

THREE MILE ISLAND NUCLEAR STATION
UNIT #1 EMERGENCY PROCEDURE 1202-35
LOSS OF DECAY HEAT REMOVAL SYSTEM

PORC CHAIRMAN
UNIT 1

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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

1. C. H. H. H. Date 8-31-79
Chairman of PORC

Unit 2 PORC Recommends Approval

NA Date —
Chairman of PORC

Unit 1 Superintendent Approval

JH Seelinger Date 9/4/79

Unit 2 Superintendent Approval

NA Date —

Manager Generation Quality Assurance Approval NA Date —

THREE MILE ISLAND NUCLEAR STATION
UNIT #1 EMERGENCY PROCEDURE 1202-35
LOSS OF DECAY HEAT REMOVAL SYSTEM

35.1 Symptoms

1. Increasing Reactor Coolant Temperature (indicates greater than 140°F as read on DH-6-TE1/2, Console Center - Vertical portion, right side).
2. D.H. Removal 1A/B Flow Lo (Annunciator and Computer at 1500 gpm)
3. D.H. Out D.H. Removal Cooler A/B Temp. Hi (Computer at 280°F)
4. Pressurizer Level Hi/Lo (Annunciator and Computer at 200 inches of H₂O)
5. 4 KV E.S. Motor Trip (Annunciator on overcurrent and under-voltage) (Computer under D.H.P. 1A/B Motor Status)
6. D.H. Removal System Valve Closed or Partially Closed

35.2 Immediate Action

A. Automatic Action

1. None

B. Manual Action

1. Verify DH-V1, V2 and V3 are open.
2. Open valve DH-V12A/B (alternate loop).
3. Shift to other string (start alternate decay heat Removal, decay heat closed cooling and decay heat river pumps).
4. Shut valve DH-V12B/A (suction of the idle pump).

35.3 Follow Up Action

- A. If failure exists in common letdown (DH-V1, DH-V2 or DH-V3) and RCS pressure boundary is intact:

Objective:

To repressurize the RCS allowing the OTSG's to be used for decay heat removal by forced circulation by starting one Reactor Coolant Pump in each loop. If pump starting requirements cannot be met, the procedure allows removal of decay heat by natural circulation.

1. Fill, vent (36" hot leg) and pressurize the RCS as necessary to assure the loops are filled.
2. Verify that RCS pressure is acceptable per 1103-6. Start a RC pump in each loop and use the steam generators to remove decay heat per OP 1102-13 Decay Heat Removal by OTSG until the D.H.R.S. is available for operation.
3. If conditions do not permit the starting of a R.C. Pump, use Steam Generators to achieve Natural Circulation per OP 1102-16 to remove Decay Heat until the D.H.R.S. is available for operation by accomplishing the following.
 - a. Start Electric Driven Emergency Feed Pump EF-P2A or B, take suction from Condensate Storage Tanks through valves CO-V10A & B, discharge through EF-V30A & B, and raise OTSG's level to between 50% on the operate range to flood feedwater nozzles.
 - b. Dump steam to condenser or to atmosphere as plant conditions allow:
to condenser open MSV-2A & B, 3A-F and 8A & B.
to atmosphere open MSV-2A & B and 4A & B.

- B. If failure exists in common letdown (DH-V1, DH-V2 or DH-V3) and RCS boundary is not intact above the elevation of the fuel transfer canal and reactor vessel head is removed:

Objective:

To flood transfer canal and lineup systems to remove decay heat with the spent fuel coolers and decay heat removal coolers by taking suction from the deep end of the fuel transfer canal:

1. Pump from BWST using Decay Heat Pumps through DH-V5A & B to the RCS via DH-V4A & B overflowing into the Fuel Transfer Canal until the BWST reaches the Lo Lo Level (3 ft.) or the Fuel Transfer Canal is full. When Canal is full, stop Decay Heat Pumps and shut DH-V5A & B.
2. Line up the Spent Fuel Cooling System to Pump from the Transfer Canal to the Decay Heat Removal System as follows:
 - a. Open valves SF-V24, 23, 22 & 17
 - b. Using SF-P1A:

Select "Fill Transf. Canal" (This opens SF-V3 & SF-V13)

Shut Control Air Valve to SF-V3 (Locks Valve Open)

Shut Control Air Valve to SF-V2 (Prevents Valve from Opening)

Select "Pool A" (This opens SF-V12 and closes SF-V13)

The following valves are now open (SF-V3 & SF-V12)

c. Using SF-P1B:

Select "Fill Transf. Canal" (This opens SF-V6 & SF-V16)

Shut Control Air Valve to SF-V6 (Locks Valve Open)

Shut Control Air Valve to SF-V5 (Prevents Valve from Opening)

Select "Pool A" (This opens SF-V15 and closes SF-V16)

The following valves are now open (SF-V6 & SF-V15)

3. Open Manual valves SF-V44 & 46 to supply Suction to Decay Heat Pump "A" from Spent Fuel Pump Discharge.
4. Throttle Manual valve DHV-19A to approximately 1/4 open position.
5. Start Spent Fuel Pump A and/or B and Decay Heat Pump A.
6. Open DH-V4A.
7. Readjust DHV-19A to a flow of less than 1000 gpm as read on local flow indicator FI-299A.

NOTE: If one Spent Fuel Cooling Pump does not supply sufficient cooling, it may be necessary to start second Spent Fuel Pump and re-adjust DHV-19A to achieve a flow of approximately 2200 gpm.

- C. If failure exists in common letdown (DH-V1, DH-V2 or DH-V3) and RCS pressure boundary open below the elevation of the fuel transfer canal:

Objective:

To flood reactor building sump through RCS opening to achieve suction for Decay Heat Removal System through DH-V6A/B.

1. Take suction on BWST through DH-V5A & B with Decay Heat Pumps and pump to RCS overflowing to the Reactor Building Sump.

CAUTION: Ensure material which could clog RB sump suction is removed prior to pumping.

2. When BWST reaches Lo Lo Level alarm, shift suction to Reactor Building Sump by opening DHV-6A&B and shutting DHV-5A & B.
 3. Throttle Pump Discharge (DHV-16A/B) as necessary to prevent Pump Cavitation.
- D. If failure is on a Core Flood Injection Nozzle (line break) and the opposite DH pump is not available:

Objective:

To take suction on the BWST with the operable Decay Heat Removal Pump and to provide cooling flow to the core through the discharge cross-connect valves and the operable (opposite) core flood injection nozzle.

1. Open DHV-38A & B (DHR cross-connect isolation valves).
2. Close DHV-4A (B) (DH Disch. Isol. Valve) to isolate failure. Line in which failure occurred will be evidenced by hi DH injection flow alarm (3500 gpm).
3. Insure DHV-4A (B) (DH Disch. Isol. Valve) open on the unaffected core flood nozzle.
4. When BWST reaches Lo Lo Level alarm, shift suction to Reactor Building sump by opening DHV-6A(B) and shutting DHV-5A (B).