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AUTH.NAME AUTHOR AFFILIATION
PARKER,W.O. DUKE POWER CO.
RECIP.NAME RECIPIENT AFFILIATION
DENTON,H.R. OFFICE OF NUCLEAR REACTOR REGULATION
REID,R.W. OPERATING REACTORS BRANCH 4

SUBJECT: FORWARDS EMERGENCY PROCEDURE EP/0/A/1800/4, "LOSS OF REACTOR COOLANT" W/INSTRUCTIONS FOR OPERATOR ACTION FOR SMALL BREAKS.

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FROM: US NRC/TIDC/Distribution Services Branch

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DUKE POWER COMPANY
POWER BUILDING
422 SOUTH CHURCH STREET, CHARLOTTE, N. C. 28242

WILLIAM O. PARKER, JR.
VICE PRESIDENT
STEAM PRODUCTION

TELEPHONE: AREA 704
373-4083

May 9, 1979

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Mr. R. W. Reid, Chief
Operating Reactors Branch #4

Re: Oconee Nuclear Station
Docket Nos. 50-269, -270, -287

Dear Mr. Denton:

With regard to my letter of May 7, 1979, Item d and Reference 2 of Enclosure D, please find attached a copy of emergency procedure EP/0/A/1800/4, "Loss of Reactor Coolant," which contains operating instructions to define operator action for small breaks.

This procedure will be implemented prior to May 12, 1979.

Very truly yours,

William O. Parker, Jr.

RLG:vr

Attachment

A001
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7905140283

DUKE POWER COMPANY

OCONEE NUCLEAR STATION

LOSS OF REACTOR COOLANT

Considers the following cases:

Case A1: Excessive RC System Leakage - No Reactor Trip.

Case A2: Small Break -- Feedwater-RC Pumps-No Reactor Trip.

Case A3: Small Break -- Feedwater-RC Pumps-Reactor Trip.

Case A4: Small Break -- No Feedwater-RC Pumps-Reactor Trip.

Case A5: Small Break -- Feedwater-No RC Pumps-Reactor Trip.

Case A6: Small Break -- No Feedwater-No RC Pumps-Reactor Trip.

Case B: Rupture in excess of capability of three (3) High Pressure Injection pumps.

Case A1: Excessive RC System Leakage - No Reactor Trip

1.0 Symptoms

1.1 Decreasing RC System pressure.

1.2 Decreasing pressurizer level.

1.3 LDST level low or decreasing more than normal.

1.4 RCS leakage calculation indicates leak.

1.5 Reactor Building sump level increasing.

1.6 RIA alarms inside containment.

1.7 Reactor Building pressure and temperature increasing.

1.8 Increasing Quench Tank pressure and temperature.

2.0 Immediate Action

2.1 Automatic

None

2.2 Manual

2.2.1 Close (3)(2)HP-5 (Letdown Isolation) if required.

2.2.2 Throttle open (3)(2)HP-26 ("A" Loop Injection) as required to maintain pressurizer level.

2.2.3 Start standby HPI pump, if necessary, to maintain RC pumps seal flow.

2.2.4 Initiate makeup to LDST. If LDST level approaches zero, open (3)(2)HP-24 to provide suction to the HPI pump(s) from the BWST.

2.2.5 Insure the RC System is 50° F subcooled and remains so. (See Enclosure 1).

2.2.6 Close (3)(2)RC-4 (Power Operated Relief Block).

3.0 Subsequent Action

3.1 Evaluate the leakage and if greater than Technical Specification limits, initiate shutdown per OP/1102/10 (Unit Shutdown), to bring the unit to cold shutdown.

3.2 Borate the RC System for cold shutdown conditions per OP/1103/15 (Reactivity Balance Calculation).

Case A2: Small Break--Feedwater-RC Pumps-No Reactor Trip

1.0 Symptoms

1.1 Low RC pressure alarm.

1.2 Low Pressurizer level alarm.

1.3 LDST level low or decreasing more than normal.

1.4 Excessive RC makeup flow, > 140 gpm.

1.5 Reactor Building sump level increasing.

1.6 RIA alarms inside containment.

1.7 Reactor Building pressure and temperature increasing.

1.8 Quench Tank pressure and temperature increasing.

2.0 Immediate Action

2.1 Automatic

None

2.2 Manual

2.2.1 Trip Reactor and verify turbine trips.

2.2.2 Close (3)(2)HP-5, (Letdown Isolation).

2.2.3 Start another HPI pump.

2.2.4 Throttle open (3)(2)HP-26, ("A" Loop Injection) if necessary, to maintain pressurizer level.

2.2.5 Initiate makeup to LDST. If LDST level approaches zero, open (3)(2)HP-24 to provide suction to the HPI pump from the BWST.

2.2.6 Insure the RC system is 50°F subcooled and remains so. (See Enclosure 1)

2.2.7 Close (3)(2)RC-4, (Power Operated Relief Block).

3.0 Subsequent Action

3.1 Initiate rapid shutdown per OP/0/A/1102/17, (Controlling Procedure for Rapid Unit Shutdown and Cooldown).

3.2 Borate the RC system for cold shutdown conditions per OP/1103/15, Reactivity Balance Calculation.

Case A3: Small Break--Feedwater-RC Pumps-Reactor Trip

1.0 Symptoms

1.1 Low RC pressure alarm

1.2 Low Pressurizer level alarm

1.3 LDST level decreasing

1.4 Excessive RC makeup flow > 140 gpm

1.5 Reactor Building sump level increasing

1.6 RIA alarms inside containment

1.7 Reactor Building pressure and temperature increasing

1.8 Quench Tank pressure and temperature increasing

2.0 Immediate Action

2.1 Automatic

2.1.1 Reactor Trip

2.1.2 Turbine Trip

2.1.3 Possible ES 1-2 actuation

2.2 Manual

2.2.1 Verify auto actions have occurred, if not, perform manually.

CAUTION: Do not override Automatic Actions of engineered safety features unless continued operation will result in unsafe plant conditions or will threaten reactor vessel integrity. (Refer to Pressure/Temperature Curve)

2.2.2 Close (3)(2)HP-5, (Letdown Isolation).

2.2.3 Start another HPI pump, if not already running.

2.2.4 Throttle open (3)(2)HP-26, ("A" Loop Injection) if necessary, to maintain pressurizer level.

2.2.5 Initiate makeup to LDST. If LDST level approaches zero, open (3)(2)HP-24 to provide suction to the HPI pump from the BWST.

2.2.6 Insure the RC System is 50°F subcooled and remains so. (See Enclosure 1)

2.2.7 Close (3)(2)RC-4, (Power Operated Relief Block).

2.2.8 If ES 1-2 actuate, maintain pressurizer level by varying the number of running pumps.

CAUTION: If the HPI system has been actuated because of a low pressure condition, it must remain in operation until either:

1. Both LPI pumps are in operation and flowing at a rate in excess of 1000 gpm each and the situation has been stable for 20 minutes,

OR

2. All hot and cold leg temperatures are at least 50 degrees below the saturation temperature for the existing RCS pressure. If 50 degrees subcooling cannot be maintained after HPI cutoff, the HPI shall be reactivated (refer to Enclosure 1). The degree of subcooling beyond 50 degrees F and length of time HPI is in operation shall be limited by the pressure/temperature

consideration for the vessel integrity (pressure/temperature curves).

NOTE: If the HPI System has been activated and RC pumps operating, at least one RCP per loop shall remain operating.

OR

3. Depending upon the nature of the low pressure transient, appropriate operator action may be required to alter the operation of the HPI system and/or the RC Pumps in order to prevent an unsafe RC system condition.

3.0 Subsequent Action

3.1 Initiate rapid shutdown per OP/0/A/1102/17, (Controlling Procedure for Rapid Shutdown and Cooldown).

3.2 Borate the RC system for cold shutdown conditions per OP/1103/15, (Reactivity Balance calculation).

Case A4: Small Break--No Feedwater-RC Pumps-Reactor Trip

1.0 Symptoms

1.1 Excessive RCS makeup

1.2 Decreasing RCS pressure

1.3 Reactor trip

1.4 Decreasing Pressurizer level

1.5 RIA alarms

1.6 LDST level low or decreasing more than normal

1.7 ES actuation 1-2

1.8 Increasing Reactor Building Temperature and Pressure and Rx. Bldg sump level

1.9 No feedwater flow and no S/G level

2.0 Immediate Action

2.1 Automatic

2.1.1 Reactor trip

2.1.2 Turbine trip

2.1.3 Possible ES actuation 1-2

2.2 Manual

2.2.1 Verify automatic actions have occurred, if not, perform manually.

CAUTION: Do not override Automatic Actions of engineered safety features unless continued operation will result in unsafe plant conditions or will threaten reactor vessel integrity. (Refer to Pressure/Temperature Curve)

2.2.2 Initiate ES 1-2 if it has not been actuated on ECCS signal.

CAUTION: If the HPI system has been actuated because of a low pressure condition, it must remain in operation until either:

1. Both LPI pumps are in operation and flowing at a rate in excess of 1000 gpm each and the situation has been stable for 20 minutes,

OR

2. All hot and cold leg temperatures are at least 50 degrees below the saturation temperature for the existing RCS pressure. If the 50 degrees subcooling cannot be maintained after HPI cutoff, the HPI shall be reactivated (refer to Enclosure 1). The degree of subcooling beyond 50 degrees F and length of time HPI is in operation shall be limited by the pressure/temperature consideration for the vessel integrity (pressure/temperature curves).

NOTE: If the HPI System has been activated and RC pumps operating, at least one RCP per loop shall remain operating.

OR

3. Depending upon the nature of the low pressure transient, appropriate operator action may be required to alter the operation of the HPI system and/or the RC Pumps in order to prevent an unsafe RC system condition.

2.2.3 Maintain maximum HPI flow.

2.2.4 Go to one RC pump per loop.

2.2.5 Open RC-4 (Power Operated Relief Block) and RC-66 (Power Operated Relief Valve) to maintain forced cooling with the HPI system.

Note: If RC-66 is not operable, Pressurizer Code Reliefs will relieve overpressure and maintain force flow.

2.2.6 Monitor RCS T_{hot} (if on scale) or incore thermocouples (Display group #29) for indication of core outlet temperature stabilization. (T_{sat} for 2500 psig = 665°F).

2.2.7 Regain feedwater as soon as possible.

3.0 Subsequent Actions

3.1 Prior to reaching 3 feet in the BWST make preparations to align the LPI system to take a suction from the Reactor Building Emergency sump and discharge to the HPI suction by aligning the following valves:

(3)(2)LP-19 (R.B. Emergency Sump Isolation Line "A") Open

(3)(2)LP-20 (R.B. Emergency Sump Isolation Line "B") Open

(3)(2)LP-54 ("A" Cooler Outlet to HP Pump Suction) Open

(3)(2)LP-56 ("B" Cooler Outlet to HP Pump Suction) Open

(3)(2)LP-15 (LP Disch. to RB Spray and HP "A" Loop) Open

(3)(2)LP-16 (LP Disch. to RB Spray and HP "B" Loop) Open

3.2 Establish LPSW to LPI coolers by making the following line-up:

(3)(2)LPSW-252 (LPI Cooler "B" Outlet to CCW Valve Byp. Control) Closed

(3)(2)LPSW-251 (LPI Cooler "A" Outlet to CCW Valve Byp. Control) Closed

(3)(2)LPSW-4 (LP Injection Cooler "A" Shell Outlet) Open

(3)(2)LPSW-5 (LP Injection Cooler "B" Shell Outlet) Open

3.3 Throttle open LPSW-252 and LPSW-251 to establish a cooldown on Reactor Bldg. sump water prior to entering HPI suction.

3.4 Start A and B LPI pumps to initiate flow path.

3.5 Monitor RCS pressure and temperature to ensure RCS remains subcooled (See Enclosure 1).

3.6 Once feedwater is available, commence feeding the OTSG's through the auxiliary feed nozzles and control level at ∿ 25 inches on the startup range and control OTSG's secondary side pressure at ∿ 1000 psig using Turbine Bypass valves.

3.7 Regain RCS pressure control by energizing the pressurizer heaters and heating the pressurizer until the pressurizer temperature indicates within the pressure temperature curve for saturation. Also close the PORV RC-66 if open.

3.8 Stop "C" HPI pump and close (3)(2)HP-27.

3.9 Close (3)(2)LP-16 and stop "B" LPI pump.

3.10 Place pressurizer heaters in automatic.

Note: RCS must be maintained subcooled (See Enclosure 1).

3.11 Monitor RCS pressure carefully to ensure that the bubble is formed in the pressurizer.

3.12 Initiate rapid cooldown per OP/0/A/1102/17, Controlling Procedure for Rapid Shutdown and Cooldown.

3.13 Borate the RC system for cold shutdown conditions per OP/1103/15, Reactivity Balance Calculation.

Case A5: Small Break -- Feedwater-No RC Pumps-Reactor Trip.

1.0 Symptoms

1.1 Decreasing RC System pressure.

1.2 Letdown storage tank level decrease.

1.3 Excessive RCS makeup flow.

1.4 Reactor Building sump level increase.

1.5 Decreasing RC System flow.

1.6 Increase in R.B. pressure and temperature.

1.7 Increase in RIA readings inside the R.B.

1.8 Quench Tank pressure and temperature increasing.

2.0 Immediate Action

2.1 Automatic

2.1.1 Reactor trip.

2.1.2 Feedwater flow swaps to the auxiliary feed header.

2.1.3 S/G levels increase to ~ 50% on the operating range.

2.1.4 ES 1-2 initiate.

2.1.5 Turbine trip.

2.2 Manual

2.2.1 Verify S/G levels increase to 50% on operating range.

2.2.2 Verify automatic actions have occurred; if not, perform steps manually.

CAUTION: Do not override automatic action of E.S. features unless continued operation will result in unsafe plant conditions or will threaten reactor vessel integrity. (Refer to Pressure/Temperature Curve).

2.2.3 Verify natural circulation is achieved by insuring the following:

2.2.3.1 RCS is 50° F subcooled and remains so. (See Enclosure #1).

2.2.3.2 Feedwater level is at ∿ 50% on the operating range.

2.2.3.3 The ΔT between T_{hot} and T_{cold} is ∿ 30° F to 40° F.

2.2.3.4 Turbine Bypass Valves are controlling T_{ave} at ∿ 555° F.

2.2.3.5 Main steam pressure is at ∿ 1000 psi.

2.2.3.6 Incore thermocouples are not increasing.

2.2.3.7 Feedwater valves indicates OPEN and flow is being observed entering steam generators.

2.2.4 If the HPI system has been actuated because of a low pressure condition, it must remain in operation until either:

2.2.4.1 Both LPI pumps are in operation and flowing at a rate in excess of 1000 gpm each and the situation has been stable for 20 minutes,

or

2.2.4.2 All hot and cold leg temperatures are at least 50 degrees below the saturation temperature for the existing RCS pressure. If 50 degrees subcooling cannot be maintained after HPI cutoff, the HPI shall be reactivated (refer to Enclosure 1). The degree of subcooling beyond 50 degrees F

and length of time HPI is in operation shall be limited by the pressure/temperature consideration for the vessel integrity (pressure/temperature curves).

NOTE: If the HPI System has been activated and RC pumps operating, at least one RCP per loop shall remain operating.

or

2.2.4.3 Depending upon the nature of the low pressure transient, appropriate operator action may be required to alter the operation of the HPI system and/or the RC Pumps in order to prevent an unsafe RC system condition.

2.2.5 Close (3)(2)RC-4 (Power Operated Relief Block).

2.2.6 Control RC System temperature by throttling the turbine bypass valves.

2.2.7 Maintain RC System pressure witin the pressure/temperature curve by adjusting HPI flow (Throttle (3)(2)HP-26 (RC Loop "A" Injection) or (3)(2)HP-27 (RC Loop "B" Injection).

3.0 Subsequent Action

3.1 Prior to reaching 3 feet in the BWST make preparations to align the LPI system to take a suction from the Reactor Building Emergency sump and discharge to the HPI suction by aligning the following valves:

(3)(2)LP-19 (RB Emerg. Sump Isolation Line "A") Open

(3)(2)LP-20 (RB Emerg. Sump Isolation Line "B") Open

(3)(2)LP-54 ("A" Cooler Outlet to HP Pump Suction) Open

(3)(2)LP-56 ("B" Cooler Outlet to HP Pump Suction) Open

(3)(2)LP-15 (LP Discharge to RB Spray and HP "A" Loop) Open

(3)(2)LP-16 (LP Discharge to RB Spray and HP "B" Loop) Open

3.1.1 Establish LPSW to LPI coolers by making the following line-up:

(3)(2)LPSW-252 (LPI Cooler "B" Outlet to CCW Valve Byp. Control) Closed

(3)(2)LPSW-251 (LPI Cooler "A" Outlet to CCW Valve Byp. Control) Closed

(3)(2)LPSW-4 (LP Injection Cooler "A" Shell Outlet) Open

(3)(2)LPSW-5 (LP Injection Cooler "B" Shell Outlet) Open

3.1.2 Throttle open LPSW-252 and LPSW-251 to establish a cooldown on Rx Bldg. sump water prior to entering HPI suction.

3.1.3 Start A and B LPI pumps to initiate flow path.

3.2 Verify RC System subcooled by 50^{o} F (See Enclosure 1) and start 1 RC pump in each loop when available.

3.3 Begin rapid cooldown per OP/0/A/1102/17 (Controlling Procedure for Rapid Unit Shutdown and Cooldown).

Case A6: Small Break -- No Feedwater-No RC Pumps-Reactor Trip.

1.0 Symptoms

1.1 Excessive RCS makeup flow > 140 gpm.

1.2 Decreasing RCS pressure.

1.3 Reactor trip.

1.4 Low pressurizer level alarm.

1.5 RIA alarms.

1.6 LDST level low or decreasing more than normal.

1.7 ES actuation.

1.8 Increasing Reactor Building temperature and Reactor Building sump level.

1.9 Quench Tank pressure and temperature increasing.

2.0 Immediate Action

2.1 Automatic

2.1.1 Reactor trip.

2.1.2 Turbine trip.

2.1.3 Possible ES 1-2 actuation.

2.2 Manual

2.2.1 Verify automatic actions have occurred, if not perform manually.

CAUTION: Do not override Automatic Actions of Engineered Safety Features unless continued operation will result in unsafe plant conditions or will threaten reactor vessel integrity. (Refer to Pressure/ Temperature Curve).

2.2.2 Initiate ES 1-2 if it has not been actuated on ECCS signal.

CAUTION: If the HPI system has been actuated because of a low pressure condition, it must remain in operation until either:

1. Both LPI pumps are in operation and flowing at a rate in excess of 1000 gpm each and the situation has been stable for 20 minutes,

or

2. All hot and cold leg temperatures are at least 50 degrees below the saturation temperature for the existing RCS pressure. If 50 degrees subcooling cannot be maintained after HPI cutoff, the HPI shall be reactivated (refer to Enclosure 1). The degree of subcooling beyond 50 degrees F and length of time HPI is in operation shall be limited by the pressure/temperature consideration for the vessel integrity (pressure/temperature curves).

   NOTE: If the HPI System has been activated and RC pumps operating, at least one RCP per loop shall remain operating.

or

3. Depending upon the nature of the low pressure transient, appropriate operator action may be required to alter the operation of the HPI system and/or the RC pumps in order to prevent an unsafe RC system condition.

2.2.3 Maintain maximum HPI flow.

2.2.4 Open RC-4 (Power Operated Relief Block) and RC-66 (Power Operated Relief Valve) to maintain forced cooling with the HPI system.

NOTE: If RC-66 is not operable, pressurizer code reliefs will relieve overpressure and maintain force flow.

2.2.5 Monitor RCS T_{hot} (if on scale) or incore thermocouples (Display Group #29) for indications of core outlet temperature stabilization. (T_{sat} for 2500 lbs = 665° F).

2.2.6 Regain feedwater as soon as possible.

3.0 Subsequent Action

3.1 Prior to reaching 3 feet in the BWST make preparations to align the LPI system to take a suction from the emergency reactor building sump and discharge to the HPI suction by aligning the following valves:

(3)(2) LP-19 (R.B. Emergency Sump Isolation Line "A") Open

(3)(2) LP-20 (R.B. Emergency Sump Isolation Line "B") Open

(3)(2) LP-54 ("A" Cooler Outlet to HP Pump Suction) Open

(3)(2) LP-56 ("B" Cooler Outlet to HP Pump Suction) Open

(3)(2) LP-15 (LP Discharge to RB Spray and HP "A" Loop) Open

(3)(2) LP-16 (LP Discharge to RB Spray and HP "B" Loop) Open

3.2 Establish LPSW to LPI coolers by making the following line-up:

(3)(2) LPSW-252 (LPI Cooler "B" Outlet to CCW Valve Byp Control) Closed

(3)(2) LPSW-251 (LPI Cooler "A" Outlet to CCW Valve Byp Control) Closed

(3)(2) LPSW-4 (LP Injection Cooler "A" Shell Outlet) Open

(3)(2) LPSW-5 (LP Injection Cooler "B" Shell Outlet) Open

3.3 Throttle open LPSW-252 and LPSW-251 to establish a cooldown on Rx Bldg. sump water prior to entering HPI suction.

3.4 Start A and B LPI pumps to initiate flow path.

3.5 Monitor RCS pressure and temperature to ensure the RCS remains subcooled (See Enclosure 1).

3.6 Commence feeding the OTSG's through the auxiliary feed nozzles, once feedwater is regained, to induce natural circulation. Feed OTSG to 50% on operating range.

3.7 Monitor for Natural Circulation.

3.7.1 RCS is 50° F subcooled and remains so (see Enclosure 1).

3.7.2 Feedwater level is at $\sim$ 50% on operating range.

3.7.3 The ΔT between T_{hot} and T_{cold} is $\sim 30^{\circ}$ F to 40° F.

3.7.4 Turbine Bypass Valves are controlling T_{ave} at $\sim 555^{\circ}$ F.

3.7.5 Main steam pressure is at $\sim$ 1000 psi.

3.7.6 Incore thermocouple temperatures are not increasing.

3.7.7 Feedwater valves indicates OPEN and flow is being observed entering steam generators.

3.8 Regain RCS pressure control by energizing the pressurizer heaters and heating the pressurizer until the pressurizer temperature indicates within the pressure-temperature curve for saturation. Also close the PORV RC-66 if open.

3.9 Stop "C" HPI pump and close (3)(2) HP-27 and (3)(2) HP-26.

3.10 Close (3)(2) LP-16 and stop "B" LPI pump.

3.11 Place pressurizer heaters in automatic.

NOTE: RCS must be maintained subcooled (See Enclosure 1).

3.12 Monitor RCS pressure carefully to ensure that the bubble is formed in the pressurizer.

3.13 Initiate Rapid Cooldown per OP/0/A/1102/17 (Controlling Procedure for Rapid Unit Shutdown and Cooldown).

3.14 Borate the R.C. System for cold shutdown conditions per OP/1103/15 (Reactivity Balance Calculation).

Case B: Rupture in excess of capability of three (3) High Pressure Injection pumps.

1.0 Symptoms

1.1 Letdown storage tank level decreasing.

1.2 Pressurizer level decreasing.

1.3 RCS pressure decreases.

1.4 RIA alarms.

1.5 Increasing Reactor Building sump level.

1.6 High Reactor Building pressure alarm, ES 1 through 6 actuation.

2.0 Immediate Action

2.1 Automatic

2.1.1 Reactor trip.

2.1.2 Turbine trip.

2.1.3 ES 1-6 actuation.

2.2 Manual

2.2.1 Verify automatic actions have occurred, if not, perform manually.

CAUTION: Do not override Automatic Actions of Engineered Safety Features unless continued operation will result in unsafe plant conditions or will threaten reactor vessel integrity. (Refer to Pressure/ Temperature Curve).

2.2.2 Check immediately for flow indication on both HPI emergency injection lines. If no flow is indicated in "B" loop, dispatch operator to open (3) (2) HP-116 within 10 minutes of ES actuation.

2.2.3 If no flow in indicated in "A" loop, dispatch operator to open (3) (2) HP-26 within 10 minutes of ES actuation.

2.2.4 After the valves are open, verify flow into both loops. If flow is not established within the above time period rapidly depressurize the RC System so that LPI ES can be actuated below 500 psig by opening Turbine bypass valves or opening RC-66 (Power operated relief valve) from ES Cabinet 13.

3.0 Subsequent Action

3.1 Continue with Unit Shutdown per OP/1102/10.

CAUTION: System must be depressurized to less than 200 psig by the time the BWST is down to 3 ft.

3.2 Verify core flood discharges at ∿ 600 psig.

3.3 If RC System pressure becomes approximately equal to OTSG secondary pressure and all three HPI pumps do not repressurize the RC System above saturated temperature conditions perform the following:

3.3.1 Close (3)(2)CF-1 (Core Flood Tank "A" Outlet) and (3)(2)CF-2 (Core Flood Tank "B" Outlet) to isolate core flood tanks.

3.3.2 Open (3)(2)RC-4 (Power Operated Relief Block) and (3)(2)RC-66 (Power Operated Relief Valve) to depressurize the RC System.

3.3.3 Start the EFDW pump and establish OTSG levels of 95% on operating range with (3)(2)FDW-315 (EFDWP Disch. to S/G "A" Control) and (3)(2)FDW-316 (EFDWP Disch. to S/G "B" Control).

3.3.4 Verify ES actuation of LPI at 500 psig in RC System or initiate manually.

3.3.5 Continue RC System depressurization to < 250 psig.

3.4 If the HPI system has been actuated because of a low pressure condition, it must remain in operation until either:

3.4.1 Both LPI pumps are in operation and flowing at a rate in excess of 1000 gpm each and the situation has been stable for 20 minutes, or ,

3.4.2 All hot and cold leg temperatures are at least 50 degrees below the saturation temperature for the existing RCS pressure. If 50 degrees subcooling cannot be maintained after HPI cutoff, the HPI shall be reactivated (refer to Enclosure 1). The degree of subcooling beyond 50 degrees F and the length of time HPI is in operation shall be limited by the pressure/temperature consideration for the vessel integrity (pressure/temperature curves).

NOTE: If the HPI System has been activated and RC pumps operating, at least one RCP per loop shall remain operating.

OR

3.4.3 Depending upon the nature of the low pressure transient, appropriate operator action may be required to alter the operation of the HPI system and/or the RC pumps in order to prevent an unsafe RC system condition.

3.5 When the BWST level decreases to the lo-lo level alarm point, open valves (3) (2) LP-19 and (3) (2) LP-20, then close valves (3) (2) LP-21 and (3) (2) LP-22.

3.6 Throttle LP injection valves (3) (2) LP-12 and (3) (2) LP-14 to prevent pump cavitation.

NOTE: High flow 4200 gpm per pump.

3.7 PH will be measured and the additon of the appropriate caustic to coolant will commence per OP/1104/30 within 30 minutes after switchover to recirculation mode of core cooling to adjust the pH to a range of 7.0 to 8.0 within 24 hours.

3.8 Sample the RB sump to determine boron concentration is not being diluted.

3.9 When RB pressure decreases to 10 psig, return two RB cooling fans to full speed.

3.10 Secure the RB spray system when RB pressure decrease to atmospheric pressure or system has operated a minimum of 80 hours. Spray System may be run longer to aid in removing airborne iodine.

3.11 Monitor the hydrogen level in RB. Place RB Hydrogen Purge System in operation per OP/0/A/1104/29.

3.12 Perform the following applicable step(s) on the appropriate unit within 24 hours;

3.12.1 Unit 1: Rack in breakers on valves LP-103 and LP-104 and open these valves. Verify flow through these valves.

3.12.1.1 If unable to verify flow through LP-103 and LP-104, rack in breaker on valve LP-105. Open LP-1, LP2,

and LP-105 and verify flow through LP-106 and LP-107.

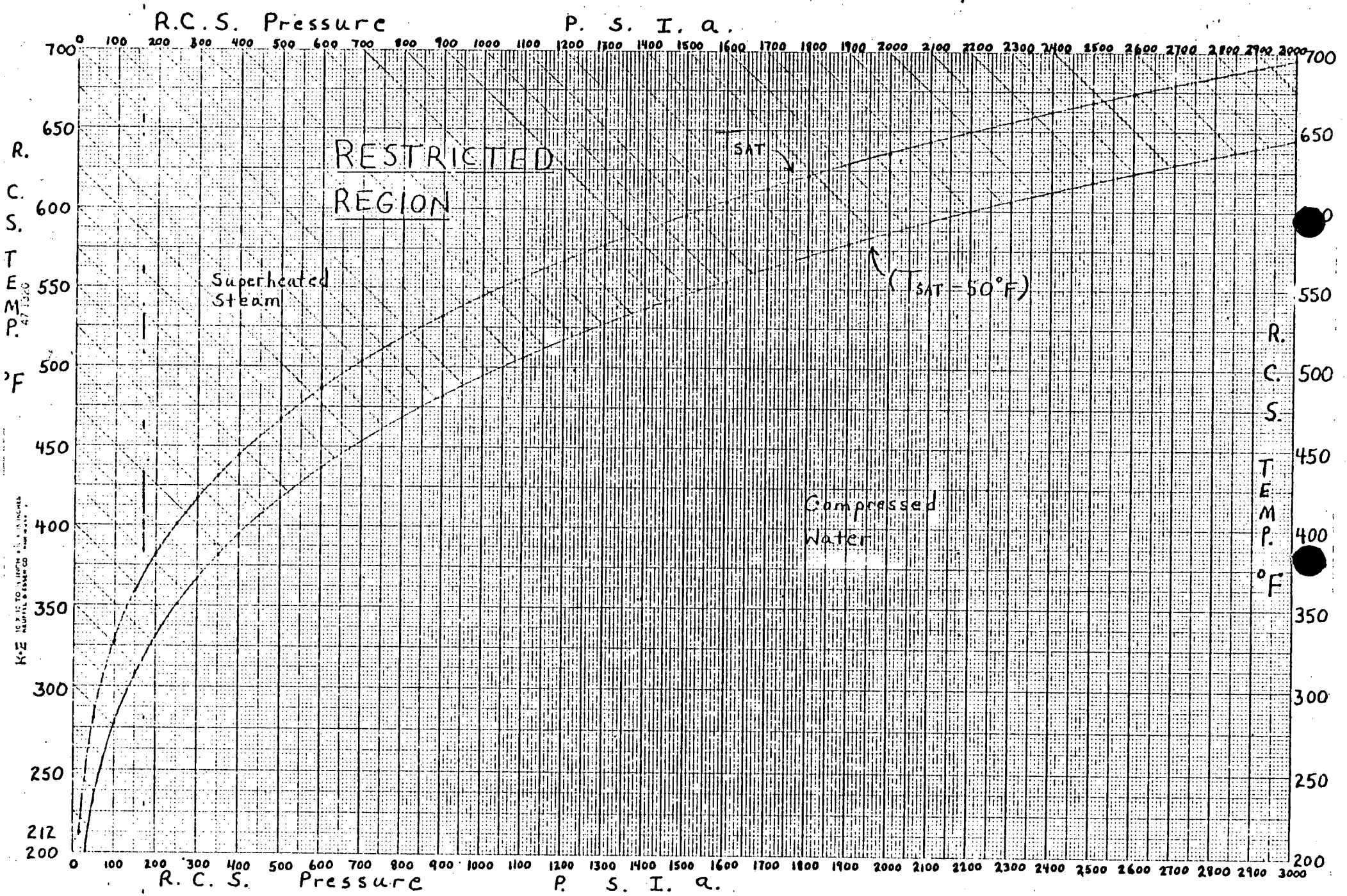
3.12.2 Unit 2: Rack in breakers on 2LP-103 and 2LP-104 and open these valves. Verify flow through these valves.

3.12.2.1 If unable to verify flow through 2LP-103 and 2LP-104, open 2LP-4, 2LP-3, 2LP-2, 2LP-1, 2LP-108 and 2LP-109 and verify flow through this line.

3.12.3 Unit 3: Rack in breakers on 3LP-103 and 3LP-104 and open these valves.

3.12.3.1 If unable to verify flow through 3LP-103 and 3LP-104, open 3LP-3, 3LP-2, 3LP-1, 3LP-108 and 3LP-109 and verify flow through this line.

Enclosure 1


R.C.S. Pressure P. S. I. a.
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400 2500 2600 2700 2800 2900 3000
700 650 600 550 500 450 400 350 300 250 212 200
R. C. S. TEMP. °F
RESTRICTED REGION
SAT
(T_{SAT} - 50°F)
Superheated Steam
Compressed Water
R. C. S. TEMP. °F
R. C. S. Pressure P. S. I. a.