Nuclear Operating Company

South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

August 31, 2011
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File No.: G25
10 CFR 50.55a

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
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South Texas Project
Units 1 and 2
Docket Nos. STN 50-498, 50-499
Request for Relief from ASME Section XI Table IWB-2500-1 for Leak Testing
Boundaries of Class 1 Pressure-Retaining Components" (RR-ENG-3-06)

Reference: NRC Office of Nuclear Reactor Regulation to Edward D. Halpin, STP Nuclear Operating Company, "South Texas Project (STP), Units 1 and 2 – Authorization of Relief Request No. RR-ENG-2-51 on System Pressure Test of Class 1, 2, and 3 Systems (TAC Nos. MD8951 and MD8952)," November 12, 2008 (ML082770785)

In accordance with the provisions of 10 CFR 50.55a(a)(3)(i) and 10 CFR 50.55a(a)(3)(ii), STP Nuclear Operating Company (STPNOC) submits this request for relief from the requirements of ASME Section XI Table IWB-2500-1 for examination of Class 1 pressure-retaining components for the third 10-year inspection interval. Approval of this relief request will exempt Class 1 components from being tested at full Reactor Coolant System pressure if they are normally isolated from full Reactor Coolant System pressure. Alternatives are proposed because either: (1) they provide an acceptable level of quality and safety, or (2) compliance with the requirements as specified would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Similar relief was requested for the second inspection interval and approved by the NRC in correspondence referenced above.

STPNOC requests NRC approval by February 28, 2012, to modify the system leakage tests to support examinations to be performed in the third 10-year inservice inspection interval for Unit 1 (September 25, 2010 to September 24, 2020) and Unit 2 (October 19, 2010 to October 18, 2020).

There are no commitments included with this request.

If there are any questions, please contact either Mr. P. L. Walker at (361) 972-8392 or me at (361) 972-7904.

Marco Ruvalcaba
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PLW

Attachments:
1. Request for Relief from ASME Section XI Table IWB-2500-1 for Leak Testing Boundaries of Class 1 Pressure-Retaining Components
2. Scope of Relief Request Applicability
3. Piping and Instrumentation Diagrams

A047
NRR

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ATTACHMENT 1

SOUTH TEXAS PROJECT

UNITS 1 AND 2

RELIEF REQUEST RR-ENG-3-06

REQUEST FOR RELIEF FROM ASME SECTION XI CODE TABLE IWB-2500-1 FOR LEAK TESTING BOUNDARIES OF CLASS 1 PRESSURE-RETAINING COMPONENTS

SOUTH TEXAS PROJECT
UNITS 1 AND 2
RELIEF REQUEST RR-ENG-3-06
REQUEST FOR RELIEF FROM ASME SECTION XI CODE TABLE IWB-2500-1 FOR LEAK TESTING BOUNDARIES OF CLASS 1 PRESSURE-RETAINING COMPONENTS

1. ASME Code Components Affected

ASME Code Class:	Code Class 1
References:	ASME Section XI, Table IWB-2500-1 and IWB-5222(b)
Examination Category:	B-P
Item Number:	B15.10
Description:	System Leakage Test
Systems:	Pressurizer Auxiliary Spray Reactor Head Vent Reactor Coolant Low Pressure Safety Injection High Pressure Safety Injection Residual Heat Removal
Component(s):	Reactor Coolant System (RCS) pressure boundary piping segments, primarily consisting of small bore piping (≤ 2" Nominal Pipe Size (NPS)). Additional segments are portions of larger diameter piping (6", 8", 10", and 12" NPS) located between check valves and isolated from the RCS, segments required to be isolated from the RCS during operation, and segments isolated from the RCS and continually under static pressure and monitored for loss of pressure. The subject piping segments are constructed of austenitic stainless steel materials.

2. Applicable Code

The South Texas Project Inservice Inspection program for the third ten-year interval complies with the requirements of ASME Section XI, 2004 Edition, no addenda, as modified by approved relief requests. IWB-2500, Table IWB-2500-1, Code Category B-P, Item Number B15.10 requires that Class 1 pressure-retaining components be Visual, VT-2 examined each refueling outage. The required system pressure test can be a system leakage test. Pursuant to IWB-5221(a), a system leakage test is performed at a pressure not less than the pressure corresponding to 100% rated reactor power.

- Per IWB-5222(a), the pressure-retaining boundary during the system leakage test shall correspond to the reactor coolant boundary, with all valves in the position required for normal reactor operation startup. The visual examination shall, however, extend to and include the second closed valve at the boundary extremity.

- Per IWB-5222(b), the pressure-retaining boundary during the system leakage test conducted at or near the end of the interval shall extend to all Class 1 pressure-retaining components within the system boundary. IWB-5222(b) requires that portions of the Class 1 system not normally pressurized to the RCS pressure associated with 100% rated reactor power be pressurized to that pressure for the test.

3. Basis for Relief from Code Requirements

STP Nuclear Operating Company (STPNOC) requests relief from applying a system leakage test at full RCS pressure to Class 1 components normally isolated from RCS pressure. Alternatives are proposed because either: (1) they provide an acceptable level of quality and safety; or (2) compliance with the requirements as specified in the Code would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Note that hardships associated with testing performed in accordance with the referenced Code requirements are:

- Special valve lineups required for these tests add unnecessary challenges to the system configuration. There are no test connections between isolation valves. Consequently, a system pressure test would require opening the first manual isolation valve to test the second isolation valve.

- The affected components are located inside containment. Being radiologically restricted, tests performed inside this area increase the total exposure to plant personnel while system lineups are modified and restored, as well as lead to contamination of test equipment.

- Use of single valve isolation for systems with design pressures less than that of full RCS pressure could result in over-pressurization of these systems with resultant damage to permanent plant equipment.

- Use of single valve isolation is a significant personnel safety hazard.

- There are no connections available to test the piping between motor-operated valves in the Residual Heat Removal system.

- Leakage past isolation valves to the RCS during system leakage tests could affect the RCS boron concentration and complicate the task of maintaining homogeneous boron concentrations.

3.1 Component Group 1:

Small bore (≤ 2" NPS) piping vents, drains, and branch lines and connections in the Reactor Coolant and Reactor Head Vent Systems

These lines and connections are equipped with manual valves (or manually actuated motor-operated valves) providing double isolation of the reactor coolant pressure boundary. These valves are generally maintained closed during normal operation. Piping outboard of the first isolation valve is not normally pressurized to the RCS pressure (2235 psig) associated with 100% rated reactor power. Under normal operating conditions, these lines and connections are subject to RCS pressure and temperature only if there is leakage past the inboard isolation valves.

Because these lines and connections typically do not have test connections that would allow them to be individually pressure-tested without design modifications, the inboard valves must be opened to pressurize these lines and connections to full RCS operating pressure to perform the IWB-5222(b) system pressure test. Pressurization by this method defeats the double isolation feature and presents significant personnel safety concerns for personnel performing the test.

Performing this test with the inboard isolation valve open requires several man-hours to position and cycle these valves for the test and restore the valves after the test is complete. Most of these valves are located in close proximity to RCS loop piping; pressure-testing requires personnel entry into high radiation areas. Based on previous outage dose rate data, estimated radiation exposure associated with scaffold erection and valve alignment and realignment would result in an additional 16 person-rem. Typical personnel dose during a refueling outage at the South Texas Project is 70 person-rem. An additional 16 person-rem would be a substantial increase.

3.2 Component Group 2:

Accumulator Injection to RCS Cold Legs A, B, and C

The pipe segments of Group 2 are part of the Safety Injection System and Residual Heat Removal System and are continuously pressurized to 650 psig because they are in the injection flow path from the safety injection accumulator tanks. Under normal operating conditions, these lines and connections are subject to RCS operating pressure and temperature only if there is leakage past the inboard check valves.

Performing the IWB-5222(b) system pressure test on these segments requires installation of a pump to pressurize the pipe segment between inboard and outboard check valves to RCS operating pressure. Such pressurization may result in over-pressurization of the adjoining systems. Use of a hydrostatic pump for pressurization creates personnel safety hazards and is expected to result in an estimated additional 0.2 person-rem.

3.3 Component Group 3:

RCS Hot Leg Safety Injection Flowpath

The pipe segments of Group 3 are in Safety Injection System and Residual Heat Removal System piping between check valves and are not normally pressurized to RCS operating pressure (2235 psig). Under normal operating conditions, these lines and connections are subject to RCS operating pressure and temperature only if there is leakage past the inboard check valves.

Pressurizing these segments to perform the IWB-5222(b) system pressure test requires connecting jumpers from the RCS to circumvent the inboard check valves. Such pressurization may over-pressurize the adjoining systems. This activity represents a significant personnel safety hazard and is expected to result in an estimated additional 0.2 person-rem.

3.4 Component Group 4:

Residual Heat Removal (RHR) Suction

The pipe segments in Group 4 are part of the RHR system. Pressurizing these segments to full plant operating pressure to perform the IWB-5222(b) system pressure test requires opening isolation valves XRH0060A ("A" train), XRH0060B ("B" train), and XRH0060C ("C" train). These isolation valves are required to be closed when the plant is in Mode 1, 2, or 3, and are interlocked to prevent opening when the RHR system could be exposed to RCS pressure exceeding its design pressure. Under normal operating conditions, these lines and connections are subject to RCS operating pressure and temperature only if there is leakage past the inboard isolation valves. In addition, this test would leave only one isolation valve (XRH0061) as protection for the Residual Heat Removal system from damage that would result from exposure to the equivalent of RCS operating pressure.

To test when not in Mode 1, 2, or 3, temporary high pressure hoses with a hydrostatic pump would have to be installed to pressurize these segments, introducing a personnel safety hazard if the connection or hose fails, and could over-pressurize the RHR system if the outboard valve does not provide isolation.

3.5 Component Group 5:

Charging and Alternate Charging

Charging and alternate charging are provided from a common header. Service alternates between them annually.

Charging pipe segments (between upstream check valves) are pressurized when the piping is in service, which is required when reactor coolant system letdown is required. If letdown is in service, charging must continue for removal of letdown flow heat. Isolation check valves (XCV0001 / XCV0004) open when the differential pressure between the charging system and the operating reactor coolant system exceeds 200 psi. The IWB-5222(b) system pressure test requires that charging be made unavailable so that RCS equivalent pressure can be sustained for the test. Letdown would not be available during the test so

that RCS pressure remains high enough to ensure that the isolation check valve does not open and initiate charging.

Alternate charging pipe segments are isolated from the operating side by a motor-operated isolation valve (MOV0003 / MOV0026). Pressurizing a segment to perform the IWB-5222(b) system pressure test requires draining the pipe segment between the outboard check valve (XCV0002 / XCV0005) and the closed upstream isolation valve. Under normal operating conditions, a segment is subject to RCS operating pressure and temperature only if there is leakage past the inboard check valve.

Auxiliary Pressurizer Spray

These pipe segments are part of the auxiliary pressurizer spray system, which is not normally pressurized. Pressurizing a segment to perform the IWB-5222(b) system pressure test requires opening normally closed upstream isolation valve CV3119. Under normal operating conditions, a segment is subject to RCS operating pressure and temperature only if there is leakage past inboard check valve CV0009.

Water in this line is supplied from the charging system with an operating pressure greater than the RCS normal operating pressure. Opening LV3119 allows water in the auxiliary pressurizer spray line, which is at containment ambient temperature, to pass through check valve CV0009 into the main spray header and through the spray nozzle to cool the pressurizer. Performing the test with the RCS at normal operating temperature would create a thermal shock transient to the spray nozzle.

4. Proposed Alternative

Pressurization of components above their normal operating temperature and pressure during the VT-2 visual examination to detect leakage is not necessary. Where piping is provided with two isolation valves, the plant is intended to operate with the first isolation valve closed and the second isolation valve utilized only for draining or venting. Piping between two isolation valves during normal operating pressure and temperature is normally pressurized, but at a pressure lower than that of the RCS.

IWB-5222(b) requires that the pressure-retaining boundary during the system leakage test conducted at or near the end of the interval extend to all Class 1 pressure-retaining components within the system boundary. Normal operating temperature and pressure conditions are used during VT-2 examinations to detect leaks during a system leakage test. The pressure boundary integrity of these components is validated and documented using identical VT-2 visual examination requirements each refueling outage. The requested relief will apply VT-2 inspections of the Class 1 boundary beyond the first isolation valves while it is at a stabilized pressure achieved while at normal operating conditions.

STPNOC performs other surveillance procedures (i.e., Local Leakage Rate Tests) to determine leakage for these components. Examination for leakage is performed while under normal operating temperature and pressure conditions. In addition to leakage testing, boric acid inspections performed during refueling outages will also identify leakage from these components. The system leakage test as an alternative to the hydrostatic test is in addition to these surveillances.

Under this relief, the pressure-retaining boundary during the leakage test conducted at or near the end of the interval corresponds to the reactor coolant system boundary, with all valves in the normal position required for normal reactor startup and operation.

4.1 Component Group 1

Small bore (≤ 2" NPS) piping vents, drains, and branch lines and connections in the Reactor Coolant and Reactor Head Vent Systems

As an alternative to the IWB-5222(b) system pressure test requirements, this request proposes an ASME Code Section XI, Table IWB-2500-1 and IWB-5221 system leakage test with isolation valves in the normally closed position. This examination will be performed at the nominal operating pressure associated with 100% reactor power after the ASME Code-required hold time is satisfied.

4.2 Component Group 2

Accumulator Injection to RCS Cold Legs A, B, and C

As an alternative to the pressure test requirements of IWB-5222(b) for these pipe segments, STPNOC will use the pressure associated with the statically pressurized Safety Injection system.

ASME Code Case N-731, "Alternative Class 1 System Leakage Test Pressure Requirements Section XI, Division 1," addresses use of alternative Class 1 system leakage test pressure requirements in lieu of IWB-5221(a) for portions of Class 1 systems that are continuously pressurized during an operating cycle by a statically pressurized passive safety injection system. ASME approved Code Case N-731 on February 22, 2005. The NRC approved Code Case N-731 for use in Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," Revision 16 (July 2010).

4.3 Component Group 3

RCS Hot Leg Safety Injection Flowpath

As an alternative to the IWB-5222(b) system pressure test for these pipe segments, STPNOC proposes to perform this test using a reduced test pressure during the full flow check valve tests of these segments with the RCS depressurized during a refueling outage.

4.4 Component Group 4

Residual Heat Removal (RHR) Suction

As an alternative to the IWB-5222(b) system pressure test requirements for these pipe segments, STPNOC proposes to perform this test using a reduced test pressure prior to valve closure, isolating these segments in the normal preparation for mode change during startup.

4.5 Component Group 5

Charging and Alternate Charging, and Auxiliary Pressurizer Spray

The temperatures and pressures present in Class 1 components during 100% reactor power are sufficient to qualify as a System Pressure Test alternative to the 10-year Hydrostatic Test to satisfy Code Case N-498-4. Normal operating temperature and pressure are used to detect leaks under the Alternative Rules for 10-year Hydrostatic Pressure Testing.

STPNOC performs other surveillance procedures (i.e., Local Leakage Rate Tests, Contaminated Leakage Rate Tests, Isolation Check Valve Leak Tests, and Inservice Leak Rate Tests) to monitor these components for leakage. Leakage is identified using normal operating temperature and pressure conditions. In addition to leakage testing, boric acid inspections performed during refueling outages will also identify leakage from these components. The system leakage test as an alternative to the hydrostatic test of the components identified by this request is in addition to these surveillances.

As an alternative to the IWB-5222(b) system pressure test requirements, STPNOC proposes to perform the test of the auxiliary pressurizer spray at a reduced pressure when pressurizer spray is initiated for normal plant cooldown in accordance with plant operating procedures. Similarly, the alternate charging line segments will be pressure-tested in conjunction with plant procedures when alternate charging is placed in service.

5. Justification for Granting Relief

5.1 Component Group 1

Group 1 segments are lines and connections equipped with manual valves providing double isolation of the Reactor Coolant System.

Approval of this alternative is supported by:

- The non-isolable portion of the reactor coolant pressure boundary lines and connections will be pressurized and visually examined as required. While isolable small diameter lines and connections will not be pressurized to full RCS pressure, a VT-2 examination will still be performed on these components.

- A typical Group 1 line and connection includes two manual valves or one manual valve, separated by a short piece of pipe or a pipe nipple, which is connected to the reactor coolant pressure boundary via another short pipe nipple. These connections are typically socket-welded followed by a surface examination of the weld after initial installation. The piping and valves are normally heavy-walled. These lines and connections are not subject to high or cyclic loads, and design ratings are greater than operating pressure.

With this information and the implications for potential personnel safety and radiation exposure that would occur as a result of meeting the ASME Code Section XI, 2004 Edition, pressure test requirements, compliance with the pressure test requirements for Group 1 lines and connections results in an unnecessary hardship without a sufficient compensating

increase in the level of quality and safety. Therefore, STPNOC requests approval of this alternative pursuant to 10 CFR 50.55a(a)(3)(ii).

5.2 Component Group 2

As part of the Safety Injection system, Group 2 segments are continuously pressurized and monitored for loss of pressure because they are in the open injection flow path from the safety injection tanks. Under Code Case N-731, the pressure associated with a statically-pressurized passive safety injection system may be used in lieu of the requirements of IWB-5221(a). Application of Code Case N-731 is limited to safety injection systems that are under pressure for an entire operating cycle. Exposure to operating RCS pressure will only occur in the event of a leaking inboard check valve (XSI0038).

Consequently, use of this alternative provides an acceptable level of quality and safety.

5.3 Component Group 3

Group 3 piping segments are part of the Safety Injection system located between check valves isolating the system from RCS pressure.

Pressurizing a Group 3 segment to meet the IWB-5222(b) system pressure test requirements requires connecting a jumper (high pressure hose) circumventing the inboard check valve boundaries from the RCS. This is a significant personnel safety hazard and would result in unnecessary personnel radiation exposure. These segments would experience RCS pressure only in the event of a leaking inboard check valve (XSI0010). In addition, this test would leave only one check valve (XRH0020) as protection for the Residual Heat Removal system from damage that would result from exposure to the equivalent of RCS operating pressure.

Compliance with IWB-5222(b) pressure testing requirements will result in unnecessary hardship without sufficient compensating increase in the level of quality and safety. Therefore, STPNOC requests approval of this alternative pursuant to 10 CFR 50.55a(a)(3)(ii).

5.4 Component Group 4

Group 4 piping segments are in the RHR system and are not pressurized to RCS pressure during normal plant operation.

Pressurizing a Group 4 segment to meet IWB-5222(b) system pressure test requirements requires that isolation valves XRH0060A ("A" train), XRH0060B ("B" train), and XRH0060C ("C" train) be opened. These isolation valves are required to be closed when the plant is in Mode 1, 2, or 3. Alternatively, installing temporary high pressure hoses with a hydrostatic pump to pressurize these segments during the refueling outage risks additional personnel exposure and introduces a significant personnel safety hazard if the connection or hose fails in the presence of inspection personnel.

Compliance with IWB-5222(b) pressure testing requirements will result in unnecessary hardship without sufficient compensating increase in the level of quality and safety.

Therefore, STPNOC requests approval of this alternative pursuant to 10 CFR 50.55a(a)(3)(ii).

5.5 Component Group 5

- Charging and Alternate Charging

  Charging pipe segments are pressurized when the piping is in service, which is required when reactor coolant system letdown is required. If letdown is in service, charging must continue to remove letdown flow heat. Isolation check valves open when the charging system differential pressure exceeds 200 psi above the reactor coolant system operating pressure. Performing the IWB-5222(b) system pressure test requires that charging be made unavailable. Consequently, letdown would not be available during the test.

  Alternate charging pipe segments are isolated from the operating side by a motor-operated isolation valve. Pressurizing a segment to perform the IWB-5222(b) system pressure test requires draining the pipe segment between the outboard check valve and the closed upstream isolation valve. Under normal operating conditions, a segment is subject to RCS operating pressure and temperature only if there is leakage past the inboard check valve.

- Auxiliary Pressurizer Spray

  Group 5 piping segments are part of the auxiliary pressurizer spray and alternate charging lines, and are not normally pressurized during plant operation.

  Pressurizing these segments to meet the IWB-5222(b) system pressure test requirements would require that normally closed upstream isolation valve LV3119 be opened. Opening this valve would allow water in the auxiliary pressurizer spray line, which is at containment ambient temperature, to pass through a check valve into the main spray header and through the spray nozzle into the pressurizer. With the RCS at normal operating temperature, this would create a thermal shock transient to the spray nozzle. Similarly, opening XCV0006 to pressurize the alternative charging line would result in unnecessary thermal shock to piping downstream.

Compliance with the IWB-5222(b) system pressure test requirements will result in an unnecessary hardship and adverse impact to plant equipment without a sufficient compensating increase in the level of quality and safety. Therefore, STPNOC requests approval of this alternative pursuant to the provisions of 10 CFR 50.55a(a)(3)(ii).

6. Duration of Proposed Alternative

The system leakage tests as described above are to be applied to examinations performed in the third 10-year inservice inspection interval (Unit 1 - September 25, 2010 to September 24, 2020 and Unit 2 – October 19, 2010 to October 18, 2020).

7. Implementation

Approval is requested by February 28, 2012, to support completion of the inspections.

ATTACHMENT 2

SOUTH TEXAS PROJECT
UNITS 1 AND 2

RELIEF REQUEST RR-ENG-3-06

SCOPE OF RELIEF REQUEST APPLICABILITY

SCOPE OF RELIEF REQUEST APPLICABILITY

SEGMENT	FIGURE	DESCRIPTION	BOUNDARY	PIPE DIA. (in)	DESIGN PRESSURE
1-A	11	RCP Seal Injection Line Drain	CV038A and CV0595A	3/4	2740 psig
1-B	11	RCP Seal Injection Line Drain	CV038B and CV0595B	3/4	2740 psig
1-C	11	RCP Seal Injection Line Drain	CV038C and CV0595C	3/4	2740 psig
1-D	11	RCP Seal Injection Line Drain	CV038D and CV0595D	3/4	2740 psig
1-E	10	Pressurizer Safety Loop Drain	RC064A and RC0164	3/4	2485 psig
1-F	10	Pressurizer Safety Loop Drain	RC064B and RC0167	3/4	2485 psig
1-G	10	Pressurizer Safety Loop Drain	RC064C and RC0162	3/4	2485 psig
1-H	2	RCS Vent/Drain	RC0123 and RC0152	3/4	2259 psig
1-I	2	RCS Vent/Drain	RC0128 and RC0146	3/4	2217 psig
1-J	2	Shutdown Level Instr. Line (Loop 1)	RC0129 and RC0142	3/4	2259 psig
1-K	10	Shutdown Level Instr. Line (Loop 4)	RC0103 and RC0163	1	2318 psig
1-L	2	Head Vent	HV3657A and HV3658A	1	2485 psig
1-M	2	Head Vent	HV3657B and HV3658B	1	2485 psig
1-N	2	Head Vent/Drain	RC0132 to flange	1	2485 psig
1-O	2 2	Reactor Coolant Drain Tank Line (Loop 1)	RC057A and RC058A RC057A and RC0200	2 3/4	2210 psig 2210 psig
1-P	2	Reactor Coolant Drain Tank Line (Loop 2)	RC057B and RC058B	2	2210 psig
1-Q	2	Reactor Coolant Drain Tank Line (Loop 3)	RC057C and RC058C	2	2210 psig

SEGMENT	FIGURE	DESCRIPTION	BOUNDARY	PIPE DIA. (in)	DESIGN PRESSURE
1-R	2	Reactor Coolant Drain Tank Line (Loop 4)	RC057D and RC058D	2	2210 psig
1-S	11	RCS Excess Letdown	CV0083 and CV0082	2	2200 psig
1-T	10	Spray Line Vent	RC0502 and RC0503	2-1/2	2318 psig
2-A	7	Cold Leg Safety Injection	XSI0007A to XSI0038A	6, 10	650 psig
	2, 3, 6		XSI0046A to XSI0038A	12	650 psig
2-B	8	Cold Leg Safety Injection	XSI0007B to XSI0038B	6, 10	650 psig
	2, 4, 6		XSI0046B to XSI0038B	12	650 psig
2-C	9	Cold Leg Safety Injection	XSI0007C to XSI0038C	6, 10	650 psig
	2, 5, 6		XSI0046C to XSI0038C	12	650 psig
2-D	3, 7	Residual Heat Removal	XRH0032A to XSI0038A	8, 10, 12	600 psig
2-E	4, 8	Residual Heat Removal	XRH0032B to XSI0038B	8, 10, 12	600 psig
2-F	5, 9	Residual Heat Removal	XRH0032C to XSI0038C	8, 10, 12	600 psig
3-A	2, 3, 7	Hot Leg Safety Injection	XSI0009A and XSI0010A	6, 8	1260 psig
3-B	2, 4, 8	Hot Leg Safety Injection	XSI0009B and XSI0010B	6, 8	1260 psig
3-C	2, 5, 9	Hot Leg Safety Injection	XSI0009C and XSI0010C	6, 8	1260 psig
	9		SI0202 and SI0170	3/4	1260 psig
	9		SI0203 and SI0168	3/4	1260 psig
3-D	3, 7	Residual Heat Removal	XRH0020A and XSI0010A	8, 10	600 psig
3-E	4, 8	Residual Heat Removal	XRH0020B and XSI0010B	8, 10	600 psig
3-F	5, 9	Residual Heat Removal	XRH0020C and XSI0010C	8, 10	600 psig
4-A	3	RHRS Pump A Suction from Hot Leg	XRH060A and XRH061A	12	600 psig
4-B	4	RHRS Pump B Suction from Hot Leg	XRH060B and XRH061B	12	600 psig
4-C	5	RHRS Pump C Suction from Hot Leg	XRH060C and XRH061C	12	600 psig

SEGMENT	FIGURE	DESCRIPTION	BOUNDARY	PIPE DIA. (in)	DESIGN PRESSURE
5-A	1, 2	Normal Charging	XCV0001and XCV0002	4	3100 psig
5-B	1, 10	Auxiliary Spray	CV0009 and LV3119	2	3100 psig
5-C	1, 2	Alternate Charging	XCV0004 and XCV0005	4	3100 psig

ATTACHMENT 3

SOUTH TEXAS PROJECT
UNITS 1 AND 2

RELIEF REQUEST RR-ENG-3-06

PIPING AND INSTRUMENTATION DIAGRAMS

FIGURE 1: CHEMICAL AND VOLUME CONTROL SYSTEM

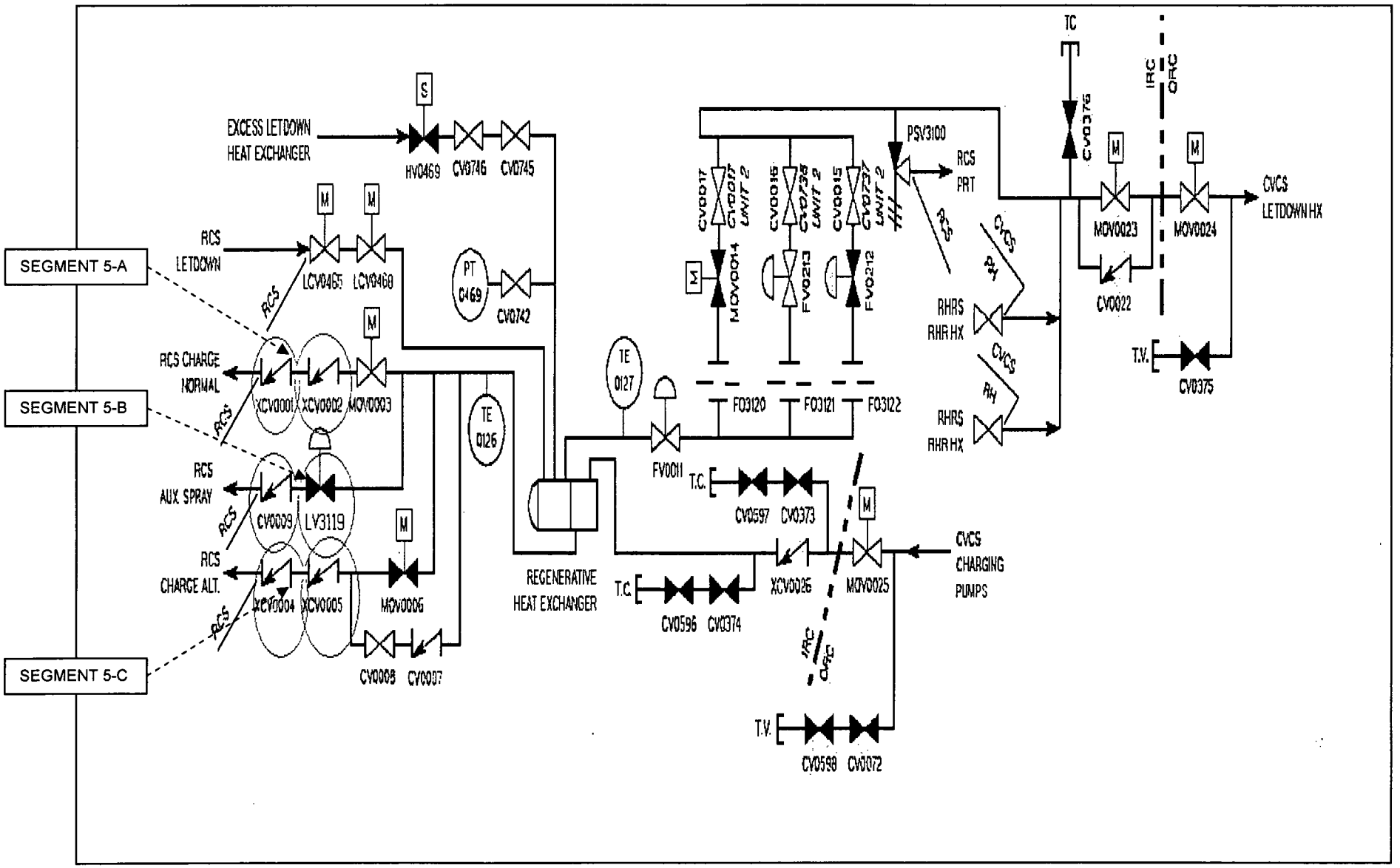

FIGURE 2: REACTOR COOLANT SYSTEM

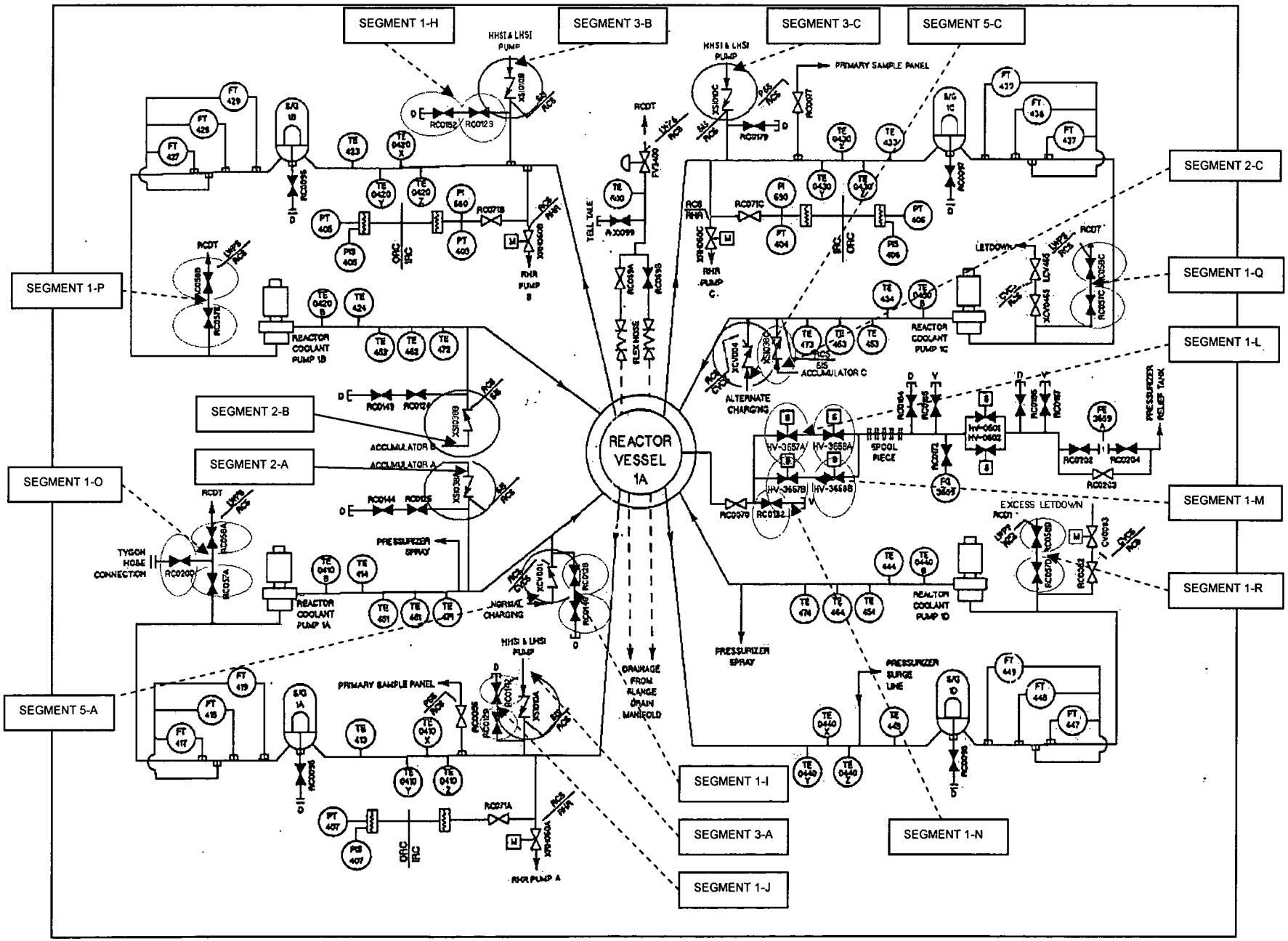

FIGURE 3: RESIDUAL HEAT REMOVAL SYSTEM TRAIN A

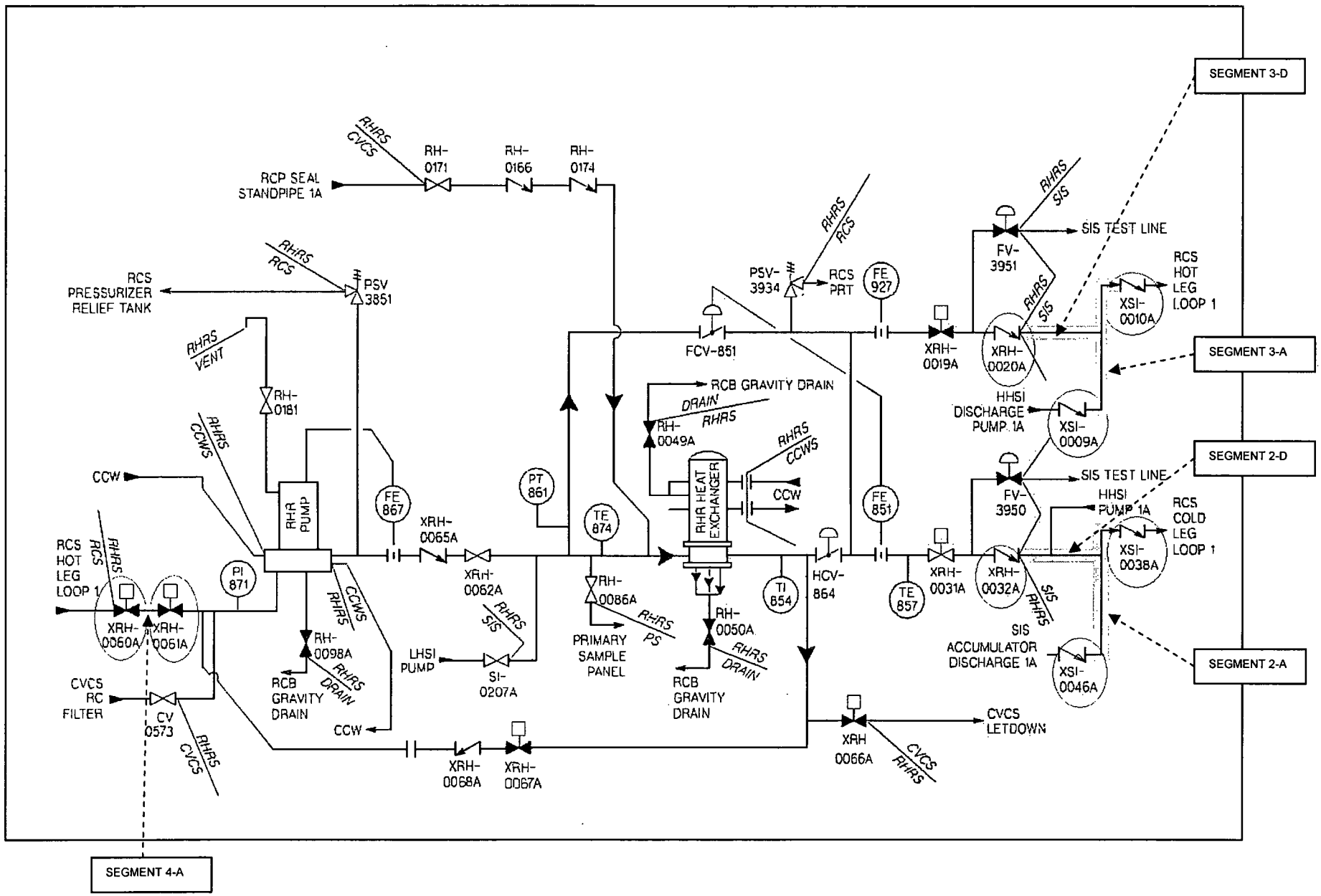

FIGURE 4: RESIDUAL HEAT REMOVAL SYSTEM TRAIN B

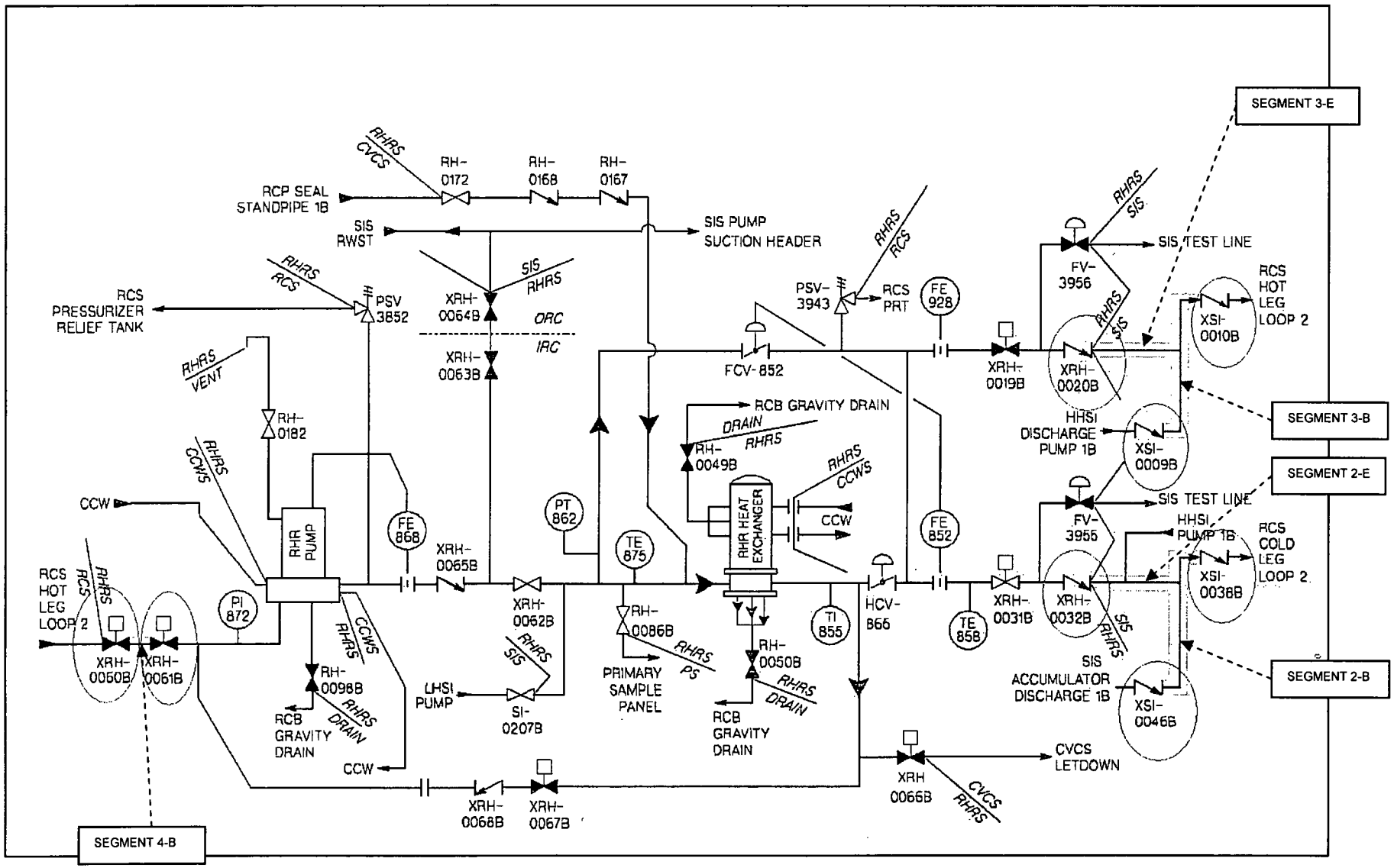

FIGURE 5: RESIDUAL HEAT REMOVAL SYSTEM TRAIN C

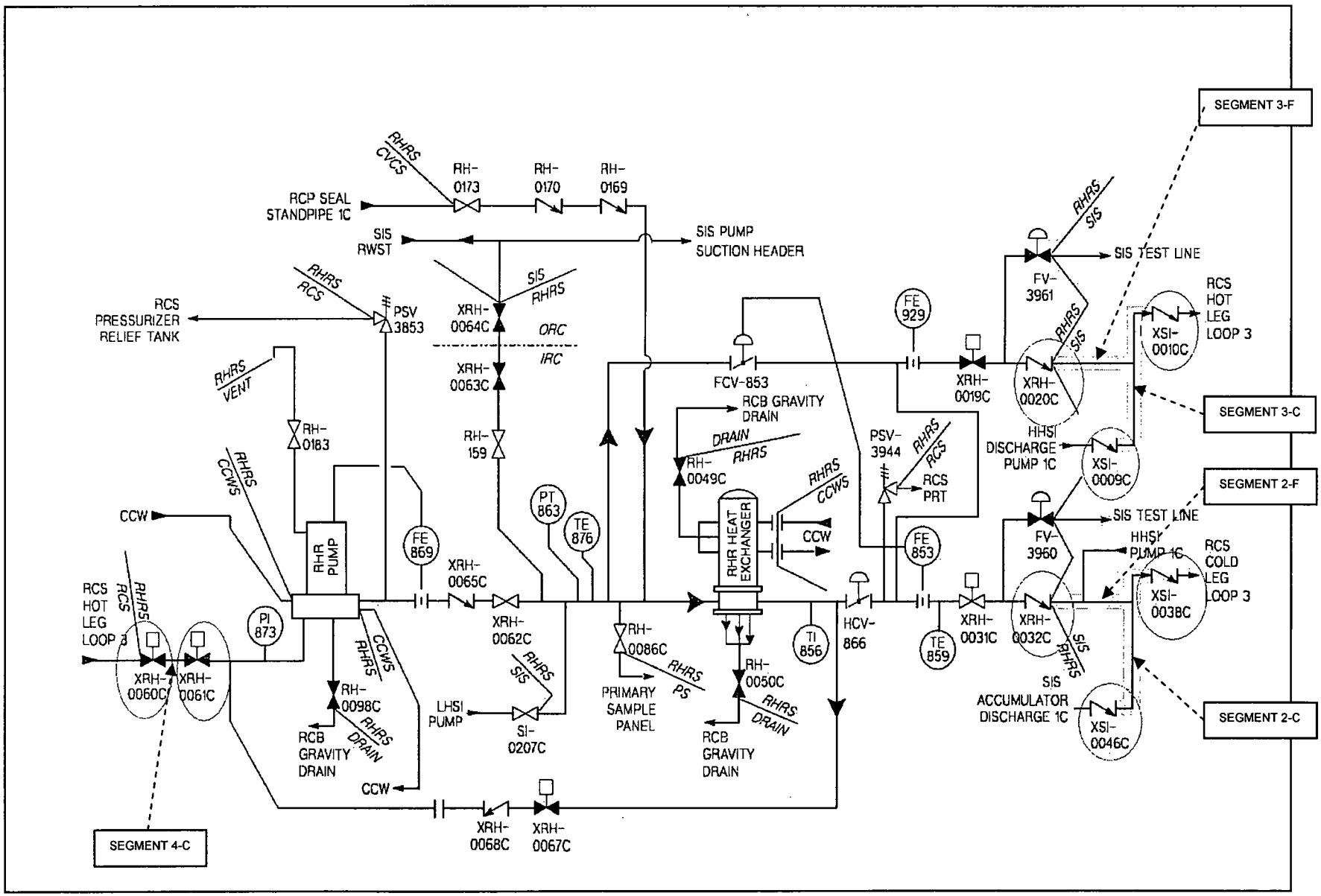

FIGURE 6: SAFETY INJECTION ACCUMULATORS

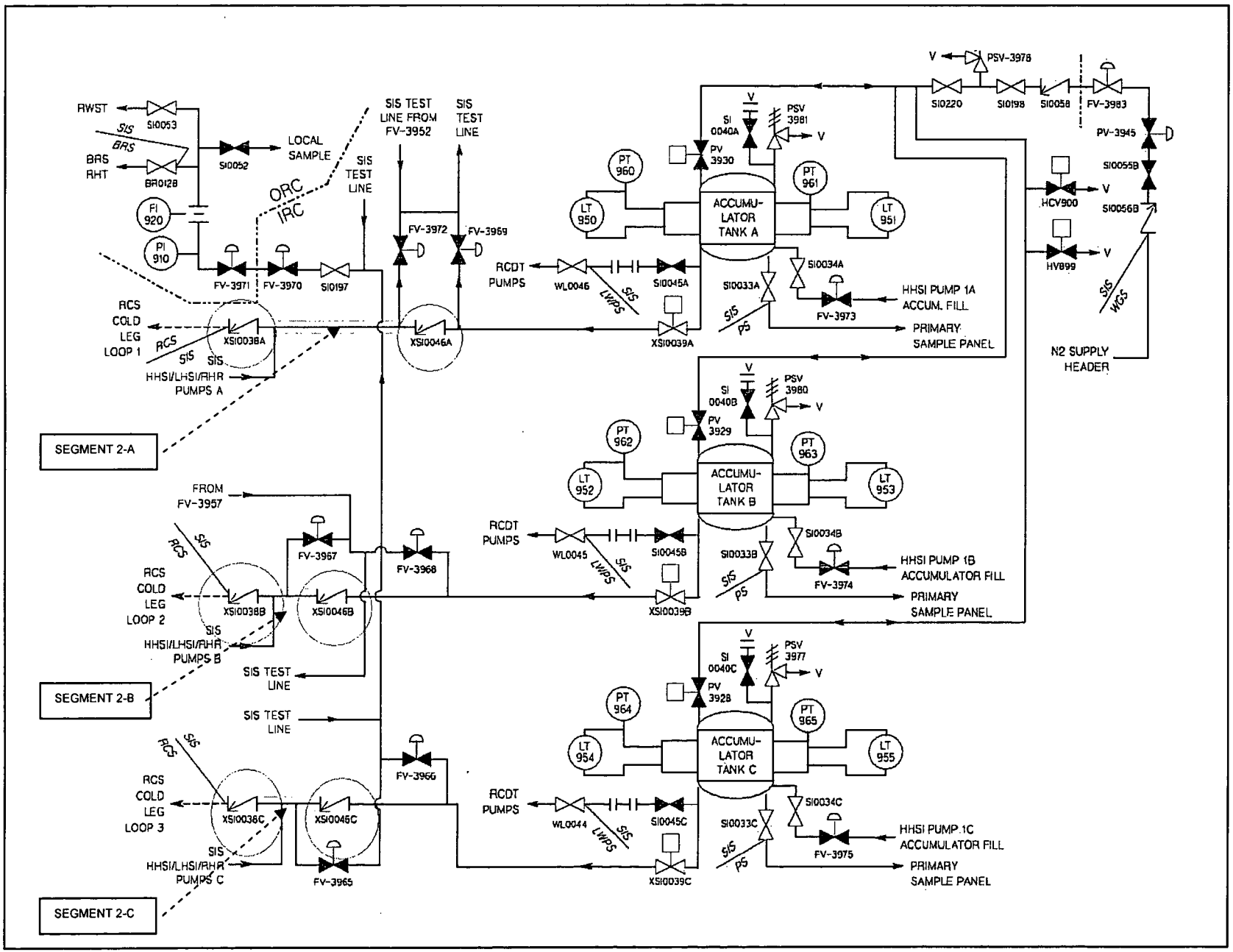

FIGURE 7: SAFETY INJECTION SYSTEM TRAIN A

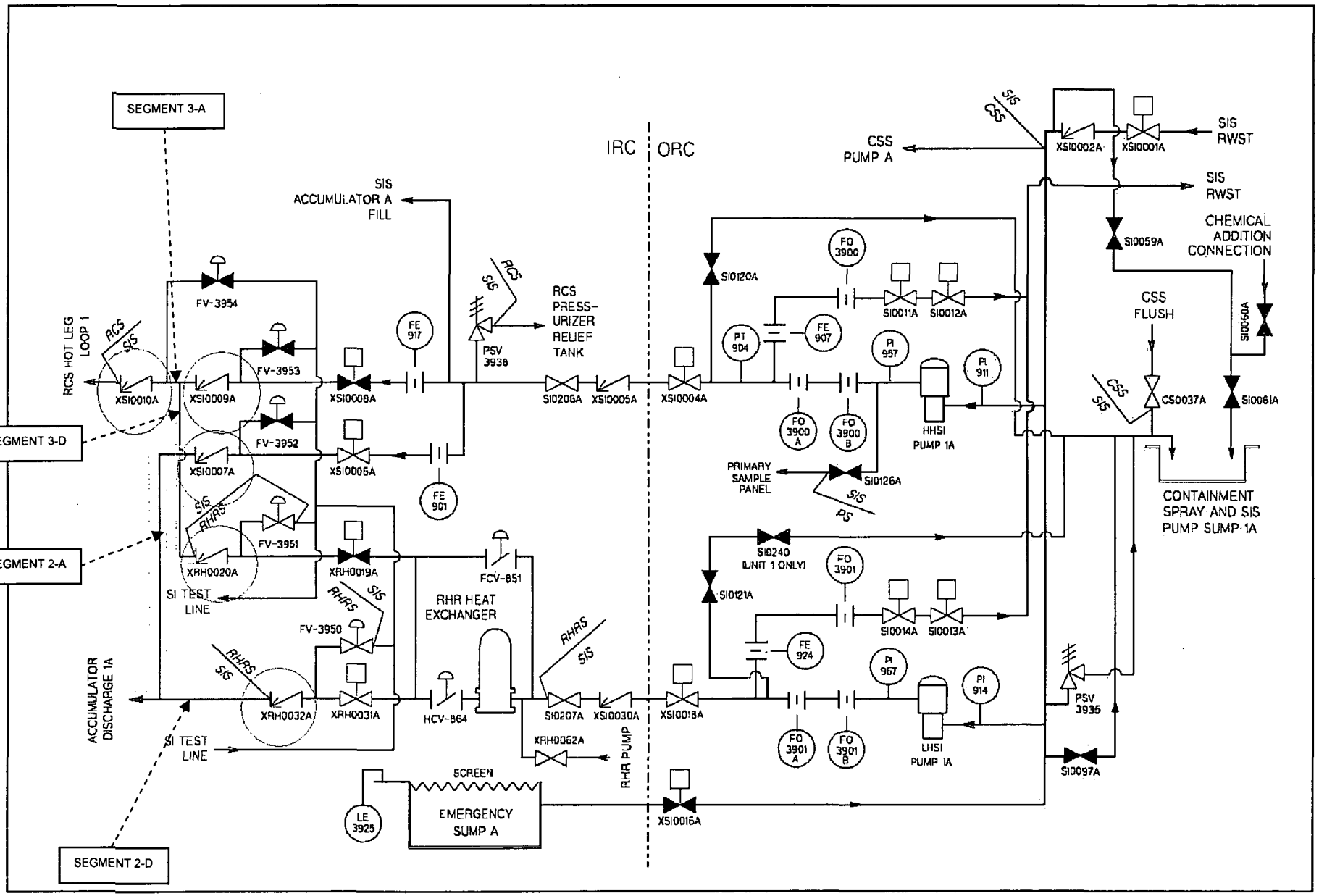

FIGURE 8: SAFETY INJECTION SYSTEM TRAIN B

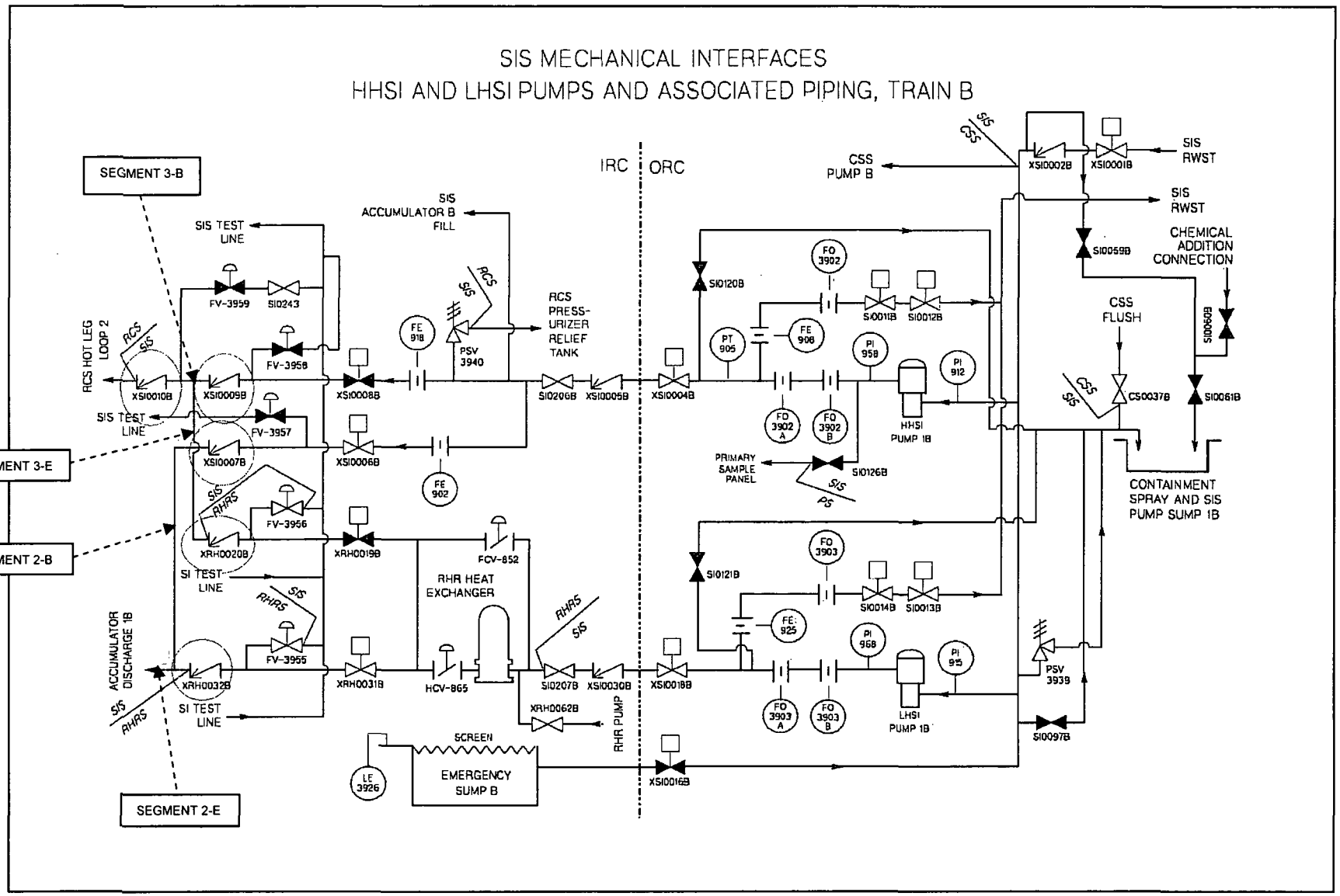

FIGURE 9: SAFETY INJECTION SYSTEM TRAIN C

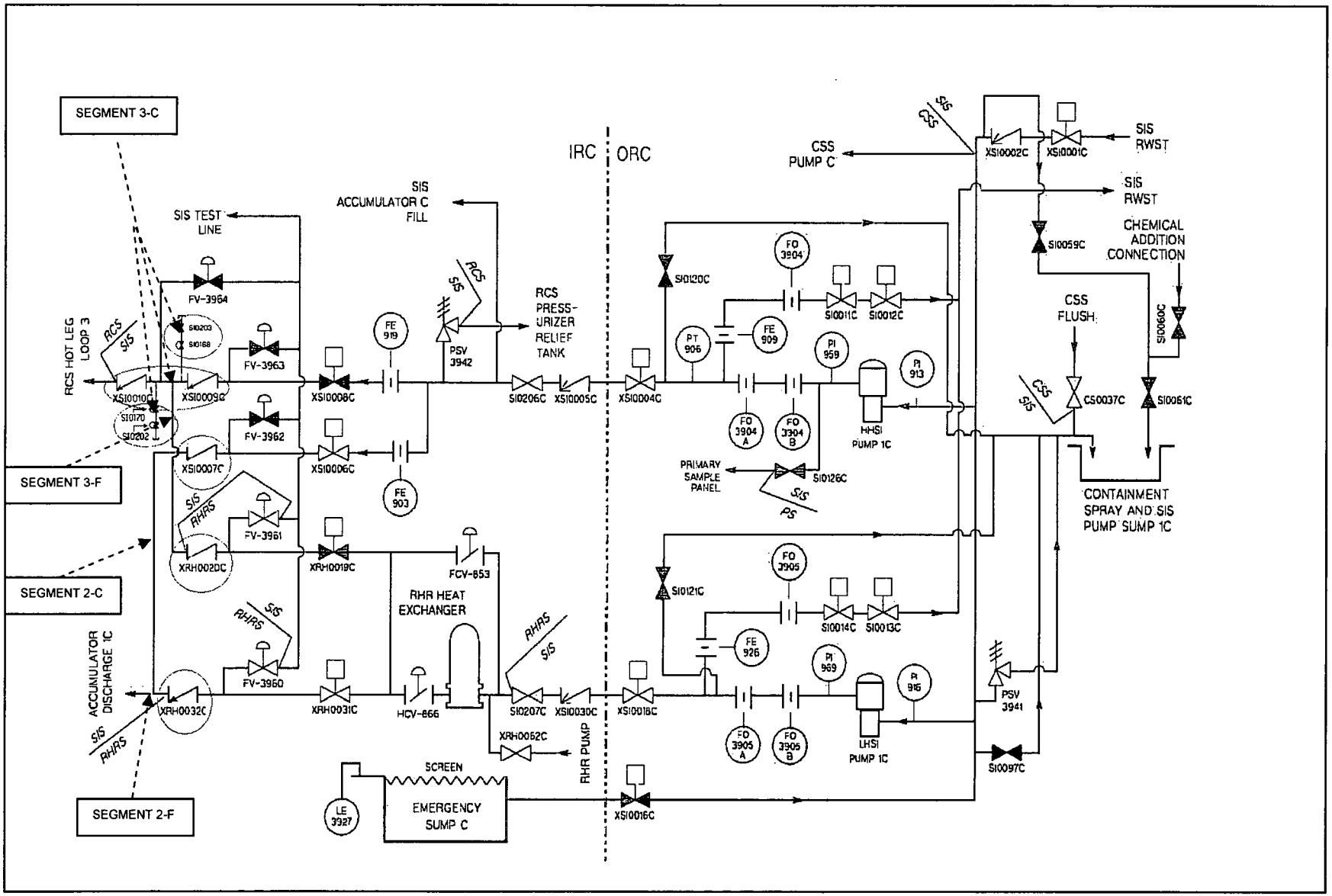

FIGURE 10: PRESSURIZER

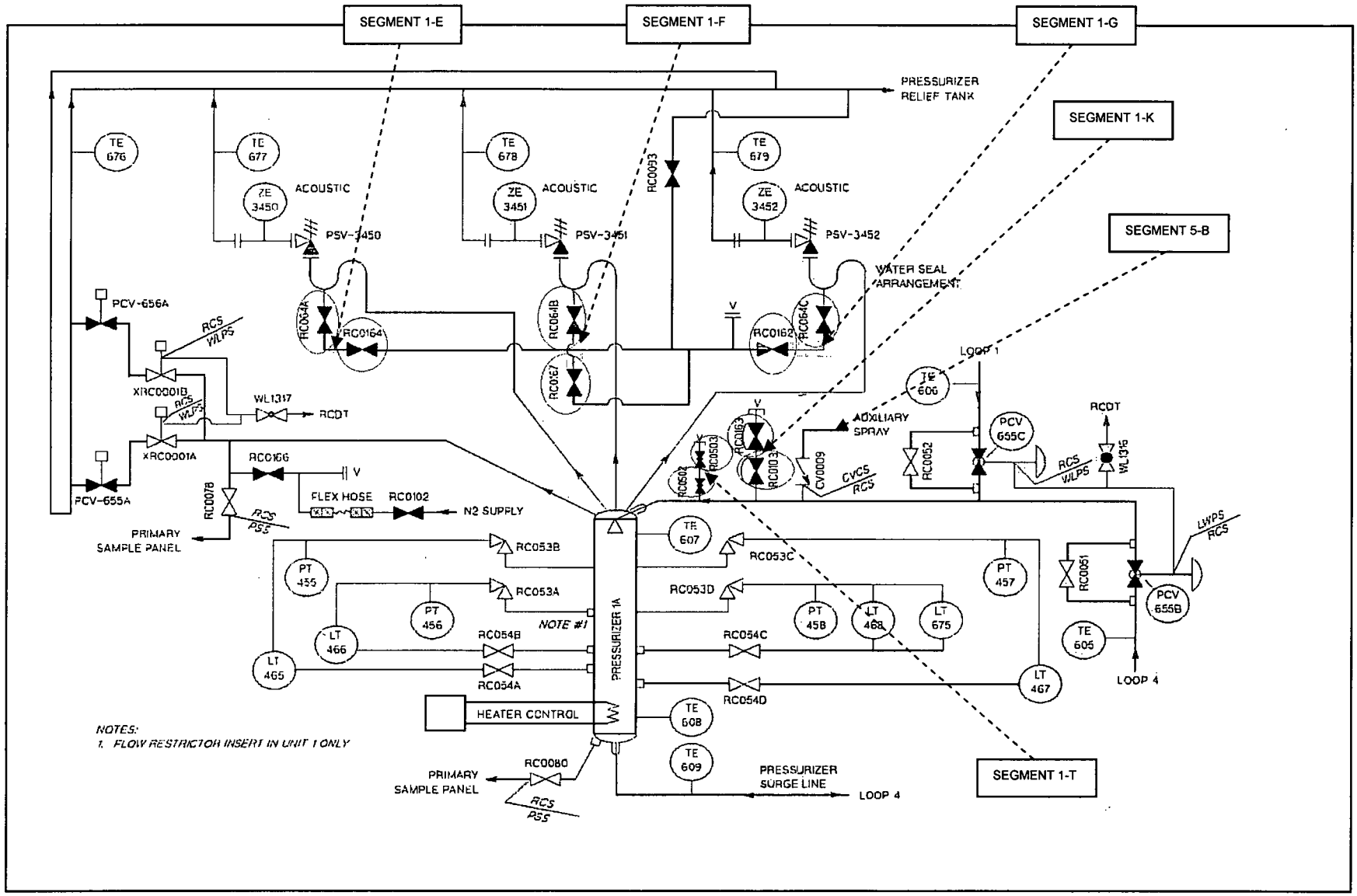

FIGURE 11: REACTOR COOLANT SYSTEM EXCESS LETDOWN