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Acting Director
Nuclear Safety & Licensing

CNRO-2005-00030

June 20, 2005

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

SUBJECT: Request for Alternative RBS-PT-001
Response to NRC Request for Additional information

River Bend Station
Docket No. 50-458
License No. NPF-47

REFERENCE: Entergy Operations, Inc. letter CNRO-2004-00003 to the NRC dated May 26, 2004

Dear Sir or Madam:

In the referenced letter, Entergy Operations, Inc. (Entergy) submitted to the NRC Request for Alternative RBS-PT-001 for use at River Bend Station. RBS-PT-001 proposed alternatives to the pressure testing requirements of ASME Section XI.

The NRC staff provided to Entergy a Request for Additional Information (RAI) to support the review and approval of RBS-PT-001. Entergy's response to the staff's RAI is provided in Enclosure 1. Entergy has incorporated these responses into RBS-PT-001, which is provided in Enclosure 2. This version of the request replaces in its entirety the version previously submitted to the staff in the referenced letter.

The NRC staff approved a similar request for Nine Mile Point Nuclear Station, Unit 2 (TAC No. MN2151) in a letter dated February 29, 2000.

Entergy requests that the NRC staff grant RBS-PT-001 on or before September 1, 2005.

This letter contains five commitments documented in Enclosure 3. These commitments supersede commitments made in the referenced letter.

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

Very truly yours,

FGB/GHD/ghd

Enclosures:
1. Response to the NRC Request for Additional Information
2. Request for Alternative RBS-PT-001
3. Licensee-Identified Commitments

cc: Mr. W. A. Eaton (ECH)
Mr. P. D. Hinnenkamp (RBS)

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Attn: Mr. Michael K. Webb
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ENCLOSURE 1

CNRO-2005-00030

RESPONSE TO THE NRC'S
REQUEST FOR ADDITIONAL INFORMATION
REGARDING REQUEST FOR ALTERNATIVE RBS-PT-001

**RESPONSE TO THE NRC'S
REQUEST FOR ADDITIONAL INFORMATION
REGARDING REQUEST FOR ALTERNATIVE RBS-PT-001**

NRC Item #1

Describe how the system leak test will be performed including how the leakage will be measured.

Entergy's Response

The integrity of the Containment Atmosphere Monitoring System (CMS) piping and Reactor Plant Sampling System (SSR) piping will be verified and monitored by performing leakage rate testing in accordance with the River Bend Station (RBS) Leakage Reduction and Monitoring Program. This testing encompasses the supply and return pneumatic tubing/piping and the hydrogen analyzer components between two manual isolation valves (one each in the supply and return pneumatic lines for the analyzer) located within containment (see Figures 1 and 2 of RBS-PT-001). System piping will be pressurized to ≥ 8 psi and held for 15 minutes.

The system leakage rate test uses the flow makeup method specified in ANSI/ANS-56.8-1994 and approved for the Appendix J Program per Regulatory Guide 1.163, Section C.1. In the makeup flow rate test, the test volume will be pressurized and maintained to at least P_{ac} (the calculated peak containment internal pressure related to the design basis accident) using a pressure regulator to maintain test pressure. (P_{ac} for RBS is 7.6 psig.) Makeup fluid (air) flow to the test volume required to maintain test pressure will be used as the leakage rate of the barrier under test (Ref. ANSI/ANS-56.8-1994 Section 6.4.2).

The leakage rate will be measured by Appendix J Local Leak Rate Test (LLRT) qualified testers, using a leak rate monitor that has been used at RBS for Appendix J local leak rate testing. The result will be compared to the acceptance criterion, which for the subject piping is ≤ 2,000 sccm per loop as established in the RBS Leakage Reduction and Monitoring Program.

NRC Item #2

Provide the basis for the 2,000 sccm acceptance criterion used in the system leakage rate test.

Entergy's Response

The leak rate acceptance criterion of 2,000 sccm per loop (4,000 sccm total) was selected as an allowable conservative leakage rate based on the following:

- *Operating Experience / Regulatory Precedence*

  The CMS system design at RBS is very similar to the CMS system at Nine Mile Point Nuclear Station, Unit 2 (NMP-2). NMP-2 proposed a similar alternative to the NRC staff in

a letter dated June 16, 1998. In that request, NMP-2 proposed to use an acceptable leak rate criterion of 20 scfh (9,424 sccm) for both loops combined (4,712 sccm per loop). The staff approved the NMP-2 request in a letter dated February 29, 2000 (TAC No. MA2151). RBS will use 2,000 sccm per loop, which is less than 50% of the NMP-2 acceptance criterion.

- *ILRT Leak Rate Margin*

  During the last integrated leak rate test (ILRT), the CMS loops were open to containment atmosphere. The calculated "as-left" Type A leak rate was 0.148% / day (63,041 sccm), which is less than the maximum allowable leak rate of 0.75 L_a or 0.24375% / day (103,825 sccm). Therefore, the 2,000 sccm criterion is a very small fraction of the ILRT leak rate margin, which is 40,784 sccm (103,825 sccm – 63,041 sccm).

- *LLRT Type B and C Leak Rate Margin*

  RBS Technical Specification (TS) SR 3.6.1.1.1 requires a leakage rate test be performed in accordance with the Primary Containment Leakage Rate Testing Program. The leak rate limit specified in this program is 0.6 L_a, or 83,061 sccm. The "as-left" Type B and C leak rate measured in the past three refueling outages were 12,392 sccm (RF-10), 21,946 sccm (RF-11), and 17,842 sccm (RF-12). These values are less than the 83,061 sccm leak rate limit. The table below compares the 4,000 sccm acceptance criterion with the margin to the TS limit for the previous three refueling outages.

Refueling Outage	*0.6 L_a TS Limit (sccm)*	*"As-Left" Type B & C Leak Rate (sccm)*	*Margin to the TS Limit (sccm)*	*CMS Acceptance Criterion (sccm)*
RF-10 (10/01)	*83,061*	*12,392*	*70,669*	*4,000*
RF-11 (4/03)	*83,061*	*21,946*	*61,115*	*4,000*
RF-12 (11/04)	*83,061*	*17,842*	*65,219*	*4,000*

As seen in the table, the CMS acceptance criterion is a small fraction of the margin to the TS limit.

NRC Item #3

Describe the RBS Leakage Reduction and Monitoring Program.

Entergy's Response

The RBS Leakage Reduction and Monitoring Program is used to meet the applicable licensing requirements listed in:

- *RBS Technical Specification 5.5.2,* Primary Coolant Sources Outside Containment

- *NRC Safety Evaluation Report Section 15-9.5,* Integrity of Systems Outside Containment Likely to Contain Radioactive Material for Pressurized-Water Reactors and Boiling-Water Reactors
- *NUREG-0737, Section III.D.1.1,* Integrity of Systems Outside Containment Likely to Contain Radioactive Material for Pressurized-Water Reactors and Boiling-Water Reactors
- *RBS Updated Final Safety Analysis Report Section 15.6.5.5.2,* Leakage for ESF System

The purpose of the RBS Leakage Reduction and Monitoring Program is to reduce and monitor leakage from selected systems outside containment to an as-low-as practical level. This program reduces radiological conditions outside containment and thereby maintains personnel exposure as-low-as reasonable achievable (ALARA). The leak rates measured during periodic system leak tests are verified to be within acceptable limits. The CMS/SSR will be leak tested once every refueling outage together with other systems in the program, such as Low Pressure Core Spray, High Pressure Core Spray, Residual Heat Removal, and Reactor Core Isolation Cooling.

NRC Item #4

Discuss the qualifications that testing personnel must meet.

Entergy's Response

The CMS/SSR system leak test and SSR valve LLRT will be performed by personnel that are qualified for Appendix J LLRT.

ENCLOSURE 2

CNRO-2005-00030

REQUEST FOR ALTERNATIVE
RBS-PT-001

ENTERGY OPERATIONS, INC.
REQUEST FOR ALTERNATIVE
RBS-PT-001

I. COMPONENTS

Components/Numbers:	Hydrogen Analyzer (CMS) Loops A and B piping, and sampling system (SSR) piping connected to CMS Loop B[1]
ASME Code Class:	2
References:	1. ASME Section XI 1992 Edition, 1993 Addenda, Table IWC-2500-1 2. ASME Section XI 1992 Edition, IWA-5211 and IWA-5240
Examination Category:	C-H
Item Numbers:	C7.30, C7.70
Description:	Performance of system leakage test as required by Table IWC-2500-1
Unit / Inspection Interval Applicability:	River Bend Station (RBS) – Second (2nd) 10-year interval

II. CODE REQUIREMENT(S)

ASME Section XI, Table IWC-2500-1, Examination Category C-H, Items C7.30 and C7.70 require the subject piping to be VT-2 visually examined during a system leakage test each inspection period. IWA-5211 requires that the VT-2 visual examination be performed while the component being tested is maintained at normal operating pressure.

III. REQUESTED ALTERNATIVE

Pursuant to 10 CFR 50.55a(a)(3)(ii), Entergy Operations, Inc. (Entergy) proposes an alternative to the system leakage test with a VT-2 visual examination required by ASME Section XI Table IWC-2500-1 as discussed below.

A. Testing in accordance with the RBS Leakage Reduction and Monitoring Program

The integrity of the Containment Atmosphere Monitoring System (CMS) piping and the Reactor Plant Sampling System (SSR) piping will be verified and monitored by performing leakage rate testing in accordance with the River Bend Station (RBS) Leakage Reduction and Monitoring Program; specifically, the supply and return pneumatic tubing/piping and the hydrogen analyzer components between two

[1] Figures 1 and 2 depict the configuration of the CMS hydrogen analyzer piping loops and SSR sampling station and piping.

manual isolation valves as shown in Figures 1 and 2). System piping will be pressurized to $\geq$ 8 psi and held for 15 minutes.

The system leakage rate test uses the flow makeup method specified in ANSI/ANS 56.8-1994 and approved for the Appendix J Program per Regulatory Guide 1.163, Section C.1. In the makeup flow rate test, the test volume will be pressurized and maintained to at least P_{ac} (the calculated peak containment internal pressure related to the design basis accident) using a pressure regulator to maintain test pressure. (P_{ac} for RBS is 7.6 psig.) Makeup fluid (air) flow to the test volume required to maintain test pressure will be used as the leakage rate of the barrier under test (Ref. ANSI/ANS-56.8-1994 Section 6.4.2).

The leakage rate will be measured using a leak rate monitor that has been used at RBS for Appendix J local leak rate testing (LLRT). The result will be compared to the acceptance criterion, which for the subject piping is $\leq$ 2,000 sccm per loop as established in the RBS Leakage Reduction and Monitoring Program. The system leakage test of CMS/SSR will be performed once every refueling outage.

B. Testing in accordance with the Primary Containment Leakage Rate Testing Program

An LLRT will be performed for the four (4) SSR isolation valves in accordance with the Primary Containment Leakage Rate Testing Program (10 CFR 50 Appendix J, Option B).

In addition to the system leakage test and the valve LLRT identified above, the CMS and SSR piping leak rates will be measured as part of the containment leak rate during the integrated leak-rate test (ILRT), which is performed in accordance with the Primary Containment Leakage Rate Testing Program.

The LLRT and ILRT are performed on a schedule determined in accordance with the Primary Containment Leakage Rate Testing Program.

Both the CMS/SSR system leak test and the SSR valve LLRT discussed above will be performed by personnel that are qualified for Appendix J LLRT.

IV. BASIS FOR ALTERNATIVE

A. Hardship

Performing the Code-required system leakage test with a VT-2 visual examination requires removing the insulation and heat tracing and applying leak detection fluid for every system pressure test. Entergy estimates that the activities associated with performing the system leakage test and associated VT-2 examination would result in plant life radiation exposure to personnel of approximately 29 man-Rem.

In addition to the high exposure, removing the heat tracing is very difficult and time consuming. Removing the heat tracing can severely damage it, requiring replacement. Once testing is complete, the leak detection fluid is removed, the heat tracing is replaced, and insulation is reinstalled. Disposing of the fluid, the wipes used in fluid removal, and damaged insulation and heat tracing is a significant radwaste impact.

B. System Design

The subject CMS hydrogen analyzers and piping, and SSR piping are designed to sample the containment and drywell atmospheres for the presence of hydrogen during post-LOCA conditions (the analyzers are placed in STANDBY mode during normal plant operation). A sample pump internal to the hydrogen analyzer draws an air sample from the containment or drywell atmosphere, which is then processed through an internal hydrogen sensor. Once analyzed, the sample is returned to the drywell atmosphere. These functions are performed using a closed loop system with a portion of the system (pneumatic piping and hydrogen analyzer) located outside containment and a portion located inside containment. The system includes approximately 700 feet of piping, of which about 350 feet are heat traced and insulated.

This piping has one safety function, which is to serve as a portion of the containment boundary. This safety function, which is passive, is ensured via Appendix J testing. This testing is the appropriate mechanism to ensure the containment boundary function is maintained.

As discussed in Section III, above, CMS and SSR system integrity will be verified by performing system leakage rate testing to Appendix J requirements and the RBS Leakage Reduction and Monitoring Program in lieu of ASME Section XI examinations. This is similar to the IWA-5244(a) requirements that allow the owner to establish acceptable leakage rate criteria for buried piping that can be isolable by means of valves. Although the subject piping is not buried, more than 50% of it is covered with heat trace and insulation.

C. Alternative Testing Methods

Entergy believes that the proposed alternative provides adequate assurance that a through-wall leak in the CMS/SSR system piping would be identified. This is based on the information provided below regarding the Leakage Reduction and Monitoring Program and the Primary Containment Leakage Rate Testing Program.

1. RBS Leakage Reduction and Monitoring Program

The RBS Leakage Reduction and Monitoring Program is used to meet the applicable licensing requirements listed in:

- RBS Technical Specification 5.5.2, *Primary Coolant Sources Outside Containment*
- NRC Safety Evaluation Report Section 15-9.5, *Integrity of Systems Outside Containment Likely to Contain Radioactive Material for Pressurized-Water Reactors and Boiling-Water Reactors*
- NUREG-0737, Section III.D.1.1, *Integrity of Systems Outside Containment Likely to Contain Radioactive Material for Pressurized-Water Reactors and Boiling-Water Reactors*
- RBS Updated Final Safety Analysis Report Section 15.6.5.5.2, *Leakage for ESF System*

The purpose of the RBS Leakage Reduction and Monitoring Program is to reduce and monitor leakage from selected systems outside containment to as-low-as practical level. This program reduces radiological conditions outside containment and thereby maintains personnel exposure as-low-as reasonable achievable (ALARA). The leak rates measured during periodic integrated system leak tests are totaled and verified to be within acceptable limits. The system leakage test of CMS/SSR will be performed once every refueling outage together with other systems in the program, such as Low Pressure Core Spray, High Pressure Core Spray, Residual Heat Removal, and Reactor Core Isolation Cooling.

Leak Rate Acceptance Criterion

The leak rate acceptance criterion of 2,000 sccm per loop (4,000 sccm total) was selected as an allowable conservative leakage rate based on the following:

- Operating Experience / Regulatory Precedence

  The CMS system design at RBS is very similar to the CMS system at Nine Mile Point Nuclear Station, Unit 2 (NMP-2). NMP-2 proposed a similar alternative to the NRC staff in a letter dated June 16, 1998. In that request, NMP-2 proposed to use an acceptable leak rate criterion of 20 scfh (9,424 sccm) for both loops combined (4,712 sccm per loop). The staff approved the NMP-2 request in a letter dated February 29, 2000 (TAC No. MA2151). RBS will use 2,000 sccm per loop, which is less than 50% of the NMP-2 acceptance criterion.

- ILRT Leak Rate Margin

  During the last ILRT, the CMS loops were open to containment atmosphere. The calculated "as-left" Type A leak rate was 0.148% / day (63,041 sccm), which is less than the maximum allowable leak rate of 0.75 L_a or 0.24375% / day (103,825 sccm). Therefore, the 4,000 sccm criterion is a small fraction of the ILRT leak rate margin, which is 40,784 sccm (103,825 sccm – 63,041 sccm).

- LLRT Type B and C Leak Rate Margin

  RBS Technical Specification (TS) SR 3.6.1.1.1 requires a leakage rate test be performed in accordance with the Primary Containment Leakage Rate Testing Program. The leak rate limit specified in this program is 0.6 L_a, or 83,061 sccm. The "as-left" Type B and C leak rate measured in the past three refueling outages were 12,392 sccm (RF-10), 21,946 sccm (RF-11), and 17,842 sccm (RF-12). These values are less than the 83,061 sccm leak rate limit. The table below compares the 4,000 sccm acceptance criterion with the margin to the TS limit for the previous three refueling outages.

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RF-10 (10/01)	83,061	12,392	70,669	4,000
RF-11 (4/03)	83,061	21,946	61,115	4,000
RF-12 (11/04)	83,061	17,842	65,219	4,000

As seen in the table, the CMS acceptance criterion is a small fraction of the margin to the TS limit.

2. Primary Containment Leakage Rate Testing Program

The Primary Containment Leakage Rate Testing Program establishes and implements leak rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50 Appendix J, Option B. This program, which is required by RBS TS 5.5.13, was developed in accordance with the guidelines contained in Regulatory Guide 1.163, *Performance-Based Containment Leak-Test Program.*

IV. 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."

Entergy believes that the radiological dose of 29 man-REM from performing the ASME Code-required system leakage test and associated VT-2 examination in addition to the burden of removing and replacing the heat tracing, and disposing of radwaste material represent a hardship without a compensating increase in the level of safety or quality. Entergy also believes that the proposed alternative testing methods, discussed in Sections III.B and IV, provide an acceptable level of quality and safety Therefore, Entergy requests authorization to perform the requested alternatives to the Code requirement pursuant to 10 CFR 50.55a(a)(3)(ii) for the remainder of the second 10-year ISI interval at RBS.

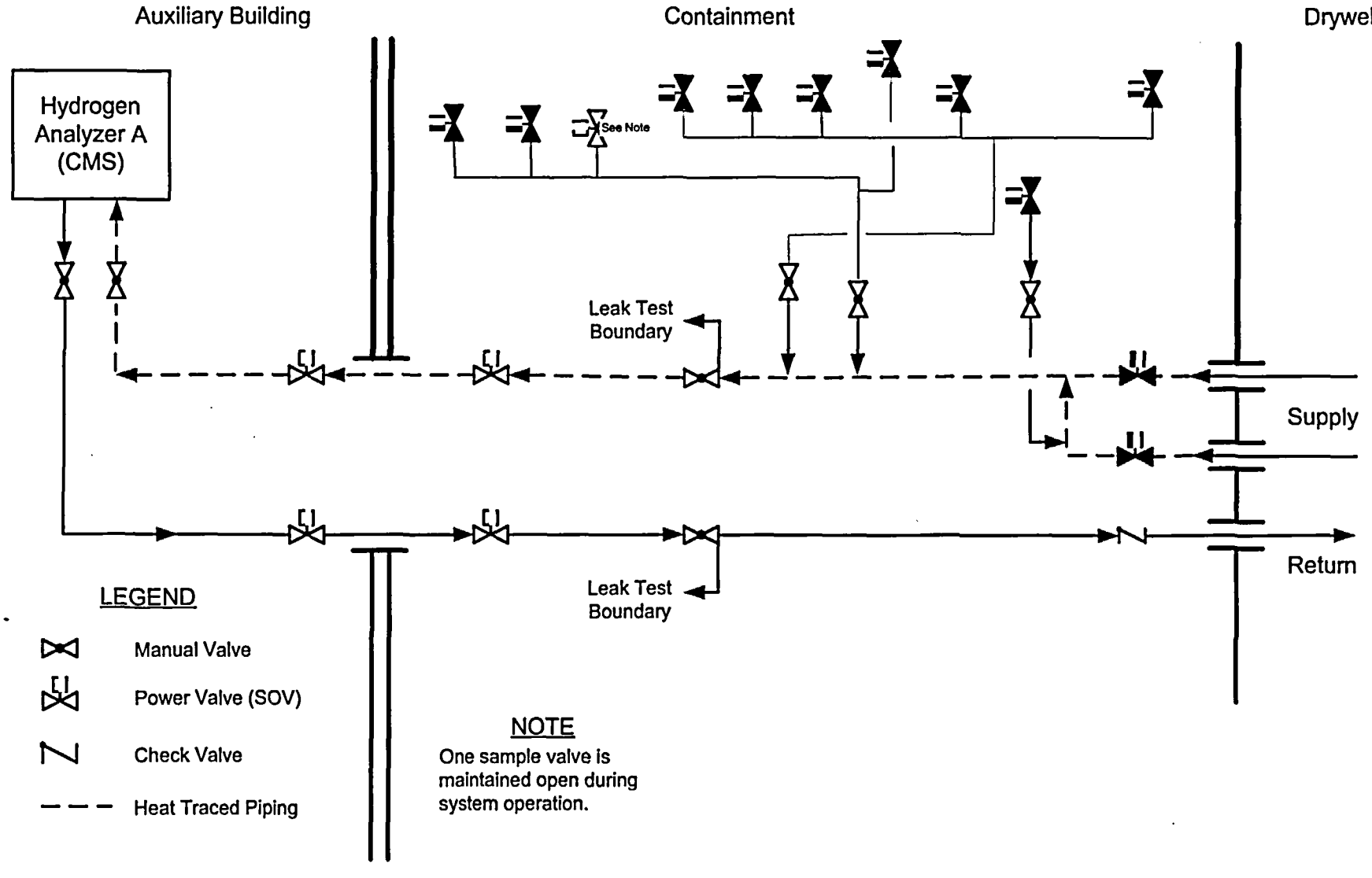

FIGURE 1
CMS Loop A

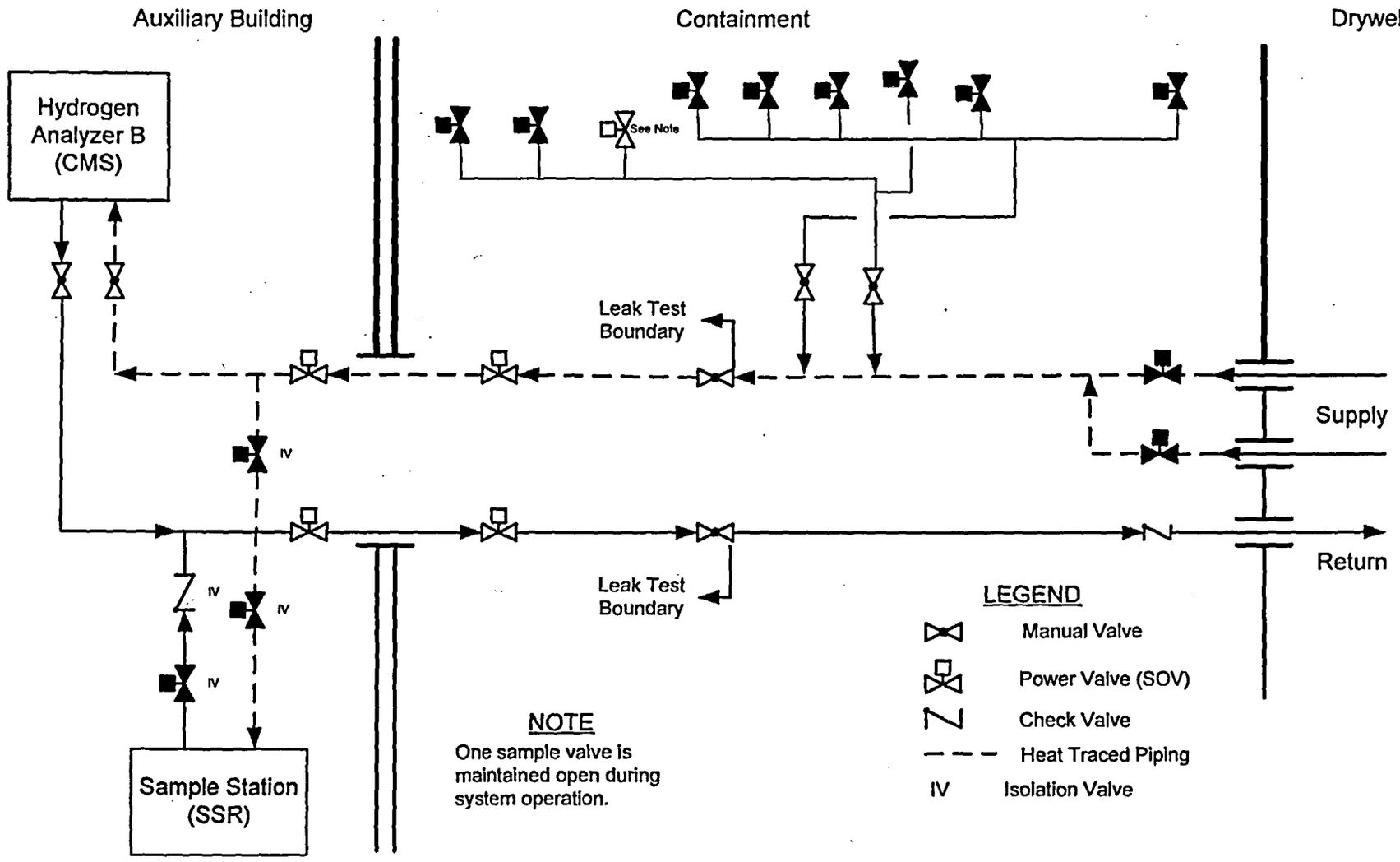

FIGURE 2
CMS Loop B

ENCLOSURE 3

CNRO-2005-00030

LICENSEE-IDENTIFIED COMMITMENTS

LICENSEE-IDENTIFIED COMMITMENTS

COMMITMENT	TYPE (check one)		SCHEDULED COMPLETION DATE (if applicable)
	ONE-TIME ACTION	CONTINUING COMPLIANCE	
1. The integrity of the Containment Atmosphere Monitoring System (CMS) piping and the Reactor Plant Sampling System (SSR) piping will be verified and monitored by performing leakage rate testing in accordance with the River Bend Station (RBS) Leakage Reduction and Monitoring Program; specifically, the supply and return pneumatic tubing/piping and the hydrogen analyzer components between two manual isolation valves as shown in Figures 1 and 2). System piping will be pressurized to $\geq$ 8 psi and held for 15 minutes.		✓	N/A
2. The system leakage rate test uses the flow makeup method specified in ANSI/ANS 56.8-1994 and approved for the Appendix J Program per Regulatory Guide 1.163, Section C.1. In the makeup flow rate test, the test volume will be pressurized and maintained to at least P_{ac} (the calculated peak containment internal pressure related to the design basis accident) using a pressure regulator to maintain test pressure. (P_{ac} for RBS is 7.6 psig.) Makeup fluid (air) flow to the test volume required to maintain test pressure will be used as the leakage rate of the barrier under test (Ref. ANSI/ANS-56.8-1994 Section 6.4.2).		✓	N/A
3. The leakage rate will be measured using a leak rate monitor that has been used at RBS for Appendix J local leak rate testing (LLRT). The result will be compared to the acceptance criterion, which for the subject piping is $\leq$ 2,000 sccm per loop as established in the RBS Leakage Reduction and Monitoring Program.		✓	N/A
4. The system leakage test of CMS/SSR will be conducted once every refueling outage.		✓	N/A

COMMITMENT	TYPE (check one)		SCHEDULED COMPLETION DATE (if applicable)
	ONE-TIME ACTION	CONTINUING COMPLIANCE	
5. An LLRT will be performed for the four (4) SSR isolation valves in accordance with the Primary Containment Leakage Rate Testing Program (10 CFR 50 Appendix J, Option B). The CMS and SSR piping leak rates will be measured as part of the containment leak rate during the integrated leak-rate test (ILRT), which is performed in accordance with the Primary Containment Leakage Rate Testing Program.		✓	N/A
6. Both the CMS/SSR system leak test and the SSR valve LLRT will be performed by personnel that are qualified for Appendix J LLRT.		✓	N/A