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THREE MILE ISLAND NUCLEAR STATION

UNIT #2 OPERATING PROCEDURE 2102-1.3

UNIT START-UP

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Unit 1 Staff Recommends Approval

Approval N/A Date
Cognizant Dept. Head

Unit 2 Staff Recommends Approval

Approval N/A Date
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Unit 1 PORC Recommends Approval

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Unit 2 PORC Recommends Approval

R.P. Warren Date 3/20/79
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Unit 1 Superintendent Approval

N/A Date

Unit 2 Superintendent Approval

U.S. Lyman Date 3/20/79

Manager Generation Quality Assurance Approval

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UNIT START-UP

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1.0 REFERENCES

1.1 Drawings Applicable for Operations.

Main and Reheat Steam, B&R Dwg. #2002.

Bleed Steam, B&R Dwg. #2003.

Auxiliary Steam, B&R Dwg. #2004.

Feedwater and Condensate, B&R Dwg. #2005.

Makeup Water Treatment and Condensate Polishing, B&R Dwg. #2006.

Feedwater Heater Drains, B&R Dwg. #2009.

Secondary Services Closed Cooling Water, B&R Dwg. #2018.

Circulating Water & River Water Chemical Treatment, B&R Dwg. #2021.

Circulating & Secondary Services Water, B&R Dwg. #2023.

Reactor Coolant Makeup & Purification, B&R Dwg. #2024.

Intermediate Closed Cooling Water, B&R Dwg. #2029.

Nuclear Services Closed Cooling Water, B&R Dwg. #2030.

Sampling Nuclear System, B&R Dwg. #2031.

Nuclear Services River Water, B&R Dwg. #2033.

Reactor Building Ventilation & Purge, B&R Dwg. #2041.

Reactor Building Normal Cooling, B&R Dwg. #2046.

Reactor Building Penetrations Forced Air Cooling, B&R Dwg. #2497.

Reactor Coolant Pump Seal Recirculation & Cooling Water, B&R Dwg. #2601.

1.2 Operating Procedure Applicable for Operation.

1.2.1 2102-1.2, Approach to Criticality.

1.2.2 2103-1.9, Reactivity Balance Calculations.

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- 1.2.3 2103-1.10, Heat Balance Calculations.
- 1.2.4 2104-1.2, Makeup and Purification System.
- 1.2.5 2105-1.4, Integrated Control System.
- 1.2.6 2105-1.1, Nuclear Instrumentation.
- 1.2.7 2106-3.1, Turbine Generator.
- 1.2.8 2106-3.3, Hydrogen Seal Oil System.
- 1.2.9 2106-1.1, Main Steam.
- 1.2.10 2106-2.4, Feed System.
- 1.2.11 2106-1.2, Extraction Steam, Stage Heater Vents and Drains.
- 1.2.12 2104-3.6, Circulating Water.
- 1.2.13 2104-1.6, Intermediate Cooling System.
- 1.2.14 2106-2.1, Condensate System.
- 1.2.15 2104-5.1, Reactor Building Normal and Emergency Ventilation.
- 1.2.16 2104-1.7, Penetration Cooling.
- 1.3 Manufacturers' Instruction Manuals.
 - 1.3.1 Diamond Power "Control Rod Drive Mechanism Control System" instruction manual Volume I and II - 01-0115-02 and 01-0116-01.
 - 1.3.2 Bailey Meter Company "Integrated Control and Non-Nuclear Instrumentation System" instruction manual Volume 1A, Volume 1B and Volume 2.
 - 1.3.3 Babcock & Wilcox, "Physics Test Manual", TMI-2. TG 06-000-23.
 - 1.3.4 Westinghouse, "Steam Turbine for Jersey Central Power & Light Unit 2" Instruction Book Volume I (I-B-NO-1250-C734).
 - 1.3.5 Westinghouse "Hydro Inner Cooled Turbine Generator for Jersey Central Power & Light Unit 2" Instruction Book (I-B-NO-20792)
- 1.4 Applicable System Descriptions.
 - 1.4.1 Not Applicable.

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1.5 Curves, Figures, Tables, etc.

1.5.1 Curves.

- Figure 1 - Core Pressure/Temperature Safety Limits.
- Figure 2 - Operational Power Imbalance Envelope (0-200 EFPD)
- Figure 3 - Control Rod Group Withdrawal Limits for 4 Pump Operation (0-200 EFPD).
- Figure 4 - Control Rod Group Withdrawal Limits for 3 Pump Operation (0-200 EFPD).
- Figure 5 - Control Rod Group Withdrawal Limits for 2 Pump Operation (0-200 EFPD).
- Figure 6 - Control Rod Group Designation and Core Position.
- Figure 7 - Reactor Coolant System Pressure/Temperature Limits for Heatup and Cooldown and Core Criticality.
- Figure 7A - Heatup/Cooldown Curve.
- Figure 8 - Minimum Boric Acid Tank Contained Volume/Concentration.
- Figure 9A - Core power vs. Rod Position Bands 4 Pump Operation (0-200).
- Figure 9B - Core Power vs. Rod Position Bands 3 Pump Operation (0-200 EFPD).
- Figure 9C - Core Power vs. Rod Position Bands 2 Pump Operation (0-200 EFPD).
- Figure 10 - Borate/Deborate $\pm 10\%$ Rod Position (BOL-140 EFPD).
- Figure 11 - RC Boron Change Needed to Reposition Rods in Bands.
- Figure 12 - Minimum Feed and Bleed Flow Rate per Load Change vs. RCS Boron Concentration.
- Figure 13 - Pressurizer Level vs. T-ave.
- Figure 14 - Shutdown Boron Concentrations vs EFPD.

1.5.2 Tables.

- Table 1 Quadrant Power Tilt Limits.

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Table 2 DNB Margin.

1.5.3 Appendix.

1. Surveillance Requirements Modes 3 to 2.
2. Surveillance Requirements Modes 2 to 1.
3. Mechanical Maneuvering Recommendations.

2.0 LIMITS AND PRECAUTIONS

2.1 Equipment.

- 2.1.1 When operating letdown coolers, intermediate cooling pumps, and intermediate coolers must be in operation.
- 2.1.2 When increasing reactor coolant temperatures greater than 532°F, monitor turbine throttle pressure to insure the turbine bypass valves maintain proper throttle pressure.
- 2.1.3 Do not attempt to start a Reactor Coolant Pump when power is greater the 30%.
- 2.1.4 The pressurizer spray valve minimum bypass flow must be maintained (≈ 1 gpm).
- 2.1.5 For normal plant heatup and cooldown conditions the maximum delta T between the feedwater line temperature and steam generator lower downcomer temperature is 440°F when using the main feedwater nozzles.
- 2.1.6 With a filled and vented RC System, do not fill, drain, or blow an OTSG dry without flow in the RC System. Flow may be through Decay Heat or RC Pumps. Rate of fill, drain, or blowdown shall not decrease RC System temperature (T-cold) or OTSG downcomer temperature by more than 50°F below initial temperature.
- 2.1.7 Maximum allowable OTSG fill rate is 500 gpm per S.G.
- 2.1.8 Maximum allowable ΔT between RCS and OTSG average shell temperature is 60°F.

2.1.9 "During startup and shutdown, when reactor average temperature is 525°, OTSG water level shall be maintained between 97 and 99 percent on the operating level instrumentation. This is done to ensure flooding of the feedwater nozzles and reduce circumferential thermal gradient cycles on the feedwater nozzles during Mode 3. Prior to entering Mode 2 OTSG water level shall be steamed down to the low level limits."

2.1.10 The Nuclear Instrumentation will be continuously monitored during any reactivity addition. During withdrawal of control rods, subcritical source multiplication will be confirmed according to the following equation or the startup will be terminated until an appropriate evaluation is made.

$$M = \frac{SDM1 (100 - SDM2)}{SDM2 (100 - SDM1)}$$

where M = Multiplication factor

SDM1 = Shutdown Margin prior to reactivity (% $\Delta k/k$)

SDM2 = Shutdown Margin after reactivity (% $\Delta k/k$)

NOTE: SDM1 and SDM2 are negative values.

2.1.11 During withdrawal of safety rods, a 1/M vs Rod Position Plot will be maintained to insure criticality is not achieved.

2.1.12 Do not exceed 2772 MW_t (Core Thermal Power).

2.1.13 Maintain power below the power level cutoff (See Figures 3 and 4) until the xenon reactivity is within 10 percent of the equilibrium value for operation at rated power and approaching stability or THERMAL POWER has been within a range of (87) to (92) percent of RATED THERMAL POWER for a period exceeding 2 hours in the soluble poison control mode, excluding xenon free start-ups.

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NOTE: Determine Xenon reactivity using either SF 2311-4 or computer program ROBAL.

- 2.1.14 Monitor core power distribution with in-core detectors and the on-line computer as follows:

During steady-state operating, a 3-D Power Map (Group 34) and a worst case Thermal Condition (Group 20) data dump should be taken every EFPD. The reactor power level, boron concentration, and core burnup should also be recorded. This data should be collected each day at midnight along with the Station Daily Log Sheet, Heat Balance (Group 32), Reactivity Balance (Group 22) and Periodic Typewriter Log Daily Summary for delivery to the Station Nuclear Engineer.

- 2.1.15 Following a significant one-step load change ($> 10\%$ rated power) above 50% rated power or significant control rod motion ($> 10\%$ insertion or withdrawal) a Worst Case Thermal Condition should be taken within one hour after the change and then every 4 to 8 hours for a period of 24 to 36 hours, or longer if evidence of a power distribution transient exists. A 3-D Power Map should be taken about 1 hour after reaching steady-state conditions. These data printouts are not necessary on the way up to full power if the Mechanical Maneuvering Recommendations are followed. However, the data from Groups 20 and 34 should be called out one hour after the power hold level is reached.
- 2.1.16 Obtain a 3-D power map whenever a large imbalance or any other core flux abnormality exists.

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- 2.1.17 When operating from 50 to 100% rated power with 4 RC pumps running, maintain cold leg differential temperatures less than 5°F. During load transient near rated power maintain cold leg differential less than 10°F.
- NOTE: With less than 4 RC pumps running the cold leg temperature may exceed these limits but not over 20°F.
- 2.1.18 Maintain all control rods and axial power shaping rods within $\pm 6.5\%$ (indicated position) of their group average height (T.S. 3.1.3.1).
- 2.1.19 Except for physics tests or exercising control rods, the control rod insertion/withdrawal limits are specified on Figure 3, Figure 4 and Figure 5 for various RC pump combinations. If the control rod position LOCA limits are exceeded, proceed with T.S. Action Statement 3.1.3.7. If the control rod position Shutdown Margin limits are exceeded, proceed with T.S. Action Statement 3.1.1.1.
- 2.1.20 Conduct surveillance testing as listed on the surveillance test schedule in accordance with Administrative Procedure - 1010.
- 2.1.21 Maintain shift logs in accordance with Administrative Procedure - 1012.
- 2.1.22 Maintain pressurizer level within the limits of Figure 13.
- 2.1.23 Do not feed steam generators via auxiliary feed nozzles except during emergency conditions or unless feedwater temperature is within 50°F of both RC System and OTSG shell; however, the

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auxiliary feed nozzles must be used for filling an empty OTSG (≤ 10 inches startup level) when RC temperature is above 200°F .

2.1.24 Maintain makeup tank level above the low level alarm.

2.2 Administrative.

2.2.1 During reactor startup do not exceed a stable startup rate of 1 DPM, the prompt change associated with this rate should be less than 1.5 DPM.

2.2.2 Do not exceed a reactor coolant heatup rate of 100°F/hr .

2.2.3 Do not load the turbine at a rate in excess of the recommended loading rate in 2106-3.1.

CAUTION: Do not exceed MMR listed in Appendix 3.

2.2.4 The reactor control rod position and boron concentration shall be maintained such that an available shutdown margin of at least $2\% \Delta k/k$ if $k_{\text{eff}} \geq 1.0$ or $1\% \Delta k/k$ if $k_{\text{eff}} < 1.0$ exists with the single most reactive rod stuck out (T.S. 3.1.1.1).

2.2.5 On annunciation of an Asymmetric Fault on Control Rod Drive, verify the status of the rods in the group. All control rods should be operable and positioned within 9 inches ($\pm 6.5\%$ indicated position) of their group average height. The misaligned rod is declared inoperable and power operation of the reactor would be restricted per T.S. 3.1.3.1.

2.2.6 If any Safety Limit (defined in Technical Specification 2.1 and 2.2) is exceeded, the Shift Supervisor shall notify the Station/Unit Superintendent. The reactor shall be placed in HOT STANDBY within one hour. The licensee shall notify the Commission, review the matter and record the results of the review, including the cause of the condition and the basis for

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corrective action taken to preclude reoccurrence. Operation shall not be resumed until authorized by the Commission.

- 2.2.7 If, during operation, the automatic safety system does not function as required, the Station/Unit Superintendent shall be notified. The Shift Supervisor shall take appropriate action as outlined in the Tech. Specs. The reporting requirements of T.S. 6.9 shall be followed. Note that this appropriate action may include shutting down the reactor.
- 2.2.8 When a Limiting Condition for Operation (LCO) (defined in Section 3 of the Technical Specifications) is not met, the Shift Supervisor shall notify the Station/Unit Superintendent. The reactor shall be placed in at least HOT STANDBY within 1 hour and in COLD SHUTDOWN within the following 30 hours unless corrective measures are completed that permit operation under the permissible ACTION statements for the specified time interval as measured from initial discovery. The reporting requirements of T.S. 6.9 shall be followed.
- 2.2.9 Quadrant tilt shall be monitored on a minimum frequency of once every twelve (12) hours during power operation above 15% of rated power. The QUADRANT POWER TILI shall not exceed the limits listed in Table 3.2-1 of Tech Spec 3.2.4. (Table 1.5.2.1 attached).
- 2.2.10 When reactor power is less than 10% FP, do not request a printout of the following computer groups:

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Gp. #

- 20 Worst Cast Thermal Condition
- 31 Fluid Condition.
- 38 Core Average Thermal Condition.
- 39 Core Map Thermal Condition.
- 40 All Thermal Output
- 53 Selected Assembly Thermal Condition

- 2.2.11 AXIAL POWER IMBALANCE shall be maintained within the limits shown on Figures 3.2-1 and 3.2-2 of Tech Spec. 3.2.1 (Figure 2 attached). The AXIAL POWER IMBALANCE shall be determined to be within limits at least once every 12 hours when above 40% of RATED THERMAL POWER except when an AXIAL POWER IMBALANCE (computer alarm package) monitor is inoperable, then calculate the AXIAL POWER IMBALANCE at least once per hour.
- 2.2.12 If axial power imbalance exceeds the limits specified, restore the axial imbalance within limits in 15 minutes or be in HOT STANDBY condition within 2 hours.
- 2.2.13 The Regulating Rod groups shall be limited in physical insertion as shown on Figures 3.1-2, 3.1-3, 3.1-4, 3.1-5, 3.1-6 and 3.1-7 of Tech Specs, with a rod group overlap of $25 \pm 5\%$ between sequential withdrawn groups 5 and 6/7. (T.S. 3.1.3.7). With the regulating rod groups inserted beyond the LOCA insertion limits, proceed with T.S. Action Statement 3.1.3.7. With the regulating rod groups inserted beyond the Shutdown Margin limits, proceed with T.S. Action Statement 3.1.1.1.
- 2.2.14 The approval of the Shift Supervisor, Radiation Protection Supervisor, and Unit/Station Superintendent, must be obtained if maintenance or extended inspections must be performed within the secondary shield, on top of the "D" Rings, or

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the reactor head area when the reactor power is greater than 1%. Reactor power must not be increased until such work is completed or the situation is re-evaluated and further approval is obtained from the Radiation Protection Supervisor, Shift Supervisor, and Unit/Station Superintendent.

- 2.2.15 Observe the maneuvering rate limitations as listed in Appendix 3. (Mechanical Maneuvering Recommendations). Refer to Appendix 3 for the appropriate power maneuvering recommendations prior to increasing power.
- 2.2.16 Following a Refueling Period, Startup, or similar operational occurrence which could alter the mixture of radionuclides in the reactor coolant, an analysis for individual gamma emitters should be performed at the condenser vacuum pump discharge.
- 2.2.17 Power operation with at least one idle reactor coolant pump is restricted to 4 hours without having changed the RPS Setpoints. If the reactor is not returned to an acceptable RC pump operating combination at the end of the 4 hour period, the reactor may be operated at restricted power level defined in Tech Spec 3.4.1.
- 2.2.18 As a condition to the operating license, operation in modes 1 and 2 with less than three RC pumps operation is not permitted.
- 2.2.19 Two Intermediate Range Neutron Flux and Rate Channels shall be OPERABLE prior to entry into Mode 2 and during reactor criticality, in accordance with Tech Spec. 3.3.1.1, Table 3.3-1.10.

NOTE: For Physics Testing the Intermediate Range detector can be connected to the reactimeter after Reactor Criticality.

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- 2.2.20 Entry into Mode 1 (>5% FP) is not permissible until Two Intermediate Range Neutron Flux and Rate Channels are OPERABLE, in accordance with Tech Spec. 3.3.1.1, Table 3.3-1.10.

NOTE: For Physics Testing, an Intermediate Range detector may be connected to the reactimeter after Entry into Mode 1.

3.0 PREREQUISITES

NOTE: Appendix 1 & 2 (Mode Change Surveillance Requirements) may be commenced prior to meeting these prerequisites.

Initial Each Step Upon Satisfactory Completion.

- ___ 3.1 Reactor coolant temperature is greater than 525°F.
- ___ 3.2 Reactor coolant pressure is within the normal operating band of 2155 \pm 50 psig.

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3.3 The Integrated Control System (ICS) control stations are in one of the below listed conditions:

A. Startup from a shutdown of greater than 4 hours:

All ICS stations are in hand and set in accordance with 2105-1.4 except the turbine bypass valves.

B. Startup from a shutdown of less than 4 hours.

All ICS stations are in hand except the turbine bypass valves and the startup feedwater valves.

3.4 One feed pump is in operation in accordance with 2106-2.4.

3.5 The Shift Supervisor will specify the boron concentration for startup.

NOTE: Prior to deboration, the control rods should be withdrawn to rod index limits.

3.6 The following applicable prerequisite applies to startups following a reactor trip:

A. For a startup following a reactor trip the cause of the trip must have been corrected, and an investigation into the circumstances must have been conducted and it must have been determined by the Station/Unit Superintendent that reactor operations can proceed safely.

B. In the case where the cause of the reactor trip is undetermined following a detailed investigation, the reactor may be restarted with concurrence from the Station/Unit Superintendent upon successful completion of the reactor protective system tests listed in the Appendix 1, Mode 3 to 2 and Mode 2 to 1 Surveillance Checklists, prior to reactor startup.

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____ 3.7 The turbine header pressure setpoint set at 47.5% (885 psig).

____ 3.8 The ICS rate of change controller is set at 0%.

NOTE: For operations below five percent power, maintain the OTSG'S on the low level limits while maintaining flow thru the feedwater nozzles by throttling FW-V-66A/B. Use the turbine bypass valves for heat removal.

____ 3.9 The pressurizer level setpoint is set at 100".

____ 3.10 Source range (cps) and intermediate range (amps) indication available on strip chart recorder located above Panel 4. If the recorder is inoperable, startup may continue with the Shift Supervisor's permission.

____ 3.11 The following prerequisites apply to Reactor Building inspection prior to plant startup.

- a. VERIFY Containment Integrity has been established per 2311-5.
- b. Verify all personnel have left the Secondary Shield area of the Reactor Building.
- c. Insure all entrances into the Secondary Shield have been locked, barricaded, and labeled with the appropriate Radiation Signs.

____ c.1 East (D) ring 282'6" level.

____ c.2 West (D) ring 282'6" level.

____ c.3 R.B. sump area 292'6" level.

____ c.4 Grating over crawl space opening 282'6" level.

____ c.5 RCDT room 282'6" level.

____ c.6 East (D) ring 347'6" level.

____ c.7 West (D) ring 347'6" level.

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- d. Verify all personnel have left the Reactor Building. APR 23 1979
- e. Announce the following two times before exit of the Reactor Building, "Attention, all personnel. The Reactor Building is now being locked".
- f. Insure that all personnel and emergency access hatches have been locked, and the key is returned to the Shift Supervisor.

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- ____ 3.12 Verify the turbine lube oil system is in operation and the turbine is on turning gear, per 2106-3.2 and 2106-3.1.
- ____ 3.13 Verify sealing steam flow is established to feedwater pump turbines and main turbine-generator seals.
- ____ 3.14 Verify a minimum of 25 inches Hg vacuum exists in Cold and Hot condenser. (2106-2.3).
- ____ 3.15 Verify condensate and feedwater system is aligned for cleanup and heatup. Place the turbine plant chemical addition system in operation per 2106-2.8.
- ____ 3.16 Mode 4 Checklist in Heatup Procedure.
- ____ 3.17 Verify that the coolant radwaste system is lined up per 2104-4.1 and 2104-1.2. Verify that the Reactor Coolant Bleed Holdup Tanks, WDL-T1A/1B/1C have sufficient capacity for reactor coolant expansion and deborating volume.
- ____ 3.18 Verify reactor coolant Chemistry Sampling System is lined up and in service per 2104-1.11.
- ____ 3.19 Verify the letdown and purification makeup system is in service in accordance with 2104-1.2. Establish the letdown flow at 45 gpm.
- NOTE: Do not reduce seal injection flow to less than 6 gpm/pump at any time. Normal flow is 8 to 10 GPM/pump.
- ____ 3.20 Verify RC System Chemistry is within the requirements of 1800.3, also verify Feedwater/Condensate Chemistry is within the specifications of 1800.3.
- ____ 3.21 Three or more RC pumps are in operation.

4.0 PROCEDURE

Initial Each Step Upon Satisfactory Completion.

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4.1 Normal Unit Startup.

____ 4.1.1 Complete Appendix 1 (checklist from Mode 3 to Mode 2).

____ 4.1.1.1 Complete 2311-3 Rod Pn Surveillance Data Sheets 2, 3, and 4 and lock the cabinets immediately prior to entering Mode 2.

____ 4.1.2 Verify applicable prersites are complete and the RCS is now at Hot Standby Ction (Mode 3).

a. The reactor has $\geq 1\%$ available shutdown margin.

b. RCS Tave $\geq 525^{\circ}\text{F}$.

c. RCS pressure is being itrolled at 2155 psig.

d. Turbine bypass valves automatic and controlling OTSG pressure at 885 ps.

e. "OTSG levels being cntiled at the low level limits."

____ 4.1.3 Ensure that:

a. High Load Limit is set t 96.2.

b. Low Load Limit is set to 0.

c. Load Rate of Change is set to Mechanical Maneuvering Recommendations of Appendix 3.

d. Set Turbine Header Pressure to 47.5% (885 psig). (Pre Req 3.7).

e. At Reactor Master Demand Station set Tave setpoint to 582°F .

f. The Steam Generator Load Ratio ΔT_c is on Manual and set to zero error).

g. Unit Master Hand/Auto station is on Manual and set to zero demand.

h. Steam Generator/Reactor Master Hand/Auto station is on Manual and set to zero demand.

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i. Reactor Master H/A station is on Manual and set to zero demand.

j. Both Feedwater Demand H/A stations are on manual with demand set to zero.

k. Both Main Feedwater valves H/A stations are on Manual with demand set to zero.

l. Both SU Feedwater Valve H/A stations are in manual and maintain OTSG's level on the low level limits.

m. Both Emergency Feedwater Valve H/A stations are on Manual with demand set to zero.

n. Both Feed Pump Speed H/A stations are on Manual with demand set to zero.

____ 4.1.3.1 Verify both Intermediate Channels operable and not feeding the reactimeter.

____ 4.1.4 Verify that condensate and feed system is lined up and operational in accordance with 2106-2.1 and 2106-2.4.

____ 4.1.5 Obtain permission from the Unit 2 Superintendent, or his designee and take the reactor critical in accordance with "Approach to Criticality" 2102-1.2.

CAUTION: Do not exceed a stable startup rate of 1 DPM.

____ 4.1.6 Stabilize the reactor 10^{-8} amps on the Intermediate Range, when the reactor is stable at 10^{-8} amps with zero startup rate, record criticality data; Boron PPM, RCS temperature, control rod position and time/date in the Control Room Log Book.

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4.1.11 Reactor Coolant will expand as the reactor coolant system heats up. Adjust letdown flow as necessary to maintain pressurizer level setpoint as indicated on Figure 13. Divert letdown flow as necessary to maintain the makeup tank level within its normal range in accordance with 2104-1.2. Increase pressurizer level setpoint as indicated on Figure 13, as RCS temperature increases.

- NOTE:
- a) MU-V17 minimum flow must be 9 gpm for valve protection.
 - b) MU-V5 minimum flow must be 10 gpm for valve protection.
 - c) As the reactor coolant system expands with the temperature increase, MU-V17 will close and makeup level will increase.

4.1.12 After the Neutron power is stabilized, place the Diamond Rod Control Station in Auto as follows:

- a. Verify Neutron Error is $< \pm 1\%$ at Panel 4 meter.
- b. At the Reactor Master H/A station, place the "MV-POS" switch in "POS" and read manual Reactor demand. It should read approximately 5% corresponding to the neutron power. (With Bailey and Diamond in Hand, Rx master tracks neutron power).
- c. Place the Diamond Rod Control station in Auto, if desired, by depressing the Auto pushbutton until the Auto light on Diamond Control Panel is illuminated. The Reactor Master "Auto" light will go out as Reactor Master is reverted to Manual.

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4.1.13 If applicable, observe Feedwater flow rate at five percent power (it should be \approx 200,000 lbs/hr OTSG). Maintain this flow rate manually and at the Reactor Master H/A station use the Raise-Lower switch to gradually increase power to approximately 10%. This will cause the OTSG's to come off the low level limits.

CAUTION: Increase power at a rate which does not exceed a maximum heatup rate of $100^{\circ}/\text{hr}$ (T.S. 3.4.9.1).

NOTE: When altering the Steam Generator level, do not allow Tave to get out of specs per 2101-1.1, Limits and Precautions, Figure 1.0-07.1.

4.1.14 When Steam Generator level is at the low level and observed feedwater flow rate is at approximately 200,000 lbs/hr, If not already done place the corresponding Startup feedwater valve in AUTO by the following steps:

- a. Shut FW-V66A/B prior to placing the associated startup feedwater valve (FW-V25A/B) in AUTO.
- b. Place the "MV-POS" switch to startup feedwater valve (FW-V25A/B) to "MV". When the MV-POS indicator is on the red diamond, place the startup feedwater valve in Auto by depressing the Auto pushbutton and holding it until the Auto light is lit.
- c. When the level on the second OTSG is at the low level limit & feedwater flow is approximately 200,000 lbs/hr, repeat step (a & b) for the corresponding startup feedwater valve.
- d. With the Bailey controller for Main FW valves, FW-V30A and FW-V30B, in MANUAL:

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- ____ 4.1.7 Ensure letdown coolers are in service in accordance with 2104-1.2.

CAUTION: Do not exceed a reactor coolant heatup rate of 100°F/hr. If both letdown coolers are not in operation, limit heatup rate as required to remain within the heat removal capacity of the available letdown cooler.

- ____ 4.1.8 Verify that prerequisites of Turbine Generator Operating Procedure 2106-3.1 are met and the 500KV substation is aligned by turbine roll per 2107-1.3, Section 4.6.2

CAUTION: Insure that the Turbine Trip Bypass Switch on Panel 18 is locked in the Normal position prior to closing B2-06.

- ____ 4.1.9 Complete Appendix 2, (Mode 2 to Mode 1 Surveillance Checklist).

- ____ 4.1.10 Using Diamond Rod Control increase power to approximately 5% neutron power while maintaining OTSG levels on the low level limits.

NOTE: Following any thermal power change of more than 15% of rated thermal power within a 1 hour period, notify HP/CHEM that primary coolant must be sampled and analyzed for Iodine (including I-131, I-133 and I-135) between 2 and 6 hours following the change per 2304-3D2. This isotopic analysis of the primary coolant shall continue at 4 hour intervals until the specific activity drops below 1.0 µCi/gm dose equivalent I-131 or 100/E µCi/gram (T.S. 4.4.8).

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1. Insure corresponding Main FW block valves, FW-V14A and FW-V14B, are closed by visual inspection.
2. Stroke FW-V30A and FW-V30B with the Bailey controller and visually verify valve movement.
3. After stroking FW-V30A and FW-V30B, with FW-V30A and FW-V30B visually verified closed; place the Main FW valves, FW-V30A and FW-V30B, in AUTOMATIC per step (b) above.

4.1.16 Place Loop A and Loop B Feedwater Demand H/A station in Auto by the following procedure:

- a. Place the "MV-POS" switch to "POS" on both Loop A and Loop B Feedwater Demand Stations and verify that the manual demand from each station is 0%.
- b. Place the "MV-POS" switch to "MV" on both Loop A and Loop B Feedwater Demand Stations. Read the error between Auto and Manual Feedwater Demand. Both stations should read 50% (zero error), if not, use the applicable procedure below to balance the Feedwater Demand Stations:

- 1) If both Feedwater Demand Stations indicate an equal error on the MV-POS Indicator, use the SG/Rx Master H/A station "Raise-Lower" switch and adjust SG/Rx demand until both feedwater Demand Stations indicate 50% (zero error).

NOTE: Feed pump speed control will be maintained using valve position or limiter Raise/Lower switch on Panel 5

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until 35% RP. Maintain ΔP of at
least 35 psi across FDW Control
valves A and B.

- 2) If the Feedwater Demand Stations indicate unequal errors, use the Steam Generator Load Ratio ΔT_c H/A station "Raise-Lower" switch and adjust ΔT_c error until both Feedwater Demand errors are equal, then repeat step (1) above.
- c. Place the "MV-POS" switch in "POS" on Loop A Feedwater Demand H/A Station.
- d. Place Loop A Feedwater Demand H/A Station in "AUTO" by depressing the "AUTO" pushbutton until the "AUTO" light is lit.
- e. Repeat steps c and d above for Loop B Feedwater Demand.

4.1.17 Place the SG/Rx Master H/A station on AUTO as follows:

- a. At the Steam Generator/Reactor Master H/A station place the MV-POS switch to MV, Meter should read 50% (Zero Error).
- b. At the SG/Rx Master H/A Station, place MV-POS switch to POS and depress the Auto pushbutton until the Auto Lamp on the station is illuminated.

CAUTION (1): Do not exceed a reactor coolant heatup rate of 100°F/hr or the capability of the available letdown flow.

CAUTION (2): Do not exceed the power increase rate of 10% per hour until 20% power (Mechanical Maneuvering Recommendations).

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NOTE: If Diamond Rod Control Station is not in
AUTO, place in AUTO per step 4.1.12.

____ 4.1.18 At the Reactor Master H/A station, with the MV-POS switch
in "POS" reading manual reactor demand, use the Raise-
Lower switch and increase power to approximately 12-14%
neutron power.

____ 4.1.19 Align the extraction steam and feedwater heater vents per
2106-1.2A.

____ 4.1.20 Bring the Turbine to Synchronous speed in accordance with
2106-3.1.

CAUTION: Turbine Bypass Valves should maintain Turbine
header pressure @ setpoint.

____ 4.1.21 Notify the dispatcher and proceed to synchronize the
generator in accordance with 2106-3.1. On automatic
synchronization, the turbine should pick up = 5% of full
load, = 48 MWe.

NOTE: Follow recommended startup and loading times
curve, Figure 5 of 2106-3.1.

CAUTION: Do not exceed the power increase rate of 10%
per hour until 20% power (Mechanical Maneuvering
Recommendations).

____ 4.1.22 Raise the Turbine Load as follows:

- a. With the Turbine in "OPER AUTO", set the setter to
150 MW by pressing Raise button.
- b. Set the load rate per 2106-3.1 at 1.6 MW per minute.
- c. Press IMP IN button.

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d. Press "GO" button.

NOTE: As turbine load increases, megawatts generated increase, thereby, the Unit Load Demand increases.

- 4.1.23 Observe the Turbine Bypass valve (MS-V25A, MS-V25B, MS-V26A, and MS-V26B) close gradually as Turbine Generator picks up the load. As Turbine Bypass Valves close completely, indicated by Zero (0) Demand on H/A Station press "OPER ICS" button and place the Turbine in Integrated Control Mode. Verify "Main Turbine on Manual" alarm is cleared, and ICS is no longer in track.
- 4.1.24 Start one Heater Drain Pump and align the feed heaters per 2106-1.2.
- 4.1.25 At the Reactor Master H/A Station with the MV-POS switch in "POS" reading manual Reactor Demand, use the Raise-Lower switch and increase power to 15% FP.
- 4.1.26 After the power is stabilized, place the Reactor Master H/A station in AUTO by the following procedure:
 - a. Place the "MV-POS" switch to "POS" and verify that the manual Reactor Demand is approximately 15%.
 - b. At the Reactor Demand Station, place the MV-POS switch in "MV" and ready Tave error. It should be 50% (zero error), if not, use the Tave setpoint knob and adjust the Tave error to 50% (zero error).
 - c. Place the "MV-POS" switch to "POS".
 - d. Place the Reactor Master H/A station to AUTO by depressing the Auto pushbutton until the "AUTO"

light is lit. "The Reactor Master Station on Manual" alarm will clear.

- e. Using the Tave setpoint knob, slowly adjust the Tave to 62% (582°F).

____ 4.1.27 Now reactor, steam generator and turbine generator are in integrated mode, except for FWPS control and the unit load is controlled by the Unit Master in "Hand".

____ 4.1.28 With the unit load stabilized at 15% of FP (=150 MWe) collect the following operating data from Plant Computer.

1. Quadrant Power Tilt.

Verify Quadrant Power Tilt is within limits of Tech Spec 3.2.4.

NOTE: While operating above 15% FP get Quadrant Power Tilt printout from Plant Computer every 12 hours.

____ 4.1.29 Notify Load Dispatcher and with his concurrence raise power to 20%, by establishing the Unit Load Demand approximately 19.2%.

CAUTION 1: Do not exceed the power increase rate of 10 percent per hour until 20 percent FP (Mechanical Maneuvering Recommendation).

CAUTION 2: Maintain Control Rods in the Transient Rod Position Band (Figure 9A, 9B, or 9C) per 2102-2.1.

Guidance on the transition from startup Feedwater Regulating Valve Control to Main Feedwater Regulating Valve Control.

CAUTION: Insure the Control Rods are in the Transient Band.

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Power level should be set to give 60 to 70% open on the Startup Feedwater Regulating Valve with approximately 80 psid across the valve. Bring Feedwater Valve ΔP to 35 psid and place the Feedpump in AUTO. This should force the Startup Feedwater Regulating to exceed 80% open position and hence open the Main Feedwater Block Valve. The Main Feedwater Regulating Valve should open to about 20% position. If necessary, increase power level to maintain the Main Feedwater Regulating Valve open. The Startup Feedwater Regulating Valve may be placed in Hand to maintain it open while power level is increased.

4.1.30

When both steam generators lift off the Low Level Limit and SG Low Level Alarm is cleared, place the steam generator load ratio ΔT_c H/A station in "AUTO" by the following procedure:

- a. Place the "MU-POS" switch to "MV" and read ΔT_c error. It should read 50% (zero error). If not, use the ΔT_c setpoint and adjust ΔT_c error to 50% (zero error) on MV-POS Indicator.
- b. Set the "MU-POS" switch "POS" and place the Steam Generator Load Ratio ΔT_c H/A station in Auto by depressing the "AUTO" pushbutton until the Auto light is lit.

4.1.31

Secure feedwater heating by Aux Steam per 2106-1.2, Section 4.1.

4.1.32

After the unit load has stabilized at 20% (192 MWE), ensure the following Turbine Drains are closed as indicated

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on Panel 17: MS-V281A & B; MS-V282A & B; MS-V283, MS-V284, MS-V285A & B and MS-V286A & B. If above valves are not closed use MS-FHS-4374 to close the valves.

NOTE: If reactor is operating with less than four (4) RC pumps, check for down pump availability and if available start non-operating pumps per 2103-1.4 before 30 percent power. Reset Nuclear overpower trip RPS setpoints for operating pump combination as per 2311-6.

4.1.33 Start the second condensate pump, condensate booster pump and place the third condensate pump and condensate booster pump pair in standby. Notify Load Dispatcher and with his concurrence raise power to 35%, by establishing the unit load demand at the unit master to approximately 33.6%.

CAUTION 1: Do not exceed the power increase rate of 30 percent per hour (Mechanical Maneuvering Recommendation).

CAUTION 2: Maintain control rods in the transient rod band (Figure 9) per 2102-2.1.

4.1.34 After the unit has stabilized at 35% load (336 MWE), start the timed opening of the Second Stage Reheater Control valves in accordance with 2106-3.1.

4.1.34.1 Prior to exceeding 30% power, place the control switch for T-56-2, 2A-32 (2B-32), 2A-42 (2B-42) in pull-to-lock position. The 4160V bus MV is read from the KW meters and adding the reading together.

- a. 2A-32 (2B-32) KW
- b. 2A-42 (2B-42) KW
- c. 2A-62 KW (T-56-2)
- d. 2B-52 KW (T-56-2)
- e. 2A-1E2 (2B-1E2) KW
- f. 2A-2E2 (2B-2E2) KW

This insures adequate voltage levels at the 480V ESF busses, in the event of a loss of an Aux. transformer.

4.1.35 Notify the Load Dispatcher and with his concurrence raise power to 40% FP, by establishing the Unit Load Demand to approximately 38.4%.

CAUTION 1: Do not exceed the power increase rate of 30 percent per hour (Mechanical Maneuvering Recommendation).

CAUTION 2: Maintain Control Rods in the transient rod position band (Figure 9A, 9B, or 9C) per 2102-2.1.

4.1.36 After the unit load has stabilized at 40% load (384 MWE), collect the following operating data from Plant Computer.

- 1. Heat Balance.
- 2. Quadrant Power Tilt.
- 3. Axial Power Imbalance.

Maintain Axial Core Imbalance by movement of APSR to remain within the limits of Tech Spec 3.2.1. (Fig 2).

NOTE: Monitor Core Imbalance on a minimum frequency of once every 12 hours during power operation above 40% F.P.

- 4.1.37 When Unit load has stabilized at 40%, (384 MWE), perform the following:
- CLOSE deaerating steam supply valves EX-V71A and 71B.
 - Ensure the casings for the non-running Heater drain pumps are flooded and vented.
 - START a second heater drain pump by placing its Panel 5 control switch to START. Ensure that suction/discharge pressures, seal injection flow, running amps, oil pressure, and oil temperatures are normal.
 - Place the third heater drain pump in STANDBY after verifying proper seal injection flow and oil levels by allowing its control switch handle(s) to return to NORMAL.
 - Monitor moisture separator-reheater drain tanks, feedwater heaters, and the heater drain tank to ensure proper water levels are being maintained.

4.1.38 At 40% load START the feedwater pump in accordance with 2106-2.1 and 2106-2.4 respectively.

- 4.1.39 Place the second feedwater pump turbine in Auto as follows:
- Using the "Raise-Lower" switch, increase turbine speed until the discharge pressure of the oncoming Feed Pump Turbine is equal to the discharge pressure of the running pump as indicated by pressure gages on Panel 5.
 - Increase the oncoming Feed Pump Turbine speed slightly and observe that the running Feed Pump Turbine speed

decreased as the Feed Water load begins to distribute itself between the pumps.

- c. Place the MV-POS switch on the oncoming Feed Pump Turbine in "MV" and read the error between Auto and manual Feed Pump Turbine speed demand. Use the Raise-Lower switch and adjust the demand until the error is zero (50% on indicator). Check that the speed of the pump in Auto decreases as the oncoming Feed Pump Turbine assumes half of the Feed Water load.
- d. Place the oncoming Feed Pump Turbine in Auto by depressing the Auto pushbutton until the "Auto" light is lit.
- e. Using the bias control on Feed Pump Turbine "A", adjust Feed Pump Turbine speeds until Feed pump "A" flow equals Feed pump "B" flow as indicated on Flow meters on Panel 4.

4.1.40 With the consent of the Load Dispatcher raise power to 72%, by establishing the Unit Load Demand to approximately 69%.

CAUTION 1: Do not exceed the power increase rate of 30 percent per hour.

CAUTION 2: Maintain Control Rods in the Transient Rod Position Band (Figure 9A, 9B, or 9C) per 2102-2.1.

4.1.41 After the unit load has stabilized at 72% load (692 MWE) collect the following operating data from Plant Computer.

1. Heat Balance.
2. Axial Power Imbalance.
3. Quadrant Power Tilt.

4.1.42 Hold the power steady for five (5) hours at = 72% F.P.

This 5 hour reactor power hold allows time for fuel pellet and clad creep to accomodate the differential thermal expansion and thereby minimizes the effects of pellet-clad interaction.

NOTE: If the reactor has been at less than 20% FP for less than 48 hours, 5 hour power hold at 72% power is not required.

4.1.43 With the consent of the Load Dispatcher raise power to 90 percent, by establishing the unit load demand to approximately 86.4 percent.

CAUTION: During the initial power escalation at cycle startup or immediately following a control rod interchange, the initial escalation above the 75% full power shall be limited to 3% per hour, with a five (5) hour hold at the power level cutoff. This hold can run concurrently with 2 hours hold required by Technical Specification 3.1.3.9.

NOTE 1: For Normal power escalation do not exceed the Power Increase Rate of 30 percent per hour.

NOTE 2: Maintain Control rods in the transient rod position band (Figure 9A, 9B, or 9C) per 2102-2.1.

4.1.44 After the unit load has stabilized at 90% load (864 MWE)
collect the following operating data from Plant Computer.

1. Heat Balance.
2. Axial Power Imbalance.
3. Quadrant Power Tilt.

4.1.45 Hold the power steady for five (5) hours at =90% FP.
This 5 hour reactor power hold allows time for fuel
pellet and clad creep to accomodate the differential
thermal expansion and thereby minimize the effects of
pellet-clad interface.

NOTE: During 90% Power Hold take 3-D Power Map 1 hour
after power is stabilized.

CAUTION: Prior to increasing Power greater than 92%,
requirements of Tech Spec 3.1.3.9 must be
satisfied.

4.1.46 With the consent of the Load Dispatcher raise power to
100% FP, by establishing the unit load demand at
approximately 96 percent.

CAUTION: During the initial power escalation at cycle
startup or immediately following a control rod
interchange, the initial escalation above the
75% full power shall be limited to 3% per hour.

NOTE 1: For Normal Power Escalation do not exceed the
power increase rate of 30 percent per hour.

NOTE 2: Maintain control rods in the transient rod
position band (Figure 9A, 9B, or 9C) per
2102-2.1 during power escalation.

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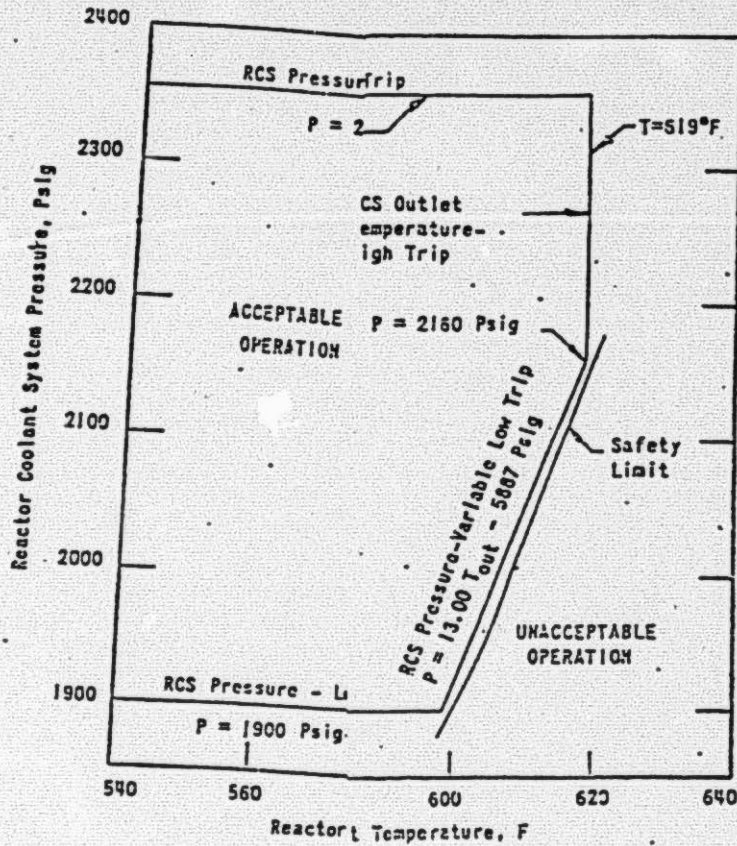


Figure 1

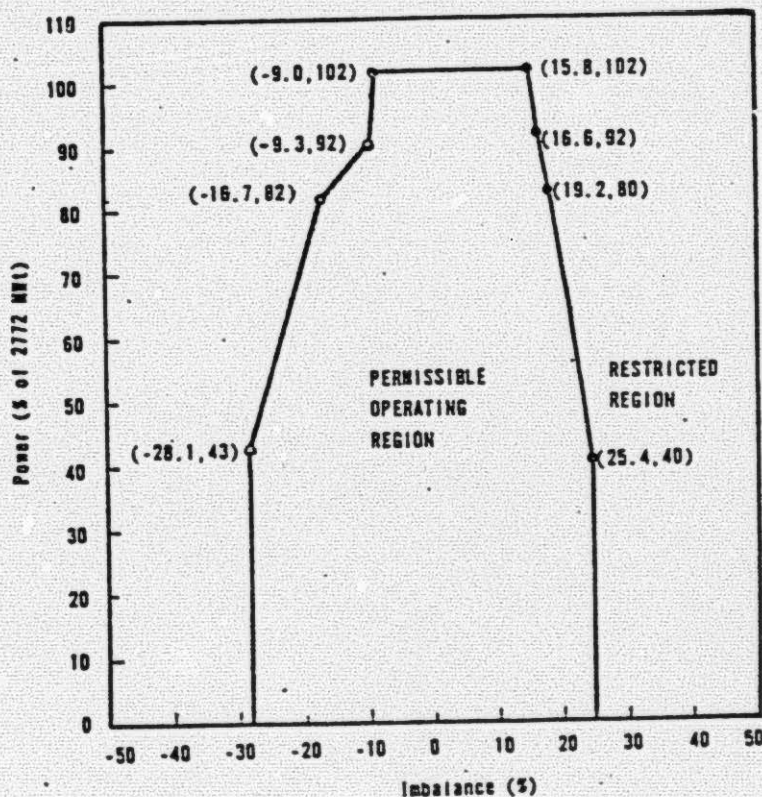
THI - UNIT 2
REACTOR CORE SAFETY LIMIT

(Tech. Spec. Figure 2.1-1)

POOR ORIGINAL

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CORE IMBALANCE VS POWER LEVEL
(0-200 ± 10 EFPD'S)

Figure 2

POOR ORIGINAL

34.0

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CORE POWER

VS.

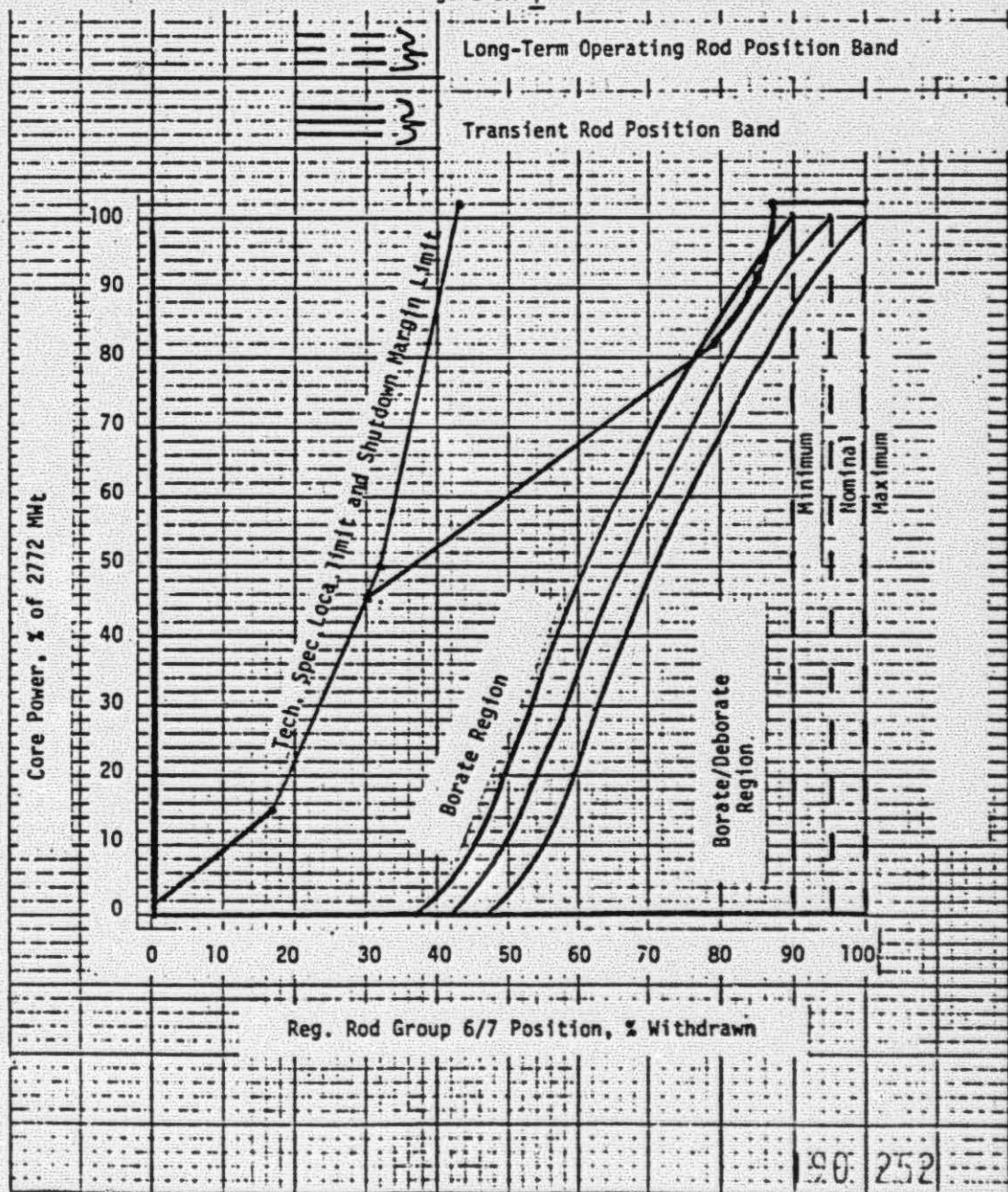
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LONG-TERM OPERATING AND TRANSIENT ROD POSITION BANDS

TMI 2 CYCLE 1 (0-200 \pm 10 EFPD's) 4 PUMP OPERATION

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Figure 9A



CORE POWER

VS.

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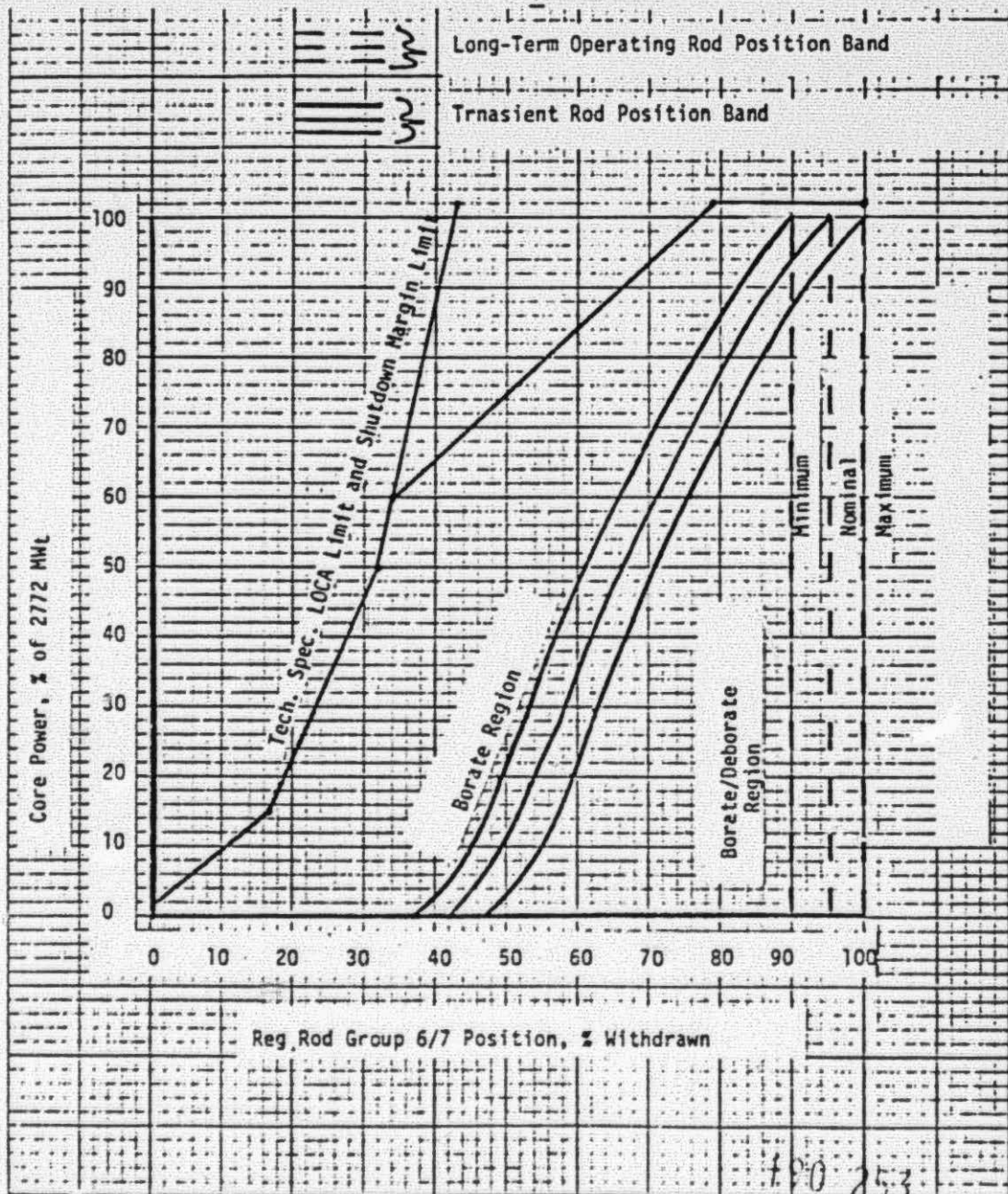
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LONG-TERM OPERATING AND TRANSIENT ROD POSITION BANDS

TMI 2 CYCLE 1 (0-200 ± 10 EFPD's) 3 PUMP OPERATION

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Figure 9B



CORE POWER

VS.

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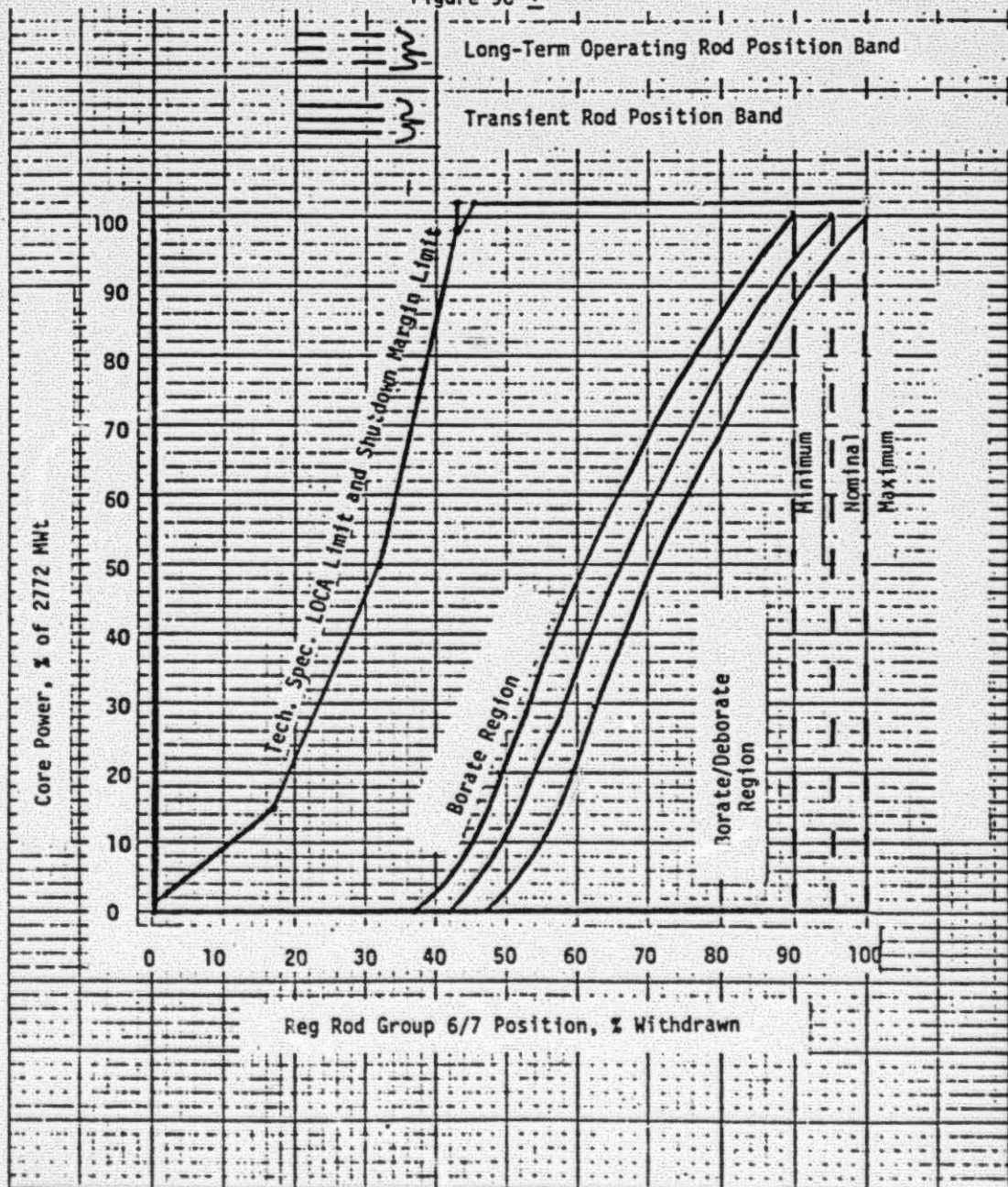
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LONG-TERM OPERATING AND TRANSIENT ROD POSITION BANDS

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TMI 2 CYCLE 1 (0-200 ± 10 EFPD'S) 2 PUMP OPERATION

Figure 9C



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TABLE 1
QUADRANT POWER TILT LIMITS

	<u>STEADY STATE LIMIT</u>	<u>TRANSIENT LIMIT</u>	<u>MAXIMUM LIMIT</u>
Measurement Independent QUADRANT POWER TILT	3.69	9.74	20.0
QUADRANT POWER TILT as Measured by:			
Symmetrical Incore Detector System	2.30	7.71	20.0
Power Range Channels	0.96	5.88	20.0
Minimum Incore Detector System	1.72	3.71	20.0

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TABLE 2
DND MARGIN

Parameter	<u>LIMITS</u>		
	Four Reactor Coolant Pumps Operating	Three Reactor Coolant Pumps Operating	One Reactor Coolant Pump Operating in Each Loop
Reactor Coolant Hot Leg Temperature, T_H °F	≤ 609.3	$\leq 609.3^{(1)}$	≤ 609.3
Reactor Coolant Pressure, psig ⁽²⁾	≥ 2060.4	$\geq 2056.4^{(1)}$	≥ 2091.4
Reactor Coolant Flow Rate, gpm	a. $> 370,496$ with THERMAL POWER $\leq 2717 \text{ MW}_t$ ⁽³⁾ b. $> 373,120$ with $2717 \text{ MW}_t < \text{THERMAL POWER} \leq 2744 \text{ MW}_t$ ⁽⁴⁾ c. $> 377,000$ with $2744 \text{ MW}_t < \text{THERMAL POWER} \leq 2772 \text{ MW}_t$	$\geq 280,400$	$\geq 182,800$

⁽¹⁾ Applicable to the loop with 2 Reactor Coolant Pumps Operating.

⁽²⁾ Limit not applicable during either a THERMAL POWER ramp increase in excess of 5% of RATED THERMAL POWER per minute or a THERMAL POWER step increase of greater than 10% of RATED THERMAL POWER.

⁽³⁾ The Nuclear Overpower trip setpoint shall be reduced to $\leq 103.5\%$ of RATED THERMAL POWER.

⁽⁴⁾ The Nuclear Overpower trip setpoint shall be reduced to $\leq 104.5\%$ of RATED THERMAL POWER.

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APPENDIX 1
SURVEILLANCE REQUIREMENTS

Appendix 1 data sheets list the surveillance requirements for ascension from Mode 3 to Mode 2.

- a. The INITIALS block for each requirement certifies that satisfactory data for the applicable Surveillance Procedure has been collected within the time interval indicated in the SURV FREQ block and is available for audit.
- b. The DATE SP SATISFIED block shall contain the date of the last satisfactory performance of the applicable Surveillance Procedure.
- c. The NAME, DATE, TIME entries at the bottom of the MODE columns signify that surveillance requirement compliance has been verified and that entry may be made into the specified OPERATIONAL MODE.
- d. When a Surveillance Procedure is established, the schedule of surveillance relevant to that procedure is a function of that procedure, the responsible supervisor and the Tech Spec Surveillance Program (AP1010).

APPENDIX 1

Mode 3 to Mode 2

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DATE SP SATISFIED	INITIALS	SURV. FREQ.	RESPON- SIBILITY	S.P. NO.	T.S. NO.	DESCRIPTION
		S,D	OPS	2301-S1	REFER TO 2301-S1	SHIFT AND DAILY CHECKS
		7 da	OPS	2301-W1	REFER TO 2301-W1	WEEKLY CHECKS
		31 DA	IC	2302-M1	4.6.4.1	H ² ANALYZER CHAN CALIB
		92 da	IC	2302-Q1	4.3.1.1.1 Tab4.3-1(2)	PWR RANGE INSTR. CALIB

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APPENDIX 1

Mode 3 to Mode 2

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DATE SP SATISFIED	INITIALS	SURV. FREQ.	RESPON- SIBILITY	S.P. NO.	T.S. NO.	DESCRIPTION
		18 mo.	IC	2302-R1.1	4.3.1.1.1 Tab 4.3-1(5,6)	RC PRESS H/L CHAN CALIB
		18 mo.	IC	2302-R1.2	4.3.1.1.1 Tab 4.3-1(3,7)	RC TEMP CH AND PRESS/TEMP COMPARATOR CALIB
		18 mo.	IC	2302-R1.3	4.3.1.1.1 Tab 4.3-1(4)	RC FLOW CHAN CALIB
		18 mo.	IC	2302-R1.4	4.3.1.1.1 Tab 4.3-1(8)	RC PUMP/FLUX COMPARATOR CHAN CALIB
		18 mo.	IC	2302-R1.5	4.3.1.1.1 Tab 4.3-1(9)	RB PRESS-HIGH CHAN CALIB
		18 mo.	IC	2302-R13	4.6.4.2(b.1)	H ² RECOMBINER CHAN CALIB
		31 da	OPS	2303-M4	4.1.3.1.2 4.1.3.2.2	CRD MOVEMENT
		31 da	OPS	2303-M13	4.6.4.3(a)	RB H ² PURGE/CLEANUP OPER CHECK
		31 da	OPS	2303-M37	4.6.4.4(a)	H ² MIX SYS REM START AND OPER CK

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APPENDIX 1

Mode 3 to Mode 2

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DATE SP SATISFIED	INITIALS	SURV. FREQ.	RESPON- SIBILITY	S.P. NO.	T.S. NO.	DESCRIPTION
		92 da	OPS	2303-Q3	4.6.4.2(a)	H ² RECOMBINER FUNCTIONAL
		18 mo.	OPS/IC	2303-R1	4.1.3.5	ROD DROP TIMES
		18 mo.	IC	2303-R2	4.3.1.1.3 Tab 3.3-1	RPS-RESPONSE TIMES
		18 mo.	OPS	2303-R14	4.6.4.2(b.2,3,4)	H ² RECOMBINER OPER TEST
		18 mo.	HP/Enrg	2303-R15	4.6.4.3(b-f)	H ² PURGE/EXH PERFORM. EVALUATION
		31 da	IC	2602-M1	4.2.1 4.2.3 4.2.2 4.2.4	INCORE BACKUP RECORDER CALIB

ALL TECH SPEC REQUIREMENTS FOR ENTRY INTO MODE 2 HAVE BEEN SATISFIED:

PERFORMED BY:

APPROVED BY:

DATE

TIME

DATE

TIME

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CCS 59
APR 23 1979

2102-1.3
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APPENDIX 2
SURVEILLANCE REQUIREMENTS

Appendix 2 data sheets list the surveillance requirements for ascension from Mode 2 to Mode 1.

- a. The INITIALS block for each requirement certifies that satisfactory data for the applicable Surveillance Procedure has been collected within the time interval indicated in the SURV FREQ block and is available for audit.
- b. The DATE SP SATISFIED block shall contain the date of the last satisfactory performance of the applicable Surveillance Procedure.
- c. The NAME, DATE, TIME entries at the bottom of the MODE columns signify that surveillance requirement compliance has been verified and that entry may be made into the specified OPERATIONAL MODE.
- d. When a Surveillance Procedure is established, the schedule of surveillance relevant to that procedure is a function of that procedure, the responsible supervisor and the Tech Spec Surveillance Program (AP1010).

APPENDIX 2

Mode 2 to Mode 1

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DATE SP SATISFIED	INITIALS	SURV. FREQ.	RESPON- SIBILITY	S.P. NO.	T.S. NO.	DESCRIPTION
		S,D	OPS	2301-S1	REFER TO 2301-S1	SHIFT AND DAILY CHECKS
		7 da	OPS	2301-W1	REFER TO 2301-W1	WEEKLY CHECKS
		18 mo.	IC	2302-R4	4.3.3.2 (b)	INCORE DETECTOR CHAN CALIB
		18 mo.	OPS	2303-R4	4.2.5.2	RCS TOTAL FLOW MEASUREMENT (When at 100% RTP)
		31 da	OPS	NOTE 1 2311-F2	4.2.2.1 (b), 4.2.2.2 4.2.3.1 (b), 4.2.3.2	POWER DISTRIBUTION (When > 20% RTP)

ALL TECH SPEC REQUIREMENTS FOR ENTRY INTO MODE 1 HAVE BEEN SATISFIED:

PERFORMED BY:	DATE	TIME	APPROVED BY:	DATE	TIME
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NOTES: 1 Provisions of Tech Spec 4.0.4 Not Applicable.

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APPENDIX 3

MECHANICAL MANEUVERING RECOMMENDATIONS

The following are the recommended maneuvering limits for TMI-2, Cycle 1:

1. The maximum rate of power increase below 20% full power shall be 10% per hour.
2. Above 20% power, normal operating procedures (Tech Spec 3.1.3.9) will apply unless the reactor has operated at less than 20% power for more than 48 hours.
3. If the power level has been below 20% full power for greater than forty-eight (48) hours, the maximum rate of power increase above 20% full power shall be 30% per hour with a five (5) hour hold at 20% full power below the power level cutoff and a five (5) hour hold at the power level cutoff. These holds can run concurrently with holds required by the Technical Specification.
4. During the initial power escalation at cycle startup or immediately following a control rod interchange, the initial escalation above the 75% full power shall be limited to 3% per hour, with a five (5) hour hold at the power level cutoff. These holds can run concurrently with Technical Specification holds where applicable.
5. With the exception of item 4 above, no restrictions are placed on required physics startup tests.

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TMI DOCUMENTS

DOCUMENT NO: TM-014

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