Entergy

Entergy Operations, Inc.
1340 Echelon Parkway
Jackson, Mississippi 39213-8298
Tel 601-368-5758

F. G. Burford
Acting Director
Nuclear Safety & Licensing

CNRO-2006-00022

April 24, 2006

U. S. Nuclear Regulatory Commission
Attn.: Document Control Desk
Washington, DC 20555-0001

SUBJECT: Request for Alternative ANO1-PT-001
Visual Examination of Extended Reactor Coolant Pressure Boundary Piping during System Leakage Tests

Arkansas Nuclear One, Unit 1
Docket No. 50-313
License No. DPR-51

REFERENCE: NRC letter to Pilgrim Nuclear Power Station (TAC No. MC1472) dated January 6, 2005.

Dear Sir or Madam:

Pursuant to 10 CFR 50.55a(a)(3)(ii), Entergy Operations, Inc. (Entergy) proposes an alternative to the requirements of ASME Section XI pertaining to system leakage tests for Arkansas Nuclear One, Unit 1 (ANO-1). Specifically, Entergy proposes to visually examine the extended reactor coolant pressure boundary (RCPB) piping between the first and second normally closed isolation valves during the Class 2 system leakage test conducted each inspection interval as an alternative to ASME Section XI IWB-5222(b). Request for Alternative ANO1-PT-001 is provided in the enclosure to this letter.

Entergy requests the NRC staff approve ANO1-PT-001 by April 1, 2007 in order to support the spring 2007 refueling outage at ANO-1.

The NRC staff approved a similar request for the Pilgrim Nuclear Power Station via the referenced letter.

Should you have any questions regarding this submittal, please contact Guy Davant at (601) 368-5756.

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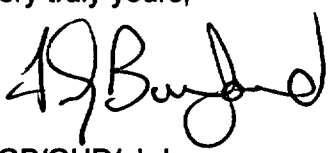
This letter contains no commitments.

Very truly yours,



FGB/GHD/ghd
Enclosure: Request for Alternative ANO1-PT-001

cc: Mr. W. A. Eaton (ECH)
Mr. J. S. Forbes (ANO)

Dr. Bruce S. Mallett
U. S. Nuclear Regulatory Commission, Region IV
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011

U. S. Nuclear Regulatory Commission
Attn: Mr. Drew Holland
MS O-7D1
Washington, DC 20555-0001

NRC Senior Resident Inspector
Arkansas Nuclear One
P. O. Box 310
London, AR 72847

ENCLOSURE

CNRO-2006-00022

ANO1-PT-001

ENTERGY OPERATIONS, INC.
ARKANSAS NUCLEAR ONE, UNIT 1
REQUEST FOR ALTERNATIVE
ANO1-PT-001

I. COMPONENTS

Components/Numbers:	Reactor Coolant Pressure Boundary 1. Decay Heat Removal System Loop "A", between check valves DH-14A, CF-1A, DH-13A and DH-18 2. Decay Heat Removal System Loop "B", between check valves DH-14B, CF-1B, DH-13B and DH-17 3. Pressurizer Auxiliary Spray piping between check valves DH-12 and DH-16
Code Class:	1
References:	ASME Section XI, 1992 Edition, 1993 Addenda, IWB-5222(b)
Examination Category:	B-P
Item Numbers:	B15.50
Description:	System Pressure Test Boundary
Unit / Inspection Interval Applicability:	ANO-1 third (3rd) 10-year interval

II. CODE REQUIREMENT(S)

ASME Section XI IWB-5222(b) requires, "The pressure retaining boundary during the system leakage test conducted at or near the end of each inspection interval shall extend to all Class 1 pressure retaining components within the system."

III. REQUESTED ALTERNATIVE

Pursuant to 10 CFR 50.55a(a)(3)(ii), Entergy requests authorization to visually examine the extended reactor coolant pressure boundary (RCPB) between the first and second normally closed isolation valves during the Class 2 system leakage test to be conducted in the current inspection period for the components identified in Section I, above.

Section IV, below, provides the basis for applying this proposed alternative to each identified line.

IV. BASIS FOR ALTERNATIVE

Performing leakage test of the Class 1 boundary beyond the inboard isolation valves at or near the end of each inspection interval requires conditions that place the plant in abnormal configurations or requires off-normal activities in order to pressurize the subject piping. These challenges include abnormal line-ups, installing jumpers around valve operation interlocks, installing and removing piping jumpers around valves, removing valve internals, and installing plugs. Associated with each challenge come additional burdens prior to plant restart, such as:

- High radiation exposure
- Erecting and removing scaffolding
- Welding
- Multiple disassembly and reassembly of valves and control circuitry

These off-normal configurations and challenges may also contribute to the risk of delaying normal plant start-up because of the critical path time and effort required to ensure system configuration is restored.

The piping subject to this request is outboard of the first isolation valve and is designed to RCPB conditions. However, its operation during normal conditions is typically not subject to RCPB operating conditions but to Class 2 system conditions of decay heat removal, auxiliary spray, or high pressure injection. While this piping is extremely difficult to test with the Class 1 leakage test, it is easily tested with the Class 2 system at Class 2 test conditions because of the check valve boundaries. Although Class 2 system pressure is lower than Class 1, it is representative of conditions for which the subject piping is exposed during both normal and accident conditions. Additionally, if the inboard valve leaked (thereby pressurizing the subject piping) and a through-wall flaw did exist that could only be detected at the higher pressure, the flaw would be discovered during the Class 1 leakage test, which is performed during each refueling outage with the inboard valve closed.

A description of each piping segment subject to this request and the burdens associated with performing the Class 1 leakage test currently required by ASME Section XI is provided below.

A. Decay Heat Removal Loop "A" Piping between Check Valves DH-14A, CF-1A, DH-13A and DH-18

The Decay Heat Removal Loop "A" piping and valves associated with this proposed alternative are shown in Figure 1.

The Class 2 function of the piping upstream of valve DH-14A is to provide a pathway to inject borated water from pressurized Core Flood Tank T-2A directly into the reactor vessel in the event of a loss of coolant accident (LOCA). This portion of piping between valves DH-14A, CF-1A, DH-13A and DH-18 is pressurized between 580 psig and 620 psig during normal plant operation.

Performing a ten-year Class 1 system leakage test of extended RCPB piping of Decay Heat Removal Loop "A" between check valves DH-14A, CF-1A, DH-13A, and DH-18 involves the following actions:

1. Erect scaffolding to access the valve nearest the reactor vessel;
2. Disassemble the valve and install a hydro plug;
3. Temporarily reassemble the valve;
4. Perform the system leakage test;
5. Disassemble the valve and remove the hydro plug;
6. Reassemble the valve; and
7. Remove the scaffolding.

The radiological dose rate in the general area of the associated piping and components is approximately 60 mrem/hr. Entergy estimates the identified actions require approximately 60 man-hours to complete resulting in a radiological exposure of approximately 3.6 man-Rem.

B. <u>Decay Heat Removal Loop "B" Piping between Check Valves DH-14B, CF-1B, DH-13B and DH-17</u>

The Decay Heat Removal Loop "B" piping and valves associated with this proposed alternative are shown in Figure 2.

The Class 2 function of the piping upstream of valve DH-14B is to provide a pathway to inject borated water from pressurized Core Flood Tank T-2B directly into the reactor vessel in the event of a LOCA. The portion of piping between valve DH-14B and valves CF-1B, DH-13B, and DH-17 is pressurized between 580 psig and 620 psig during normal plant operation.

Performing a ten-year Class 1 system leakage test of extended RCPB piping of Decay Heat Removal Loop "B" between check valves DH-14B, CF-1B, DH-13B, and DH-17 involves the same actions identified in Section IV.A, above, applied to Loop "B" piping and components. The radiological dose rate in the general area of the associated components is approximately 20 mrem/hr. Entergy estimates the identified actions require approximately 60 man-hours to complete resulting in a radiological exposure of approximately 1.2 man-Rem.

C. <u>Pressurizer Auxiliary Spray Piping between Check Valves DH-12 and DH-16</u>

The Pressurizer Auxiliary Spray System piping and valves associated with this proposed alternative are shown in Figure 3.

The Class 2 function of the Pressurizer Auxiliary Spray piping is to provide a boron dilution flow path to the reactor core via the pressurizer hot leg. A non-safety function provides a method to cool down and depressurize the Reactor Coolant System (RCS) using the Decay Heat Removal Auxiliary Spray System during plant shutdown. Depressurization is performed at approximately 280 psig every refueling

outage. Pressurizer Auxiliary Spray is put into service to complete the RCS cooldown. While RCS is cooled down at pressures between 200 to 250 psi, the Pressurizer Auxiliary Spray line is put into service via the Decay Heat Removal System. With the Decay Heat Removal pump discharge pressure below 400 psi, Auxiliary Spray provides a continuous, small fluid volume to the reactor vessel for approximately 2 to 3 hours. Therefore, this 5-inch, non-insulated portion of the line would see approximately 280 psi during the remaining cool-down period of 2 - 3 hours.

Performing a ten-year Class 1 system leakage test of extended RCPB piping of the Pressurizer Auxiliary Spray System piping between check valves DH-12 and DH-16 requires the same actions identified in Section IV.A, above, applied to the Pressurizer Auxiliary Spray piping and components. The section of piping between check valves DH-12 and DH-16 is 5 inches long and 1½ inches in diameter. The radiological dose rate in the general area of these components is approximately 10 mrem/hr. Entergy estimates the identified actions require approximately 40 man-hours to complete resulting in a radiological exposure of approximately 0.4 man-Rem.

V. CONCLUSION

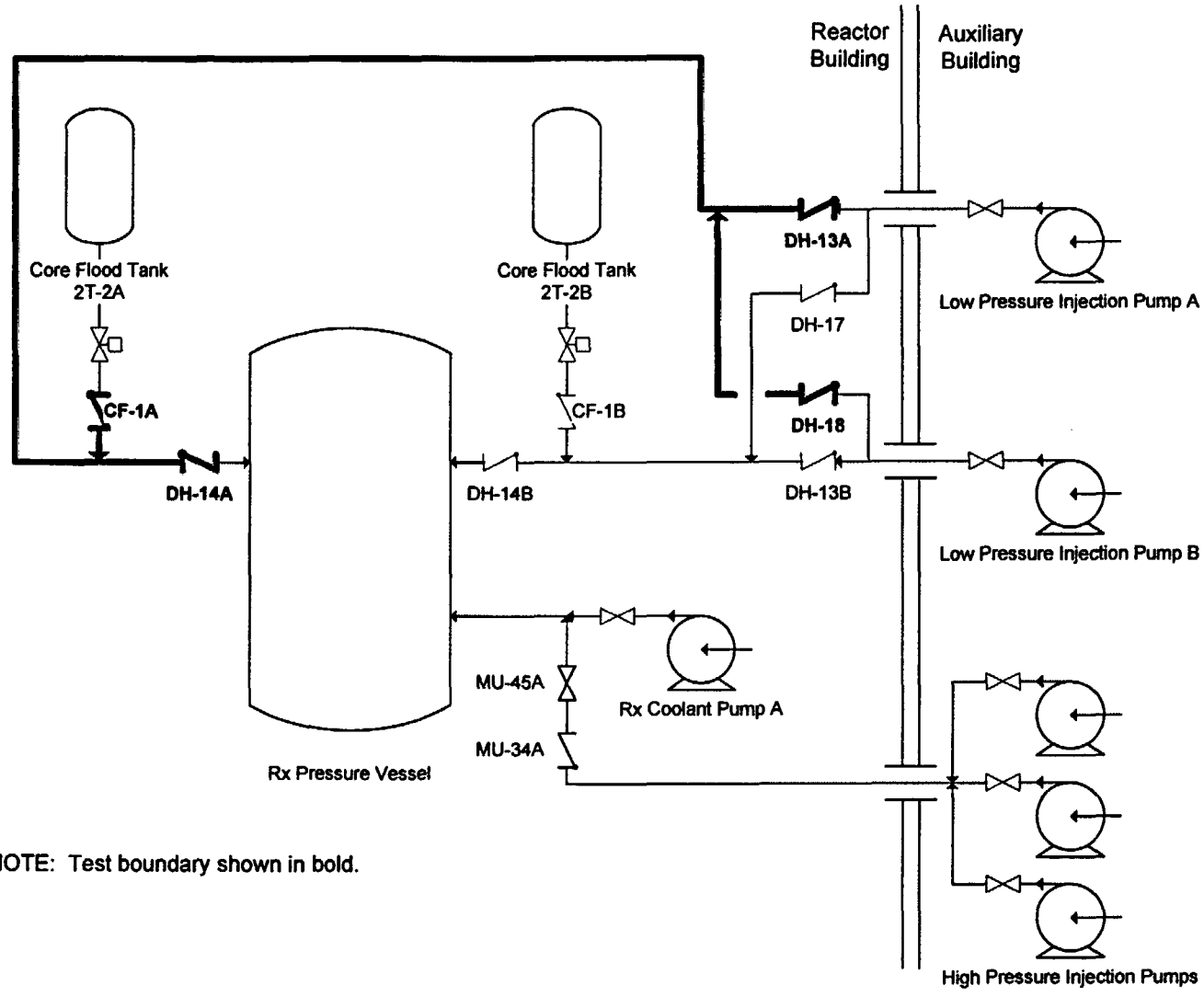
10 CFR 50.55a(a)(3) states:

"Proposed alternatives to the requirements of (c), (d), (e), (f), (g), and (h) of this section or portions thereof may be used when authorized by the Director of the Office of Nuclear Reactor Regulation. The applicant shall demonstrate that:

(i) The proposed alternatives would provide an acceptable level of quality and safety, or

(ii) Compliance with the specified requirements of this section would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety."

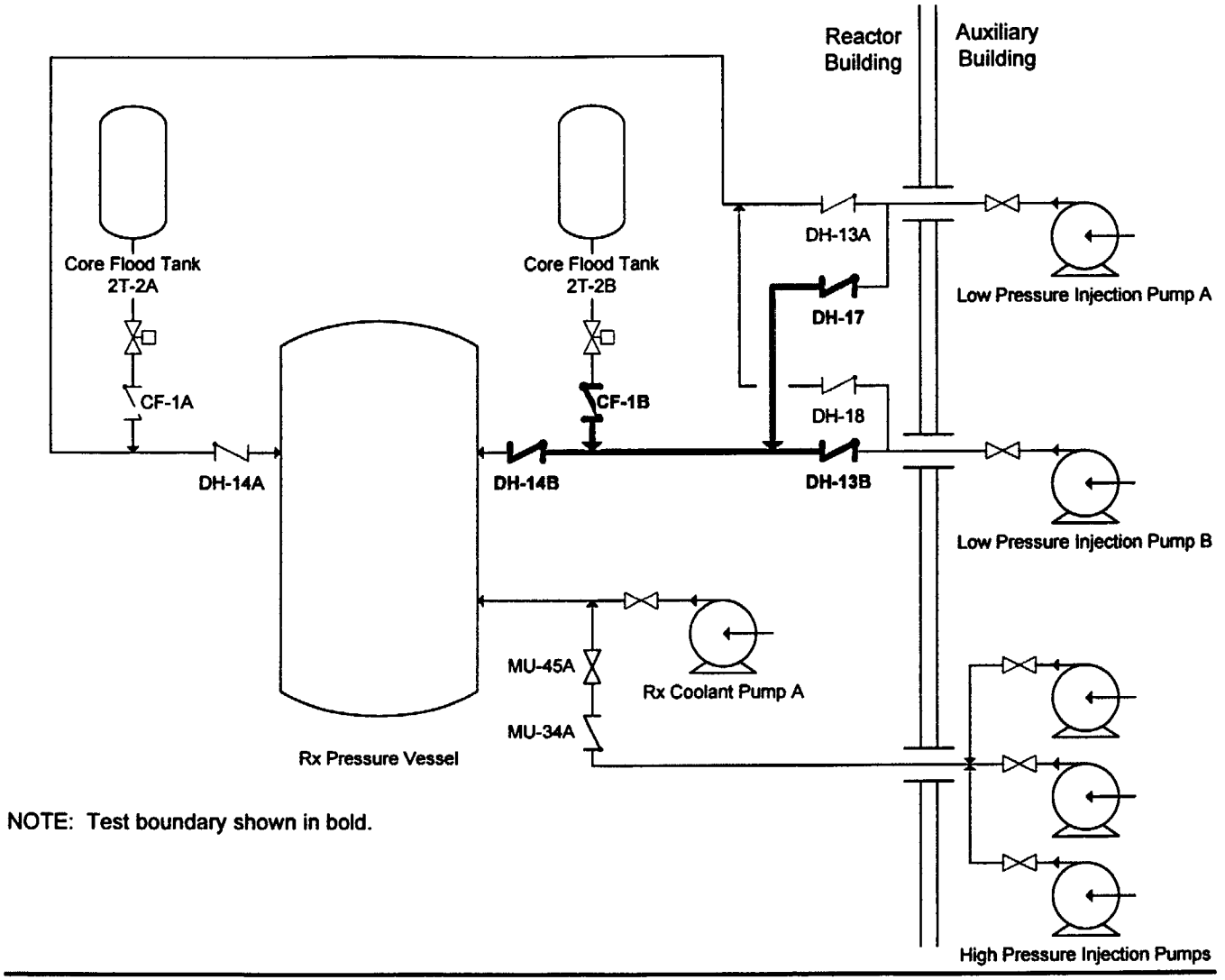
As discussed in Section IV above, to perform a Class 1 system leakage test of the subject piping will result in undue burden without a compensating increase in quality and safety. The proposed alternative to visually examine the extended RCPB between the first and second normally closed isolation valves that experience Class 2 pressure during the Class 2 system leakage test conducted in the current inspection period of the inspection interval provides adequate assurance of the pipe's leak tightness. Therefore, Entergy requests authorization to perform the requested alternative to the Code requirement pursuant to 10 CFR 50.55a(a)(3)(ii).



NOTE: Test boundary shown in bold.

FIGURE 1

DECAY HEAT REMOVAL SYSTEM LOOP "A"



NOTE: Test boundary shown in bold.

FIGURE 2

DECAY HEAT REMOVAL SYSTEM LOOP "B"

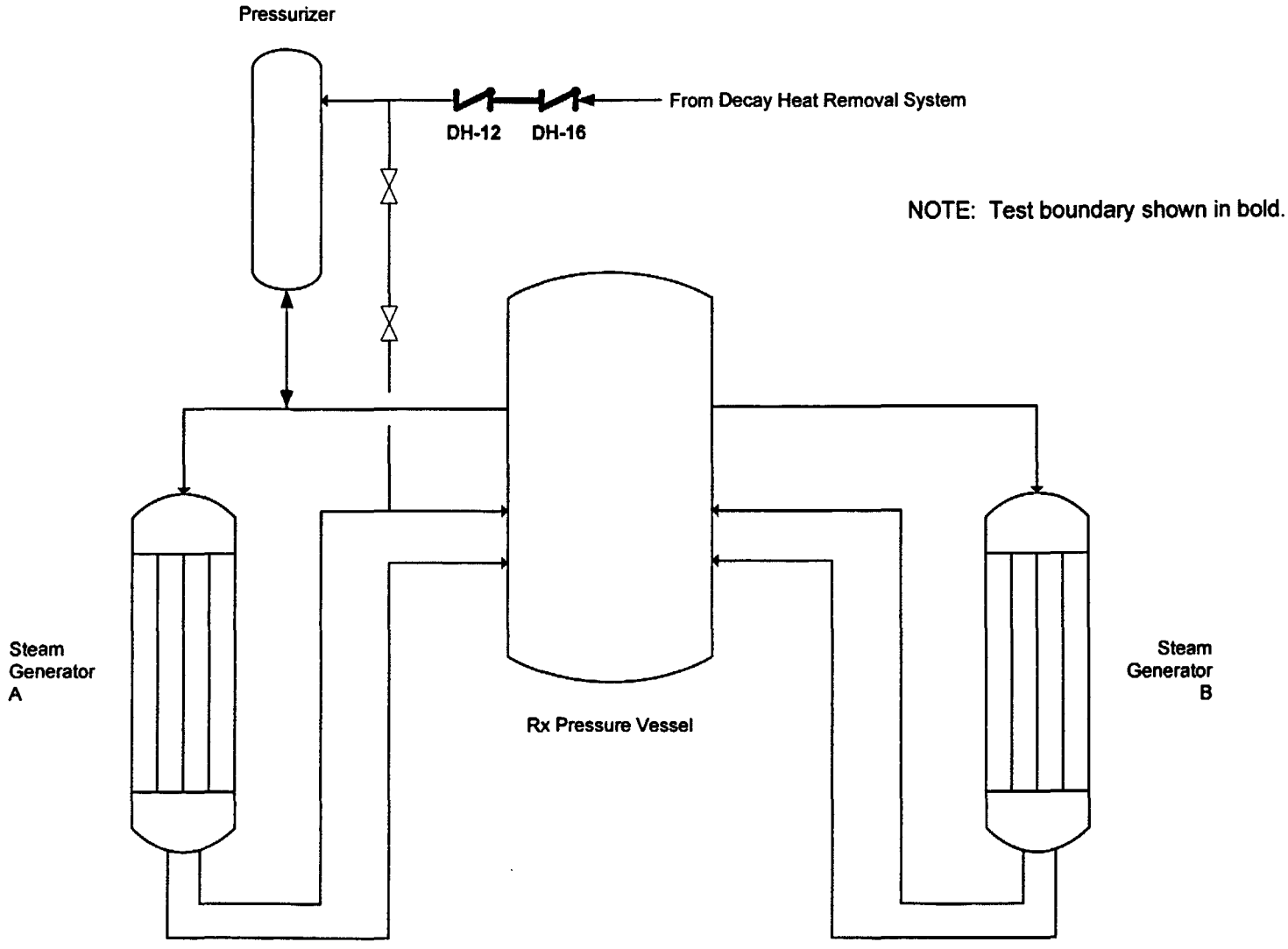


FIGURE 3

PRESSURIZER AUXILIARY SPRAY SYSTEM