

THREE MILE ISLAND NUCLEAR STATION
UNIT #1 EMERGENCY PROCEDURE 1202-37
COOLDOWN FROM OUTSIDE THE CONTROL ROOM

PORC CHAIRMAN
UNIT 1

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Unit 2 Staff Recommends Approval

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THREE MILE ISLAND NUCLEAR STATION
UNIT #1 EMERGENCY PROCEDURE 1202-37
COOLDOWN FROM OUTSIDE THE CONTROL ROOM

37.1 Symptoms

1. Conditions such as fire or smoke makes continued occupancy of the Control Room impossible.

NOTE: It is very improbable that any condition could arise which would prevent safe occupancy of the control room; however, if such a condition does occur and total evacuation of the control room becomes necessary, then the actions provided in this procedure will be followed to achieve cold shutdown.

37.2 Immediate Action

A. Automatic Action

No automatic action is associated with this event.

B. Manual Action

1. Make every effort to eliminate the cause for the control room evacuation. As soon as the cause has been eliminated, re-enter the control room and continue plant cooldown operations from the control room.
2. Before evacuating the control room, complete the following actions:
 - a. Depress REACTOR TRIP pushbutton on console CC.
 - b. Start the motor driven EMERGENCY FEED PUMPS from console CL & CC.
 - c. Depress 1A FEEDPUMP TURBINE and 1B FEEDPUMP TURBINE TRIP push buttons on CL.

NOTE: This will AUTO START the STEAM DRIVEN
EMERGENCY FEED PUMP.

- d. Reduce number of REACTOR COOLANT PUMPS to one per loop.

NOTE: If possible keep RC-P-1A and RC-P-1C running for forced flow thru the core, pressurizer spray flow, and good mixing for letdown samples.

- e. Close MU-V-3, LTDN Block valve from console CC.
- f. Cross-tie the Nuclear and Turbine Plant channels of the M&I sound powered phones in the rear of panel PLF.
- g. Open MU-V-51, set maximum strokes on the boric acid pumps stroke counters and start both boric acid pumps from the vertical LWDS panel.
- h. Maintain makeup pump in operation and pressurizer level and seal injection control in automatic.

37.3 Follow Up Action

Objective: The objective of this procedure is to trip the reactor and initiate emergency boration prior to leaving the control room. Verify that the primary plant stabilizes at hot shutdown and if reentry into the control room is prohibited commence a controlled plant cooldown from outside the control room.

1. If the control room was evacuated before any or part of the above immediate manual actions were completed, proceed as indicated on the next page.

COMPONENT	C.R. ACTION	ACCOMPLISHED	ACTION OUTSIDE C.R. IF UNABLE TO ACCOMPLISH IN CONTROL ROOM	LOCATION
Reactor	Trip		Open Rod Drive Breakers 1A & 1B on 1G & 1L 480V Reactor Plant Bus	Control Tower Elev. 338'
EF-P-2A/2B	Start		At 1D and 1E E.S. 4160V Bus using 69 Key Start Locally	Control Tower Elev. 338'
FW-P-1A/1B	Trip		At the Front Standards Trip Turbines Manually	Turbine Bldg. Elev. 322'
RC-P-1A thru 1D	Maintain One Pump In Each Loop		At 1A and 1B 6900V Reactor Plant Bus using 69 Key Trip locally	Turbine Bldg. Elev. 322'
MU-V-3	Close		Manually close MU-V-109B, MU-V-99 and MU-V-97B	Aux. Bldg. Elev. 281' in M.U. System Valve Room
MU-P-1A, 1B, & 1C	Maintain One Pump In Operation		At 1D and 1E E.S. 4160V Bus using 69 Key Switch Locally	Control Tower Elev. 338'
Communications	Crosstie		At Hot Instrument Shop crosstie nuclear and Turbine Plt. Channels (Channels 1 & 2) (Install Prefabricated Jumper)	Control Tower Elev. 306'
MU-V-51	Open		Open locally by use of Manual Handwheel	Aux. Bldg. Elev. 281' on West Wall Near Seal Return Coolers
CA-P-1A/1B	Start		At 1A and 1B E.S. 480V M.C.C. start locally	Control Tower Elev. 322'

2. Upon leaving the control room, man the following locations:
 - a. Alternate communications center on elevation 322' in the control building at the test patch panel-Shift Foreman and one CRO.
 - b. 281' elevation in Auxiliary Building for Reactor Coolant System inventory control at the Makeup Valve manifold -1 man.
 - c. 295' elevation in the Intermediate Building for heat removal thru the steam generators-1 man for EF-V-30A&B and 1 man for MS-V-4A&B.

3. Pressurizer level control is in automatic with a makeup pump running with suction from the makeup tank thru MU-V-12. If necessary to take manual control, close MU-V-91A(B) and open MU-V-92.

When the Makeup Tank level indicates 20", open MU-V-14A to shift suction to the BWST and close MU-V-12 until the boric acid pumps have increased the Makeup Tank Level. Then additional boric acid can be added to the RCS from the Makeup Tank.

4. Heat can be removed from the RCS by throttling MS-V4A and B to control the cooldown rate. EF-V-30 & B can be used to control OTSG level at the 30" or at 50% on the operate range if the RC pumps are off.
5. Parameter readout and control means available at the Test Patch Panel.

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PARAMETER	READOUT	CONTROLLED BY
Pressurizer Level	0-400"	Automatic control or MU-V-92
Makeup Tank Level	0-100"	Alternate use of MU-V-12 & MU-V-14
RCS pressure	0-2500 psig	Use on-off control of pressurizer heaters at E & F MCC on elevation 322
RCS temperature	50-650 loop A	MS-V-4A
	50-650 loop B	MS-V-4B
OTSG Level (Operate Range)	0-100% OTSG A	EF-V-30A
	0-100% OTSG B	EF-V-30B
Operating RCP's Flow	Pump Pwr Monitor	

6. After establishing communications between the Shift Supervisors and stations listed in step 2, utilize EF-V-30A/B and MS-V-4A/B to maintain RC temp at 532⁰F. Monitor RCS Pressure and temperature in accordance with Figure #1 to assure that RCS is subcooled.
7. While maintaining 532⁰F, the CRO with the shift supv. will attempt to reman the control room and prove the ability to adequately control the parameter outlined in step 6 above. If this is possible, terminate the procedure and remain at hot shutdown or cooldown with normal operating procedures.

8. Monitor RC Pump Power Monitor for indication that Rx Coolant Pumps are running. If all Rx Coolant Pumps trip, raise OTSG level to 50% to promote natural circulation cooldown.
9. If unable to re-enter the control room, proceed with cooldown as outlined in the following steps:
 - A. Add the equivalent of 906 cu ft of 8700 ppm boric acid from the boric acid mix tank to the makeup tank.
 - B. Stop RC-PLC.
 - C. If a faster rate of makeup to the RCS is required, use the makeup system on the High Pressure Injection mode by opening MU-V-14's MU-V-16's and starting the ES selected makeup pumps. Also start the Decay Heat Closed and River Water systems to cool the makeup pumps.
 - D. Observe the temperature - Pressure relationship of Figure 7 in OP 1102-11 cooldown.

NOTE: During cooldown plot temperature/pressure in Figure 1 of 1102-11 every 30 minutes. Mark time of point in curve every 2 hours.

- E. When the reactor coolant system pressure decreases to less than or equal to 1650 psi and prior to 1550 bypass the three high pressure injection channels of ES actuation A & B by physically closing the following relays by pressing against the relay's magnet:
 1. Bistable auxiliary relay 62X/RC1A in ES Channel Relay Cabinet 1A.
 2. Bypass relay 43/RC1A in ES Channel Relay Cabinet 1A.

3. Bistable auxiliary relay 63X/RC2A in ES Channel Relay Cabinet 2A.
 4. Bypass relay 43/RC2A in ES Channel Relay Cabinet 2A.
 5. Bistable auxiliary relay 63X/RC3A in ES Channel Relay Cabinet 3A.
 6. Bypass relay 43/RC3A in ES Channel Relay Cabinet 3A.
 7. Bistable auxiliary relay 63X/RC1B in ES Channel Relay Cabinet 1B.
 8. Bypass relay 43/RC1B in ES Channel Relay Cabinet 1B.
 9. Bistable auxiliary relay 63X/RC2B in ES Channel Relay Cabinet 2B.
 10. Bypass relay 43/RC2B in ES Channel Relay Cabinet 2B.
 11. Bistable auxiliary relay 63X/RC3B in ES Channel Relay Cabinet 3B.
 12. Bypass relay 43/RC3B in ES Channel Relay Cabinet 3B.
- F. When the reactor coolant system pressure continues to decrease to less than or equal to 900 rsi and prior to 550 psi bypass the three low pressure injection channels of ES actuation A and B by physically closing the following relays by pressing against the relays magnet:
1. Bistable auxiliary relay 63X/RC4A in ES Channel Relay Cabinet 1A.
 2. Bypass relay 43/RC4A in ES Channel Relay Cabinet 1A.
 3. Bistable auxiliary relay 63X/RC5A in ES Channel Relay Cabinet 2A.
 4. Bypass relay 43/RC5A in ES Channel Relay Cabinet 2A.

5. Bistable auxiliary relay 63X/RC6A in ES Channel Relay Cabinet 3A.
 6. Bypass relay 43/RC6A in ES Channel Relay Cabinet 3A.
 7. Bistable auxiliary relay 63XRC4B in ES Channel Relay Cabinet 1B.
 8. Bypass relay 43/RC4B in ES Channel Relay Cabinet 1B.
 9. Bistable auxiliary relay 63X/RC5B in ES Channel Relay Cabinet 2B.
 10. Bypass relay 43/RC5B in ES Channel Relay Cabinet 2B.
 11. Bistable auxiliary relay 63X/RC6B in ES Channel Relay Cabinet 3B.
 12. Bypass relay 43/RC6B in ES Channel Relay Cabinet 3B.
- G. After the reactor coolant system pressure is reduced to 700 psig, close the core flood isolation valves CF-V1A and CF-V1B using the selector switches on 1C ESV Motor Control Center.
- CAUTION: Refer to Figure #1A Heatup and Cooldown Curve for simultaneous operation of RCP and Decay Heat Pump.
- H. To place the RCS on Decay Heat Removal proceed as follows:
1. Close Decay Heat Suction from Borated Water Storage Tank Valve DH-V5A and DH-V5B using manual operators.
 2. Ensure that Sodium Hydroxide Tank Suction Isolation Valves BS-V2A and BS-V2B are closed.
 3. Open manually operated Decay Heat Suction Split Isolation Valves DH-V12A or DH-V12B.

4. Manually open Decay Heat Suction Containment Isolation Valve DH-V3.
5. Open motor operated Decay Heat Discharge Isolation at Containment Vessel Valves DH-V4A or DH-V4B using controls located at ESV Motor Control Center 1A and ESV Motor Control Center 1B.
6. Open motor operated Decay Heat Suction from Loop "B" valves DH-V1 and DH-V2 using controls located at ESV Motor Control Center 1C.
- I. Start one decay heat removal pump by closing the motor feeder breaker at ES 4160 volt switchgear 1D6 or E.S. 4160 volt switchgear 1E7. Continue to operate one decay heat removal pump and stop TL operating reactor coolant pump. Lower reactor coolant temperature to $<140^{\circ}\text{F}$. Control cooldown rate between 250°F and 140°F to conform with Tech Spec by throttling decay heat exchanger outlet isolation valves DH-V-10A or DH-V-19B.
- J. Control reactor coolant pressure to conform with Tech Specs (ref. FSAR Section 15). To decrease pressure in R.C.S., open normally locked closed valve DHV-64 and manually open RC-V4 (enter RB to operate RC-V-4). When RCS temperature is $<190^{\circ}\text{F}$ and RCS pressure is <100 psig, secure the RC pump seals and makeup system.
- K. After shutdown conditions have been established eliminate the cause for evacuation of the control room, if this has not already been accomplished and reenter the control room.

- L. Reestablish control over the following valves at the control room:
1. Makeup pump suction from borated water storage tank valves MU-V14A and MU-V14B.
 2. High pressure injection isolation at containment vessel valves MU-V16A, MU-V16B, MU-16C and MU-16D.
 3. Make-up tank suction valve isolation valve MU-V12.
 4. Letdown isolation valve at containment vessel MU-V3.
 5. Letdown split to filters or holdup tanks valve MU-V8.
 6. Atmospheric steam dump valve MU-V4A and MU-V4B.
 7. Decay heat suction from borated water storage tank valves DH-V5A and DH-V5B.
 8. Decay heat isolation line isolation valve RC-V4.
 9. Decay heat suction containment isolation valve DH-V3.
- M. Reestablish control over emergency feedwater control valves EF-V30A and EF-V30B.

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