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NINE MILE POINT NUCLEAR STATION UNIT 2

OPERATING PROCEDURE

PROCEDURE NO. N2-OP-37

REACTOR WATER CLEANUP SYSTEM

APPROVALS	SIGNATURES	DATE AND INITIALS REVISION 3	REVISION 4	REVISION 5
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FOR INFORMATION ONLY

Summary of Pages (Cont'd on Cover Sheet 2)

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NIAGARA MOHAWK POWER CORPORATION

THIS PROCEDURE NOT TO BE USED
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SUBJECT TO PERIODIC REVIEW.

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Cover Sheet Continuation (Page 2)

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35d,35e	August 1991 (PCE 16655)

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A. TECHNICAL SPECIFICATIONS

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4.0 3/4.6.3 Primary Containment Isolation Valves

B. SYSTEM DESCRIPTION

The purpose of the Reactor Water Cleanup System (RWCU) is to maintain high reactor water quality by removing corrosion products, soluble and insoluble impurities from the reactor. The RWCU system also provides a means of removing excess water from the reactor vessel (flow rejection) and in an emergency can be used for additional reactor pressure control as directed by N2-EOP-RP.

During normal operation, RWCU takes suction from the reactor recirc pump suctions and the reactor bottom head drain line. Reactor water is pumped through the tube side of the regenerative and non-regenerative heat exchangers where it is cooled to less than 120°F. The water is then directed through the filter/demineralizer units where impurities are removed. After leaving the filter/demineralizers, the water passes through the shell side of the regenerative heat exchangers where it is heated prior to being returned to the reactor through the feedwater system.

During flow rejection, system flow is essentially the same as during normal operation except that after passing through the filter/demineralizer units a portion of the RWCU flow is directed to either the Main Condenser or to the radwaste Waste Collector Tanks. Reject flow is directed to the Main Condenser if available. If the main condenser is not available, reject flow is directed to the Liquid Radwaste System.

RWCU system operation is manually controlled from Main Control Room Panel Panel P602. The RWCU pumps and motor operated valves as well as system flow control valves and reject flow control valve are controlled from panel P602.

The filter/demineralizers are controlled from local panels 2WCS-IPNL187 and 2WCS-IPNL188. The controls on this panel are used to backwash and precoat the filter/demineralizers. In addition, controls on these panels are used for placing filter/demineralizers in service and removing them from service. Controllers for each filter/demineralizer's flow control valve is also located on these local panels. Panels 2WCS-IPNL187 and 2WCS-IPNL188 are located on the 328' elevation of the reactor building.

The RWCU system is provided with two containment isolation valves (2WCS*MOV102 and 2WCS*MOV112). These valves receive isolation signals from NSSSS. The WCS isolation signals are 1) Low Low Reactor Water Level, 2) High Pump Room and Heat Exchanger Room Ambient Temperature, 3) High Differential Flo of 150.5 gpm with a 45 sec. time delay, 4) High Non Regenerative Heat Exchanger Outlet Temperature, 5) Reactor Building Radioactive Pipe Chase High Temperature and 6) Standby Liquid Control or Redundant Reactivity Control Initiation. 3

The RWCU pumps will trip if any of the following conditions occur: 1) Pump suction flow low (15 min. TD) or, 2) if either system isolation valve (2WCS*MOV102 or 2WCS*MOV112) is not full open.

Because of the Feedwater Piping Temperature stratification having occurred at the feedwater and RWCU return thermal tee, during low power operation, the following rules should be applied for RWCU system operation:

a. With Reactor Water Temperature less than 200°F, RWCU can be operated at rated flow with return to feedwater.

b. With Reactor Water Temperature greater than 200°F, and less than 20% power, RWCU shall be operated with one pump, full reject to main condenser or radwaste at 170 to 200 gpm.

c. With Reactor Power greater than 20%, RWCU can be transferred to FW return at rated flow.

d. If a Reactor Scram occurs, RWCU system shall be realigned to one pump with full reject to the main condenser/radwaste.

C. OPERATING REQUIREMENTS

1.0 Systems

1.1 Condensate Storage and Transfer System (CNS) available with 2 pumps operating for backwashing WCS filter/demineralizers.
N2-OP-4

1.2 Primary Containment Isolation System.
N2-OP-83

1.3 Reactor Building Closed Loop Cooling Water System (CCP) in operation with cooling water available to the RWCU Non-regenerative Heat Exchanger (2WCS-E3) and RWCU pump seal coolers.
N2-OP-13

1.4 Instrument and Service Air (IAS) available to provide air to RWCU instruments and controls, air operated valves and for filter/demineralizer backwash. N2-OP-19

1.5 Liquid Radwaste System (LWS) available to receive sludge from RWCU filter/demineralizer backwash. N2-OP-40

1.6 Normal AC Distribution to provide power to components listed in Table II. N2-OP-71

1.7 Reactor Building Drains (DER, DFR) N2-OP-63

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1.9 Emergency AC Distribution to Provide Power to RWCU Isolation Valves N2-OP-72

1.10 Normal DC Distribution N2-OP-73A

1.11 Process Sampling (SSR) N2-OP-17

D. PRECAUTIONS/LIMITATIONS

1.0 When RWCU is being used to reject water, non-regenerative heat exchanger outlet temperature must be monitored. As reactor temperature and pressure increase, reject flow must be reduced to maintain heat exchanger outlet temperature less than 130°F. If heat exchanger outlet temperature is allowed to increase to 140°F, a cleanup system isolation will result.

2.0 Do not exceed the maximum non-regenerative heat exchanger closed cooling water (CCP) exit temperature of 180°F.

3.0 This step has been deleted.

4.0 Maintain CCP to the RWCU pumps anytime the pumps are in operation or pump temperature is greater than 130°F.

5.0 2WCS-MOV106 and 2WCS-MOV107 (Appendix R Valves) will be energized only when RWCU is being operated in blowdown.

6.0 When venting high temperature water, the water may flash to steam. Exercise extreme caution during these operations. Always slowly throttle open vent valves.

7.0 Do not return the RWCU system to operation following actuation of the Standby Liquid Control System as it will remove the Sodium Pentaborate from the reactor water, except as directed by N2-EOP-RPV to support either pressure control or boron injection using RWCU.

8.0 The heatup rate of the RWCU pumps should not exceed 10°F per minute.

9.0 All RWCU areas should be considered high radiation areas. Contact radiation protection prior to entering these areas.

10.0 Remove all filter/demineralizers from service per Section F.2.0 prior to starting or stopping a RWCU recirculation pump.

11.0 All evolutions causing changes in RWCU flow should be made slowly. Rapid changes in flow can result in filter/ demineralizer breakthrough. This may cause plugging of the filter/demineralizer effluent strainers and will require removal of the filter/demineralizer from service and backwash of the strainers.

12.0 Monitor Filter Demineralizer effluent conductivity. Backwash and precoat F/D if the following guidelines are exceeded:

a. If RWCU is operating with FW return and outlet conductivity approaches 0.1 μmho/cm.

12.0 (Cont)

b. If RWCU is operating with full reject to condenser and outlet conductivity approaches inlet conductivity.

12.1 The Chemistry Department will sample RWCU daily and advise that a F/D be backwashed and precoated if the influent sample silica count exceeds 100 ppb and the effluent sample of an individual F/D exceeds 50 ppb silica.

12.2 When WCS System is isolated and unavailable for continuous conductivity monitoring per Tech. Spec. 3/4.4.4.c, alternate sampling must be performed. See OP-17 and Tech. Spec. 3/4.4.4.c.

13.0 Rapid loss of RWCU flow may result in the filter media being dropped from the septa. Following an RWCU isolation or RWCU pump trip it is good practice to backwash and precoat the Filter/demineralizers prior to restoring the system to service.

14.0 Anytime operations are being performed at panel 2WCS-IPNL187 and 2WCS-IPNL188 the operator at the local panels should remain in direct voice communication with the Main Control Room.

15.0 Prior to resetting an isolation of the RWCU system, the cause of the isolation must be determined and corrected.

16.0 Always precoat the filter/demineralizers prior to pumping water through them. Pumping through bare filter septor may cause them to corrode and/or plug.

16.1 To prevent resin damage/depletion, precoat of filter/demin should not take place unless filter/demin will be placed on line within 24 hours. | 7

17.0 Do not attempt to backwash more than one filter/demineralizers at the same time. The filter/demineralizers share a common drain path to Phase Separator. Attempting to backwash two filter demins simultaneously may result in restriction to flow and a poor backwash.

18.0 Prior to backwash of RWCU filter/demineralizers notify Radiation Protection that a backwash will be performed.

19.0 RWCU shall be operating in total reject to main condenser when Reactor Water Temperature is greater than or equal to 200°F and Reactor Power is less than 20%. (Except as required to support N2-EOP-6, Att. 19)

20.0 Observe all precautions to limit radiation exposure and the spread of contamination. Water from leakage or drain/vent operations should be treated as contaminated. Whenever possible, make provisions to contain the source of the water.

21.0 Do not change valve position indication light bulbs on the filter/demineralizer control panels, 2WCS-IPNL187 & 2WCS-IPNL188 when they are energized this will cause fuses to blow and a possible shutdown of a cleanup filter.

22.0 When changing system flow; i.e., starting/stopping pumps, changing lineups, adding/removing F/D's from service; station an operator at PNL's 2CEC*PNL632/642 to monitor the differential flow meters so that a system isolation may be avoided.

23.0 Do not simultaneously open 2WCS-MOV107 and 2WCS-MOV106 as a loss of condenser vacuum could occur.

24.0 This step deleted.

25.0 During single Rx. Recirculation Loop operation (1 loop isolated) maintain WCS System Flow below 500 gpm to ensure adequate NPSH is available to the pump (2WCS-P1A,B). Only one pump should be in operation with the other isolated in standby. The second pump can be started for pump swap.

26.0 Notify SSS prior to any manipulation of those valves listed in Attachment 2.

27.0 The Chemistry Department should be notified to isolate their sample lineups from the WCS Demineralizer influent and effluent sample points if the WCS system is isolated or shutdown for $\geq$ 30 minutes.

28.0 When starting up the WCS system, venting is required if the WCS system has been isolated or shutdown for $\geq$ 30 minutes.

29.0 Mode "B" operation of the WCS system, (utilizing the WCS system to prevent thermal stratification of the reactor vessel during periods when no recirc flow and feed flow are available), is prohibited due to thermal stress on the feedwater system. (GE SIL #436)

30.0 Seal water injection to pump mechanical seals should be maintained to an out-of-service pump by maintaining that pump's suction and discharge valve open until the pump cools down sufficiently to preclude seal damage. (NMP69801; GESIL258 R.0, S.1, S.2).

31.0 Pump cavitation can occur during restart following containment isolation or cleanup system isolation or depressurization (NMP69801; GESIL258 R.0, S.1, S.2).

32.0 Do not run both WCS pumps when Reactor coolant temperature is greater than 200°F, due to potential for overheating the mechanical seals.

33.0 When operating Reactor Recirculating pumps on high speed, Reactor Water Cleanup indication of Bottom Head Drain Flow (G33-R610 on 2CEC*PNL602) is grossly inaccurate. The meter can be used to trend raising/lowering flow. Meter off-scale indicates a possible line break. 15708

E. STARTUP PROCEDURE

The Reactor Water Cleanup System will normally be placed in operation under cold conditions prior to reactor startup.

1.0 Initial Fill and Vent

1.1 Verify that closed loop cooling is available to RWCU Pump 1A(B) Bearing and Seal Cooler.

1.2 Open/verify open CCP supply to RWCU P1A(B) Bearing and Seal Cooler, supply valves 2CCP-V832, 2CCP-V833, 2CCP-V911 and 2CCP-V913.

1.3 Open/verify open CCP discharge from RWCU P1A(B) Bearing and Seal Cooler; discharge valves 2CCP-V834, 2CCP-V835, 2CCP-V912 and 2CCP-V914.

1.4 Place the RWCU pump 1A(B) control switches on P602 in "PULL-TO-LOCK".

1.5 Perform system electrical lineup in accordance with Table II.

1.6 Reset any RWCU isolation signals at P602 and then perform system valve lineup in accordance with Table I with exception of 2WCS*MOV103, 2WCS*MOV101 and 2WCS*MOV200 remain closed.

1.7 This step deleted.

1.8 Open/verify open Recirc Pump 1A(B) Suction valves 2RCS*MOV10A and 2RCS*MOV10B (P602), if required.

CAUTION:

MONITOR REACTOR WATER LEVEL DURING RWCU FILLING AND VENT.

1.9 Slowly throttle open Cleanup Suction Inside Blocking 2WCS*MOV103 to begin filling the WCS piping.

CAUTION:

OBSERVE PRECAUTIONS/LIMITATION 20.0 DURING SYSTEM VENTING.

1.10 Open 2WCS-P1A seal cavity vent valve 2WCS-V385A. Slowly throttle open 2WCS-V386A. When a solid stream of water issues from the vent, close 2WCS-V386A and 2WCS-V385A.

1.11 Open 2WCS-P1B seal cavity vent valve 2WCS-V385B. Slowly throttle open 2WCS-V386B. When a solid stream of water issues from the vent, close 2WCS-V386A and 2WCS-V385B.

1.12 Open Vessel Bottom Dr to Clean up Suction 2WCS*MOV101 and verify that Clean Up Suction Inside Blocking 2WCS*MOV103 is full open.

1.13 The remainder of the system will be filled and vented during the cleanup pump start per Steps E.2.0 or E.4.0 of this procedure.

2.0 Starting a RWCU Pump (2WCS-P1A or P1B) With System Flow Return to Feedwater

NOTE: Refer to H.2.0 of this procedure if RWCU pump and system temperature difference is greater than 100°F.

NOTE: The filter/demineralizers are the high point of the system and are automatically vented during the precoat process. Although the piping upstream and downstream of the filter/demineralizer isolation valves is also at a higher elevation than the rest of the system, it was not provided with a means of venting. In a case where the system has been breached or partially drained, refer to Section H.7.0 for additional venting instructions.

2.1.1 Open (or verify open) 2 WCS*MOV102.

2.1.2 Open (or verify open) 2 WCS*MOV112.

2.1.3 Verify the following for the pump to be started:

a. Pump oil level is normal.

b. Pump shaft can be freely rotated by hand.

c. Seal cooling water is available at the pump seal coolers.

NOTE: If the system has been filled and vented completely, the manual discharge valve for the pump being started does not need to be closed. If the system has been breached or partially drained, the manual discharge valve should be closed for the first pump to be started. It is necessary to establish system flow above 140 gpm in 15 minutes or the pump will be tripped on low flow. Perform Steps 2.7 and 2.8 as quickly as possible after starting the pump.

2.2 Close the Clean Up P1A(B) discharge isolation valve (2WCS-V30A or 2WCS-V30B) for the pump to be started if the system requires venting. If the system is already filled and vented, verify the pump discharge valve 2WCS-V30A(B) is full open.

2.3 Partially open the Cleanup Demin Bypass 2WCS-MOV110 and 2WCS*MOV200 (This will allow filling of the WCS piping if not previously filled).

2.4 This step deleted.

2.5 Start pump 2WCS-P1A(B) by holding its control switch in the "START" position for 3 seconds.

2.6 Following startup of an RWCU pump, an operator should check pump seal cavity temperature to verify that adequate seal cooling is available.

NOTE: Steps 2.7, 2.8, and 2.9 are to be performed only if the system is being filled OR venting is required and the pump discharge isolation valve was closed in Step E.2.2. When starting a pump with the system full, proceed to Step 2.10 after starting the pump.

CAUTION:

VENTING IS REQUIRED IF THE WCS SYSTEM HAS BEEN ISOLATED OR SHUTDOWN FOR ≥ 30 MINUTES.

CAUTION:

OBSERVE PRECAUTIONS/LIMITATIONS 20.0 DURING SYSTEM VENTING.

2.7 Throttle open the Clean Up P1A(B) discharge isolation valve 2WCS-V30A(B) to increase the system fill rate, if required.

2.8 Vent the following WCS equipment, if required:

a. The tube side of the non-regenerative heat exchanger (2WCS-E3) by opening Non Regen Hx Tube Side Vent valve 2WCS-V51 and slowly throttling open Non Regen Hx Tube Side Vent valve 2WCS-V52. When a solid stream of water issues from the vent, close valves 2WCS-V51 and 2WCS-V52.

b. The tube side of the regenerative heat exchanger (2WCS-E2) by opening Regen Hx Tube Side Vent valve 2WCS-V23 and slowly throttling open Regen Hx Tube Side Vent valve 2WCS-V24. When a solid stream of water issues from the vent, close valves 2WCS-V23 and 2WCS-V24.

c. The shell side of the regenerative heat exchanger (2WCS-E2) by opening Regen Hx Tube Side Vent valve 2WCS-V37 and slowly throttling open Regen Hx Tube Side Vent valve 2WCS-V38. When a solid stream of water issues from the vent, close valves 2WCS-V37 and 2WCS-V38.

d. Vent the system discharge piping by removing the pipe cap and opening the following valves:

1. Open 2WCS-V354, Vent Upstream of 2WCS-MOV111, and slowly throttle open 2WCS-V355. When a solid stream of water issues from the vent, close 2WCS-V354 and 2WCS-V355. Replace the pipe cap.

2.8 (Cont'd)

2. Open 2WCS-V356, Vent Downstream of 2WCS-MOV111, and slowly throttle open 2WCS-V357. When a solid stream of water issues from the vent, close valves 2WCS-V356 and 2WCS-V357. Replace the pipe cap.

2.9 With the system completely filled and vented, slowly throttle open the Cleanup P1A(B) Discharge Isolation Valve 2WCS-V30A(B) while observing system flow on flow indicator 2WCS-FI1609 (2G33-R609) on P602.

a. If system flow approaches 400 gpm (one pump running) before 2WCS-V30 A(B) is full open, begin throttling closed the Return to Feedwater Isolation valve 2WCS*MOV200 at P602 while continuing to open 2WCS-V30 A(B).

NOTE: As a guide, for steady state operation system flow and valve positions with filter demineralizers in service should be as follows:

F/D's In Service	2WCS-MOV110 Position	2WCS*MOV200 Position	Flow (GPM)	
4	Closed	Throttled as required per H.3.0	680-700 (F/D flow) ≃ 900 (System Flow)	3
3	Closed	Throttled as required per H.3.0	510-525 F/D flow) ≃ 900 (System Flow)	
2	Closed	Throttled as required per H.3.0	340-350 (F/D flow) ≃ 450 (System Flow)	
1	Throttled as required (two pump operation)	Throttled as required	170-175 (F/D flow) 400-900 (System Flow)	
1	Closed (one pump operation)	Throttled as required	170-175 (F/D flow) ≃ 225 (System flow)	
0	Open	Throttled as required	≃ 400 (System flow)	

2.10 Throttle the Clean Up Demin Bypass 2WCS-MOV110 open and the Return to Feedwater Isolation 2WCS*MOV200 as necessary until system flow increases to approximately 400 gpm per pump and the Clean Up Demin Bypass 2WCS-MOV110 is full open.

2.11 Verify the following locally:

a. RWCU pump P1A(B) discharge pressure is approximately 250 psig greater than reactor pressure (2WCS-PI186). If not, then throttle the Return to Feedwater Isolation 2WCS*MOV200 as required to obtain the desired pressure.

NOTE: Increasing seal temperature or the inability of the seal coolers to maintain seal temperature may be an indication of improper venting of the seal coolers.

b. Pump seal cavity temperature rise is not excessive per 2WCS-TIS36A,C(B,D). If seal temperature rise is excessive, re-vent the seal and seal coolers.

NOTE: All Filter/Demineralizers should be removed from service prior to starting or stopping pumps.

NOTE: During single Rx. Recirculation Loop operation, observe Precautions/Limitations 25.0.

2.12 If a second pump is to be started, repeat Steps 2.1, 2.2, 2.4, 2.5, 2.6, 2.10 and 2.11 as required.

2.13 Lock open both Clean Up pump P1A and P1B discharge isolation valves 2WCS-V30A and 2WCS-V30B.

2.14 Verify that the differential flow transmitters 2WCS*FT67X(Y), *FT68X(Y) and *FT69X(Y) have been vented and the bypass switches are in operate if required by Tech Specs per the operating mode of the system.

2.15 If necessary, inform Chemistry that they may re-establish their sample paths from the WCS System. | TCN-54

3.0 Placing Filter Demineralizers in Service With Flow Return to Feedwater

NOTE: Any flow surges or water hammer experienced while placing filter demineralizers in service may cause resin breakthrough. This will result in a plugged effluent strainer and will require that the effluent strainer be backwashed.

NOTE: The A and B filter demineralizers are controlled from panel 2WCS-IPNL187. The C and D filter demineralizers are controlled from panel 2WCS-IPNL188.

NOTE: Prior to placing a filter demineralizer in service, it should be backwashed and precoated in accordance with Sections F.4.0 and F.5.0 as required.

3.1 Verify that the 4A (B)(C)(D) filter demineralizer has been backwashed and precoated and is in hold, ready for service.

3.2 Verify CLOSED the valves listed on Attachment 2 for 4A (B,C,D) Filter. TCN-49

NOTE: The following steps are performed at panel 2WCS-IPNL187 (4A and 4B F/D) or panel 2WCS-IPNL188 (4C and 4D F/D) unless otherwise stated.

NOTE: Flow Controller 2WCS-FIC1016 (2G36-R022) A(B)(C)(D) should be operated in manual when removing from or placing a F/D into service. Ensure that the slow/low detent is used. TCN-49

3.3 Place the flow controller 2WCS-FIC1016 (2G36-R022) A(B)(C)(D) for the filter/demineralizer to be placed in service in manual. Depress the decrease pushbutton and run the controller output signal to 0%.

3.4 Establish voice communications between 2WCS-IPNL187 (188) and the Main Control Room.

NOTE: When the Filter Mode Switch is placed in the "FILTER" position, the Flt/Demin Inlet Isolation Valves 2WCS-AOV23A(B)(C)(D), 2WCS-AOV22A(B)(C)(D) and the Flt/Demin Outlet Isolation Valve 2WCS-AOV27A(B)(C)(D) will open. Since flow controller output signal is 0%, the Flt/Demin Outlet Flow Control valve 2WCS-FV16A(B)(C)(D) will remain closed and the hold pump 2WCS-P6A(B)(C)(D) will continue running.

3.5 Place the appropriate F/D Mode Switch in the "FILTER" position. Verify the following:

a. Flt/Demin Inlet Isolation Valve 2WCS-AOV22A(B)(C)(D) opens.

b. Flt/Demin Inlet Isolation Valve 2WCS-AOV23A(B)(C)(D) opens.

c. Flt/Demin Outlet Isolation Valve 2WCS-AOV27A(B)(C)(D) opens.

d. Flt/Demin Flow Control valve 2WCS-FV16 A(B)(C)(D) remains shut

NOTE: Steps 3.6 and 3.10 should be performed only if the First two Flt/Demin are being placed in service and the cleanup Demin Bypass Valve 2WCS-MOV110 is open. (per the chart on page 8 Step 2.9)

3.6 At P602, throttle the Return to Feedwater Isolation Valve 2WCS*MOV200 to set the system flow at approximately 400 gpm per operating pump. Throttle the Clean up Demin Bypass Valve 2WCS-MOV110 closed until system flow as indicated by 2WCS-FI1609 (2G33-R609) decreases to approximately 200 gpm per operating pump.

NOTE: 2WCS-MOV110 should not be moved unless FLT/Demins flow control valves are in AUTO or fully CLOSED, or an Operator is stationed at the associated panel to adjust the flow controller as required. TCN-3

3.7 Slowly, at the rate of about 1% per second, increase the output of flow controller 2WCS-FIC1016 (2G36-R022) A(B)(C)(D) to increase flow through the Flt/Demin to obtain flow through the F/D of 170-175 gpm.

3.8 Verify that the hold pump 2WCS-P6A(B)(C)(D) stops when F/D flow is greater than 153 gpm.

3.9 At the Flt/Demin flow controller 2WCS-FIC1016 (2G36-R022) A(B)(C)(D), null the controller error signal and place the controller in "AUTO".

NOTE: If the Flow Control Valve Controller 2WCS-FIC1016 A,B,C,D is left in manual, a hold-out shall be hung on the controller to identify that the controller is in manual.

NOTE: It is acceptable to leave the Flow Control Valve in manual if control is unstable in automatic. Frequent checks on filter/demin operation should be made when control is in manual and a change in system status is made.

NOTE: Step 3.10 to be performed after the second FLT/Demin is in AUTO. (or after first F/D is in AUTO if only one pump is in operation).

3.10 At P602, slowly jog closed the Clean Up Demin Bypass Valve 2WCS-MOV110 full closed. Closely monitor F/D flow during this operation.

NOTE: If the conditions of Step 3.11.a and 3.11.b are not met, remove the Flt/Demin from service, backwash and precoat the Flt/Demin per the appropriate sections of this procedure. If the condition in step 3.11.C is not met, then backwash the strainer per the appropriate sections of this procedure.

3.11 Verify the following:

a. Effluent conductivity is less than 0.1 umho/cm.

b. Filter/Demin dp is less than 15 psid.

c. Effluent strainer dp is less than 5 psid.

NOTE: Prior to placing subsequent filter(s) in service, reduce the flow of the in-service filter(s) until the respective hold pump starts. Ensure the hold pump has been running on the in-service filter(s) for >30 seconds prior to placing the new F/D in service. This will prevent system perturbations from dumping the running filters. When the new filter(s) in service repeat Steps 3.7, 3.8 and 3.9 for running filters.

3.12 Repeat Steps 3.1 through 3.11, as required, until the desired number of filter demineralizer units are in service.

3.13 With 2 or more filter demineralizer units in service, throttle the Return to Feedwater Isolation Valve 2WCS*MOV200 so that the following conditions are met:

a. The Clean Up Demin Bypass Valve 2WCS-MOV110 is full closed.

3.13 (Cont'd)

b. Flow through each filter demineralizer as indicated by 2WCS-FI1016 (2G33-R605) A, B, C, D on P602 is 170-175 gpm.

c. Pump discharge pressure as indicated on local pressure indicator 2WCS-PI186 is approximately 250 psig greater than reactor pressure.

d. The Flt/Demin Flow Control Valves 2WCS-FV16A, B, C, D flow demand signal from flow controllers 2WCS-FIC1016 (2G36-R022) A, B, C, D is set between 85% and 90% as indicated on the controller output signal indicator.

e. The Flt/Demin Flow Control Valves 2WCS-FV16A,B,C&D are at least 20% open and no more than 80% open as indicated on flow controller 2WCS-FIC1016 (2G36-R022) A,B,C,D valve position indicator.

4.0 Starting a RWCU Pump (2WCS-P1A or P1B) With Full Reject to Main Condenser/Radwaste

NOTE: The filter/demineralizers are the high point of the system and are automatically vented during the precoat process. Although the piping upstream and downstream of the filter/demineralizer isolation valves is also at a higher elevation than the rest of the system, it was not provided with a means of venting. In a case where the system is breached or partially drained, refer to Section H.7.0 for additional venting instructions.

NOTE: Refer to Section H.2.0 if RWCU Pump and Reactor Water Temperature difference is greater than 100°F.

4.1 Verify the following for the pump to be started:

a. Pump oil level is normal.

b. Pump shaft can be freely rotated by hand.

c. Seal cooling water is available at the pump seal coolers.

4.2 Verify Condensate/Feedwater is operating and controlling the Reactor Water Level, or RCIC is available to maintain Rx water level.

NOTE: If the system has been filled and vented completely, the manual discharge valve for the pump being started does not need to be closed. If the system has been breached or partially drained, the manual discharge valve should be closed for the first pump to be started. It is necessary to establish system flow above 140 gpm in 15 minutes or the pump will be tripped on low flow. Perform Steps 4.9 and 4.10 as quickly as possible after starting the pump.

4.3 Unlock and Close the Cleanup P1A(B) discharge isolation valve (2WCS-V30A or 2WCS-V30B) for the pump to be started if the system requires venting. If the system is already filled and vented, verify the pump discharge valve 2WCS-V30A(B) is locked full open.

4.4 Verify 2WCS*MOV200, Return to Feedwater, is closed. Partial open the Cleanup-Demin. Bypass 2WCS-MOV110 to allow filling.

4.5 Clear Yellow Holdout and open 2WCS-MOV107 or MOV106 at P602.

4.6 This step deleted.

4.7 Start pump 2WCS-P1A(B) by holding its control switch in the "START" position for 3 seconds and then throttle open 2WCS-FV135 to about 30% open

4.8 Following startup of an RWCU pump, and operator should check pump seal cavity temperature to verify that adequate seal cooling is available.

NOTE: Steps 4.9, 4.10, 4.11 and 4.12 are to be performed only if the system is being filled and vented. When starting a pump with the system full, proceed to Steps 4.11 and 4.12 after starting the pump.

CAUTION:

VENTING IS REQUIRED IF THE WCS SYSTEM HAS BEEN ISOLATED OR SHUTDOWN FOR ≥ 30 MINUTES. *

4.9 Throttle open the Cleanup P1A(B) discharge isolation valve 2WCS-V30A(B) to increase the system fill rate, if required.

4.10 Vent the following WCS equipment, if required:

a. The tube side of the non-regenerative heat exchanger (2WCS-E3) by opening Non Regen Hx Tube Side Vent valve 2WCS-V51 and slowly throttling open Non Regen Hx Tube Side Vent valve 2WCS-V52. When a solid stream of water issues from the vent, close valves 2WCS-V51 and 2WCS-V52.

b. The tube side of the regenerative heat exchanger (2WCS-E2) by opening Regen Hx Tube Side Vent valve 2WCS-V23 and slowly throttling open Regen Hx Tube Side Vent valve 2WCS-V24. When a solid stream of water issues from the vent, close valves 2WCS-V23 and 2WCS-V24.

c. The shell side of the regenerative heat exchanger (2WCS-E2) by opening Regen Hx Tube Side Vent valve 2WCS-V37 and slowly throttling open Regen Hx Tube Side Vent valve 2WCS-V38. When a solid stream of water issues from the vent, close valves 2WCS-V37 and 2WCS-V38.

d. Vent the system discharge piping by removing the pipe cap and opening the following valves:

1. Open 2WCS-V354, Vent Upstream of 2WCS-MOV111, and slowly throttle open 2WCS-V355. When a solid stream of water issues from the vent, close 2WCS-V354 and 2WCS-V355. Replace the pipe cap.

4.10 (Cont'd)

2. Open 2WCS-V356, Vent Downstream of 2WCS-MOV111, and slowly throttle open 2WCS-V357. When a solid stream of water issues from the vent, close valves 2WCS-V356 and 2WCS-V357. Replace the pipe cap.

4.11 With the system completely filled and vented, slowly throttle open the Cleanup P1A(B) Discharge Isolation Valve 2WCS-V30A(B) to fully open if not yet in full open position, and lock it open.

4.12 Open Blowdown Restricting Orifice Bypass Valve 2WCS-MOV108 full open and throttle 2WCS-FV135 as required to establish 170-175 gpm reject flow.

4.12.1 Verify SHUT the valves listed on Attachment 2 for F/D 4A (B,C,D). TCN-49

4.13 Place a filter demineralizer into service as follows:

a. Establish communication between 2WCS-IPNL187(188) and Control Room.

b. Place the appropriate F/D Mode Switch in the "FILTER" position and verify:

1. Flt/Demin Inlet Isolation Valve 2WCS-AOV22A(B)(C)(D) opens.

2. Flt/Demin Inlet Isolation Valve 2WCS-AOV23A(B)(C)(D) opens.

3. Flt/Demin Outlet Isolation Valve 2WCS-AOV27A(B)(C)(D) opens.

4. Flt/Demin Flow Control Valve 2WCS-FCV16A(B)(C)(D) remains shut.

c. Slowly increase the output of flow controller 2WCS-FIC1016A(B)(C)(D) and jog close 2WCS-MOV110, cleanup Demin Bypass Valve, to obtain 170-175 gpm F/D flow, between 85% and 87% on controller output signal indicator.

d. Verify hold pump 2WCS-P6A(B)(C)(D) stops when F/D flow is greater than 153 gpm.

e. Fully close 2WCS-MOV110.

f. Null the F/D flow controller and place the controller in "AUTO".

g. Verify Flt/Demin Flow Control Valve 2WCS-FCV16A,B,C,D is at least 20% open and no more than 80% open as indicated by flow controller 2WCS-FIC1016 (2G36-R022) A,B,C,D valve position indicator. Throttle 2WCS-FV135 as required to obtain proper position for 2WCS-FCV16A,B,C,D.

4.14 Verify that the differential flow transmitters 2WCS*FT67X*Y), *FT69X(Y) have been vented and the bypass switches are in operate if required by Tech Specs per the operating mode of the system.

4.15 If necessary, inform Chemistry that they may re-establish their sample path from the WCS System TCN-5

F. NORMAL OPERATION

1.0 Periodic Operational Checks

1.1 The operator should periodically check the following conditions:

a. Cleanup pump 2WCS-P1A and P1B seal cooling water outlet temperature is less than 140°F as read on 2CCP-TI77A and 2CCP-TI77B.

b. Each filter demineralizer flow is 170-175 gpm as read on 2WCS-FI1016A, B, C, D (2G36-R605 A, B, C, D) at P602.

c. Cleanup pump 2WCS-P1A and P1B oil level is normal.

d. Non-regenerative heat exchanger outlet temperature is less than 120°F as read on temperature indicator WCS-TI1114 (2G33-R607) with the selector switch in position 3 (both located on P602).

e. Cleanup pump discharge pressure is approximately 250 psig greater than reactor pressure at local indicator 2WCS-PI186.

f. Filter/demin dp is less than 15 psid as read at 2WCS-PI1020A, B, C, D on panels 2WCS-IPNL187 and 2WCS-IPNL188.

g. Filter/demin post strainer (2WCS-STR5A, B, C, D) dp is less than 5 psid as read on 2WCS-PI1019A, B, C, D on panels 2WCS-IPNL187 and 2WCS-IPNL188.

h. Effluent conductivity of each filter/demin is less than 0.1 umho/cm as read on 2SSR-CI-6A, B, C, D at panels 2WCS-IPNL187 and 2WCS-IPNL188.

i. No excessive leakage from the pump seals.

F. NORMAL OPERATION (Cont'd)

2.0 Filter/Demineralizer Removal From Service (for Backwash or Maintenance)

NOTE: Filter/demineralizers should be removed from service when any of the following conditions occur: 1) F/D effluent conductivity increases to greater than .1 umho/cm, 2) F/D differential pressure is greater than 15 psid, 3) F/D effluent strainer differential pressure is greater than 10 psid, 4) F/D inlet temperature is greater than 130°F and increasing, 5) silica content is high as determined by the Chemistry Department.

NOTE: See Attachment 1, Flt/Demin Controller Logic Schematic, as an aid in following the automatic functions of the Flt/Demin Controllers during backwash and precoat operations.

2.1 Establish communications between the control room and local panels 2WCS-IPNL187 (188).

NOTE: All operations in this section will be performed at panel 2WCS-IPNL187 (F/D A and B) or 2WCS-IPNL188 (F/D C and D) unless otherwise stated.

Removal of a filter demineralizer from service requires coordination between the operator at the filter/demineralizer panel and the operator at Main Control Room panel P602. Continuous communication should be maintained between these locations. Flow Controller 2WCS-F1C1016 (G36-R022) A(B)(C)(D) should be operated in manual. Ensure that the slow/low detent is used.

2.2 Verify SHUT the valves listed on Attachment 2 for F/D 4A (B,C,D). TCN-49,51

2.3 Slowly reduce flow through the Flt/Demin to be removed from service by reducing the output of the F/D flow controller 2WCS-FIC1016 (2G36-R022) A(B)(C)(D) until the F/D Flow Control Valve 2WCS-FCV16A (B)(C)(D) is full closed.

2.4 Verify the filter/demin hold pump (2WCS-P6A, B, C or D) starts when filter/demin flow drops to less than 153 gpm.

2.5 Place the filter mode switch in the "HOLD" position. Verify that Flt/Demin Inlet Isolation valves 2WCS-AOV23A, B, C or D, 2WCS-AOV22A, B, C, D and Flt/Demin Outlet Isolation Valve 2WCS-AOV27A, B, C, D close.

NOTE: The filter/demineralizer is now out of service and in standby.

2.6 Throttle closed Return to Feedwater Valve 2WCS*MOV200 as required to maintain a valve position of 20% - 80% open for the Flow Control Valves (2WCS-FCV16A,B,C,D) of the Filter/Demins remaining in service.

NOTE: If all FLT/Demins are to be removed from service refer to Section G.1.2. *4

2.7 Repeat Steps 2.3 through 2.6 above for removing second filter demineralizer from service.

NOTE: FLT/Demin Effluent Strainers do not require backwash if the differential pressure across the strainer was ≤ 3 PSID when the FLT/Demin was in service.

3.0 Filter/Demineralizer Effluent Strainer Backwash

3.1 Verify the strainer's associated filter/demineralizer has been removed from service (Section F.2.0).

3.1.1 Verify SHUT the valves listed on Attachment 2 for F/D 4A (B,C,D).

3.2 Depending on the strainer to be backwashed, close the applicable valve:

a. Flt/Demin 4A Outlet Isolation 2WCS-V70 for strainer 5A.

b. Flt/Demin 4B Outlet Isolation 2WCS-V80 for strainer 5B.

c. Flt/Demin 4C Outlet Isolation 2WCS-V90 for strainer 5C.

d. Flt/Demin 4D Outlet Isolation 2WCS-V100 for strainer 5D.

NOTE: Notify SSS prior to any manipulation of those valves listed on Attachment 2.

3.3 Open the following valves for the strainer to be backwashed in the order listed:

a. Strainer 5A: Strnr 5A Condensate Flush Isolation 2WCS-V111, Strnr 5A Condensate Flush Isolation 2WCS-V110, Strnr 5A Drain 2WCS-V78, STR 5A Drain 2WCS-V77.

b. Strainer 5B: Strnr 5B Condensate Flush Isolation 2WCS-V113, Strnr 5B Condensate Flush Isolation 2WCS-V112, STR 5B Drain 2WCS-V88, STR 5B Drain 2WCS-V87.

c. Strainer 5C: Strnr 5C Condensate Flush Isolation 2WCS-V115, Strnr 5C Condensate Flush Isolation 2WCS-V114, STR 5C Drain 2WCS-V98, STR 5C Drain 2WCS-V97.

d. Strainer 5D: Strnr 5D Condensate Flush Isolation 2WCS-V117, Strnr 5D Condensate Flush Isolation 2WCS-V116, STR 5D Drain 2WCS-V108, STR 5D Drain 2WCS-V107.

3.4 After approximately two (2) minutes, close the applicable valves as follows:

a. Strainer 5A: Strnr 5A Condensate Flush Isolation 2WCS-V111, Strnr 5A Condensate Flush Isolation 2WCS-V110, Strnr 5A Drain 2WCS-V78, STR 5A Drain 2WCS-V77.

b. Strainer 5B: Strnr 5B Condensate Flush Isolation 2WCS-V113, Strnr 5B Condensate Flush Isolation 2WCS-V112, STR 5B Drain 2WCS-V88, STR 5B Drain 2WCS-V87.

c. Strainer 5C: Strnr 5C Condensate Flush Isolation 2WCS-V115, Strnr 5C Condensate Flush Isolation 2WCS-V114, STR 5C Drain 2WCS-V98, STR 5C Drain 2WCS-V97.

d. Strainer 5D: Strnr 5D Condensate Flush Isolation 2WCS-V117, Strnr 5D Condensate Flush Isolation 2WCS-V116, STR 5D Drain 2WCS-V108, STR 5D Drain 2WCS-V107.

3.4.1 Verify SHUT (Restored Position) the valves listed on Attachment 2 for F/D 4A (B,C,D).

3.5 Open the following applicable valves:

a. Strainer 5A: Flt/Demin 4A Outlet Isolation 2WCS-V70

b. Strainer 5B: Flt/Demin 4B Outlet Isolation 2WCS-V80

c. Strainer 5C: Flt/Demin 4C Outlet Isolation 2WCS-V90

d. Strainer 5D: Flt/Demin 4D Outlet Isolation 2WCS-V100

NOTE: Filter/demineralizer is now ready to be backwashed and precoated per section F.4.0 and F.5.0 or placed in service per section E.3.0.

4.0 Filter/Demineralizer Backwash

4.1 This step deleted. 15944

4.2 Perform Section H.8.0 of this procedure to ensure the filter/demineralizer is FULL.

NOTE: See Attachment 1, Flt/Demin Controller Logic Schematic, as an aid in following the automatic functions of the Flt/Demin Controllers during backwash and precoat operations.

4.3 Verify the Filter/Demineralizer to be backwashed is placed in HOLD per Section F.2.0 of this procedure prior to backwash.

4.4 Contact Radwaste to ensure that sufficient volume exists in the Phase Separators to accept a backwash.

NOTE: Only one Filter/Demineralizer in each subsystem can be isolated and backwashed at a time.

4.5 Verify SHUT valves listed on Attachment 2 for F/D 4A(B,C,D).

4.6 Notify Radiation Protection prior to commencing Filter/Demineralizer backwash.

4.7 At the filter/demin panel 2WCS-IPNL187(188), remove the filter/demin to be backwashed from service per Section F.2.0 and verify that the Filter/Demin goes into the "Hold Mode" by observing the following actions:

a. 2WCS-AOV31A(B,C,D) opens

b. 2WCS-P6A(B,C,D) running

c. 2WCS-FV16A(B,C,D) to the zero % open

d. 2WCS-AOV22A(B,C,D); AOV23A(B,C,D); AOV27A(B,C,D) close

4.8 Once in the "Hold Mode", the Filter/Demin is now ready to be backwashed. Press the Backwash Initiate push button allowing the backwash sequence to begin if the following interlocks are met:

a. Backwash tank (phase sep) level is not higher than setpoint

b. Other Filter/demin is not in backwash

c. Power is off no longer than one (1) second

d. Local Functions Interlock Switch is in Normal or set to other F/D

4.9 If the Backwash sequence prematurely stops and valves do not open as required (hydraulic lock-up), perform Section H.6.0 of this procedure to remove the hydraulic lock and free up the valves for backwash operation.

4.9.1 If the shutdown (all valves closed) pushbutton has been pushed (for maintenance or otherwise), push the reset and then backwash initiate p/b prior to proceeding. 15986

4.10 When the above conditions are met, make ready valves 2WCS-AOV54A(B,C,D); AOV52A(B,C,D); AOV51A(B,C,D); AOV28A(B,C,D) and AOV61A(B,C,D) open.

4.11 Depressurization - valve 2WCS-AOV30A(B,C,D) opens, depressurizing the Filter/demin vessel.

4.12 Vessel Fill - 2WCS-AOV47A(B); AOV26A(B,C,D) open to supply condensate makeup water for vessel fill. When filter/demin vessel is completely filled; 2WCS-AOV30A(B,C,D); AOV26A(B,C,D); and AOV47A(B) close. (2-2 1/2 min.)

4.13 Air Introduction/Dome Drain - 2WCS-AOV29A(B,C,D); AOV25A(B,C,D) open to drain the vessel dome area. (70 seconds)

4.14 Air Pressurization - 2WCS-AOV29A(B,C,D) closes and AOV25A(B,C,D) remains open to pressurize the filter/demin with Service Air. (1 min.)

NOTE: If the holding pump 2WCS-P6A(B,C,D) is running prior to initiating backwash, it will stop and valve 2WCS-AOV31A(B,C,D) closes when valve 2WCS-AOV44A(B,C,D) opens.

4.15 First Air Bump and Drain - Drain to Radwaste valve 2WCS-AOV44A(B,C,D) opens allowing the first air bump and drain. When AOV44A(B,C,D) is fully open, 2WCS-AOV25A(B,C,D) closes. (40 sec.)

4.16 Vent and Drain - Vent to Radwaste valve 2WCS-AOV30A(B,C,D) opens allowing the filter/demin to vent and drain. When AOV30A(B,C,D) is full open, 2WCS-AOV44A(B,C,D) closed.

4.17 Second Vessel Fill - 2WCS-AOV47A(B) and 2WCS-AOV26A(B,C,D) open to supply condensate makeup water for vessel fill. When the filter/demin vessel is completely filled; 2WCS-AOV30A(B,C,D), AOV-26A(B,C,D), and AOV47A(B) close. (2-2 1/2 min.)

4.18 Second Air Introduction/Dome Drain - 2WCS-AOV29A(B,C,D), AOV25A(B,C,D) open to drain the vessel dome area. (70 sec.)

4.19 Second Air Pressurization - 2WCS-AOV29A(B,C,D) closes and AOV25A(B,C,D) remains open to pressurize the filter/demin with Service Air. (1 min.)

4.20 Second Air Bump and Drain - Valve 2WCS-AOV44A(B,C,D) opens allowing the second air bump and drain. When AOV44A(B,C,D) is fully open, 2WCS-AOV25A(B,C,D) closes. (40 sec.)

4.21 Vent and Drain - 2WCS-AOV30A(B,C,D) opens, providing the filter/demin to vent and drain.

4.22 Filter Standby/"Shudown Mode" - After the second backwash is complete, the filter/demin will automatically go into the "Shutdown Mode". The valves that remain open are 2WCS-AOV54A(B,C,D); AOV52A(B,C,D); AOV51A(B,C,D); AOV28A(B,C,D); AOV61A(B,C,D); AOV44A(B,C,D); AOV30A(B,C,D). The Backwash indicating light will go off and the shutdown indicating light will come on.

NOTE: Individual valve/pump operation can be performed using the push button/indicating light switches while in the shutdown mode. The Function Interlock Switch must be placed on the Filter/demin of the valves desired to be operated.

4.23 The filter/demineralizer is now ready for precoating per Section F.5.0.

5.0 Filter/Demineralizer Precoat

5.1 This step deleted. 15944

5.2 Perform Section H.8.0 of this procedure to ensure the filter/demineralizer is FULL. 15944

NOTE: See Attachment 1, Flt/Demin Controller Logic Schematic, as an aid in following the automatic functions of the Flt/Demin Controllers during backwash and precoat operations.

NOTE: DO NOT allow the EPI FLOC RESIN to dry out. It should be stored in air tight buckets and not allowed to freeze.

5.3 Verify the Filter/Demineralizer to be precoated has been backwashed and is in standby (shutdown mode), ready for precoat.

5.4 Verify I&C present to verify proper Filter/Demin precoat evolution.

5.5 Verify that 3 buckets of EPI FLOC 21-H HYDROGEN FORM RESIN have been transported to the precoat tanks.

5.6 Verify SHUT valves listed on Attachment 2 for F/D 4A(B,C,D).

NOTE: The following steps are performed at local panel 2WCS-IPNL187 for filter/demin 4A and 4B and panel 2WCS-IPNL188 for filter/demin 4C and 4D.

Resin is added directly to precoat tank 2WCS-TK11A for F/D A and B or 2WCS-TK11B for F/D C and D.

If the Precoat Tank Level Low Alarm is received, the precoat operation will be terminated and the backwash required interlock will latch.

Only one filter/demineralizer in each subsystem can be precoated at a time. If both F/D's in a sub-system are ready for precoat at the same time (have been backwashed and are in Shutdown Mode), the Functions Interlock Switch must be used to lock out one of the F/D's. Set the Functions Interlock Switch to one of the F/D's and precoat the other F/D in that subsystem. Return the Function Interlock Switch to Normal after precoating the first F/D.

5.7 Verify the following for the Filter/Demin to be precoated:

5.7.1 Control Switch in HOLD.

5.7.2 All automatic valves are CLOSED except:

a. 2WCS-AOV54A(B,C,D)

b. 2WCS-AOV52A(B,C,D)

c. 2WCS-AOV51A(B,C,D)

d. 2WCS-AOV28A(B,C,D)

e. 2WCS-AOV61A(B,C,D)

f. 2WCS-AOV44A(B,C,D)

g. 2WCS-AOV30A(B,C,D)

5.7.3 Valves listed on Attachment 2 are SHUT.

5.8 Turn the Solka-Floc Resin/Solka Floc Only switch to the "SOLKA-FLOC ONLY" position.

NOTE: If the Precoat Initiate pushbutton is depressed with the precoat tank agitator off, the precoat cycle will start and continue until the FLT/Demin and piping is full. The cycle will then stop until the agitator is started and has been running for 1 minute. The precoat cycle will then resume and run until completion.

5.9 Press the precoat initiate pushbutton to begin the Flt/Demin precoat process.

5.10 Rinse - After the precoat process has been initiated, AOV26A(B,C,D) and AOV47A,B are opened, allowing the Flt/Demin to rinse with water. (25 sec.)

5.11 Filter Fill - when the FH/Demin rinse is complete AOV44A(B,C,D) is closed, allowing the Flt/Demin to Fill with water. (2-2.5 min)

5.12 Fill the precoat tank to a level above the Low Level Alarm Setpoint, and just below the top of the drain stand pipe inside the tank to ensure adequate volume for proper resin mixing.

NOTE: The precoat tank agitator may be started and resin mixing may be started prior to Step 5.6. No more than 1/4 bucket of resin should be mixed prior to precoat recirculation on the Flt/Demin.

5.13 Start the appropriate precoat tank agitator by depressing the agitator start pushbutton at the precoat tank.

NOTE: DO NOT add large amounts of resin periodically or add all the resin at once. This will cause an uneven precoat and greatly decrease Flt/Demin performance and longevity.

5.14 Add resin at a slow and constant rate (aprox. 3-4 min. per bucket) to the precoat tank until all 3 buckets have been added. | 15642

5.15 After all resin has been added, allow the precoat cycle to run until completion. Check flow glass 2WCS-FG37A(B) periodically to verify clear water is being returned to the precoat tank (resin is being deposited on filter septa).

5.16 After the precoat cycle is complete, verify the following:

a. The appropriate holding pump 2WCS-P6A, B, C or D is running, and 2WCS-AOV31A(B,C,D) is open.

b. The filter/demin is in the "HOLD" mode.

5.17 Perform the following:

a. Turn off the precoat tank agitator by depressing the agitator stop pushbutton.

5.18 The filter demineralizer is now ready to be returned to service per Section E.3.0.

6.0 RWCU Full Reject Operation to Prevent Feedwater Stratification

Following steps shall be performed if any of the following plant conditions below occurs:

A. Prior to Reactor Water Temperature exceeding 200°F.
B. Prior to Reactor Power decreasing below 20%.
C. During the Post Scram recovery.

6.1 Verify Condensate/Feedwater System is operating and controlling the Reactor Water Level.

6.2 This step deleted.

6.3 Lineup the RWCU as follows:

NOTE: The following steps provide the guidelines to operate RWCU System in one pump and one filter demineralizer with full reject to the condenser. If all four Flt/Demins, 2WCS-Flt/Demin 4A (B,C,D), and both recirculation pumps, 2WCS-P1A(B), are in service; perform Steps a through e until only two Flt/Demins remain in service then continue with steps f through 1. If only two Flt/Demins and one pump are in service remove one F/D per Steps a through e then perform steps i and j.1.

CAUTION:

DO NOT SIMULTANEOUSLY OPEN 2WCS-MOV107 AND 2WCS-MOV106 AS A LOSS OF CONDENSER VACUUM COULD OCCUR.

a. Clear yellow holdout and open 2WCS-MOV107 or MOV106 at 2CEC-PNL602.

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b. Establish communications between the Control Room and local panels 2WCS-IPNL187(188).

NOTE: Flow Controller 2WCS-FIC1016(G36-R022) A(B,C,D) should be operated in manual when removing from or placing a Flt/Demin in service. Ensure that the slow/low detent is used.

c. Slowly reduce flow through the Flt/Demin to be removed from service by reducing the output of the F/D flow controller 2WCS-FIC1016 (2G36-R022)A(B)(C)(D) until the F/D Flow Control Valve 2WCS-FCV16A(B)(C)(D) is full closed.

d. Verify the filter/demin hold pump (2WCS-P6A, B, C or D) starts when filter/demin flow drops to less than 153 gpm.

e. Place the filter mode switch in the "HOLD" position. Verify that Flt/Demin Inlet Isolation valves 2WCS-AOV23A, B, C or D, 2WCS-AOV22A, B, C, D and Flt/Demin Outlet Isolation Valve 2WCS-AOV27A, B, C, D close.

6.3 (Cont'd)

f. Slowly throttle open Cleanup Demineralizer Bypass 2WCS-MOV110 to establish approx. 800 gpm system flow as indicated on P602.

g. Repeat steps b to e as necessary to remove the other two Flt/Demins from service. Verify RWCU system flow indicates approx. 400 gpm.

h. Stop pump 2WCS-P1A(B) by momentarily placing its control switch in the "STOP" position.

i. Open Blowdown Restricting Orifice Bypass 2WCS-MOV108.

i.1 This step deleted. TCN-57

j. Simultaneously throttle close 2WCS*MOV200 to fully closed and slowly increase 2WCS-FV135 to maintain about 170-175 gpm reject flow.

j.1 This step deleted. TCN-5

k. Slowly place one filter demineralizer in service by simultaneously placing the filter demineralizer in service and throttling close 2WCS-MOV110 to maintain RWCU reject flow of 170 to 175 gpm.

l. Fully close 2WCS-MOV110 when the filter demineralizer is in service.

6.4 It is desirable to maintain the RWCU reject flow between 170 to 175 gpm during reactor low power operation.

6.5 Perform the following steps to change the filter demineralizer inservice:

a. Simultaneously slowly throttle open cleanup Demineralizer Bypass 2WCS-MOV110 and remove filter demineralizer from service per Steps b through e above. Maintain RWCU reject flow at about 175 gpm using 2WCS-MOV110.

b. Place a new filter demineralizer in service per Steps 6.3 k and l above.

NOTE: When Flt/Demin manipulation is complete place Flow Controller 2WCS-FIC1016 (G36-R022)A(B,C,D) in "AUTO" and verify that the valve position indicator on the Flow Controller reads between 20% and 80% open. If not throttle valve(s) downstream of F/D Flow control Valve 2WCS-FCV16A(B,C,D) to adjust system back pressure.

7.0 Transfer RWCU Return to Feedwater

CAUTION:

THE FOLLOWING STEPS SHOULD BE PERFORMED ONLY WHEN REACTOR POWER IS GREATER THAN 20% OR TEMPERATURE IS $\leq$ 200°F.

7.1 This step deleted.

7.2 Simultaneously throttle open Demineralizer Bypass 2WCS-MOV110 and remove filter demineralizer from service per Section F.2.0.

7.3 Maintain RWCU reject flow at about 175 gpm by throttling 2WCS-MOV110 to full open and simultaneously throttling 2WCS-FV135 as necessary.

7.3.1 This step deleted.

7.4 Simultaneously throttle open Return to Feedwater Isolation 2WCS*MOV200 and throttle close 2WCS-FV135. If plant start-up is in progress, throttle FV135 to full close; if plant is shut down, throttle FV135 as required to match CRD flow and maintain vessel level.

7.4.1 This step deleted.

NOTE: Step 7.5 will not be required if Rx Vessel water level is being maintained by WCS flow rejection.

7.5 Shut 2WCS-MOV107 Reject to Main Condenser or 2WCS-MOV106 Reject to Radwaste. De-energize MCC 2NHS-MCC008 Cubicle 2E or MCC 2NHS-MCC008 Cubicle 2C as directed by N2-OP-101A and place a Yellow Hold Out on power supply.

7.6 Throttle open 2WCS*MOV200 as necessary to increase system flow to approximately 400 gpm.

7.7 Close Blowdown Restricting Orifice Bypass 2WCS-MOV108.

NOTE: During single Rx. Recirculation Loop operation, observe Precautions/Limitations 25.0.

7.8 Start second RWCU Pump per Section H.2.0 or E.2.0 of this procedure, and then place Flt/Demins into service per Section E.3.0.

8.0 Filter Demineralizer Precoat Using EPIFLOC 21-H/91-H

8.1 This step deleted. 15944

8.2 Perform Section H.8.0 of this procedure to ensure the Filter Demineralizer is FULL.

NOTE: See Attachment 1, Flt/Demin Controller Logic Schematic, as an aid in following the automatic functions of the Flt/Demin Controllers during backwash and precoat operations.

NOTE: DO NOT allow the EPIFLOC RESIN to dry out. It should be stored in air tight buckets and not allowed to freeze.

8.3 Verify the filter/demineralizer to be precoated has been backwashed and is in standby (Shutdown Mode) ready for precoat.

8.4 Verify that 2 1/2 buckets of Epifloc 21-H Hydrogen Form Resin has been transported to the precoat tank.

8.5 Verify that 2 buckets of the Epifloc 91-H Hydrogen Form Resin has been transported to the precoat tank.

NOTE: The following steps are performed at local panel 2WCS-IPNL187 for filter/demin 4A and 4B and panel 2WCS-IPNL188 for filter/demin 4C and 4D.

Resin is added directly to the precoat tank 2WCS-TK11A for filter/demineralizer 4A and 4B or precoat tank 2WCS-TK11B for filter/demineralizer 4C and 4D.

If the Precoat Tank Level Low Alarm is received, the precoat operation will be terminated and the backwash required interlock will latch.

Only one filter/demineralizer in each subsystem can be precoated at a time. If both filter/demineralizers in a sub system are ready for precoat at the same time (have been backwashed and are in Shutdown Mode), the Functions Interlock switch must be used to lock out one of the filter/demineralizers. Set the Functions Interlock Switch to one of the filter/demineralizers and precoat the other filter/demineralizer in that subsystem. Return the Function Interlock Switch to Normal after precoating the first filter/demineralizer. TCN-89

8.6 Verify I&C present to verify proper Filter/Demin precoat evolution.

8.7 Verify the following for the Filter/Demin to be precoated:

8.7.1 Control Switch in HOLD.

8.7.2 All automatic valves are CLOSED except:

a. 2WCS-AOV54A(B,C,D)

b. 2WCS-AOV52A(B,C,D)

c. 2WCS-AOV51A(B,C,D)

d. 2WCS-AOV28A(B,C,D)

e. 2WCS-AOV61A(B,C,D)

f. 2WCS-AOV44A(B,C,D)

g. 2WCS-AOV30A(B,C,D)

8.7.3 Valves listed on Attachment 2 are SHUT.

8.8 Turn the Solka-Floc Resin/Solka Floc Only switch to the "SOLKA-FLOC ONLY" position.

NOTE: If the Precoat Initiate pushbutton is depressed with the precoat tank agitator off, the precoat cycle will start and continue until the Flt/Demin and piping is full. The cycle will then stop until the agitator is started and has been running for 1 minute. The precoat cycle will then resume and run until completion.

8.9 Press the Precoat Initiation pushbutton to begin the Flt/Demin precoat process.

8.10 Rinse - After the precoat process has been initiated, 2WCS-AOV26A (B,C,D) and 2WCS-AOV47A (B) are opened, allowing the Flt/Demin to rinse with water. (approx. 25 seconds)

8.11 Filter Fill - When the Flt/Demin rinse is complete 2WCS-AOV44A (B,C,D) is closed, allowing the Flt/Demin to fill with water. (approx. 2 - 2.5 minutes)

8.12 Fill the precoat tank to a level above the Low Level Alarm Setpoint, and just below the top of the drain stand pipe inside the tank to ensure adequate volume for proper resin mixing.

NOTE: The precoat tank agitator may be started and resin mixing may be started prior to Step 8.6. No more than 1/4 bucket of resin should be mixed prior to precoat recirculation on the Flt/Demin.

8.13 Start the appropriate precoat agitator by depressing the agitator start pushbutton at the precoat tank. TCN-89

8.14 Add 2 1/2 buckets of the Epifloc 21-H Hydrogen Form to the precoat tank.

NOTE: Make sure that the resin is added slowly to the precoat tank so that a good precoat of the septa is made. Approximately 3 to 4 minutes per bucket would give a good precoat.

8.15 After adding the 2 1/2 buckets of Epifloc 21-H, allow the water to become clear indicating all of the precoat has coated on the septa (approximately 1.5 minutes).

8.16 Add 2 buckets of the Epifloc 91-H Hydrogen Form to the precoat tank.

NOTE: Make sure that the resin is added slowly to the precoat tank so that a good precoat of the septa is made. Approximately 3 to 4 minutes per bucket would give a good precoat.

8.17 After all of the resin has been added, allow the precoat cycle to run until completion. Check flow glass 2WCS-FG37A (B) periodically to verify clear water is being returned to the precoat tank (resin is being deposited on the filter septa).

8.18 After the precoat cycle is completed, verify the following:

a. The appropriate holding pump 2WCS-P6A(B,C,D) is running and 2WCS-AOV31A(B,C,D) is open.

b. The Filter/Demineralizer is in the "HOLD" mode.

8.19 Turn off the precoat tank agitator by depressing the agitator stop pushbutton. TCN-89

8.20 The Filter/Demineralizer is now ready to be returned to service per Section E.3.0.

G. SHUTDOWN PROCEDURE

NOTE: With RWCU out of service, Reactor Coolant chemistry control is absent. If RWCU is out of service for extended periods, Technical Specification 3/4.4.4 Reactor Coolant Chemistry limits may be approached and/or exceeded. Also, continuous reactor coolant conductivity monitoring may be out of service, see Tech. Spec. 3/4.4.4.c and OP-17.

1.0 RWCU Shutdown

1.1 Notify Chemistry WCS will be secured, and to swap continuous coolant sampling to Rx Recirc influent. TCN-8 C

1.2 Remove all RWCU filter/demineralizers as follows:

1.2.1 Establish communications between the Control Room and local panels 2WCS-IPNL187 (188).

1.2.2 Slowly reduce flow through the Flt/Demin to be removed from service by reducing the output of the F/D flow controller 2WCS-FIC1016 (2G36-R022) A(B)(C)(D) until the F/D Flow Control Valve 2WCS-FCV16A (B)(C)(D) is full closed.

1.2.3 Verify the filter/demin hold pump (2WCS-P6A, B, C or D) starts when filter/demin flow drops to less than 153 gpm.

1.2.4 Place the filter mode switch in the "HOLD" position. Verify that Flt/Demin Inlet Isolation valves 2WCS-AOV23A, B, C or D, 2WCS-AOV22A, B, C, D and Flt/Demin Outlet Isolation Valve 2WCS-AOV27A, B, C, D close.

NOTE: The filter/demineralizers is now out of service and in standby.

1.2.5 Repeat Steps 1.2.1 - 1.2.4 for any additional filter/demineralizer to be removed from service until 2 filter demineralizers are left in service.

1.2.6 When only two filter/demineralizers are left in service at P602, slowly bump throttle open the Clean Up Demin Bypass Valve 2WCS-MOV110 to establish about 600 gpm system flow as indicated by flow indicator 2WCS-FI1609 (2G33-R609) on P602.

1.2.7 Slowly reduce flow through the Flt/Demin to be removed from service by reducing the output of the F/D flow controller 2WCS-FIC1016 (2G36-R022) A(B)(C)(D) until the F/D Flow Control Valve 2WCS-FCV16A (B)(C)(D) is full closed.

1.2.8 Verify the filter/demin hold pump (2WCS-P6A, B, C or D) starts when filter/demin flow drops to less than 153 gpm.

1.2.9 Place the filter mode switch in the "HOLD" position. Verify that Flt/Demin Inlet Isolation valves 2WCS-AOV23A, B, C or D, 2WCS-AOV22A, B, C, D and Flt/Demin Outlet Isolation Valve 2WCS-AOV27A, B, C, D close.

NOTE: The filter/demineralizer is now out of service and in standby.

1.2.10 When only one filter demineralizer is in service at P602, slowly throttle open the Clean Up Demin Bypass Valve 2WCS-MOV110 to establish about 600 gpm system flow (400 gpm system flow for 1 pump operation) as indicated by flow indicator 2WCS-FI1609 (2G33-R609) on P602. TCN 83

1.2.11 Slowly reduce flow through the Flt/Demin to be removed from service by reducing the output of the F/D flow controller 2WCS-FIC1016 (2G36-R022) A(B)(C)(D) until the F/D Flow Control Valve 2WCS-FCV16A (B)(C)(D) is full closed.

1.2.12 Verify the filter/demin hold pump (2WCS-P6A, B, C or D, starts when filter/demin flow drops to less than 153 gpm.

1.2.13 Place the filter mode switch in the "HOLD" position. Verify that Flt/Demin Inlet Isolation valves 2WCS-AOV23A, B, C, D, 2WCS-AOV22A, B, C, D and Flt/Demin Outlet Isolation Valve 2WCS-AOV27A, B, C, D close.

NOTE: The filter/demineralizers are now out of service and in standby.

1.3 Slowly throttle filter/demin bypass valve 2WCS-MOV110 closed to reduce system flow, as indicated by Flow Indicator 2WCS-FI1609 (2G33-R609) on P602, to 400 gpm or less.

NOTE: The following step defeats the Low Flow Pump Trip to support pump warmup when swapping pumps. TCN 83

1.3.1 If this section is being performed to swap pumps (ie stop one pump then start another) then notify I&C to isolate 2WCS-PDS115, otherwise proceed to Step 1.4.

1.4 Stop pump 2WCS-P1A by momentarily placing its control switch on P602 in the "STOP" position.

1.5 Stop pump 2WCS-P1B by momentarily placing its control switch on P602 in the "STOP" position.

1.6 Close Cleanup Demin Bypass Valve 2WCS-MOV110.

NOTE: It is not necessary to shut pump discharge valve 2WCS-V30A(B) after removing pump(s) from service if the system is to remain filled. Valves should only be closed as required for pump/system isolation, maintenance, or as directed by SSS. See precaution 30 and 31 of this procedure.

1.7 Close pump discharge valve 2WCS-V30A(B), if required.

1.8 If the system is to be shutdown for $\geq$ 30 minutes, notify Chemistry to secure their sample lineups from the WCS Demineralizer influent and effluent sample points.

H. OFFNORMAL PROCEDURE

1.0 Reduction From 2 Pump Operation to 1 Pump Operation

CAUTION:

ISOLATION OF A PUMP OR STOPPING A PUMP WITH THE SYSTEM HOT MAY CAUSE DEGRADED SEALS SINCE SEAL COOLING FLOW IS PROVIDED BY THE PUMP.

NOTE: This section assumes the system is in the normal operating configuration with 4 Filter/Demins and 2 pumps in operation.

1.1 This step deleted.

1.2 Remove all filter/demins from service per Section G, Step 1.2 through 1.3 of this procedure.

1.3 Stop the pump to be removed from service by momentarily placing its control switch on P602 in the stop position.

NOTE: It is not necessary to shut pump discharge valve 2WCS-V30A(B) after removing pump(s) from service if the system is to remain filled. Valves should only be closed as required for pump/system isolation, maintenance, or as directed by SSS. See precaution 30 and 31 of this procedure.

1.4 Fully close 2WCS-V30A(B) for the idle pump, if required.

2.0 Placing a Cold WCS Pump in service with the System Hot

NOTE: The secured pump is considered "cold" if the temperature difference between it and the system is greater than 100°F. If the difference is less than 100°F, start the pump per the normal pump startup procedure.

NOTE: Lineup RWCU to Feedwater or full reject as dictated by plant condition.

2.1 Using a hand held pyrometer, monitor the pump casing temperature on the inboard side, midway between the inlet and outlet nozzles. | TCN-81

2.2 Clear any markups on the pump, pump suction valves, or pump coolers. Verify CCP is available to the pump seal coolers. If not, lineup CCP to the WCS pump seal cooler per N2-OP-13.

2.3 Close/verify closed Clean Up P1A(B) Suction Isolation valves 2WCS-V27A (B), V28A (B) and cleanup P1A(B) Discharge Isolation V30A (B).

2.4 If the pump was isolated and drained during the shutdown, fill and vent the pump as follows:

a. Attach a hose to the nearest CNS supply header and route to the WCS pump room floor drain.

b. Slowly open the CNS block valve and flush the CNS header to the floor drain until the water is clean.

c. Close the CNS supply block valve.

d. Attach the hose to the test connection at Strnr 10A(B) Pressure Test Conn valve 2WCS-V301 (V302) on 2WCS-P1A(B) suction.

e. Slowly open the CNS block valve.

f. Open Strnr 10A(B) Pressure Test Conn valves 2WCS-V301 (V302) and 2WCS-V350 (352).

g. Open pump 2WCS-P1A(B) casing drain valves 2WCS-V8 and V10 (2WCS-V16 and V18) slowly open valves 2WCS-V9 and V11 (2WCS-V17 and V19). When a solid stream of water issues from the drains, close valves 2WCS-V8, V9, V10 and V11 (2WCS-V16, V17, V18 and V19).

h. Open pump 2WCS-P1A(B) seal cavity vent valve 2WCS-V385A(B). Slowly open valve 2WCS-V386A(B). When a solid stream of water issues from the vent, close valves 2WCS-V385A(b). and 2WCS-V386A(B).

i. Close Strnr 10A(B) Pressure Test Conn WCS-V301 (V302), WCS-V350 (V352) and the CNS block valve.

j. Disconnect the hose from valve Strnr 10A(B) Pressure Test Conn 2WCS-V301 (V302) and the CNS header. Drain excess water to the floor drain. Minimize spillage from hose.

2.4.1 Secure operating pump (2WCS-P1A,B) in accordance with Section G.1.0 of this procedure.

2.5 Clear any WCS isolation signals (if present) per Section H.4.0 of this procedure.

CAUTION:

DRAINING 2WCS-PDS115 WILL CAUSE LDS TIMERS TO INITIATE THE FOLLOWING STEP MUST BE PERFORMED AS QUICKLY AS POSSIBLE TO PREVENT WCS SYSTEM AUTOMATIC ISOLATION. 15716

2.5.1 If no other pump is running, notify I&C to trap pressure on the high side of 2WCS-PDS115 as follows: (This step N/A if 2WCS-PDS115 was isolated during pump shutdown, Section G.1.0)

a. Open drain valve on low side of 2WCS-PDS115.

b. Close high side isolation valve when indication on 2WCS-PDS115 is approximately 15 inches of water or more.

c. Close low side isolation valve of 2WCS-PDS115.

d. Close low side drain valve of 2WCS-PDS115.

2.6 This step deleted.

2.7 Open Cleanup P1A(B) Suction Isolation Valve 2WCS-V28A(B), and lock it open.

CAUTION:

THE PIPING UPSTREAM OF 2WCS-V27A(B) IS AT REACTOR PRESSURE WHILE THE PIPING AND PUMP DOWNSTREAM IS AT A MUCH LOWER PRESSURE. EXERCISE CARE WHEN OPENING THESE VALVES AND BE PREPARED TO CLOSE THEM IF ANY EXTREME LEAKAGE IS APPARENT.

2.8 Slowly open the Cleanup P1A(B) Suction Isolation valve 2WCS-V27A(B), and lock it open.

2.9 Crack open the discharge bypass valve 2WCS-V383A(B)

2.10 Start pump 2WCS-P1A(B) by holding its control switch on P602 in the "START" position for 3 seconds.

2.11 Slowly open the bypass valve 2WCS-V383A(B) to heat the pump up at a rate not to exceed 10 degrees per minute.

2.11.1 Slowly throttle 2WCS-MOV110 OPEN.

2.11.2 If WCS System has been isolated for shutdown for ≥ 30 minutes vent per Step E.4.10.

CAUTION:

INSURE VALVE IS JUST CRACKED OPEN WHEN PERFORMING NEXT STEP TO PROVIDE SUFFICIENT BACK PRESSURE DUE TO LOW FLOW FROM WCS PUMP DUE TO BYPASS VLV THROTTLE. 15716

2.11.3 Upon completion of venting throttle open 2WCS*MOV200.

2.12 Once pump is within 100°F of coolant temperature open pump discharge valve 2WCS-V30A(B) and lock it open.

2.13 Close discharge bypass valve 2WCS-V383A(B).

2.13.1 If 2WCS-PDS115 high side pressure was isolated, notify I&C to return to service as follows:

a. Open high side isolation valve on 2WCS-PDS115.

b. Open low side isolation valve on 2WCS-PDS115.

c. Ensure sufficient system flow is present by the indication on 2WCS-PDS115 being > 3 inches of water.

2.14 Throttle open the return to feedwater isolation valve 2WCS-MOV200 on P602 until system flow increases to 400 gpm per pump as indicated on 2WCS-FI1609 (2G33-R609).

NOTE: During single Rx. Recirculation Loop operation, observe Precautions/Limitations 25.0.

2.14.1 If necessary, inform Chemistry that they may re-establish their sample paths from the WCS System.

2.15 Repeat Steps 2.1 through 2.11 for the other pump and perform the following:

NOTE: - RWCU Pump shutdown time should be minimized to keep the RWCU pump casing in a hot condition.

1. When the pump is within 100 degrees of coolant temperature, manually trip the RWCU pump 2WCS-P1B(A).

2. Open the pump discharge valve 2WCS-V30B (A), and lock it open.

3. Close the pump discharge bypass valve 2WCS-V383B(A).

4. Restart 2WCS-P1B(A) by holding its control SW on P602 in "Start" position for 3 seconds.

2.16 Place filter/demineralizers on line per section E.3.0 of this procedure as required.

3.0 Flow Rejection

NOTE: The WCS System is used in the reject mode to support the following operations:

NOTE: Performance of this procedure may be required by the EOPs. Changes to this section of the procedure (including renumbering) are required to be reviewed by the EOP Coordinator (N2-EOP-RPV). TCN-70

a. Reactor water level control while shutdown
b. Reactor startup (Vessel Temperature <200°F)
c. As directed by N2-EOP-RP
d. Reactor Cavity drain down following refuel operations (Rx Water Temperature < 120°F)

CAUTION:

1. DO NOT EXCEED MAXIMUM NON-REGENERATIVE HEAT EXCHANGER CLOSED LOOP COOLING WATER (CCP) EXIT TEMPERATURE OF 180°F. TCN-72

2. IF 140°F AT THE OUTLET OF THE NON-REGENERATIVE HEAT EXCHANGER OUTLET IS REACHED OR EXCEEDED, A SYSTEM ISOLATION WILL RESULT.

3. WHEN REJECTING, IF THE OUTLET OF THE NON-REGENATIVE HT. EXCHANGER EXCEEDS 120°F, TAKE THE FILTER/DEMINERALIZERS OUT OF SERVICE OR DECREASE REJECT FLOW TO MAINTAIN FILTER DEMINERALIZER INLET TEMPERATURE LESS THAN OR EQUAL TO 120°F. TCN-72

4. DO NOT OPEN REJECT TO WASTE COLL TK 2WCS-MOV106 AND REJECT TO MAIN CONDENSER MOV107 SIMULTANEOUSLY AS THIS WOULD RESULT IN A LOSS OF CONDENSER VACUUM AND SUBSEQUENT TURBINE TRIP.

5. VERIFY CONDENSATE/FEEDWATER/CRD IS OPERATING AND CONTROLLING THE REACTOR WATER LEVEL, OR RCIC IS AVAILABLE TO MAINTAIN RX WATER LEVEL.

6. WHEN CHANGING SYSTEM FLOW MONITOR THE DIFFERENTIAL FLOW METERS SO THAT A SYSTEM ISOLATION MAY BE AVOIDED.

3.1 Startup RWCU per section E.4.0 of this procedure if not already in operation.

NOTE: The Return to Feedwater Isolation Valve 2WCS*MOV200 may be throttled to provide back pressure for reject operations if required.

NOTE: The Return to Feedwater Isolation Valve 2WCS*MOV200 may be closed to allow full reject to support Reactor Cavity drain down after Refuel operations.

3.2 If reject flow is to be directed to radwaste, clear the Yellow Hold Out on Reject to Waste Coll Tk valve 2WCS-MOV106 power supply at 2NHS-MCC008 cubicle 2C.

3.3 If reject flow is to be directed to the main condenser, clear the Yellow Hold Out on Reject to Main Condenser valve 2WCS-MOV107 power supply at 2NHS-MCC008 cubicle 2E.

3.4 Verify the demand from WCS Blowdown Flow Controller 2WCS-FV135 is 0 and that 2WCS-FV135 is closed (as indicated by G33-R602 at approximately 0 gpm). TCN-72

3.5 This step deleted.

3.6 Open Reject to Waste Coll Tk valve 2WCS-MOV106 or Reject to Main Condenser 2WCS-MOV107 as required.

NOTE: If flow is to be directed to radwaste, verify that the liquid radwaste waste collector tanks have enough capacity to accept the flow.

3.7.1 Throttle the Return to Feedwater Isolation Valve 2WCS*MOV200 to provide back pressure, if required. TCN-69

3.7.2 Use the Reject Flow Control 2WCS-FV135 Manual Control Station (2WCS-FC1135 (2G33-R606) on P602) thumbwheel to throttle open the WCS Blowdown Flow Controller 2WCS-FV135 to obtain the desired reject flow rate as indicated on 2WCS-FR1602 (2G33-R602) on panel P602.

NOTE: If desired flow cannot be obtained with 2WCS-FV135 fully open, 2WCS-MOV108 may be throttled open to obtain the desired flow.

3.7.3 Throttle open Reject Restricting Orifice Bypass Valve 2WCS-MOV108, if required. TCN-69

3.8.1 Increase or decrease the demand on Reject Flow Control Valve 2WCS-FV135 Manual Control Station 2WCS-FC1135 to control the following: TCN-69

a. Non-regenerative heat exchanger outlet temperature

b. Reactor water level

c. Reactor pressure

3.8.2 If Reactor cavity level is being lowered following Refuel operations, full reject may be established by closing RTN to FWS Isol Vlv 2WCS*MOV200. TCN-69

3.8.3 If it becomes unnecessary to maintain full reject flow, slowly throttle open 2WCS*MOV200 while throttling closed 2WCS-FV135 to maintain demineralizer flows ~ 175 gpm each with FCV position between 20-80%. TCN-68

3.9 When operation in the reject mode is no longer desired, slowly decrease flow at the Reject Flow Control Valve 2WCS-FV135 Manual Control Station 2WCS-FC1135 (2G33-R606) on P602 to 0, and verify the valve is closed.

3.10 This step deleted.

3.11 If flow was being directed to radwaste, close Reject to Waste Coll Tk valve 2WCS-MOV106 and open 2NHS-MCC008 cubicle 2C. Place Yellow Hold Out on the power supply as directed by OP-101A.

3.12 If flow was being directed to the main condenser, close Reject to Main Condenser valve 2WCS-MOV107 and open the breaker at 2NHS-MCC008 cubicle 2E. Place Yellow Hold Out on the power supply as directed by OP-101A.

3.13 Close/verify closed WCS Blowdown Restricting Orifice Bypass valve 2WCS-MOV108, as desired.

4.0 Restoration After Isolation

4.1 At local panel 2WCS-IPNL187 and 2WCS-IPNL188, verify that all RWCU filter demineralizers are in the hold mode.

4.2 If WCS was in the reject mode prior to the isolation, it is possible that the system has been depressurized and/or has lost some of its volume of water. Close WCS Blowdown Flow Control Valve 2WCS-FV135 at manual controller 2WCS-FC1135 (2G33-R606) on panel P602. If not planning to re-enter the reject mode, close the valve, open the breaker and place a yellow Hold Out on the power supply of whichever of the following valves that was open (when required by N2-OP-101A):

a. Reject to Waste Coll Tk 2WCS-MOV106, power supply at 2NHS-MCC008 Cub 2C.

b. Reject to Main Condenser 2WCS-MOV107, power supply at 2NHS-MCC008 Cub 2E.

Place the system back into service per Section E. "Startup Procedure", beginning with subsection E.1.0. "Initial Fill and Vent" and continuing with the required subsection(s) for the mode of operation desired.

4.2.1 Verify SHUT the valves listed on Attachment 2.

4.3 Verify that all RWCU isolation signals are cleared and reset using the isolation reset pushbutton on P602.

4.3.1 SHUT 2WCS-MOV101

4.3.2 SHUT 2WCS-MOV103

4.4 Open the WCS Inboard Isolation Valve 2WCS-MOV102 and the WCS Outboard Isolation Valve 2WCS-MOV112 at P602.

4.4.1 Slowly throttle open 2WCS-MOV103 to pressurize the system.

4.5 Close Cleanup Demin Bypass valve 2WCS-MOV110 at P602.

4.5.1 Open 2WCS-MOV101

4.6 If RWCU pump temperatures are within 100°F of recirc. temperature, start the cleanup pumps per Section E.2.0. Otherwise start the cleanup pumps per Section H.2.0.

5.0 Maximizing RWCU System Cooling on Loss of Shutdown Cooling, or to assist Reactor Pressure Control; to be Used Only as directed by N2-EOP-RPV or N2-OP-31 Section H.10. *6

NOTE: Performance of this procedure may be required by the EOPs. Changes to this section of the procedure (including renumbering) are required to be reviewed by the EOP Coordinator (N2-EOP-RPV).

CAUTION:

1. DO NOT EXCEED MAXIMUM NON-REGENERATIVE HEAT EXCHANGER CLOSED LOOP COOLING (CCP) EXIT TEMPERATURE OF 180°F.

2. IF 140°F AT THE NON-REGENERATIVE HEAT EXCHANGER OUTLET IS REACHED OR EXCEEDED THE RWCU SYSTEM WILL ISOLATE.

3. IF 120°F IS ACHIEVED AT THE NON-REGENERATIVE HEAT EXCHANGER OUTLET THE RWCU FILTER DEMINERALIZERS SHOULD BE ISOLATED TO PREVENT FILTER MEDIUM DAMAGE.

5.1 This step deleted.

NOTE: If time permits, remove all Flt/Demins from service per Section F.2.0 prior to starting another RWCU pump.

5.2 If both RWCU pumps are not in operation, start additional pump(s) in accordance with section H.2 or H.3 of this procedure.

5.3 Ensure that adequate cooling flow is being supplied to the non-regenerative heat exchanger per N2-OP-13. Maximum obtainable flow is 1430 gpm prior to CCP to non-regenerative heat exchanger bypass valve (2CCP-FV126) operation.

5.4 Maximize RWCU flow by throttling open Cleanup Demin Bypass 2WCS-MOV110 (design system flow rate is 900 gpm for 2 pumps) if required. |*5

5.5 If required, remove filter demineralizers from service in accordance with section F.2.0 of this procedure.

5.6 Operate the RWCU system as required to maintain desired pressure or desired cooldown rate.

5.7 Restore RWCU system to normal operation or remove from service in accordance with applicable sections of this procedure when no longer required in accordance with N2-EOP-RPV or N2-OP-31 Section H.10.

5.8 This step deleted.

6.0 Removal of Hydraulic Lockup on AOV's

6.1 If backwash make ready valve 2WCS-AOV51(A,B,C,D), (Filter/Demin drain to Radwaste), does not open as required for the backwash sequence, a hydraulic lock on the valve may have occurred. Remove the hydraulic lock by relieving the pressure in the drain line via the drain flush line. Slowly throttle open the appropriate Flt/Demin Flush Isolation Valve V74(V84, V94, V104) to relieve the pressure and allow AOV51(A,B,C,D) to open.

6.1.1 Close the Flt/Demin Flush Isolation Valve opened above.

6.2 If backwash make ready valve 2WCS-AOV54(A,B,C,D), (Precoat to Flt/Demin Isol), does not open as required for the backwash sequence, a hydraulic lock on the valve may have occurred. Remove the hydraulic lock by relieving the pressure in the precoat inlet line via the precoat flush line. Slowly throttle open the appropriate Flt/Demin Flush Isolation Valve V73(V83,V93,V103) to relieve the pressure and allow AOV54(A,B,C,D) to open.

6.2.1 Close the Flt/Demin Flush Isolation Valve opened above.

6.3 If a hydraulic lock occurs, that prevents any AOV from opening, requiring depressurization of the Flt/Demin vessel, perform the following steps.

6.3.1 Notify the SSS, per Precaution D.26.0, that V77 and V78, listed on Attachment 2, will be manipulated.

6.3.2 Open 2WCS-V77.

6.3.3 Slowly throttle open 2WCS-V78 to relieve Flt/Demin vessel pressure and allow the AOV(s) to open.

6.3.4 Shut 2WCS-V77 and V78. Notify the SSS that V77 and V78 are shut.

7.0 Addition Venting Instructions

CAUTION:

THIS PROCEDURE IS TO BE USED WHENEVER THE SYSTEM HAS BEEN BREACHED OR PARTIALLY DRAINED AND THE SYSTEM TEMPERATURE AS READ ON TEMPERATURE INDICATOR G33-R607 FOR POINTS 1 AND 4 IS LESS THAN 212°F.

7.1 Verify 2WCS*MOV112 is SHUT. 16410

7.2 Verify 2WCS*MOV200 is SHUT.

7.3 Verify all 4 Filters Demins have been backwashed per Section F.4.0.

7.4 Establish communications between the I&C Technician and an Operator at the Filter Demin Vent Line Sight glasses, 2WCS-FG15A (B,C,D) on valve MEZ; El. 318.

7.5 Instruct the I&C Technician to operate the programming terminal to position valves as follows:

7.5.1 OPEN WCS-AOV22A (B,C,D).

7.5.2 OPEN WCS-AOV23A (B,C,D).

7.5.3 OPEN WCS-AOV27A (B,C,D).

7.5.4 OPEN WCS-FCV16A (B,C,D).

7.5.5 OPEN WCS-AOV26A (B,C,D).

7.5.6 MANUALLY OPEN WCS-FCV16A (B,C,D) FROM CONTROLLER

7.5.7 SHUT WCS-AOV51A (B,C,D).

7.5.8 OPEN WCS-AOV47A (B).

7.6 When flow is observed at Filter Demin Vent Line Sightglass, instruct the I&C Technician at the programming terminal to reposition valves as follows:

7.6.1 SHUT WCS-AOV47A (B).

7.6.2 SHUT WCS-AOV26A (B,C,D).

7.6.3 SHUT WCS-AOV23A (B,C,D).

7.6.4 SHUT WCS-AOV22A (B,C,D).

7.6.5 SHUT WCS-AOV27A (B,C,D).

7.6.6 SHUT WCS-FCV16A (B,C,D).

7.6.7 MANUALLY SHUT WCS-FCV16A (B,C,D) FROM CONTROLLER.

7.6.8 OPEN WCS-AOV51A (B,C,D).

7.7 Repeat Steps H.7.5 through H.7.6 for the next two Reactor Water Cleanup Filter/Demin.

7.8 Repeat Step H.7.5 for the last Filter/Demin.

7.9 When flow is observed at Filter/Demin Vent Line Sightglass, instruct the I&C Technician at the programming terminal to SHUT WCS-AOV61A (B,C,D).

7.10 Vent additional WCS equipment per E.2.8, of this procedure. 16410

7.11 Instruct the I&C Technician at the programming terminal to reposition valves as following:

7.11.1 SHUT WCS-AOV47A (B).

7.11.2 SHUT WCS-AOV26A (B,C,D).

7.11.3 SHUT WCS-AOV23A (B,C,D).

7.11.4 SHUT WCS-AOV22A (B,C,D).

7.11.5 SHUT WCS-AOV27A (B,C,D).

7.11.6 SHUT WCS-FCV16A (B,C,D).

7.11.7 MANUALLY SHUT WCS-FCV16A (B,C,D) FROM CONTROLLER.

7.11.8 OPEN WCS-AOV61A (B,C,D).

7.11.9 OPEN WCS-AOV51A (B,C,D).

7.12 Continue with system startup per the applicable section of this procedure.

8.0 Overriding Filter/Demin Full Level Element 2WCS-LE62A (B, C, or D)

NOTE: This procedure should be used when a level element is suspected of malfunctioning.

NOTE: If the level element indicates full all the time, it will preclude an effective backwash and it will cause the filter to cycle back to backwash initiate during precoat.

8.1 It is desirable to contact I&C department to operate the programming terminal for filter/demin Control Panels 2WCS-IPNL187, 188. (This section may be performed by an operator, with the permission of the CSO and SSS.

8.2 Plug in terminal to desired filter/demin (specific plug for each filter) on the front of 2WCS-IPNL187 or 188.

8.3 Plug in power connection to 120 vac receptacle.

8.4 Turn terminal on.

8.5 Push 1 on the keyboard and then 1 again for mode 11.

8.6 Verify lower left corner of CRT says Run/Program. If not, go into respective control panel and place key switch to Run/Program.

8.7 Push Search key.

8.8 Push 5 then 3 (for bit manipulation).

8.9 Push 1, then 1 again, then 3 to enter 113.

8.10 Move cursor with <--> (left-right) button to Step 11.

8.10.1 Determine if input is always full (1) or always empty (0).

8.10.2 If always empty (0) go to Step 8.16.

8.10.3 If always full (1) and hold pump is running, or vessel is known to be full backwash per Section F.4 of this procedure then go to Step 8.13.3.

8.11 If input shows vessel always full (1) and the vessel is known to be empty, push Force Off key.

8.12 Push Insert key.

8.13 The level element logic now sees the filter/demin as empty.

8.13.1 After initiating backwash per Step F.4 of this procedure stand by the precoat room door and listen for the filter/demin to fill. This is indicated by a distinct change in flow noise (sounds almost like flow stops) with the respective 2WCS-AOV47 (A or B) open.

8.13.2 When demin is full as determined in Step 8.13.1, go back to terminal and perform the following:

a. Push Force Off key.

b. Push Remove key.

8.13.3 The system now goes through a drain cycle, after AOV's 26 and 47 close.

8.13.4 After AOV 29 opens

a. Push Force Off key.

b. Push Insert key.

8.13.5 Once the vessel is fully drained the second fill starts. Listen for the vessel to fill as in Step 8.13.1.

8.13.6 When demin is full go back to terminal and perform the following:

a. Push Force Off key.

b. Push Remove key.

8.13.7 After AOV 29 opens for second vessel drain

a. Push Force Off key.

b. Push Insert key.

8.13.8 System is now ready for precoating.

8.13.9 If backwash only is to be performed:

a. Unplug terminal from 2WCS-IPNL187 or 188.

b. Turn off terminal.

c. Unplug power connection for terminal.

8.14 After initiating precoat per Step F.5.6 of this procedure stand by the precoat room door and listen for the filter/demin to fill. This is indicated by a distinct change in flow noise (sounds almost like flow stops) with the respective 2WCS-AOV47 (A or B) open.

8.15 When demin is full as determined in Step 8.14, go back to terminal and perform the following:

a. Push Force Off key.

b. Push Remove key.

c. Unplug terminal from 2WCS-IPNL187 or 188.

d. Turn off terminal.

e. Unplug power connection for terminal.

16655

8.15.1 Continue with normal precoat.

8.16 If input always indicates empty (0) and hold pump is running or vessel is known to be full,

a. Push Force On key.

b. Push Insert key.

Then go to Step 8.16.3.

8.16.1 If input always indicates empty (0) and the vessel is known to be empty, backwash per Step F.4 of this procedure. Stand by the precoat room door and listen for the filter/demin to fill. This is indicated by a distinct change in flow noise (sounds almost like flow stops) with the respective 2WCS-AOV47 (A or B) open.

8.16.2 When demin is full as determined in Step 8.16.1, go to terminal and perform the following:

a. Push Force On key.

b. Push Insert key.

8.16.3 The system now goes through a drain cycle, after AOV's 26 and 47 close.

8.16.4 After AOV 29 opens

a. Push Force On key.

b. Push Remove key.

8.16.5 Once the vessel is fully drained, the second fill starts. Listen for the vessel to fill as in Step 8.16.1.

8.16.6 When demin is full go back to terminal and perform the following:

a. Push Force On key.

b. Push Insert key.

8.16.7 After AOV 29 opens for second vessel drain

a. Push Force On key.

b. Push Remove key.

8.16.8 If backwash is only to be performed, wait until the shutdown light comes on, then

a. Unplug terminal from 2WCS-IPNL187 or 188.

b. Turn off terminal.

c. Unplug power connection for terminal.

8.16.9 System is now ready for precoating.

16655

8.16.10 After initiating precoat per Step F.5.6 of this procedure stand by the precoat room door and listen for the filter/demin to fill. This is indicated by a distinct change in flow noise (sounds almost like flow stops) with the respective 2WCS-AOV47 (A or B) open.

16655

8.16.11 When demin is full as determined in Step 8.16.10, go back to terminal and perform the following:

a. Push Force On key.

b. Push Insert key.

8.16.12 After precoat is complete and filter is in hold,

a. Push Force On key.

b. Push Remove key.

c. Unplug terminal from 2WCS-IPNL187 or 188.

d. Turn off terminal.

e. Unplug power connection for terminal.

9.0 RWCU Bottom Head Suction Only

CAUTION:

SYSTEM FLOW SHALL BE MAINTAINED LESS THEN 220 GPM DURING THIS MODE OF OPERATION.

CAUTION:

SEE PRECAUTION/LIMITATION D.33.0 OF THIS PROCEDURE. G33-R610 INDICATION HIGHLY INACCURATE DURING FAST SPEED REACTOR RECIRCULATION PUMP OPERATION.

NOTE: During filter changeover it is permissible to operate the pump in a low flow condition.

9.1 Verify the Reactor is in a Cold Shutdown condition.

9.2 IF the RWCU is operating THEN perform the following:

9.2.1 Establish 1 pump and 1 filter demineralizer operation in accordance with applicable sections of this procedure.

9.2.2 Verify open 2WCS*MOV101, CLEANUP SUCT VLV FROM VESSEL BOTTOM

9.2.3 Verify system flow is less than 220 gpm as indicated on 2WCS-FI610 at panel P602.

9.2.4 Slowly throttle full closed 2WCS*MOV103, CLEANUP SUCT INSIDE BLOCKING VLV.

9.2.5 Close 2WCS*MOV104, CLEANUP SUC VLV FROM RECIRC B.

9.2.6 Close 2WCS*MOV105, CLEANUP SUC VLV FROM RECIRC A.

10.0 WCS Valve Operation to Perform Drywell Leak Location

NOTE: The purpose of this section is to provide direction in a method to locate the source of unidentified leakage inside the Primary Containment. These steps may be completed in whole or in part as determined by Operations and Engineering and as required to isolate an identified leakage path. Any valves left in an OFF Normal position shall be appropriately tagged.

10.1 Place any in service filter/demineralizers in hold (standby) per Section F.2.0 of this procedure.

10.2 Close 2WCS*MOV101, RPV Bottom Head Drain Supply to WCS.

10.3 Observe appropriate drywell parameters (floor drain leakage rate and particulate activity) for a period of two hours for trend.

10.4 Open 2WCS*MOV101, RPV Bottom Head Drain Supply to WCS.

10.5 Close 2WCS*MOV104, supply from Reactor Recirc. Loop B.

10.6 Observe appropriate drywell parameters (floor drain leakage rate and particulate activity) for a period of two hours for trend.

10.7 Open 2WCS*MOV104, supply from Reactor Recirc. Loop B.

10.8 Close 2WCS*MOV105, supply from Reactor Recirc. Loop A.

10.9 Observe appropriate drywell parameters (floor drain leakage rate and particulate activity) for a period of two hours for trend.

10.10 Open 2WCS*MOV105, supply from Reactor Recirc. Loop A.

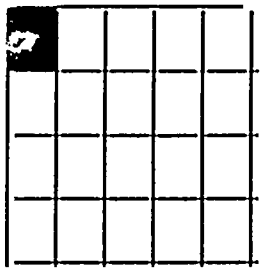
10.11 Restore filter/demineralizers to service as directed by the SSS.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS

1.0 1871-1 Backwash Receiving Tank High Level

BACKWASH
RECEIVING TANK
HI LEVEL

1871-1



1871-1

1.1

Computer Point	Computer Printout	Source
WCSBC09	RWCU SYS 1 BW RCVG TK LVL	2G36-N006A

*2

1.2 Automatic Response

NONE

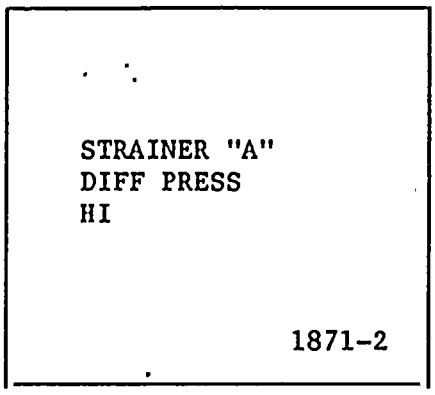
1.3 Corrective Action

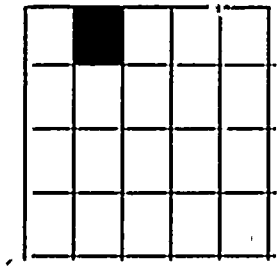
NOTE: A high level in the backwash receiving tank will prevent the initiation of a backwash cycle, however, any cycle in progress will continue to completion.

a. If a backwash cycle is in progress, allow it to continue to completion.

b. Notify the Rad Waste Control Room of the condition and direct them to transfer the spent resin from the backwash receiving tank per the appropriate Rad Waste procedure.

2.0 1871-2 Strainer "A" Differential Pressure High





1871-2

2.1

Computer Point	Computer Printout	Source
WCSBC01	RWCU VES A EFFL STRN D/P	2WCS-PS1019A Setpoint 5 psid.
NONE	HIGH-HIGH DP (ISOLATION)	2WCS-PS1019A Setpoint 10 PSID

*2

2.2 Automatic Response

a. At 5 psid - NONE

b. At 10 psid Flt/Demin 4A Outlet Flow Controller 2WCS-FV16A, Flt/Demin 4A Inlet Isolation AOV22A, Flt/Demin 4A Inlet Isolation AV023A, and Flt/Demin 4A Outlet Isolation AOV27A fully close.

2.3 Corrective Action

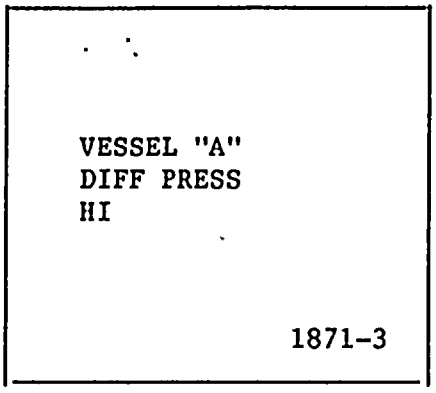
a. Verify Flt/Demin 4A Outlet Flow Controller 2WCS-FV16A, Flt/Demin 4A Inlet Isolation AOV22A, Flt/Demin 4A Inlet Isolation AOV23A, and Flt/Demin 4A Outlet Isolation AOV27A have fully closed.

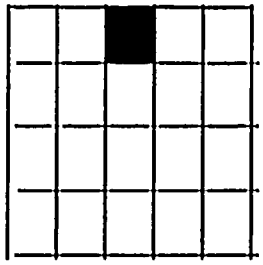
b. Backwash Strainer 5A per section F.3.0 of this procedure.

c. Backwash and precoat the A filter demineralizer per sections F.4.0 and F.5.0 of this procedure.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

3.0 1871-3 Vessel "A" Differential Pressure High





1871-3

3.1	Computer Point	Computer Printout	Source
	WSCBC03	RWCU VES A DP	2WCS-PS1020A Setpoint 30 psid

*2

3.2 Automatic Response

a. Flt/Demin 4A Outlet Flow Controller 2WCS-FV16A, Flt/Demin 4A Inlet Isolation AOV22A, Flt/Demin 4A Inlet Isolation AOV23A and Flt/Demin 4A Outlet Isolation AOV27A fully close.

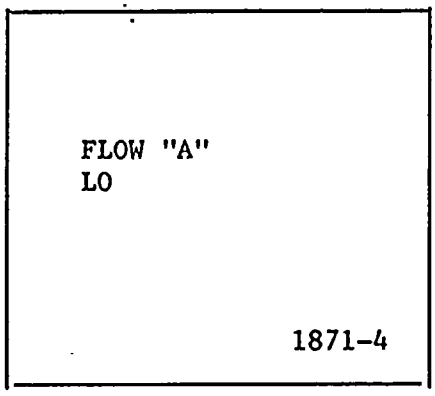
3.3 Corrective Action

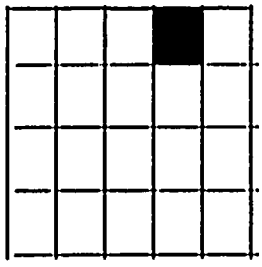
a. Verify Flt/Demin 4A Outlet Flow Controller 2WCS-FV16A, Flt/Demin 4A Inlet Isolation AOV22A, Flt/Demin 4A Inlet Isolation AOV23A and Flt/Demin 4A Outlet Isolation AOV27A fully close.

b. Backwash and precoat the A filter demineralizer per sections F.4.0 and F.5.0.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

4.0 1871-4 Flow "A" Low





1871-4

4.1	Computer Point	Computer Printout	Source	
	WCSBC05	RWCU VES A DISCH FLOW	2WCS-FS1016A Setpoint-34 gpm.	*2

4.2 Automatic Response

a. If the A filter demineralizer is in the "FILTER" mode and hold pump 2WCS-P6A has not been running for at least 15 seconds, then the following valves close:

1. Flt/Demin 4A Outlet Flow Controller 2WCS-FV16A
2. Flt/Demin 4A Inlet Isolation 2WCS-AOV22A
3. Flt/Demin 4A Inlet Isolation 2WCS-AV023A
4. Flt/Demin 4A Outlet Isolation 2WCS-AV027A

b. Otherwise there is no automatic response.

4.3 Corrective Action

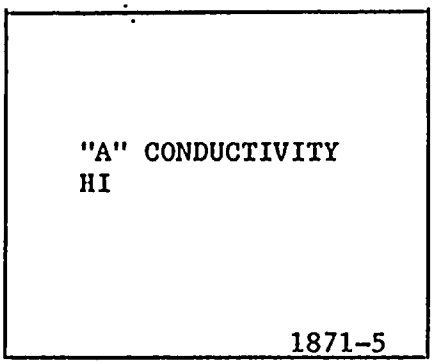
a. Verify Flt/Demin 4A Outlet Flow Controller 2WCS-FV16A, Flt/Demin 4A Inlet Isolation AOV22A, Flt/Demin 4A Inlet Isolation AOV23A and Flt/Demin 4A Outlet Isolation AOV27A have fully closed if required.

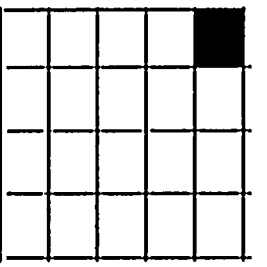
b. Determine the cause of the low flow condition and correct.

c. Backwash and precoat the A filter demineralizer per sections F.4.0 and F.5.0 if required.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

5.0 1871-5 "A" Conductivity Hi





1871-5

5.1	Computer Point	Computer Printout	Source	
	WCSBC07	RWCU VES A EFFL COND	2SSR-CSHY6A Setpoint- 0.1 umho/cm	*2

5.2 Automatic Response

NONE

5.3 Corrective Action

a. Verify the following at panel 2SSR-IPNL145:

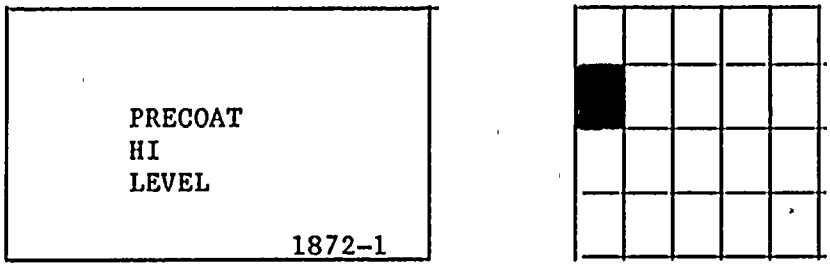
1. Proper sample flow rate.

2. Sample temperature is 77°F ± 1°F.

b. If sample flow and temperature are normal then isolate the A filter demineralizer and perform a backwash and precoat per sections F.4.0 and F.5.0 of this procedure.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

6.0 1872-1 Precoat High Level



1872-1

6.1	Computer Point	Computer Printout	Source	
	WCSBC11	RWCU PRECOAT TANK A LVL	2WCS-LS1056A	*2

6.2 Automatic Response

NONE

6.3 Corrective Action

NOTE: The Precoat Tank High Level alarm may be received during the addition of resin to the precoat tank. As the filter demineralizers are precoated, the resin is removed from the water that is recirculated from the precoat tank. This causes level in the precoat tank to decrease below the high level setpoint.

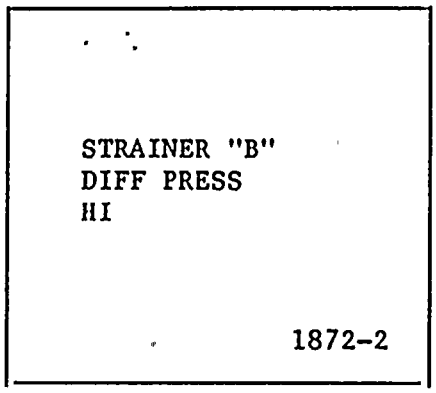
a. If resin is being added to the precoat tank, suspend resin addition until the alarm clears.

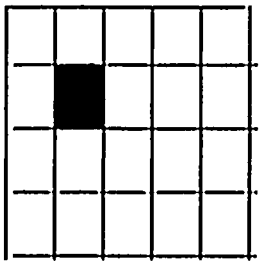
b. If all resin has been deposited on the Filter Demineralizers and the alarm has not cleared, manually open precoat tank drain valve 2WCS-V121 until the high level alarm has cleared. Reclose valve 2WCS-V121 prior to receiving the low level alarm.

c. Continue resin addition and filter demineralizer precoat as required.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont'd)

7.0 1872-2 Strainer "B" Differential Pressure High





1872-2

7.1

Computer Point	Computer Printout	Source
WCSBC02	RWCU VES B EFFL STRN D/P	2WCS-PS1019B Setpoint 5 psid
NONE	HIGH-HIGH DP (ISOLATION)	2WCS-PS1019B Setpoint 10 psid

*2

7.2 Automatic Response

a. At 5 psid - NONE

b. At 10 psid Flt/Demin 4B Outlet Flow Controller 2WCS-FV16B, Flt/Demin 4B Inlet Isolation AOV22B, Flt/Demin 4B Inlet Isolation AOV23B, and Flt/Demin 4B Outlet Isolation AOV27B fully close.

7.3 Corrective Action

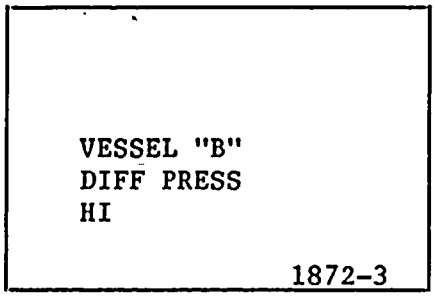
a. Verify Flt/Demin 4B Outlet Flow Controller 2WCS-FV16B, Flt/Demin 4B Inlet Isolation AOV22B, Flt/Demin 4B Inlet Isolation AOV23B, and Flt/Demin 4B Outlet Isolation AOV27B have fully closed.

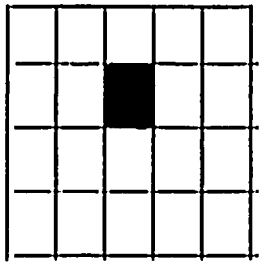
b. Backwash Strainer 5B per section F.3.0 of this procedure.

c. Backwash and precoat the B filter demineralizer per sections F.4.0 and F.5.0 of this procedure.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

8.0 1872-3 Vessel "B" Differential Pressure High





1872-3

8.1	Computer Point	Computer Printout	Source	
	WCSBC04	RWCU VES B D/P	2WCS-PS1020B Setpoint 30 psid	*2

8.2 Automatic Response

a. Filter Demin Isolation Valves Flt/Demin 4B Outlet Flow Controller 2WCS-FV16B, Flt/Demin 4B Inlet Isolation AOV22B, Flt/Demin 4B Inlet Isolation AOV23B and Flt/Demin 4B Outlet Isolation AOV27B fully close.

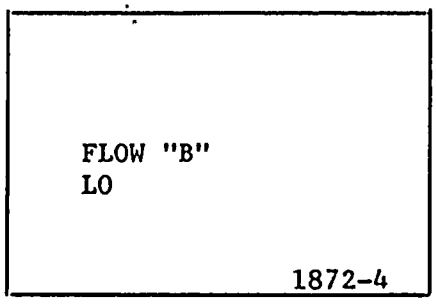
8.3 Corrective Action

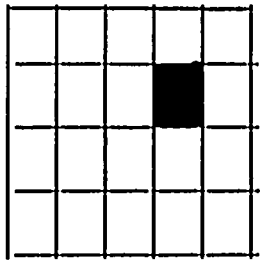
a. Verify Flt/Demin 4B Outlet Flow Controller 2WCS-FV16B, Flt/Demin 4B Inlet Isolation AOV22B, Flt/Demin 4B Inlet Isolation AOV23B and Flt/Demin 4B Outlet Isolation AOV27B fully close.

b. Backwash and precoat the B filter demineralizer per sections F.4.0 and F.5.0.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

9.0 1872-4 Flow "B" Low





1872-4

9.1	Computer Point	Computer Printout	Source	
	WCSBC06	RWCU VES B DISCH FLOW	2WCS-FS1016B Setpoint-34 gpm	*2

9.2 Automatic Response

a. If the B filter demineralizer is in the "FILTER" mode and hold pump 2WCS-P6B has not been running for at least 15 seconds then the following valves close:

1. Flt/Demin 4B Outlet Flow Controller 2WCS-FV16B
2. Flt/Demin 4B Inlet Isolation 2WCS-AOV22B
3. Flt/Demin 4B Inlet Isolation 2WCS-AOV23B
4. Flt/Demin 4B Outlet Isolation 2WCS-AOV27B

b. Otherwise there is no automatic response.

9.3 Corrective Action

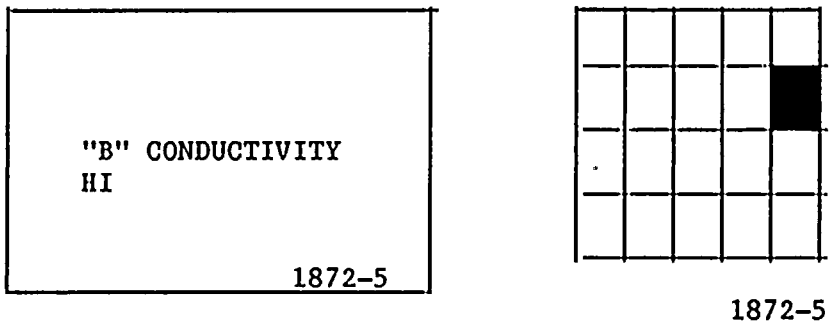
a. Verify Flt/Demin 4B Outlet Flow Controller 2WCS-FV16B, Flt/Demin 4B Inlet Isolation AOV22B, Flt/Demin 4B Inlet Isolation AOV23B, and Flt/Demin 4B Outlet Isolation AOV27B have fully closed if required.

b. Determine the cause of the low flow condition and correct.

c. Backwash and precoat the B filter demineralizer per sections F.4.0 and F.5.0, if required.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

10.0 1872-5 "B" Conductivity High



10.1	Computer Point	Computer Printout	Source	
	WCSBC08	RWCU VES B EFFL COND	2WCS-CSHY6B Setpoint- 0.1 umho/cm	*2

10.2 Automatic Response

NONE

10.3 Corrective Action

a. Verify the following at panel 2SSR-IPNL145:

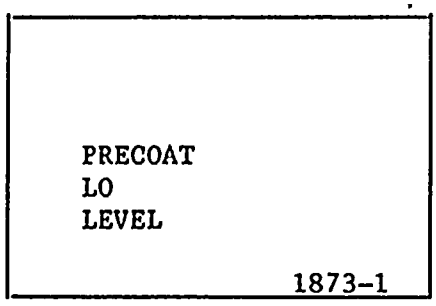
1. Proper sample flow rate.

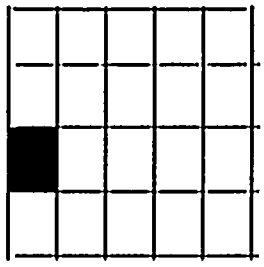
2. Sample temperature is 77°F ± 1°F.

b. If sample flow and temperature are normal then isolate the B filter demineralizer and perform a backwash and precoat per sections F.4.0 and F.5.0 of this procedure.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

11.0 1873-1 Precoat Low Level





1873-1

11.1	Computer Point	Computer Printout	Source	
	WCSBC10	RWCU PRECOAT TANK A LVL	2WCS-LS1056A Setpoint-15 inches	*2

11.2 Automatic Response

a. If the A or B filter demineralizer is in a precoat cycle, the precoat is terminated and the "BACKWASH REQUIRED" interlock is latched.

11.3 Corrective Action

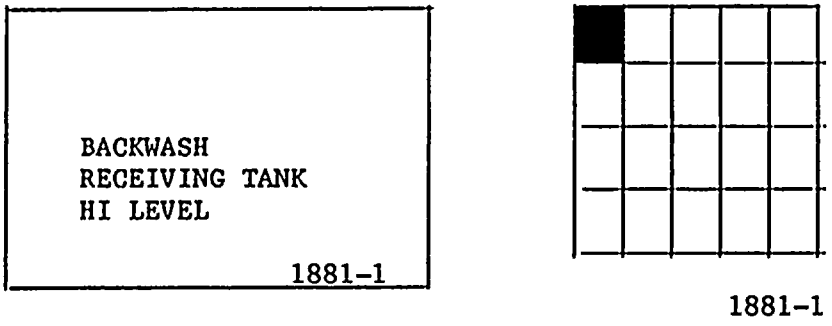
a. Determine the cause of the low level condition and correct.

b. Backwash and precoat the applicable filter demineralizer per section F.4.0 and F.5.0 of this procedure.

NOTE: If this alarm occurred during the early steps of a precoat, it is a good indication the filter/ demin vessel was not full. This could be caused by the level element (2WCS-LE62 "A" or "B") for the vessel being precoated indicating full all the time. Performing a backwash and precoat per Section H.8 may help determine if the level element is not functioning.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

12.0 1881-1 Backwash Receiving Tank High Level



1881-1

12.1	Computer Point	Computer Printout	Source
	WCSBC20	RWCU SYS 2 BW RCVG TK LVL	2G36-N006B

*2

12.2 Automatic Response

NONE

12.3 Corrective Action

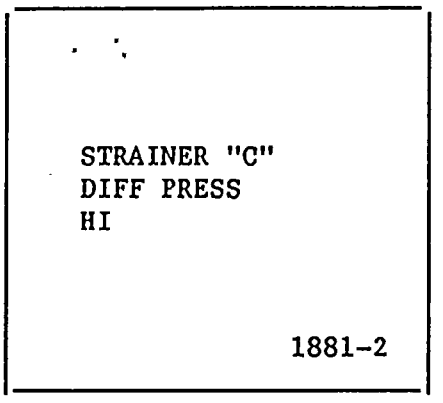
NOTE: A high level in the backwash receiving tank will prevent the initiation of a backwash cycle, however, any cycle in progress will continue to completion.

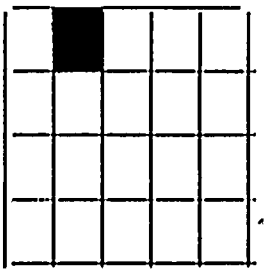
a. If a backwash cycle is in progress, allow it to continue to completion.

b. Notify the Rad Waste Control Room of the condition and direct them to transfer the spent resin from the Backwash receiving tank per the appropriate Rad Waste procedure.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont'd)

13.0 1881-2 Strainer "C" Differential Pressure High





1881-2

13.1

Computer Point	Computer Printout	Source
WCSBC12	RWCU VES C EFFL STRN D/P	2WCS-PS1019C Setpoint 5 psid
NONE	HIGH-HIGH DP (ISOLATION)	2WCS-PS1019C Setpoint 10 psid

*2

13.2 Automatic Response

a. At 5 psid - NONE

b. At 10 psid Flt/Demin 4C Outlet Flow Controller 2WCS-FV16C, Flt/Demin 4C Inlet Isolation AOV22C, Flt/Demin 4C Inlet Isolation AOV23C, and Flt/Demin 4C Outlet Isolation AOV27C fully close.

13.3 Corrective Action

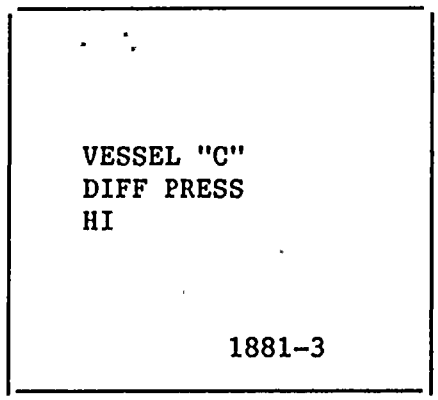
a. Verify Flt/Demin 4C Outlet Flow Controller 2WCS-FV16C, Flt/Demin 4C Inlet Isolation AOV22C, Flt/Demin 4C Inlet Isolation AOV23C, and Flt/Demin 4C Outlet Isolation AOV27C have fully closed.

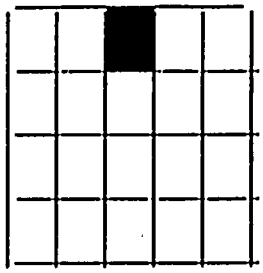
b. Backwash Strainer 5C per section F.3.0 of this procedure.

c. Backwash and precoat the C filter demineralizer per sections F.4.0 and F.5.0 of this procedure.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

14.0 1881-3 Vessel "C" Differential Pressure High





1881-3

14.1	Computer Point	Computer Printout	Source	
	WCSBC14	RWCU VES C D/P	2WCS-PS1020C Setpoint 30 psid	*2

14.2 Automatic Response

a. Flt/Demin 4C Outlet Flow Controller 2WCS-FV16C, Flt/Demin 4C Inlet Isolation AOV22C, Flt/Demin 4C Inlet Isolation AOV23C and Flt/Demin 4C Outlet Isolation AOV27C fully close.

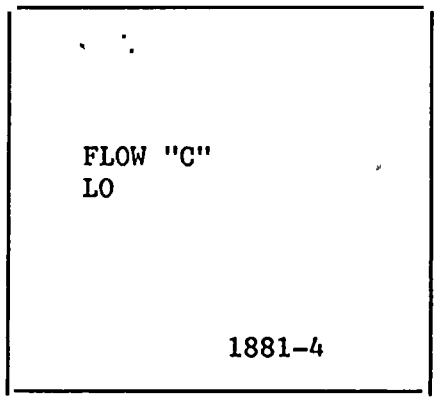
14.3 Corrective Action

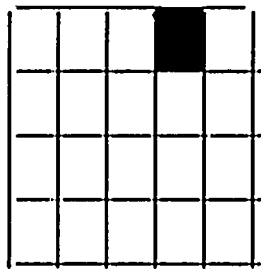
a. Verify Flt/Demin 4C Outlet Flow Controller 2WCS-FV16C, Flt/Demin 4C Inlet Isolation AOV22C, Flt/Demin 4C Inlet Isolation AOV23C and Flt/Demin 4C Outlet Isolation AOV27C fully close.

b. Backwash and precoat the C filter demineralizer per sections F.4.0 and F.5.0 of this procedure.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

15.0 1881-4 Flow "C" Low





1881-4

15.1	Computer Point	Computer Printout	Source	
	WCSBC16	RWCU VES C DISCH FLOW	2WCS-FS1016C Setpoint 34 gpm	*2

15.2 Automatic Response

a. If the C filter demineralizer is in the "FILTER" mode and hold pump 2WCS-P6C has not been running for at least 15 seconds, then the following valves close:

1. Flt/Demin 4C Outlet Flow Controller 2WCS-FV16C
2. Flt/Demin 4C Inlet Isolation 2WCS-AOV22C
3. Flt/Demin 4C Inlet Isolation 2WCS-AOV23C
4. Flt/Demin 4C Outlet Isolation 2WCS-AOV27C

b. Otherwise, there is no automatic response.

15.3 Corrective Action

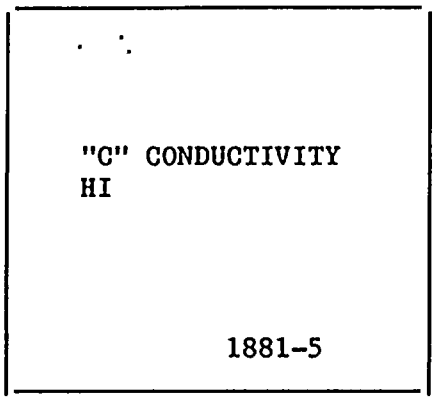
a. - Verify Flt/Demin 4C Outlet Flow Controller 2WCS-FV16C, Flt/Demin 4C Inlet Isolation AOV22C, Flt/Demin 4C Inlet Isolation AOV23C and Flt/Demin 4C Outlet Isolation AOV27C have fully closed if required.

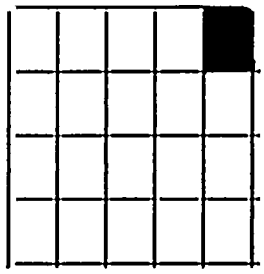
b. Determine the cause of the low flow condition and correct.

c. Backwash and precoat the C filter demineralizer per sections F.4.0 and F.5.0 if required.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

16.0 1881-5 "C" Conductivity High





1881-5

16.1	Computer Point	Computer Printout	Source	
	WCSBC18	RWCU VES C EFFL COND	2WCS-CSHY6C Setpoint-0.1 umho/cm	*2

16.2 Automatic Response

NONE

16.3 Corrective Action

a. Verify the following at panel 2SSR-IPNL145:

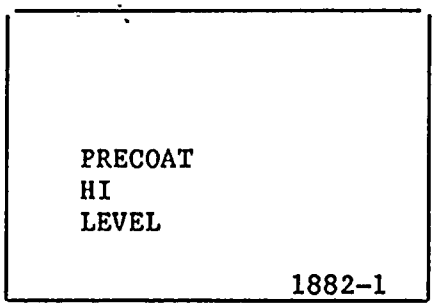
1. Proper sample flow rate.

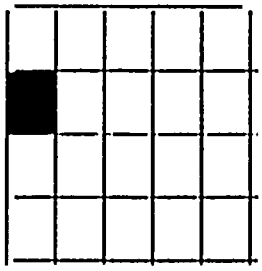
2. Sample temperature is 77°F ± 1°F.

b. If sample flow and temperature are normal then isolate the C filter demineralizer and perform a backwash and precoat per sections F.4.0 and F.5.0 of this procedure.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

17.0 1882-1 Precoat High Level





1882-1

17.1	Computer Point	Computer Printout	Source	
	WCSBC22	RWCU PRECOAT TANK B LVL	2WCS-LS1056B	*2

17.2 Automatic Response

NONE

17.3 Corrective Action

NOTE: The Precoat Tank High Level Alarm may be received during the addition of resin to the precoat tank. As the filter demineralizers are precoated, the resin is removed from the water that is recirculated from the precoat tank. This causes level in the precoat tank to decrease below the high level setpoint.

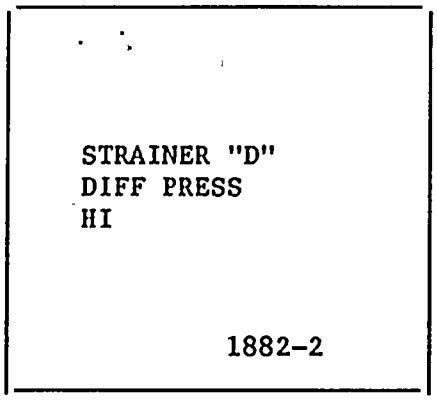
a. If resin is being added to the precoat tank, suspend resin addition until the alarm clears.

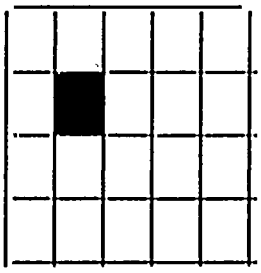
b. If all resin has been deposited on the Filter Demineralizers and the alarm has not cleared, manually open precoat tank drain valve 2WCS-V131 until the high level alarm has cleared. Reclose valve 2WCS-V131 prior to receiving the low level alarm.

c. Continue resin addition and filter demineralizer precoat as required.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont'd)

18.0 1882-2 Strainer "D" Differential Pressure High





1882-2

18.1

Computer Point	Computer Printout	Source
WCSBC13	RWCU VES D EFFL STRN D/P	2WCS-PS1019D Setpoint 5 psid
NONE	HIGH-HIGH DP (ISOLATION)	2WCS-PS1019D Setpoint 10 psid

*2

18.2 Automatic Response

a. At 5 psid - NONE

b. At 10 psid Flt/Demin 4D Outlet Flow Controller 2WCS-FV16D, Flt/Demin 4D Inlet Isolation AOV22D, Flt/Demin 4D Inlet Isolation AOV23D, and Flt/Demin 4D Outlet Isolation AOV27D fully close.

18.3 Corrective Action

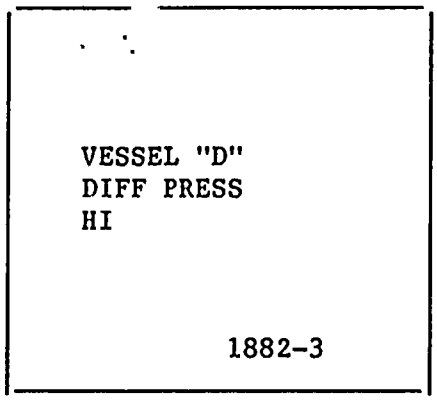
a. Verify Flt/Demin 4D Outlet Flow Controller 2WCS-FV16D, Flt/Demin 4D Inlet Isolation AOV22D, Flt/Demin 4D Inlet Isolation AOV23D, and Flt/Demin 4D Outlet Isolation AOV27D have fully closed.

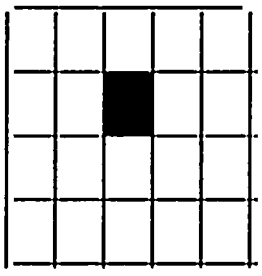
b. Backwash Strainer 5D per section F.3.0 of this procedure.

c. Backwash and precoat the D filter demineralizer per sections F.4.0 and F.5.0 of this procedure.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

19.0 1882-3 Vessel "D" Differential Pressure High





1882-3

19.1	Computer Point	Computer Printout	Source	
	WCSBC15	RWCU VES D D/P	2WCS-1020D Setpoint-30 psid	*2

19.2 Automatic Response

a. Flt/Demin 4D Outlet Flow Controller 2WCS-FV16D, Flt/Demin 4D Inlet Isolation AOV22D, Flt/Demin 4D Inlet Isolation AOV23D and Flt/Demin 4D Outlet Isolation AOV27D fully close.

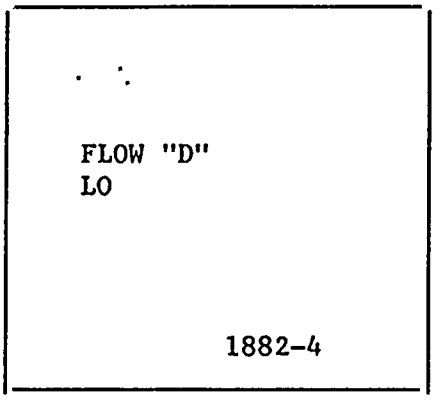
19.3 Corrective Action

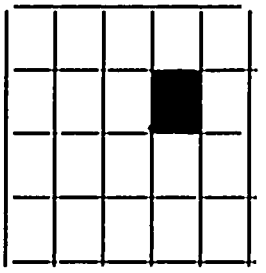
a. Verify Flt/Demin 4D Outlet Flow Controller 2WCS-FV16D, Flt/Demin 4D Inlet Isolation AOV22D, Flt/Demin 4D Inlet Isolation AOV23D and Flt/Demin Outlet Isolation AOV27D fully close.

b. Backwash and precoat the D filter demineralizer per sections F.4.0 and F.5.0.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

20.0 1882-4 Flow "D" Low





1882-4

20.1	Computer Point	Computer Printout	Source
	WCSBC17	RWCU VES D DISCH FLOW	2WCS-FS1016D Setpoint-34 gpm

*2

20.2 Automatic Response

a. If the D filter demineralizer is in the "FILTER" mode and hold pump 2WCS-P6D has not been running for at least 15 seconds then the following valves close.

1. Flt/Demin 4D Outlet Flow Controller 2WCS-FV16D
2. Flt/Demin 4D Inlet Isolation 2WCS-AOV22D
3. Flt/Demin 4D Inlet Isolation 2WCS-AOV23D
4. Flt/Demin 4D Outlet Isolation 2WCS-AOV27D

b. Otherwise there is no automatic response.

20.3 Corrective Action

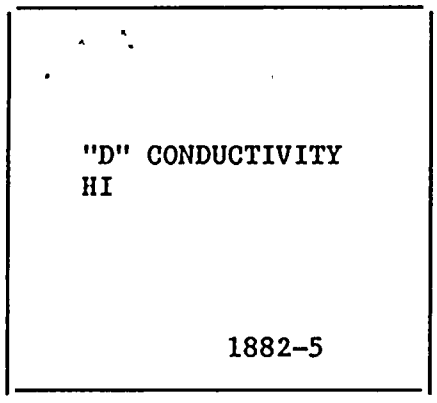
a. Verify Flt/Demin 4D Outlet Flow Controller 2WCS-FV16D, Flt/Demin 4D Inlet Isolation AOV22D, Flt/Demin 4D Inlet Isolation AOV23D and Flt/Demin 4D Outlet Isolation AOV27D have fully closed if required.

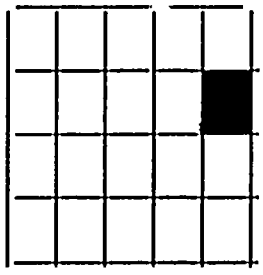
b. Determine the cause of the low flow condition and correct.

c. Backwash and precoat the D filter demineralizer per sections F.4.0 and F.5.0 if required.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

21.0 1882-5 "D" Conductivity High





1882-5

21.1

Computer Point	Computer Printout	Source
WCSBC19	RWCU VES D EFFL COND	2WCS-CSHY6D Setpoint-0.1 umho/cm

*2

21.2 Automatic Response

NONE

21.3 Corrective Action

a. Verify the following at panel 2SSR-IPNL145:

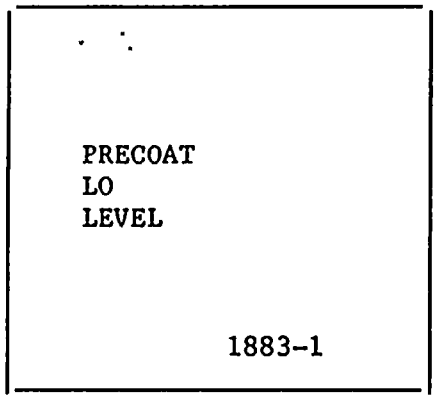
1. Proper sample flow rate.

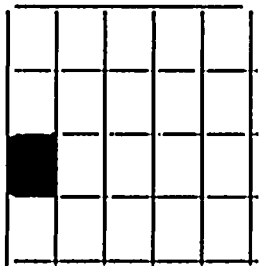
2. Sample temperature is 77°F ± 1°F.

b. If sample flow and temperature are normal, then isolate the D filter demineralizer and perform a backwash and precoat per sections F.4.0 and F.5.0 of this procedure.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

22.0 1883-1 Precoat Low Level





1883-1

22.1

Computer Point	Computer Printout	Source	
WCSBC21	RWCU PRECOAT TANK B LVL	2WCS-LS1056B Setpoint-15 inches	*2

22.2 Automatic Response

a. If the C or D filter demineralizer is in a precoat cycle, the precoat is terminated and the "BACKWASH REQUIRED" interlock is latched.

22.3 Corrective Action

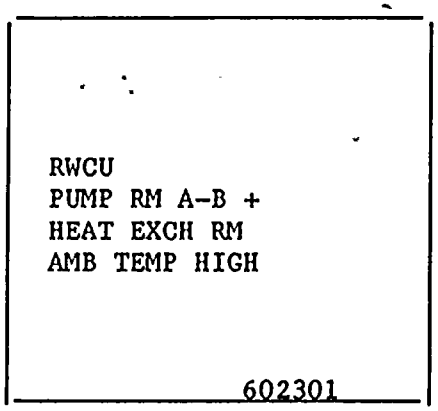
a. Determine the cause of the low level condition and correct.

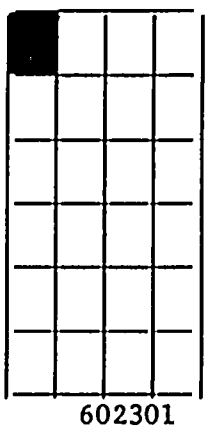
b. Backwash and precoat the applicable filter demineralizer per section F.4.0 and F.5.0 of this procedure.

NOTE: If this alarm occurred during the early steps of a precoat, it is a good indication the filter/ demin vessel was not full. This could be caused by the level element (2WCS-LE62 "C" or "D") for the vessel being precoated indicating full all the time. Performing a backwash and precoat per Section H.8 may help determine if the level element is not functioning.

23.0 602301 Reactor Water Cleanup Pump Room A-B and Heat Exchanger Room Ambient Temperature High

Reflash: No





23.1	Computer Point	Computer Printout	Source	
	WCSTC08	RWCU PP RM A-B/HX RM TMP	2WCS*TE33A, 2WCS*TE33C and 2WCS*TE33E to recorder 2MSS-TRSH-1001(E31-R608)A switch 6 on PNL632 Setpoint 125°	*2

23.2 Automatic Response

NONE

23.3 Corrective Action

a. Verify alarm on the process computer.

b. Check points 10, 11 and 12 on recorder 2MSS-TRSH-1001(E31-R608)A located at PNL632 to determine the location of the high temperature.

c. If the high temperature is in the 2WCS-P1A or P1B room, shutdown and isolate the appropriate pump per section H.1.0 of this procedure. This may stop the temperature increase and prevent a WCS isolation. Check pump rooms for possible steam leakage.

d. If the high temperature is in the 2WCS-E2 and 2WCS-E3 Heat Exchanger room, check it for steam leakage.

e. Verify that the Normal Reactor Building Ventilation is in operation.

CAUTION

High temperature in an RWCU area is indicative of a possible high pressure steam leak. Exercise extreme caution when entering and working in these areas while the equipment is at high temperatures.

f. Determine the cause of the high temperature and correct.

g. Upon correction of the cause of the alarm, re-establish system operation per the appropriate section of this procedure.

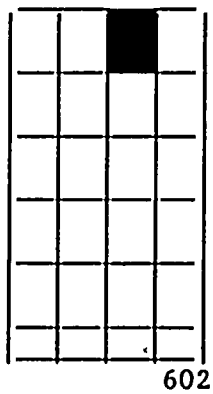
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

24.0 602303 Division I Reactor Water Cleanup Valves Motor Overload

Reflash: Yes

DIVISION I
RWCU
VALVES
MOT OVERLOAD

602303



602303

24.1

Computer Point	Computer Printout	Source
WCSTC01	WCS RTN ISO V MOV200 MOT	49X-2WCSA02 (Valve 2WCS-MOV200)
WCSTC02	WCS SUC OB IV MOV112 MOT	49X-2WCSN15 (Valve 2WCS*MOV112)

*2

24.2 Automatic Response

NONE

24.3 Corrective Action

a. Refer to Technical Specification 3/4.6.3.

b. Determine the cause of the overload and correct.

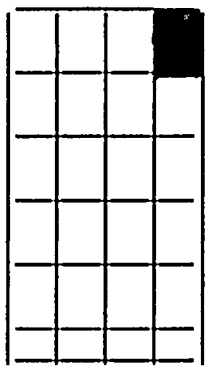
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

25.0 602304 Division II Reactor Water Cleanup Valves Motor Overload

Reflash: No

DIVISION II
RWCU
VALVES
MOT OVERLOAD

602304



602304

25.1	Computer Point	Computer Printout	Source	
	WCSTC04	WCS SUC IB IVMOV102 MOT	49X-2WCSN01 (Valve 2WCS*MOV102)	*6

25.2 Automatic Response

NONE

25.3 Corrective Action

a. Refer to Technical Specification 3/4.6.3.

b. Determine the cause of the overload condition and correct.

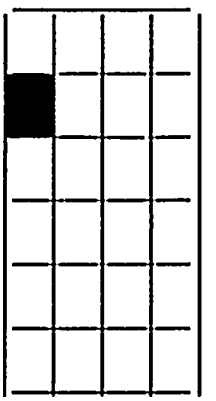
I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

26.0 602305 Outboard Reactor Water Cleanup Isolation System Inoperable

Reflash: No

OUTBOARD
RWCU
ISOL SYSTEM
INOPERABLE

602305



602305

26.1

Computer Point	Computer Printout	Source
WCSBC27	OUTBOARD RWCU ISOL SYS	1. RWCU PMP SUCT ISOL VLV 2WCS*MOV112 INOP *2
		2. RWCU RTN ISOL VLV 2WCS-MOV200 INOP

26.2 Corrective Action

a. Refer to the following INOP Equipment Status Lights for response.

b. Refer to Technical Specification 3/4.6.3.

Equipment Status Light	Source	Automatic Action
1. RWCU PMP SUCT ISOL VLV 2WCS*MOV112 INOP	74-2WCSN15	NONE

Corrective Action

a. Verify power is available to WCS Outboard Isolation valve 2WCS*MOV112 by verifying that at least one of the valve position indicating lights on P602 is energized.

b. If power is not available to the valve, then check the following:

1. Fuse 3A-2WCSN15 has not blown.

2. WCS Outboard Isolation Valve 2WCS*MOV112 power supply at 2EHS-MCC102C breaker 17B is closed.

c. Determine the cause of the valve inop signal and correct as required.

Equipment Status Light	Source	Automatic Action
2. RWCU RTN ISOL VLV 2WCS-MOV200 INOP	74-2WCSA02	NONE

Corrective Action

a. Verify power is available to WCS Return to Feedwater System Isolation Valve 2WCS-MOV200 by verifying that at least one of the valve position indicating lights on P602 is energized.

b. If power is not available to the valve, then check the following:

1. Fuse 3A-2WCSA02 has not blown.

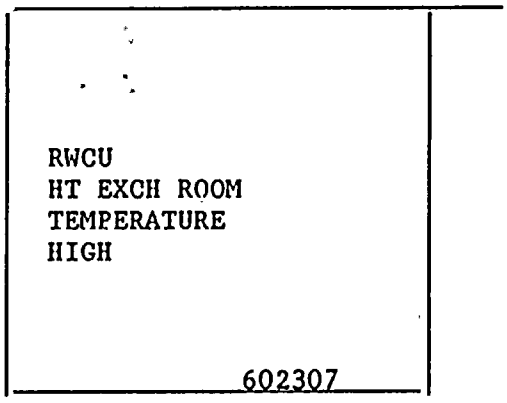
2. WCS Return to Feedwater System Isolation Valve 2WCS-MOV200 power supply at 2EHS-MCC102 breaker 7D is closed.

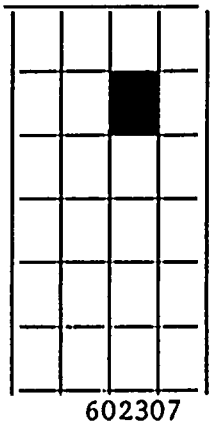
c. Determine the cause of the valve inop signal and correct as required.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

27.0 602307 Reactor Water Cleanup Heat Exchanger Room Temperature High

Reflash: Yes




602307

27.1

Computer Point	Computer Printout	Source
LDSTC63	RWCU HX RM TEMP RPS D1	2WCS-TS-1601E, Setpoint 131°
LDSTC64	RWCU HX RM TEMP RPS D2	2WCS-TS-1601F, Setpoint 131°

*2

27.2 Automatic Response

a. WCS Inboard Isolation Valves 2WCS*MOV102 and/or WCS Outboard Isolation Valve MOV112 fully close.

b. RWCU pump 2WCS-P1A and P1B trip due to system isolation valve closure.

27.3 Corrective Action

a. Verify WCS Inboard Isolation Valves 2WCS*MOV102 and WCS Outboard Isolation Valve MOV112 have fully closed by checking the green valve position indicating lights on PNL602.

b. Verify RWCU pumps 2WCS-P1A and P1B have tripped by checking each pump's green light on PNL602 and verifying that alarm 602314 (RWCU Pump 1A/1B Auto Trip) actuates.

c. Verify the alarm on the process computer.

d. Refer to N2-EOP-SC.

e. Determine the cause of the high temperature condition and correct.

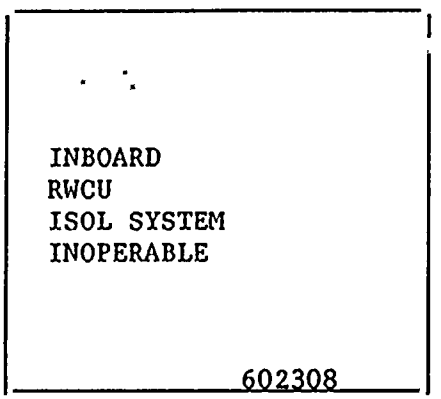
NOTE: Be aware that a rapid decrease in RWCU flow may result in the filter/demineralizer resins being dropped from the septums. It is recommended that following a system isolation the filter/demineralizers be backwashed and precoated prior to system restart. This will prevent the transfer of the filter/demineralizer resins to the RPV.

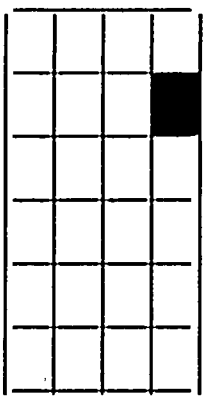
f. Upon correction of the alarm condition, re-establish system operation per the appropriate sections of this procedure.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

28.0 602308 Inboard Reactor Water Cleanup Isolation System Inoperable

Reflash: No




602308

28.1

Computer Point	Computer Printout	Source	
WCSBC26	INBOARD RWCU ISOL SYS	1. RWCU SUCT INBD ISOL MOV102 INOP	*2

28.2 Corrective Action

a. Refer to the following INOP Equipment Status Lights for response.

b. Refer to Technical Specification 3/4.6.3.

Equipment Status Lights	Source	Automatic Action
1. RWCU PMP INBD ISOL MOV102 INOP	74-2WCSN01	NONE

Corrective Action

a. Verify power is available to WCS Inboard Isolation valve 2WCS*MOV102 by verifying that at least one of the valve position indicating lights on P602 is energized.

b. If power is not available to the valve, then check the following:

1. Fuse 3A-2WCSN01 has not blown.

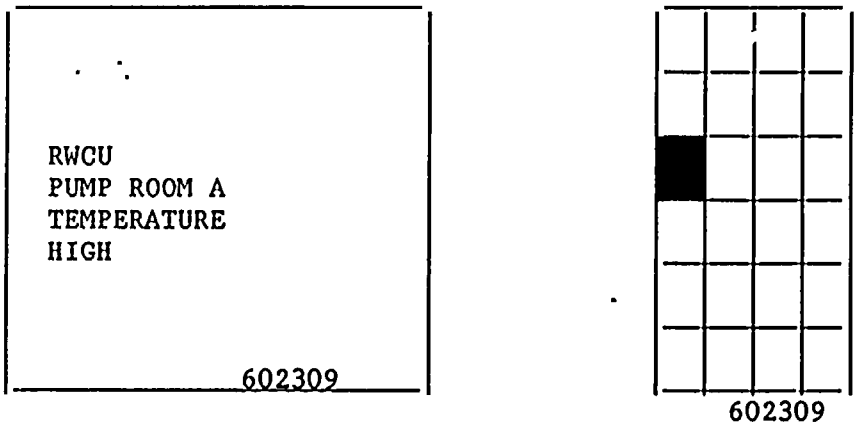
2. WCS Inboard Isolation Valve 2WCS*MOV102 power supply at 2EHS-MCC302D breaker 15D is closed.

c. Determine the cause of the valve INOP signal and correct as required.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

29.0 602309 · Reactor Water Cleanup Pump Room A Temperature High

Reflash: Yes



29.1

Computer Point	Computer Printout	Source	
LDSTC55	RWCU PMP RM A TMP RPS D1	2WCS-TS-1601A, Setpoint 131°F	*2
LDSTC56	RWCU PMP RM A TMP RPS D2	2WCS-TS-1601B, Setpoint 131°F	*2

29.2 Automatic Response

a. WCS Inboard Isolation Valve 2WCS*MOV102 and/or WCS Outboard Isolation Valve *MOV112 fully close.

b. RWCU pump 2WCS-P1A and 2WCS-P1B trip due to system flow isolation.

29.3 Corrective Action

a. Verify WCS Inboard Isolation Valve 2WCS*MOV102 and WCS Outboard Isolation Valve *MOV112 have fully closed by checking the green valve position indicating lights on PNL602.

b. Verify RWCU pumps 2WCS-P1A and P1B have tripped by checking the green pump lights on PNL602 and verifying that alarm 602314 (RWCU PUMP 1A/1B AUTO TRIP) actuates.

c. Verify the alarm on the process computer.

d. Refer to N2-EOP-SC.

CAUTION:

HIGH TEMPERATURE IN AN RWCU AREA IS INDICATIVE OF A POSSIBLE HIGH PRESSURE STEAM LEAK. EXERCISE EXTREME CAUTION WHEN ENTERING AND WORKING IN THESE AREAS WHILE THE EQUIPMENT IS AT HIGH TEMPERATURES.

e. Determine the cause of the high temperature condition and correct.

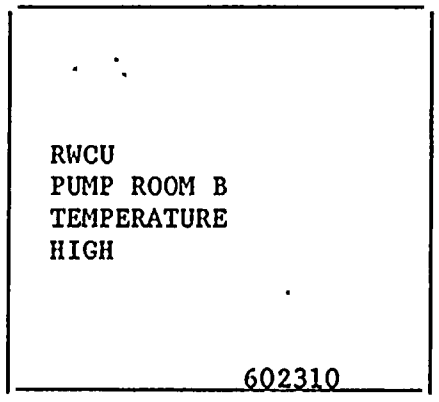
NOTE: Be aware that a rapid decrease in RWCU flow may result in the filter/demineralizer resins being dropped from the septums. It is recommended that following an RWCU system isolation the filter/demineralizers be backwashed and precoated prior to system re-start. This will prevent the transfer of filter/demineralizer resins to the RPV.

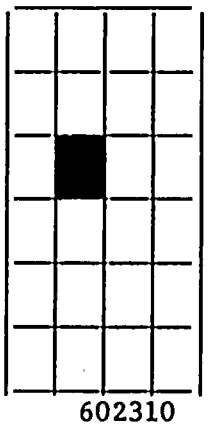
f. Upon correction of the alarm condition, re-establish system operation per the appropriate sections of this procedure.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

30.0 602310 · Reactor Water Cleanup Pump Room B Temperature High

Reflash: Yes





30.1

Computer Point	Computer Printout	Source	
LDSTC59	RWCU PMP RM B TMP RPS D1	2WCS-TS-1601C, Setpoint 146°F	*2
LDSTC60	RWCU PMP RM B TMP RPS D2	2WCS-TS-1601D Setpoint 146°F	*2

30.2 Automatic Response

a. WCS Inboard Isolation Valve 2WCS*MOV102 and/or WCS Outboard Isolation Valve *MOV112 fully close.

b. RWCU pump 2WCS-P1A and 2WCS-P1B trip due to system flow isolation.

30.3 Corrective Action

a. Verify WCS Inboard Isolation Valve 2WCS*MOV102 and WCS Outboard Isolation Valve *MOV112 have fully closed by checking the green valve position indicating lights on PNL602.

b. Verify RWCU pumps 2WCS-P1A and P1B have tripped by checking the green pump lights on PNL602 and verifying that alarm 602314 (RWCU PUMP 1A/1B AUTO TRIP) actuates.

c. Verify the alarm on the process computer.

d. Refer to N2-EOP-SC.

CAUTION:

HIGH TEMPERATURE IN AN RWCU AREA IS INDICATIVE OF A POSSIBLE HIGH PRESSURE STEAM LEAK. EXERCISE EXTREME CAUTION WHEN ENTERING AND WORKING IN THESE AREAS WHILE THE EQUIPMENT IS AT HIGH TEMPERATURES.

e. Determine the cause of the high temperature condition and correct.

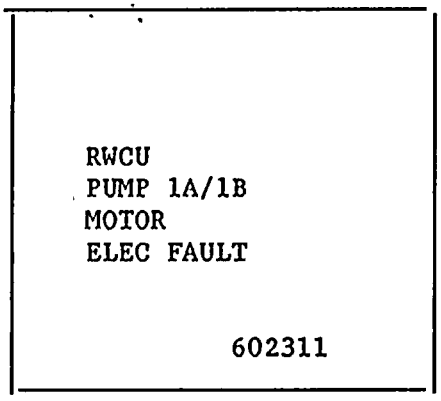
NOTE: Be aware that a rapid decrease in RWCU flow may result in the filter/demineralizer resins being dropped from the septums. It is recommended that following an RWCU system isolation the filter/demineralizers be backwashed and precoated prior to system re-start. This will prevent the transfer of filter/demineralizer resins to the RPV.

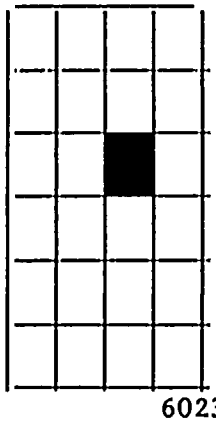
f. Upon correction of the alarm condition, re-establish system operation per the appropriate sections of this procedure.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

31.0 602311 Reactor Water Cleanup Pump 1A/1B Motor Electrical Fault

Reflash: Yes





602311

31.1

Computer Point	Computer Printout	Source
WCSUC03	RWCU PMP 1A MOT ELEC	520C-2WCSA01
WCSUC04	RWCU PMP 1B MOT ELEC	520C-2WCSB01

*2

31.2 Automatic Response

a. 2WCS-P1A or 2WCS-P1B has tripped.

31.3 Corrective Action

a. Determine which pump has tripped by checking the green pump status lights on PNL602.

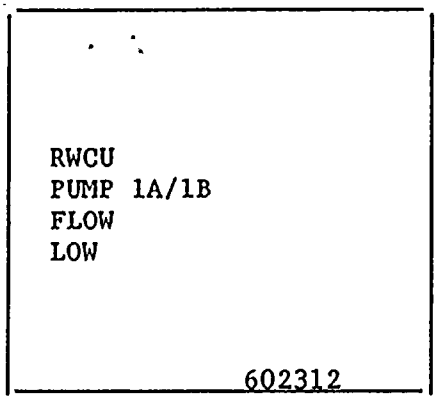
b. Verify the alarm on the process computer.

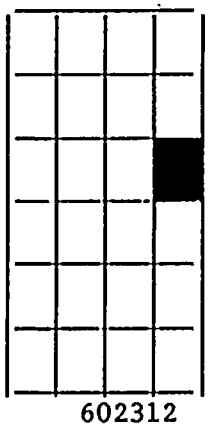
c. Check for Pump motor overload at 2NJS-US5 Cubicle 4D for P1A or 2NJS-US6 Cubicle 4A for P1B.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

32.0 602312 ·Reactor Water Cleanup Pump 1A/1B Flow Low

Reflash: No





32.1	Computer Point	Computer Printout	Source	
	WCSFC05	RWCU PMP 1A/1B FLOW	2WCS-PDS115 Setpoint - 140 gpm - dec. + 45 sec. Time Delay	*2

32.2 Automatic Response

a. 2WCS-P1A or 2WCS-P1B trip after low flow condition has existed for 15 minutes.

32.3 Corrective Action

NOTE: This annunciator will be initiated during pump start operations such as warming a cold pump or initial fill of the RWCU system. Care should be taken to limit operations at low flow to less than 15 minutes total to prevent pump trips.

a. Verify that 2WCS-P1A and 2WCS-P1B have tripped if the problem has not been corrected after 15 minutes by checking the green pump lights on P602.

b. Verify that all filter/demineralizer air operated valves are in the correct position for operating Filter/demins.

c. Verify that the following WCS motor operated valves are open by checking their red position indicating lights on P602:

1. Cleanup Suction Fr B Recirc 2WCS*MOV104

2. Cleanup Suction Fr B Recirc 2WCS*MOV105

3. Vessel Bottom Drain to Cleanup Suction 2WCS*MOV101

4. Cleanup Suction Inside Blocking 2WCS*MOV103

d. Dispatch an operator to verify the following manual valves are locked open for the operating pump(s): | TCN-4

1. Cleanup P1A(B) Suction Isolation 2WCS-V27A and V27B

2. Cleanup P1A(B) Suction Isolation 2WCS-V28A and V28B

3. Cleanup P1A(B) Discharge Isolation 2WCS-V30A and V30B

e. If all valves checked in 32.3.b, 32.3.c and 32.3.d are in their proper position, check the system lineup to verify a proper/adequate discharge flow path.

f. Determine the cause of the low suction flow and correct.

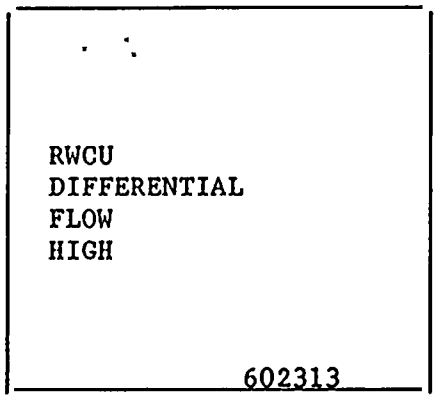
NOTE: Be aware that a rapid decrease in RWCU flow may result in the filter/demineralizer resins being dropped from the septums. Depending on system operating status prior to an RWCU pump trip, it may be necessary to backwash and precoat the filter/demineralizers prior to system re-start.

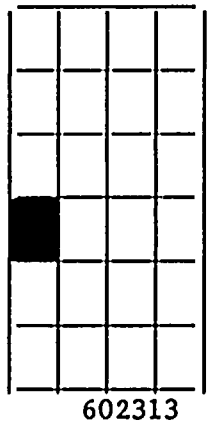
g. Upon correcting the low flow condition, re-establish system operation per the appropriate sections of this procedure.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

33.0 602313 . Reactor Water Cleanup Differential Flow High

Reflash: Yes





33.1	Computer Point	Computer Printout	Source	
	LDSFC01	RWCU DIFF FLOW RPS D1	2WCS-FS1605A, Setpoint 150.5 gpm-Inc + 45 sec. TD	*2
	LDSFC02	RWCU DIFF FLOW RPS D2	2WCS-FS1605B, Setpoint 150.5 gpm-Inc + 45 sec. TD	*2

33.2 Automatic Response

a. WCS Inboard Isolation Valve 2WCS*MOV102 and/or WCS Outboard Isolation Valve 2WCS*MOV112 fully close.

b. RWCU pumps 2WCS-P1A and 2WCS-P1B trip due to system flow isolation.

33.3 Corrective Action

a. Verify WCS Inboard Isolation Valve 2WCS*MOV102 and WCS Outboard Isolation Valve 2WCS*MOV112 have fully closed by checking the green valve position indicating light on PNL602.

b. Verify RWCU pumps 2WCS-P1A and 2WCS-P1B have tripped by checking the green pump lights on PNL602 and verifying that alarm 602314 (RWCU PUMP 1A/1B AUTO TRIP) has actuated.

c. Verify the alarm on the process computer.

d. Determine the cause of the high differential flow alarm and correct.

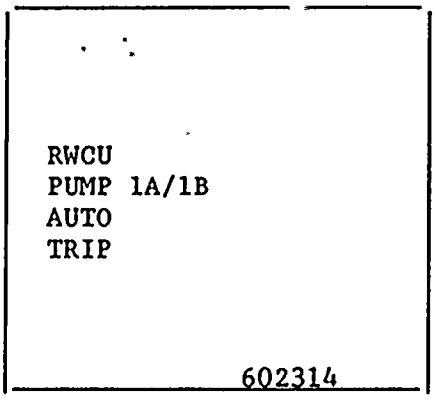
NOTE: Be aware that a rapid decrease in RWCU flow may result in the filter/demineralizer resins being dropped from the septums. It is recommended that following an RWCU system isolation the filter/demineralizers be backwashed and precoated prior to system re-start. This will prevent the transfer of filter/demineralizer resins to the RPV.

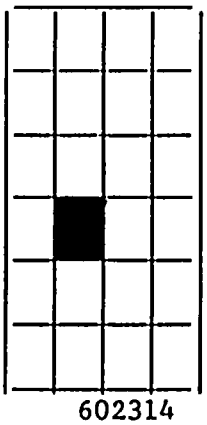
e. Upon correction of the alarm condition, re-establish system operation per the appropriate sections of this procedure.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

34.0 602314 . Reactor Water Cleanup Pump 1A/1B Auto Trip

Reflash: Yes




602314

34.1

Computer Point	Computer Printout	Source
WCSUC01	RWCU PMP 1A AUTO TRIP	52-2WCSA01 S5A-2WCSA01
WCSUC02	RWCU PMP 1B AUTO TRIP	52-2WCSB01 S5A-2WCSB01

*2

34.2 Automatic Response

a. RWCU pump 2WCS-P1A and/or P1B has tripped.

34.3 Corrective Action

a. Determine which pump has tripped by checking the green pump lights on PNL602.

b. Verify the alarm on the process computer.

c. Check for any of the following which can cause a pump trip:

1. Pump motor overload at 2NJS-US5 Cubicle 4D for P1A or 2NJS-US6 Cubicle 4A for P1B

2. Pump WCS Inboard Isolation Valve 2WCS*MOV102 and WCS Outboard Isolation Valve 2WCS*MOV112 not fully open by checking the green pump lights on PNL602.

3. Pump suction flow low.

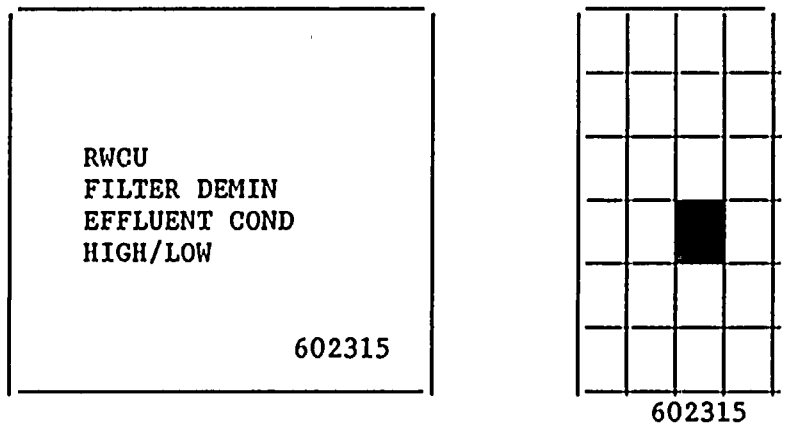
NOTE: Be aware that a rapid decrease in RWCU flow may result in the filter/demineralizer resins being dropped from the septums. Depending on system operating status prior to an RWCU pump trip, it may be necessary to backwash and precoat the filter demineralizers prior to system restart.

4. Upon correcting the condition causing the pump trip, re-establish system operation per the appropriate sections of this procedure.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

35.0 602315 Reactor Water Cleanup Filter Demineralizer Effluent Conductivity High/Low

Reflash: Yes



35.1	Computer Point	Computer Printout	Source	
	WCSCC05	RWCU FLT/DEMIN EFFL COND	2SSR-CSHX-6A 2SSR-CSLX-6A 2SSR-CSHX-6B 2SSR-CSLX-6B 2SSR-CSHX-6C 2SSR-CSLX-6C 2SSR-CSHX-6D 2SSR-CSLX-6D High Setpoint-.1 umho/cm - Inc. Low Setpoint - (.04) umho/cm Dec.	*2

35.2 Automatic Response

NONE

35.3 Corrective Action

a. Verify the alarm on the process computer.

b. Determine which Filter/Demin effluent conductivity is High/Low and whether the conductivity is High or Low by checking at one of the following locations:

   1. F/D outlet conductivity indicators on local panels 2WCS-PNL187 or 2WCS-PNL188.

   2. F/D outlet conductivity indicating transmitters at the Reactor Plant Sample Station Panel 2SSR-IPNL145.

c. If the conductivity is low, check the following:

   1. Sample flow rate is adequate at panel 2SSR-IPNL145

   2. Sample temperature is 77°F ± 1°F at panel 2SSR-IPNL145

d. If sample flow and temperature are normal, notify I&C to repair/recalibrate the appropriate loop.

e. If the conductivity is high, check the following:

   1. Sample flow rate is adequate at panel 2SSR-IPNL145.

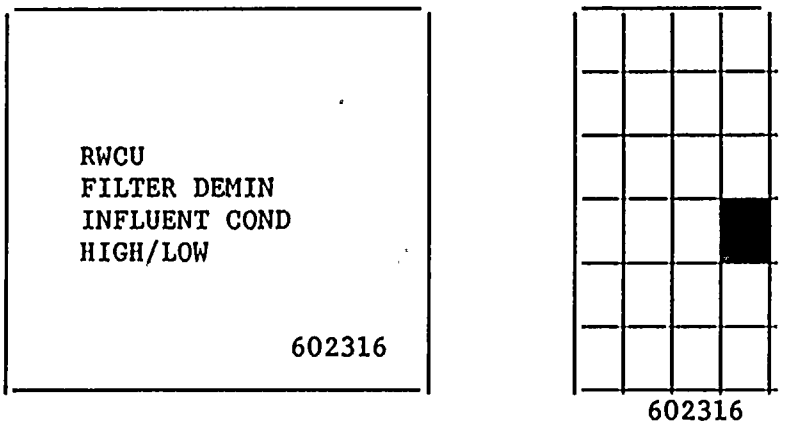
   2. Sample temperature is 77°F ± 1°F at panel 2SSR-IPNL145.

f. If sample flow and temperature are normal, then isolate the appropriate filter/demineralizer and perform a filter/demineralizer backwash and precoat per the applicable section of this procedure.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

36.0 602316 Reactor Water Cleanup Filter Demineralizer Influent Conductivity High/Low

Reflash: No



36.1	Computer Point	Computer Printout	Source	
	WCSCC06	RWCU FLT/DEMIN INFL COND	2SSR-CSH-106 2SSR-CSL-106 High Setpoint- 1.0 umho/cm-Inc. Low Setpoint-(0.064) umho/cm-Dec.	*2

36.2 Automatic Response

NONE

36.3 Corrective Action

a. Verify the alarm on the process computer.

b. Determine whether the conductivity is High or Low by checking at one of the following locations:

1. F/D Influent Conductivity recorder 2WCS-CR-106A (Red Pen) on PNL602.

2. F/D Influent Conductivity Indicating Transmitter 2SSR-CIT-106 at Panel 2SSR-IPNL145.

c. If the conductivity is low, check the following:

1. Sample flow rate is adequate at panel 2SSR-IPNL145

2. Sample temperature is 77°F ± 1°F at panel 2SSR-IPNL145

d. If sample flow and temperature are normal, notify I&C to repair/recalibrate the appropriate loop.

NOTE: RWCU F/D Influent Conductivity should be about the same as RCS Conductivity. If the F/D Influent conductivity is High, a comparison of the indications given by the Blue Pen of recorder 2WCS-CR106A and the Red Pen of recorder 2WCS-CR106B will be useful. If both are indicating approximately the same value, then the alarm is probably valid.

e. If the conductivity is high, perform the following:

1. Notify the Chemistry Department to take a grab sample at 2SSR-IPNL145 per Tech. Spec. 3/4.4.4.

2. Check that sample flow is proper at 2SSR-IPNL145.

3. Check that sample temperature is 77°F ± 1°F at panel 2SSR-IPNL145.

f. If sample flow and temperature are normal, then perform the following as required to bring Influent Conductivity back in Spec.

1. Any actions required by Tech. Spec. 3/4.4.4.

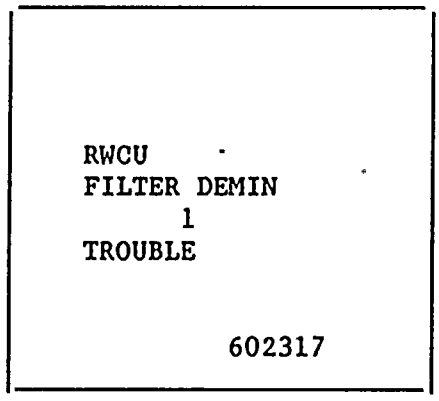
2. Check feedwater quality and correct as required per N2-OP-03.

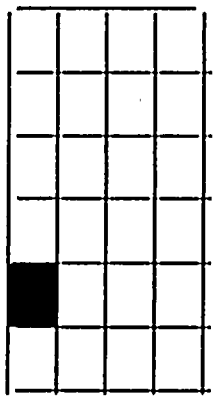
3. Check RWCU filter demineralizer outlet conductivities and perform backwashes and precoats as required to begin cleaning up the reactor water.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

37.0 602317 Reactor Water Cleanup Filter Demineralizer 1 Trouble

Reflash: Yes





602317

NOTE: Refer to the appropriate alarm response for annunciators located on panel 2WCS-PNL187 for this window.

37.1

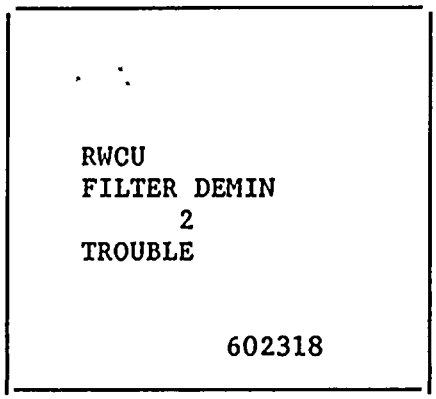
Computer Point	Computer Printout	Section	Page
WCSBC01	RWCU VES A EFFL STRN HIGH D/P	2.0	37
WCSBC02	RWCU VES B EFFL STRN HIGH D/P	7.0	43
WCSBC03	RWCU VES A D/P	3.0	38
WCSBC04	RWCU VES B D/P	8.0	44
WCSBC05	RWCU VES A DISCH FLOW	4.0	39
WCSBC06	RWCU VES B DISCH FLOW	9.0	45
WCSBC07	RWCU VES A EFFL COND	5.0	41
WCSBC08	RWCU VES B EFFL COND	10.0	47
WCSBC09	RWCU SYS 1 BW RCVG TK LVL	1.0	36
WCSBC10	RWCU PRECOAT TANK A LVL	11.0	48
WCSBC11	RWCU PRECOAT TANK A LVL	6.0	42
WCSBC23	RWCU FLTR/DEMIN 1	N/A	N/A

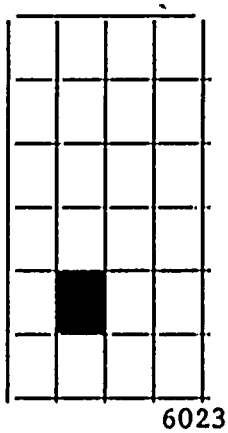
*2

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

38.0 602318 Reactor Water Cleanup Filter Demineralizer 2 Trouble

Reflash: Yes





NOTE: Refer to the appropriate alarm response for annunciators located on panel 2WCS-PNL188 for this window.

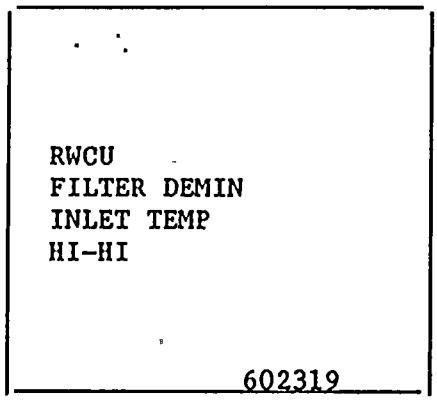
38.1

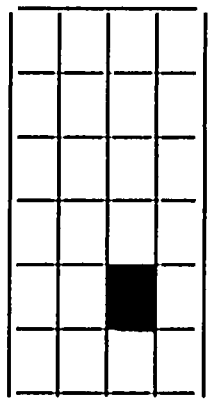
Computer Point	Computer Printout	Section	Page	
WCSBC12	RWCU VES C EFFL STRN D/P	13.0	50	
WCSBC13	RWCU VES D EFFL STRN D/P	18.0	56	
WCSBC14	RWCU VES C D/P	14.0	51	
WCSBC15	RWCU VES D D/P	19.0	57	
WCSBC16	RWCU VES C DISCH FLOW	15.0	52	
WCSBC17	RWCU VES D DISCH FLOW	20.0	58	*2
WCSBC18	RWCU VES C EFFL COND	16.0	54	
WCSBC19	RWCU VES D EFFL COND	21.0	60	
WCSBC20	RWCU SYS 2 BW RCVG TK LVL	12.0	49	
WCSBC21	RWCU PRECOAT TANK B LVL	22.0	61	
WCSBC22	RWCU PRECOAT TANK B LVL	17.0	55	
WCSBC28	RWCU FLTR/DEMIN 2	N/A	N/A	

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

39.0 602319 - Reactor Water Cleanup Filter Demineralizer Inlet Temperature High-High

Reflash: No




602319

39.1	Computer Point	Computer Printout	Source
	WCSTC06	RWCU FLTR/DEMIN INL TEMP	2WCS-TIS1008 Setpoint - 140°F

*2

39.2 Automatic Response

a. WCS Outboard Isolation Valve 2WCS*MOV112 fully closes.

b. RWCU pumps 2WCS-P1A and P1B trip due to valve 2WCS*MOV112 not full open.

39.3 Corrective Action

a. Verify WCS Outboard Isolation valve 2WCS*MOV112 has fully closed by checking the green valve position indicating light on P602.

b. Verify that RWCU pumps 2WCS-P1A and P1B have tripped by checking the green pump lights on P602.

c. Verify the alarm on the process computer.

d. Determine the Filter Demineralizer inlet temperature by placing the RWCU temperature selector switch on P602C to position 3 and reading the indicated temperature on 2WCS-TI1114 (2G33-R607).

e. Determine the cause of the high temperature condition and correct.

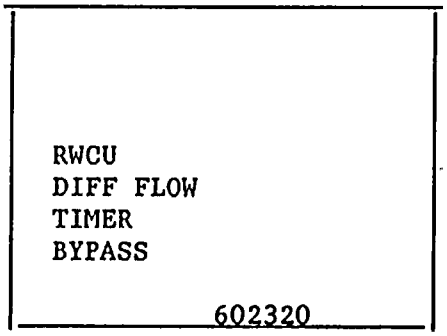
NOTE: Be aware that a rapid decrease in RWCU flow may result in the filter/demineralizer resins being dropped from the septums. It is recommended that following a system isolation the filter/demineralizers be backwashed and precoated prior to system restart. This will prevent the transfer of filter/demineralizer resins to the RPV.

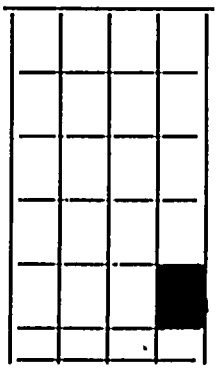
f. Upon correction of the alarm condition, re-establish system operation per the appropriate sections of this procedure.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

40.0 602320 Reactor Water Cleanup Differential Flow Timer Bypass

Reflash: Yes





602320

40.1	Computer Point	Computer Printout	Source	
	LDSBC07	RWCU DIFF FLO TMR A BYP	2E31-R621A	*2
	LDSBC08	RWCU DIFF FLO TMR B BYP	2E31-R621B Timer = 45 secs.	*2

40.2 Automatic Response

NONE

40.3 Corrective Action

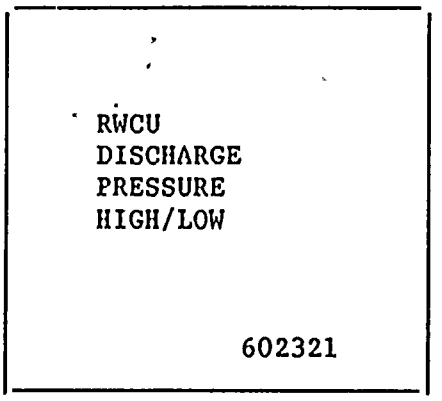
NOTE: This annunciator indicates that cleanup differential flow has exceeded its setpoint of 150.5 gpm and the 45 second timers (2E31-R621A and/or 2E31-R621B) have started timing out. At the end of 45 seconds, if differential flow has not dropped below 150.5 gpm, a full WCS isolation will occur.

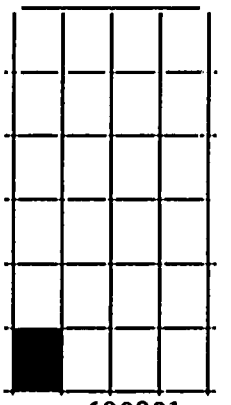
a. Suspend any operational evolutions which may be causing a perturbation in cleanup system flow until this annunciator clears. Make any changes to system operation in a slow, controlled manner to prevent flow transients of the magnitude necessary to trip the high differential flow circuits.

b. Prepare to respond to a cleanup isolation per the appropriate sections of this procedure.

41.0 602321 Reactor Water Cleanup Discharge Pressure High/Low

Reflash: No





41.1	Computer Point	Computer Printout	Source
	WCSPC09	RWCU DISCH PRESS	2WCS-PS181 Setpoint 5 psig 2WCS-PS182 Setpoint - 140 psig

*2

41.2 Automatic Response

a. WCS Blowdown Flow Controller 2WCS-FV135 fully closes.

41.3 Corrective Action

NOTE: Information alarm if blowdown has been terminated.

a. Verify that WCS Blowdown Flow Controller 2WCS-FV135 fully closes.

b. Check that WCS Blowdown Restricting Orifice Bypass valve 2WCS-MOV108 is closed.

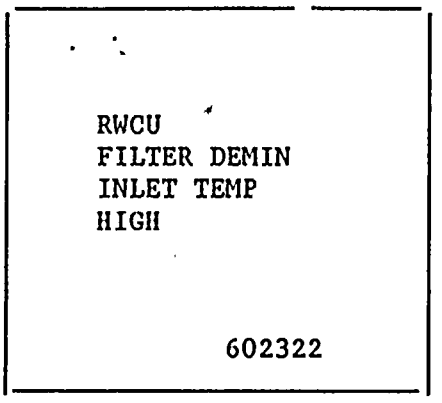
c. Verify the alarm on the process computer.

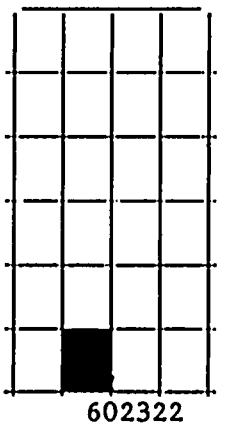
d. Determine the cause of the alarm condition and correct.

e. Re-establish blowdown flow if required by opening 2WCS-MOV107 or 2WCS-MOV106 prior to adjusting FV135.

42.0 602322 Reactor Water Cleanup Filter Demineralizer Inlet . - . . Temperature High

Reflash: No





42.1	Computer Point	Computer Printout	Source	
	WCSTC05	RWCU FLTR/DEMIN INL TEMP	2WCS-TS120 Setpoint-130°F	*2

42.2 Automatic Response

NONE

42.3 Corrective Action

a. Verify the alarm on the process computer.

b. Continuously monitor Filter/Demineralizer inlet temperature by placing the RWCU Temperature Selector Switch on P602C to position 3 and reading the Non-Regen HT Exch outlet temperature on Temperature Indicator 2WCS-TI1114 (2G33-R607) on P602C.

c. If WCS is being operated in the blowdown mode, reduce blowdown flow.

d. Dispatch an operator to verify proper RBCLCW to the Non-Regenerative Heat Exchanger and to verify proper RBCLCW temperature.

e. If temperature continues to rise, dispatch an operator to panels 2WCS-PNL187 and PNL188 and remove Filter/ Demineralizer from service per section H.4.0.

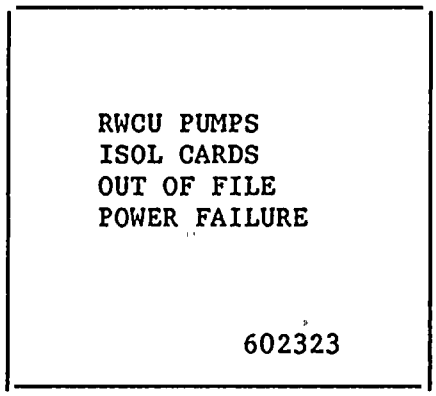
f. Determine the cause of the high temperature and correct.

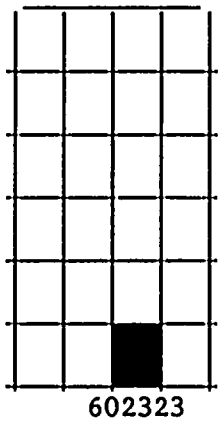
g. Once the cause of the high temperature condition has been determined and corrected, restore the system to normal operation per the appropriate sections of this procedure.

I. PROCEDURE FOR CORRECTING ALARM CONDITIONS (Cont.)

43.0 602323 Reactor Water Cleanup Pumps Isolator Cards Out of File/Power Failure

Reflash: Yes





43.1

Computer Point	Computer Printout	Source
WCSBC24	D1 RWCU ISO OOF/PWR FAIL	2G33-AT3
WCSBC25	D2 RWCU ISO OOF/PWR FAIL	2G33-AT2

*3

43.2 Automatic Response

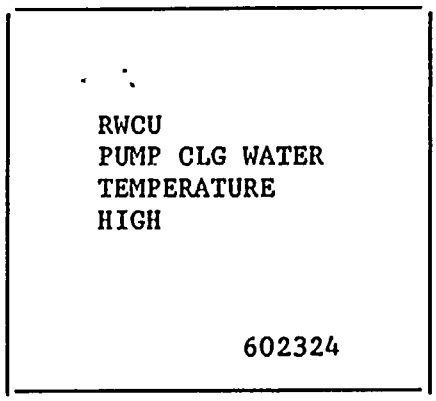
NONE

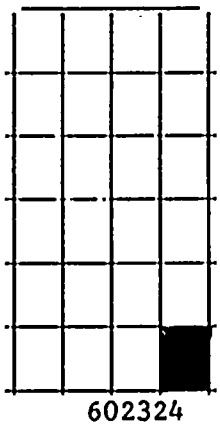
43.3 Corrective Action

a. Determine which isolator card is causing the alarm and repair/replace as required.

44.0 602324 Reactor Water Cleanup Pump Cooling Water Temperature High

Reflash: No





44.1	Computer Point	Computer Printout	Source	
	WCSTC07	RWCU PMP CLG WTR TEMP	2WCS-TIS36A, B, C, D Setpoint - 185°F Inc.	*2

44.2 Automatic Response

NONE

44.3 Corrective Action

a. Verify alarm on the process computer.

b. Dispatch an operator to local panel 2CES*RAK002 (R.B. el. 289' Az. 332). Check 2WCS-TIS36A, B, C, D to determine whether the high seal temperature is on 2WCS-P1A or 2WCS-P1B.

c. Verify RBCLCW flow to the seal cooler on the affected pump.

d. If seal temperature continues to increase or cannot be lowered to below 250°F, secure the affected pump per section H.1.0 of this procedure.

e. Determine the cause of the high seal temperature and correct.

f. Place the affected pump back in operation per section H.2.0 or E.2.0 of this procedure.

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initial & Date	Remarks
	Main Control Room Panel 2CEC-PNL602C				
2WCS*MOV104	Supply from Reactor Recirc. Loop "B"	Open			
2WCS*MOV105	Supply from Reactor Recirc. Loop "A"	Open			
2WCS*MOV103	Main Supply from Reactor Recirc. System	Open			
2WCS*MOV102	WCS Inboard Isolation	Open			
2WCS*MOV101	RPV Bottom Head Drain Supply to WCS	Open			
2WCS*MOV112	WCS Outboard Isolation	Open			
2WCS*MOV200	WCS Return to Feedwater System Isol.	Open or Throttled			
2WCS-MOV111	WCS Heat Exchanger Bypass	Shut			
2WCS-MOV109	WCS Regen Hx Disch Isol	Open			
2WCS-MOV110	WCS Filter Demineralizer Bypass	Shut or Throttled			
2WCS-MOV108	WCS Blowdown Restricting Orifice Bypass	Shut			
2WCS-MOV106	WCS Blowdown to Radwaste Isol	Shut *			
2WCS-MOV107	WCS Blowdown to Main Condenser	Shut *			
2WCS-FV135	WCS Blowdown Flow Controller	Shut			

* Appendix "R" valve

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initial & Date	Remarks
	Rx Bldg. Elv. 328' Panel 2WCS-IPNL187				
2WCS-AOV44A	Flt/Demin 4A Drain To Radwaste	Shut			
2WCS-AOV51A	Flt/Demin 4A Drain To Radwaste	Shut			
2WCS-AOV30A	Flt/Demin 4A Vent To Radwaste	Shut			
2WCS-AOV28A	Flt/Demin 4A Dome Drain	Shut			
2WCS-AOV29A	Flt/Demin 4A Dome Drain	Shut			
2WCS-AOV25A	Flt/Demin 4A Service Air Isol.	Shut			
2WCS-AOV53A	Precoat to Flt/Demin 4A Isol.	Shut			
2WCS-AOV54A	Precoat to Flt/Demin 4A Isol.	Shut			
2WCS-AOV31A	Holding Pmp 6A Discharge Isol.	Shut			
2WCS-AOV22A	Flt/Demin 4A Inlet Isol.	Note 1			
2WCS-AOV23A	Flt/Demin 4A Inlet Isol.	Note 1			
2WCS-FCV16A	Flt/Demin 4A Outlet Flow Controller	Note 2			
2WCS-AOV27A	Flt/Demin 4A Outlet Isol.	Note 1			
2WCS-AOV52A	Precoat Return from Flt/Demin 4A	Shut			
2WCS-AOV26A	Precoat Return from Flt/Demin 4A	Shut			
2WCS-AOV61A	Flt/Demin 4A Vent	Shut			

NOTE 1: OPEN in service, SHUT not in service.
NOTE 2: AUTO in service, SHUT not in service.

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initial & Date	Remarks
	Rx Bldg. Elv. 328' Panel 2WCS-IPNL187				
2WCS-AOV44B	Flt/Demin 4B Drain To Radwaste	Shut			
2WCS-AOV51B	Flt/Demin 4B Drain To Radwaste	Shut			
2WCS-AOV30B	Flt/Demin 4B Vent To Radwaste	Shut			
2WCS-AOV28B	Flt/Demin 4B Dome Drain	Shut			
2WCS-AOV29B	Flt/Demin 4B Dome Drain	Shut			
2WCS-AOV25B	Flt/Demin 4B Service Air Isol.	Shut			
2WCS-AOV53B	Precoat to Flt/Demin 4B Isol.	Shut			
2WCS-AOV54B	Precoat to Flt/Demin 4B Isol.	Shut			
2WCS-AOV31B	Holding Pmp 6B Discharge Isol.	Shut			
2WCS-AOV22B	Flt/Demin 4B Inlet Isol.	Note 1			
2WCS-AOV23B	Flt/Demin 4B Inlet Isol.	Note 1			
2WCS-FCV16B	Flt/Demin 4B Outlet Flow Controller	Note 2			
2WCS-AOV27B	Flt/Demin 4B Outlet Isol.	Note 1			
2WCS-AOV52B	Precoat Return from Flt/Demin 4B	Shut			
2WCS-AOV26B	Precoat Return from Flt/Demin 4B	Shut			
2WCS-AOV61B	Flt/Demin 4B Vent	Shut			

NOTE 1: OPEN in service, SHUT not in service.
NOTE 2: AUTO in service, SHUT not in service.

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initial & Date	Remarks
2WCS-FCV55A	Precoat Return to 2WCS-TK11A	Shut			
2WCS-PCV63A	Resin Meter Condensate Pump 16A Flush PCV	Variable			
2WCS-AOV47A	Condensate B/W to F/D 4A and 4B	Shut			
2WCS-AOV48A	Resin Meter Condensate Pump 16A Flush Isol.	Shut			
2WCS-AOV50A	Resin TK15A Outlet Isol.	Shut			
2WCS-AOV46A	Precoat Pmp 12A Suction Isol.	Shut			
2WCS-AOV49A	Resin Meter 16A Discharge Isol.	Shut			
	Rx Bldg. Elv. 328' Panel 2WCS-IPNL 188				
2WCS-AOV44C	Flt/Demin 4C Drain to Radwaste	Shut			
2WCS-AOV51C	Flt/Demin 4C Drain to Radwaste	Shut			
2WCS-AOV30C	Flt/Demin 4C Vent To Radwaste	Shut			
2WCS-AOV28C	Flt/Demin 4C Dome Drain	Shut			
2WCS-AOV29C	Flt/Demin 4C Dome Drain	Shut			
2WCS-AOV25C	Flt/Demin 4C Service Air Isol.	Shut			
2WCS-AOV53C	Precoat to Flt/Demin 4C Isol.	Shut			
2WCS-AOV54C	Precoat to Flt/Demin 4C Isol.	Shut			
2WCS-AOV61C	Flt/Demin 4C Vent	Shut			

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initial & Date	Remarks
2WCS-AOV31C	Holding Pmp 6C Discharge Isol.	Shut			
2WCS-AOV22C	Flt/Demin 4C Inlet Isol.	Note 1			
2WCS-AOV23C	Flt/Demin 4C Inlet Isol.	Note 1			
2WCS-FCV16C	Flt/Demin 4C Outlet Flow Controller	Note 2			
2WCS-AOV27C	Flt/Demin 4C Outlet Isol.	Note 1			
2WCS-AOV52C	Precoat Return from Flt/Demin 4C	Shut			
2WCS-AOV26C	Precoat Return from Flt/Demin 4C	Shut			
	Rx Bldg. Elv. 328' Panel 2WCS-IPNL 188				
2WCS-AOV44D	Flt/Demin 4D Drain to Radwaste	Shut			
2WCS-AOV51D	Flt/Demin 4D Drain to Radwaste	Shut			
2WCS-AOV30D	Flt/Demin 4D Vent To Radwaste	Shut			
2WCS-AOV28D	Flt/Demin 4D Dome Drain	Shut			
2WCS-AOV29D	Flt/Demin 4D Dome Drain	Shut			
2WCS-AOV25D	Flt/Demin 4D Service Air Isol.	Shut			
2WCS-AOV53D	Precoat to Flt/Demin 4D Isol.	Shut			
2WCS-AOV54D	Precoat to Flt/Demin 4D Isol.	Shut			
2WCS-AOV61D	Flt/Demin 4D Vent	Shut			

NOTE 1: OPEN in service, SHUT not in service.
NOTE 2: AUTO in service, SHUT not in service.

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initial & Date	Remarks
2WCS-AOV31D	Holding Pmp 6D Discharge Isol.	Shut			
2WCS-AOV22D	Flt/Demin 4D Inlet Isol.	Note 1			
2WCS-AOV23D	Flt/Demin 4D Inlet Isol.	Note 1			
2WCS-FCV16D	Flt/Demin 4D Outlet Controller	Note 2			
2WCS-AOV27D	Flt/Demin 4D Outlet Isol.	Note 1			
2WCS-AOV52D	Precoat Return from Flt/Demin 4D	Shut			
2WCS-AOV26D	Precoat Return from Flt/Demin 4D	Shut			
2WCS-FCV55B	Precoat Return to TK11B	Shut			
2WCS-PCV63B	Resin Meter Pump 16B Condensate Flush PCV	Variable			
2WCS-AOV47B	Condensate B/W to Flt/Demin 4C and 4D	Shut			
2WCS-AOV48B	Resin Meter Pump 16B Condensate Flush	Shut			
2WCS-AOV50B	Resin TK15B Outlet Isol.	Shut			
2WCS-AOV46B	Precoat Pump 12B Suction Isol.	Shut			
2WCS-AOV49B	Resin Meter Pump P16B Discharge Isol.	Shut			
2WCS*V368	2WCS*MOV104 Upstream Drain	Shut			
2WCS*V369	2WCS*MOV104 Upstream Drain	Shut			

NOTE 1: OPEN in service, SHUT not in service.
NOTE 2: AUTO in service, SHUT not in service.

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initial & Date	Remarks
2WCS*V316	2WCS*MOV104 Downstream Drain	Shut			
2WCS*V317	2WCS*MOV104 Downstream Drain	Shut & Capped			
2WCS*V366	2WCS*MOV105 Upstream Drain	Shut			
2WCS*V367	2WCS*MOV105 Upstream Drain	Shut			
2WCS*V314	2WCS*MOV105 Downstream Drain	Shut			
2WCS*V315	2WCS*MOV105 Downstream Drain	Shut and Capped			
2WCS*V39	Test Conn. Upstream of 2WCS*MOV102	Shut			
2WCS*V40	Test Conn. Upstream of 2WCS*MOV102	Shut and Capped			
2WCS*V146	*FT67Y Inst. Root Inbd Isol.	Open			
2WCS*V147	*FT67Y Inst. Root Inbd Isol.	Open			
2WCS*V152	*FT67X Inst. Root Inbd Isol.	Open			
	Location: Drywell Elv. 261'				
2WCS*V153	*FT67X Inst. Root Inbd Isol.	Open			
2WCS*V307	2WCS*MOV101 Upstream Drain	Shut			

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initial & Date	Remarks
2WCS*V308	2WCS*MOV101 Upstream Drain	Shut and Capped			
2WCS*V32	2WCS*MOV101 Upstream Isol.	Open			
2WCS*V41	2WCS*MOV101 Bypass	Shut			
	Location: Rx Bldg. Elev. 240'				
2WCS-V45	Test Conn. Downstream 2WCS*MOV112	Shut			
2WCS-V46	Test Conn. Downstream 2WCS*MOV112	Shut and Capped			
2WCS*V305	*FI67X Inst. Root Outbd Isol.	Open			
2WCS*V306	*FI67X Inst. Root Outbd Isol.	Open			
2WCS*V240	Test Conn. Downstream 2WCS*V305	Shut			
2WCS*V241	Test Conn. Downstream 2WCS*V305	Shut			
2WCS*EFV222	Excess Flow Check Valve Downstream of 2WCS*V305	Installed			
2WCS*V242	Test Conn. Downstream 2WCS*V306	Shut			
2WCS*V243	Test Conn. Downstream 2WCS*V306	Shut			

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initial & Date	Remarks
2WCS*EFV300	Excess Flow Check Valve Downstream of 2WCS*V306	Installed			
2WCS*V220	*FT134 Inst. Root Isol.	Open			
2WCS*V244	Test Conn. Downstream 2WCS*V220	Shut			
2WCS*V245	Test Conn. Downstream 2WCS*V220	Shut and Capped			
2WCS*EFV221	FT134 Excess Flow Check Valve	Installed			
2WCS*V141	*FT67Y Inst. Root Outbd Isol.	Open			
2WCS*V140	*FT67Y Inst. Root Outbd Isol.	Open			
2WCS*V155	Test Conn. Downstream 2WCS*V141	Shut			
2WCS*V156	Test Conn. Downstream 2WCS*V141	Shut and Capped			
2WCS*EFV224	Excess Flow Check Valve Downstream of 2WCS*V141	Installed			
2WCS*V148	Test Conn. Downstream 2WCS*V140	Shut			
2WCS*V149	Test Conn. Downstream 2WCS*V140	Shut and Capped			

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initial & Date	Remarks
2WCS*EFV223	Excess Flow Check Valve Downstream of 2WCS*V140	Installed			
2WCS-V154	PI113 Inst. Root Isol.	Open			
	Location: Rx Bldg Elv 215' P1A Room				
2WCS-V27A	Cleanup P1A Suction Isol.	Locked Open			
2WCS-V28A	Cleanup P1A Suction Isol.	Locked Open			
2WCS-V313	Cleanup P1A Suction Line Drain	Shut			
2WCS-V312	Cleanup P1A Suction Line Drain	Shut			
2WCS-V301	Strnr 10A Pressure Test Conn.	Shut and Capped			
2WCS-V350	Strnr 10A Pressure Test Conn.	Shut			
2WCS-V304	Strnr 10A Pressure Test Conn.	Shut and Capped			
2WCS-V351	Strnr 10A Pressure Test Conn.	Shut			

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initial & Date	Remarks
2WCS-V8	Cleanup P1A Suction Casing Drain	Shut			
2WCS-V9	Cleanup P1A Suction Casing Drain	Shut			
2WCS-V10	Cleanup P1A Discharge Casing Drain	Shut			
2WCS-V11	Cleanup P1A Discharge Casing Drain	Shut			
2WCS-V44A	Cleanup P1A Seal Flush Isol.	Open			
2WCS-V29A	Cleanup P1A Discharge Check	Installed			
2WCS-V30A	Cleanup P1A Discharge Isol.	Locked Open			
2WCS-V42A	Cleanup P1A Seal Flush Check	Installed			
2WCS-V383A	V30A Bypass Line Isol	Shut			
	Location: Rx Bldg Elv 215' P1B Room				
2WCS-V27B	Cleanup P1B Suction Isol.	Locked Open			
2WCS-V28B	Cleanup P1B Suction Isol.	Locked Open			
2WCS-V4	Cleanup P1B Suction Line Drain	Shut			

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initial & Date	Remarks
2WCS-V5	Cleanup P1B Suction Line Drain	Shut			
2WCS-V302	Strnr 10B Pressure Test Conn.	Shut and Capped			
2WCS-V352	Strnr 10B Pressure Test Conn.	Shut			
2WCS-V303	Strnr 10B Pressure Test Conn.	Shut and Capped			
2WCS-V353	Strnr 10B Pressure Test Conn.	Shut			
2WCS-V16	Cleanup P1B Suction Casing Drain	Shut			
2WCS-V17	Cleanup P1B Suction Casing Drain	Shut			
2WCS-V18	Cleanup P1B Discharge Casing Drain	Shut			
2WCS-V19	Cleanup P1B Discharge Casing Drain	Shut			
2WCS-V44B	Cleanup P1B Seal Flush Isol.	Open			
2WCS-V42B	Cleanup P1B Seal Flush Check	Installed			
2WCS-V29B	Cleanup P1B Discharge Check	Installed			

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initial & Date	Remarks
2WCS-V30B	Cleanup P1B Discharge Isol.	Locked Open			
2WCS-V383B	V30B Bypass Line Isol.	Shut			
2WCS-V385A	Cleanup P1A Seal Flush Line Vent	Shut			
2WCS-V386A	Cleanup P1A Seal Flush Line Vent	Shut			
2WCS-V385B	Cleanup P1B Seal Flush Line Vent	Shut			
2WCS-V386B	Cleanup P1B Seal Flush Line Vent	Shut			
	Location: Steam Tunnel 240'				
2WCS*V210	FT68X, FT68Y Inst. Root Isol.	Open			
2WCS*V211	FT68X, FT68Y Inst. Root Isol.	Open			
2WCS-V47	WCS Discharge Header Check to FWS	Installed			
2WCS-V346	WCS Discharge Header Check to FWS	Installed			
2WCS-V89	Test Conn. Upstream of 2WCS*MOV200	Shut and Capped			
2WCS-V99	Test Conn. Upstream of 2WCS*MOV200	Shut			

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initial & Date	Remarks
2WCS*V323	WCS Discharge Header to FWS Drain	Shut			
2WCS*V324	WCS Discharge Header to FWS Drain	Shut and Capped			
2WCS*V325	WCS Discharge Header to FWS Drain	Shut			
2WCS*V326	WCS Discharge Header to FWS Drain	Shut and Capped			
	Location: Rx Bldg Elv 306' HX Room				
2WCS-V159	PI186, PT116 Inst. Root Isol.	Open			
2WCS-V354	Vent Upstream of 2WCS-MOV111	Shut			
2WCS-V355	Vent Upstream of 2WCS-MOV111	Shut and Capped			
2WCS-V22	Regen Hx Inlet Isol.	Open			
2WCS-V23	Regen Hx Tube Side Vent	Shut			
2WCS-V24	Regen Hx Tube Side Vent	Shut			
2WCS-V25	Regen Hx Tube Side Drain	Shut			
2WCS-V26	Regen Hx Tube Side Drain	Shut			
2WCS-V35	Regen Hx Shell Side Drain	Shut			

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initial & Date	Remarks
2WCS-V36	Regen Hx Shell Side Drain	Shut			
2WCS-V37	Regen Hx Shell Side Vent	Shut			
2WCS-V38	Regen Hx Shell Side Vent	Shut			
2WCS-RV139	Regen Hx Tube Side Relief	Not Gagged			
2WCS-RV140	Regen Hx Shell Side Relief	Not Gagged			
2WCS-V356	Vent Downstream of 2WCS-MOV111	Shut			
2WCS-V357	Vent Downstream of 2WCS-MOV111	Shut and Capped			
2WCS-V387	Drain Upstream of PI118	Shut			
2WCS-V388	Drain Upstream of PI118	Shut and Capped			
2WCS-V160	PI118 Inst. Root Valve	Open			
2WCS-V51	Non Regen Hx Tube Side Vent	Shut			
2WCS-V52	Non Regen Hx Tube Side Vent	Shut			

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initial & Date	Remarks
2WCS-RV141	Non Regen Hx Tube Side Relief	Not Gagged			
2WCS-V53	Non Regen Hx Tube Side Drain	Shut			
2WCS-V54	Non Regen Hx Tube Side Drain	Shut			
2WCS-V63	Reactor Plant Sampling Isol.	Open			
2WCS-V64	Reactor Plant Sampling Isol.	Open			
2WCS-V162	PI121 Inst. Root Isol.	Open			
2WCS-RV142	Non Regen Hx Shell Side Relief	Not Gagged			
2WCS-V59	Non Regen Hx Shell Side Vent	Shut			
2WCS-V60	Non Regen Hx Shell Side Drain	Shut			
2WCS-V163	PI124 Inst. Root Isol.	Open			
2WCS-V69	FCV135 Upstream Isol.	Open			
2WCS*V165	FT69X, FT69Y Inst. Root Isol.	Open			
2WCS*V166	FT69X, FT69Y Inst. Root Isol.	Open			
2WCS-V167	PS182 Inst Root Isol.	Open			

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initial & Date	Remarks
2WCS-V157	Vent Downstream of 2WCS-MOV106	Shut and Capped			
2WCS-V164	PS181 Inst. Root Isol.	Open			
2WCS-V322	Drain Downstream of 2WCS-MOV107	Shut and Capped			
2WCS-V382	Drain Downstream of MOV107	Shut and Capped			
2WCS-V376	Vent Downstream MOV106	Shut and Capped			
2WCS-RV125	Relief for Condenser/ Radwaste Blowdown Lines	Not Gagged			
2WCS-V75	Flt/Demin 4A Chemical Cleaning Isol.	Shut and Flanged			
2WCS-V85	Flt/Demin 4B Chemical Cleaning Isol.	Shut and Flanged			
2WCS-V95	Flt/Demin 4C Chemical Cleaning Isol.	Shut and Flanged			
2WCS-V105	Flt/Demin 4D Chemical Cleaning Isol.	Shut and Flanged			
2WCS-V120	TK11A & 15A Drain Check	Installed			
2WCS-V130	TK11B & 15B Drain Check	Installed			
2WCS-V79	Flt/Demin Service Air Check	Installed			

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initial & Date	Remarks
2WCS-V208	PI38A Inst. Root Isol.	Open			
2WCS-RV41A	Flt/Demin Service Air Relief	Not Gagged			
2WCS-RV41B	Flt/Demin Service Air Relief	Not Gagged			
2WCS-V215	Flt/Demin Service Air Check	Installed			
2WCS-V223	PI38B Inst. Root Isol.	Open			
	Location: Rx Bldg Elv 328'				
2WCS-V73	Isol. Flt/Demin 4A Flush	Shut			
2WCS-V74	Isol. Flt/Demin 4A Flush	Shut			
2WCS-V76	Flt/Demin 4A Chemical Cleaning Isol.	Shut and Flanged			
2WCS-V330	PDT70A Inst. Root Isol.	Open			
2WCS-V331	PDT70A Inst. Root Isol.	Open			
2WCS-V332	STR17A Drain	Shut			
2WCS-V333	STR17A Drain	Shut			

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initial & Date	Remarks
2WCS-V78	STR5A Drain	Shut			
2WCS-V77	STR5A Drain	Shut			
2WCS-RV21A	Relief on Inlet Line to Flt/Demin 4A	Not Gagged			
2WCS-V171	PDT20A Inst. Root Isol.	Open			
2WCS-V172	PDT20A Inst. Root Isol.	Open			
2WCS-V70	Flt/Demin 4A Outlet Isol.	Open			
2WCS-V173	PDT19A Inst. Root Isol.	Open			
2WCS-V174	PDT19A Inst. Root Isol.	Open			
2WCS-V176	FT16A Inst. Root Isol.	Open			
2WCS-V177	FT16A Inst. Root Isol.	Open			
2WCS-V111	STR5A Condensate Flush Isol.	Shut			
2WCS-V110	STR5A Condensate Flush Isol.	Shut			
2WCS-V71	Holding Pmp 6A Suction Isol.	Open			
2WCS-V254	Strnr 8A Pressure Test Conn.	Shut			

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initial & Date	Remarks
2WCS-V358	Strnr 8A Pressure Test Conn.	Shut and Capped			
2WCS-V255	Strnr 8A Pressure Test Conn.	Shut			
2WCS-V359	Strnr 8A Pressure Test Conn.	Shut and Capped			
2WCS-V72	Holding Pmp P6A Discharge Check	Installed			
2WCS-V66	Rx Plant Sampling Isol.	Open			
2WCS-V65	Rx Plant Sampling Isol.	Open			
2WCS-V181	PDT20B Inst. Root Isol.	Open			
2WCS-V182	PDT20B Inst. Root Isol.	Open			
2WCS-V334	PDT70B Inst. Root Isol.	Open			
2WCS-V335	PDT70B Inst. Root Isol.	Open			
2WCS-V336	STR17B Drain	Shut			
2WCS-V337	STR17B Drain	Shut			
2WCS-V80	Flt/Demin 4B Outlet Isol.	Open			
2WCS-V183	PDT19B Inst. Root Isol.	Open			
2WCS-V184	PDT19B Inst. Root Isol.	Open			

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initial & Date	Remarks
2WCS-V186	FT16B Inst Root Isol.	Open			
2WCS-V187	FT16B Inst. Root Isol.	Open			
2WCS-V112	STR5B Condensate Flush Isol.	Shut			
2WCS-V113	STR5B Condensate Flush Isol.	Shut			
2WCS-V87	STR5B Drain	Shut			
2WCS-V88	STR5B Drain	Shut			
2WCS-V86	Flt/Demin 4B Chemical Cleaning Isol.	Shut and Flanged			
2WCS-V83	Flt/Demin 4B Flush Isol.	Shut			
2WCS-V84	Flt/Demin 4B Flush Isol.	Shut			
2WCS-V81	Holding Pmp P6B Suction Isol.	Open			
2WCS-V256	Strnr 8B Pressure Test Conn.	Shut			
2WCS-V360	Strnr 8B Pressure Test Conn.	Shut and Capped			
2WCS-V257	Strnr 8B Pressure Test Conn.	Shut			
2WCS-V361	Strnr 8B Pressure Test Conn.	Shut and Capped			

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initial & Date	Remarks
2WCS-V82	Holding Pmp 6B Discharge Check	Installed			
2WCS-RV21B	Relief on Inlet Line to Flt/Demin 4B	Not Gagged			
2WCS-V250	Rx Plant Sampling Isol.	Open			
2WCS-V251	Rx Plant Sampling Isol.	Open			
2WCS-V93	Flt/Demin 4C Flush Isol.	Shut			
2WCS-V94	Flt/Demin 4C Flush Isol.	Shut			
2WCS-V96	Flt/Demin 4C Chemical Cleaning Isol.	Shut and Flanged			
2WCS-V339	PDT70C Inst. Root Isol.	Open			
2WCS-V338	PDT70C Inst. Root Isol.	Open			
2WCS-V341	STR17C Drain	Shut			
2WCS-V340	STR17C Drain	Shut			
2WCS-V98	STR5C Drain	Shut			
2WCS-V97	STR5C Drain	Shut			
2WCS-RV21C	Relief Valve on Inlet Line to Flt/Demin 4C	Not Gagged			
2WCS-V191	PDT 20C Inst. Root Isol.	Open			

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initial & Date	Remarks
2WCS-V192	PDT 20C Inst. Root Isol.	Open			
2WCS-V90	Flt/Demin 4C Outlet Isol.	Open			
2WCS-V193	PDT19C Inst. Root Isol.	Open			
2WCS-V194	PDT19C Inst. Root Isol.	Open			
2WCS-V196	FT16C Inst. Root Isol.	Open			
2WCS-V197	FT16C Inst. Root Isol.	Open			
2WCS-V114	STR5C Condensate Flush Isol.	Shut			
2WCS-V115	STR5C Condensate Flush Isol.	Shut			
2WCS-V91	Holding Pmp 6C Suction Isol.	Open			
2WCS-V258	Strnr 8C Pressure Test Conn.	Shut			
2WCS-V362	Strnr 8C Pressure Test Conn.	Shut and Capped			
2WCS-V259	Strnr 8C Pressure Test Conn.	Shut			
2WCS-V363	Strnr 8C Pressure Test Conn	Shut and Capped			
2WCS-V92	Holding Pmp 6C Discharge Check	Installed			
2WCS-V67	Rx Plant Sampling Isol.	Open			
2WCS-V68	Rx Plant Sampling Isol.	Open			

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initial & Date	Remarks
2WCS-V103	Flt/Demin 4D Flush Isol.	Shut			
2WCS-V104	Flt/Demin 4D Flush Isol.	Shut			
2WCS-RV21D	Relief Valve on Inlet Line to Flt/Demin 4D	Not Gagged			
2WCS-V342	PDT70D Inst. Root Isol.	Open			
2WCS-V343	PDT70D Inst. Root Isol.	Open			
2WCS-V344	STR17D Drain	Shut			
2WCS-V345	STR17D Drain	Shut			
2WCS-V201	PDT20D Inst. Root Isol.	Open			
2WCS-V202	PDT20D Inst. Root Isol.	Open			
2WCS-V106	Flt/Demin 4D Chemical Cleaning Isol.	Shut and Flanged			
2WCS-V100	Flt/Demin 4D Outlet Isol.	Open			
2WCS-V203	PDT19D Inst. Root Isol.	Open			
2WCS-V204	PDT19D Inst. Root Isol.	Open			
2WCS-V107	STR5D Drain	Shut			
2WCS-V108	STR5D Drain	Shut			

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initial & Date	Remarks
2WCS-V206	FT16D Inst. Root Isol.	Open			
2WCS-V207	FT16D Inst. Root Isol.	Open			
2WCS-V116	STR5D Condensate Flush Isol.	Shut			
2WCS-V117	STR5D Condensate Flush Isol.	Shut			
2WCS-V101	Holding Pmp 6D Suction Isol.	Open			
2WCS-V260	Strnr 8D Pressure Test Conn.	Shut			
2WCS-V364	Strnr 8D Pressure Test Conn.	Shut and Capped			
2WCS-V261	Strnr 8D Pressure Test Conn.	Shut			
2WCS-V365	Strnr 8D Pressure Test Conn.	Shut and Capped			
2WCS-V102	Holding Pmp 6D Discharge Check	Installed			
2WCS-V252	Rx Plant Sampling Isol.	Open			
2WCS-V253	Rx Plant Sampling Isol.	Open			
2WCS-V134	Resin TK15B Condensate Makeup	Shut			
2WCS-V189	PI39B Inst. Root Isol.	Open			
2WCS-V135	Condensate Supply Check	Installed			

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initial & Date	Remarks
2WCS-V132	Precoat TK11B Condensate Makeup	Shut			
2WCS-V139	Precoat to Millipore Filter Isol.	Shut			
2WCS-RV45B	Condensate Relief to Liquid Radwaste	Not Gagged			
2WCS-RV43B	Relief on Return Line from Flt/Demin 4C & 4D	Not Gagged			
2WCS-V137	Precoat Pmp Recirc to Precoat TK11B	Shut			
2WCS-V136	Precoat Pmp 12B Discharge Isol.	Open			
2WCS-RV42B	Precoat Pmp 12B Discharge Relief	Not Gagged			
2WCS-V138	Precoat Pmp 12B Discharge Check	Installed			
2WCS-V199	PI40B Inst. Root Isol.	Open			
2WCS-V145	Strnr 9B Test Conn.	Shut and Capped			
2WCS-V277	Strnr 9B Drain	Shut and Capped			
2WCS-V144	Strnr 9B Test Conn.	Shut and Capped			
2WCS-V198	PI57B Inst. Root Isol.	Open			

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initial & Date	Remarks
2WCS-RV71B	Resin Meter Pump 16B Discharge Relief	Not Gagged			
2WCS-V133	Resin TK15B Drain	Shut			
2WCS-V131	Precoat TK11B Drain	Shut			
2WCS-V129	Precoat TK11B Skimmer Isol.	Shut			
2WCS-V124	Condensate Makeup to Resin TK15A	Shut			
2WCS-V125	Condensate Supply Check	Installed			
2WCS-V122	Precoat TK11A Condensate Makeup	Shut			
2WCS-V118	Precoat to Millipore Filter Isol.	Shut			
2WCS-V119	Precoat TK11A Skimmer Isol.	Shut			
2WCS-V121	Precoat TK11A Drain	Shut			
2WCS-V381	Resin TK15B Condensate Drain	Shut and Capped			
2WCS-RV71A	Resin Meter Pmp P16A Discharge Relief	Not Gagged			
2WCS-V178	PI39A Inst. Root Isol.	Open			
2WCS-RV45A	Condensate Relief to Liquid Radwaste	Not Gagged			
2WCS-V179	PI57A Inst. Root Isol.	Open			

VALVE LINEUP

Valve No.	Description	Required Position	Actual Position	Initial & Date	Remarks
2WCS-V123	Resin TK15A Drain	Shut			
2WCS-V384	Resin TK15A Condensate Drain	Shut and Capped			
2WCS-V142	Strnr 9A Test Conn.	Shut and Capped			
2WCS-V276	STR9A Drain	Shut and Capped			
2WCS-V143	Strnr 9A Test Conn.	Shut and Capped			
2WCS-V188	PI40A Inst. Root Isol.	Open			
2WCS-V128	Precoat Pmp PI12A Discharge Check	Installed			
2WCS-V127	Precoat Pmp 12A Recirc to Precoat TK11A	Shut			
2WCS-RV43A	Relief on Return Line from Flt/Demin 4A & 4B	Not Gagged			
2WCS-V126	Precoat Pmp P12A Discharge Isol.	Open			
2WCS-RV42A	Precoat Pmp P12A Discharge Relief	Not Gagged			
2WCS-V268	3-way to Liquid Radwaste	Installed			TCN-4

TABLE II

SYSTEM POWER SUPPLY LINEUP

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2WCS*MOV104	Supply from Reactor Recirc Loop "B"	2NHS-MCC011	2C	On			
2WCS*MOV105	Supply from Reactor Recirc Loop "A"	2NHS-MCC011	3A	On			
2WCS*MOV103	Main Supply from Reactor Recir System	2NHS-MCC011	2B	On			
2WCS*MOV101	Supply from RPV Drain	2NHS-MCC011	2A	On			
2WCS*MOV102	2WCS-Inside I.V. (Suction)	2EHS*MCC302D	15D	On			
2WCS*MOV112	2WCS-Outside I.V. (Suction)	2EHS*MCC102C	17B	On			
2WCS-MOV111	RWCU System Bypass	2NHS-MCC008	6C	On			
2WCS-MOV109	2WCS-E2 (RHX) Discharge	2NHS-MCC008	3C	On			
2WCS*MOV200	2WCS Return to Feedwater System	2EHS*MCC102A	7D	On			
2WCS-MOV110	2WCS F/D Bypass Vlv	2NHS-MCC008	6B	On			
2WCS-MOV108	2WCS-RO127 Bypass	2NHS-MCC008	3E	On			

TABLE II

SYSTEM POWER SUPPLY LINEUP

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	- Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2WCS-MOV106	Reject to Radwaste	2NHS-MCC008	2C	Off and Tagged			Appendix R
2WCS-MOV107	Reject to Main Condenser	2NHS-MCC008	2E	Off and Tagged			Appendix R
2WCS-P1A	RWCU Recirculation Pump "A"	2NJS-US5	4D	Racked In			
2WCS-P1B	RWCU Recirculation Pump "B"	2NJS-US6	4A	Racked In			
2WCS-H1A	2WCS-P1A Motor Heater	2SCA-PNL201	11	On			
2WCS-H1B	2SCA-P1B Motor Heater	2SCA-PNL201	6	On			
2WCS-P6A	Filter/Demineralizer "A" Hold Pump	2NHS-MCC008	4A	On			
2WCS-P6B	Filter/Demineralizer "B" Hold Pump	2NHS-MCC008	4B	On			
2WCS-P6C	Filter/Demineralizer "C" Hold Pump	2NHS-MCC009	4C	On			

TABLE II

SYSTEM POWER SUPPLY LINEUP

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2WCS-P6D	Filter/Demineralizer "D" Hold Pump	2NHS-MCC009	4D	On			
2WCS-P12A	Filter/Demineralize Precoat Pump "A"	2NHS-MCC008	4C	On			
2WCS-P12B	Filter/Demineralize Precoat Pump "B"	2NHS-MCC009	2F	On			
2WCS-MIX 100A	Precoat Tank (2WCS-TK11A) Agitator	2NHS-MCC008	4D	On			
2WCS-MIX 100B	Precoat Tank (2WCS-TK11B) Agitator	2NHS-MCC009	4B	On			
2WCS-MIX 101A	Resin Feed Tank (2WCS-TK15A) Agitator	2NHS-MCC008	4E	Off			
2WCS-MIX 101B	Resin Feed Tank (2WCS-TK15B) Agitator	2NHS-MCC009	4A	Off			
2WCS-IPNL 187	Filter Demineralizer Controller Panel (System I)	2BYS-PNLA101	13	On			
		2SCA-PNL200	6	On			
		2BYS-PNLA101	1	On			
		2SCA-PNL200	4	On			
		2SCA-PNL406	4	On			
2WCS-P16A	Resin Metering Pump	2SCA-PNL200	1	Off			

TABLE II

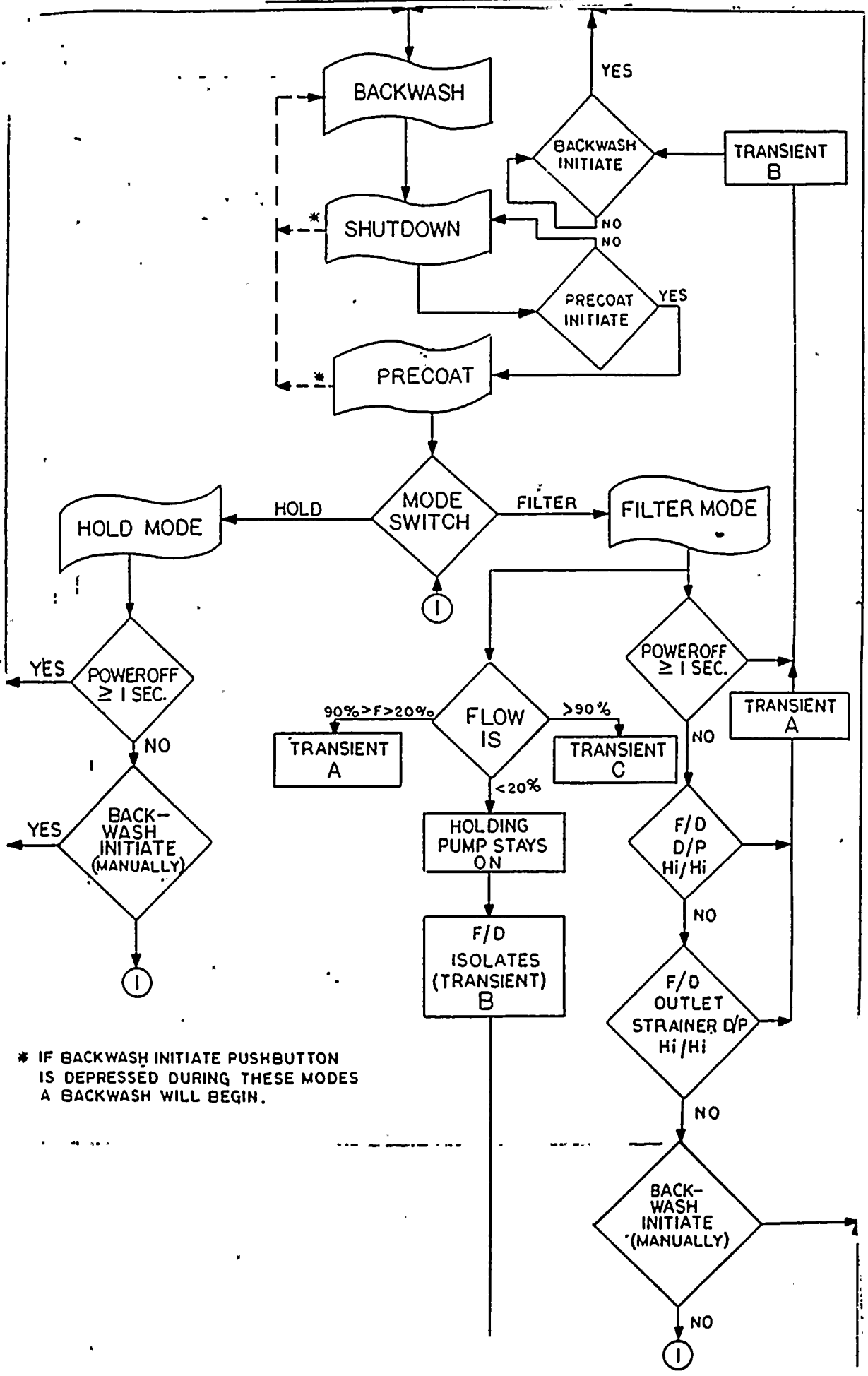
SYSTEM POWER SUPPLY LINEUP

COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2WCS-IPNL 188	Filter Demineralizer Controller Panel (System II)	2SCA-PNL201	21	On			
		2BYS-PNLB102	1	On			
		2BYS-PNLB102	13	On			
		2SCA-PNL406	5	On			
		2SCA-PNL201	18	On			
2WCS-P16B	Resin Metering Pump	2SCA-PNL201	17	Off			
2WCS-FV135	WCS Blowdown Flow Control Valve	2SCA-PNL201	20	On			
2WCS-FC1135	WCS Blowdown Flow Controller	2VBS-PNLB102	3	On			
2WCS-TR1643	Reactor Bottom Head Temperature Recorder	2VBS-PNLB101	14	On			
2WCS-TIS1008	Filter Demin Inlet Temperature	2VBS*PNLA103	3	On			
2G33-K600	WCS 24 Volt DC Power Supply	2VBS-PNLB102	3	On			

TABLE II

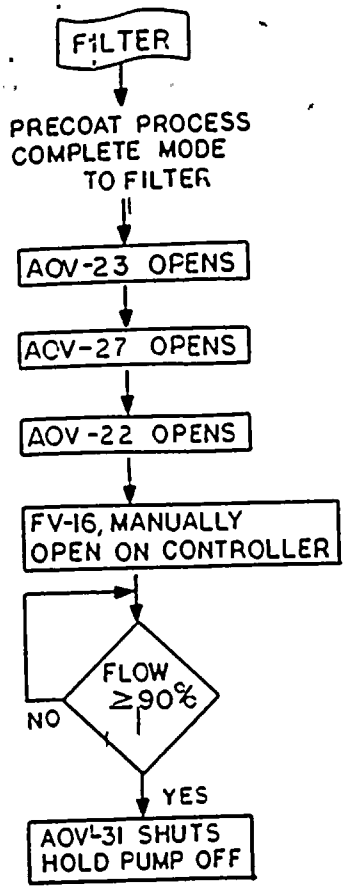
SYSTEM POWER SUPPLY LINEUP

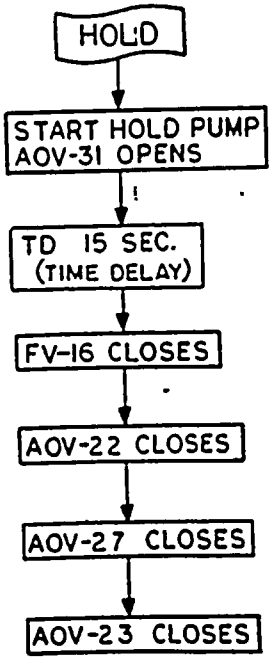
COMPONENT NO.	COMPONENT DESCRIPTION	POWER SUPPLY Bus Number	Cubicle/ Breaker	NORMAL POSITION	ACTUAL POSITION	INITIALS/ DATE	REMARKS
2E31-K600A	WCS/Leak Detection 24VDC Power Supply (Div I)	2VBS*PNLA103	5	On			
2E31-K600B	WCS/Leak Detection 24VDC Power Supply (Div II)	2VBS*PNLB103	6	On			
2MSS*TRSH1001	WCS Temperature Recorder	2VBS*PNLA103	14	On			
2MSS*E/I1001B	WCS Temperature Voltage to Current Converter	2VBS*PNLB103	14	On			

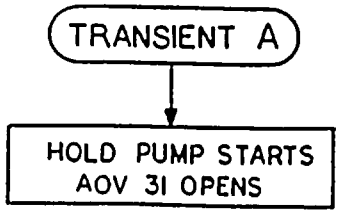

BACKWASH
SHUTDOWN
PRECOAT
PRECOAT INITIATE
YES
NO
BACKWASH INITIATE
TRANSIENT B
MODE SWITCH
HOLD
FILTER
HOLD MODE
FILTER MODE
POWEROFF ≥ 1 SEC.
YES
NO
BACK-WASH INITIATE (MANUALLY)
FLOW IS
90%>F>20%
>90%
<20%
TRANSIENT A
TRANSIENT C
HOLDING PUMP STAYS ON
F/D ISOLATES (TRANSIENT) B
F/D D/P Hi/Hi
F/D OUTLET STRAINER D/P Hi/Hi
TRANSIENT A
1
* IF BACKWASH INITIATE PUSHBUTTON IS DEPRESSED DURING THESE MODES A BACKWASH WILL BEGIN.

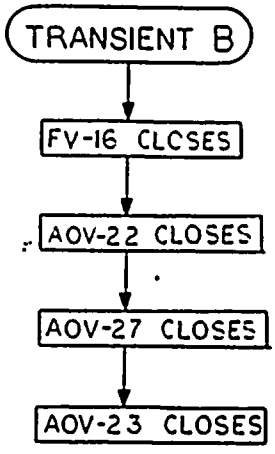
ATTACHMENT 1

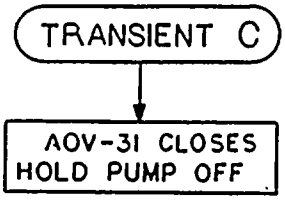
FLT/DEMIN CONTROLLER LOGIC SCHEMATICS











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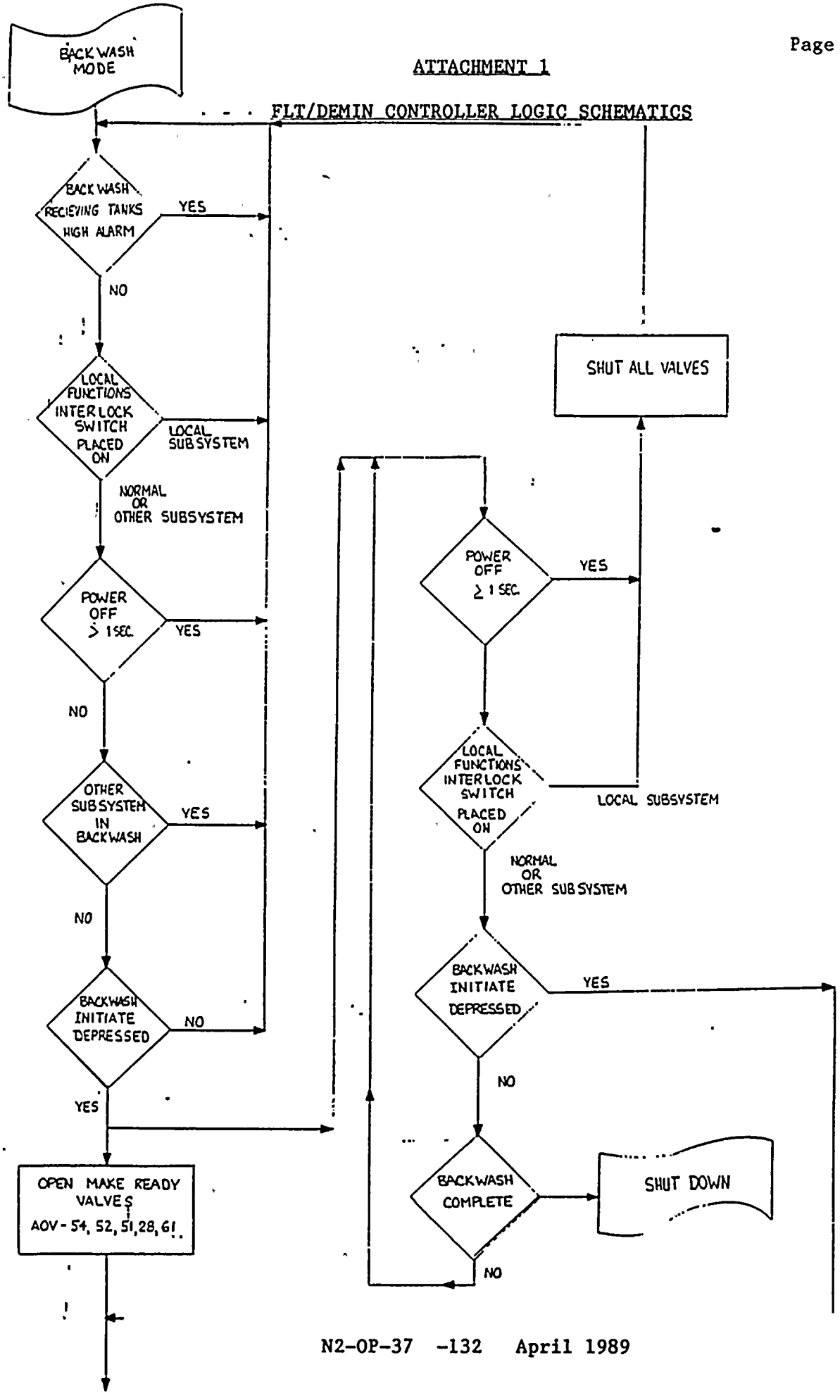
FLT/DEMIN CONTROLLER LOGIC SCHEMATICS



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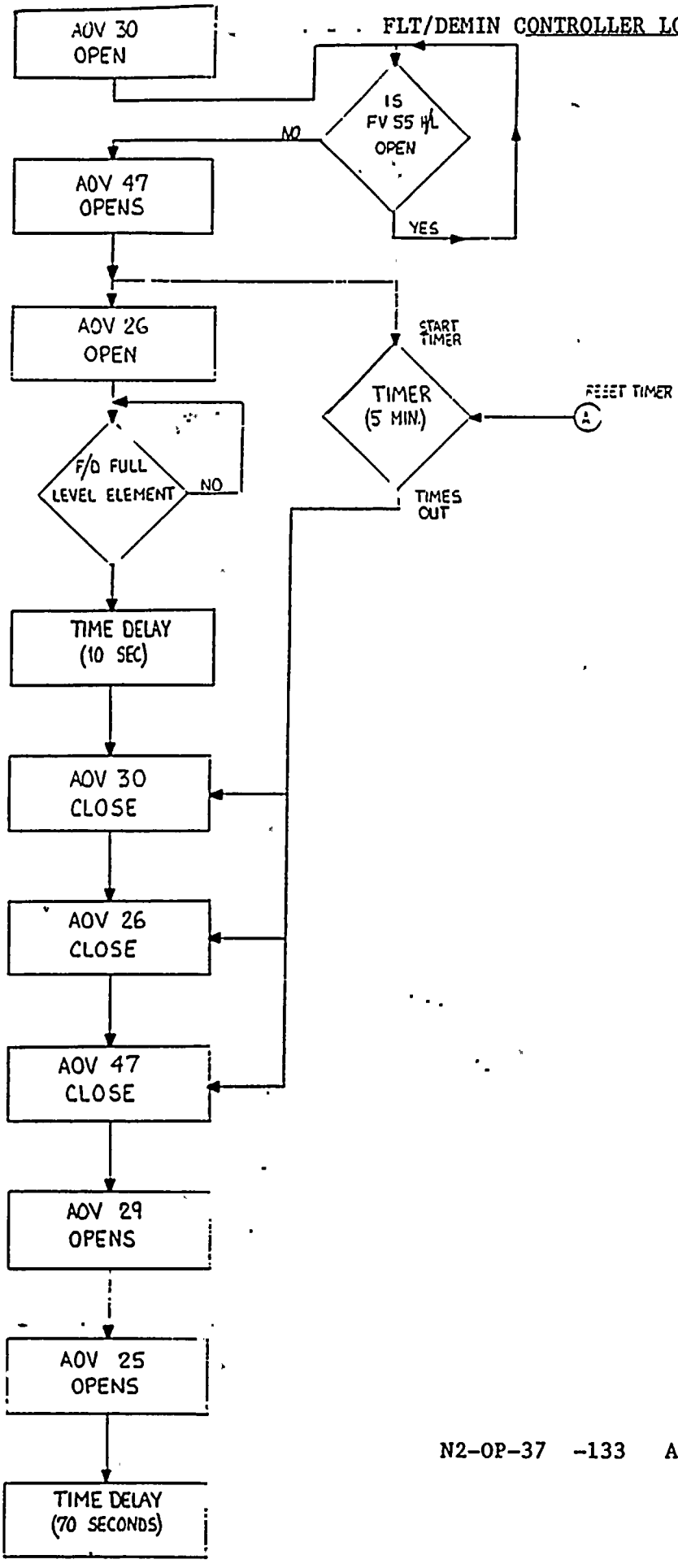

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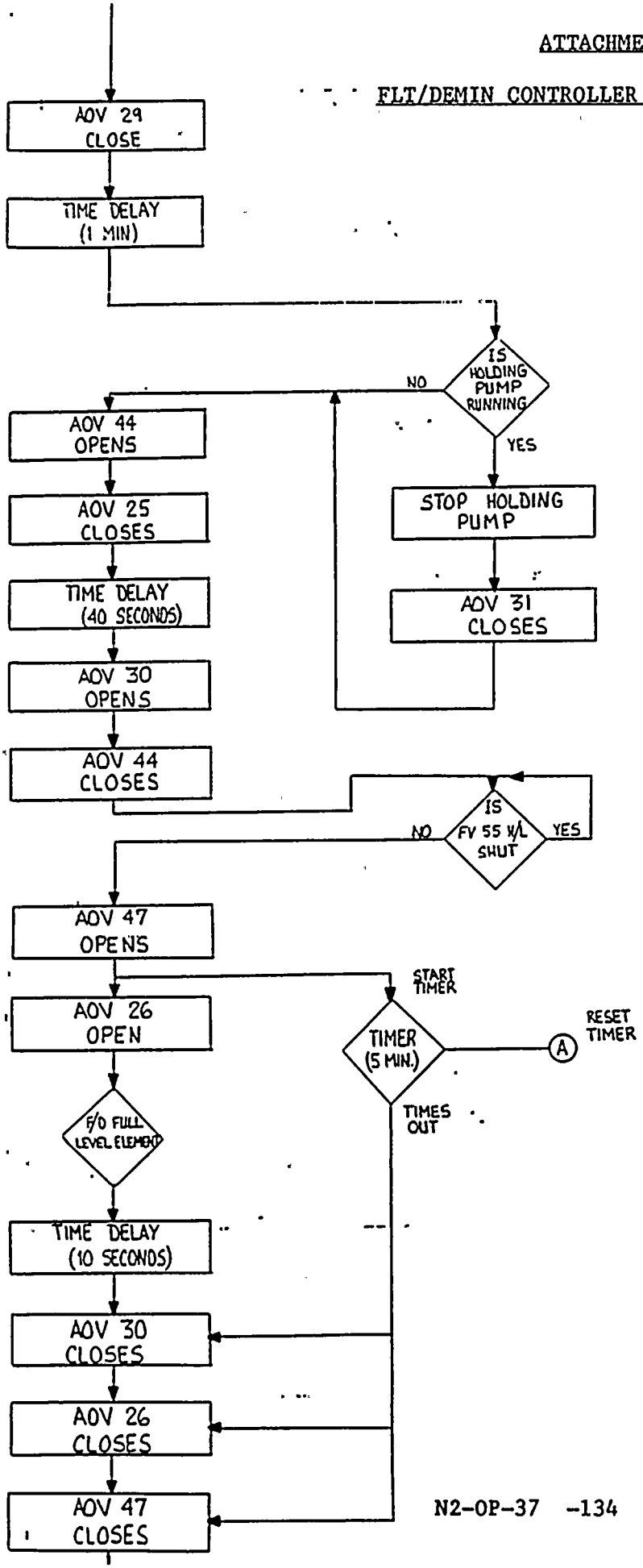
FLT/DEMIN CONTROLLER LOGIC SCHEMATICS



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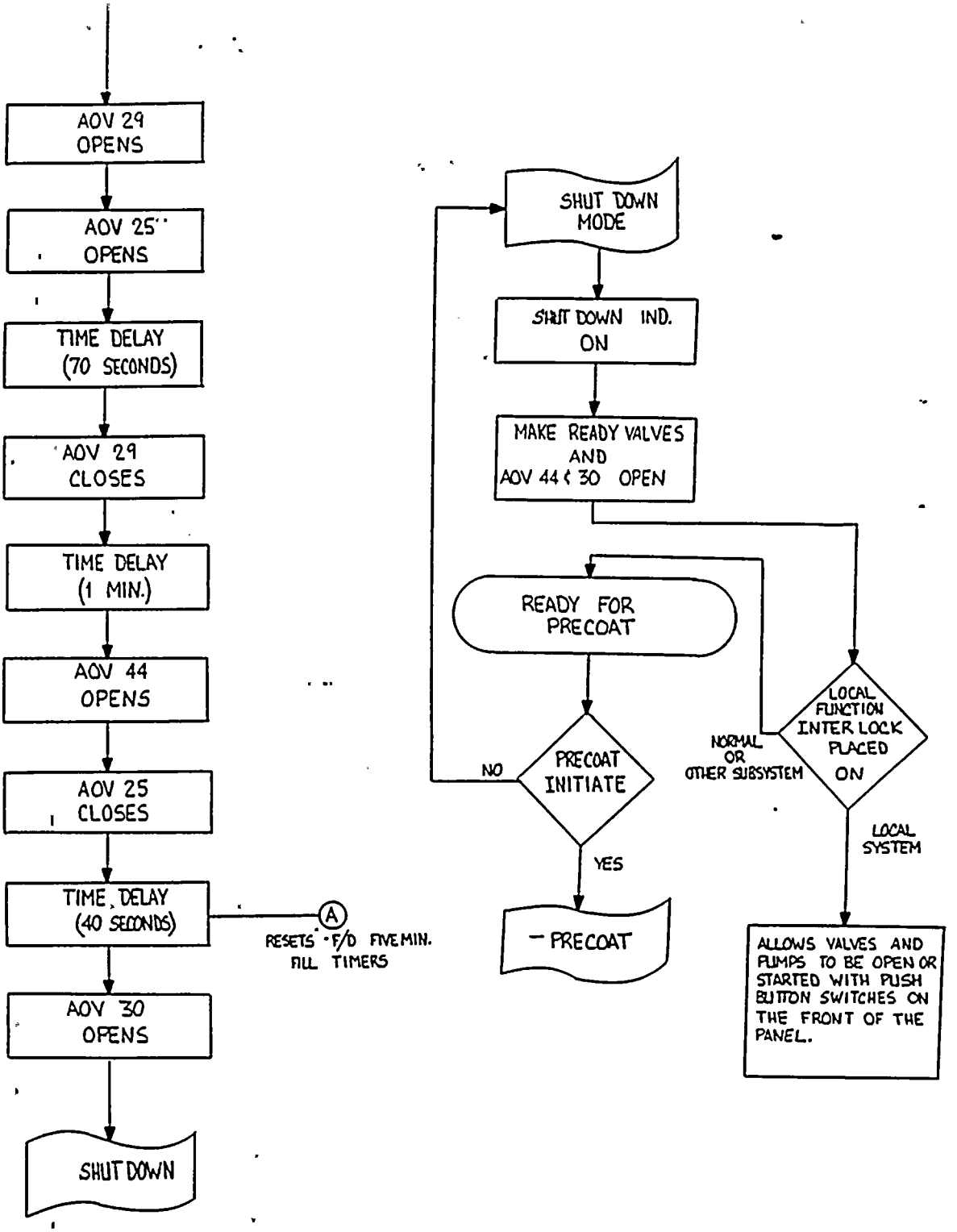
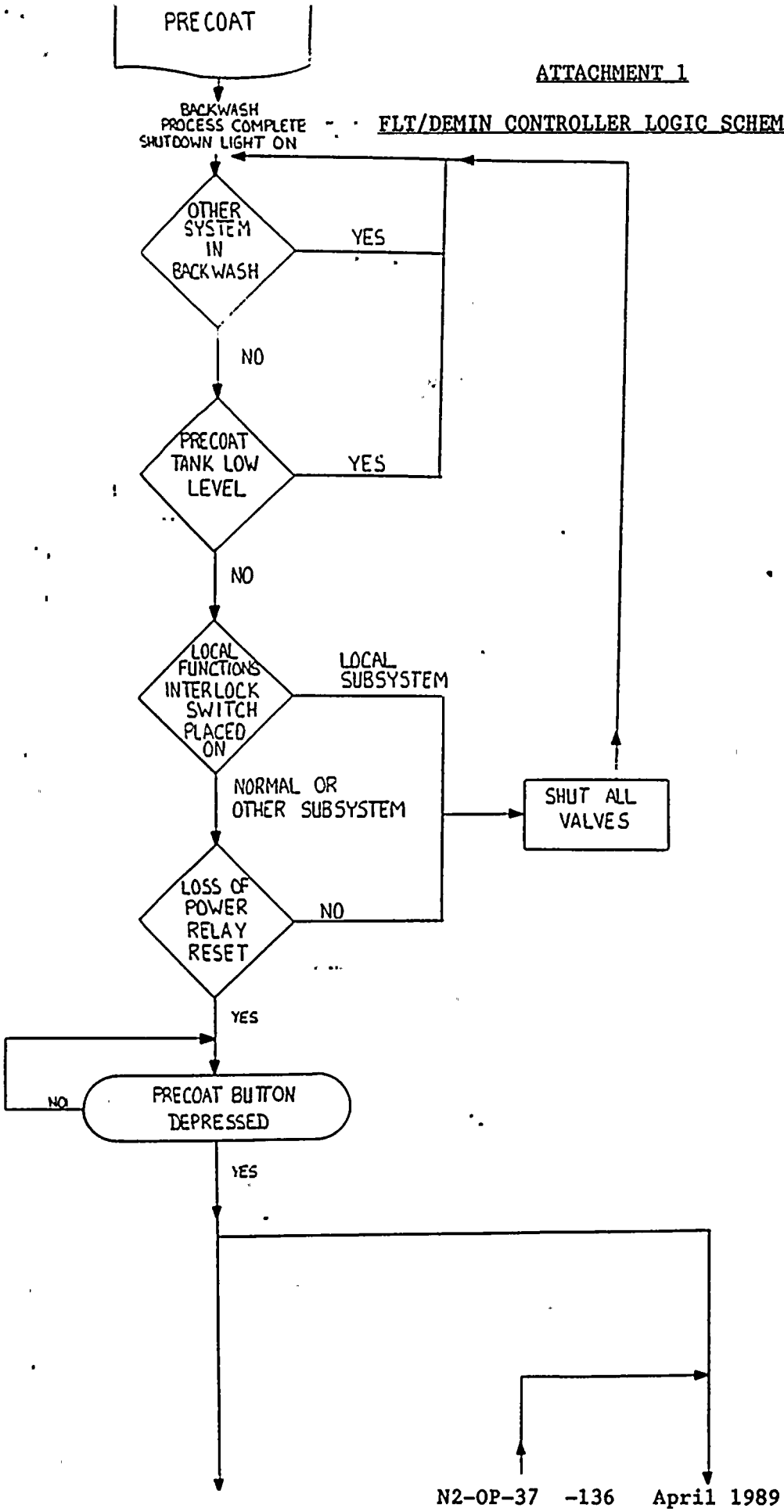
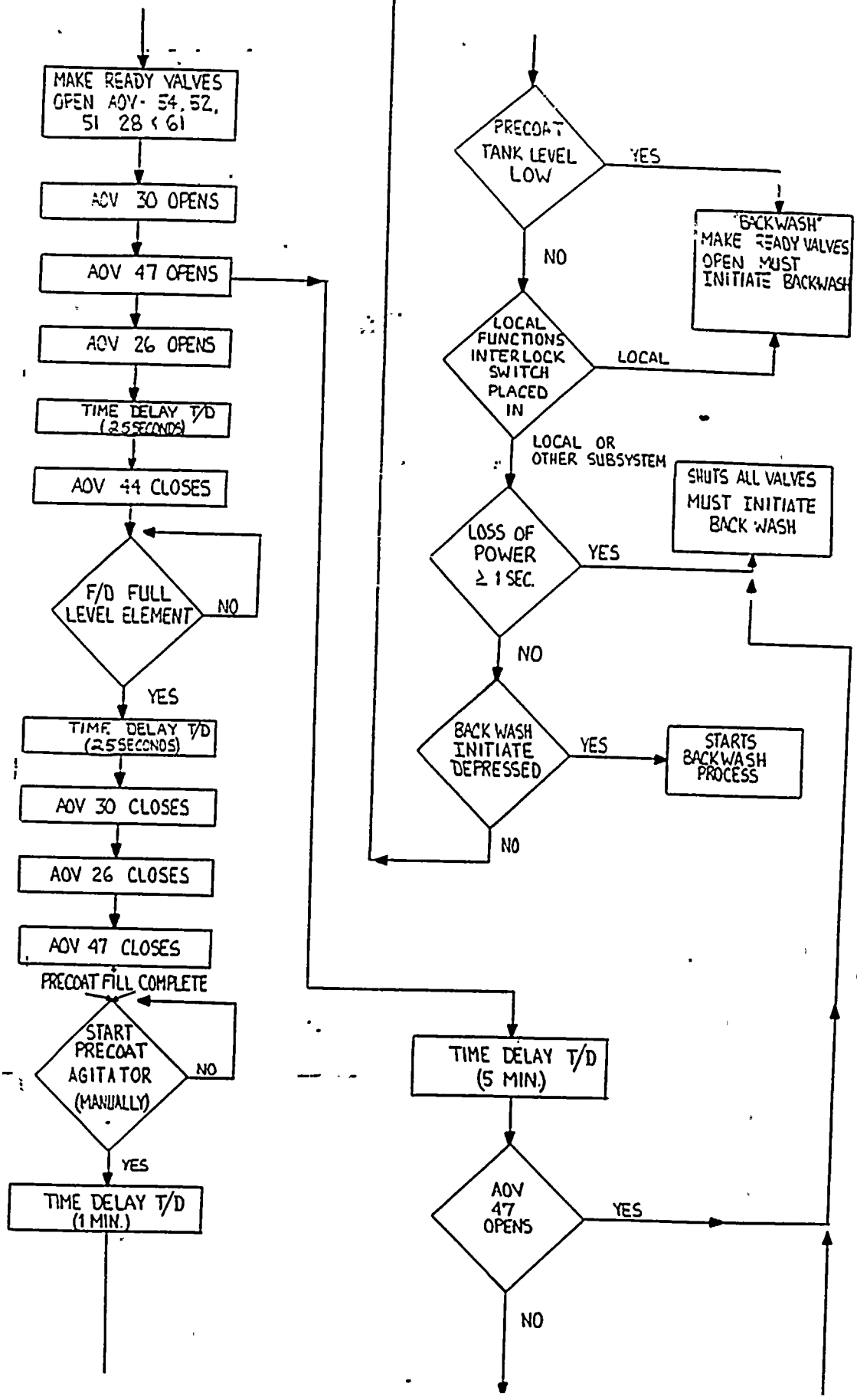
FLT/DEMIN CONTROLLER LOGIC SCHEMATICS



ATTACHMENT 1

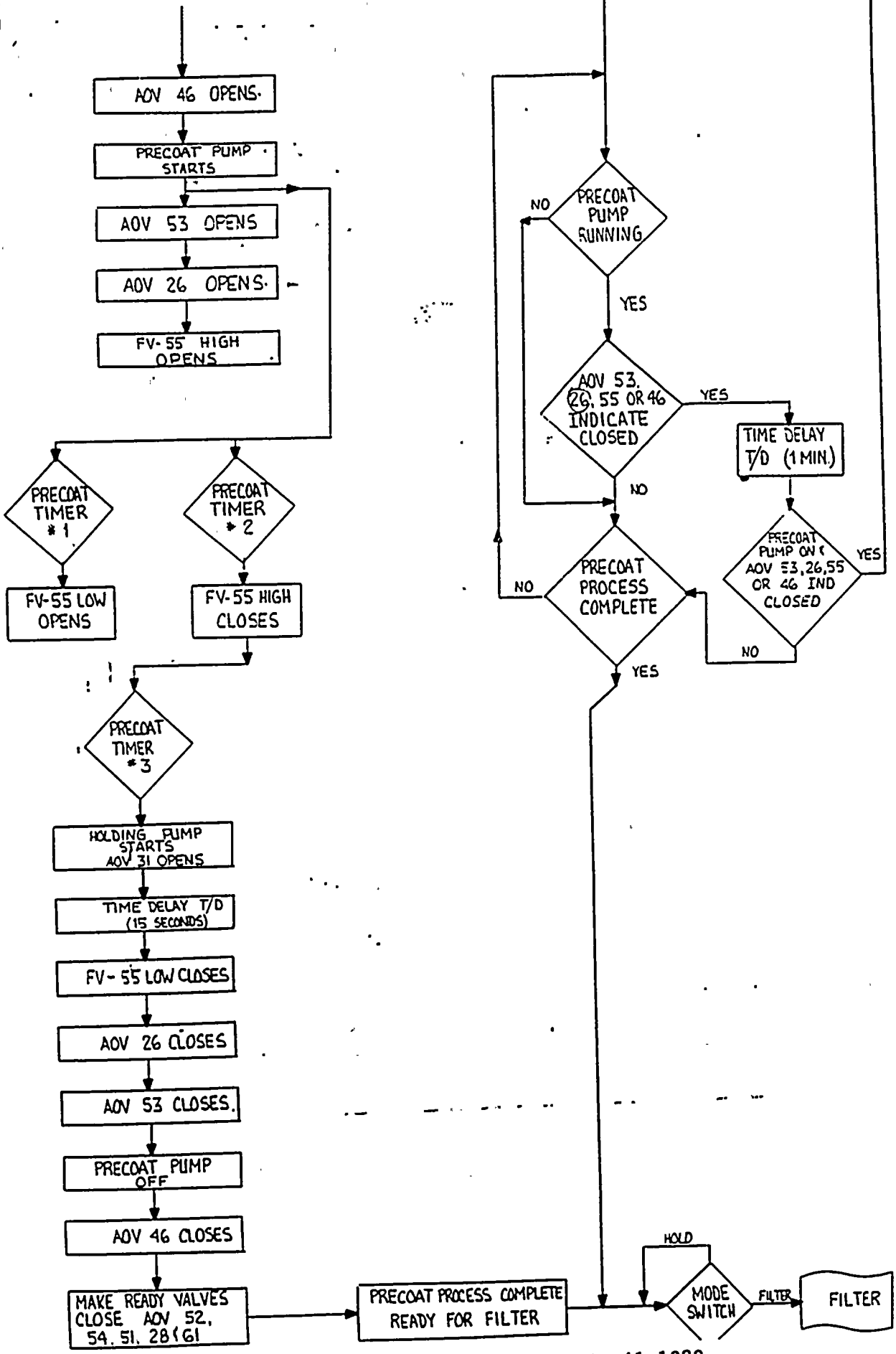
FLT/DEMIN CONTROLLER LOGIC SCHEMATICS




MAKE READY VALVES OPEN AOV- 54, 52, 51 28 & 61
AOV 30 OPENS
AOV 47 OPENS
AOV 26 OPENS
TIME DELAY T/D (2.5 SECONDS)
AOV 44 CLOSES
F/D FULL LEVEL ELEMENT
NO
YES
TIME DELAY T/D (2.5 SECONDS)
AOV 30 CLOSES
AOV 26 CLOSES
AOV 47 CLOSES
PRECOAT FILL COMPLETE
START PRECOAT AGITATOR (MANUALLY)
NO
YES
TIME DELAY T/D (1 MIN.)
PRECOAT TANK LEVEL LOW
YES
NO
"BACKWASH" MAKE READY VALVES OPEN MUST INITIATE BACKWASH
LOCAL FUNCTIONS INTERLOCK SWITCH PLACED IN
LOCAL
LOCAL OR OTHER SUBSYSTEM
SHUTS ALL VALVES MUST INITIATE BACK WASH
LOSS OF POWER ≥ 1 SEC.
YES
NO
BACK WASH INITIATE DEPRESSED
YES
STARTS BACKWASH PROCESS
NO
TIME DELAY T/D (5 MIN.)
AOV 47 OPENS
YES
NO

ATTACHMENT 1

FLT/DEMIN CONTROLLER LOGIC SCHEMATICS



ATTACHMENT 2

VALVE NUMBER	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	RESTORED POSITION	INITIAL
FILTER/DEMIN 4A:					
2WCS-V78	STR5A Drain	SHUT			
2WCS-V77	STR5A Drain	SHUT			
2WCS-V110	STR5A Cond. Flush Isol.	SHUT			
2WCS-V111	STR5A Cond. Flush Isol.	SHUT			
2WCS-V332	STR17A Drain	SHUT			
2WCS-V333	STR17A Drain	SHUT			
FILTER/DEMIN 4B:					
2WCS-V88	STR5B Drain	SHUT			
2WCS-V87	STR5B Drain	SHUT			
2WCS-V112	STR5B Cond. Flush Isol.	SHUT			
2WCS-V113	STR5B Cond. Flush Isol.	SHUT			
2WCS-V336	STR17B Drain	SHUT			
2WCS-V337	STR17B Drain	SHUT			

NOTE: Contact SSS prior to any manipulations.

ICN-

VALVE NUMBER	DESCRIPTION	REQUIRED POSITION	ACTUAL POSITION	RESTORED POSITION	INITIAL
FILTER/DEMIN 4C:					
2WCS-V98	STR5C Drain	SHUT			
2WCS-V97	STR5C Drain	SHUT			
2WCS-V114	STR5C Cond. Flush Isol.	SHUT			
2WCS-V115	STR5C Cond. Flush Isol.	SHUT			
2WCS-V340	STR17C Drain	SHUT			
2WCS-V341	STR17C Drain	SHUT			
FILTER/DEMIN 4D:					
2WCS-V108	STR5B Drain	SHUT			
2WCS-V107	STR5B Drain	SHUT			
2WCS-V116	STR5B Cond. Flush Isol.	SHUT			
2WCS-V117	STR5D Cond. Flush Isol.	SHUT			
2WCS-V344	STR17D Drain	SHUT			
2WCS-V345	STR17D Drain	SHUT			

NOTE: Contact SSS prior to any manipulations.