Submitted: _____ SP Number 29.024.01
(Section Head)

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(Plant Manager)

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DRAFT

TRANSIENT WITH FAILURE TO SCRAM
EMERGENCY PROCEDURE

1.0 SYMPTOMS

1.1 A valid scram signal due to a reactor transient is alarmed or indicated and all control rods do not insert as indicated on the full core display, rod position printout on the computer, or four rod display.

1.2 Reactor pressure and/or neutron flux indication increases abruptly and may go off-scale on recorders and meters.

1.3 Safety relief valves may lift.

2.0 AUTOMATIC ACTIONS

2.1 1115 psig reactor vessel pressure and above actuates various safety relief valves. _____

2.2 1120 reactor vessel pressure TRIPS the reactor recirculation pumps. _____

3.0 IMMEDIATE OPERATOR ACTIONS

3.1 Manually scram reactor. _____

3.1.1 Arm and depress manual scram pushbutton. _____

3.1.2 Place the mode switch in refuel. _____

3.1.3 Verify all rods are inserted. _____

3.2 If the reactor scrams, all rods insert, and power is decaying, refer to SP 29.010.01, Emergency Shutdown, and do not continue this procedure. _____

3.3 Trip the recirculation pumps. _____

3.4 Commence suppression pool cooling per SP 23.121.01, residual heat removal (RHR) system. _____

4.0 SUBSEQUENT OPERATOR ACTION

4.1 Determine if reactor power is 6% or greater.

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4.1.1 If reactor power is 6% or greater, continue this procedure at Step 4.2. _____

4.1.2 If reactor power is less than 6%, continue this procedure at Step 4.4. _____

4.2 Start either A or B standby liquid control pump and inject the entire contents of the tank. Verify isolation/isolate RWCU. _____

4.3 Terminate all injection into the RPV with the exception of CRD and RCIC or HPCI at a flow rate of approximately (Later) _____

4.4 The following attempts to scram the reactor are to be performed concurrently if manpower is available.

4.4.1 Confirm all scram valves are open by observation of scram valve position lights. If not, perform the following. _____

4.4.1.1 DE-ENERGIZE RPS Subchannel Logic by opening breakers on panel 1C71*PNL-ØØ1, CB2A, 2B, 7A, and 7B in the Relay Room. _____

4.4.1.2 Vent air from the scram air system by closing valve C11-Ø2V-Ø7Ø4 and opening vent valve downstream of C11-01V-7104. _____

4.4.1.3 Restore when all scram valves are open. _____

4.4.2 Bypass the scram discharge volume high level scram switches, reset the RPS trip and verify the vent and drain valves open. _____

4.4.2.1 Alternately RESET the Reactor Protective System and SCRAM the reactor until all rods are fully inserted. _____

4.4.3 Bypass the scram discharge volume (SDV) high level scram switches, reset the RPS trip and verify the vent and drain valves open. _____

4.4.3.1 INDIVIDUALLY SCRAM Control Rods at Local Hydraulic Control Units (HCU's) by placing both NORM-TEST-S.R.I. switches to the TEST position. _____

4.4.4 Insert those rods not fully inserted with the reactor manual control system as the Rod Sequence Control System (RSCS) permits. _____

4.5 SAMPLE reactor coolant frequently to verify boron concentration above the level determined to maintain the plant shutdown. _____

4.6 After the reactor is shutdown to the level where the only source of power is decay heat, PROCEED to stabilize Plant Condition in Hot Shutdown as follows:

CAUTION

Do not shutdown SBLC Injection once it has been started until the SBLC Solution Tank is verified to be empty.

4.7 PERFORM either steps 4.7.1, 4.7.2 or 4.7.3.

4.7.1 Maintain Reactor pressure between 800 and 1000 psig by use of Main Condenser Bypass Valves.

CAUTION

Consult with the Nuclear Engineer to confirm that boron concentration in the reactor will be sufficient to maintain the reactor shutdown after accounting for a normal startup of the Steam Condensing Mode of RHR.

4.7.2 Maintain reactor pressure between 800 and 1000 psig by use of the RHR steam condensing in accordance with SP 23.121.01, Residual Heat Removal (RHR) System.

4.7.3 Maintain reactor pressure between 900 and 1000 psig by opening safety relief valves and utilizing Suppression Pool Cooling to limit Suppression Pool temperature.

4.8 When the reactor is to be placed in COLD SHUTDOWN, PROCEED using the following considerations:

4.8.1 Confirm by sample results and consultations with the Nuclear Engineer that sufficient negative reactivity has been inserted into the reactor to account for the positive reactivity effects of temperature decrease and dilution.

4.8.2 Start the reactor recirc pumps in slow speed.

4.8.3 If the main condensor is available, Shutdown and Cooldown in accordance with SP 22.ØØ5.Ø1, Shutdown to Cold Shutdown.

CAUTION

Insure the unborated water in the RHR Shutdown Cooling lines does not temporarily dilute the boron in the core and allow inadvertent criticality.

CAUTION

The RHR pump minimum flow valve must be overridden in the closed position to prevent the loss of borate water when starting up Shutdown Cooling.

4.9 When reactor pressure has decreased to 135 psig, Startup RHR Shutdown Cooling in accordance with SP 23.121.Ø1, Residual Heat Removal (RHR) System. _____

4.10 If flooding the reactor vessel up to the steam dome is necessary, use a source of water borated to at least the same concentration as the water in the reactor. The SBLC Solution Tank can be used. _____

4.11 Maintain boron concentration in the vessel between 750 and 1000 PPM. _____

5.0 FINAL PLANT CONDITIONS

5.1 The plant is in cold shutdown conditions. _____

5.2 Reactor level being maintained between 33.5" and 42.75" _____

Watch Engineer Review _____
(Watch Engineer)

6.0 DISCUSSION

An ATWS is extremely unlikely but will require prompt operator action to mitigate the consequences. Operator concerns are as follows:

6.1 Verify Recirc. pumps trip.

6.2 Shutdown the reactor.

6.3 Limit reactor pressure.

6.4 Maintain the core covered.

6.5 Limit Suppression Pool temperature.

6.6 Place plant in Cold Shutdown.

The operator must attempt to scram the reactor with the most readily available means. If the reactor cannot be maintained subcritical with Control Rods and reactor level falls below +12.5" or Suppression Pool temperature can't be maintained below 110°F, SBLC must be initiated to minimize containment heat-up. Suppression Pool Cooling should be initiated as soon as possible to ensure suppression pool temperature limits are not exceeded.

A Cooldown must not be initiated until control rods are inserted or Boron concentration is satisfactory to prevent a restart of the reactor.

Once Boron injection is started, it must be run to completion.