VERMONT YANKEE

PRIMARY CONTAINMENT LEAKAGE RATE TESTING

1980

TEST COORDINATORS

B.R. Webber

S.A. Vekasy

PREPARED BY

K.A. Whitney

D.L. Phillips

B.R. Webber

INTRODUCTION

During the 1980 Refuel Outage which occurred during the period from September 27, 1980 to December 28, 1980, a Type A Containment Integrated Leakage Rate Test was performed. Previous Leak Rate Test Reports were filed with the USNRC in January 1975, August 1978, and January 1980.

This report describes primary containment testing performed after the October 1979 Type A Test and 1979 Refuel Outage up to and including the December 1980 Type A Test. In accordance with the requirements of 10 CFR 50 , Appendix J, a summary analysis of all periodic Type B and Type C tests that were performed since then is included in this report. The Type B and Type C test results included in this report are from the 1980 Refuel Outage.

All testing performed during the period covered by this report conformed to the rules and regulations specified in 10 CFR 50, Appendix J.

SUMMARY

The plant was shut down on September 27, 1980 for annual refueling and maintenance. The Type B and C test program was started shortly before the plant shutdown. The Type A test was conducted at the end of the refuel outage.

Pressurization for the Type A test commenced on December 19, 1980 with two air compressors of 1800 SCFM total capacity and approximately a 5 psi/hr charging rate. Containment pressure was raised to the calculated peak accident pressure of 44 psig over a 7-hour and 50-minute period. During this time period, the pressurization rate was reduced at the 5, 15, and 40 psig levels to facilitate investigation for containment leakage. No significant leaks were found during the pressurization period.

After stabilizing for ten hours, the 24-hour test period was initiated at 1300 on December 20, 1980. The 24-hour test was completed December 21, 1980 at 1300.

The absolute method of leakage determination was employed. The containment leakage rate was determined from the slope of a least squares fit of mass of air versus time (see Figure II). The measured leakage rate at the upper one sided 95% confidence level was 0.199 WT%/Day. The final corrected leakage rate at the upper one sided 95% confidence level was 0.261 WT%/Day

Description of Test

The containment was made ready for the integrated leakage rate test and pressurization commenced at 1910 hours on December 19, 1980. Pressurization was accomplished by using two mobile, oil free air compressors, each with a capacity of 900 SCFM. They were connected by hose to the nitrogen purge supply at the flange connection upstream of FCV-1-156-10 as shown on the attached Figure I. At the 5, 15, and 30 psig containment pressure levels, leakage location survey personnel were dispatched and no significant leaks were found.

After gradual reduction of the pressurization rate, the air inbleed was isolated at 0300 on December 20, 1980, when a test pressure of 44.60 psig was attained. Data Collection to measure temperature stability began at 0400. At 1000, investigation into a problem with containment pressure signal input to the process computer determined that the zero pot adjustment of the mercury manometer was not locked.

The zero pot was readjusted to make the process computer input accurate. A one point calibration to the process computer was then performed to improve process computer and mercury manometer agreement.

Based on expected acceptable leakage and temperature stabilization, the 24 hour test was commenced at 1300 on December 20, 1980.

At 1900, Test Personnel noticed a sudden increase in the torus liquid level as indicated by the process computer. Investigation determined that the torus liquid level had not changed. The process computer indicated a torus level of 1.67 FT, the torus level from LI-16-19-38B read 0.92 FT.

After the reference leg for LT-16-19-38A was backfilled at 2015, the computer indicated a level of 0.92 FT, as did LI-16-19-38B. There appeared to have been an air bubble in the reference leg of LT-16-19-38A.

At this point it was decided to manually back fit data into a modified time share calculation of the containment mass due to 1) the process computers calculated mass of air inaccuracy due to the faulty torus level transmitter, and 2) suspect computer readings of containment pressure as compared to mercury manometer indications. Data was available from chart recordings to

verify that the torus level had been constant at 0.92 ft. since 1300 on December 20, 1980. Due to earlier problems with the computer indication of containment pressure, the mercury manometer indication had been recorded at 10 minute intervals since the beginning of the test and was avai e for use in the calculation.

Table 1980-A (Primary Containment Leakage Rate Data Sheet) contains 1) the results of the time share program (PCLRTP) contained mass calculations, 2) the containment pressure as read from the mercury manometer local readout in the control room, and 3) weighted average drywell temperature.

The peak pressure Type A Test was completed at 1300 December 21, 1980. A supplemental test, (required by Appendix J, 10 CFR 50) to verify the accuracy of the instrumentation was conducted by metering a mass of air approximately equal to the allowable leakage back into the containment. This pump back of 227.1 lbm was completed at 1433 hours. Sufficient data had been gathered at 1530 hours to determine that this verification was successful. Containment depressurization commenced at 1815, and was completed at 0425 on December 22, 1980. All plant systems were returned to normal as required by operational needs on December 22, 1980.

Analysis and Interpretation of Test Data

The total containment air mass calculation was performed for every ten minute interval of the 24 hour test period. Input data for the calculation consisted of containment pressure, drywell and torus weighted average air temperature, drywell and torus dew points, and torus water level.

The data, consisting of 145 independent calculations of contained total air mass at ten minute intervals, lends itself to a statistical analysis based upon a time dependent rate of change of the contained mass of air. A small pressure change over the test interval is the basis for the assumption that the containment leakage rate was constant with respect to time.

A linear least square fit is employed to develop the best straight line fit to the data. The slope of this least squares fit line is the leakage rate.

The equation of the least squares fit line is of the form:

$$Q = b + mT$$

where: Q = mass of air

b = Q intercept (Q value at time 0)

m = slope of line (leakage rate)

T = time

N = number of data points

The values for b and m are determined from the following equations:

$$b = \frac{\Sigma Q - m\Sigma T}{N}$$

$$m = \frac{N\Sigma QT - \Sigma Q\Sigma T}{N\Sigma T^2 - (\Sigma T)^2}$$

The upper one sided 95% confidence level (UCL) of the leakage rate (slope of line) may be determined from the standard error of the slope and a "Students Table of t". The standard error is:

$$\text{Standard Error, } S(m) = \left[\frac{1}{N-2}\left[\frac{\text{VARIANCE}^* \text{ of } Q}{\text{VARIANCE}^* \text{ of } T} - m^2\right]\right]^{1/2}$$

$$S(m) = \left[\frac{1}{N-2}\left[\frac{N\Sigma Q^2 - (\Sigma Q)^2}{N\Sigma T^2 - (\Sigma T)^2} - m^2\right]\right]^{1/2}$$

The upper one sided 95% confidence level on the true leakage rate (1) is:

UCL (Approx.) = Lam + 2400 *(t .95)* (S (m) /b)

Where: UCL = Upper Confidence Level

Lam = - (2400) * (m/b)

t .95 = The t factor at the 95% confidence level for 145 Data points (143 degrees of freedom) = 1.65

(1) ANSI/ANS 56.8- 1980, Appendix B

* Variance = (Standard Deviation)^2 = $\Sigma \frac{(xi - \bar{x})^2}{n}$

Test Results

A linear least square fit of the 145 data points calculated during this test (presented in Table 1980 - A), result in the following equation:

$$Q = 74777 - 6.104\ T$$

Where:

74777 represents the initial mass of contained air in pounds

-6.104 represents the leakage rate in the lbm/hr.

The upper one sided 95% confidence level on the leakage rate using this data is:

$$\begin{aligned} ULC &= -Lam + 2400\ (t.95)\ (S\ (m)\ /b) \\ &= -(2400)\ (m/b) + 2400\ (t\ .95)\ (S\ (m)\ /b) \\ &= -(2400)\ (-6.104/74777) + 2400\ (1.65)\ (0.066606/74777) \\ &= +0.1994\ \text{WT\%/Day} \end{aligned}$$

Correction Factors

1. Correction for loss through isolation valves

   V-3-181

   V-12-68 = + 0.0289 WT%/Day

   V-12-15

2. Correction for increase in drywell sump levels

   + 0.0232 WT%/Day

3. Correction for increase in reactor vessel water level

   + 0.00943 WT%/Day

The corrected leak rate at the upper one sided 95% confidence level is 0.261 WT%/Day. This measured value is less than the Technical Specification limit of 0.75 La, (Where La= 0.80 weight percent of contained mass per 24 hours), which is equivalent to 0.60 weight percent of contained mass per 24 hours.

Verification of Instrumentation Sensitivity

Section III.A.3 (b) of Appendix J to 10 CFR 50 requires that the accuracy of the Type A Test shall be verified by a supplemental test. The Pumpback Method of verification was selected. In this method, a known quantity (mass) of air is metered into the containment and is compared with the change in the calculated weight of air. The required accuracy between the metered quantity and the calculated quantity is specified in Appendix J to be $\pm$ .25 La.

The quantity metered back was selected to be approximately equivalent to the allowable leakage rate of 0.60 WT%/Day. The actual quantity metered was 610 FT^3. At 57 psig feed pressure and 60° F, which is equivalent to 227.1 pounds mass, the air charge required 8 minutes and 5 seconds to complete.

The average of five calculated values of mass of air prior to the charge was 74621.2 lbs. The average of five calculated values of mass of air following the charge was 74855.4 lbs. During the 60 minute elapsed time between before and after average measurements at the measured leakage rate of 6.104 lbm/hr, 6.1 lbs was assumed to leak during the pump back test.

The balance is as follows:

Mass following air charge	74855.4
Mass prior to charge	74621.2
Difference	234.2
"Normal Leakage"	6.1
Total Difference	240.3

The comparison to the actual charge of 227.1 lbs is:

240.3 - 227.1 = 13.2 lbs. difference

The allowable Supplement Test error of .25 La = 149.55 lbs.

The 13.2 lbs in the 1980 Supplement Test was well within the accuracy limits specified in Appendix J.

PRIMARY CONTAINMENT LEAKAGE RATE DATA SHEET

(TYPE A)

TABLE 1980 - A

Time (Min)	Contained Mass (pounds)	Pressure "Hg	Temp. °F	Time (Min)	Contained Mass (pounds)	Pressure "Hg	Temp. °F
1300 *	74780	119.864	85.2	1630	74750	119.898	85.8
1310	74773	119.865	85.3	1640	74750	119.898	85.8
1320	74774	119.866	85.3	1650	74749	119.898	85.8
1330	74768	119.868	85.4	1700	74749	119.898	85.8
1340	74769	119.870	85.4	1710	74748	119.898	85.8
1350	74770	119.872	85.4	1720	74748	119.896	85.8
1400	74764	119.873	85.5	1730	74747	119.895	85.8
1410	74765	119.876	85.5	1740	74748	119.896	85.8
1420	74766	119.877	85.5	1750	74740	119.896	85.9
1430	74768	119.881	85.5	1800	74741	119.898	85.9
1440	74770	119.883	85.5	1810	74742	119.899	85.9
1450	74763	119.884	85.6	1820	74743	119.900	85.9
1500	74764	119.884	85.6	1830	74743	119.900	85.9
1510	74765	119.887	85.6	1840	74743	119.901	85.9
1520	74764	119.887	85.6	1850	74737	119.902	86.0
1530	74766	119.889	85.6	1900	74737	119.903	86.0
1540	74767	119.891	85.7	1910	74737	119.903	86.0
1550	74755	119.894	85.7	1920	74737	119.903	86.0
1600	74761	119.894	85.7	1930	74738	119.904	86.0
1610	74756	119.896	85.7	1940	74732	119.905	86.1
1620	74749	119.897	85.8	1950	74733	119.906	86.1

* Start of 24 hour test

Test Asst. C Kelleher 12/20/80

Date 12/20/80

Approved B R Wilson

Test Coordinator

VYOPF 4029.04
Original

PRIMARY CONTAINMENT LEAKAGE RATE DATA SHEET

(TYPE A)

TABLE 1980 - A

Time (Min)	Contained Mass (pounds)	Pressure "Hg	Temp. °F	Time (Min)	Contained Mass (pounds)	Pressure "Hg	Temp. °F
2000	74733	119.907	86.1	2330	74718	119.905	86.3
2010	74732	119.907	86.1	2340	74712	119.905	86.4
2020	74734	119.908	86.1	2350	74712	119.905	86.4
2030	74733	119.907	86.1	2400	74710	119.903	86.4
2040	74732	119.907	86.2	2410	74709	119.901	86.4
2050	74733	119.907	86.1	2420	74708	119.899	86.4
2100	74726	119.907	86.2	2430	74708	119.899	86.4
2110	74726	119.907	86.2	2440	74708	119.899	86.4
2120	74726	119.907	86.2	2450	74708	119.899	86.4
2130	74726	119.907	86.2	0100	74708	119.899	86.4
2140	74726	119.907	86.2	0110	74700	119.898	86.5
2150	74728	119.907	86.2	0120	74700	119.898	86.5
2200	74726	119.907	86.2	0130	74701	119.899	86.5
2210	74719	119.907	86.3	0140	74700	119.899	86.5
2220	74719	119.907	86.3	0150	74700	119.899	86.5
2230	74718	119.906	86.3	0200	74701	119.899	86.5
2240	74718	119.906	86.3	0210	74701	119.900	86.5
2250	74718	119.906	86.3	0220	74702	119.901	86.5
2300	74718	119.905	86.3	0230	74702	119.901	86.5
2310	74719	119.905	86.3	0240	74701	119.900	86.5
2320	74719	119.905	86.3	0250	74701	119.900	86.5

Test Asst. C Kelleher 12/20/80

Date 12/20/80 - 12/21/80

Approved B R Webber

Test Coordinator

VYOPF 4029.04
Original

PRIMARY CONTAINMENT LEAKAGE RATE DATA SHEET

(TYPE A)

TABLE 1980-A

Time (Min)	Contained Mass (pounds)	Pressure "Hg	Temp. °F	Time (Min)	Contained Mass (pounds)	Pressure "Hg	Temp. °F
0300	74701	119.899	86.5	0630	74677	119.883	86.8
0310	74694	119.899	86.6	0640	74677	119.881	86.8
0320	74700	119.897	86.5	0650	74675	119.878	86.9
0330	74699	119.896	86.5	0700	74668	119.878	86.9
0340	74698	119.895	86.6	0710	74666	119.876	86.9
0350	74691	119.894	86.6	0720	74665	119.874	86.9
0400	74690	119.893	86.6	0730	74664	119.873	86.9
0410	74691	119.893	86.6	0740	74663	119.871	86.9
0420	74690	119.892	86.6	0750	74662	119.869	86.9
0430	74690	119.892	86.6	0800	74660	119.867	86.9
0440	74691	119.892	86.7	0810	74660	119.866	86.9
0450	74683	119.892	86.7	0820	74659	119.865	86.9
0500	74683	119.892	86.7	0830	74665	119.863	86.9
0510	74690	119.891	86.7	0840	74665	119.863	86.9
0520	74689	119.890	86.7	0850	74663	119.861	86.9
0530	74682	119.890	86.8	0900	74663	119.860	86.9
0540	74682	119.889	86.8	0910	74662	119.859	86.9
0550	74681	119.888	86.8	0920	74659	119.853	87.0
0600	74679	119.886	86.8	0930	74647	119.846	87.0
0610	74679	119.885	86.8	0940	74650	119.840	86.9
0620	74678	119.883	86.8	0950	74649	119.838	86.9

Test Asst. C Kelleher 12/21/80

Date 12/21/80

Approved B R Weber

Test Coordinator

VYOPF 4029.04
Original

PRIMARY CONTAINMENT LEAKAGE RATE DATA SHEET

(TYPE A)

TABLE 1980-A

Time (Min)	Contained Mass (pounds)	Pressure "Hg	Temp. °F	Time (Min)	Contained Mass (pounds)	Pressure "Hg	Temp. °F
1000	74645	119.831	86.9	1330	74626	119.835	87.0
1010	74643	119.829	86.9	1340	74627	119.838	87.1
1020	74637	119.828	86.9	1350	74619	119.837	87.1
1030	74635	119.826	86.9	1400	74619	119.837	87.1
1040	74634	119.825	86.9	1410	74620	119.839	87.1
1050	74633	119.824	86.9	1420	74621	119.840	87.1
1100	74632	119.822	86.9	1430 **	74721	120.013	87.2
1110	74632	119.823	86.9	1440	74858	120.255	87.3
1120	74625	119.823	87.0	1450	74860	120.246	87.2
1130	74625	119.823	87.0	1500	74853	120.245	87.2
1140	74626	119.823	87.0	1510	74853	120.245	87.2
1150	74625	119.823	87.0	1520	74853	120.245	87.2
1200	74627	119.825	87.0	1530	74853	120.245	87.2
1210	74627	119.826	87.0	1540			
1220	74629	119.829	87.0	1550			
1230	74629	119.829	87.0	1600			
1240	74629	119.830	87.0	1610			
1250	74629	119.830	87.0	1620			
1300 *	74630	119.831	87.0	1630			
1310	74631	119.833	87.0	1640			
1320	74625	119.834	87.0	1650			

Test Asst. C Kellahea 12/21/80

Date 12/21/80

Approved B B. Wilbur

Test Coordinator

*End of 24 hour test

**Supplemental Test Pump back completed at 1433

VYOPF 4029.04
Original

AIR SUPPLY SCHEMATIC

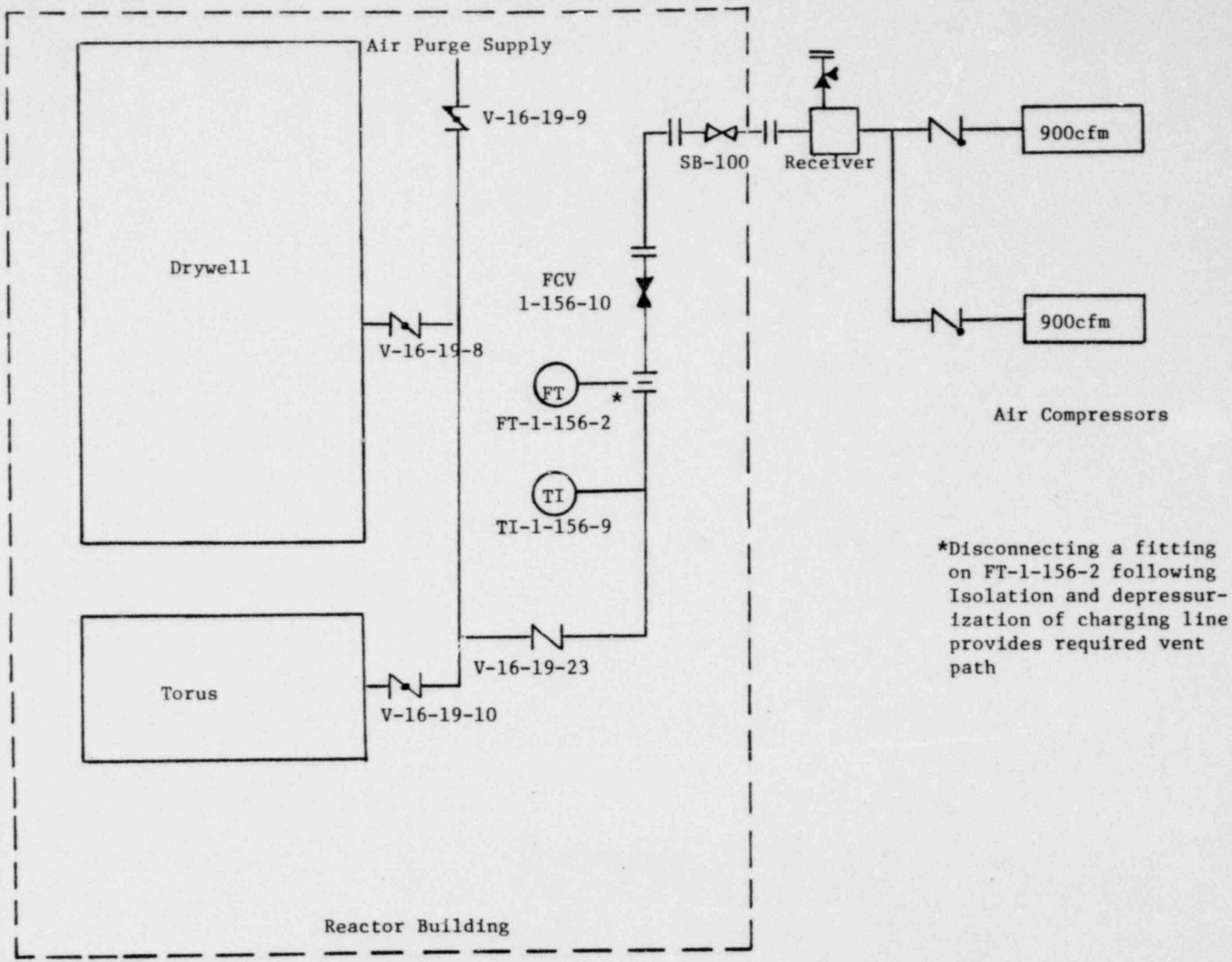


Figure I

FIGURE II

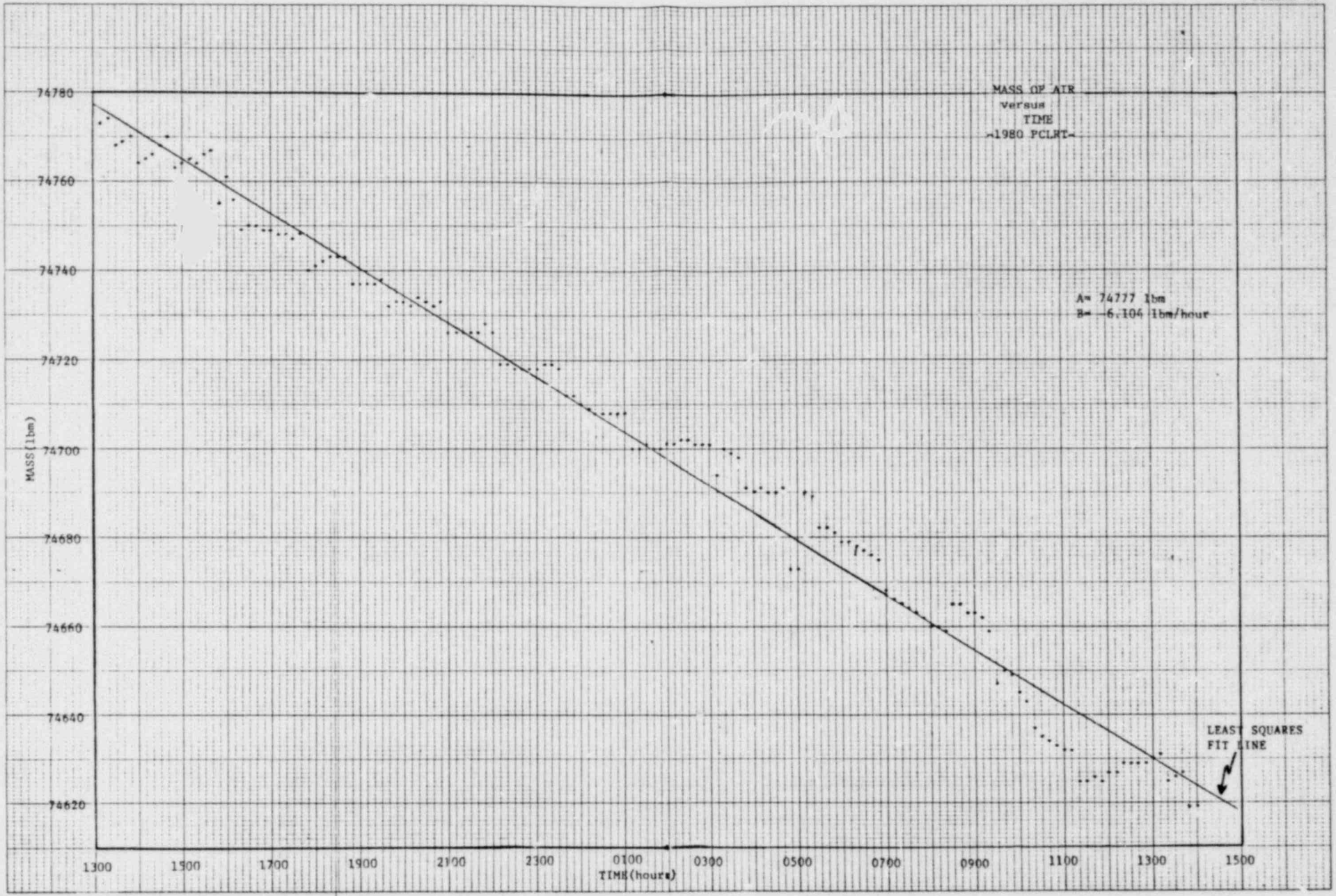
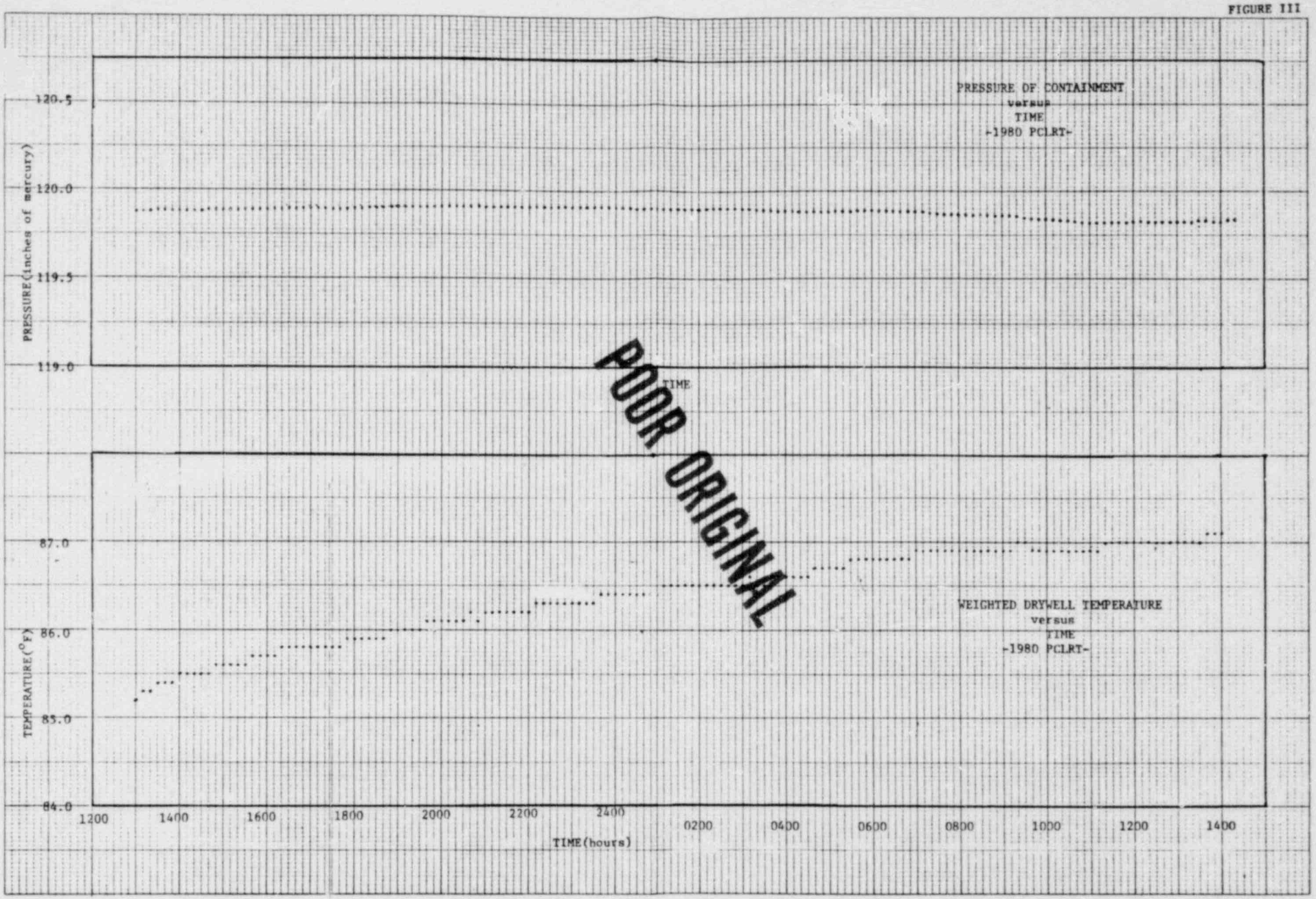

MASS OF AIR
Versus
TIME
-1980 PCLRT-
A= 74777 lbm
B= -6.104 lbm/hour
LEAST SQUARES
FIT LINE
MASS (lbm)
74780
74760
74740
74720
74700
74680
74660
74640
74620
1300
1500
1700
1900
2100
2300
0100
0300
0500
0700
0900
1100
1300
1500
TIME(hours)

FIGURE III



1980 TYPE B AND C TESTING

Introductory Description of Testing

During the 1980 Refueling Outage, Type B and C primary containment leak rate testing was conducted in accordance with 10 CFR 50 Appendix J. Type B leakage tests were performed on containment penetrations utilizing gasketed seals prior to being opened. This provided accurate as-found leakage data from the previous operating cycle. After each containment penetration closeout, a Type B leak test was again performed. This leakage data was combined with all measured leakages of the various containment isolation valves as a baseline for the upcoming operating cycle. The summary test results for Type B gasketed seals is presented in Table 80-B.

Type C leakage tests were also conducted in accordance with 10 CFR 50 Appendix J, on containment isolation valves. Four types of leakage tests were used, 1.) the water leakage method, 2.) the pressure drop method, 3.) the pressure buildup method, and 4.) the in-leakage test method. All valves that were found to have leakage rates in excess of that allowed by the Technical Specifications were reported to the Director of the Office of Inspection and Enforcement, Region I, in two thirty-day licensee event reports, LER 80-39/3L and LER 80-43/3L. Following disassembly, repair, and retesting, a satisfactory leakage rate was demonstrated. The summary for Type C valves is presented in Table 80-C.

Penetrations That Exceeded the Type B Leakage Criteria

On October 10, 1980, TIP Penetration Flange X-35A was leak rate tested and the test volume could not be pressurized. Disassembly of the double-gasketed flange revealed the inner O-ring to be deformed. Primary containment isolation was maintained due to the integrity of the outer O-ring seal. The O-ring seals were replaced, and the leakage between the seals was verified to be 0.0 lbm/hr. on October 16, 1980.

Valves That Exceeded the Leakage Criteria

1. Tech. Spec. Isolation Valves

During the 1980 refueling outage, three primary containment isolation valves were found to have seat leakages in excess of that permitted by the Technical Specifications. On all valves found to have leakage greater than that allowed, a second valve on the same line provided the proper primary containment isolation capability. The three valves and their "as-found" leakage rates are as follows:

Valve Description	As-Found Leakage Rate	Date of Event
V-16-20-20 (Containment Purge Makeup Isolation Valve)	Indeterminable	9/29/80
LRW-83 (Drywell Floor Drain)	Indeterminable	9/30/80
RCIC-15 (RCIC Steam Supply)	1.531 lbm/hr.	12/20/80

Testing, repair, and retest details for the valves found to have excessive seat leakage are described below:

a. Containment Purge Makeup Isolation Valve

On September 29, 1980, the Containment Purge Makeup Isolation Valve V16-20-20 was leak rate tested and the test volume could not be pressurized.

Disassembly and inspection of the valve revealed that there was dirt under the valve seat. The valve internals were cleaned and the valve reassembled. Following this maintenance, the leakage past the seat was verified to be $\leq$ 0,014 lbm/hr. V16-20-20 is an Aktomatic 1" 300 lb. gate valve.

b. Drywell Floor Drain

On September 30, 1980, the Drywell Floor Drain Valve LRW-83 was leak rate tested and the test volume could not be pressurized. Disassembly and inspection revealed the valve internals to be dirty. The valve internals were cleaned and the valve reassembled. Following this maintenance, the leakage past the seat was verified to be 0.234 lbm/hr on October 2, 1980. LRW-83 is a Walworth 3" 300 lb. gate valve.

c. RCIC Steam Supply

On December 20, 1980, the RCIC Steam Supply Valve RCIC-15 was retested during the Type A test after the RCIC-16 valve had been repacked. The leakage rate was determined to be greater than that allowed by the Technical Specifications. Disassembly and inspection of the valve revealed seating surfaces which required smoothing. The valve disk and seat were lapped and the leakage past the repaired valve was verified to be 0.112 lbm/hr. on December 23, 1980. RCIC-15 is a Walworth 3' 900 lb. gate valve.

2. Other Isolation Valves

a. CAD Vent

On September 30, 1980, the CAD Vent Valve VG-22B was leak rate tested and the test volume could not be pressurized. The plug and seat were lapped and the valve reassembled. Following this maintenance, the leakage past the seat was verified to be < 0.022 lbm/hr on October 2, 1980. VG-22B is a Crane-Flowmatics 1" 150 lb. globe valve.

b. On September 30, 1980, the Radiation Monitor Return Valve VG-76A was leak tested and the test volume could not be pressurized. The disk assembly was replaced and the actuator mechanism was cleaned. Following this maintenance, the leakage past the seat was verified to be 0.089 lbm/hr. on October 2, 1980. During the test period, VG-76A was listed in Technical Specifications Table 4.7.2.b as a primary containment isolation valve not subject to Type C leakage test. Subsequently, an ammendment to the Technical Specifications requires that a Type C leakage test be performed.

Quantative Calculations of Technical Specifications Limits

1. The combined leak rate of all penetrations and valves subject to Type B and C tests shall be less than 0.60 La. Sixty (60) percent of La = 354 lbm/day.

2. The leakage from any one isolation valve shall not exceed 5% of Ltm. Five (5) percent of Ltm = 0.522 lbm/hr.

3. The leakage from any one main steam line isolation valve shall not exceed 11.5 SCFH at 24 PSIG (Pt).

General Conclusion

Based on the successful completion of the Type A, B, and C leak rate test programs, along with the corrective action taken as a result of the test data, it is concluded that the condition of the Primary Containment System is acceptable for continued plant operation. The plant was returned to service with a containment leakage of less than 0.261 WT%/Day. This compares to the allowed leakage of 0.600 WT%/Day.

Table 80-B Summary Test Results for Type B Testing

PENETRATION NUMBER	DESCRIPTION	LEAKAGE (LBM/HR) INITIAL	RETEST
X-2	Personnel Lock	0.430	
	Bellows Seals		
X-7A	Main Steam Line A	0	
X-7B	Main Steam Line B	0	
X-7C	Main Steam Line C	0	
X-7D	Main Steam Line D	0	
X-9A	Feedwater A	0	
X-9B	Feedwater A	0	
X-11	HPCI Steam Line	0	
X-12	RHR Suction	0	
X-13A	RHR Return A	0	
X-13B	RHR Return B	0	
X-14	Cleanup Suction	0	
X-16A	Core Spray A	0	
X-16B	Core Spray B	0	
	Electrical Penetrations		
100A	Electrical Penetration	0	
100B	Electrical Penetration	0	
100C	Electrical Penetration	0	
100D	Electrical Penetration	0	
101A	Electrical Penetration	0.2987	0.00056
101C	Electrical Penetration	0	
101D	Electrical Penetration	0	
101D	Electrical Penetration	0	
102	Electrical Penetration	0	
103	Electrical Penetration	0.0028	

Table 80-B (cont'd) Summary Test Results for Type B Testing

PENETRATION NUMBER	DESCRIPTION	LEAKAGE (LBM/HR) INITIAL	RETEST
104A	Electrical Penetration	0	
104B	Electrical Penetration	0.0014	
104C	Electrical Penetration	0	
104C	Electrical Penetration	0	
105A	Electrical Penetration	0	
105B	Electrical Penetration	0	
105C	Electrical Penetration	0	
105D	Electrical Penetration	0	
214	Electrical Penetration	0	
	NW Torus Manway Electrical Connectors	0.00014	
	Double Gasketed Seals		
X-1	Equipment Hatch	0.00087	
X-4	Drywell Head Access Hatch	0.0000085	
X-6	Control Rod Drive Removal Hatch	0.000036	0.000045
X-200A	Torus Access Hatch	0	0.000030
X-200B	Torus Access Hatch	0	0
VBC-A	Vacuum Breaker Access Cover	0	0
VBC-B	Vacuum Breaker Access Cover	0.00009	0.000019
VBC-C	Vacuum Breaker Access Cover	0.000047	0.000028
VBC-D	Vacuum Breaker Access Cover	0	0.000076
VBC-E	Vacuum Breaker Access Cover	0.00038	0.000019
VBC-F	Vacuum Breaker Access Cover	0.00017	0.000038
VBC-G	Vacuum Breaker Access Cover	0	0.000019
VBC-H	Vacuum Breaker Access Cover	0	0.000019
VBC-I	Vacuum Breaker Access Cover	0.000038	0.0
VBC-J	Vacuum Breaker Access Cover	0	0.000047

Table 80-B (cont'd) Summary Test Results for Type B Testing

PENETRATION NUMBER	DESCRIPTION	LEAKAGE (LBM/HR) INITIAL	RETEST
VBSL-A	Vacuum Breaker Shaft Left	0.0000084	
VBSR-A	Vacuum Breaker Shaft Right	0.000034	
VBSL-B	Vacuum Breaker Shaft Left	0	
VBSR-B	Vacuum Breaker Shaft Right	0.000042	
VBSL-C	Vacuum Breaker Shaft Left	0.0000084	
VBSR-C	Vacuum Breaker Shaft Right	0	
VBSL-D	Vacuum Breaker Shaft Left	0.000084	
VBSR-D	Vacuum Breaker Shaft Right	0	
VBSL-E	Vacuum Breaker Shaft Left	0	
VBSR-E	Vacuum Breaker Shaft Right	0.0000084	
VBSL-F	Vacuum Breaker Shaft Left	0.00021	
VBSR-F	Vacuum Breaker Shaft Right	0.0000084	
VBSL-G	Vacuum Breaker Shaft Left	0	
VBSR-G	Vacuum Breaker Shaft Right	0.0000084	
VBSL-H	Vacuum Breaker Shaft Left	0	
VBSR-H	Vacuum Breaker Shaft Right	0.0000084	
VBSL-I	Vacuum Breaker Shaft Left	0.0000084	
VBSR-I	Vacuum Breaker Shaft Right	0	
VBSL-J	Vacuum Breaker Shaft Left	0	
VBSR-J	Vacuum Breaker Shaft Right	0	
SLH-A	Shear Lug Access Cover	0.00037	
SLH-B	Shear Lug Access Cover	0	
SLH-C	Shear Lug Access Cover	0.000010	
SLH-D	Shear Lug Access Cover	0	
SLH-E	Shear Lug Access Cover	0.00029	
SLH-F	Shear Lug Access Cover	0.00010	
SLH-G	Shear Lug Access Cover	0.000015	
SLH-H	Shear Lug Access Cover	0.000022	
---	Drywell Head Flange	0.0323	0.0027
X-213-A	Torus Drain	0.000004	0.000004
X-213-B	Tour Drain	0.000011	0
X-35A	TIP Penetration Flange	Could not Pressurize	0
X-35B	TIP Penetration Flange	0	
X-35C	TIP Penetration Flange	0	
X-35E	TIP Penetration Flange	0	
	Total B Penetration Leakage After Repairs	0.4399827 lbm/hr	

Summary Test Results for Type C Testing

Table 80-C

VALVE(S) TESTED	DESCRIPTION	LEAKAGE (LBM/HR) INITIAL	RETEST
MS-77	Main Steam Drain	0.113	
RV39 & 40	Recirc. Sample	<0.022	
RHR-57	RHR Disch.to Radwaste	0.009	
LRW-83	Drywell Floor Drain	Could Not Pressurize	0.234
LRW-95	Drywell Equip.Drain	0.207	
SB-16-19-8,9,10 & 23	Containment Purge	0	
SB-16-19-11A & 12A	Vacuum Relief	0	
SB-16-19-11B & 12B	Vacuum Relief	0.009	
SB-16-19-6,7,6A,6B,7A&7B	Containment Exhaust	0.433	
RCU-18	Reactor Cleanup	0.022	<0.003
V-16-20-20	Containment Purge Makeup	Could not pressurize	≤0.014
V-16-20-22A	Containment Purge Makeup	0.053	
V-16-20-22B	Containment Purge Makeup	0.015	
RCU-68	Reactor Cleanup	0.231	
HPCI-16	HPCI Steam Supply	0.015	
RCIC-16	RCIC Steam Supply	0.888	0.112
CA-38A	Cont.Air Compressor	<0.022	
CA-38B	Cont.Air Compressor Suction	<0.022	
CA-89B	Cont. Air Check Valve	0.458	0.404
CA-89C	Cont.Air Check Valve	0.089	0.390
NG 13A & 13B	CAD Injection	<0.015	
NG 12A & 12B	CAD Injection	<0.015	
NG 11A & 11B	CAD Injection	0.266	
VG-9A	CAD Vent	<0.022	
VG-22A	CAD Vent	<0.022	
VG-9B	CAD Vent	0.056	

Table 80-C (cont'd) Summary Test Results for Type C Testing

VALVE(S) TESTED	DESCRIPTION	LEAKAGE (LBM/HR) INITIAL	RETEST
VG-22B	CAD Vent	Could not pressurize	< 0.022
VG-23	CAD Rad. Mon. Supply	< 0.022	
VG-26	CAD Rad. Non. Supply	< 0.022	
VG-76A	Rad. Mon. Return	Could not pressurize	0.089
VG-76B	Rad. Mon. Return	<0.015	
CRD-181	CRD Return Check Valve	0.231	
MS-74	Main Steam Drain	<0.023	
HPCI-15	HPCI Steam Supply	<0.015	
RCIC-15	RCIC Steam Supply	0.112	0.112
RCU-15	Reactor cleanup	0	0.439
LRW-82	Drywell Dloor Drain	0.037	
LRW-94	Drywell Equipment Drain	0.015	
RHR-66	RHR Discharge to Radwaste	0.045	

Total Type C Leakage Following Repairs 3.791 lbm/hr

Total Type B & C Leakage Following Repairs 4.231 lbm/hr

VALVE(S) TESTED	DESCRIPTION	LEAKAGE (SCFH) INITIAL	RETEST
MS80A	A Main Steam Line	1.64	
MS86A	A Main Steam Line	4.95	
MS80B	B Main Steam Line	2.03	
MS86B	B Main Steam Line	1.98	
MS80C	C Main Steam Line	0	
MS86C	C Main Steam Line	7.29	
MS80D	D Main Steam Line	0.44	
MS86D	D Main Steam Line	7.55	