

INDIAN POINT STATION

UNIT NO. 2

SOP-1.1 Rev. 0

Filling and Venting the Reactor Coolant System

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Filling and Venting the Reactor Coolant System1.0 Intent

To provide a procedure for filling and venting the Reactor Coolant System (RCS).

2.0 Precautions and Limitations

- 2.1 Do not pressurize the RCS above ambient unless the reactor vessel temperature is greater than 70°F. Do not pressurize the RCS above 500 psig unless reactor vessel flange metal is above 93°F and the reactor studs are operationally tensioned.

NOTE: This temperature must be maintained until the Reactor Vessel head is de-tensioned.

- 2.2 Observe the pressure - temperature limitations of the RCS heat up curve (See Graphs Book).
- 2.3 Do not attempt to do any RCS venting if the reactor coolant system temperature is greater than 180°F.
- 2.4 The fill water shall have a boron concentration equal to or greater than that required to maintain the cold shutdown margin. (See Graphs Book)
- 2.5 The reactor vessel local level indication should be taken out of service when the pressurizer cold calibrated level indication reads about 20% of span.

NOTE: When the pressurizer is vented to the pressurizer relief tank, the level system will indicate 2.3 feet high per 1 psig of pressure in the Pressure Relief Tank.

- 2.6 Do not open RCP no. 1 seal return valves until the RCS pressure is greater than 100 psig.
- 2.7 During filling and venting, the RCP No. 1 seal by pass valve must be closed unless the No. 1 seal return valves are open and there is at least a 100 psig pressure differential across the No. 1 seal.
- 2.8 Fill water should be greater than 95°F.
- 2.9 Whenever venting, the possibility exists to discharge contaminated water to a local uncontained area. A means should be provided to catch and contain the water.

2.10 When filling and venting seal injection flows should be in service to prevent a crud buildup at the RCP No. 1 seals.

2.11 For operation of the RCP's see procedure SOP-1.3.

3.0 Initial Conditions

3.1 The vessel head is bolted in place. RCS level is approximately at the midpoint of the nozzles or greater and the RHR system is in service.

3.2 The RCS is aligned as per COL-2.

3.3 The following systems are operable:
Component Cooling Water System
Chemical and Volume Control System (CVCS)
Residual Heat Removal System (RHR)

3.4 All required electrical supplies, equipment and instrumentation are operable.

3.5 Communication is established between the Control Room and containment. A man should be stationed inside containment to check for open lines.

3.6 Sources of fill water are available by the following methods:

- a. CVCS hold up tanks - Method "A"
- b. Blended makeup - Method "B"
- c. RWST - Method "C"
- d. RWST via RHR - Method "D"

4.0 Procedure

4.1 Open the following valves:

- a. Pressurizer sprays (PCV 455A and 455B)
- b. Normal & alternate charging (204A and 204B)
- c. Reactor head vent (500)

4.2 Open pressurizer vent valve (527) and attach hose to ventilation system.

4.3 Align CVCS as per SOP-3.1

4.4 Line up source of water and commence filling by one of the following methods:

- a. Method A - Filling via the VCT from a CVCS holdup tank - See step 5.0.
- b. Method B - Filling via the VCT from blended makeup - see step 6.0
- c. Method C - Filling via the VCT from RWST - see step 7.0
- d. Method D - Filling via RHR from RWST - see step 8.0.

4.5 Have a man inside containment to check for open lines and an increasing level on local Reactor Coolant Level indication system.

Caution:

If using water from a CVCS hold up tank monitor level in tank.

4.6 Continue filling the RCS. When level indicates about 20% on pressurizer wide range cold calibrated instrumentation, isolate the local level indication system.

4.7 Place the reactor vessel flange leak detection system in service as per COL-2.

4.8 When a solid stream of water comes out of the Reactor Vessel head vent, close vent valve (500).

4.9 Establish RHR letdown and purification by opening the purification flow control valve (HCV-133) and the letdown back pressure regulator (PCV-135). Place PCV-135 in manual and open slowly until letdown flow (~25 gpm) is indicated.

Note: Do not place the demineralizers in service if hydrazine is being used to scavenge oxygen.

4.10 When water issues from the pressurizer vent (527), close vent valve.

4.11 Adjust charging pump speed, back pressure control valve (PCV-135) and/or purification path hand control valve (HCV-133) as necessary to maintain desired RCS pressure.

CAUTION:

- a. Stay within limits of the heatup curves.
- b. Starting or stopping an RHR pump will change the head on the letdown path by 150 psig which will affect the Reactor Coolant system pressure greatly when solid.

4.12 When the RCS is >100 psig, establish RCP seal flows as follows:

- a. Open #1 seal return isolation valves (261A, 261B, 261C, and 261D).
- b. Open #1 seal by pass valve (246)

CAUTION:

Do not open the #1 seal bypass valve unless the #1 seal return isolation valves are open and there is a minimum of 100 psig pressure across the #1 seal.

- 4.13 Vent all the points listed in tables I & II.
- 4.14 Start a RCP in accordance with SOP-1.3, run it for about one minute, then shut it down.
- 4.15 Wait about 30 minutes, then vent the reactor head vent (500) and pressurizer vent (527).
- 4.16 Repeat steps 4.14 and 4.15 for the other RCP(s).
- 4.17 Depressurize the RCS.
- 4.18 Wait about 30 minutes, then vent the reactor head vent (500) and pressurizer vent (527).
- 4.19 Repressurize the RCS to 400-450 psig.
- 4.20 Simultaneously run all RCP(s) for 5-10 minutes, then shut down.
- 4.21 Depressurize RCS.
- 4.22 Wait about 30 minutes and vent the reactor head vent (500) and pressurizer vent (527).
- 4.23 If a lot of air is vented, repeat the pump run and venting as per step 4.19 through 4.22.
- 4.24 Repressurize the RCS to 400-450 psig.
- 4.25 Vent the instrument lines in accordance with Table III.
- 4.26 Install blind flanges/caps on the vent points designated in Tables I and II.

5.0 Method "A" - Filling from a CVCS Holdup Tank

5.1 Filling from #23 CVCS Holdup Tank

5.1.1 Isolate #23 HUT from possible sources of unborated water by closing the following valves:

1100	RCDT pump discharge	shut	_____
1133	Concentrates Tank discharge	shut	_____
1182B	Evaporator Recirculation inlet	shut	_____
1247	Monitor Tank pump discharge	shut	_____

5.1.2 Line up valves to recirculate #23 CVCS holdup tank as follows:

1270	#21 HUT recirc. suction	tag shut	_____
1126	#22 HUT recirc. suction	tag shut	_____
1128	#23 HUT recirc. suction	open	_____
1113	Recirc. pump suction	open	_____
1109	Recirc. pump discharge	shut	_____
1299	Recirc. pump recirc discharge	open	_____
1298	#21 HUT recirc. inlet	shut	_____
1297	#22 HUT recirc. inlet	shut	_____
1296	#23 HUT recirc. inlet	open	_____
1123	#23 HUT drain	shut	_____
1125C	#23 HUT outlet	shut	_____

5.1.3 Recirculate #23 HUT with the recirculation pump.

5.1.4 Line up valves to pressurize #23 HUT as follows:

1269	Vent header isolation	shut	_____
1102	#21 HUT vent header	shut	_____
1263	#22 HUT vent header	shut	_____
1264	#23 HUT vent header	open	_____
1121	#21 HUT drain	tag shut	_____
1122	#22 HUT drain	tag shut	_____
1125A	#21 outlet	tag shut	_____
1125B	#22 outlet	tag shut	_____
1120	#23 HUT inlet	shut	_____

CAUTION: Whenever the normally locked open vent header valve for a CVCS holdup tank is closed, the suction valves to the gas stripper feed pump and recirculation pump and tank drain valve are to be tagged shut to avoid drawing a vacuum in the tank.

- 5.15 Adjust V-1049, Holdup Tank Nitrogen Regulator, to maintain 10 psig in No. 23 Holdup Tank.
- 5.1.6 When No. 23 holdup tank has been recirculating for a minimum of two hours sample its contents for boron concentration and verify that the concentration is greater than or equal to that required for cold shutdown.
- 5.1.7 Commence transfer of #23 HUT to the Volume Control Tank (VCT) as follows:
- a. Isolate normal letdown
 - b. Throttle #23 HUT recirc. inlet valve (1296) until the recirculation pump discharge pressure is about 50 psig.
 - c. Gradually open valve (1289) at the inlet to the reactor coolant filter.
 - d. Observe the level in the VCT to be increasing.
 - e. VCT pressure should be maintained with N₂ at less than 30 psig during transfer of water from the HUT.
 - f. Rate of fill shall be controlled to avoid drawing a vacuum in the HUT.
 - g. When the VCT level is about 50%, place a charging pump in service as per SOP 3.1, step 4.1 and commence filling the RCS through both the charging and seal injection flow paths.
 - h. Adjust charging pump speed and transfer valve (1289) as necessary to achieve a stable level in the VCT and a desired fill rate.
 - i. Monitor #23 HUT pressure closely during the transfer operation. If pressure drops below 5 psig decrease the transfer rate. If pressure drops to 1 psig stop the transfer by shutting the transfer line valve (1289). Do not reinitiate transfer until pressure is restored to approximately 10 psig.
 - j. When level in #23 HUT has decreased below 30% the nitrogen regulator may be reset for its normal pressure.

NOTE: With 10 psig in the tank there should be sufficient gas volume at this point to allow transfer of the remainder of the tank contents before pressure drops below 1 psig.

k. Normal letdown may be re-established, if desired, once the transfer from the holdup tank has been verified to be proceeding satisfactorily

5.1.8 When transfer of the holdup tank contents has been completed, close the transfer line valve (1289), stop the recirculation pump and restore all valves positioned in steps 5.1.1 through 5.1.4 above to their normal positions.

5.1.9 Lock the transfer valve (1289) in the closed position.

5.2 Filling from #22 CVCS Holdup Tank

5.2.1 Isolate #22 HUT from possible sources of unborated water by closing the following valves:

1100 RCDT pump discharge	shut	_____
1133 Concentrates Tank discharge	shut	_____
1182A Evaporator Recirc. inlet	shut	_____
1247 Monitor Tank pump discharge	shut	_____

5.2.2 Line up valves to recirculate #22 CVCS holdup tank as follows:

1270 #21 HUT Recirc. suction	tag shut	_____
1128 #23 HUT Recirc. suction	tag shut	_____
1126 #22 HUT Recirc. suction	open	_____
1113 Recirc. pump suction	open	_____
1109 Recirc. pump discharge	shut	_____
1299 Recirc. pump Recirc discharge	open	_____
1298 #21 HUT Recirc. inlet	shut	_____
1296 #23 HUT Recirc. inlet	shut	_____
1297 #22 HUT Recirc. inlet	open	_____
1122 #22 HUT drain	shut	_____
1125B #22 HUT outlet	shut	_____

5.2.3 Recirculate #22 HUT with the recirculation pump.

5.2.4 Line up valves to pressurize #22 HUT as follows:

1269 Vent header isolation	shut	_____
1102 #21 HUT vent header	shut	_____
1264 #23 HUT vent header	shut	_____
1263 #22 HUT vent header	open	_____
1121 #21 HUT drain	tag shut	_____
1123 #23 HUT drain	tag shut	_____
1125A #21 outlet	tag shut	_____
1125C #23 outlet	tag shut	_____
1119 #22 HUT inlet	shut	_____

CAUTION: Whenever the normally locked open vent header valve for a CVCS holdup tank is closed, the suction valves to the gas stripper feed pump and recirculation pump and tank drain valve are to be tagged shut to avoid drawing a vacuum in the tank.

- 5.2.5 Adjust PCV-1049, Holdup Tank Nitrogen Regulator, to maintain 10 psig in No. 22 Holdup tank.
- 5.2.6 When No. 22 holdup tank has been recirculating for a minimum of two hours sample its contents for boron concentration and verify that the concentration is greater than or equal to that required for cold shutdown.
- 5.2.7 Commence transfer of #22 HUT to the Volume Control tank (VCT) as follows:
 - a. Isolate normal letdown.
 - b. Throttle #22 HUT recirc. inlet valve (1297) until the recirculation pump discharge pressure is about 50 psig.
 - c. Gradually open valve (1289) at the inlet to the reactor coolant filter.
 - d. Observe the level in the VCT to be increasing.
 - e. VCT pressure should be maintained with N₂ at less than 30 psig during transfer of water from the HUT.
 - f. Rate of fill shall be controlled to avoid drawing a vacuum in the HUT.
 - g. When the VCT level is about 50%, place a charging pump in service as per SOP-3.1, step 4.1 and commence filling the RCS through both the charging and seal injection flow paths.
 - h. Adjust charging pump speed and transfer valve (1289) as necessary to achieve a stable level in the VCT and a desired fill rate.
 - i. Monitor #22 HUT pressure closely during the transfer operation. If pressure drops below 5 psig decrease the transfer rate. If pressure drops to 1 psig, stop the transfer by shutting the transfer line valve (1289). Do not reinitiate transfer until pressure is restored to approximately 10 psig.

- j. When level in #22 HUT has decreased below 30% the nitrogen regulator may be reset for its normal pressure.

NOTE: With 10 psig in the tank there should be sufficient gas volume at this point to allow transfer of the remainder of the tank contents before pressure drops below 1 psig.

- k. Normal letdown may be re-established, if desired, once the transfer from the holdup tank has been verified to be proceeding satisfactorily.

5.2.8 When transfer of the holdup tank contents has been completed, close the transfer line valve (1289), stop the recirculation pump and restore all valves positioned in steps 5.2.1 through 5.2.4 above to their normal positions.

5.2.9 Lock the transfer valve (1289) in the closed position.

5.3 Filling from #21 CVCS Holdup Tank

- 5.3.1 Isolate #21 HUT from possible sources of unborated water by closing the following valves:

1100	RCDT pump discharge	shut	_____
1133	Concentrates Tank discharge	shut	_____
1211	Evaporator Recirculation inlet	shut	_____
1247	Monitor tank pump discharge	shut	_____

- 5.3.2 Line up valves to recirculate #21 CVCS Holdup Tank as follows:

1128	#23 HUT recirc. suction	tag shut	_____
1126	#22 HUT recirc. suction	tag shut	_____
1270	#21 HUT recirc. suction	open	_____
1113	Recirc. pump suction	open	_____
1109	Recirc. pump discharge	shut	_____
1299	Recirc pump recirc. discharge	open	_____
1296	#23 HUT recirc. inlet	shut	_____
1297	#22 HUT recirc. inlet	shut	_____
1298	#21 HUT recirc. inlet	open	_____
1121	#21 HUT drain	shut	_____
1125A	#21 HUT outlet	shut	_____

- 5.33 Recirculate #21 HUT with the recirculation pump.

5.3.4 Line up valves to pressurize #21 HUT as follows:

1269	Vent header isolation	shut	_____
1264	#23 HUT vent header	shut	_____
1263	#22 HUT vent header	shut	_____
1102	#21 HUT vent header	open	_____
1123	#23 HUT drain	tag shut	_____
1122	#22 HUT drain	tag shut	_____
1125C	#23 outlet	tag shut	_____
1125B	#22 outlet	tag shut	_____
1104	#21 HUT Inlet	shut	_____

CAUTION: Whenever the normally locked open vent header valve for a CVCS holdup tank is closed, the suction valves to the gas stripper feed pump and recirculation pump and tank drain valve are to be tagged shut to avoid drawing a vacuum in the tank.

5.3.5 Adjust PCV-1049, Holdup Tank Nitrogen Regulator, to maintain 10 psig in No. 21 Holdup Tank.

5.3.6 When No. 21 holdup tank has been recirculating for a minimum of two hours sample its contents for boron concentration and verify that the concentration is greater than or equal to that required for cold shutdown.

5.3.7 Commence transfer of #21 HUT to the Volume Control Tank (VCT) as follows:

- a. Isolate normal letdown.
- b. Throttle #21 HUT recirc. inlet valve (1298) until the recirculation pump discharge pressure is about 50 psig.
- c. Gradually open valve (1289) at the inlet to the reactor coolant filter.
- d. Observe the level in the VCT to be increasing.
- e. VCT pressure should be maintained with N₂ at less than 30 psig during transfer of water from the HUT.
- f. Rate of fill shall be controlled to avoid drawing a vacuum in the HUT.

- g. When the VCT level is about 50%, place a charging pump in service as per SOP-3.1, step 4.1 and commence filling the RCS through both the charging and seal injection flow paths.
- h. Adjust charging pump speed and transfer valve (1289) as necessary to achieve a stable level in the VCT and a desired fill rate.
- i. Monitor #21 HUT pressure closely during the transfer operation. If pressure drops below 5 psig decrease the transfer rate. If pressure drops to 1 psig, stop the transfer by shutting the transfer line valve (1289). Do not re-initiate transfer until pressure is restored to approximately 10 psig.
- j. When level in #21 HUT has decreased below 30% the nitrogen regulator may be reset for its normal pressure.

NOTE: With 10 psig in the tank there should be sufficient gas volume at this point to allow transfer of the remainder of the tank contents before pressure drops below 1 psig.

- k. Normal letdown may be re-established if desired once the transfer from the holdup tank has been verified to be proceeding satisfactorily.

5.3.8 When transfer of the hold up tank contents has been completed, close the transfer line valve (1289), stop the recirculation pump and restore all valves positioned in steps 5.3.1 through 5.3.4 above to their normal positions.

5.3.9 Lock the transfer valve (1289) in the closed position.

6.0 Method "B" - filling via the VCT from blended makeup

- 6.1 Set controls for blended makeup for the desired boron concentration (see Graphs book) of water to be added.
- 6.2 Place the make up mode selector switch in the "MANUAL" position.
- 6.3 Place makeup control switch in the "START" position.

- 6.4 Verify VCT level is greater than 40% and a N₂ cover gas is being maintained between 20 and 30 psig.
 - 6.5 Place a charging pump in service as per SOP-3.1, step 4.1 and commence filling the RCS through both the charging and seal injection flow paths.
 - 6.6 Adjust charging pump speed to maintain about 50% level in the VCT.
- 7.0 Method "C" - Filling via the VCT from RWST
- 7.1 Open the RWST outlet valve (LCV-112 B) to the charging pumps.
 - 7.2 Close the VCT discharge valve (LCV-112C).
 - 7.3 Place a charging pump in service as per SOP-3.1, step 4.1 and commence filling the RCS through both the charging and seal injection flow paths.
 - 7.4 Adjust charging pump speed to maintain the desired fill rate.
- 8.0 Method "D" - Filling via RHR from the RWST
- 8.1 Verify that the RHR miniflow valves (743, 1870) are open.
 - 8.2 Close the RHR heat exchanger discharge valves (HCV-638, HCV-640).
 - 8.3 Open the RHR pumps suction valve (MOV-882) from the RWST.
 - 8.4 Close the RHR pumps suction valves (MOV-730, MOV-731) from RCS loop 22.
 - 8.5 Start a RHR pump if one isn't already running.
 - 8.6 Commence filling the RCS at the desired rate by opening the RHR heat exchanger discharge valves (HCV-638, HCV-640).

TABLE I

Component and Piping Vent Points

Component/Piping Description	Valve No.	Remarks
* 2" Safety Injection Line to Loop No. 21 Hot Leg (Line No. 56)	S29	After check valves Blind Flange
* 2" Safety Injection Line to Loop No. 23 Hot Leg (Line NO.56)	S30	After Check Valves, Blind Flange
* 2" Safety Injection Line to Loop No. 22 Cold Leg (Line No. 16)	S22	After Check Valves, Blind Flange
* 2" Safety Injection Line to Loop No. 24 Cold Leg (line No. 16)	S23	After Check Valves, Plug installed
* Regenerative Heat Exchanger	C59	Channel Head Vent, Blind Flange
* Excess Letdown Heat Exchanger	1158a	Channel Head Vent, Cap
* Auxiliary Spray	C-55	Blind Flange
Non-Regenerative Heat Exchanger	1158C	Channel Head Vent, Blind Flange
Reactor Coolant Filter	304A	Blind Flange
Reactor Coolant Filter Bypass	306	Crack Open then Close
Seal Water Return Filter	224A	Blind Flange
Seal Water Return Filter Bypass	221A	Crack Open then Close
Seal Water Return Heat Exchanger	224C	Channel Head Vent, Blind Flange
Seal Water Return Heat Exchanger Bypass	221B	Crack Open then Close
Seal Water Supply Filter	239E	Blind Flange
Seal Water Supply Filter	239F	Blind Flange
Seal Water Supply Filter Bypass	248	Crack Open then Close

Note: * - Inside Containment

TABLE II

Component and Piping Vent Points

<u>Component/Piping Description</u>	<u>Valve No.</u>	<u>Remarks</u>
Reactor Coolant System		
Reactor Vessel Head Vent	500	Blind Flange
Pressurizer Vent	527	Blind Flange
Reactor Coolant Pump No. 21		
Seal Water Supply	254A	Blind Flange
No. 1 Seal Bypass	255A	Blind Flange
No. 1 Seal Return	242A	Blind Flange
Reactor Coolant Pump No. 22		
Seal Water Supply	254B	Blind Flange
No. 1 Seal Bypass	255B	Blind Flange
No. 1 Seal Return	242B	Blind Flange
Reactor Coolant Pump No. 23		
Seal Water Supply	254C	Blind Flange
No. 1 Seal Bypass	255C	Blind Flange
No. 1 Seal Return	242C	Blind Flange
Reactor Coolant Pump No. 24		
Seal Water Supply	254D	Blind Flange
No. 1 Seal Bypass	255D	Blind Flange
No. 1 Seal Return	242D	Blind Flange

TABLE III

Instrumentation Vent Points

Transmitter Description	No.	Location
* Pressurizer Pressure	PT474	Rack 19, Elev. 68'
	PT455	Rack 19, Elev. 68'
	PT456	Rack 19, Elev. 68'
	PT457	Rack 19, Elev. 68'
	PT458A	Rack 19, Elev. 68'
* Pressurizer Level	LT459	Rack 19, Elev. 68'
	LT460	Rack 19, Elev. 68'
	LT461	Rack 19, Elev. 68'
	LT462	Rack 19, Elev. 68'
* Loop No. 21 Flow	FT414	Rack 20, Elev. 68'
	FT415	Rack 20, Elev. 68'
	FT416	Rack 20, Elev. 68'
* Loop No. 22 Flow	FT424	Rack 20, Elev. 68'
	FT425	Rack 20, Elev. 68'
	FT426	Rack 20, Elev. 68'
* Loop No. 23 Flow	FT434	Rack 20, Elev. 68'
	FT435	Rack 20, Elev. 68'
	FT436	Rack 20, Elev. 68'
* Loop No. 24 Flow	FT444	Rack 20, Elev. 68'
	FT445	Rack 20, Elev. 68'
	FT446	Rack 20, Elev. 68'
* RCS Wide Range Pressure **	PT403	Stm.Gen. No.24, Elev.46'
Low Pressure Letdown Pressure**	PT135	PAB, Elev. 98'
Low Pressure Letdown Flow	FT134	PAB, Elev. 98'
Charging Line Pressure	PT142	PAB, Elev. 80'
Charging Line Flow	FT128	Penetration Area, Elev.51'
* Excess Letdown Pressure	PT121	Outside Ringwall, Elev.46'
* Reactor Coolant Pump No. 21		
Labyrinth Seal ΔP	PT147	Rack 23, Elev. 68'
No. 1 Seal ΔP	PT188	Rack 23, Elev. 68'
No. 1 Seal Return Low Flow	FT159A	Outside Ringwall, Elev.46'
No. 1 Seal Return High Flow	FT159B	Outside Ringwall, Elev.46'
* Reactor Coolant Pump No. 22		
Labyrinth Seal ΔP	PT145	Rack 23, Elev. 68'
No. 1 Seal ΔP	PT187	Rack 23, Elev. 68'
No. 1 Seal return Low Flow	FT158A	Outside Ringwall, Elev.46'
No. 1 Seal Return High Flow	FT158B	Outside Ringwall, Elev.46'
* Reactor Coolant Pump No. 23		
Labyrinth Seal ΔP	PT131	Rack 23, Elev. 68'
No. 1 Seal ΔP	PT186	Rack 23, Elev. 68'
No. 1 Seal return Low Flow *	FT157A	Outside Ringwall, Elev.46'
No. 1 Seal retrun High Flow	FT157B	Outside Ringwall, Elev.46'

TABLE III (Continued)

Indicator - Controller Description	No.	Location
Reactor Coolant Pump No. 24		
Labyrinth Seal ΔP	PT124	Rack 23, Elev. 68'
No. 1 Seal ΔP	PT183	Rack 23, Elev. 68'
No. 1 Seal Return Low Flow	FT156A	Outside Ringwall, Elev. 46'
No. 1 Seal Return High Flow	FT156B	Outside Ringwall, Elev. 46'
Seal Water Supply Filter P	PIC189	PAB, Elev. 80'
RCP No. 21 Seal Bypass Flow	FIC176	Outside Ringwall, Elev. 46'
RCP No. 22 Seal Bypass Flow	FIC172	Outside Ringwall, Elev. 46'
RCP No. 23 Seal Bypass Flow	FIC171	Outside Ringwall, Elev. 46'
RCP No. 24 Seal Bypass Flow	FIC166	Outside Ringwall, Elev. 46'
RCP No. 21 Seal Injection Flow	FII144	Penetration Area, Elev. 51'
RCP No. 22 Seal Injection Flow	FII143	Penetration Area, Elev. 51'
RCP No. 23 Seal Injection Flow	FII116	Penetration Area, Elev. 51'
RCP No. 24 Seal Injection Flow	FII115	Penetration Area, Elev. 51'

Notes:

- * - Inside Containment
- ** - Notify CCR Before venting