feedwater Header A Vent Dnstr. of MOV47A	Shut			
2FWS-V97A	Feedwater Header A Vent Dnstr. of MOV47A	Shut			
	FDWTR PUMP 1B TURBINE BLDG. EL. 250'				

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TABLE I
VALVE LINEUP
FEEDWATER

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNM-V222B	PI72B Inst. Root Isol.	Open			
2CNM-V78B	PI73B & 74B, PS73B & 74B, PT70B Inst. Root Isol.	Open			
2CNM-RV71B	Feedwater Pump 1B Suction Relief	Not Gagged			
2CNM-V212B	Feedwater Pump 1B Suction Vent	Shut			
2CNM-V370B	Feedwater Pump 1B Suction Vent	Open*			
2FWS-V155	LV10B Bonnet Leakoff Root	Shut			
2FWS-V156	LV10B Bonnet Leakoff Root	Shut & Capped			
2FWS-V1B	PI8B Inst. Root Isol.	Open			
2FWS-V2B	PT9B Inst. Root Isol.	Open			
2FWS-V5B	2FWS-PT2B Test Conn.	Shut			
2FWS-V60B	2FWS-PT2B Test Conn.	Shut & Capped			
2FWS-V134B	Feedwater Pump 1B Low Flow Line Drain	Shut			
2FWS-V135B	Feedwater Pump 1B Line Drain	Shut & Capped			
2FWS-V136B	Feedwater Pump 1B Line Vent	Shut			

*It is permissible to shut this valve if V212B leaks through.

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TABLE I
VALVE LINEUP
FEEDWATER

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2FWS-V3B	Feedwater Pump 1B Disch. Check	Installed			
2FWS-V129B	Feedwater Pump 1B Low Flow Line Check	Installed			
2FWS-V137B	Feedwater Pump 1B Line Vent	Shut & Capped			
2FWS-V110B	Feedwater Pump 1B Low Flow Line Drain	Shut			
2FWS-V111B	Feedwater Pump 1B Low Flow Line Drain	Shut & Capped			
2FWS-V103B	Feedwater Pump 1B Low Flow Line Isol.	Open			
2FWS-V24B	Feedwater Pump 1B Casing Drain	Shut			
2FWS-V160B	Feedwater Pump 1B Casing Drain	Shut			
2FWS-V140B	Feedwater Pump 1B Warmup Line Check	Installed			
2FWS-V25B	Feedwater Pump 1B Warmup Line Isol.	Open			
	HEATER BAY 'B' EL 250'				
2CNM-V220B	Feedwater Pump 1B Suction Drain	Shut & Capped			
2CNM-V75B	FT 68B Inst. Root Isol.	Open			
2CNM-V74B	FT 68B Inst. Root Isol.	Open			
2FWS-V73B	MOV17B Drain	Shut			

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VALVE LINEUP

FEEDWATER

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2FWS-V74B	MOV17B Drain	Shut & Capped			
2FWS-V59B	MOV17B Equalizing Isol.	Shut			
2FWS-V31B	PI41B Inst. Root Isol.	Open			
2FWS-V6B	6th Point Heater 6B Outlet Test Connection	Shut			
2FWS-V64B	6th Point Heater 6B Outlet Test Connection	Shut			
2FWS-V71B	6th Point Heater 6B Outlet Header Drain	Shut			
2FWS-V72B	6th Point Heater 6B Outlet Header Drain	Shut & Capped			
	HTR BAY 'B' EL. 277'				
2DTM-V305B	MOV84B Manual Vent to Cond.	Shut			
2CNM-HV60B	MOV84B Vent	Shut			
2DTM-V303B	MOV84B Manual Vent				
2DTM-V304B	MOV84B Manual Vent				
2CNM-HV59B	MOV84B Bypass Isol.	Shut			
2CNM-V367	MOV84B Bypass Manual Isol.	Shut			
2FWS-RV11B	6th Point Heater 6B Outlet Relief	Not Gagged			
2FWS-HV43B	6th Point Heater 6B Disch. Header Vent	Shut			
2FWS-V70B	HV43B Isol.	Open			

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VALVE LINEUP

FEEDWATER

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2FWS-V91B	HV42B Isol.	Open			
2FWS-HV42B	MOV47B Vent	Shut			
2FWS-V161B	MOV47B Manual Vent	Shut			
2FWS-V162B	MOV47B Manual Vent	Shut			
2FWS-V67B	Feedwater Header B Vent Dnstr of MOV47B	Shut			
2FWS-97B	Feedwater Header B Vent Dnstr of MOV47B	Shut			
	FDWTR PUMP P1C T. BLDG. EL. 250'				
2CNM-V222C	PI72C Inst. Root Isol.	Open			TCN-93
2CNM-V78C	PI73C & 74C, PC73C & 74C, PT70C Inst. Root Isol.	Open			
2CNM-RV71C	Feedwater Pump 1C Suction Relief	Not Gagged			TCN-93
2CNM-V212C	Feedwater Pump 1C Suction Vent	Shut			
2CNM-V370C	Feedwater Pump 1C Suction Vent	Open*			
2FWS-V153	LV10C Bonnet Leakoff Root	Shut			
2FWS-V154	LV10C Bonnet Leakoff Root	Shut & Capped			

*It is permissible to shut this valve if V212C leaks through.

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VALVE LINEUP
FEEDWATER

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2FWS-V1C	PI18C Inst. Root Isol.	Open			
2FWS-V2C	PT9C Inst. Root Isol.	Open			
2FWS-V5C	2FWS-PT2C Test Conn.	Shut			
2FWS-V60C	2FWS-PT2C Test Conn.	Shut & Capped			
2FWS-V24C	Feedwater Pump 1C Casing Drain	Shut			
2FWS-V160C	Feedwater Pump 1C Casing Drain	Shut			
2FWS-V140C	Feedwater Pump 1C Warmup Line Check	Installed			
2FWS-V25C	Feedwater Pump 1C Warmup Line Isol.	Open			
	HEATER BAY 'C' EL 250'				
2CNM-V220C	Feedwater Pump 1C Suction Drain	Shut & Capped			
2CNM-V75C	FT 68C Inst. Root Isol.	Open			
2CNM-V74C	FT 68C Inst. Root Isol.	Open			
2FWS-V73C	MOV17C Drain	Shut			
2FWS-V74C	MOV17C Drain	Shut & Capped			
2FWS-V59C	MOV17C Equalize Isol.	Shut			
2FWS-V31C	PI41C Inst. Root Isol.	Open			

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VALVE LINEUP

FEEDWATER

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2FWS-V6C	6th Point Heater 6C Outlet Test Connection	Shut			
2FWS-V64C	6th Point Heater 6C Outlet Test Connection	Shut			
2FWS-V71C	6th Point Heater 6C Outlet Header Drain	Shut			
2FWS-V72C	6th Point Heater 6C Outlet Header Drain	Shut & Capped			
	HEATER BAY 'C' EL. 277'				
2DTM-V305C	Manual Vent to Condenser	Shut			
2CNM-HV60C	MOV84C Vent	Shut			
2DTM-V303C	MOV84C Manual Vent	Shut			
2DTM-V304C	MOV84C Manual Vent	Shut			
2CNM-HV59C	MOV84C Bypass Isol.	Shut			
2CNM-V367C	MOV84C Bypass Manual Isol.	Shut			
2FWS-HV43C	6th Point Heater Disch. Header Vent	Shut			
2FWS-V70C	HV43C Isol.	Open			
2FWS-V91C	HV42C Isol.	Open			
2FWS-HV42C	MOV47C Vent	Shut			
2FWS-V161C	MOV47C Manual Vent	Shut			
2FWS-V162C	MOV47C Manual Vent	Shut			
2FWS-V67C	Feedwater Header C Vent Dnstr. of MOV47C	Shut			
2FWS-V97C	Feedwater Header C Vent Dnstr. of MOV47C	Shut			

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VALVE LINEUP

FEEDWATER

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
	COMMON HDR VLVS HTR BAY 'B'				
2FWS-V94	Reheater Drain Tank Quench Spray Isol.	Shut			
2FWS-V83	Feedwater Pumps Bypass Line Vent	Shut			
2FWS-V98	Feedwater Pumps Bypass Line Vent	Shut			
2FWS-V101	6th Point Heaters Bypass Line Drain	Shut			
2FWS-V102	6th Point Heaters Bypass Line Drain	Shut & Capped			
2FWS-V81	6th Point Heaters Bypass Line Drain	Shut			
2FWS-V82	6th Point Heaters Bypass Line Drain	Shut & Capped			
2FWS-RV11C	6th Point Heater 6C Outlet Relief	Not Gagged			
2FWS-V105	FT109 Inst. Root Isol.	Open			
2FWS-V106	FT109 Inst. Root Isol.	Open			

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VALVE LINEUP

FEEDWATER

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
	FDWTR TO CLEANUP TURBINE BLDG EL. 277'				
2FWS-V107	PI 112, PS 112 Inst. Root Isol.	Open			
2FWS-V112	Low Energy Feedwater Cleanup Header Vent	Shut			
2FWS-V113	Low Energy Feedwater Cleanup Header Vent	Shut			
2FWS-V108	PI 113, PS 113 Inst. Root Isol.	Open			
2FWS-V114A	Low Energy Feedwater Cleanup Header Drain	Shut			
2FWS-V115A	Low Energy Feedwater Cleanup Header Drain	Shut & Capped			
2FWS-HVX113	Low Energy Feedwater Cleanup Control Valve	Shut Manual Operator in Fully CCW			
2FWS-V118A	Low Energy Feedwater Cleanup Header Drain	Shut & Capped			
2FWS-V116	Low Energy Feedwater Cleanup Header Vent	Shut			

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VALVE LINEUP

FEEDWATER

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2FWS-V117	Low Energy Feedwater Cleanup Header Vent	Shut			
2FWS-V114B	Low Energy Feedwater Cleanup Header Drain	Shut			
2FWS-V115B	Low Energy Feedwater Cleanup Header Drain	Shut & Capped			
2FWS-HVY113	Low Energy Feedwater Cleanup Control Valve	Shut Manual Operator in Fully CCW			
2FWS-V118B	Low Energy Feedwater Cleanup Header Drain	Shut & Capped			
2FWS-V120	High Energy Feedwater Cleanup Header Vent	Shut			
2FWS-V121	High Energy Feedwater Cleanup Header Vent	Shut			
2FWS-V122A	High Energy Feedwater Cleanup Line A Drain	Shut			
2FWS-V123A	High Energy Feedwater Cleanup Line A Drain	Shut & Capped			
2FWS-V124A	High Energy Feedwater Cleanup Line A Vent	Shut			
2FWS-V125A	High Energy Feedwater Cleanup Line A Vent	Shut			

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VALVE LINEUP

FEEDWATER

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2FWS-HVX111	High Energy Feedwater Cleanup Line A Isol.	Shut Manual Operator in Fully CW			
2FWS-V122B	High Energy Feedwater Cleanup Line B Drain	Shut			
2FWS-V123B	High Energy Feedwater Cleanup Line B Drain	Shut & Capped			
2FWS-V124B	High Energy Feedwater Cleanup Line B Vent	Shut			
2FWS-V125B	High Energy Feedwater Cleanup Line B Vent	Shut			
2FWS-HVY111	High Energy Feedwater Cleanup Line B Isol.	Shut Manual Operator in Fully CW			
2FWS-V124C	High Energy Feedwater Cleanup Line C Vent	Shut			
2FWS-V125C	High Energy Feedwater Cleanup Line C Vent	Shut			
2FWS-HVZ111	High Energy Feedwater Cleanup Line C Isol.	Shut Manual Operator in Fully CW			
	FEED HDRS A & B TO RX, T.B., EL. 250'				
2FWS-V79	Turbine Plant Sampling Isol.	Open			
2FWS-V88	HV105 Isol.	Open			

TABLE I

VALVE LINEUP

FEEDWATER

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2FWS-HV105	6th Pnt Htrs Disch Hdr Vent	Shut			
2FWS-V35A	PT40A Inst. Root Isol.	Open			
2FWS-V145A	Feedwater Header Drain	Shut			
2FWS-V146A	Feedwater Header Drain	Shut			
2FWS-V35B	PT40B Inst. Root Isol.	Open			
2FWS-V145B	Feedwater Header Drain	Shut			
2FWS-V146B	Feedwater Header Drain	Shut			
2FWS-V7A	FT1A Inst. Root Isol.	Open			
2FWS-V8A	FT1A Inst. Root Isol.	Open			
2FWS-V65A	PDI1A Inst. Root Isol.	Open			
2FWS-V66A	PDI1A Inst. Root Isol.	Open			
2FWS-V7B	FT1B Inst. Root Isol.	Open			
2FWS-V8B	FT1B Inst. Root Isol.	Open			
2FWS-V65B	PDI1B Inst. Root Isol.	Open			
2FWS-V66B	PDI1B Inst. Root Isol.	Open			
2FWS-V132A	Feedwater Header A Vent	Shut			

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VALVE LINEUP

FEEDWATER

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2FWS-V133A	Feedwater Header A Vent	Shut			
2FWS-V127A	Feedwater Header A Drain	Shut			
2FWS-V128A	Feedwater Header A Drain	Shut			
2FWS-V132B	Feedwater Header B Vent	Shut			
2FWS-V133B	Feedwater Header B Vent	Shut			
2FWS-V127B	Feedwater Header B Drain	Shut			
2FWS-V128B	Feedwater Header B Drain	Shut			
	REACTOR BLDG EL. 240'				
2FWS*V10A	Feedwater Header A Test Conn	Shut			
2FWS-V104A	Feedwater Header A Check	Installed			
2FWS-V104B	Feedwater Header B Check	Installed			
2FWS*V11A	Feedwater Header A Test Connection	Shut & Capped			
2FWS*V14A	Feedwater Header A Test Conn	Shut			
2FWS*V15A	Feedwater Header A Test Conn	Shut & Capped			
2FWS*V50A	Feedwater Header A Drain	Shut			
2FWS*V51A	Feedwater Header A Drain	Shut & Capped			

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VALVE LINEUP

FEEDWATER

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2FWS*V10B	Feedwater Header B Test Connection	Shut			
2FWS*V11B	Feedwater Header B Test Connection	Shut & Capped			
2FWS*V14B	Feedwater Header B Test Connection	Shut			
2FWS*V15B	Feedwater Header B Test Connection	Shut & Capped			
2FWS*V50B	Feedwater Header B Drain	Shut			
2FWS*V51B	Feedwater Header B Drain	Shut & Capped			
	DRYWELL EL. 250'				
2FWS*V89A	V12A Drain	Shut			
2FWS*V90A	V12A Drain	Shut & Capped			
2FWS*V89B	V12B Drain	Shut			
2FWS*V90B	V12B Drain	Shut & Capped			
2FWS*V12A	Feedwater Header A Inboard Check	Installed			
2FWS*V12B	Feedwater Header B Inboard Check	Installed			

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VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
	DRYWELL EL. 260'				
2FWS*V19A	Feedwater Header A Test Connection	Shut			
2FWS*V20A	Feedwater Header A Test Connection	Shut & Capped			
2FWS*V19B	Feedwater Header B Test Connection	Shut			
2FWS*V20B	Feedwater Header B Test Connection	Shut & Capped			
	DRYWELL EL. 290'				
2FWS*HCV54A	Feedwater Header A Isol. Inside Manual	Locked Open			
2FWS*V99A	HCV54A Vent	Shut			
2FWS*V100A	HCV54A Vent	Shut & Capped			
2FWS*HCV54B	INSIDE DRYWELL FD HDR MANUAL I.V.	Locked Open			
2FWS*V99B	HCV54B Vent	Shut			
2FWS*V100B	HCV54B Vent	Shut & Capped			
	DRYWELL EL. 310'				
2FWS*V18A	Feedwater Line A Test Test Connection	Shut & Capped			

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VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2FWS*V16A	Feedwater Line A Test Connection	Shut			
2FWS*V18B	Feedwater Line B Test Connection	Shut & Capped			
2FWS*V16B	Feedwater Line B Test Connection	Shut			
2FWS*V18D	Feedwater Line D Test Connection	Shut & Capped			
2FWS*V16D	Feedwater Line D Test Connection	Shut			
2FWS*V18E	Feedwater Line E Test Connection	Shut & Capped			
2FWS*V16E	Feedwater Line E Test Connection	Shut			
2FWS*V18F	Feedwater Line F Test Connection	Shut & Capped			
2FWS*V16F	Feedwater Line F Test Connection	Shut			
	FEEDWATER PUMP P1A				

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VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2FWR-V1A	Feedwater Pump 1A Minimum Flow Isol.	Open			
2FWR-V2A	Feedwater Pump 1A Minimum Flow Line Vent	Shut			
2FWR-V3A	Feedwater Pump 1A Minimum Line Vent	Shut & Capped			
2FWR-FV2A	Feedwater Pump 1A Minimum Flow Valve	Shut Manual Operator in Neutral			
2FWR-V1B	Feedwater PUmp 1B Minimum Flow Valve	Open			
2FWR-V2B	Feedwater Pump 1B Minimum Flow Line Vent	Shut			
2FWR-V3B	Feedwater Pump 1B Minimum Flow Line Vent	Shut & Capped			
2FWR-FV2B	Feedwater Pump 1B Minimum Flow Valve	Shut Manual Operator in Neutral			
	FEEDWATER PUMP P1C				
2FWR-V1C	Feedwater Pump 1C Minimum Flow Isol.	Open			
2FWR-V2C	Feedwater Pump 1C Minimum Flow Line Vent	Shut			

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VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2FWR-V3C	Feedwater Pump 1C Minimum Flow Line Vent	Shut & Capped			
2FWR-FV2C	Feedwater Pump 1C Minimum Flow Valve	Shut Manual Operator in Neutral			
	Feedwater Pump P1A				
2FWP-V12A	Feedwater Pump P1A Seal Water Isol.	Open			
2FWP-V14A	PCV5A Inlet Isol.	Open			
2FWP-V15A	PCV 5A Outlet Isol.	Open			
2FWP-V16A	PCV5A Bypass Isol.	Shut			
2FWP-V17A	PDT5A Inst. Root Isol.	Open			
2FWP-V30A	Strainer 1A Drain	Shut & Capped			
2FWP-V35A	Feedwater Pump P1A Seal Water Control Valve	Throttled			
2FWP-V24A	Seal Water Inlet Inst. Tap Isol.	Shut & Capped			
2FWP-V31A	Seal Water Pressure Tap	Shut & Capped			
2FWP-V32A	Seal Water Pressure Tap	Shut & Capped			

TABLE I

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2FWP-V25A	Seal Water Inlet Inst. Tap Isol.	Shut & Capped			
2FWP-V18A	PI4A Inst. Root Isol.	Open			
2FWP-V44A	PDT 9A Equalizing Valve	Shut			
2FWP-V13A	PI3A Inst. Root Isol.	Open			
2FWP-V40A	PDT 9A Inst. Valve	Open			
2FWP-V41A	PDT 9A Inst. Valve	Open			
2FWP-V45A	PDT 10A Equalizing Valve	Shut			
2FWP-V42A	PDT 10A Inst. Valve	Open			
2FWP-V43A	PDT 10A Inst. Valve	Open			
	Feedwater Pump P1B				
2FWP-V12B	Feedwater Pump P1B Seal Water Isol.	Open			
2FWP-V14B	PCV5B Inlet Isol.	Open			
2FWP-V15B	PCV5B Outlet Isol.	Open			
2FWP-V16B	PCV5B Bypass Isol.	Shut			
2FWP-V17B	PDT5B Inst. Root Isol.	Open			
2FWP-V30B	Strainer 1B Drain	Shut & Capped			
2FWP-35B	Feedwater Pump P1B Seal Water Control Valve	Throttled			
2FWP-V24B	Seal Water Inlet Inst. Tap Isol.	Shut & Capped			
2FWP-V25B	Seal Water Inlet Inst. Tap Isol.	Shut & Capped			
2FWP-31B	Seal Water Pressure Tap	Shut & Capped			

TABLE I

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2FWP-32B	Seal Water Pressure Tap	Shut & Capped			
2FWP-V18B	PI4B Instr. Root Isol.	Open			
2FWP-V44B	PDT 9B Equalizing Valve	Shut			
2FWP-V13B	PI3B Inst. Root Isol.	Open			
2FWP-V40B	PDT 9B Inst. Valve	Open			
2FWP-V41B	PDT 9B Inst. Valve	Open			
2FWP-V45B	PDT 10B Equalizing Valve	Shut			
2FWP-42B	PDT 10B Inst. Valve	Open			
2FWP-43B	PDT 10B Inst. Valve	Open			
	Feedwater Pump P1C				
2FWP-V12C	Feedwater Pump 1C Seal Water Isol.	Open			
2FWP-V14C	PCV5C Inlet Isol.	Open			
2FWP-V15C	PCV5C Outlet Isol.	Open			
2FWP-V16C	PCV5C Bypass Isol.	Shut			
2FWP-V17C	PDT5C Inst. Root Isol.	Open			
2FWP-V30C	Strainer 1C Drain	Shut & Capped			
2FWP-V35C	Feedwater Pump P1C Seal Water Control Valve	Throttled			
2FWP-V24C	Seal Water Inlet Inst. Tap Isol.	Shut & Capped			
2FWP-V25C	Seal Water Inlet Inst. Tap Isol.	Shut & Capped			
2FWP-V18C	PI4C Inst. Root Isol.	Open			

TABLE I

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2FWP-V44C	PDT 9C Equalizing Valve	Shut			
2FWP-V13C	PI3C Inst. Root Isol.	Open			
2FWP-V40C	PDT 9C Inst. Valve	Open			
2FWP-V41C	PDT 9C Inst. Valve	Open			
2FWP-V45C	PDT 10C Equalizing Valve	Shut			
2FWP-V42C	PDT 10C Inst. Valve	Open			
2FWP-V43C	PDT 10C Inst. Valve	Open			
	Feedwater Pump P1A				
2FWL-V7A	PS19A,2A,PI19A,2A Root Isol.	Open			
2FWL-V5A	PDIS 3A Inst. Root Isol.	Open			
2FWP-31C	Seal Water Pressure Tap	Shut & Capped			
2FWP-32C	Seal Water Pressure Tap	Shut & Capped			
2FWL-V6A	PDIS 3A Inst. Root Isol.	Open			
2FWL-V4A	Filter Inlet 3-Way	--			
2FWL-V3A	Filter Outlet 3-Way	--			
2FWL-V24A	Filter Fill Isol.	Shut			
2FWL-V21A	Filter 1A Vent	Shut & Capped			
2FWL-V22A	Filter 2A Vent	Shut & Capped			
2FWL-V12A	Filter 1A Drain	Shut			
2FWL-V13A	Filter 2A Drain	Shut			

TABLE I

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2FWL-V17A	Lube Oil Cooler E1A Shellside Vent	Shut & Plugged			
2FWL-V18A	Lube Oil Cooler E1A Tubeside Vent	Shut & Plugged			
2FWL-V19A	Lube Oil Cooler E1A Tubeside Drain	Shut & Plugged			
2FWL-V20A	Lube Oil Cooler E1A Shellside Drain	Shut			
2FWL-V8A	PS1A, PI1A, Inst. Root Isol.	Open			
2FWL-V11A	PI5A Inst. Root Isol.	Open			
2FWL-V23A	Aux. Lube Oil Pump Header Vent	Shut & Plugged			
2FWL-V25A	Lube Oil Reservoir Drain Isol.	Shut & Capped			
2FWL-RV4A	A Lube Oil Header Relief Valve	Not Gagged			
2FWL-V1A	Main Lube Oil Pump P1A Disch. Check	Installed			
2FWL-V2A	Aux. Lube Oil Pump P2A Disch. Check	Installed			
2FWL-V14A	Feedwater P1A Motor Lube Oil Inlet Check	Installed			
2FWL-V15A	Feedwater P1A Motor Lube Oil Inlet Check	Installed			
2FWL-V7B	PS19B, PI19B, PS2B PI2B Inst. Root Isol.	Open			
2FWL-V5B	PDIS 3B Inst. Root Isol.	Open			
2FWL-V6B	PDIS 3B Inst. Root Isol.	Open			
2FWL-V4B	Filter Inlet 3-Way	---			

TABLE I

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2FWL-V3B	Filter Inlet 3-Way	--			
2FWL-V24B	Filter Fill Isol.	Shut			
2FWL-V21B	Filter 1B Vent	Shut & Capped			
2FWL-V22B	Filter 2B Vent	Shut & Capped			
2FWL-V25B	Lube Oil Reservoir Drain Isol.	Shut & Capped			
2FWL-V12B	Filter 1B Drain	Shut			
2FWL-V13B	Filter 2B Drain	Shut			
2FWL-V17B	Lube Oil Cooler E1B Shellside Vent	Shut & Plugged			
2FWL-V18B	Lube Oil Cooler E1B Tubeside Vent	Shut & Plugged			
2FWL-V19B	Lube Oil Cooler E1B Tubeside Drain	Shut & Plugged			
2FWL-V20B	Lube Oil Cooler E1B Shellside Drain	Shut			
2FWL-V8B	PS1B, PI1B Inst. Root Isol.	Open			
2FWL-V11B	PI5B Inst. Root Isol.	Open			
2FWL-V23B	Aux. Lube Oil Pump Header Vent	Shut & Plugged			
2FWL-V1B	Main Lube Oil Pump P1B Disch. Check	Installed			
2FWL-V2B	Aux. Lube Oil Pump P2B Disch. Check	Installed			
2FWL-V14B	Feedwater P1B Motor Lube Oil Inlet Check	Installed			

TABLE I

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2FWL-V15B	Feedwater P1B Motor Lube Oil Inlet Check	Installed			
2FWL-RV4B	B Lube Oil Header Relief Valve	Not Gagged			
2FWL-V7C	PS19C, PI19C, PS2C, PI2C Inst. Root Isol.	Open			
2FWL-V5C	PDIS 3C Inst. Root Isol.	Open			
2FWL-V6C	PDIS 3C Inst. Root Isol.	Open			
2FWL-V4C	Filter Inlet 3-Way	---			
2FWL-V3C	Filter Outlet 3-Way	---			
2FWL-V24C	Filter Fill Isol.	Shut			
2FWL-V21C	Filter 1C Vent	Shut & Capped			
2FWL-V22C	Filter 2C Vent	Shut & Capped			
2FWL-V12C	Filter 1C Drain	Shut			
2FWL-V13C	Filter 2C Drain	Shut			
2FWL-V17C	Lube Oil Cooler E1C Shellside Vent	Shut & Plugged			
2FWL-V18C	Lube Oil Cooler E1C Tubeside Vent	Shut & Plugged			
2FWL-V25C	Lube Oil Reservoir Drain Isol.	Shut & Capped			

TABLE I

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2FWL-V19C	Lube Oil Cooler E1C Tubeside Drain	Shut & Capped			
2FWL-V20C	Lube Oil Cooler E1C Shellside Drain	Shut			
2FWL-V8C	PS1C, PI1C Inst. Root Isol.	Open			
2FWL-V11C	PI5C Inst. Root Isol.	Open			
2FWL-V23C	Aux. Lube Oil Pump Header Vent	Shut & Plugged			
2FWL-V1C	Main Lube Oil Pump P1C Disch. Check	Installed			
2FWL-V2C	Main Lube Oil Pump P2C Disch. Check	Installed			
2FWL-V14C	Feedwater P1C Motor Lube Oil Inlet Check	Installed			
2FWL-V15C	Feedwater P1C Motor Lube Oil Inlet Check	Installed			
2FWL-RV4C	C Lube Oil Header Relief Valve	Not Gagged			

TABLE I

VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2ZIP-V18	Zinc Tank Fill Isol.	Open			
2ZIP-V20	Zinc Tank Fill Line Drain	Shut & Capped			
2ZIP-V17	Zinc Tank Fill Isol.	Open			
2ZIP-F012	Zinc Tank Fill Solenoid Isol.	Shut			
2ZIP-F013	Zinc Tank Overflow Solenoid Isol.	Open			
2ZIP-V1	Zinc Tank Drain Isol.	Shut			
2ZIP-V2	Zinc Injection Pump P1A Inlet	Open			
2ZIP-V3	Zinc Injection Pump P1B Inlet	Open			
2ZIP-F006A	Zinc Injection Pump P1A Disch. Relief	Not Gagged			
2ZIP-F006B	Zinc Injection Pump P1B Disch. Relief	Not Gagged			
2ZIP-V4	Zinc Injection Pump P1A Disch. Isol.	Open			
2ZIP-V5	Zinc Injection Pump P1B Disch. Isol.	Open			

TABLE I

VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2ZIP-V6	Zinc Injection Pump P1A Disch. Isol.	Open			
2ZIP-V7	Zinc Injection Pump P1B Disch. Isol.	Open			
2ZIP-V8	Zinc Return to Condensate Check	Installed			
2ZIP-V9	Zinc Return to Condensate Isol.	Open			
2ZIP-HCV21	Feedwater to Zinc Inlet Isol.	Open			
2ZIP-V10	Feedwater to Zinc Inlet Isol.	Open			
2ZIP-V14	Feedwater to Zinc Inlet Isol.	Open			
2ZIP-V12	Feedwater to Zinc Inlet Drain	Shut & Capped			
2ZIP-V19	Zinc Return to Condensate Vent	Shut & Capped			
2ZIP-RV100	Zinc Return to Condensate Relief	Not Gagged			
2ZIP-V13	Zinc Return to Condensate Drain	Shut & Capped			

TABLE I

VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2CNM-V351	Condenser Neck Spray Manual Isolation	0			
2CNM-MOV126	Condenser Neck Spray Motor Operated Isolation	Closed			
2CNM-V354	Condenser A Inlet Throttle Valve	Throttled and Locked			
2CNM-V355	Condenser A Inlet Throttle Valve	Throttled and Locked			
2CNM-V356	Condenser B Inlet Throttle Valve	Throttled and Locked			
2CNM-V357	Condenser B Inlet Throttle Valve	Throttled and Locked			
2CNM-V358	Condenser C Inlet Throttle Valve	Throttled and Locked			
2CNM-V359	Condenser C Inlet Throttle Valve	Throttled and Locked			
2CNM-V352	Condenser Neck Spray Main Header Drain	Shut and capped			
2CNM-V353	Condenser Neck Spray Main Header Vent	Shut and capped			
2CNM-V360	Condenser A Inlet Header Drain	Shut and capped			
2CNM-V361	Condenser A Inlet Main Header Drain	Shut and capped			
2CNM-V362	Condenser B Inlet Main Header Drain	Shut and capped			
2CNM-V363	Condenser B Inlet Header Drain	Shut and capped			
2CNM-V364	Condenser C Inlet Header Drain	Shut and capped			
2CNM-V365	Condenser C Inlet Header Drain	Shut and capped			

TABLE I

VALVE LINE-UP

Valve No.	Description	Required Position	Actual Position	Initials & Date	Remarks
2ZIP-V16	Zinc Spill Pan Drain	Shut & Capped			
2ZIP-V11	Zinc to Condensate Inlet Isol.	Open			
2ZIP-V15	Zinc to Condensate Inlet Isol.	Open			
2ZIP-V22	Feedwater to Zinc Vent	Shut & Capped			
2FWS-V2000A	Feedwater Pump 1A Seal Water Vent	Shut & Plugged			
2FWS-V2001A	Feedwater Pump 1A Seal Water Vent	Shut & Plugged			
2FWS-V2000B	Feedwater Pump 1B Seal Water Vent	Shut & Plugged			
2FWS-V2001B	Feedwater Pump 1B Seal Water Vent	Shut & Plugged			
2FWS-V2001C	Feedwater Pump 1C Seal Water Vent	Shut & Plugged			
2FWL-RV11A	Lube Oil Pump Disch. Header Relief	Not Gagged			
2FWL-RV11B	Lube Oil Pump Disch. Header Relief	Not Gagged			
2FWL-RV11C	Lube Oil Pump Disch. Header Relief	Not Gagged			

TABLE II

SYSTEM POWER SUPPLY LINEUP

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	-	Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2CNM-P1A	A Condensate pump	2NNS-SWG011	-	ACB11-7	Racked In			
2CNM-P1B	B condensate pump	2NNS-SWG013	-	ACB13-3	Racked In.			
2CNM-P1C	C condensate pump	2NNS-SWG011	-	ACB11-8	Racked In			
2CNM-P1C	C condensate pump	2NNS-SWG013	-	ACB13-2	Racked In			
2CNM-P2A	A condensate booster pump	2NPS-SWG001	-	ACB1-7	Racked In			
2CNM-P2B	B condensate booster pump	2NPS-SWG003	-	ACB3-5	Racked In			
2CNM-P2C	C condensate booster pump	2NPS-SWG001	-	ACB1-12	Racked In			
2CNM-P2C	C condensate booster pump	2NPS-SWG003	-	ACB3-11	Racked In			
2CNM-H1A	A condensate pump motor heater	2SCA-PNL103	-	Breaker #1	On			

TABLE II

SYSTEM POWER SUPPLY LINEUP

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	-	Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2CNM-H1B	B condensate pump motor heater	2SCA-PNL103	-	Breaker #6	On			
2CNM-H1C	C condensate pump motor heater	2SCA-PNL103	-	Breaker #2	On			
2CNM-H2A	A condensate booster pump motor heater	2SCA-PNL103	-	Breaker #7	On			
2CNM-H2B	B condensate booster pump motor heater	2SCA-PNL103	-	Breaker #5	On			
2CNM-H2C	C condensate booster pump motor heater	2SCA-PNL103	-	Breaker #8	On			
2CNM-MOV3A	A condensate pump discharge valve	2NHS-MCC010A	-	4A	On			
2CNM-MOV7A	A condensate booster pump suction valve	2NHS-MCC010A	-	4B	On			

TABLE II

SYSTEM POWER SUPPLY LINEUP

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	-	Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2CNM-MOV32A	A low pressure heater string outlet valve	2NHS-MCC010A	-	4C	On			
2CNM-MOV33A	A low pressure heater string inlet valve	2NHS-MCC010A	-	4D	On			
2CNM-MOV63A	A condensate pump suction valve	2NHS-MCC010A	-	5A	On			
2CNM-MOV64A	Air ejector intercondenser E3A inlet valve	2NHS-MCC010A	-	5B	On			
2CNM-MOV65A	Air ejector intercondenser E3A outlet valve	2NHS-MCC010A	-	5C	On			
2CNM-MOV66A	Steam packing exhauster E2A inlet valve	2NHS-MCC010A	-	5D	On			
2CNM-MOV67A	Steam packing exhauster E2A outlet valve	2NHS-MCC010A	-	6A	On			
2CNO-P2A	A condensate booster pump Auxiliary oil pump	2NHS-MCC010A	-	11A	On			

TABLE II

SYSTEM POWER SUPPLY LINEUP

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number - Cubicle/ Breaker		NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2CNM-AOV101	Low pressure heater strings bypass valve	2SCA-PNL403	3	On			
2CNM-AOV109	Condensate demineralizer bypass valve	2SCA-PNL403	3	On			
2CNM-MOV120	Exhaust hood spray MOV	2NHS-MCC010C	15C	On			
2CNM-MOV122	Reactor feed pumps bypass valve	2NHS-MCC010C	15D	On			
2CNM-MOV3C	C condensate pump discharge valve	2NHS-MCC010C	16A	On			
2CNM-MOV7C	C condensate booster pump suction valve	2NHS-MCC010C	16B	On			
2CNM-MOV32C	C low pressure heater string outlet valve	2NHS-MCC010C	16C	On			
2CNM-MOV33C	C low pressure heater string inlet valve	2NHS-MCC010C	16D	On			

TABLE II

SYSTEM POWER SUPPLY LINEUP

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number - Cubicle/ Breaker		NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2CNM-MOV63C	C condensate pump suction valve	2NHS-MCC010C -	17A	On			
2CNO-P2B	B condensate booster pump Auxiliary oil pump	2NHS-MCC010B -	28E	On			
2CNM-MOV67B	Steam packing exhauster E2B outlet valve	2NHS-MCC010B -	31A	On			
2CNM-MOV63B	B condensate pump suction valve	2NHS-MCC010B -	32A	On			
2CNM-MOV64B	Air ejector intercondenser E3B inlet valve	2NHS-MCC010B -	32B	On			
2CNM-MOV65B	Air ejector intercondenser E3B outlet valve	2NHS-MCC010B -	32C	On			
2CNM-MOV66B	Steam packing exhauster E2B inlet valve	2NHS-MCC010B -	32D	On			

TABLE II

SYSTEM POWER SUPPLY LINEUP

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number - Cubicle/ Breaker		NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2CNM-MOV3B	B condensate pump discharge valve	2NHS-MCC010B -	33A	On			
2CNM-MOV7B	B condensate booster pump suction valve	2NHS-MCC010B -	33B	On			
2CNM-MOV32B	B low pressure heater string outlet valve	2NHS-MCC010B -	33C	On			
2CNM-MOV33B	B low pressure heater string inlet valve	2NHS-MCC010B -	33D	On			
2CNO-P2C·	C condensate booster pump Auxiliary oil pump	2NHS-MCC004 -	2A	On			
2FWS*AOV23A & B	Feedwater Inlet Check Valve	2SCI-PNLA101 -	22	On			
2FWS-LS1101A,B,C 2FWS-PS1102A,B,C 2FWS-PS1103A,B,C	LV10A,B,C Hydraulic Annunciator	2VBS-PNLB101 -	15	On			
2FWS-P1A	RX FEEDWATER PUMP P1A	2NPS-SWG001	ACB1-8	RACKED IN			

TABLE II

SYSTEM POWER SUPPLY LINEUP

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	– Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2FWS-P1B	RX FEEDWATER PUMP P1B	2NPS-SWG003	ACB3-7	RACKED IN			
2FWS-P1C	RX FEEDWATER PUMP P1C	2NPS-SWG001	ACB1-13	RACKED IN			
2FWS-P1C	RX FEEDWATER PUMP P1C	2NPS-SWG003	ACB3-12	RACKED IN			
2FWS*MOV21A	'A' FEED HEADER OUTSIDE I.V.	2EHS*MCC102A	8C	On			
2FWS*MOV21B	'B' FEED HEADER OUTSIDE I.V.	2EHS*MCC102C	18C	On			
2FWS-HV105	6th PT. F.W. HTR DISCH HDR VENT	2SCI-PNLB103	6	On			
2CNM-MOV84A	RX FEEDWATER PMP 'A' SUCTION I.V.	2NHS-MCC010A	6B	On			
2CNM-MOV84B	RX FEEDWATER PUMP 'B' SUCTION I.V.	2NHS-MCC010B	31B	On			
2CNM-MOV84C	RX FEEDWATER PUMP 'C' SUCTION I.V.	2NHS-MCC010C	17B	On			
2FWL-P2A	P1A AUX L.O. PUMP	2NHS-MCC-010A	11C	On			

TABLE II

SYSTEM POWER SUPPLY LINEUP

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	- Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2FWL-P2B	P1B AUX L.O. PMP	2NHS-MCC010B	26D	On			
2FWL-P2C	P1C AUX L.O. PMP	2NHS-MCC004	2C	On			
2FWS-MOV17A	6th PT FEED HTR INLET I.V. 'A'	2NHS-MCC003A	5A	On			
2FWS-MOV22A	6th PT FEED HTR OUTLET IV 'A'	2NHS-MCC003A	5B	On			
2FWS-MOV47A	Rx FEED PMP 'A' DISCHARGE IV	2NHS-MCC003A	5C	On			
2FWS-H1A	RX FEED PUMP 'A' MOTOR HTR	2NHS-MCC003A	7B	On			
2FWS-LV10A 2FWS-PNL10A	FEEDWATER LEVEL CONTROL VALVE 10A MOTOR OPERATOR & CONTROL PANEL	2NHS-MCC003A	7C	On			TCN-92
2FWS-MOV112	LOW ENERGY CLEANUP ISOL. VALVE	2NHS-MCC003C	9B	On			
2FWS-MOV17C	6th PT FEED HTR INLET I.V. 'C'	2NHS-MCC003C	11A	On			
2FWS-MOV22C	6th PT FEED HTR OUTLET I.V. 'C'	2HNS-MCC003C	11B	On			

TABLE II

SYSTEM POWER SUPPLY LINEUP

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	– Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2FWS-MOV47C	RX FEED PUMP 'C' DISCHARGE I.V.	2NHS-MCC003C	11C	On			
2FWS-MOV110	HI ENERGY F.W. RECYCLE B.V.	2NHS-MCC003C	12C	On			
2FWS-MOV102	HI PRESS HTR STRING BYPASS I.V.	2NHS-MCC003C	12D	On			
2FWS-LV10C 2FWS-PNL10C	FEEDWATER LEVEL CONTROL VALVE 10C MOTOR OPERATOR & CONTROL PANEL	2NHS-MCC003C	14A	On			TCN-92
2FWS-H1C	RX FEED PUMP 'C' MOTOR HTR	2NHS-MCC003C	15F	On			
2FWS-H1B	RX FEED PUMP 'B' MOTOR HTR	2NHS-MCC003B	21A	On			
2FWS-LV10B 2FWS-PNL10B	FEEDWATER LEVEL CONTROL VALVE 10B MOTOR OPERATOR & CONTROL PANEL	2NHS-MCC003B	21B	On			TCN-92
2FWS-MOV17B	6th PT FEED HTR INLET I.V. 'B'	2NHS-MCC003B	23A	On			
2FWS-MOV22B	6th PT FEED HTR OUTLET I.V. 'B'	2NHS-MCC003B	23B	On			
2FWS-MOV47B	RX FEED PUMP 'B' DISCHARGE I.V.	2NHS-MCC003B	23C	On			

TABLE II

SYSTEM POWER SUPPLY LINEUP

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2CNM-HV60A, B,C	CONDENSATE VENT VALVES	2SCA-PNL 300	4	On			
2FWS-HV42A/B/C	F.W. DISCH. VENT	2SCI-PNLB103	25	On			
2CNM-HV59A, B,C	RX FEED PUMP A,B,C SUCT. ISOL. BYPASS	2SCA-PNL300	4	On			
2FWS-HV43A/B/C	6th PT HTR DISCH HDR VENT 'A'	2SCI-PNLB103	26	On			
	REACTOR FEEDWATER PUMPS BEARING VIBRATION	2SCI-PNLA102	18	On			

TABLE II

SYSTEM POWER SUPPLY LINEUP

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	– Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2CNM-HV51A, 52A,55A,56A, 57A,58A,119	Condensate System A Valves	2SCA-PNL300	2	On			
2CNM-HV51B, 52B,55B,56B, 57B,58B,	Condensate System B Valves	2SCA-PNL300	21	On			
2CNM-HV51C, 52C,55C,56C, 57C,58C,	Condensate System C Valves	2SCA-PNL300	3	On			
2FWS-HVX113 2FWS-HVY113	Low Energy Feedwater Cleanup Control Valve	2SCI-PNLB101	24	On			
2FWR-FV2A/ 2CNM-FT68A	Feedwater Pump 1A Minimum Flow Valve	2SCI-PNLA101	13	On			
2FWR-FV2B/ 2CNM-FT68B	Feedwater Pump 1B Minimum Flow Valve	2SCI-PNLA102	14	On			
2FWR-FV2C/ 2CNM-FT68C	Feedwater Pump 1C Minimum Flow Valve	2SCI-PNLA101	15	On			
2FWS*HCV54A 2FWS*HCV54B	Feedwater Block Valve Indicating Lights	2SCI-PNLB101	29	On			

TABLE II

SYSTEM POWER SUPPLY LINEUP

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2FWS-HVX111 2FWS-HVY111 2FWS-HVZ111	High Energy Feedwater Cleanup Control Valve	2SCI-PNLB101	24	On			
2CNM-NBEX1A, 1B,1C,2A,2B, 2C, 2CNM-NBEY1A, 1B,1C,2A,2B,2C	Condensable Booster Pump 2A, 2B,2C Inboard/Outboard Shaft Vibration	2SCI-PNLA102	18	On			
2CNM-FV38A	Condensate Booster Pump 2A Min. Flow Valve	2SCI-PNLA101	8	On			
2CNM-FV38B	Condensate Booster Pump 2B Min. Flow Valve	2SCI-PNLA102	8	On			
2CNM-FV38C	Condensate Booster Pump 2C Min. Flow Valve	2SCI-PNLA101	1	On			
2CNM*PT46A	Main Condenser Vacuum	2VBS*PNLA103	14	On			
2CNM*PT46B	Main Condenser Vacuum	2VBS*PNLB103	14	On			
2CNM*PT46C	Main Condenser Vacuum	2VBS*PNLA104	13	On			

TABLE II

SYSTEM POWER SUPPLY LINEUP

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	- Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2CNM*PT46D	Main Condenser Vacuum	2VBS*PNLB104	13	On			
2CNM-FV114	Condensate Min. Flow Valve	2SCI-PNLB101	10	On			
2CNM-ZI114	FV114 Position Indication	2SCA-PNL300	37	On			
2FWS*MOV21A,B	Inop Status Light	2SCM*PNL104A	14	On			
2FWS*MOV21A,B	Feedwater Inlet Shutoff Isolator	2SCM*PNL104A	13	On			
2FWS-LV55A,B & 2CNM-LV137	High Pressure Low Flow Control Valve & Startup Level Control Valve	2VBS*PNLB101 2VBS-PNLB101	15	On			
2FWS-TT19A,B 2FWS-TT20A,B	Feedwater Temperature	2VBS-PNLB101	14	On			
2ZIP-PNL102	Zinc Analyzer Power	2SCA-PNL406	28	On			
2ZIP-SKID1	Zinc Skid Power	2SCA-PNL103	36	On			
2ZIP-PNL101	Zinc Analyzer Power	2SCA-PNL103	38	On			

TABLE II

SYSTEM POWER SUPPLY LINEUP

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2CNM-MOV126	Condenser Neck Spray Isolation Valve	2NHS-MCC010 Bus C	21B	On			