DUKE POWER COMPANY
McGUIRE NUCLEAR STATION
REACTOR TRIP

1.0 Symptoms

1.1 Any Alarm on Reactor Trip First Out Panel.

1.2 All rod bottom lights are illuminated.

1.3 Nuclear Instrumentation indicating a rapid decrease in Neutron flux.

1.4 If there is not a rapid drop in nuclear power and the control rods are not inserted, then this is an "Anticipated Transient Without Scram" event.

2.0 Immediate Action

2.1 Automatic

2.1.1 All rods drop into core.

2.1.2 Turbine-Generator trip.

2.1.3 Feedwater Isolation when Tavg decreases to 564°F.

2.1.4 Steam Dumps Arm-Actuate and/or PORV lift.

2.2 Manual

NOTE: Do not place systems in manual unless misoperation in automatic is apparent.

2.2.1 If all rods do not drop into the core then:

2.2.1.1 Manually trip the reactor.

2.2.1.2 If a reactor trip has not yet occurred, then manually trip the MG set Bkrs. locally.

2.2.1.3 If a reactor trip has not yet occurred, immediately actuate safety injection

2.2.1.4 If a reactor trip has not yet occurred, place the Control Rod Drive Bank Selector Switch in manual and insert rods.

2.2.2 If turbine generator did not trip, then:

2.2.2.1 Manually trip turbine from Control Room or locally at the turbine.

2.2.2.2 If a turbine trip has not yet occurred, then place DEH Control in manual, and manually close the Governor Valves.

2.2.3 If Feedwater Isolation does not occur when tavg decreases to 564°F, then:

2.2.3.1 Close the main feedwater regulating valves and valves.

2.2.3.2 If feedwater isolation has not yet occurred, close the main Feedwater Containment Isol. Valves.

2.2.3.3 If feedwater isolation has not yet occurred, manually trip the feedwater pumps.

2.2.4 If steam dumps fail to arm-actuate and/or PORV's fail to lift, then:

2.2.4.1 Check steam pressure mode setting at 1090 psig and place in pressure mode control.

2.2.4.2 Close all PORV manual loaders and place PORV selector switch in manual. Regulate PORV's to maintain steam pressure as desired.

2.2.5 Secure all boron dilution operations.

3.0 Subsequent Action

3.1 Verify Pzr. level, NC Pressure, charging and letdown flow, Tavg, S/G levels and S/G Pressures are normal.

3.2 If any pressurizer PORV's open on high pressurizer pressure, ensure reseating at 2315 psig decreasing.

NOTE: If PORV fails to close and pressure is less than 2315 psig, then close the associated PORV isolation valves.

3.3 Ensure the CA System is feeding the Steam Generators. If not, manually start the motor driven CA Pumps.

3.4 Announce occurrance over plant paging system.

3.5 Note the cause of the trip on the first out panel before resetting the alarm.

3.6 If all rods are not fully inserted, borate 150 ppm for each rod not inserted per OP/1/A/6150/09 (Boron Concentration Control).

3.7 Transfer NR-45 to one source range channel and one intermediate range channel for indication. Ensure a negative period and decaying count rate.

3.8 When the cause of the trip has been determined, withdraw the shutdown banks per OP/1/A/6150/08 (Rod Control).

3.9 Verify no load pzr. pressure and level are restored and maintained (2235 psig and 25% respectively).

3.10 Select "Reset" on the Moisture Separator Reheater Panel.

3.11 Transfer Aux. Steam Supply to Main Steam by opening LAS-12 (Unit 1 Mn. Stm. to Aux. Stm. Hdr. Control Inlet Isolation) and close LAS-9 (Unit 1 "C" Htr. Bleed to Aux. Stm. Hdr. Isolation).

3.12 Transfer steam dump control to the "Pressure" mode and adjust controller as necessary to maintain Tave 557°F (approximately 1090 psig).

CAUTION: Ensure Primary and Secondary Systems have stabilized before going to pressure mode.

3.13 Secure any excess Condensate Booster Pumps and Hotwell Pumps.

3.14 Place Auto Start Defeat switches of Aux. Feedwater Pumps A & B to "Defeat".

3.15 Verify Volume Control Tank level is being maintained.

3.16 Reset Hi Flux at Shutdown Alarm when neutron flux decreases below setpoint.

3.17 Notify Chemistry to obtain a NC System boron sample and perform a reactivity balance calculation and maintain a shutdown margin equal to or greater than 1.6% Δk/k-per OP/0/A/6100/06 (Reactivity Balance Calculation).

3.18 Notify Plant Manager or Superintendent of Operations per Station Directive 3.1.6 (Reasons for Notifying the Manager or Superintendent of Operations).

3.19 If it is desired to supply Aux. Steam from the Electric Boilers, place the boilers in operation per OP/1/B/6250/07B (Electric Boilers).

3.19.1 As 1AS-120 (Aux. Elec. Blr. A & B to AS Isol.) is opened slowly throttle closed 1AS-12 (Unit 1 SM to AS Hdr. Cont. Inlet Isol.).

3.20 Take manual control and close the following valves:

1CF-32 (Steam Gen. 1A FDW Control)
1CF-23 (Steam Gen. 1B FDW Control)
1CF-20 (Steam Gen. 1C FDW Control)
1CF-17 (Steam Gen. 1D FDW Control)
1CF-104 (Steam Gen. 1A FDW Control Bypass Control)
1CF-105 (Steam Gen. 1B FDW Control Bypass Control)
1CF-106 (Steam Gen. 1C FDW Control Bypass Control)
1CF-107 (Steam Gen. 1D FDW Control Bypass Control)

3.21 Reset Train A & B Feedwater Isolation.

3.22 Position the following valves:

S/G "A": Close 1CF-150 (CF Tempering Flow to S/G 1A, 1B, 1C, and 1D Aux. Feedwater Nozzle Isol.)
Open 1CF-126-B (S/G 1A CF to CA Nozzle Isol.)
Open 1CF-151-A (CF Tempering Flow to S/G 1A Aux. Feedwater Nozzle Isol.)

S/G "B": Open 1CF-127-B (S/G 1B CF to CA Nozzle Isol.)
Open 1CF-153-A (CF Tempering Flow to S/G 1B Aux. Feedwater Isol.)

S/G "C": Open 1CF-128-B (S/G 1C CF to CA Nozzle Isol.)
Open 1CF-155-B (CF Tempering Flow to S/G 1C Aux. Feedwater Isol.)

S/G "D": Open 1CF-129-B (S/G 1D CF to CA Nozzle Isol.)
Open 1CF-157-B (CF Tempering Flow to S/G 1D Aux. Feedwater Isol.)

3.23 Start a Feedwater Pump per OP/1/A/6250/01 (Condensate and Feedwater System) and secure Auxiliary Feedwater per OP/1/A/6250/02 (Auxiliary Feedwater System) when desired and maintained steam generator levels at no load values (~25%).

3.24 If an ATWS has occurred, bring the plant to cold shutdown within 30 hours.

3.25 Determine the cause of the reactor trip and correct the problem. If restart is desired, refer to OP/1/A/6100/05 (Reactor Trip Recovery). If shutdown is necessary, refer to OP/1/A/6100/02 (Controlling Procedure for Unit Shutdown).

3.26 After the count rate has decreased to .5 decade below the "Source Range High Flux Level at Shutdown" alarm setpoint, the shutdown banks may be inserted if desired.