CONTROLLED COPY
CENTRAL FILE

2102-3.2
Revision 13
03/10/79

THREE MILE ISLAND NUCLEAR STATION
UNIT #2 OPERATING PROCEDURE 2102-3.2
UNIT COOLDOWN

Table of Effective Pages

Page	Date	Revision	Page	Date	Revision	Page	Date	Revision
1.0	04/18/78	6	21.0	06/21/77	1			
2.0	05/17/77	0	22.0	04/18/78	6			
3.0	01/31/78	4						
4.0	06/28/78	9						
5.0	08/04/77	2						
6.0	11/18/77	3						
7.0	06/28/78	9						
8.0	01/05/79	12						
8.1	01/05/79	12						
9.0	06/21/77	1						
10.0	01/05/79	12						
10.1	01/05/79	12						
11.0	08/25/78	10						
11.1	06/28/78	9						
12.0	06/28/78	9						
13.0	01/31/78	4						
13.1	01/31/78	4						
14.0	03/10/79	13						
15.0	03/10/79	13						
15.1	03/10/79	13						
16.0	03/30/78	5						
17.0	03/30/78	5						
18.0	06/21/77	1						
19.0	04/18/78	6						
20.0	03/10/79	13						

Unit 1 Staff Recommends Approval
Approval NA Date —
Cognizant Dept. Head

Unit 2 Staff Recommends Approval
Approval NA Date —
Cognizant Dept. Head

Unit 1 PORC Recommends Approval
NA Date —
Chairman of PORC

Unit 2 PORC Recommends Approval
RPWarren Date 3/7/79
V. Chairman of PORC

Unit 1 Superintendent Approval
NA Date —

Unit 2 Superintendent Approval
Jo Logan Date 3/10/79

Manager Generation Quality Assurance Approval NA Date 279

TMI 55-A Rev 8/77

THREE MILE ISLAND NUCLEAR STATION

UNIT #2 OPERATING PROCEDURE 2102-3.2

UNIT COOLDOWN

Table of Contents

NOTE: The following procedures should be performed in conjunction with this procedure: 2303-Q7, 2313-CD1, and 2313-CD2. (See steps 4.2, 4.17, 4.26, and 4.27 of this procedure)

195 280

THREE MILE ISLAND NUCLEAR STATION

UNIT #2 OPERATING PROCEDURE 2102-3.2

UNIT COOLDOWN

1.0 REFERENCES.

1.1 Drawings Applicable for Operation.

1.1.1 Reactor Coolant System: BR-2024.

1.1.2 Makeup and Purification System: BR-2024.

1.1.3 Decay Heat Removal System: BR-2026.

1.1.4 Radwaste Disposal - Reactor Coolant Liquid: BR-2027.

1.1.5 Chemical Addition: BR-2025.

1.1.6 Main and Reheat Steam System: BR-2002.

1.1.7 Bleed Steam System: BR-2003.

1.1.8 Auxiliary Steam System: BR-2004.

1.1.9 Feedwater and Condensate Polishing System: BR-2005.

1.1.10 Makeup Water Treatment and Condensate Polishing System: BR-2006

1.1.11 Steam Generator Secondary Side Vents and Drains Systems: BR-2414.

1.2 Operating Procedures Applicable for Operation.

1.2.1 2101-1.1 Nuclear Plant Limist and Precautions.

1.2.2 2102-3.1 Unit Shutdown.

1.2.3 2102-3.3 Decay Heat Removal Via OTSG.

1.2.4 2103-1.2 Soluble Posison Concentration Control.

1.2.5 2103-1.3 Pressurizer Operation

1.2.6 2103-1.4 Reactor Coolant Pump Operation.

1.2.7 2103-1.5 H_2 Addition and Degasification.

1.2.8 2104-1.2 Makeup and Purification.

1.2.9 2104-1.3 Decay Heat Removal.

1.2.10 2104-3.1 Nuclear Service River Water.

1.2.11 2104-3.3 Decay Heat Closed Cooling Water.

1.2.12 2105-1.2 Reactor Protection System.

1.2.13 2106-1.3 Auxiliary Steam.

1.2.14 2106-1.5 Turbine Bypass.

1.2.15 2106-2.1 Condensate.

1.2.16 2106-2.4 Feedwater.

1.2.17 2106-2.5 OTSG Secondary Fill, Drain, and Layup.

1.2.18 2203-1.4 RC Pump and Motor Emergencies.

1.2.19 2401-4A Removal and Replacement of Manway and Inspection Covers of the OTSG.

1.3 Manufacturer Instruction Manuals.

Not Applicable.

1.4 System Descriptions

Not Applicable.

1.5 Curves, Tables, etc.

1.5.1 Figure 1 - Reactor Coolant System Cooldown Limitations.

1.5.2 Figure 2 - Simultaneous DH System/RC Pump Operation Limits for Cooldown.

1.5.3 Figure 3 - Boron concentrations as function of life.

2.0 <u>LIMITS AND PRECAUTIONS</u>

2.1 Equipment.

2.1.1 Reactor Coolant Temperature, Pressure, and Cooldown Rates shall be maintained within limits specified in Figures 3.4-2 and 3.4-3 of T.S. 3.4.9.1. (Refer to Figures 1 and 2 attached) as indicated on Loop A/B Tc Wide TT2 or TT4, RC-5A/B-TT2 or TT4 on Panel 4.

195 282

2.1.2 Presurizer Maximum Cooldown Rate is 100°F/hr. (TS 3.4.9.2a).

2.1.3 The maximum allowable temperature difference between the pressurizer and the spray fluid is 410°F (TS 3.4.9.2b).

2.1.4 The temperature of the secondary coolant in the steam generators as indicated by "Steam Generator Downcomer Temperature - Lower A(B)" SP-3A(B)-TT1,2 on Panel 4 shall be > 110°F when the pressure of the secondary coolant in the steam generator is > 237 psig as indicated by "Steam Generator Main Steam Pressure" (SP-6A(B)-TT1,2 on Panel 4 (T.S.3.7.2.1).

2.1.5 Seal water injection flow is required to all reactor coolant pumps when reactor coolant temperature is above 200°F and pressure is above 200 psig, except when operating in the Loss of Injection Mode.

2.1.6 The maximum allowable DH cooler ΔT between the tube and shell is 200°F. (Determined by subtracting DHCCW Temperature Loop A(B) indicated on DC-T1-967(968) from DH Pump Suction Temperature A(B) indicated on DH-6A(B)-TI1(2)).

2.1.7 For shutdown operations, with Gps. 1 & 2 withdrawn, maintain the main feedwater nozzles submerged.

2.1.8 Once cooled and depressurized to < 200°F and < 200 psig respectively and all RC pumps have been stopped, secure seal injection and isolate seal bleedoff. Seal return should be secured before going below 150 psig.

2.1.9 Maximum allowable temperature change rate between 0-15% power is 100°F/hr. (TS 3.4.9.1 - applicable at all times).

2.1.10 When cooling down with a dry steam generator, the maximum allowable temperature difference between the shell temperature (as indicated by SP-2A(B)-TE1-5) of the dry OTSG and the RC

195 283

Temperature (as indicated by RC-5A(B)-TT2,4) in the loop with the dry steam generator is 100°F.

2.1.11 The maximum ΔT between the feedwater line temperature (as indicated by SP-5A(B)-TE1,2) and steam generator lower downcomer temperature (as indicated by RC-5A(B)-TT2,4) is 440°F when using the main feedwater nozzles.

2.1.12 Do not open the DH letdown line valves until the reactor coolant system pressure is below the maximum allowable pressure for DH system operation (refer to Figure 2).

2.1.13 Before RC system temperature decreases to 500°F, at least one RC pump must be secured.

2.1.14 The closing of the core flood tank isolation valves must occur when RC system pressure is < 750 psig but > 700 psig.

2.2 Administrative.

2.2.1 When the DH System is in operation without any RC pumps operating, "DH Removal Suction Temperature Loop A(B)" (DH6-T1-1(2) on Panel 8) will be used as the RCS temperature indicator (refer to Figure 2).

2.2.2 When operating at an RCS pressure < 500 psig, the low range RCS pressure instrument must be used for operational (not recording) purposes.

2.2.3 Prior to unit cooldown, verify that correct amount and concentration of boric acid is available for injection into the MU/RC system to provide required shutdown margin at cold conditions.

2.2.4 When adding makeup water to MU/RC system, insure that the water quality is within limits set forth in plant chemical manual.

2.2.6 During boration verify boron concentration approximately every 30 ppm.

2.2.7 If cooldown is being conducted in order to remove the reactor vessel head, ensure that the more restrictive of the following reactivity conditions are met:

2.2.7.1 A K_{eff} of 0.95 or less, which includes a 1% $\Delta K/K$ conservative allowance for uncertainties, or

2.2.7.2 A Boron Concentration of $\geq$ 1800 ppm, which includes a 50 ppm conservative allowance for uncertainties.

2.2.8 When the reactor power is less than 15% FP, do not request a printout of the following computer groups unless their operability below 15% FP has been verified:

GP.#	Description
20	Worst Case Thermal Conditions
31	Fluid Conditions
38	Core Average Thermal Conditions
39	Core Map of Thermal Conditions
40	All Thermal Outputs
53	Selected Assembly Thermal Conditions

2.2.9 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 lincesee shall notify the Commission, review the matter and record the results of the review, including the cause of the condition and the basis for corrective action taken to preclude reoccurrence. Operation shall not be resumed until authorized by the Commission.

2.2.10 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.

2.2.11 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 requirement of T.S. 6.9 shall be followed.

2.2.12 The active means of decay heat removal may be interrupted providing the following limits are not exceeded:

1. Reactor coolant temperature and pressure are within the limits of cooldown curve Figure 1.
2. Pressurizer level above 100".
3. OTSG average shell temperature must be within 60°F of RCS water temperature.
4. No RCS Boron dilution is in progress.

2.2.13 Ensure that the safety rods are not "cocked" after any abnormal RCS depressurization which exceeds the temp. and pressure limits of the CRDM's.

3.0 PREREQUISITES (Initial each step when completed).

_____3.1 Reactor at Hot Standby (Mode 3) with one reactor coolant pump running per loop and safety rod groups 1 & 2 100% withdrawn

195 286

_____3.2 Degassing of reactor coolant system is complete in accordance with 2102-3.1. If additional degas is needed during cooldown, refer to 2103-1.5.

_____3.3 Heat dissipation using steam generators and turbine bypass valves and/or atmosphere dump valves is in progress.

_____3.4 Sufficient boric acid solution and reactor grade water available to makeup to the reactor coolant system during cooldown. Required final boron concentration has been determined as per 2103-1.2 and Figure 3 and added to the RCS prior to decreasing Tave below 500°F.

_____3.5 Pressurizer level indicator/controller is in auto, set to maintain pressurizer level at 220".

_____3.6 Letdown flow from RCS is secured, MU-V376 closed.

_____3.7 OTSG level maintained between 97 and 99% on operate range level indication to keep main FW nozzles submerged. If OTSG water level exceeds 390" (ie > 100% in the Operate Range) invoke action statement b of T.S. paragraph 3.4.5

_____3.8 One feedwater pump has been secured per 2106-2.4.

_____3.9 One feedwater pump and gland steam system are supplied from auxiliary steam.

4.0 PROCEDURE (Initial each step when completed).

NOTE: Completion of Appendix A, Mode 3 to 4 checklist, should be completed before cooling below 280°F.

NOTE: Subsections 4.2, 4.17, 4.26, 4.27, and 4.39 of this operating procedure contain references to surveillance procedures 2303-Q7, 2313-CD1, and 2313-CD2 which include valve testing.

195 287

4.2 Lineup borated and demineralized water addition systems to makeup system during cooldown. Perform the following operations while cooling down.

_____4.2.1 Add borated water as required to maintain MU tank normal level. Complete Section 6.1 of 2313-CD1.

NOTE: Perform this step (4.2.1) in conjunction with surveillance procedure 2313-CD1, subsection 6.1.

_____4.2.1.1 Required final boron concentration has been determined as per 2103-1.2 and Figure 3 and added to the RCS prior to decreasing Tave below 500°F.

_____4.2.2 When required boron addition is completed, add demineralized or borated RC bleed in batches. If adding water of

195 288

lesser boron concentration than that of reactor coolant system, evaluate affects by monitoring source range instrumentation.

NOTE: Boration and concentration makeup should be complete prior to placing DH System in operation.

_____4.3 Turn pressurizer heaters off on Panel 4.

4.4 Complete the following switch line up at panel 4 when steam pressure is between 800 and 650 psig.

_____4.4.1 A stm. line break F.W. Latching System - Bypass.

_____4.4.2 B Stm. line break F.W. Latchig System - Bypass.

NOTE: Failure to complete this step before 600 psig will result in automatic initiation of the Feedwater Latching System.

_____4.5 Place the following on computer trend recorders until cooldown is complete. Mark the recorders with date, time, and scale, and every scale change and time. When cooldown is complete, remove chart paper date and time and attach to signed off procedure.

(1) Pt 0397 Loop B Tcold.

(2) Pt 0398 RC Pressure.

(3) Pt 0389 Pressurizer Temperature.

(4) Pt 0394 Loop A Tcold (optional).

NOTE: During pressurizer auxiliary spray operation, monitor spray water temperature differential per SP-2311-7.

The above satisfies Surveillance Requirements of TS 4.4.9.1.1 and 4.4.9.2. In addition plot RCS Temperature and Pressure on

195 289

figure 1 every 30 minutes. Record the time of each 2 hour data point on the figure.

_____4.6 Place turbine bypass valves in manual and adjust bypass valves and pressurizer spray valve to maintain a cooldown rate such that a maximum cooldown of 100°F in any one hour period is not exceeded (TS 3.4.9.1).

NOTE: Maintain pressurizer level at 220" without exceeding the capacity of the makeup system.

_____4.6a Maintain feedwater nozzles submerged through this procedure by establishing steam generator levels at 97 to 99% on the operating level instruments in accordance with 2106-2.5. At the same time, open the bypass line around the feedwater control valve (FW-V66A/B) and control OTSG level by using either the lower tube sheet drains in order to let down through the SG Hot Drain Cooler to the Heater Drain Tank per 2106-2.5 Section 4.6 or open Turbine Bypass Valves to steam down as required. If OTSG water level exceeds 390" (i.e. if water level is > 100% in the operate range) invoke action statement b of Tech. Spec. paragraph 3.4.5.

_____4.7 Insure Auxiliary steam is available for supplying gland sealing steam and feedwater heating per 2106-1.3.

_____4.7.1 If not already in progress establish constant OTSG blowdown thru normal sample valves or thru hot drain coolers. This will help to keep from concentrating chemicals in OTSG.

195 290

_____4.8 At a reactor coolant pressure of 2075 psig, stop cooldown and maintain steady RC System temperature and pressure. When steady conditions are met, insert safety groups 1 & 2 and verify group 8 at ≈ 38 inches. If refueling of reactor is to follow, fully insert rod group 8.

NOTE: Inserting rod group 8 may add reactivity and a small increase in count rate may be observed.

_____4.9 Trip control drive breakers and depressurize to less than 1820 psig using spray valve.

_____4.10 At approximately 1800 psig, place all four reactor protective channels in shutdown bypass.

_____4.11 Reset RPS high flux trip point to 5% as per 2105-1.2.

_____4.12 Recock safety groups 1 & 2 to full out position. Verify subcritical multiplication and plot 1/M vs rod position during rod withdrawal to insure criticality is not attained on the safety group.

_____4.13 At < 1920 psig but > 1800 psig, bypass all the channels of the safety injection system (6 buttons).

_____4.14 Continue cooldown at 100°F/hr. Do not exceed 100°F change in any 1 hour. Reset Pressurizer Level control setpoint to 100" (25% setpoint). At RCS pressure < 1000 psig place the control switch for the 2 non operating MUP's in pull to lock.

_____4.14a At 600 psig steam pressure place MS-V207, EF-P-2A & 2B control switches in pull to lock. Insure EF-V11A & B are in hand and are closed. Also insure EF-V12A & 12B are closed. This will prevent feeding the OTSG's through the EF lines with the condensate pumps once OTSG pressure decreases.

_____4.15 Secure and trip the operating feedpump turbine per 2106-2.4.

CAUTION: Do not isolate both feedwater pumps flowpaths.

NOTE: Feedwater flow will then continue through the idle feedwater pumps.

_____4.16 Before RCS pressure goes below 750 psig, close CF-V-1A and CF-V-1B to test the alarms per 2303-R6.

_____4.17 At < 750 psig but > 700 psig RC system pressure, insure core flood valves CF-V1A & 1B are closed. Open and tag the power supplies to these valves.

195 292

NOTE: At an RC system pressure of 530 psi ± 20 psi, with pressure and temperature within the heatup/cooldown curve, Surveillance Procedure 2313-CD2 should be performed.

_____4.18 Place gland sealing steam on aux steam as per 2106-1.4.

_____4.19 At 150 psig steam pressure, stop condensate booster pump per 2106-2.1.

195 293

_____4.19a Before reducing RC temperature below 280°F, the mode 3 to mode 4 checklist should be completed.

_____4.20 At less than 500 psig RC System pressure, switch to use of RC System low range pressure indication (RC-3A-PI2) and Figure 2 for cooldown limits.

_____4.21 At 275°F and < 450 PSIG RC system pressure place the NDTT mode key switch for the electro relief valve RC-R2 in AUTO to activate the 500 psig relief setpoint. Ensure the electromatic relief valve control switch is also in AUTO.

_____4.22 At 360 psig RC System pressure or as specified by curve 3 of Figure 2, insert safety rod groups 1 & 2. Open and Red Tag open the trip breakers. Insure a 1% Δk/k shutdown margin by verifying RC System boron concentration is greater than the concentration required for (< 300°F) from Figure 3.

_____4.23 Place makeup control valve in manual and establish a 25 inch per hour increase in pressurizer level to 320 inches.

_____4.23a Reduce the number of operating RCP's to two in one loop if not already accomplished per 2103-1.4.

_____4.24 Reduce RC System temperature to approximately 250°F.

_____4.25 With RC System temperature at approximately 250°F, reduce the RC pressure to the midpoint of the operating "Window" of Curve 5 or 6 of Figure 2 for two RC Pump operation per loop (250-288 psig). Maintain RC pressure within this operating "Window" by using the pressurizer spray valve and SCR heater banks as required per 2103-1.3.

_____4.26 With the RC pressure under steady control at the midpoint of the operating "Window" place the DH System in service per

195 294

2104-1.3 Decay Heat Removal. The DH System return temperature to the reactor vessel shall be established at a value no less than allowed by the (75°F) maximum step temperature change. The 100°F change in any one hour still applies.

NOTE: Prior to starting DH System, insure that Mechanical Draft Cooling Tower is in operation with a stable efficient temperature. After starting DH System, monitor effluent temperature and Δ T closely. Insure that subsequent tower operation will not change Δ T at a rate greater than 2°F/hr and that the differential temperature limitations of the ETS are not exceeded.

NOTE: Following step 4.26, perform subsection 6.2 of Surveillance Procedure 2313-CD1.

4.27 Line up auxiliary pressurizer spray from the DH System as follows:

_____4.27.1 "CLOSE" pressurizer spray valve (RC-V1).

_____4.27.2 "CLOSE" pressurizer spray isolation valve (RC-V3).

_____4.27.3 "OPEN" DH auxiliary spray isolation valve (RC-V149) and control as required to control pressure (manual spray line valves DH-V186A or V186B and DH-V187 should be open per 2104-1.3).

NOTE: Before proceeding to 4.28, perform subsection 6.3 of Surveillance Procedure 2313-CD1.

_____4.28 Commence shift and Daily check of differential temperature of the DH water temperature and the pressurizer temperature (TS 4.4.9.2).

_____4.29 Once the DH System has been brought on line and RC System pressure control can be maintained satisfactorily with RC-V149, "SHUT OFF" the running RC pumps per 2103-1.4.

NOTE: Once the RC pumps are shut off, the following should be noted:

1. The lower pressure limit for NPSH (Curve 6 of Figure 2) is no longer applicable.
2. The indicated temperature used with Figure 2 should now be taken from the DH System return temperature to the reactor vessel (DH-2-TI-1 and 2).

_____4.30 Before reducing RCS temperature below 200°F, the Mode 4 to Mode 5 checklist of Appendix "B" should be completed.

NOTE: A Boron Injection flowpath must be established before the makeup pumps are tagged out. 2301-M2 Attachment 3, 4A or 4B must be current.

CAUTION: Do not exceed a cooldown rate of 100°F/hr in the pressurizer.

_____4.31 Slowly "OPEN" the DH auxiliary spray isolation valve (RC-V149) until a temperature increase is detected in the pressurizer surge line. Adjust the DH auxiliary spray isolation valve (in the close direction) until the temperature returns to its previous value. With this amount of auxiliary spray flow, depressurize the RC System to a minimum of 45 psig as read on low range pressure indication (RC-3A-PI2) and allow pressurizer level to increase to 320 inches.

NOTE: This spray adjustment is to prevent pressurizer out surge into the RC hot leg. The pressurizer surge temperature should be monitored closely throughout the continuation of cooldown. If the surge line temperature increases again, adjust the auxiliary

spray throttle valve (in the close direction) until the temperature reutrns to its previous value.

_____4.32 "CLOSE" the Turbine Bypass Valves.

_____4.33 Continue RC System cooldown using DH System not to exceed 100°F in any 1 hour.

_____4.33.1 Verify OTSG chemistry before securing feed water heating. Drain and refill OTSG's as necessary.

_____4.34 After the DH System is in service, OTSG layup may be initiated per 2106-2.5. If OTSG's are to be placed in Full Wet Layup, install pins in hangers MSH-105, -106, -169, -115, -116, -170, -125, -126, -171, -135, -136, -172. The hanger pin holes may have to be aligned by adjusting the hanger turnbuckles to allow for insertion of the pins. If the hanger turnbuckle needs to be adjusted, measure the distance between the screws using an inside caliper or other suitable measuring device and record this distance in Appendix C. During plant heatup when the hanger pins are to be removed the hanger turnbuckles must be reset to the distances recorded in Appendix C.

_____4.34.a. Insure a boration injection flowpath verification is current (2301-M2 Attachment 3 or 4A or 4B).

_____4.35 Secure RC pump seal injection and stop the operating MU Pump when RC System temperature and pressure are below 200°F psig per 2104-1.2. Seal return must be secured before going below 150 psig. When RCS pressure is < 150 psig rack out the breakers for all the MU Pumps.

_____4.36 When the RC System temperature is below 200°F, rack out the reactor building spray pumps (BS-P1A & P1B) in order to eliminate any inadvertent actuation and close DH-V133A and B.

_____4.37 At 140°F RC System temperature (as indicated on DH-6-TI-1 and 2) use RC-V149 to carefully reduce RC-3A-PI2 pressure to 15 psig. Cooldown is now considered complete; however, DH System operation should continue in order to remove residual decay heat from the core. Refer to 2103-1.6 for total depressurization of RC System and N_2 blanketing as required.

_____4.38 Secure support systems when no longer required.

_____4.39 Perform Surveillance Procedure 2303-Q7, Cold Shutdown Valve Operability Test.

DOCUMENT/ PAGE PULLED

ANO. 7906140330

NO. OF PAGES 3

REASON:

- [x] PAGE ILLEGIBLE:
  - [ ] HARD COPY FILED AT: PDR (CF)
    OTHER _____
  - [ ] BETTER COPY REQUESTED ON ___/___/___
- [ ] PAGE TOO LARGE TO FILM:
  - [ ] HARD COPY FILED AT: PDR CF
    OTHER _____
  - [ ] FILMED ON APERTURE CARD NO. _____

195 300

APPENDIX A

MODE 3 TO MODE 4 SURVEILLANCE CHECKLIST

Mode 3 to Mode 4

DATE SP SATISFIED	INITIALS	SURV. FREQ.	RESPON-SIBILITY	SP NO.	TS NO.	DESCRIPTION
		18 Mo.		2305-R1	4.5.3 (c)	ECCS EM Sump Clean Insp.
		18 Mo.		2303-R8	4.5.3 (d)	ECCS Isol, Inlk/Leak Insp.
		31 Da.		2301-M7	4.5.3 (b)	ECCS Vlv lineup Verif - S/D
		31 da.		2303-M1/M2	4.5.3 (f)	MU & DHR Pump Funct.
		31 da.		2303-M2	4.1.2.5	DHR PMP Oper Test

NAME_____

DATE_____

TIME_____

195 301

APPENDIX B

MODE 4 TO MODE 5 SURVEILLANCE CHECK LIST

Mode 4 to Mode 5

DATE SP SATISFIED	INITIALS	SURV. FREQ.	RESPON-SIBILITY	SP NO.	TS NO.	DESCRIPTION
		SD		2301-S1	4.1.2.8 (b)	BWST Temp - S/D
		7 da		2301-W1	4.1.2.1 (a)	Boron Sys Flow Path Temp.
		7 da		2301-W1	4.8.1.2.1 (a)	AC Pwr Bkr Align CK-S/D
		7 da		2301-W1	4.8.2.2	AC BUS Bkr Align Ck
		7 da		2301-W1	4.8.2.4.1	DC Bus Bkr Align Ck
		7 da		2301-W2	4.8.2.4.2 (a)	Battery Check
		31 da		2303-M26	4.1.2.6	BA Pump Funct S/D
		7 da		2304-W1	4.1.2.8 (a)	Boron Source Conc. - S/D
		31 da		2301-M2 ATT 3,4A or 4B	4.1.2.1 (b)	*Boron Inj Vlv Lineup Verif.
		31 da		2303-M16	4.8.1.2.2 (a)	DG Fuel Inv/Oper Ck
		31 da		2303-M1	4.1.2.3	MU Pump Oper Test
		92 da		2304-Q1	4.8.1.2.2 (b)	DG Vis, H_2O + SED ck
		92 da		2301-Q1	4.8.2.4.2 (b)	Battery Insp - S/D

NAME_____

DATE_____

TIME_____

* 2301-M2 Attachment 3, 4A or 4B must be current before MU pumps are disabled in Step 4.35. Progress into Mode 5 need not be delayed as long as 2301-M2 Attachment 1 and 2A or 2B are current.

APPENDIX B

MODE 4 TO MODE 5 SURVEILLANCE CHECKLIST

Mode 4 to Mode 5

DATE SP SATISFIED	INITIALS	SURV. FREQ.	RESPON-SIBILITY	SP NO.	TS NO.	DESCRIPTION
		18 Mo.		2303-R16	4.8.1.2.1 (b)	AC Pwr Bus XFER -SD
		18 Mo.		2305-R3	4.8.1.2.2 (c)	DG Insp - S/D
		18 Mo.		2303-R21	4.8.1.2.2 (c) (2-6)	DG Auto Stary & Load Seq.
		18 Mo.		2303-R22	4.8.2.4.2 (c) (d)	Battery Cap. Test -S/D

NAME_____

DATE_____

TIME_____

APPENDIX C

HANGER NUMBER	DISTANCE BETWEEN SCREWS
MSH-105	
MSH-106	
MSH-169	
MSH-115	
MSH-116	
MSH-170	
MSH-125	
MSH-126	
MSH-171	
MSH-135	
MSH-136	
MSH-172	

TMI DOCUMENTS

DOCUMENT NO: TM-0404

COPY MADE ON _____ OF DOCUMENT PROVIDED BY

METROPOLITAN EDISON COMPANY.

Wilda R. Mullinix, NRC

7906140330

195 278