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PORC CHAIRMAN

UNIT 1

1202-14
Revision 5
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THREE MILE ISLAND NUCLEAR STATION
UNIT #1 EMERGENCY PROCEDURE 1202-14
LOSS OF R.C. FLOW, R.C. PUMP TRIP

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Unit 1 Staff Recommends Approval

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Cognizant Dept. Head

Unit 2 Staff Recommends Approval

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N/A Date —

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THREE MILE ISLAND NUCLEAR STATION
UNIT #1 EMERGENCY PROCEDURE #1202-14
LOSS OF R.C. FLOW, R.C. PUMP TRIP

14.1 SYMPTOMS

1. Annunciator Alarm for Auto Trip
   a. Reactor Coolant Pump trip caused by:
      1. Running Undervoltage (Time Delay)
      2. Instantaneous Overcurrent (Short Circuit)
      3. Time Delay Overcurrent (Overload)
      4. Ground Fault
      5. Phase Balance
      6. Current Differential
      7. Total loss of I.C. and seal injection flow
2. R.C. Pump disagreement light on control switch
3. Conditions requiring manual trip of R.C. Pump.
   a. Motor bearing temperature exceeds the following:
      1. Upper and lower guide bearings 185°F on the computer.
      2. Up thrust bearing 195°F on the computer.
      3. Down thrust bearing 195°F on the computer.
   b. Motor winding temperature of 150°C as indicated on the annunciator and computer.
   c. Pump bearing temperature exceeds 225°F as indicated on computer, TE-19, 0521-0524.
   d. Pump seal #1 leakoff temperature exceeds 225°F as indicated on the computer.

e. Motor vibration exceeds .002" as indicated on the computer and confirmed by test equipment installed on 338 ft. elevation of the Control Tower by the ICS cabinets.

f. Shaft vibration exceeds 20 mills with 4 pumps operating or 30 mills with a single pump operating as indicated by the pump vibration detectors.

g. Alarm received from motor air cooler leak detector as indicated by an annunciator and/or the computer.

4. Low Flow on R.C. System Flow indicated.

14.2 IMMEDIATE ACTION

a. Automatic Action

1. Loss of two (2) R.C. Pumps in one (1) loop or loss of more than two (2) pumps will result in a Reactor and Turbine trip, initiated by the RPS.

2. Loss of one (1) pump or one (1) pump in each loop may result in a Reactor and Turbine trip if the ICS cannot reduce the load rapidly enough to prevent exceeding any RPS set points; otherwise the ICS will run back the load to a level that is compatible with the number of pumps remaining in operation.

3. The Turbine Driven and Motor Driven Emergency Feedwater Pump Auto-Starts, and EFW flow occurs upon the loss of four (4) R.C. pumps. Steam Generator level will increase to 50% on the operating range. Main feedwater valves close.

4. R.C. pump H.P. lift pump Auto-Starts on trip of R.C. Pump.

5. If the reactor is not tripped and both Feedwater ICS Control Stations are in auto and not on low level limit the feed flow will be ratioed according to R.C. Flow in the respective loops.

6. If running with four (4) pumps and one (1) trips, plant will run back to 75%; if running with three (3) pumps and one (1) trips, plant will run back to 49% power provided RPS doesn't trip the reactor.

b. Manual Action

NOTE: The parameters indicated by an asterisk will be reverified as the first step in follow-up action.

1. If a condition is present which necessitates manual tripping of R.C. Pump(s), manually reduce the load to 75%* for three (3) pump operation or 49%* for two (2) pump operation; reduce power, if practical, and trip the reactor if less than two (2) pumps.

2. Start the H.P. lift and Backstop oil pumps, trip the R.C. pump; verify Feed Flows are ratioed.

NOTE: The backstop oil pumps must be manually started on an R.C. Pump Auto Trip.

3. For trip of all four pumps:

a. Trip the reactor and perform immediate manual actions of EP 1202-4.

b. Verify EF pump(s) start and discharge pressure develops to ≥1010 psig*.

c. If conditions permit, attempt to restart one reactor coolant pump in each loop.

14.3 FOLLOW-UP ACTION

Objective:

To verify runback or trip of reactor on loss of RC pumps and to verify adequate heat removal with either natural or forced circulation.

1. Reverify the parameters marked with an asterisk in Immediate Manual Action using alternate indication if available.
2. After the tripped pump(s) indication is received, and the R.C. pump speed reaches zero, shutdown the H.P. oil lift pump and the backstop oil pumps.

   NOTE: Based on coastdown tests, R.C. pump speed will be zero 20 minutes after pump trip.

   NOTE: Do not secure the seal water to the tripped pump seals, the Intermediate Cooling Water to the Thermal Barrier or the Nuclear Service Closed Cooling Water to the pump motor.
3. If all four R.C. pumps trip perform action for a reactor trip per EP 1202-4. Then proceed with natural circulation cooldown as outlined in Natural Circulation Operating Procedure OP 1102-16.